

## **APPENDIX D**

### **Documentation of Case Studies**

## FINAL CASE STUDY DOCUMENTATION

Title	AR 215, Ozark National Forest, AR
Location	AR 215 from Cass to Ozark in the Ozark National Forest (US Forest Hwy 65), NW Arkansas' Franklin and Johnson Cos.
Lead Agency	Arkansas State Highway and Transportation Department
Contact Person	Claude Klinck, PE
Phase Completed	Construction
Purpose and Need	Inadequate roadway for current and anticipated traffic – travel lane too narrow, surface rough (gravel), and unnecessary amount of dust and siltation produced, detracting from the personal experience and water quality of the streams and river.

### CSS Qualities

- ◆ Project team (make up)  
The project team included: engineers, planners, and environmentalists.
- ◆ Stakeholders (make up, utilization, interaction)  
The major stakeholders included: US Forest Service, National Park Service, US Army Corps of Engineers, Arkansas Natural Heritage Commission, Arkansas Dept. of Environmental Quality and Arkansas Natural and Scenic River Commission.
- ◆ Public involvement (types, documentation)  
One-on-one and small group meetings were held throughout the process with the major stakeholders.
- ◆ Design solution (process, modes and alternatives examined)  
Roadway geometric and natural materials were brought together. Some built features were made possible by using special geotechnical design methods and materials that are not seen. The design maintains the visual quality of the viewscape from the Mulberry River and provides scenic overlooks of the forest and the river for the roadway traveler.
- ◆ CSS concepts by project phase  
CSS was practiced from planning through construction.
- ◆ Lessons learned  
The final design solution required addressing design speed flexibly in order to meet U.S. Forest Service requirements to limit the project footprint. The agency learned a greater appreciation for aesthetics within the context of a natural forest environment.

Note: this is considered a CSS legacy project with the first two of five segments being constructed by late 1998. The Arkansas highway agency had the planning and design responsibility for these first segments and it was their first full-fledged experience with CSS practices.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	3.0

Seek broad-based public involvement	3.0
Use full range of communication methods	2.0
Achieve consensus on purpose and need	3.0
Utilize full range of design choices	2.7
Address alternatives and all modes	3.0
Maintain environmental harmony	3.7
Address community & social issues	3.0
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.0
Track and meet all commitments	3.0
Create a lasting value for the community	3.0
Use all resources effectively (time & budget)	2.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The project team strongly pursued several CSS principles including: Use of interdisciplinary teams; Maintain environmental harmony; Address aesthetic treatments & enhancements; and Consider a safe facility for users & community. It should be noted that the project has a rural forest setting that lacks an abundance of nearby residents.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.0
Increased stakeholder/public participation compared to other projects	NA	3.0
Increased stakeholder/public participation	3.0	2.3
Increased stakeholder/public ownership	3.0	3.0
Increased stakeholder/public trust	3.0	3.0
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	3.0
Improved predictability of project delivery	2.0	3.0
Improved project scoping	NA	3.0
Improved project budgeting	NA	3.0

Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.0
Improved opportunities for joint use and development	3.0	2.3
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.0
Minimized overall impact to human environment	4.0	3.7
Minimized overall impact to natural environment	4.0	3.7
Improved mobility for all users	4.0	3.0
Improved walkability	4.0	2.0
Improved bikeability	4.0	2.0
Improved safety (vehicles, pedestrians, and bikes)	4.0	3.7
Improved multi-modal options	--	2.7
Improved community satisfaction	4.0	3.0
Improved quality of life for community	4.0	3.0
Fit with local government land use plan	3.0	4.0
Improved speed management	3.0	3.0
Design features appropriate to context	4.0	3.0
Optimized maintenance and operations	NA	3.0
Minimized disruption	3.0	2.3
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The project team tended to strongly agree that several benefits accrued including: Fit with local government land use plan; Minimized overall impact to human environment; Minimized overall impact to natural environment; and Improved safety (vehicles, pedestrians, and bikes). It must be noted that a few benefits certainly did not accrue, mainly due to the unique nature of this project. The local government (county official) stakeholder responding indicated strongly that several benefits accrued: Minimized overall impact to human environment; Minimized overall impact to natural environment; Improved mobility for all users; Improved quality of life for community; and Design features appropriate to context. This early CSS project with its unique features and setting has been recognized as a success by the agency and the several stakeholders. Information from an earlier detailed case study involving direct interviews with agency and primary stakeholder personnel was also available to researchers.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.0
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	3.0	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.0	NA
My relationship with the stakeholders was best described as	NA	2.3
My relationship with the interested public was best described as	NA	1.7

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

There was significant agreement between stakeholder and team member responses indicating satisfaction regarding the relationships. Contrary to the typical Arnstein gap, this project had the stakeholder response (We established a partnership) exceed the team member response (We established a consultation relationship) in terms of the level of the relationship achieved.

#### Case Summary

- ◆ Major benefits

The Arkansas Route 215 project in the Ozark National Forest exemplifies the CSS principle -- achieve consensus on purpose and need. Providing for travel improvement and access to camping and other recreation opportunities while keeping the roadway foot print to a minimum was agreed upon. The consensus was achieved through a series of one-on-one conversations and group meetings involving the state DOT's divisional staffs, the US Forest Service, and the Water Quality and Scenic Preservation agencies beginning in the planning stage and continuing into the design stage. This desired minimalist approach took a bit of trial and error to achieve an acceptable design solution which included acceptable cross-section and geometrics that was sensitive to view sheds from the roadway and from the adjacent Mulberry River.

The Arkansas project also exemplifies the CSS principle – maintain environmental harmony. Extraordinary steps were taken in the design of Route 215 to ensure that the project was in harmony with the environment. The footprint was minimized with a curb and gutter design and the road generally follows the centerline of its gravel predecessor with a minimum of new cuts and fills. Attention was given to protecting the viewshed from the Mulberry River for canoeists and rafters while an overlook was provided for the motorists of the river valley. Natural stone from the area was used for retaining walls and for the stone veneer on the overlook walls.

- ◆ Lessons learned

The final design solution required addressing design speed flexibly in order to meet U.S. Forest Service requirements to limit the project footprint. The agency learned a greater appreciation for aesthetics within the context of a natural forest environment.

- ◆ Overall level of success

The local and resource agency stakeholders have expressed satisfaction in the level of success achieved by the Arkansas highway agency in planning and designing this unique CSS project.



## FINAL CASE STUDY DOCUMENTATION

Title	SR 179 Reconstruction
Location	Sedona, Coconino Counties, Arizona
Lead Agency	Arizona DOT (ADOT)
Contact Person	Jennifer Livingston Toth, DMJM Harris Consultants
Phase completed	Design/PS&E – Construction is nearly complete on Phase 1 (of 2 Phases)
Purpose and Need	The purpose of this project was to reconstruct SR 179 in the Sedona, AZ area to improve safety and mobility while preserving the scenic, aesthetic, historic, environmental and community values.

### CSS Qualities

- ◆ Project Team (make up)  
The ADOT staff included officials from various agency divisions including, planning, environmental, design and construction. The Arizona DOT established three teams: 1) a Public Outreach Team (ADOT officials, stakeholder representatives and public involvement consultants working as part of the Project Team), 2) a Project Team (ADOT officials and planning & design consultants) and 3) an Executive Team (ADOT officials charged with overall planning & design oversight along with participants/representatives from the public and 6 other stakeholder groups). In addition to these, four design advisory panels were created to provide input to Segment Concept Design. These panels included ADOT staff and consultants along with selected stakeholders for each project segment. Arizona DOT also provided speakers to address stakeholders and the public about transportation issues that impacted project decision making.
- ◆ Stakeholders (make up, utilization, interaction).  
In addition to the Arizona DOT and FHWA, the stakeholder groups included the Big Park Regional Coordinating Council, Yavapai County, Coconino National Forest, City of Sedona and Coconino County. Those stakeholders worked cooperatively with the Arizona DOT on Executive, Public Outreach and Project Management Teams and on the Segment Concept Design panels. As a consequence there was close cooperation and involvement with Arizona DOT in the early phases of project development. Stakeholder initiatives including grants were an outgrowth of this interaction/cooperation.
- ◆ Public involvement (types, documentation)  
A wide variety of communication methods have been used in all phases of the project to interface with the general public through construction. Those included: community interviews, charrettes, focus group meetings, information booths, educational forums, informal meetings, newsletters, news releases to public media, a website, a safety inspection vehicle (during construction), a telephone hotline and a project office staffed by ADOT personnel that was available to the public.
- ◆ Design solution (process, modes and alternatives examined).  
The stakeholders and public input indicated the need to stress preservation on this project while providing a safer road that minimized congestion problems. A divided two-lane road was employed with roundabouts and separate left turn lanes at full median openings. Shoulders are provided for breakdowns. A raised median is provided that limits access at driveways. The project footprint is minimized to prevent intrusion into scenic areas adjacent to the roadway. Multi-modal accommodation was

included for pedestrians (full-length sidewalks), bikers (road shoulders) and buses (transit stops).

- ◆ **CSS concepts by project phase**  
A multidisciplinary process was employed throughout project development. It included extensive and iterative public/stakeholder feedback on Arizona DOT proposals to shape the preferred alternative. This approach was continued in both project design and construction.
- ◆ **Lessons learned**  

Communication Communication in the early stage of project development (Scoping) was important in establishing/building public trust. ADOT found it worthwhile to repeat public/stakeholder input at meetings to ensure that all facets of that input were fully understood by the Public Outreach Team.

Public and Stakeholder Input Extensive efforts have been made throughout the project to obtain substantial agreement on the project design. ADOT staff was gratified with level of public input in identifying concerns and the degree of cooperation with other stakeholder agencies. They considered it important to retain some flexibility in developing the project within the agreed upon design. Proper documentation of project decisions was a key factor.

Project Development Process When the public and stakeholders accepted the ADOT project development process, they became accepting of the decisions that resulted from the process. This was aided by the desire of the impacted communities to have input in project decisions. Oversight by a strong project manager was considered vital to project success. Decisions made by design and construction had to be based on agreements derived during planning.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.6
Involve stakeholders	3.7
Seek broad-based public involvement	3.9
Use full range of communication methods	3.9
Achieve consensus on purpose and need	3.2
Utilize full range of design choices	3.6
Address alternatives and all modes	3.6
Maintain environmental harmony	3.5
Address community & social issues	3.6
Address aesthetic treatments & enhancements	3.5
Consider a safe facility for users & community	3.6
Document project decisions	3.6
Track and meet all commitments	3.3
Create a lasting value for the community	3.4
Use all resources effectively (time & budget)	2.8

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective  
There were 15 respondents that were considered as team members, including responses of two persons identified as team leaders. The project team indicated that in general all principles were present except "Use all resources effectively (time and budget)" with a score of 2.8.

The project used interdisciplinary agency/stakeholder teams that addressed all anticipated (required) areas and it seemed to have worked well. Team member survey responses were received from team members who identified themselves as planning engineers, design engineers, landscape architects, public relations specialists, safety engineers, environmental scientists, project managers, right of way specialists, forest managers, and elected officials. All were involved in the planning phase of the project and some were involved in project design and construction as well. Two members were involved in all phases of the project. Approximately three-quarters of the respondents were new to CSS with 0-3 years of experience, while a few had a longer experience (over 4 years). Finally, most team members had more than 10 years of relevant experience.

On the issue of using all resources effectively, some team members were concerned about the costs and time requirements for developing the project and several thought the project was expensive and would not provide sufficient mobility in the future.

On the positive side, there are three principles that the team was in agreement that were highly met. These include the "Involve stakeholders" (3.7), "See Broad-based Public Involvement" (3.9) and "Use a Full Range of Communication Tools" (3.9). These ratings were in agreement with some of the Team survey comments. In particular, the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed. Other principle ratings ranged from 3.2 to 3.6 with 8 being 3.5 or above.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation	NA	3.7
Increased stakeholder/public participation	2.8	3.3
Increased stakeholder/public ownership	2.6	3.3
Increased stakeholder/public trust	2.4	3.3
Decreased costs for overall project delivery	NA	1.9
Decreased time for overall project delivery	NA	2.1
Improved predictability of project delivery	1.7	2.5
Improved project scoping	NA	3.3

Improved project budgeting	NA	2.3
Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.4
Improved opportunities for joint use and development	3.0	3.1
Improved sustainable decisions and investments	NA	2.8
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	2.3	2.8
Minimized overall impact to natural environment	2.8	3.0
Improved mobility for all users	2.5	2.6
Improved walkability	3.2	3.3
Improved bikeability	3.3	3.4
Improved safety (vehicles, pedestrians, and bikes)	3.0	3.3
Improved multi-modal options	2.7	3.2
Improved community satisfaction	2.4	3.0
Improved quality of life for community	2.5	3.1
Fit with local government land use plan	2.5	3.2
Improved speed management	3.0	2.9
Design features appropriate to context	2.5	3.5
Optimized maintenance and operations	NA	2.7
Minimized disruption	1.7	2.7
Increased risk management and liability protection	NA	2.8

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits:

The benefit survey responses were relatively balanced (stakeholders-7; project team-15). The two groups agreed that “Increased opportunities for partnering or shared funding or in-kind resources”, “Improved opportunities for joint use development”, “Improved walkability”, “Improved bikeability” and “Improved safety (vehicles, pedestrians and bikes)” were benefits obtained in the project. Both groups agreed that benefits related to “Improved predictability of project delivery”, “Minimized overall impact to the human environment”, “Improved mobility for all users” and “Minimized disruption” were not achieved. The project team believed that benefits were realized related to “Increased stakeholder/public participation”, “Increased stakeholder/public ownership”, “Increased stakeholder/public trust”, “Improved project scoping”, “Improved multi-modal options”, “Improved community satisfaction”, “Improved quality of life for community”, “Fit with local government land use plan” and “Design features appropriate to the context”. However, the stakeholders disagreed about those. The stakeholders thought the project provided “Improved speed management” while the project team was in slight disagreement. The project team believed that the project provided “Improved stakeholder/public feedback”, “Improved stakeholder/public participation” and “Improved environmental stewardship”. They did not believe that it provided “Decreased costs for project delivery”, “Decreased time for project delivery”, “Improved predictability of project delivery”, “Improved budgeting”, “Improved

sustainable decisions or investments”, “Optimized maintenance and operations” or “Increased risk management and liability projection”.

Due to the pristine environment that was impacted, low stakeholder survey ratings could be anticipated. What is of interest on this project is that it has been successfully programmed and it is proceeding without any attempts to block it by litigation. Some dissatisfaction was noted from the project team as the road that is being built has fewer lanes for through traffic than the preferred alternative addressed in the project FONSI. The project team concurred that the public/stakeholders had been involved in the project development process and that the resulting project incorporated features appropriate to its context.

◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Major project meetings were documented during the project development process. Public/ stakeholder attendance for most meetings was good ranging from 200 for the “kick-off” meeting to 988 for the third charrette.
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	There were numerous agreements and special actions taken to mitigate environmental impacts. The project was in an very environmentally sensitive area from many aspects and only required a FONSI for environmental clearance.
Minimized overall impact to human environment	The 9-mile long project required only 1 personal relocation and 49 partial takings of personal property. There were 4 relocations of businesses/public property and 4 relocations.
Minimized overall impact to natural environment	

Improved mobility for all users	Nine miles of sidewalk was placed along the project. Nine miles of bike lanes were incorporated into the shoulders. Four bus routes were to be implemented.
Improved walkability	See above
Improved bikeability	See above
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	See above
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

- ◆ Other benefits  
As previously noted, this difficult project was enacted without significant public opposition. The project has garnered considerable national acclaim and positive media exposure for AZDOT.
- ◆ Arnstein comparison  
The following Arnstein comparison indicates greater project team satisfaction with the stakeholder/public involvement than the stakeholder group. There is a significant prior confrontational history with this project which may have resulted in the lower stakeholder scores.

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.8	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.4
I am satisfied with the relationship I had with the interested public	NA	3.1
I am satisfied with the procedures and methods that allowed input to project decisions	2.8	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.0	NA
My relationship with the stakeholders was best described as	NA	2.7
My relationship with the interested public was best described as	NA	2.6

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success

This project is a successful application of CSS. Neither the stakeholders nor the project team were totally gratified with the outcome, but both parties had to make significant compromises and in the end the project is proceeding. Whether it will result in the stakeholders' anticipated level of disruption or the project teams' concerns for future performance remains to be seen. In all likelihood the project will satisfy both parties and will serve the purpose for which it was intended.



One of eight roundabouts constructed (or to be constructed) on SR 179.

## FINAL CASE STUDY DOCUMENTATION

Title	Mandela Parkway Corridor Improvement
Location	Oakland, CA
Lead Agency	CALTRANS
Contact Person	Laurie Smith
Phase completed	Construction – In Plant Establishment for 2 more years.
Purpose and Need	Improve the Mandela Parkway

### CSS Qualities

- ◆ Project Team (make up)  
The Office of Landscape Architecture took the lead for this project and the other departments within Caltrans provided functional support – this included Civil, Hydraulics, Traffic, Highway Operations, Electrical, Environmental Engineering, Cultural Resources and Right of Way. Caltrans worked closely with the City of Oakland's Public Works Agency and the various impacted departments such as Parks and Recreation, Electrical, Traffic, ADA Commission, City Council. Representing the West Oakland neighborhood were three community members called the Landscape Subcommittee of the Community Advisory Board, who regularly attended meetings throughout the design process and still give their input. They are a prominent sculpture artist, a local realtor and a local property owner and longtime community activist. Caltrans also worked with the Oakland Fire department, AC Transit (Bus), the Oakland Housing Authority, the State Office of Historic Preservation, California Highway Patrol, East Bay Municipal Water District, Alameda County Congestion Management Agency and the West Oakland Commerce Association.
- ◆ Stakeholders (make up, utilization, interaction)  
See above for stakeholders. Usually, the meetings were in small groups to gather their input and support and product. There were also larger meetings, such as the regular meetings of the West Oakland Commerce Association
- ◆ Public involvement (types, documentation)  
There were numerous public meetings throughout the project initiation and design process to invite input and to show the design solutions.
- ◆ Design solution (process, modes and alternatives examined)  
Caltrans initially wanted to rebuild the freeway in the same alignment following the earthquake and collapse. The community strongly opposed this since the freeway viaduct had effectively divided the West Oakland neighborhood. In response, Caltrans realigned the freeway further west leaving Nelson Mandela Parkway as excess land. Then the process began on determining the development plans for the vacant land. Several ideas arose, including developing the land for housing and buildings, and turning it into a park for art and recreation. The parkway idea with collections of plants was settled on.
- ◆ CSS concepts  
West Oakland has the largest collection of intact Victorian houses in North America so the project's site furnishings, such as light fixtures, benches, drinking fountains and plantings fit in with that era's style.
- ◆ Lessons learned  
The results from the project team survey were used to provide a summary of the lesson learned. These are grouped in the following categories:

Communication: Early and continuous communication between Caltrans and City of Oakland resulted in a successful project. This was more important for this project, since it was eventually turned over to the City for maintenance and upkeep. The help provided by the City was viewed both as consulting (they facilitated the landscape subcommittee) and as team members (worked on designs and solutions) resulting in a project that was properly designed for its context.

Public and Stakeholder Input: Early involvement of the public resulted in designs that were more appropriate. Formation of relationships between Caltrans and the public as well as keeping the public informed were viewed as strong aspects of the project. Public interaction allowed for a focused attention to develop solutions. Involvement of stakeholders (the City and all other interested parties) from the earliest stage possible was viewed as a positive aspect of the process that had a positive effect in the development of the final project designs.

Project Development Process: Some members noted that the process may take longer but it resulted in a project that had more satisfied “customers”. More flexible designs were evaluated because the right of way was relinquished to the City. The project delivery schedule is important as to when and what type of CSS may be effective. It was noted that if CSS becomes an afterthought, then the project scope and schedule will still drive the process.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.6
Involve stakeholders	3.8
Seek broad-based public involvement	3.5
Use full range of communication methods	3.4
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.0
Address alternatives and all modes	3.1
Maintain environmental harmony	3.7
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.6
Consider a safe facility for users & community	3.9
Document project decisions	3.5
Track and meet all commitments	3.3
Create a lasting value for the community	3.8
Use all resources effectively (time & budget)	3.1

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3 agree; 2;disagree; and1: strongly disagree).

### Discussion on CSS principles

- ◆ Project team’s perspective

There were 19 respondents that were considered as team members, including the response of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principles with the lowest scores were “Utilize full range of design choices” (3.0), “Address alternatives and all modes” (3.1) and “Use all resources effectively” (3.1).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as design engineers, landscape architects, public relations specialists, construction engineers, environmental scientists, maintenance personnel, and project managers. All were involved in the design phase of the project and several were involved in project planning and construction as well. There were at least two members that were involved in all phases of the project. Approximately one-half of the respondents were new to CSS with 0-3 years of experience, while a few had a longer experience (over 6 years). Finally, most team members had more than 10 years of relevant experience.

As noted above, there were three principles that had a low score (3.0 and 3.1) that indicates that these principles were “barely” applied. A further review of the comments provided by the team members that scored these principles with the low score did not provide any additional information to clarify the reasons for their low score. On the contrary, the meeting minutes show that most of the potential modes (walking, biking, public transit, and driving) were addressed. On the issue of using all resources effectively, no additional insight could be provided, since there were no comments provided by the team members that could clarify this issue.

On the positive side, there are three principles that the team was in agreement that were highly met. These include the “Consider a safe facility for users & community” (3.9), “Involve stakeholders” (3.8) and “Create a lasting value for the community” (3.8). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.4
Increased stakeholder/public participation compared to other projects	NA	3.4
Increased stakeholder/public participation	3.0	3.4
Increased stakeholder/public ownership	3.0	3.6
Increased stakeholder/public trust	3.0	3.4
Decreased costs for overall project delivery	NA	2.3
Decreased time for overall project delivery	2.0	2.8
Improved predictability of project delivery	2.5	2.6
Improved project scoping	NA	2.9

Improved project budgeting	NA	2.8
Increased opportunities for partnering or shared funding or in-kind resources	2.0	3.0
Improved opportunities for joint use and development	3.0	3.4
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.4
Minimized overall impact to human environment	3.0	3.3
Minimized overall impact to natural environment	3.0	3.3
Improved mobility for all users	3.5	3.5
Improved walkability	3.5	3.9
Improved bikeability	3.5	3.9
Improved safety (vehicles, pedestrians, and bikes)	3.5	3.7
Improved multi-modal options	3.0	3.4
Improved community satisfaction	3.0	3.8
Improved quality of life for community	4.0	3.8
Improved speed management	--	3.3
Design features appropriate to context	3.5	3.5
Optimized maintenance and operations	NA	3.2
Minimized disruption	3.0	3.1
Increased risk management and liability protection	NA	3.0
Fit with local government land use plan	3.5	3.7

#### Discussion on Benefit Values

##### ◆ Semi-Quantitative Benefits

Overall, both stakeholders and team members indicated that several benefits materialized as a result of the process followed. Almost all benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. Benefits that had high scores (equal or greater than 3.7, indicating that most of the participants strongly agree) include “Improved quality of life for community”, “Improved walkability and bikeability”, “Improved community satisfaction”, “Improved safety”, and “Fit with local government land use plan”. These benefits indicate that the project resulted in a better environment for the community and there is an agreement between team members and stakeholders on these issues.

There are a few benefits that had a score below 3.0 that indicate that the respondents believe that the benefit was marginally materialized. These include “Decreased costs for overall project delivery”, “Decreased time for overall project delivery”, “Improved predictability of project delivery”, and “Improved project scoping and budgeting”. These answers indicate that the respondents perceive that the process resulted in longer time and higher costs for the project and had no significant effects on predictability neither of the completion nor in its budgeting and scoping.

An apparent trend of the benefits materialized is the consistent difference between the perspective of the team and the stakeholders, where for all common benefits the team scored them higher. In general, these differences are not large and it may be attributed to the fact that there were only two stakeholders that completed the survey. Therefore, any comparisons could be conducted cautiously.

◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Four public and 12 stakeholder meetings at various project phases; large attendance; significant comments;
Decreased costs for overall project delivery	Estimated \$11.5 mil; Actual \$13.6 mil (due to bids for project and not cost overruns); no scope or order changes.
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	No scope change orders
Improved project budgeting	No change orders
Increased opportunities for partnering or shared funding or in-kind resources	City of Oakland developed a memorial area; takes over maintenance after 3 years.
Improved environmental stewardship	
Minimized overall impact to human environment	No impacts
Minimized overall impact to natural environment	No impacts
Improved mobility for all users	New wider sidewalks, a new bike lane and multi-purpose paths; encourage transit with providing BART connection
Improved walkability	1.3 miles of new sidewalk and multi-purpose path
Improved bikeability	1.3 miles on new bike lanes and connection to Bay Trail
Improved safety (vehicles, pedestrians, and bikes)	NA
Improved multi-modal options	New wider sidewalks, a new bike lane and multi-purpose paths; encourage transit with providing BART connection
Improved speed management	NA
Optimized maintenance and operations	NA
Minimized disruption	Scheduled construction 13 months; actual
Increased risk management and liability protection	NA

The data supports the semi-quantitative results noted in the previous table and indicates that the high scores for the various improvements noted are indeed true. However, the available data repudiate the perception for those benefits that had the lower scores (below 3.0). There were no change orders and scope changes submitted for the project indicating that the budgeting and scoping of the project was appropriate. Moreover, the time for the completion of the project was altered twice due to need for legislation to approve the budget and the rebidding process due to the fact that received construction bids were approximately \$1 million over the estimated project costs—hence the higher project cost. Therefore, the perceived notion of longer time and higher costs is not supported by the available data.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.6
I am satisfied with the relationship I had with the interested public	NA	3.5
I am satisfied with the procedures and methods that allowed input to project decisions	2.5	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. Again the team showed higher levels of satisfaction working with both stakeholders and public. The stakeholders also showed a reasonable level of satisfaction working with the team.

There is a difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. The team members showed a greater satisfaction with almost an even split between those who agreed and those who strongly agreed. On the other hand, the two stakeholders showed a split choice between agreeing and disagreeing and the comments provided did not allow for any further elaboration on this issue.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.0	NA
My relationship with the stakeholders was best described as	NA	2.6
My relationship with the interested public was best described as	NA	2.4

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a slightly different perspective. The team members indicated that they viewed that relationship between consultation and partnership, while the stakeholders noted that it was a consultation relationship. The difference noted here is similar to what one may expect where team members tend to view things slightly different and more optimistic than the stakeholders. An interesting observation is that there were three team members that viewed this relationship as letting stakeholders to provide direction.

- ◆ Overall level of success  
The project is a successful use of CSS processes. Without the close cooperation of the project team with the City of Oakland the project would not have been completed. The use of extensive public involvement was instrumental in defining appropriate solutions. The cooperation with the City resulted in more flexible designs because the right of way was relinquished to the City.



## FINAL CASE STUDY DOCUMENTATION

Title	Berthoud Pass Mountain Access Project - Phases 1 and 2
Location	US 40 in Arapaho National Forest in Clear Creek County, Colorado
Lead Agency	Colorado DOT
Contact Person	Ina Zisman (CDOT)
Phase completed	Maintenance and Operations
Purpose and Need:	The existing facility had a narrow roadway that posed safety issues and mobility issues due to limited passing opportunities on the winding, mountainous road. The existing roadway also posed numerous environmental problems due to: 1) poor aesthetics, 2) water quality and erosion control issues, 3) slope stability issues, 4) wetlands damage, 5) wildlife impacts. Also of concern were the economic impacts to the local communities and ski industry of any reconstruction work.

### CSS Qualities

- ◆ Project Team (make up)  
Colorado DOT team incorporated multidisciplinary team-planners, environmental resource specialists, landscape architects, and design engineers; consultants were used for both design and public involvement. The U.S. Forest Service was an active partner in the project team throughout project development.
- ◆ Stakeholders:  
Project stakeholders included: U.S. Forest Service, U.S. Fish and Wildlife Service, Corps of Engineers, Colorado Division of Wildlife, Upper Clear Creek Watershed Group, Clear Creek Community and Partners for Access to the Woods.
- ◆ Public involvement:  
Meetings were held with impacted communities and stakeholders. Simulations and renderings were employed to provide iterative, collaborative design process. During construction, a public information process was employed including use of a public relations officer assigned to the project and employment of a public relations consultant. Media updates, project displays in public offices and businesses and a project website were also provided to inform the public about the project. Also message boards were used to inform motorists of closures during construction.
- ◆ Design solution  
Design considerations included minimizing project footprint, minimizing size/visual impacts of retaining walls, minimizing impacts to forest, and accommodating wildlife.
- ◆ CSS concepts by project phase:  
Colorado DOT used an iterative, collaborative design process involving the public and stakeholders to provide an acceptable project. Visualization was a key tool used to communicate design proposals/ alternates to the public/stakeholders, especially on retaining wall designs. Consensus decision-making was used throughout the project development process. During construction road closures were limited to provide access to recreational areas.
- ◆ Lessons learned:  
The project team believed that meeting public expectations for an excellent project that was appropriate for the context of the area was important to the project's success. They established a good partnership with the stakeholders, listened to their concerns and established mutual respect. This allowed the project team to fully

understand the issues. They coupled that knowledge with a proactive environmental stance that “raised the environmental bar” to where the public was very accepting of the project. During construction, the project team used extensive communications to apprise motorists of travel delays related to the project. They also revised work scheduling where possible to limit those delays.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	4.0
Seek broad-based public involvement	3.8
Use full range of communication methods	4.0
Achieve consensus on purpose and need	3.8
Utilize full range of design choices	3.5
Address alternatives and all modes	3.0
Maintain environmental harmony	4.0
Address community & social issues	3.8
Address aesthetic treatments & enhancements	4.0
Consider a safe facility for users & community	4.0
Document project decisions	3.8
Track and meet all commitments	3.8
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	4.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team’s perspective

The project included an interdisciplinary team (including consultants) that effectively planned and designed the project. The project team respondents were two officials from the CDOT region office including one identified as the project team leader and two consultants. Project team responses were obtained from personnel that worked in planning, design, traffic, environmental, geotechnical, construction and project management areas. They all had over 10 years of experience in developing transportation projects and three had 4 to 6 years experience with CSS (one having 0-3 years related experience).

The project team agreed that all principles were present since all had an average score of 3.0 or greater. The principles with the lowest scores were “Address all alternatives and modes” and “Utilize a full range of design choices”. In part, these were limited due to the reconstruction and environmental aspects of this project.

The project team responses indicated strong agreement all other principles assigning them scores between 3.8 and 4.0.

### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.8
Increased stakeholder/public participation compared to other projects	NA	3.8
Increased stakeholder/public participation	2.0	3.5
Increased stakeholder/public ownership	2.7	3.5
Increased stakeholder/public trust	3.0	4.0
Decreased costs for overall project delivery	NA	2.5
Decreased time for overall project delivery	NA	3.0
Improved predictability of project delivery	3.0	3.8
Improved project scoping	NA	3.8
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	2.0	3.5
Improved opportunities for joint use and development	2.0	3.3
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	4.0
Minimized overall impact to human environment	3.0	3.5
Minimized overall impact to natural environment	3.0	4.0
Improved mobility for all users	3.7	4.0
Improved walkability	2.0	2.5
Improved bikeability	3.0	3.3
Improved safety (vehicles, pedestrians, and bikes)	3.5	4.0
Improved multi-modal options	2.0	2.0
Improved community satisfaction	3.0	3.8
Improved quality of life for community	3.0	3.8
Fit with local government land use plan	3.0	3.8
Improved speed management	3.0	3.5
Design features appropriate to context	3.5	4.0
Optimized maintenance and operations	NA	3.8
Minimized disruption	3.0	3.3

Increased risk management and liability protection	NA	3.0
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Discussion on Benefit Values

◆ Semi-Quantitative Benefits

The semi-quantitative benefits analysis had a balanced stakeholder/project team survey response (stakeholders-3; project team-4). The responding stakeholders represented historic, environmental, park and local government perspectives. The stakeholders disagreed with the project team on the CSS benefits related to “Increased stakeholder/public participation”, “Increased stakeholder/public ownership”, “Increased opportunities for partnering or in-kind resources” and “Improved opportunities for joint use and development”. Where joint rankings were obtained on other CSS benefits, both groups were in general agreement though the stakeholder rankings tended to be lower than those of the project team.

◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	
Minimized overall impact to human environment	
Minimized overall impact to natural environment	The sediment catch basins, paved drains and snow shoulders allowed CDOT to capture about 70 percent of the traction sand used in winter months. In the past, this material had contaminated streams, eroded slopes and harmed wetlands.
Improved mobility for all users	
Improved walkability	
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	

Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

- ◆ Other benefits

This project provided a wide range of significant benefits to communities, the environment and the U.S. Forest Service that is seeking to maintain the character of the area. Improved maintenance and roadway design will both improve CDOT efforts to cope with large snowfalls in the area in an environmentally friendly manner. This project is unique in that it benefits all parties involved.

- ◆ Arnstein comparison

Arnstein Question Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.3	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	3.5
I am satisfied with the procedures and methods that allowed input to project decisions	3.3	3.8

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.3	NA
My relationship with the stakeholders was best described as	NA	3.3
My relationship with the interested public was best described as	NA	2.3

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success

This project entailed considerable cooperation between CDOT and stakeholders, especially the US Forest Service. Environmental features have protected soil, plants, animals and the water and preserved a historic park area. During construction, CDOT sought to maintain traffic flow (or at least minimize delays). Extensive efforts were made to inform the public of traffic conditions. This project has been awarded five national awards for engineering excellence including the AASHTO Center for Environmental Excellence Best Practices for Context Sensitive Solutions Notable Achievements Award (2005).



## FINAL CASE STUDY DOCUMENTATION

Title	US 285 (Foxton Road to Bailey)
Location	near Denver, CO
Lead Agency	Colorado DOT
Contact Person	Jeff Kullman (CDOT)
Phase completed	Construction
Purpose and Need	The purpose of this project was improve the safety and capacity of US 285 by eliminating inconsistent lane configurations, deficient roadway geometry and speed variations on the existing road while addressing issues posed by mountain terrain, winter weather and frequent access points.

### CSS Qualities

- ◆ Project Team (make up)  
The project team for the Feasibility Study and the NEPA Process included civil engineers, environmental planners, wildlife biologists, landscape architects, structural engineers, drainage engineers, and noise and air quality analysts. The consultant project managers for both phases were environmental planners and the team manager was an engineer and certified planner.
- ◆ Stakeholders (make up, utilization, interaction)  
Agencies involved in this project are CDOT, FHWA, EPA, U.S. Army Corps of Engineers, SHPO, Division of Wildlife, Jefferson County, Park County, and the Denver Regional Council of Governments. Value engineering conducted during EIS preparation included members of the public, neighborhoods; wildlife agencies, the Sierra Club, and open space agencies.
- ◆ Public involvement (types, documentation)  
Numerous communication tools were utilized to communicate community needs, constraints and design concepts. These included:
  - GIS graphic techniques to catalogue travel times, actual vs. posted speeds, access points, and environmental resources.
  - Visual simulation (both computerized and artist rendering types) of possible design concepts, particularly at the access points.
  - Highly graphic Web site and newsletters.
  - Design alternatives presented in both engineering plans and color aerials to facilitate understanding.
  - Displays of alternatives for retaining wall textures and designs—with surveys set up at public workshops to gather input.

The public involvement activities (e.g. scoping meetings) to determine community and agency concerns included:

- Three public workshops at key points in the process to obtain input on the design and design refinements.
- Neighborhood and property owner meetings to discuss specific property impacts.
- A Value Engineering team involved representatives from the Preserve Our Mountain Community group and a member of the general public from one of the rural counties.
- Three newsletters.
- A project Web site.
- Press releases.

- Special outreach to low-income and minority populations.
- ◆ Design solution (process, modes and alternatives examined)  
Community/stakeholder values were addressed in a preliminary basis by planned incorporation of desired actions/features related to the proposed project. Open spaces were preserved by cooperative work with local agencies to purchase/set aside parcels of land, grade separated intersections were used instead of conventional intersections and one potential grade separation was eliminated, improved access control, clear zones and curve elimination improved safety. Environmental issues were addressed by avoidance and minimization of takings of wetlands and use of animal crossings. Aesthetic features included texturing of bridge and retaining wall concrete and rock/slope cutting in a natural manner.
- ◆ CSS concepts by project phase  
The significant public/stakeholder involvement undertaken in the NEPA Phase was used effectively to address concerns using appropriate actions including investigation of flexible design options, cooperative access control and land banking agreements, minimization of environmental impacts and appropriate aesthetic treatments. Value engineering resulted in the elimination of an unnecessary grade separated interchange.
- ◆ Lessons learned  
In general, the Project Team was very favorable towards the use of CSS. They felt it increased public interest, ownership and consensus and improved communication and understanding of project goals. It also created an overall well balanced project. The Project Team believed that early recognition/action on issues facilitated project development. That could be achieved by listening to stakeholder/public concerns. They involved the resource agencies and public to develop solutions and sought creative methods to address project challenges. Opponents could be swayed by involving them in the project development process.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.6
Involve stakeholders	3.8
Seek broad-based public involvement	3.6
Use full range of communication methods	3.1
Achieve consensus on purpose and need	3.6
Utilize full range of design choices	3.4
Address alternatives and all modes	3.4
Maintain environmental harmony	3.6
Address community & social issues	3.4
Address aesthetic treatments & enhancements	3.8
Consider a safe facility for users & community	3.6
Document project decisions	3.6
Track and meet all commitments	3.3
Create a lasting value for the community	3.6

Use all resources effectively (time & budget)	3.3
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Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The Project Team survey respondents included design engineers, construction engineers, traffic engineers, historic and environmental specialists, and a project manager. Two were from consultants, one was from the FHWA and five were from CDOT. The project team respondents worked on the project from long range planning through construction. Seven team members had 10 + years experience in project development and five members had 6+ years experience with CSS. They noted that all the CSS principles had been applied. The highest ranked were "Involve all stakeholders" and "Address aesthetic treatments & enhancements".

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.4
Increased stakeholder/public participation compared to other projects	NA	3.1
Increased stakeholder/public participation	3.0	3.4
Increased stakeholder/public ownership	2.7	3.3
Increased stakeholder/public trust	3.0	3.4
Decreased costs for overall project delivery	NA	2.7
Decreased time for overall project delivery	NA	2.9
Improved predictability of project delivery	2.8	3.1
Improved project scoping	NA	3.1
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	2.5	3.3
Improved opportunities for joint use and development	3.0	3.0
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.5
Minimized overall impact to human environment	3.0	3.3
Minimized overall impact to natural environment	3.0	3.5
Improved mobility for all users	3.2	3.8
Improved walkability	2.0	3.3
Improved bikeability	2.5	3.4
Improved safety (vehicles, pedestrians, and bikes)	3.3	3.5

Improved multi-modal options	2.7	3.0
Improved community satisfaction	3.0	3.4
Improved quality of life for community	3.0	3.7
Fit with local government land use plan	3.0	3.4
Improved speed management	2.3	3.3
Design features appropriate to context	3.0	3.4
Optimized maintenance and operations	NA	3.0
Minimized disruption	3.0	3.2
Increased risk management and liability protection	NA	3.1

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The semi-quantitative benefits analysis had a balanced stakeholder/project team survey response (stakeholders-7; project team-8). The responding stakeholders represented historic, archeological, environmental, park and local government perspectives. The stakeholders disagreed with the project team on the CSS benefits related to “Increased stakeholder/public ownership”, “Improved predictability of project delivery”, “Increased opportunities for partnering or in-kind resources”, “Improved opportunities for joint use and development”, “Improved walkability”, “Improved Bikeability” “Improved multi-modal options” and “Improved speed management”. Where joint rankings were obtained on other CSS benefits, both groups were in general agreement though the stakeholder rankings tended to be lower than those of the project team.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	
Decreased costs for overall project delivery	Aggregate CSS-related cost savings of \$200,000 (wetland mitigation), \$500,000 (downgrade EIS to EA), \$55,000,000 (grade separated intersections v. interchanges), \$6,000,000 (elimination of one intersection), \$200,000 (reduced use of CDOT personnel) v. \$2,000,000 (wildlife underpasses), \$100,000 (culvert for small animals), \$250,000 (aesthetic bridge treatment)
Decreased time for overall project delivery	Downgrading from EIS to EA saved 8 months project

	time.
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	Worked with open space agencies to identify parcels that could be acquired for that purpose.
Improved environmental stewardship	
Minimized overall impact to human environment	
Minimized overall impact to natural environment	Wetland impacts reduced from 4 acres to 0.7 acres. 72 culvert crossings will be modified to incorporate small animal crossings. Rock & slope cutting done in a natural manner.
Improved mobility for all users	Travel times were reduced for more than 80% of all access points.
Improved walkability	Installation of a trail a Wisp Creek
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	Number of conflict points reduced by 75 %
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

◆ Arnstein comparison

Arnstein Question Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.1
I am satisfied with the procedures and methods that allowed input to project decisions	3.0	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	1.6	NA

My relationship with the stakeholders was best described as	NA	2.9
My relationship with the interested public was best described as	NA	2.4

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success

This project demonstrates that CSS can provide real project cost savings if agencies focus on providing facilities that meet the needs/desires of communities. The total claimed project savings exceeds \$50 million using a practical design approach. Significant reductions in environmental impacts/mitigation costs were obtained by judicious selection of the project corridor.



## FINAL CASE STUDY DOCUMENTATION

Title	Transportation Expansion (T-REX) Project
Location	Denver, Colorado
Lead Agency	Colorado Department of Transportation
Contact Person	Rick Clarke, Project Director
Phase completed	Construction complete September 2006
Purpose and Need	Improve mobility, enhance safety, provide for alternate modes

### CSS Qualities

- ◆ Project Team (make up)
  - Colorado Department of Transportation
  - Regional Transportation District
  - FHWA
  - FTA
  - Carter & Burgess, Inc. (Consultants)
  - Disciplines: Engineering, Planning, Biologists, Cultural Resource Specialists
- ◆ Stakeholders (make up, utilization, interaction)

Two committees were used: a Technical Committee and a Policy Committee. Numerous meetings were held with these two groups. The Policy Committee was instrumental in securing New Starts funding for the light rail component.
- ◆ Public involvement (types, documentation)

Numerous traditional public meetings were held and over 200 meetings were held over a several year MIS and NEPA process with neighborhood and business organizations. During the Design-Build T-REX construction project, there was a very proactive public information program. Public information managers from the owner's team (CDOT and RTD) worked collaboratively with the contractor's public information team to keep stakeholders informed of progress and construction activities in a timely manner.
- ◆ Design solution (purpose and need, process, modes and alternatives examined, documentation)

During the MIS phase, a multi-level screening process was used to develop and evaluate modes such as Bus/HOV lanes, light rail transit, highway expansion, commuter rail transit; and alternative alignments. A number of possible locations for transit stations were also developed and evaluated. The design solution that best met purpose and need and minimized environmental impacts was a combination of highway widening and LRT corridors.
- ◆ CSS concepts by project phase

The basic CSS concepts that were incorporated by phase were:

  - Purpose and Need (choice of modes): LRT was chosen over additional highway expansion or HOV lanes because it provides very high capacity for very little space. The project is in a very constrained corridor and a multi-lane highway expansion would have had numerous residential and business relocations.
  - EIS Phase: At Colorado Boulevard, a depressed profile was chosen for LRT because it had less of an impact on a several story apartment building.
  - PE Phase: Narrowed shoulders were chosen adjacent to several parks to minimize impact to those properties protected by Section 4(f).
  - Final design: Implementation of a program to allow neighbors to opt-out of a programmed noise wall was done to preserve views of the mountains.

- ◆ Lessons learned  
Very aggressive, proactive and transparent public and local agency involvement is essential throughout all phases of the project. The partnership spirit and culture that was implemented during the EIS, design and construction phases among all of the project team members was instrumental in the project's success.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	3.7
Seek broad-based public involvement	3.7
Use full range of communication methods	3.7
Achieve consensus on purpose and need	3.7
Utilize full range of design choices	3.3
Address alternatives and all modes	3.4
Maintain environmental harmony	3.2
Address community & social issues	3.5
Address aesthetic treatments & enhancements	3.3
Consider a safe facility for users & community	3.5
Document project decisions	3.7
Track and meet all commitments	3.5
Create a lasting value for the community	3.7
Use all resources effectively (time & budget)	3.6

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective  
There were 27 respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principles with the lowest scores were "Maintain environmental harmony" (3.2), "Utilize full range of design choices" (3.3) and "Address aesthetic treatments and enhancements" (3.3).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as design engineers, landscape architects, public relations specialists, construction engineers, traffic engineers, environmental scientists, right of way specialists, light rail engineers, legal advisors, and project managers. Most were involved in the planning and design phases of the project and all were involved in construction. There were at least six members that were involved in all phases of the project. Approximately two-thirds of the respondents were new to

CSS with 0-3 years of experience, while most of the remaining respondents had a longer experience (over 6 years). Finally, almost all team members had more than 10 years of relevant experience.

As noted above, there were three principles that had a low score (3.2 and 3.3) that indicates that these principles were “barely” applied. A further review of the comments provided by the team members that scored these principles with the low score did not provide any additional information to clarify the reasons for their low score.

On the positive side, there are several principles that the team was in agreement that were highly met (a score greater than or equal to 3.7). These include the “Use of interdisciplinary team”, “Involve stakeholders”, “Seek broad-based public involvement”, “Use full range of communication methods”, “Achieve consensus on purpose and need”, “Document project decisions”, and “Create a lasting value for the community” (all had a score of 3.7). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed. The use of various public involvement approaches as well the interaction with stakeholders were additional strong points that were identified by the comments of the team respondents.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.1
Increased stakeholder/public participation compared to other projects	NA	3.5
Increased stakeholder/public participation	3.2	3.2
Increased stakeholder/public ownership	3.4	3.3
Increased stakeholder/public trust	3.3	3.4
Decreased costs for overall project delivery	NA	2.7
Decreased time for overall project delivery	NA	3.3
Improved predictability of project delivery	3.9	3.6
Improved project scoping	NA	3.3
Improved project budgeting	NA	3.3
Increased opportunities for partnering or shared funding or in-kind resources	3.2	3.4
Improved opportunities for joint use and development	3.3	3.2
Improved sustainable decisions and investments	NA	3.2
Improved environmental stewardship	NA	3.1
Minimized overall impact to human environment	3.5	3.3
Minimized overall impact to natural environment	3.4	3.0

Improved mobility for all users	3.8	3.7
Improved walkability	2.9	3.1
Improved bikeability	2.8	2.9
Improved safety (vehicles, pedestrians, and bikes)	3.2	3.5
Improved multi-modal options	3.7	3.6
Improved community satisfaction	3.7	3.5
Improved quality of life for community	3.7	3.5
Fit with local government land use plan	3.3	3.4
Improved speed management	3.2	3.1
Design features appropriate to context	3.5	3.2
Optimized maintenance and operations	NA	3.2
Minimized disruption	3.3	3.5
Increased risk management and liability protection	NA	3.3

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

Overall, both stakeholders and team members indicated that several benefits materialized as a result of the process followed. Almost all benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. Benefits that had high scores (equal or greater than 3.7, indicating that most of the participants strongly agree) include “Improved mobility for all users” (team), “Improved multi-modal options”, “Improved community satisfaction”, “Improved quality of life for community” (stakeholders). These benefits indicate that the project resulted in a better environment for the community and there is an agreement between team members and stakeholders on these issues.

There are a few benefits that had a score below 3.0 that indicate that the respondents believe that the benefit was marginally materialized. These include “Decreased costs for overall project delivery”, “Improved bikeability” (team), and “Improved walkability and bikeability” (stakeholders). These answers indicate that the respondents perceive that the process resulted in higher costs for the project and had no significant impacts for pedestrians and bicyclists.

An apparent trend of the benefits materialized is the consistent difference between the perspective of the team and the stakeholders, where for all common benefits the team scored them higher. In general, these differences are not large.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Several meetings with public and stakeholders throughout the planning and design phases with

	large attendance
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	Agreement with SHPO to project a historic bridge and CDOT to donate ROW
Improved environmental stewardship	Aesthetic treatments to mitigate visual impacts; wetland replacement
Minimized overall impact to human environment	Some relocations (homes, apartments, businesses)
Minimized overall impact to natural environment	3.2 acres of wetland replacement
Improved mobility for all users	18 pedestrian crossings at bridges; 6 bicycle crossings; 17.9 miles of light rail
Improved walkability	New crossings and station designs to improve pedestrian access
Improved bikeability	New crossings and incorporation of stations to existing bicycle network
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

The data supports the semi-quantitative results noted in the previous table and indicates that the high scores for the various improvements noted are indeed true. However, the available data repudates the perception for those benefits that had the lower scores (below 3.0) regarding the bikeability and walkability issues. However, the cost related concerns were not evaluated due to lack of additional data. The project had some impacts to natural and human environment but the EIS provided an extensive list of mitigation efforts to ameliorate these impacts.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.6	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3

I am satisfied with the relationship I had with the interested public	NA	3.2
I am satisfied with the procedures and methods that allowed input to project decisions	3.3	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. For this project, the stakeholders showed higher levels of satisfaction working with the team than the team with stakeholders and public. However, both groups showed a relatively high satisfaction score.

There is almost no difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. Both groups showed a good level of satisfaction indicating adequacy of input solicitation. Again, the stakeholders showed a slightly greater level of satisfaction than the team members.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.3	NA
My relationship with the stakeholders was best described as	NA	2.7
My relationship with the interested public was best described as	NA	2.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a slightly different perspective. The team members indicated that they viewed that relationship between consultation and partnership, while the stakeholders noted that it was a consultation relationship. The difference noted here is similar to what one may expect where team members tend to view things slightly different and more optimistic than the stakeholders.

- ◆ Overall level of success

This is a successful use of CSS processes in a multi-modal project. The transparent public and local agency involvement was essential throughout all phases of the project and resulted in the development of a solution that considered more than highways. The partnership spirit and culture that was implemented during the EIS, design and construction phases among all of the project team members was instrumental in the project's success.



## FINAL CASE STUDY DOCUMENTATION

Title	Oyster River Roundabout
Location	Route 162 and SR 705, West Haven, Connecticut
Lead Agency	ConnDOT
Contact Person	Arthur Gruhn, Chief Engineer
Phase Completed	Construction
Purpose and Need	Traffic volume, accident rate and pedestrian concerns required improvement of the intersection.

### CSS Qualities

- ◆ **Project Team (make up)**  
The project team included: traffic and design engineers, a landscape designer, an environmental coordinator and an illumination designer.
- ◆ **Stakeholders (make up, utilization, interaction)**  
Project stakeholders included: the mayor and city staff, community leaders, and area residents and business owners. A major resource agency, the State Department of Environmental Protection, was also involved.
- ◆ **Public involvement (types, documentation)**  
Informal meetings and public meetings were part of the public involvement program. Photographs, renderings, videos and advanced visualization techniques were all used.
- ◆ **Design solution (process, modes and alternatives examined)**  
A signalized intersection was warranted, but the preliminary design presented some unfavorable features. The roundabout design allows the planned traffic volume to be accommodated with less paving needed. This then allowed a sidewalk to be constructed within the existing footprint. The roundabout also has the potential to calm traffic and reduce the potential for fatal crashes -- both were citizen concerns. The roundabout solution also provides the community with a gateway that has added value.
- ◆ **CSS concepts by project phase**  
Both design and construction phases used CSS.
- ◆ **Lessons learned**  
Visualization was found to be extremely useful in explaining the project to the public. Building trust with stakeholders/public required – establishing a strong partnership with local officials; holding informational meeting with groups of property owners; and tracking all concerns and explaining our responses. Stakeholders often disagreed with each other and not all could be satisfied. There never seemed to be enough information on the use of roundabouts according to the project team.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	3.7

Seek broad-based public involvement	3.7
Use full range of communication methods	3.3
Achieve consensus on purpose and need	2.7
Utilize full range of design choices	3.3
Address alternatives and all modes	3.3
Maintain environmental harmony	4.0
Address community & social issues	3.3
Address aesthetic treatments & enhancements	4.0
Consider a safe facility for users & community	4.0
Document project decisions	3.7
Track and meet all commitments	4.0
Create a lasting value for the community	3.7
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The project team clearly pursued strongly (score of 4.0) several of the CSS principles including: maintaining environmental harmony; aesthetic treatments and enhancements; considering a safe facility for users and community; and tracking and meeting all commitments. In addition, it was clearly agreed that some 10 other principles were applied (scores above 3.0). Somewhat at variance with all the other principles was the score of 2.7 for the achieving consensus on purpose and need. However, the overall opinion of the team was that the principles of CSS were pursued.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	2.0
Increased stakeholder/public participation compared to other projects	NA	3.3
Increased stakeholder/public participation	2.8	3.0
Increased stakeholder/public ownership	2.8	2.0
Increased stakeholder/public trust	2.4	2.3
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	1.7
Improved predictability of project delivery	2.8	3.0

Improved project scoping	NA	3.0
Improved project budgeting	NA	1.5
Increased opportunities for partnering or shared funding or in-kind resources	3.0	2.5
Improved opportunities for joint use and development	2.4	2.0
Improved sustainable decisions and investments	NA	2.0
Improved environmental stewardship	NA	2.5
Minimized overall impact to human environment	2.7	3.0
Minimized overall impact to natural environment	3.0	3.3
Improved mobility for all users	3.3	3.3
Improved walkability	2.6	3.7
Improved bikeability	2.5	3.0
Improved safety (vehicles, pedestrians, and bikes)	2.8	3.3
Improved multi-modal options	2.3	3.0
Improved community satisfaction	2.2	2.0
Improved quality of life for community	2.7	2.0
Fit with local government land use plan	2.8	3.5
Improved speed management	3.2	3.7
Design features appropriate to context	2.8	3.7
Optimized maintenance and operations	NA	2.0
Minimized disruption	2.8	3.3
Increased risk management and liability protection	NA	--

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits
 

Several benefits were highly agreed upon by the stakeholders (beyond that perceived by the team) including: Increased stakeholder/public ownership; Increased stakeholder/public trust; Increased opportunities for partnering or shared funding or in-kind resources; and Improved quality of life for community. There was a positive consensus agreement (3.3) on the achievement of “Improved mobility for all users” by the stakeholders and the project team. The project team expressed a high level of benefits that included: Improved walkability; Improved speed management; Design features appropriate to context; and Fit with local government land use plan. However, the team expressed disagreement that either “Improved project budgeting” or “Decreased time for overall project delivery” was a benefit that was achieved.
- ◆ Quantitative Benefits
 

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.8	NA
I am satisfied with the relationship I had with the stakeholders	NA	2.3
I am satisfied with the relationship I had with the interested public	NA	2.7
I am satisfied with the procedures and methods that allowed input to project decisions	2.5	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

It is interesting to note that the first question pair indicates that the stakeholders were a bit more satisfied with their relationship to the project team than the project team was with their relationship with the stakeholders. The stakeholders were not as satisfied with the procedures that allowed input to project decisions as were the members of the project team.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	1.5	NA
My relationship with the stakeholders was best described as	NA	1.7
My relationship with the interested public was best described as	NA	1.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The responses to the last three questions suggest that the relationship during the project between stakeholders and the project team was viewed primarily as informational relationship that touched upon being viewed as a consultation relationship, but was certainly not viewed as a partnership.

#### Case Summary

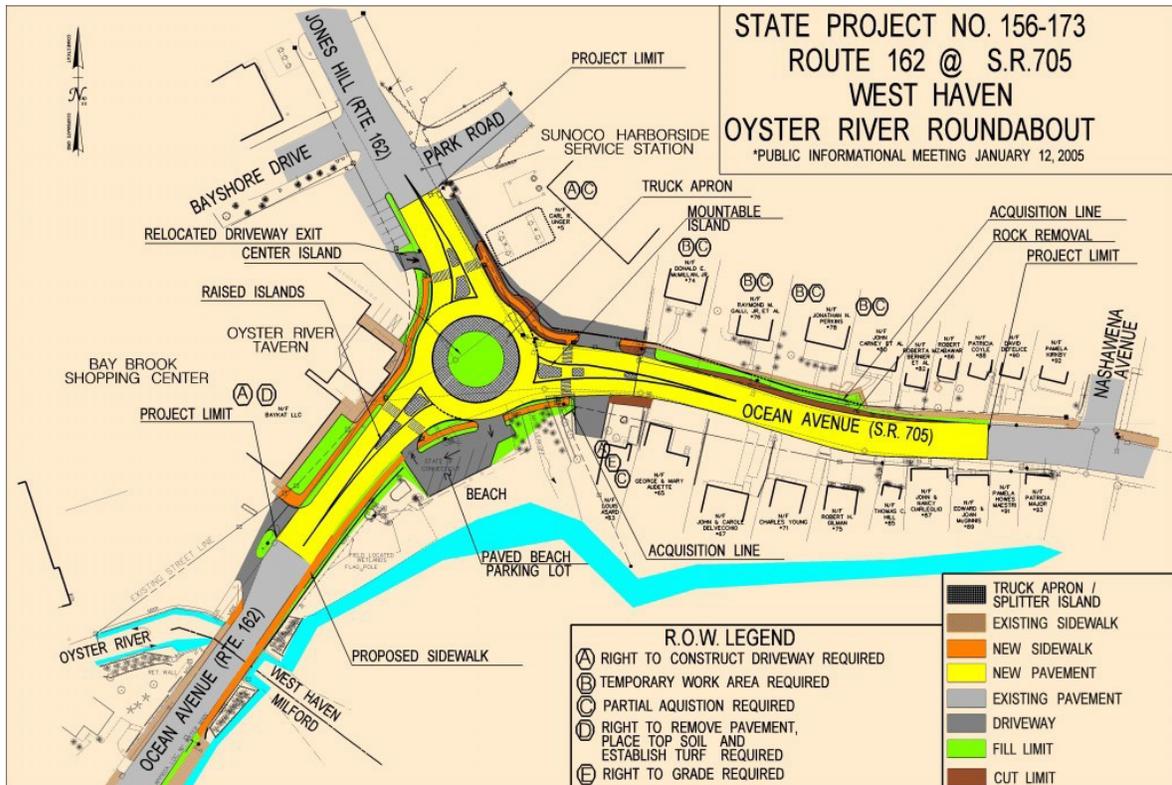
- ◆ Major principles

The Connecticut Oyster River Roundabout project in West Haven exemplifies the CSS principle – seek broad- based community involvement. The location of this 3-leg roundabout is uniquely sited along Long Island Sound adjacent to a small parking lot serving a public beach and surrounded with single family homes and a small shopping plaza. The planning, design, and construction phases involved the affected home owners and business interests along with the local town officials. The final intersection design (the roundabout option) and incorporation of specific features (e.g. sidewalks) as well as construction phasing (to avoid the busiest summer months) were the direct result of community involvement. Visualization techniques were useful from the vary outset in consideration of the roundabout option. Much of the success of this project is attributed to the early involvement of all interested parties.

The Connecticut Oyster River Roundabout project in West Haven also exemplifies the CSS principle – consider community and social issues. City officials and local leaders of the West Haven community wanted the roundabout to serve as a “gateway” to include landscaping and special lighting. The final alignment was chosen to avoid an endangered species of beach grass with the help of the state’s Department of Environmental protection. Many residents were concerned about high speeds and found the roundabout option as a useful way to provide traffic calming. In addition, the roundabout design did not require additional right-of-way. The original roadway’s overall footprint that included a stop controlled intersection was maintained

and the design was able to also accommodate the community requested sidewalk. The new roadway design is seen as maintaining the community's character while providing specific enhancements that create a lasting value.

- ◆ Major benefits (semi-quantitative only)
  - From the stakeholder perspective the top four major benefits were:
    - Improved mobility for all users
    - Improved speed management
    - Minimized overall impact to natural environment (tied with)
    - Increased opportunities for partnering or shared funding or in-kind resources
  - From the team member perspective the top three major benefits were:
    - Improved walkability
    - Improved speed management
    - Design features appropriate to context
- ◆ Lessons learned
  - Building trust with stakeholders/public required – establishing a strong partnership with local officials; holding informational meeting with groups of property owners; and tracking all concerns and explaining responses. Visualization was found to be extremely useful.
- ◆ Overall level of success for the project is judged to be relatively high. The median expert opinion score of the project team for application of the CSS principles is 3.7 (tending toward strong agreement). The median score of the project team regarding their expert opinion on benefits achieved was 3.0 representing sound agreement. The corresponding median score for a smaller subset of benefits, as perceived by the stakeholders, was only slightly lower at 2.8 (tending toward sound agreement).



## FINAL CASE STUDY DOCUMENTATION

Title	M Street and Wisconsin Avenue Sidewalk Reconstruction
Location	Georgetown, DC
Lead Agency	District of Columbia DOT
Contact Person	Karyn Le Blanc (DDOT)
Phase completed	Construction
Purpose and Need:	Deteriorated utilities and sidewalks in the Georgetown area were contributing to urban decay in a historic area. A cooperative initiative was developed between the District of Columbia and relevant utilities to accelerate improvements in this area and address current problems negatively impacting the community.

### CSS Qualities

- ◆ Project Team (make up)  
District of Columbia DOT (DDOT) officials comprised the project team.
- ◆ Stakeholders (make up, utilization, interaction)  
Several utilities-Pepco, Washington Gas, Verizon, and DDOT to facilitate needed repairs, share common costs and form an Executive Management Committee (EMC) to oversee the project. An Advisory Neighborhood Committee (general public and businesses); and Community Relations Team (representatives of local government, universities, hospitals and the city council) were formed to provide input to the EMC and provide support during the project.
- ◆ Public involvement (types, documentation)  
Meetings have been held with public/stakeholders to plan the work. To minimize disruption signs have been employed along with media announcements and a website. Local law enforcement has been used to manage traffic and towing of cars parked in work zones. A local stakeholder group, the Commission of Fine Arts, conducted review of steps taken by DDOT to rehabilitate the sidewalks. Media releases, signs and a website were used to inform the public about project activities.
- ◆ Design solution (process, modes and alternatives examined)  
Sidewalk rehabilitation/reconstruction included the use of brick walkways, planting of trees, preservation of existing trees (to the maximum extent possible) and accommodation for disabled persons.
- ◆ CSS concepts by project phase  
The EMC meets weekly to discuss the progress of the work, public comments and local concerns. The project has featured minimum disruption during work. The sidewalks were esthetically enhanced. Public involvement was used to help schedule the work and phasing. A DDOT liaison has attended local community and business meetings to answer questions related to the project. DDOT has sought to provide a rapid response to public concerns.
- ◆ Lessons learned  
The project team believed that public involvement from the start was vital. Involving and partnering with other stakeholders was also a key to the project's success. Communications was another key factor. The project team met weekly and reviewed public complaints and actions taken to resolve those. This also provided much project support.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	4.0
Seek broad-based public involvement	4.0
Use full range of communication methods	4.0
Achieve consensus on purpose and need	4.0
Utilize full range of design choices	3.3
Address alternatives and all modes	3.7
Maintain environmental harmony	3.0
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.3
Consider a safe facility for users & community	3.3
Document project decisions	3.7
Track and meet all commitments	3.3
Create a lasting value for the community	3.7
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The project team respondents included a public relations specialist/community liaison, a construction engineer and the project manager. Two of those had over 10 years of project development experience and over 6 years experience with CSS. The project team agreed that all principles were present since all had a score of 3.0 or higher. The lowest ranked of those was "Maintain environmental harmony".

The principles "Use of interdisciplinary teams", "Involve stakeholders", "Seek broad-based public involvement" "Use full range of communications methods", and "Achieve consensus on purpose and need" were the highest ranked principles with all project team members in strong agreement of their application.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.7
Increased stakeholder/public participation compared to other projects	NA	3.7
Increased stakeholder/public participation	4.0	3.7

Increased stakeholder/public ownership	4.0	4.0
Increased stakeholder/public trust	4.0	4.0
Decreased costs for overall project delivery	NA	3.0
Decreased time for overall project delivery	NA	3.3
Improved predictability of project delivery	4.0	3.7
Improved project scoping	NA	4.0
Improved project budgeting	NA	3.3
Increased opportunities for partnering or shared funding or in-kind resources	4.0	3.7
Improved opportunities for joint use and development	4.0	3.3
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	4.0	3.3
Minimized overall impact to natural environment	4.0	3.3
Improved mobility for all users	4.0	3.7
Improved walkability	4.0	3.7
Improved bikeability	3.0	2.7
Improved safety (vehicles, pedestrians, and bikes)	4.0	3.0
Improved multi-modal options	3.0	2.7
Improved community satisfaction	4.0	4.0
Improved quality of life for community	4.0	3.7
Fit with local government land use plan	3.0	3.3
Improved speed management	3.0	3.0
Design features appropriate to context	4.0	3.7
Optimized maintenance and operations	NA	3.0
Minimized disruption	4.0	3.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits  
The semi-quantitative benefits analysis was imbalanced (stakeholders-1; project team-3) Where corresponding rankings were provided, the stakeholder generally was in agreement with the project team often providing equivalent or higher rankings.
- ◆ Quantitative Benefits  
There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	4.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	4.0
I am satisfied with the procedures and methods that allowed input to project decisions	4.0	3.7

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.0	NA
My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	2.7

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

◆ Overall level of success

This project exemplifies that CSS can be successfully applied to transportation modes other than roadways. Due to the scope of this project, CSS was vital in facilitating its execution in all phases while maintaining stakeholder/public satisfaction with all facets of the agency's actions. Partnering with utilities reduced costs, public disruption and prevented the need for subsequent damage to the completed sidewalk for follow-on necessary utility work.



## FINAL CASE STUDY DOCUMENTATION

Title	I 4 Reconstruction
Location	Tampa, FL
Lead Agency	Florida DOT
Contact Person	Adam Perez (FDOT)
Phase completed	Construction
Purpose and Need	The existing facility was functionally obsolete and did not provide an acceptable level of service. The project addressed anticipated future traffic demands will provide sufficient median size to allow future expansion and/or multimodal use for mass transit. The upgraded roadway was expanded to 6 lanes with modern design features. This project is part of a comprehensive initiative to upgrade roads in the Tampa area.

### CSS Qualities

- ◆ Project Team (make up)  
Florida DOT (FDOT), FHWA and consultants comprised the project team. The team multidisciplinary background was broad addressing: engineers, planners, architects, and archeologists with expertise in roadway design, structural design, drainage design, traffic design, utilities, permitting, community team forming, environmental permitting and issues and public involvement.
- ◆ Stakeholders (make up, utilization, interaction)  
Stakeholders were involved at appropriate points throughout the project development process. The stakeholders included: numerous advisory groups, City of Tampa, National Park Service, SHPO and permitting agencies, FHWA, and local not-for-profit groups (e.g. historic commissions and a Latin commission).
- ◆ Public involvement (types, documentation)  
Public involvement was used to provide guidance in an iterative design process. Many tools were used including charrettes, focus groups, public meetings, face-to-face meetings, websites, visualization, surveys, variable message boards and newsletters. All worked well.
- ◆ Design solution (process, modes and alternatives examined)  
Expansion of the facility required takings of residences and historic properties. These were minimized by the use of a design that employed retaining walls to limit ROW takings. Residences were taken over time and many historic properties were repaired/relocated. The ROW purchased includes at 64' median to provide future expansion for public mass transit. Amenities include construction of a pedestrian plaza and fountain. Bridge spans were expanded to accommodate pedestrians and new structures/underpasses were built to provide pedestrian connectivity within communities previously separated by the existing I 4.
- ◆ CSS concepts by project phase:  
Public/stakeholder involvement was employed during planning, design and construction. Historic structures were moved/rehabilitated and many resituated in the previously depressed north section of Ybor were resold to help renew that area. Within financial constraints, the project was intended to minimize community disruption, address problems posed by existing I 4 and provide a facility that would accommodate future mass transit. The construction was staged with to minimize disruption to traffic. Traffic flow was maintained by limiting lane closures to nighttime and detours through mid-week to avoiding the entertainment district in Ybor City.

Contractors were required to have experience with historic preservation to minimize damage to adjacent buildings during demolition and impacted buildings during relocation.

◆ Lessons learned

The project team stressed early and continuous involvement with the public and stakeholders. Local residents provided valuable input into the project and partnering with prominent locals helped keep the project on track. The project team noted the values of persistence, useful. Over the duration of the project, Tampa had three different mayors. The project team noted that such changes can undo much previous work. They recommended involving the senior staff of local governments as a means of insuring continuity in partnering. The project team noted that a proactive relationship with the media was beneficial. They also felt that it would be beneficial to obtain decisions/commitments on aesthetics, enhancements and maintenance agreements early in the project development process. All outcomes were positive. The values of property throughout Ybor City are increasing and many property owners are upgrading their residences. Crime in the area has been decreasing due to a commitment of local government to provide additional law enforcement. The public and stakeholders have been pleased the work and facility.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.7
Seek broad-based public involvement	3.8
Use full range of communication methods	3.7
Achieve consensus on purpose and need	3.2
Utilize full range of design choices	3.2
Address alternatives and all modes	3.0
Maintain environmental harmony	3.2
Address community & social issues	3.3
Address aesthetic treatments & enhancements	3.8
Consider a safe facility for users & community	3.3
Document project decisions	3.2
Track and meet all commitments	3.2
Create a lasting value for the community	3.5
Use all resources effectively (time & budget)	2.8

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Discussion on CSS principles

◆ Project team's perspective

The project included an interdisciplinary team (including consultants) that effectively planned and designed the project. The project team respondents were three officials

from the FDOT district office including one identified as the project team leader. Project team responses were obtained from FDOT district/consultant personnel that were in planning, design, environmental/historic analyses, project management and public relations. They all had over 6 years experience in CSS and over 10 years of experience in developing transportation projects. They were involved in all phases of project development from long-planning through maintenance.

The project team agreed that all principles were present except “Use all resources effectively (time and budget)” which had an average score of 2.8. The genesis of the project was a local transportation study begun in 1987 and as the project progressed, it was halted several times due to budget issues. Additionally, it was a very expensive project due to the amount of land/building purchased and efforts to move/rehabilitate historic dwellings.

The project team responses indicated strong agreement that “Involve all stakeholders”, “Use a full range of communication tools” and “Seek broad-based public involvement” were met give those principles average ratings of 3.7, 3.7 and 3.8.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.2
Increased stakeholder/public participation compared to other projects	NA	3.2
Increased stakeholder/public participation	2.3	3.2
Increased stakeholder/public ownership	2.3	3.0
Increased stakeholder/public trust	2.3	2.8
Decreased costs for overall project delivery	NA	2.2
Decreased time for overall project delivery	NA	2.0
Improved predictability of project delivery	3.0	2.8
Improved project scoping	NA	2.3
Improved project budgeting	NA	2.3
Increased opportunities for partnering or shared funding or in-kind resources	2.7	3.2
Improved opportunities for joint use and development	3.0	3.0
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	2.8
Minimized overall impact to human environment	3.3	3.0
Minimized overall impact to natural environment	2.7	3.2
Improved mobility for all users	3.7	3.7
Improved walkability	3.5	2.8

Improved bikeability	2.0	2.3
Improved safety (vehicles, pedestrians, and bikes)	3.0	3.2
Improved multi-modal options	2.0	2.8
Improved community satisfaction	3.5	3.0
Improved quality of life for community	3.3	3.2
Fit with local government land use plan	3.3	3.2
Improved speed management	3.3	3.0
Design features appropriate to context	3.0	3.5
Optimized maintenance and operations	NA	2.3
Minimized disruption	2.7	3.0
Increased risk management and liability protection	NA	2.4

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The semi-quantitative benefits analysis was relatively balanced in the numbers of respondents (stakeholders-6; project team-7). In general, the stakeholders gave significantly lower scores than the project team for several benefits including “Increased stakeholder/public participation” and “Increased stakeholder/public ownership”. In part, those rankings likely reflect the low values for “Increased stakeholder/public trust”. Other stakeholder rankings that were low (below the “Agree” level) included “Increased opportunities for partnering or shared funding or in-kind resources”, “Minimized overall impact to the natural environment”, “Improved bikeability”, “Improved multi-modal options” and “Minimized disruption”. The overall project team responses were slightly less positive than the stakeholders about “Improved predictability of project delivery” and “improved walkability”. Both the stakeholders and project team were in agreement about the presence of several CSS benefits including “Improved opportunities for joint use and development”, “Minimized overall impacts to the human environment”, “Improved mobility for all users”, “Improved safety (vehicles, pedestrians, and bikes)”, “Improved community satisfaction”, “Improved quality of life for community”, “Fit with local government land use plan”, “Improved speed management” and “Design features appropriate to the context”. The project team ranked most agency accruing benefits low including “Decreased costs for overall project delivery”, “Decreased time for overall project delivery”, “Improved project scoping”, “Improved project budgeting”, “Improved environmental stewardship”, “Optimized maintenance and operations”, and “Increased risk management and liability protection”. The project team agreed that the project provided “Improved sustainable decisions and investments”.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	
Decreased costs for overall project delivery	

Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	
Minimized overall impact to human environment	35 historic properties were moved, refurbished and resold.
Minimized overall impact to natural environment	
Improved mobility for all users	
Improved walkability	
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

- ◆ Other benefits  
The original I -4 separated Ybor City leading to a decline of the northern segment. This project has worked to improve mobility for Latinos allowing improved mobility between the two segments. Local governments have provided increased police protection in the northern area leading to reduced crime. Property values in both segments of Ybor City have risen and the public is moving into the previously depressed northern segment.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.2
I am satisfied with the relationship I had with the interested public	NA	3.2
I am satisfied with the procedures and methods that allowed input to project decisions	2.7	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
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My relationship with the project team was best described as	1.7	NA
My relationship with the stakeholders was best described as	NA	2.8
My relationship with the interested public was best described as	NA	1.5

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success

Public involvement was used to provide guidance in an iterative design process. Many tools were used including charrettes, focus groups, public meetings, face-to-face meetings, websites, visualization, surveys, variable message boards and newsletters. Public/stakeholder involvement was employed during planning, design and construction. Historic structures were moved/rehabilitated and many resituated in the previously depressed north section of Ybor were resold to help renew that area. The project team stressed early and continuous involvement with the public and stakeholders. Local residents provided valuable input into the project and partnering with prominent locals helped keep the project on track.



## FINAL CASE STUDY DOCUMENTATION

Title	IA, Hwy 1, Keosauqua Bridge
Location	City of Keosauqua, Van Buren County, Iowa
Lead Agency	Iowa DOT
Contact Person	Mitchell Dillavou, Engineering Bureau Director
Phase Completed	Construction
Purpose and Need	Replace a deteriorating historic bridge quickly reaching its intended lifespan (1939 was the last structural improvement) located in a unique setting that includes a nearby historic hotel and scenic river front area.

### CSS Qualities

- ◆ Project Team (make up)  
A District Engineer served as the Team Leader and the team included: a cultural resource specialist, multiple environmental experts, a road designer, a bridge architectural designer, and multiple bridge engineers.
- ◆ Stakeholders (make up, utilization, interaction)  
A “Bridge Committee” was established that consisted of 15 individuals including community leaders and citizen representatives. The committee answered an extensive questionnaire focusing on preferences, provided critical review of design proposals and other issues and provided as a mechanism for distributing information to the community-at-large. Stakeholders included: Department of Natural Resources, Corps of Engineers, U.S. Coast Guard, the State Historic Preservation Officer and the local utility companies.
- ◆ Public involvement (types, documentation)  
The public involvement program included informal meetings with local citizens to determine bridge design preferences. A primer on bridge design terms was prepared along with the use of visualization techniques, perspective renderings and finally a scale model was built for display.
- ◆ Design solution (process, modes and alternatives examined)  
A full range of alternatives for the replacement of the bridge were considered. A participatory design approach involving team members and stakeholders/public was carried out. The solution reached also accommodated bike and pedestrian use.
- ◆ CSS concepts by project phase  
CSS was used throughout the project’s development.
- ◆ Lessons learned as expressed by members of the project team included:  
CSS takes more effort, but the result is more satisfying to most; when we listened and addressed concerns, local pride and ownership grew; given adequate opportunity the public will temper wants in face of budget constraints; additional time is required to investigate options; guidelines are needed to help future CSS projects; public partnering needs to start as early as possible; roles of stakeholders must be clearly identified; the structure type and budget limits needs early identification.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.2

Involve stakeholders	3.7
Seek broad-based public involvement	3.5
Use full range of communication methods	3.2
Achieve consensus on purpose and need	3.2
Utilize full range of design choices	3.2
Address alternatives and all modes	3.5
Maintain environmental harmony	3.2
Address community & social issues	3.3
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.8
Document project decisions	3.2
Track and meet all commitments	3.2
Create a lasting value for the community	3.8
Use all resources effectively (time & budget)	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

In the project team's expert opinion several CSS principles were strongly pursued including: Consider a safe facility for users & community; Create a lasting value for the community; Involve stakeholders; and Address aesthetic treatments & enhancements. It was agreed that the remaining principles were also pursued albeit not quite as strongly.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.6
Increased stakeholder/public participation compared to other projects	NA	3.8
Increased stakeholder/public participation	3.0	3.2
Increased stakeholder/public ownership	3.1	3.4
Increased stakeholder/public trust	3.3	3.2
Decreased costs for overall project delivery	NA	2.2
Decreased time for overall project delivery	NA	2.6
Improved predictability of project delivery	2.2	2.8
Improved project scoping	NA	2.7

Improved project budgeting	NA	2.6
Increased opportunities for partnering or shared funding or in-kind resources	2.8	3.0
Improved opportunities for joint use and development	3.0	3.2
Improved sustainable decisions and investments	NA	3.2
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	3.3	3.0
Minimized overall impact to natural environment	3.0	3.2
Improved mobility for all users	3.3	3.5
Improved walkability	3.4	3.7
Improved bikeability	3.7	3.7
Improved safety (vehicles, pedestrians, and bikes)	3.6	3.7
Improved multi-modal options	3.6	3.2
Improved community satisfaction	3.4	3.4
Improved quality of life for community	3.1	3.2
Fit with local government land use plan	3.1	3.2
Improved speed management	3.0	2.8
Design features appropriate to context	3.6	3.5
Optimized maintenance and operations	NA	3.2
Minimized disruption	2.8	3.2
Increased risk management and liability protection	NA	3.3

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The project team's expert opinion indicated rather strongly that several benefits accrued including: Increased stakeholder/public participation compared to other projects; Improved walkability; Improved bikeability; Improved safety (vehicles, pedestrians, and bikes); Improved stakeholder/public feedback; Improved mobility for all users; and Design features appropriate to context. Stakeholders also strongly indicated that several benefits accrued including: Improved bikeability; Improved safety (vehicles, pedestrians, and bikes); Improved multi-modal options; and Design features appropriate to context. In the stakeholders' view the least benefit was minimized disruption and from the project team's view the least benefit was decreased costs for overall project delivery.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
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I am satisfied with the relationship we had with project team	3.4	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.5
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	3.4	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.5	NA
My relationship with the stakeholders was best described as	NA	2.5
My relationship with the interested public was best described as	NA	2.3

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

It is notable that in the first question pair (satisfaction with the relationship) that the perspective of both the project team members and the stakeholders was relatively high. The stakeholders were even more satisfied with the procedures that allowed them input than the project members themselves. The responses to the last three items suggest that there was a consensus on the nature of the relationship between the project team and stakeholders being viewed at some where between a consultant and partner relationship. This speaks very highly of the CSS process established for this project.

#### Case Summary

- ◆ Major principles
  - Along with considering a safe facility and creating a lasting value for the community two other CSS principles were applied successfully.

The Iowa Des Moines River Bridge project at Keosauqua exemplifies the CSS principle – utilize a full range of design choices. Extensive consideration was given to restoration of the existing bridge which was listed on the Historic Register. The nature of the piers and the limited vertical and horizontal clearance of the truss structure as well as the need to close the bridge to traffic for an extended period made the restoration option unacceptable to the community. The need to maintain some traffic capability, the desire to keep the new structure as near as possible to the exiting bridge's footprint, the desire to maintain the general appearance of the existing bridge and the desire to maintain the view sheds from the bridge and toward the bridge became part of the design criteria. The final design balanced the historical and cultural factors (employing a bridge aesthetic specialist) with the need to provide a roadway, the traffic calming of the old narrow lane bridge while providing enhanced facilities for pedestrians and a new bikeway. A local Bridge Committee was formed that included 15 community leaders and citizen representatives to work with the project design staff to review concepts and scenarios which included use of visualization techniques. This facilitated the development of options and selection of the design solution in a timely manner. Samples of the textured concrete and painted steel railings, along with a scale model of the near final design, was presented to the community for review.

The Iowa Des Moines River Bridge project at Keosauqua also exemplifies the CSS principle – provide aesthetic treatments and enhancements. The word ‘keosauqua’ means ‘stream bearing a floating mass of ice’ in a Native American language. The community placed a high importance on the historical significance of the bridge and scenic river front area for the City of Keosauqua. While this would be the third bridge to be build crossing the river in this location – enhancing the design and providing aesthetic treatments was agreed to be the best way to provide lasting value to the community. Designers assessed the features of the bridge to be replaced and chose the most pleasing features while eliminating most negative aspects with the help of the local Bridge Committee. Weathering steel was chosen for the superstructure and the Committee chose a red-brown color for the railings which are of a unique design that reflects the truss design of the replaced bridge. The sheer size of the earlier piers with their steel icebreaker plates on the upstream surfaces are dramatized in the new design and small pedestrian over looks are centered above each pier. Bridge lighting is of the same design as that incorporated into nearby streetscapes. Both sides of the river offer uninterrupted views of the bridge from the shoreline; one side has the Lacey Keosauqua State Park while the other has a small city park and the nearby historic Hotel Manning.

◆ Major benefits (semi-quantitative only)

From the stakeholder perspective the top major benefits were:

- Improved bikeability
- Improved safety (vehicles, pedestrians, and bikes)
- Improved multi-modal options
- Design features appropriate to context  
(the above four benefits accrued high tied scores of 3.6)

From the team member perspective the top major benefits were:

- Increased stakeholder/public participation compared to other projects
- Improved walkability
- Improved bikeability
- Improved safety (vehicles, pedestrians, and bikes)  
(the above four benefits accrued high tied scores of 3.7)

◆ Lessons learned

The lessons learned included:

CSS takes more effort, but the result is more satisfying; additional time is required to investigate options; public partnering needs to start as early as possible; given adequate opportunity, the public will temper wants in face of budget constraints and guidelines are needed to help future CSS projects.

◆ Overall level of success

This project is judged to be very successful in terms of CSS process and resulting benefits.



## FINAL CASE STUDY DOCUMENTATION

Title	Prairie Parkway Phase I Engineering Study
Location	Kane, Kendall, Will, Grundy, LaSalle and DeKalb Counties 50 miles west/southwest of Chicago
Lead Agency	Illinois DOT
Contact Person	Rick Powell
Phase completed	Final Environmental Impact Statement
Purpose and Need	The need relates to improving regional mobility, addressing local transportation deficiencies, improving access to regional jobs and improving transportation safety. The Prairie Parkway Study is intended to identify alternative transportation improvements in a North-South corridor between I-80 and I-88 that will meet projected needs.

### CSS Qualities

- ◆ Project Team (make up)  
During the Phase I Project Development Study, multidisciplinary team approach with: 1) an IDOT oversight group (upper management), a local interest group (PAST), a Technical Advisory Group (local government officials, other stakeholders & PAST) and a resource agency group (applicable state and federal agencies). Once the purpose and need was established, the Technical Advisory Group was superseded by a Corridor Planning Group (consisting of representative from local jurisdictions to aid in the development and assessment of alternatives. Several task forces (transportation, environmental and land use) with representatives of interest groups, municipal staff, and county staff provided technical input and recommendations to Corridor Planning Group. IDOT utilized a Project Study Team consisting of IDOT District 3 personnel, Parsons Brinkerhoff Quade & Douglas and Smith Engineering Consultants to develop the DEIS. After the issuance of the DEIS, the Corridor Planning Group continued to provide the Project Study Team with guidance concerning CSS, access, roadway enhancements, environmental impacts and mitigation, and public involvement.
- ◆ Stakeholders (make up, utilization, interaction)  
The stakeholders included resource agencies (U.S Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Illinois Environmental Protection Agency, Illinois Department of Natural Resources, Illinois Department of Agriculture, FAA, FEMA and FHWA). Additionally, local governments from 7 counties and 32 municipalities as was the Chicago Metropolitan Agency for Planning were consulted. Several IDOT agencies (aeronautics and rail) and regional planning and soil conservation districts were involved as well. A variety of civic, business and other interest groups were involved in the project through meetings and membership in the project advisory groups/task forces.
- ◆ Public involvement (types, documentation)  
During Phase I, over 100 public meetings were held to identify transportation needs in the region. A telephone survey on area transportation needs was conducted with 1,000 respondents. Other public involvement included focus group meetings, newsletters and fact sheets, presentations to interested groups and a website. Following the development of the purpose and need statement, public meetings were held to review transportation alternatives as part of the DEIS and FEIS public hearing processes.
- ◆ Design solution (process, modes and alternatives examined)

The proposed route is intended to meet high anticipated population growth in the region and accommodate new businesses. The preferred alternative is to construct a new North-South freeway connecting I-80 and I-88 and to widen an existing state route (IL 47). The project has a total length of 37 miles. Transit, no-build and other alternatives were reviewed under the NEPA process, but rejected as not meeting the purpose and need. One build alternative was evaluated that had somewhat lower impacts, but which did not best address purpose and need. Significant stakeholder/public involvement was employed during development of the project purpose and need, selection/evaluation of project alternatives and formulation of alternative designs.

- ◆ CSS concepts by project phase
 

During the Phase I project development study and in subsequent phases of project development, stakeholder/public input was sought by a variety of means including the creation of advisory groups, surveys and public meetings. Those inputs were used to assist the Project Study Team in scoping, selecting the preferred alternative and developing design features for the alternatives. Concepts employed included minimizing disruption by avoiding environmental/community impacts to the greatest extent possible, coordination with resource agencies to develop acceptable mitigation, accommodation for a multi-use facility, improving mobility and economic (job) opportunity and conformance with local land use plans (to the greatest extent possible). Use of CSS is to be employed throughout the normal project development process (including construction).
- ◆ Lessons learned
 

Communication The IDOT Phase I Project Development process successfully involved the public and stakeholders. Some public/stakeholders and DOT project team members felt that there were too many meetings and that the project dragged on as a result.

Public and Stakeholder Input The public/ stakeholders appreciated having a voice in project decision making. It helped diffuse criticism of the project and promoted trust of IDOT. IDOT consultants cooperated with the public and stakeholders. While some public/stakeholders thought that input was not factored into some decisions, others believed that their input was solicited, valued and taken into consideration. Project team members believed that it was better to bring the public/stakeholders into the process early to avoid having to explain prior project history and decisions. They also noted that it takes time to built trust. Where competing stakeholder interests arose, it was useful for IDOT to act as a decision broker or referee. Some thought that too many people participated in the technical task forces making them unwieldy and unnecessarily extending project development. They believed that participation should have been limited to parties having pertinent knowledge about applicable issues.

Project Development Process The public/stakeholders appreciated the use of CSS on the project. They thought it promoted better transportation decisions especially where different community interests existed. The project team thought that CSS facilitated the project though extensive resources and time were required. CSS helped promote project acceptance even from opponents though some were reluctant to accept project findings or decision making. Project team members thought some communities were unrealistic in their enhancement “wish lists”.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.9

Seek broad-based public involvement	3.9
Use full range of communication methods	3.5
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.4
Address alternatives and all modes	3.8
Maintain environmental harmony	3.0
Address community & social issues	3.3
Address aesthetic treatments & enhancements	3.4
Consider a safe facility for users & community	3.6
Document project decisions	3.6
Track and meet all commitments	3.5
Create a lasting value for the community	3.2
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

There were 8 respondents to the survey that were considered as project team members, including the team leader. The project team indicated that all principles were present. The lowest overall rating was given to “maintain environmental harmony”. The Prairie Parkway project was large encompassing 37 miles of road construction traversing numerous communities. Direct and cumulative impacts were inevitable; however the extensive efforts of IDOT to avoid, minimize or mitigate impacts conformed to that CSS principle. The highest ratings for “involve stakeholders” and “seek broad based public involvement” reflect the many meetings and use of advisory groups to drive project decision making.

The project used interdisciplinary agency/stakeholder teams that addressed all anticipated (required) areas. Project team member survey responses were received from team members who identified themselves as transportation planners, traffic engineers, design engineers, environmental specialists, community and regional planners, community specialists and project managers. Several team members were involved in the Phase I Project Planning. Five were involved in project planning. Several members were also involved in project design. Most of the project team were new to CSS with 0-3 years of experience, while several had a longer experience (over 4 years). Finally, all project team members had more than 10 years of relevant experience.

On the positive side, there are three principles that the team was in agreement that were highly met. These include the “Involve stakeholders” (3.9), “See Broad-based Public Involvement” (3.9) and “Address Alternatives and All Modes” (3.8). These ratings were in agreement with some of the project team survey comments. Other principle ratings ranged from 3.0 to 3.6 with 6 being 3.5 or above.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.0
Increased stakeholder/public participation compared to other projects	NA	3.2
Increased stakeholder/public participation	2.9	2.8
Increased stakeholder/public ownership	2.8	3.0
Increased stakeholder/public trust	3.0	3.0
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	2.8
Improved predictability of project delivery	2.7	3.4
Improved project scoping	NA	3.0
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	2.9	2.0
Improved opportunities for joint use and development	3.0	3.3
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	2.9	3.2
Minimized overall impact to natural environment	3.2	3.0
Improved mobility for all users	3.2	3.2
Improved walkability	2.1	3.0
Improved bikeability	3.0	3.4
Improved safety (vehicles, pedestrians, and bikes)	3.2	3.2
Improved multi-modal options	2.6	2.6
Improved community satisfaction	2.8	3.0
Improved quality of life for community	2.7	3.0
Fit with local government land use plan	2.6	3.3
Improved speed management	3.3	3.3
Design features appropriate to context	3.1	3.2
Optimized maintenance and operations	NA	2.5
Minimized disruption	2.6	3.5
Increased risk management and liability protection	NA	--

#### Discussion on Benefit Values

- ◆ The responses were relatively balanced (stakeholders-16; project team-8). In general, the stakeholder scores were lower than those of the project team. Of interest are the somewhat low overall ratings for “increased stakeholder/public participation” and “increased stakeholder/public ownership” due to the numerous attempts by IDOT to engage stakeholders and the public through open forums, multi-representative project teams/task forces and surveys. The project team and public/stakeholders agreed that the resulting project incorporated features appropriate to its context. This is a large project and significant disruption could be expected. One projected outcome was that the population in the impacted areas would eventually become shifted due to the project and perhaps there was some concern on the part of the stakeholders/public about those impacts upon communities and the natural environment. Another concern may have been the significant impacts on farmland, though some of this land may have been qualified for farm land though it was currently undeveloped.
  
- ◆ **Semi-Quantitative Benefits:**  
Semi-quantitative benefits were provided from survey responses and those of the stakeholders and project team were listed in the last table. Sufficient survey replies were received for both the stakeholders (16) and project team (8) to provide sufficient validation of the semi-quantitative benefits.
  
- ◆ **Quantitative Benefits**  
In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Many meetings (100+) were held with stakeholders/public. Stakeholders participated in providing information that contributed to project decision making.
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	The project conforms to IDOT agriculture land preservation policy.
Minimized overall impact to human environment	Minimal takings
Minimized overall impact to natural environment	
Improved mobility for all users	The project is projected to save 66,000 travel hours per day by 2030.
Improved walkability	
Improved bikeability	

Improved safety (vehicles, pedestrians, and bikes)	The preferred alternative will result in 710 fewer accidents per year in the region.
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

- ◆ Other benefits  
The project will address large regional growth (28 percent from 1990 to 2000) and projected increase through 2030 (91 percent) and provide needed access to jobs in the Chicago Metropolitan Area that don't exist locally. This is necessary to improve/maintain the economic viability in the region. Mobility and safety were improved to aid motorists.
- ◆ Arnstein comparison  
The following Arnstein comparison indicates project team satisfaction with the stakeholder/public involvement similar to the stakeholder group.

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.5	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.7
I am satisfied with the relationship I had with the interested public	NA	3.2
I am satisfied with the procedures and methods that allowed input to project decisions	3.5	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.5	NA
My relationship with the stakeholders was best described as	NA	2.0
My relationship with the interested public was best described as	NA	1.3

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success  
This project is a successful application of CSS primarily in the Phase I project development study which featured extensive stakeholder/public outreach by IDOT. The subsequent project development through the issuance of the Final Environmental Impact Statement incorporated continued extensive involvement of stakeholders/public. Avoidance and other mitigation actions were complete and most impacted communities endorsed the preferred alternative. Considering the magnitude

of this project, CSS succeeded in generating sufficient stakeholder/public approval to facilitate its progress.

## FINAL CASE STUDY DOCUMENTATION

Title	New Reconstruction of Cemetery Road (KY 234)
Location	Bowling Green, Kentucky
Lead Agency	Kentucky Transportation Cabinet
Contact Person	Jeff Moore (KYTC)
Phase completed	Maintenance and Operations
Purpose and Need	The need existed to provide improved and additional access into the Bowling Green Central Business District from a new interchange on I-65. The project was also intended to relieve traffic congestion and improve safety on Cemetery Road by constructing a 4-lane facility and to accommodate future growth in the community by providing additional capacity sufficient to handle projected traffic volumes.

### CSS Qualities

- ◆ Project Team (make up)  
The Kentucky Transportation Cabinet project multidisciplinary team included personnel from planning, design, environmental, and construction. The team also included consultants involved with planning, design and landscape architecture.
- ◆ Stakeholders (make up, utilization, interaction)  
Project stakeholders included: Local Governments-City of Bowling Green, Warren County Judge-Executive's Office; Resource Agencies/MPOs-Kentucky Heritage Council, City-County Planning Commission (Bowling Green-Warren County); Local Interest Groups-The Greenways Commission, Operation P.R.I.D.E. Citizens for Improving Cemetery Road; Others-Neighborhood Associations, Western Kentucky University, Warren County 4H Extension Board and the Bowling Green Tree Board; Individuals-Primarily adjacent landowners and businesses. The local governments incorporated MOUs for future maintenance along the right of ways. Resource agencies provided input on project features/enhancements. Significant stakeholder involvement related to providing zoning acceptable to businesses and the public.
- ◆ Public involvement (types, documentation)  
Public involvement was solicited through a variety of methods including: public meetings (project and zoning) and press releases to mass media.
- ◆ Design solution (process, modes and alternatives examined)  
The revised Cemetery Road incorporated expansion of the existing roadway to four lanes along with a new intersection with I 65. Extensive use was made of green spaces along the roadway that incorporated berms to mask the road from adjacent houses. Newly created intersections were signalized using long mast light poles. An additional contract was incorporated into the project for tree/shrubbery plantings along the route.
- ◆ CSS concepts by project phase  
The project incorporated significant interaction with the public and stakeholders to identify opportunities for enhancing the community by providing amenities in the planning and design phases. Controlled access was used in conjunction with local zoning restrictions to prevent undesirable commercialization and housing growth along the project. Further opportunities for community enhancement were identified in the construction phase and incorporated in the completed project. Cooperation with stakeholders resulted with the enactment of zoning regulations and limited access to many portions of the road promoting public support. MOUs with local governments facilitated upkeep of the significant green spaces along the project.

- ◆ Lessons learned  
The extensive use of public involvement resulted in modifications to the initial design that provided a project pleasing to the community. Close agency cooperation with the local MPO greatly facilitated the public's acceptance of the road. Additional CSS features were incorporated as the project developed, even into the maintenance/operations phase. The project team believed that the slow pace of initial project planning led to a smooth transition into design and construction as many community issues/options were fully explored and decisions made early on. The project team believed that it is best to resolve long-term maintenance responsibilities prior to construction when communities request enhancements such as plantings that require long-term upkeep.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	3.3
Seek broad-based public involvement	3.7
Use full range of communication methods	3.3
Achieve consensus on purpose and need	3.7
Utilize full range of design choices	3.0
Address alternatives and all modes	3.3
Maintain environmental harmony	3.3
Address community & social issues	4.0
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.3
Track and meet all commitments	3.0
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

### Discussion on CSS principles

- ◆ Project team's perspective  
The project included an interdisciplinary team (including consultants) that effectively planned and designed the project. The project team respondents were three officials from the KYTC district office including one identified as the project team leader. Project team responses were obtained from KYTC district personnel that were planning, design and construction engineers. They all had 4 to 6 years experience in CSS and over 10 years of experience in developing transportation projects.

The project team agreed that all principles were present since all had an average score of 3.0 or greater. The principles with the lowest scores were "Track and meet

all commitments” and “Use all resources effectively (time & budget)”. The project commitments were properly addressed, though some improvement could have been gained by obtaining commitments for maintaining plantings from outside agencies. It took KYTC significant time to fully develop the project due to the many decisions/actions required from local governments and planning agencies. Some of those were going to affect follow-on projects further complicating the situation. Also, the attendant landscaping for the project was expensive and time-consuming which may have impacted the Project Team’s ratings for the effective use of time and resources.

The project team responses indicated strong agreement that “Use of interdisciplinary teams”, “Address community & social issues” and “Create lasting value for the community” were met give those principles average ratings of 4.0.

### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation compared to other projects	NA	3.3
Increased stakeholder/public participation	4.0	2.7
Increased stakeholder/public ownership	4.0	3.5
Increased stakeholder/public trust	4.0	3.0
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	2.3
Improved predictability of project delivery	3.0	3.3
Improved project scoping	NA	3.0
Improved project budgeting	NA	2.7
Increased opportunities for partnering or shared funding or in-kind resources	4.0	3.0
Improved opportunities for joint use and development	3.0	3.3
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	4.0	3.7
Minimized overall impact to natural environment	4.0	3.0
Improved mobility for all users	4.0	4.0
Improved walkability	4.0	4.0
Improved bikeability	4.0	4.0
Improved safety (vehicles, pedestrians, and bikes)	4.0	4.0
Improved multi-modal options	3.0	3.3

Improved community satisfaction	4.0	3.7
Improved quality of life for community	4.0	3.7
Fit with local government land use plan	4.0	3.7
Improved speed management	4.0	3.0
Design features appropriate to context	4.0	3.7
Optimized maintenance and operations	NA	2.7
Minimized disruption	3.0	3.3
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The semi-quantitative benefits analysis is negatively impacted by the few survey respondents (stakeholders-1; project team-3) obtained. In part, this is due to a lapse in time between completion of the project and survey solicitation. Many of the principals, both stakeholders and project team members, had retired or changed jobs and few could be contacted about the project. The lone stakeholder indicated that the project provided many benefits agreeing or strongly agreeing on 18 CSS benefits. The overall project team responses were also positive about CSS benefits except for “Increased stakeholder participation”, “Decreased costs for project delivery”, “Decreased time for project delivery”, “Improved budgeting” and “Optimized maintenance and operations”. The district and local governments/planning agencies have had a history close cooperation that predates this project. While this project had some new CSS elements, stakeholder involvement may not have been exceptional for this project. Decreased cost and time for project delivery and improved budget responses are related to the significant effort and cost needed to address stakeholder/public concerns and provide necessary beautification to the project. Maintenance and operations ratings were impacted by the lack of working agreements to maintain plantings once the project was completed.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	The Cabinet provided electric service for 4 long mast signal poles provided and serviced by the city of Bowling Green.

Improved environmental stewardship	
Minimized overall impact to human environment	There were only 6 residential and 1 business relocation (less than the other alternatives). \$0.5 million was spent on plantings to
Minimized overall impact to natural environment	
Improved mobility for all users	
Improved walkability	A two-mile long multi-use path was incorporated in the project.
Improved bikeability	A two-mile long multi-use path was incorporated in the project.
Improved safety (vehicles, pedestrians, and bikes)	In the 4 years before project completion there were 206 crashes with 56 injuries and 2 fatalities. After the project there were 124 crashes with 33 injuries and no fatalities.
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

◆ Other benefits

Local government /agencies will have opportunities to utilize excess project land for parks/multi-use paths. A local zoning plan was developed to provide orderly development along KY 234. The plan was enacted in conjunction with limited access provided by KYTC. The multi-use path was extended to provide a tie-in with a future path along an adjacent road (to be reconstructed by KYTC). A local university has placed numerous banners and a gateway along the road. Local civic groups and municipalities have assumed vegetation upkeep along the route including mowing and maintenance of flower/foilage plantings in the raised medians.

◆ Arnstein comparison

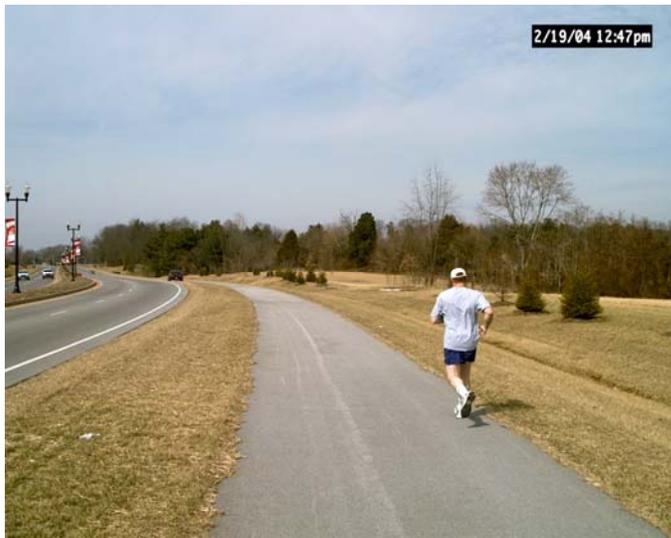
Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	4.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	4.0	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.0	NA
My relationship with the stakeholders was best described as	NA	3.3
My relationship with the interested public was best described as	NA	2.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

- ◆ Overall level of success  
This project was a successful use of CSS. Without close cooperation of local stakeholder agencies (who provided significant interfacing with the public), this project would have faced strong opposition. Previous attempts to use conventional project development to reconstruct KY 234 had stalled due to local opposition.



## FINAL CASE STUDY DOCUMENTATION

Title	US27/68 Paris Pike Reconstruction
Location	Lexington – Paris, Kentucky
Lead Agency	Kentucky Transportation Cabinet
Contact Person	Phillip Logsdon
Phase completed	Construction/Operation
Purpose and Need	The purpose of this project was to upgrade a 13.5-mile segment of roadway between Lexington and Paris to increase capacity, improve inadequate geometrics and design features to address safety concerns, and to respond to social demands of the community for an improved regional corridor route.

### CSS Qualities

- ◆ Project Team (make up)  
The project team was comprised of several consultants, including those with expertise in highway design, environmental impacts, landscape architecture, and historic preservation. In addition, there were representatives of the Kentucky Transportation Cabinet and the Federal Highway Administration.
- ◆ Stakeholders (make up, utilization, interaction)  
An Advisory Task Force was formed after a 14-year court injunction prohibiting work on the project was removed, allowing the project to proceed under the direction and control of the Paris-Lexington Road Project Advisory Task Force. The role of the Task Force was to guide the project development and management through the stages of design and construction with minimal impacts to the historic and scenic resources unique to the Paris Pike corridor. The Task Force was comprised of citizen community leaders and representatives of the local governmental and political units. Of specific note were several resource agencies involved from the beginning stages of the project; including the State Historic Preservation Officer, representatives of the Bluegrass Trust for Historic Preservation, and the Land and Nature Trust of the Bluegrass. Numerous meetings were held throughout the project development process with significant input from the Advisory Task Force, as well as resource agencies.
- ◆ Public involvement (types, documentation)  
Extensive public involvement was utilized to seek input and guide the project during the various stages of project development. The Advisory Task Force played a significant role in the interaction and involvement of the public. As previously noted, the timeline and overall schedule for the project was interrupted and delayed by inabilities of participants to reach a consensus on the direction, scale, and potential impacts. There was direct community involvement in the early stages of the project, specifically landowners adjacent to the existing alignment of US 27/US 68. A coalition of affected landowners and other indirectly affected citizens were responsible for filing a lawsuit that resulted in an injunction and halted progress on the project prior to completion of the right-of-way acquisition. Significant events in the eventual acceptance of the project by the public were “hayride tours” which permitted landowners and other interested parties to see firsthand the project corridor and understand project plans.
- ◆ Design solution (process, modes and alternatives examined)  
Roadway alignment was selected to avoid and/or minimize impacts to historical properties and structures. Highway design consultants joined with environmental

specialists, landscape architects, and historic preservationists to develop a design that would be safe, efficient, with minimal impacts to the historic and scenic resources unique to the Paris Pike corridor.

◆ CSS concepts

Extensive landscaping and aesthetic treatments such as grass shoulders, wood timber guardrail, and stone facades matching indigenous outcrops were used to blend the roadway into the surrounding horse farm countryside traversed by the new roadway. Roadway alignment was selected to avoid and minimize impacts to historical properties and structures. Dry-stone walls were prominent along the corridor and approximately three miles of walls were dismantled and reconstructed or constructed. Historic signature entrances to horse farms were avoided where practical and where impacted, new entrances were built to match the original entrances as part of the contract cost. Roadway alignment and median widths were selected to minimize impact to matriarchal trees. Utility easement modifications were coordinated to lessen impact on trees. An endangered species, Running Buffalo Clover, was transplanted to a fence-protected easement purchased specifically for this purpose. Water channel changes were combined to minimize and control erosion. Archeological site investigations were performed at Monterey and McConnel Station.

◆ Lessons learned

A major emphasis of the project was environmental sensitivity to the construction processes used on the project. The project received special attention for the management and cooperative processes used to achieve the partnerships necessary to achieve success in creating an acceptable project as viewed by the stakeholders. The Advisory Task Force was a positive factor in creating a trusting relationship between the public and the project team. Success was achieved from the overall attention given to site and corridor-specific characteristics. A quality-based prequalification process was used to secure contractors with experience and overall credentials most suited to the project. Contractor involvement in constructability reviews was a critical component resulting in appropriate attention being given to the design sensitivities delineated in the project documents. An outcome of the various cooperative partnerships was fewer change orders as compared to typical projects. Overall, the Paris Pike project was a successful effort involving a wide range of stakeholders in the development and direction of designing and constructing a highway through an aesthetic and historic section of central Kentucky.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.8
Involve stakeholders	4.0
Seek broad-based public involvement	3.5
Use full range of communication methods	3.3
Achieve consensus on purpose and need	3.3
Utilize full range of design choices	3.3
Address alternatives and all modes	3.0
Maintain environmental harmony	4.0
Address community & social issues	3.0

Address aesthetic treatments & enhancements	4.0
Consider a safe facility for users & community	3.8
Document project decisions	3.3
Track and meet all commitments	3.5
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

There were three surveys completed and returned by the project team. These team members included an employee of the Kentucky Transportation Cabinet, a Federal Highway Administration representative, and a consultant. There was relatively high agreement with opinions by all respondents that the 15 CSS principles were applied. This project was initially delayed and eventually successful based on the involvement of stakeholders, primarily represented by the Advisory Task Force. Survey results supported that level of involvement with scores of 4.0 for "Involve stakeholders" and "Create a lasting value for the community". The other areas of focus and emphasis were environmental sensitivity and aesthetic treatments, with rating scores of 4.0 for "Maintain environmental harmony" and "Address aesthetic treatments and enhancements". Also receiving high scores (ratings of 3.8) were the principles "Use of interdisciplinary teams" and "Create a safe facility for users and community". The lowest scores were 3.0 and were associated with "Address alternatives and all modes", "Address community & social issues", and "Use all resources effectively (time & budget)".

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation compared to other projects	NA	3.5
Increased stakeholder/public participation	3.2	3.3
Increased stakeholder/public ownership	3.5	3.3
Increased stakeholder/public trust	3.3	3.0
Decreased costs for overall project delivery	NA	1.8
Decreased time for overall project delivery	NA	2.3
Improved predictability of project delivery	3.0	2.8
Improved project scoping	NA	3.0
Improved project budgeting	NA	2.7
Increased opportunities for partnering or shared funding or in-kind resources	3.5	2.8

Improved opportunities for joint use and development	3.0	3.0
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	3.2	3.3
Minimized overall impact to natural environment	3.5	3.0
Improved mobility for all users	3.7	4.0
Improved walkability	2.6	2.5
Improved bikeability	2.4	2.5
Improved safety (vehicles, pedestrians, and bikes)	3.8	3.0
Improved multi-modal options	2.5	2.0
Improved community satisfaction	3.3	3.5
Improved quality of life for community	3.4	3.5
Fit with local government land use plan	3.0	3.3
Improved speed management	3.2	3.3
Design features appropriate to context	3.8	4.0
Optimized maintenance and operations	NA	2.7
Minimized disruption	3.3	3.3
Increased risk management and liability protection	NA	2.5

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

This project was aimed to improve safety and capacity, while provided a regional corridor route that was compatible with the surrounding horse farms and scenic bluegrass countryside. A major effort was expended in arranging partnerships of interdisciplinary teams and stakeholders to insure the success of the project. The role of the Advisory Task Force was a major component in achieving the project goals. Results from the survey of stakeholder and team members indicated the success of focusing on this partnership to develop a project compatible with the natural environment and public expectations. There were six responses from the stakeholder group and their opinions were generally consistent with those of the project team. The highest level of agreement, and likewise the highest scores were representative of CSS benefits that represented improved mobility and safety, as well as use of design features appropriate to the context. Other high scores were related to stakeholder and public involvement and/or interaction with the project team. Benefits that received the lowest scores from both the stakeholders and the project team included decreased time, decreased budget, walkability, bikeability, and improved multimodal options.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Advisory Task Force met numerous times to provide project guidance
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	Historic Wright House was converted to multi-use interpretive center
Improved environmental stewardship	Running Buffalo Clover was transplanted; Wetland mitigation onto 5.5 acres
Minimized overall impact to human environment	Minimal impacts to buildings and structures through historic preservation evaluations
Minimized overall impact to natural environment	Three miles of dry-laid stone fences rebuilt to maintain character of road; Landscape architect evaluated project to insure road context was retained
Improved mobility for all users	
Improved walkability	
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	Crash rates significantly lower for completed project compared to statewide
Improved multi-modal options	
Improved speed management	Average speeds after project completion near posted speeds, except in transition zones
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	Community involvement in project allowed court injunction to be lifted and project to proceed

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.3	NA

I am satisfied with the relationship I had with the stakeholders	NA	3.5
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	3.2	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempt to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. There did not appear to be a significant difference between the views of stakeholders in their relationship with the project team (rating of 3.3) as compared to the relationship views of project team members with stakeholders (rating of 3.5). Also, satisfaction levels of the stakeholders and the project team in their perception of procedures and methods that allowed input into project decisions was similar (3.2 for stakeholders and 3.3 for project team members).

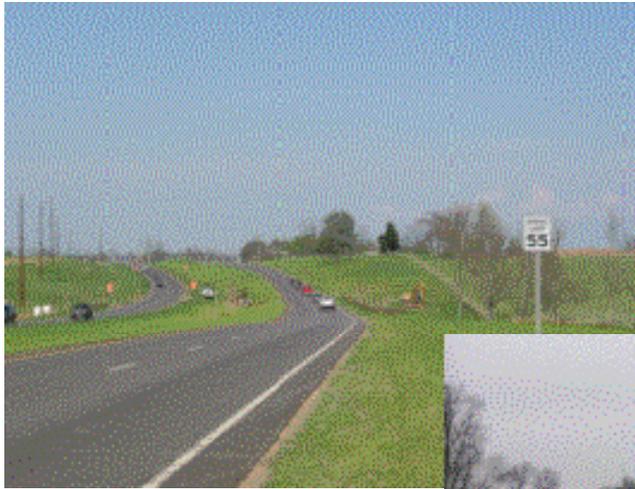
Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.8	NA
My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	3.3

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. There appeared to be feeling of serving in a combination consultation and participation role when the stakeholders described their relationship with the project team. The project team best described their relationship as that of participation when describing their relationship with stakeholders. Project team members described their relationship with the public as a combination of participation and control or direction. This appears to be consistent with the prominent role played in the project by the stakeholders as the Advisory Task Force.

- ◆ Overall level of success

The Paris Pike project was a successful effort involving a wide range of stakeholders in the development and direction of designing and constructing a highway through an aesthetic and historic section of central Kentucky. Extensive public involvement was utilized to seek input and guide the project during the various stages of project development. An Advisory Task Force was formed after a 14-year court injunction prohibiting work on the project was removed, allowing the project to proceed under the direction and control of the Paris-Lexington Road Project Advisory Task Force. The Advisory Task Force was a positive factor in creating a trusting relationship between the public and the project team.



## FINAL CASE STUDY DOCUMENTATION

Title	T2 Transportation Tomorrow
Location	Louisville, KY
Lead Agency	Transit Authority of River City (Louisville) TARC
Contact Person	Nina Walfoort
Phase completed	entered Preliminary Engineering; project currently on hold
Purpose and Need	Travel and congestion in the South Central Corridor have dramatically increased due to population and employment growth within the Louisville Metropolitan Area (LMA). An important indicator of congestion has been growth in trips on I-65 that neither begin nor end in the LMA, but are “through trips” on the interstate system. The combined travel on I-65 for local, regional and through trips has resulted in slower and less predictable travel times and reduced mobility for many interlocking travel markets in the South Central Corridor. Accessibility to jobs, business establishments, and cultural, entertainment, institutional and public service destinations is deteriorating and is considered a primary limiting factor to social and economic development. Neighborhoods are affected by the diversion of some longer trips to the local street system. Existing bus transit operates in mixed traffic and experiences the same congestion as a private automobile. In most circumstances, the rising congestion penalizes the transit traveler more so than the automobile traveler when both in-vehicle and out-of-vehicle travel times are taken into consideration. Existing transit, therefore, does not, and cannot, effectively compete with the single occupant vehicle (SOV).

### CSS Qualities

- ◆ Project Team (make up)  
The project team was led by the TARC Executive Director and had representation from project development and public information departments. Members also included a technical program manager, a communications coordinator, and a planner.
- ◆ Stakeholders (make up, utilization, interaction)  
Smoketown and Shelby Park residents; Louisville residents from other neighborhoods; TARC officials; Urban Design Studio representatives; Kentucky Transportation Center Representatives
- ◆ Public involvement (types, documentation)  
T2 carried out an extensive public involvement process with neighborhoods, businesses, city planners, and transportation planners to negotiate the best possible alignment for the overall light rail system. Over a period of seven years, T2 held over 900 meetings involving thousands of participants. T2 worked closely with individual residents to find ROW that minimized the impact on existing housing and maximized the benefits of a light rail system. T2 also collaborated with academic researchers at KTC and the Urban Design Studio, a cooperative effort between UK and the U. of Louisville. This phase concentrated on the design of one of the Transit-Oriented Developments that were anticipated to be part of the system.

Two sets of meetings were held. Stage I was to introduce the Kentucky Transportation Center team to the community focus group, to explain the methodology, to dry run the electronic voting system so that further meetings could

be held as efficiently as possible and to focus the assessment questions. Stage 2 involved the building and evaluation of the virtual reality models. On January 23, 2002 the first focus group meeting was held from 5:30-7:30 pm at Mt. Olive Baptist Church.

- ◆ Design solution (process, modes and alternatives examined)  
It became clear that the community group had some preferences regarding suitability for the neighborhood, and that these did not always align with their purely aesthetic preferences. The next step of the public involvement process consisted of two focus group meetings aiming to test the team's ability to replicate the preference scoring process. The replication was successful, gaining input from another part of the neighborhood and thus providing a broader preference base. As per design, data from the two meetings was aggregated into one database. A third meeting was held where three virtual-reality visualizations were displayed. The response to these visual models was striking. The team had been concerned about the overall qualitative 'feel' of the models and whether participants would be distracted by the differences between 'real' photographs and simulated landscapes that appear in the virtual reality simulations. Instead, respondents ignored such differences and immediately went to the design issues they were interested in. The final three scenarios were viewed, reviewed, and scored by the public, and the relative rank was consistent with the original public input.
- ◆ CSS concepts by project phase  
In the predesign phase the following principles were utilized: Use of interdisciplinary; teams; Involve stakeholders; Seek broad-based public involvement; Use full range of communication methods; Address community & social issues; Address aesthetic treatments & enhancements; Document project decisions; Create a lasting value for the community; and Use all resources effectively (time & budget).
- ◆ Lessons learned  
Opportunities for public involvement are not always recognized by general public because of low expectations generated by past public involvement processes. Repeated and consistent interaction with the relevant public on a particular project and/or by a particular agency builds a positive reputation and improves levels and thus quality of public participation. Public meetings must be carefully designed to gather the maximum input from the greatest number of participants in the minimum necessary time. Thus methods that rely on individual speeches by participants are doomed to failure because of the inefficient use of time. Information input must be rapid, anonymous, transparent, and democratic. Planning and design teams must decide ahead of time exactly what information they need and exactly how it will be incorporated into the planning and design process and how the public will be able to verify that their input was part of the process.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.8
Involve stakeholders	3.8
Seek broad-based public involvement	3.8
Use full range of communication methods	3.8
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.3
Address alternatives and all modes	3.7

Maintain environmental harmony	3.8
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.5
Consider a safe facility for users & community	3.8
Document project decisions	3.5
Track and meet all commitments	3.5
Create a lasting value for the community	3.2
Use all resources effectively (time & budget)	3.4

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

Based on the survey responses as well as comments received through the survey the project team notes that an appropriate CSD&S approach was taken throughout the completed phases. This included the identification of appropriate stakeholders and public groups on the local level to build support for the project, as well as utilizing the full range of alternatives and design choices for its execution. The lowest rated principle was "Create a lasting value for the community" which received a rating of 3.2. This may be more of a reaction to the fact that the project has not been funded and moved toward completion more than a commentary on the plan proposed by the study. Most other principles received high marks 3.5 with 6 of the 15 receiving a score of 3.8 out of 4, demonstrating that the project felt the project was executed well. A review of comments by the project team note that the proper support from the community and stakeholders was achieved, however, adequate support for the project on a state and federal level was not achieved to provide appropriate funding. As one respondent stated "We had grass roots support (but) never got the grass tops support" This may add an additional issue that must be addressed when examining stakeholder involvement and communication needs.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.5
Increased stakeholder/public participation compared to other projects	NA	3.5
Increased stakeholder/public participation	2.8	3.7
Increased stakeholder/public ownership	2.7	3.8
Increased stakeholder/public trust	2.4	3.5
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	2.5
Improved predictability of project delivery	2.3	2.0

Improved project scoping	NA	3.0
Improved project budgeting	NA	3.3
Increased opportunities for partnering or shared funding or in-kind resources	2.6	3.4
Improved opportunities for joint use and development	2.6	3.4
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	2.2	3.4
Minimized overall impact to natural environment	2.3	3.6
Improved mobility for all users	2.5	3.0
Improved walkability	2.5	2.6
Improved bikeability	2.7	2.4
Improved safety (vehicles, pedestrians, and bikes)	2.4	2.6
Improved multi-modal options	2.3	2.8
Improved community satisfaction	2.3	2.8
Improved quality of life for community	2.4	2.8
Fit with local government land use plan	2.8	3.6
Improved speed management	2.5	2.0
Design features appropriate to context	2.5	3.4
Optimized maintenance and operations	NA	2.0
Minimized disruption	2.5	3.0
Increased risk management and liability protection	NA	2.5

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits
 

Comparing the responses of the project team and the stakeholders, there appears to be a definite gap between the perceived benefits of the project. Question related to stakeholder/public participation, ownership and trust were rated almost a full point lower by the stakeholders (2.4-2.8) than the project team (3.5-3.8). This may be indicative of the fact that the project was not completed and reflect some frustration on the part of stakeholders for the lack of implementation. In fact that only areas, where agreement between the two appeared were areas where both the project team and stakeholders both disagreed about benefit being achieved by the project. This included improved walkability (2.5-2.6) and bikeability (2.7-2.4), as well as safety multi-modal options and community satisfaction.
- ◆ Quantitative Benefits
 

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.7	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.7
I am satisfied with the relationship I had with the interested public	NA	3.8
I am satisfied with the procedures and methods that allowed input to project decisions	2.6	3.5

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	1.9	NA
My relationship with the stakeholders was best described as	NA	2.5
My relationship with the interested public was best described as	NA	2.8

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

Examining the Arnstein questions above, similar disagreement can be seen between the project team and the project stakeholders. While the project team rated their satisfaction with the stakeholders and public as relatively high (3.7 and 3.8, respectively), stakeholders had an average rating of 2.7. Likewise, stakeholders viewed their relationship somewhere between an informational and consultation based relationship, while the project team viewed it as between a consultation and partnership.

- ◆ Overall level of success

The project team was led by the TARC Executive Director and had representation from project development and public information departments. Members also included a technical program manager, a communications coordinator, and a planner. T2 carried out an extensive public involvement process with neighborhoods, businesses, city planners, and transportation planners to negotiate the best possible alignment for the overall light rail system. Over a period of seven years, T2 held over 900 meetings involving thousands of participants. T2 worked closely with individual residents to find ROW that minimized the impact on existing housing and maximized the benefits of a light rail system. T2 also collaborated with academic researchers at KTC and the Urban Design Studio, a cooperative effort between UK and the U. of Louisville. This phase concentrated on the design of one of the Transit-Oriented Developments that were anticipated to be part of the system. Based on the survey responses as well as comments received through the survey the project team notes that an appropriate CSD&S approach was taken throughout the completed phases.

## FINAL CASE STUDY DOCUMENTATION

Title	MD Route 75
Location	Town of Union Bridge, MD
Lead Agency	Maryland State Highway Agency
Contact Person	
Phase completed	Construction
Purpose and Need	The purpose of this project was rehabilitation and improvement of MD 75 through the Town of Union Bridge including improvement of the sidewalks along the corridor while creating a “sense of place” as you enter into Union Bridge and maintaining and enhancing the historic qualities of the community.

### CSS Qualities

- ◆ Project Team (make up)  
A multi-disciplinary design team was formed including highway, drainage, lighting, geotechnical, structural and traffic engineering, landscape architecture, and environmental science.
- ◆ Stakeholders (make up, utilization, interaction)  
A Task Force was set up that included representatives from the design team, the State, business owners, adjacent property owners, and concerned citizens.
- ◆ Public involvement (types, documentation)  
Project alternatives were developed in close coordination with members of the Task Force. The alternatives analysis included a matrix of key elements, such as safety, cost, and impacts. This matrix, as well as the rendered concept plans for the alternatives was reviewed by the Task Force and then presented to the Mayor and the Main Street Revitalization Committee for input and comments. Monthly updates in the form of newsletters were mailed to residents. Visual tools used for presentation at the community meetings included:
  - Color rendered concept plans of the alternatives and all of the historic properties,
  - Color rendered landscape plan
  - 3 dimensional perspective renderings showing before and after views of the Town, and
  - A display showing the bump outs at Broadway and MD 75
  - Site visits of key features to assist in visualizing location of new workSHA representatives were always available to address any issue that might arise. Throughout construction partnership meetings were held to address any concerns and keep everyone up to date on construction schedules. Local participation in the project from start to finish resulted in the Town accepting responsibility for maintenance of aesthetic treatments.
- ◆ Design solution (process, modes and alternatives examined)  
The improvement of pedestrian access, speed reduction through the town, and development of alternative route for the cement trucks were design challenges that were addressed with the help of the task force. The geometric layout of the resulting project aimed to minimize property impacts. Sight lines to businesses were carefully considered in the design of the proposed landscaping. Sidewalks and crosswalks were constructed using patterns and colors which complimented the historic character of the Town.

- ◆ CSS concepts by project phase  
The use of the task force was essential in developing solutions and communicating them to the public. Items of importance to the residents and businesses in the Town were assessed during the early Task Force meetings through discussions with Town officials, property owners, and the Main Street Revitalization Committee. Later in the planning phase, public meetings were held that allowed for understanding what was important to the community by receiving the input of concerned citizens. These community values included safety, accessibility, visibility for businesses, aesthetic enhancements, and the desire for creating a “sense of place” as you enter into Union Bridge. These values were incorporated into the design by selecting the alternative that was best able to address these values. The project creates a lasting value for the community by providing an aesthetically pleasing corridor, maintains the historic character of the area, and improved pedestrian safety and opportunities. A memorandum of understanding regarding maintenance of the landscaping and gateway signs was developed and signed.
- ◆ Lessons learned  
The success of SHA’s process was measured by the feedback given during the Task Force meetings and the meetings that were held with a larger group of stakeholders. SHA’s District Office is in continuous contact with the Town’s leaders who convey comments from motorists, elected officials, business owners, and citizens in the Town of Union Bridge. Early and continuous communication avoided possible problems later in the project design and construction. The public involvement resulted in a shorter time for the project delivery.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.8
Seek broad-based public involvement	3.4
Use full range of communication methods	3.4
Achieve consensus on purpose and need	3.6
Utilize full range of design choices	3.4
Address alternatives and all modes	3.1
Maintain environmental harmony	3.4
Address community & social issues	3.3
Address aesthetic treatments & enhancements	3.3
Consider a safe facility for users & community	3.5
Document project decisions	3.4
Track and meet all commitments	3.4
Create a lasting value for the community	3.5
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

## Discussion on CSS principles

### ◆ Project team's perspective

There were 12 respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principle with the lowest score was "Address all alternatives and all modes" (3.1).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as design engineers, environmental specialists, construction engineers, highway district engineers, utility relocation specialists, project management and program managers. All were involved in the design phase of the project and several were involved in project planning and construction as well. The highway district engineer was also involved in the maintenance phase of the project and there were a few members that were involved in two or more phases of the project. Approximately two-thirds of the respondents had a long experience with CSS projects (over 6 years) and only two respondents indicated that they were new to CSS with 0-3 years of experience. Finally, most team members had more than 10 years of relevant experience.

As noted above, there was only one principle that had a low score (3.1) indicating that this principle was "barely" applied. A further review of the comments provided by the team members that scored this principle with the low score did not provide any additional information to clarify the reasons for the low score.

There is only one principle that the team was in agreement that was highly met; "Involve stakeholders" (3.8). This strong agreement was also highlighted in several of the comments provided where the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed.

## CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation compared to other projects	NA	2.8
Increased stakeholder/public participation	--	3.3
Increased stakeholder/public ownership	--	3.5
Increased stakeholder/public trust	--	3.3
Decreased costs for overall project delivery	NA	2.2
Decreased time for overall project delivery	NA	2.4
Improved predictability of project delivery	--	2.7
Improved project scoping	NA	3.0

Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	--	3.3
Improved opportunities for joint use and development	--	3.1
Improved sustainable decisions and investments	NA	3.2
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	--	3.1
Minimized overall impact to natural environment	--	3.2
Improved mobility for all users	--	3.3
Improved walkability	--	3.5
Improved bikeability	--	2.9
Improved safety (vehicles, pedestrians, and bikes)	--	3.5
Improved multi-modal options	--	2.8
Improved community satisfaction	--	3.4
Improved quality of life for community	--	3.4
Fit with local government land use plan	--	3.5
Improved speed management	--	2.9
Design features appropriate to context	--	3.5
Optimized maintenance and operations	NA	3.4
Minimized disruption	--	3.3
Increased risk management and liability protection	NA	2.8

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

There were no stakeholders that completed the survey. Overall, team members indicated that several benefits materialized as a result of the process followed. Several benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. There are five benefits with a score of 3.5 (the highest noted among the responses and indicating that the participants were split) including “Increased stakeholder/public participation”, “Improved walkability”, “Design features appropriate to the context”, “Improved safety”, and “Fit with local government land use plan”. These benefits indicate that the project resulted in an appropriate contextual design for the community.

There are a few benefits that had a score below 3.0 that indicate that the respondents believe that the benefit was marginally materialized. Among those with the lowest scores were “Decreased costs for overall project delivery”, “Decreased time for overall project delivery”, and “Improved predictability of project delivery”. These answers indicate that the respondents perceive that the process resulted in longer time and higher costs for the project and had no significant effects on predictability of the project completion.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.4
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	2.5
My relationship with the interested public was best described as	NA	2.4

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. However, in this case this was not possible due to the lack of stakeholder responses. The team showed high levels of satisfaction working with both stakeholders and public. The question on the level of relationship between team and stakeholders showed that team members viewed that relationship between consultation and partnership.

◆ Overall level of success

This project demonstrated a successful application of CSS processes through the use of an interdisciplinary team, the establishment of an advisory committee, and continuous communication with the public and stakeholders. These efforts resulted in a in a shorter time for the project delivery and the development of a project that creates a lasting value for the community by providing an aesthetically pleasing corridor, maintains the historic character of the area, and improved pedestrian safety and opportunities.

# MD-75 BUMPOUT



## FINAL CASE STUDY DOCUMENTATION

Title	US 1 Planning Study
Location	College Park, MD
Lead Agency	Maryland State Highway Agency
Contact Person	N/A
Phase completed	Planning
Purpose and Need	The purpose of this project was improvement of US 1 through the City of College Park to address safety, manage congestion, improve pedestrian and bicycle facilities, and incorporate a sense of place along the corridor.

### CSS Qualities

- ◆ Project Team (make up)  
A Study Team was set up that was comprised of highway and traffic engineers, landscape architects, graphic designers, planners, and included considerable stakeholder representation.
- ◆ Stakeholders (make up, utilization, interaction)  
A Focus Group was formed and included representatives from local businesses, residents, elected officials, and state and local government representatives. The Study Team collaborated closely with the Focus Group and was able to produce the best possible design with the greatest cost-to-benefit ratio to present to the public for feedback. The result was an impressive amount of constructive community action to help the team best meet the safety, aesthetic, and operational needs of the corridor. The Focus Group was responsible for communicating the progress of the study to the local citizens and businesses that were not directly involved with the study.
- ◆ Public involvement (types, documentation)  
The Study Team solicited feedback through focus group meetings, individual property owner meetings, workshops, and interagency review meetings with resource agencies. During meetings that were held to discuss the overall study participants made suggestions on locations for access and access consolidation. In addition, the business owners also were able to better define the logistics of their business in order to help the team determine the location of median breaks and u-turns. An Alternates Public Workshop was held to present the preliminary alternates developed for this study and to receive input from the public concerning support or opposition to each alternate. A Location/Design Public Hearing was held to present the results of the detailed engineering and environmental studies for the proposed improvements to the citizens in the project area and to accept public testimony. This information was then utilized by the Study Team to evaluate the alternates and make modifications in support of public concerns. An Informational Public Workshop was held to present the options developed and to receive feedback. The communication tools used to communicate during the planning study included the following:
  - Brochures summarized project description, the Alternates Public Workshop, and for the Location/Design Public Hearing
  - Newsletters provided frequent updates on the study and summarized project description for the Business Community Meetings and for the June 2004 Informational Workshop),
  - Displays were used at all public meetings to depict the alternates under consideration, traffic conditions, environmental impacts, schedule, and next

steps and renderings were used for all public meetings to show the features of the alternates once they had been chosen.

- ◆ Design solution (process, modes and alternatives examined)  
The Study Team worked tirelessly through a collaborative and interactive process with the community to develop an alternate that incorporates “community livability features and aesthetic treatments”. One of the goals of the study was to create a “Sense of Place” along the US 1 corridor by developing streetscape plans that, through the use of landscaping, utility relocation and other unifying elements, present users with consistent and coherent themes, which is the basis of CSS principles. The Study Team, through coordination with local property owners and business associations, was able to minimize impacts and decrease associated right-of-way costs. Bicycle lanes, consolidated access points, bus pull-offs, improved sidewalk connectivity and pedestrian crossings, street trees and landscaped panels, improved lighting and other aesthetic improvements were incorporated while maintaining a minimal footprint to avoid impacts to local commercial properties.
- ◆ CSS concepts by project phase  
An extensive group of stakeholders and affected citizens was consulted extensively and consistently throughout the project. Several meetings were held with special interest and advocacy groups to receive suggestions on how they envisioned the improved corridor. The interests of the community are represented in the selected alternate. An extensive public involvement process was utilized to solicit input and shape the final alternative selected. The final design includes several treatments that will address safety, mobility, aesthetic, and environmental issues. When constructed, the project will offer increased safety, economic growth, and rate of multi-modal transportation usage.
- ◆ Lessons learned  
By utilizing the talents and resources of those who provided input, the Study Team was able to produce an alternate that provided the greatest possible improvements to the function and safety of the highway and implement features beneficial to the aesthetic quality of the corridor. Feedback received from the community consistently applauded the Study Team’s efforts to incorporate the comments, ideas and critiques of the proposed designs as provided by the public. The interaction with the Focus Group has been one of the strongest and most consistent such relationships for a Project Planning Study in recent memory.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.5
Seek broad-based public involvement	3.6
Use full range of communication methods	3.8
Achieve consensus on purpose and need	3.4
Utilize full range of design choices	3.2
Address alternatives and all modes	3.4
Maintain environmental harmony	3.5
Address community & social issues	3.5

Address aesthetic treatments & enhancements	3.5
Consider a safe facility for users & community	3.5
Document project decisions	3.7
Track and meet all commitments	3.5
Create a lasting value for the community	3.3
Use all resources effectively (time & budget)	3.5

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The project team survey was completed by 5 project team members all with the state transportation agency. For all principles the team members either responded as agree or strongly agree, indicating a high agreement that all 15 principles were applied. This project was ultimately successful due to the high level of coordination between the project team and the community. This coincides with the principle "Use full range of communication methods" as the highest ranked alternative. The lowest ranked principle was "Utilize a full range of design choices." Only one respondent indicated strong agreement with this principle. Similarly, only one respondent indicated strong agreement with "Address alternative and all modes" (one responded "Unknown"). This may be indicative of the fact that the project was a roadway rehabilitation project and thus limited the amount of design choices and alternatives that could be explored.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.0
Increased stakeholder/public participation compared to other projects	NA	3.5
Increased stakeholder/public participation	--	3.3
Increased stakeholder/public ownership	--	3.3
Increased stakeholder/public trust	--	3.5
Decreased costs for overall project delivery	NA	4.0
Decreased time for overall project delivery	NA	2.0
Improved predictability of project delivery	--	2.3
Improved project scoping	NA	3.0
Improved project budgeting	NA	2.8
Increased opportunities for partnering or shared funding or in-kind resources	--	3.0
Improved opportunities for joint use and development	--	2.8
Improved sustainable decisions and investments	NA	--

Improved environmental stewardship	NA	3.5
Minimized overall impact to human environment	--	3.3
Minimized overall impact to natural environment	--	3.0
Improved mobility for all users	--	3.0
Improved walkability	--	3.3
Improved bikeability	--	3.3
Improved safety (vehicles, pedestrians, and bikes)	--	3.3
Improved multi-modal options	--	2.7
Improved community satisfaction	--	3.5
Improved quality of life for community	--	3.3
Fit with local government land use plan	--	3.2
Improved speed management	--	2.7
Design features appropriate to context	--	3.2
Optimized maintenance and operations	NA	2.7
Minimized disruption	--	3.0
Increased risk management and liability protection	NA	2.5

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits:

NO stakeholders completed the survey and therefore comparison of project team member and stakeholder benefits is not possible. However, the varied range of responses by the project team does give some indication of the benefits on the project. It is interesting to note that highest rated benefit was “decreased costs for overall project delivery” (4.0; strongly agree) while at the same time the lowest rated benefit was “decreased time for overall project delivery” (2.0; disagree) This may be indicative of the way in which the project worked with stakeholders to reduce impacts and right of way costs, leading to a cheaper project overall, but increasing the amount of time required for public involvement, planning and design. It was also by a respondent to “Involve key stakeholders earlier in the project.” This may be indicative of a project that had to revisit some aspects of the project due to stakeholder concern.

Once of the lessons learned stated by a respondent was that “t is difficult to balance the desires of all stakeholders in on a project in a highly urbanized area where the goals of the various stakeholder groups are not consistent.” While this presents a challenge it is also noted that “improved community satisfaction” and “improved quality of life for community” wee both rated relatively high (3.3 and 3.5 respectively.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.2
I am satisfied with the relationship I had with the interested public	NA	3.2
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.2

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	2.6
My relationship with the interested public was best described as	NA	1.6

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

No stakeholders completed the survey for this project, which does not allow for a comparison of project team member and stakeholder responses. It is interesting to note that the project team had relatively high levels of satisfaction with their relationships with the stakeholders and public, while at the same time describing those relationships relatively low compared to other projects studied. The stakeholder relationship was identified as between a consultative and partnership, while the public relationship was described as between informational and consultative.

- ◆ Overall level of success

A Focus Group was formed and included representatives from local businesses, residents, elected officials, and state and local government representatives. The Study Team collaborated closely with the Focus Group and was able to produce the best possible design with the greatest cost-to-benefit ratio to present to the public for feedback. The result was an impressive amount of constructive community action to help the team best meet the safety, aesthetic, and operational needs of the corridor. An Alternates Public Workshop was held to present the preliminary alternates developed for this study and to receive input from the public concerning support or opposition to each alternate. The Study Team worked tirelessly through a collaborative and interactive process with the community to develop an alternate that incorporates “community livability features and aesthetic treatments”. The Study Team, through coordination with local property owners and business associations, was able to minimize impacts and decrease associated right-of-way costs. By utilizing the talents and resources of those who provided input, the Study Team was able to produce an alternate that provided the greatest possible improvements to the function and safety of the highway and implement features beneficial to the aesthetic quality of the corridor. Feedback received from the community consistently applauded the Study Team’s efforts to incorporate the comments, ideas and critiques of the proposed designs as provided by the public.



**Draft**

## FINAL CASE STUDY DOCUMENTATION

Title	ME Route 26
Location	Sabbathday Village, New Gloucester and Poland, ME
Lead Agency	MaineDOT
Contact Person	
Phase completed	Construction
Purpose and Need	The purpose of this project was to improve 5.5 miles of a deficient portion of State Route 26, to address safety and travel conditions and at the same time minimize environmental and community features.

### CSS Qualities

- ◆ Project Team (make up)  
Maine DOT assembled at the outset of the project a multi-disciplinary team of engineers, planners, scientists, and public involvement specialists from different firms to work on the project. Within MaineDOT, a multi-disciplinary team was formed and a team-based approach used throughout project development. This team consisted of representatives of most departments and bureaus within the DOT, including planning, design, right-of-way (ROW), construction and maintenance.
- ◆ Stakeholders (make up, utilization, interaction)  
A 13-member Public Advisory Committee (PAC) was also formed consisting of officials from the towns, two regional Council of Government representatives, regional Transportation Advisory Committee, and local citizens, including a member of the Shaker Village community. The PAC was instrumental in assisting MaineDOT in the identification of transportation problems and purpose and needs, establishing and prioritizing project goals, developing and assessing alternatives, the identification of impacts, developing and providing feedback on potential mitigation measures, and serving as a conduit between MaineDOT and the community. The PAC members spoke on behalf of the project at public meetings, answered phone calls and inquiries from their neighbors and constituents, and provided valuable feedback to MaineDOT.
- ◆ Public involvement (types, documentation)  
The project team invited input not only from members of the public, but also from other diverse stakeholders. MaineDOT formally met with the local leaders (boards of selectmen and councilmen) from each town to discuss the project. There were also many informal meetings and discussions held between MaineDOT and local leaders over the course of the project spanning from planning, project development, through design and construction. The primary communication tools used were large scale features mapping, photo-simulations, and the WWW to aid in distribution of project information and the EA. Photo simulations of the proposed highway alignment in relation to the Shaker Village were generated to assist the Shakers, the PAC, the public and agencies to better visualize how the proposed highway would look from several points within the historic Shaker Village. The EA and Section 4(f) Evaluation were posted on MaineDOT's website in .pdf to aid in disseminating it and facilitating its public review and comment. This was an important tool in public outreach as many seasonal travelers and out-of-state property owners use Route 26 but could not make a special trip to attend the public hearing or review the EA. As part of the formation of the project's purpose and needs statement, the PAC and public were asked to identify and prioritize their community goals for the project to help make the project more reflective of the community's values and vision. The PAC and public identified and prioritized nine goals as part of the Project Purpose, as well as, specified nine

project needs. As the project was developed, these goals and needs were periodically revisited to help ensure that the preferred alternative was developed that was reflective of the communities values and vision. At the conclusion of the NEPA process, the community goals that had been developed at the beginning of the project were revisited for the final time; all of the goals had been met by the Preferred Alternative. Individual meetings and communications also occurred with the Towns, the Shaker Community and other stakeholders throughout the design and construction phases. Extensive discussions took place between MaineDOT and the Shaker community with regard to design, the identification of minimization and mitigation measures, and construction issues associated with improvements in the vicinity of the Shaker Village.

- ◆ Design solution (process, modes and alternatives examined)  
The development of an alignment that would address the safety issues of the roadway was central to the design challenges to be addressed. The PAC and public participated in the identification of natural, historic, scenic and other resources and values in the study area and helped develop the features mapping of the area during the planning and development phase. The PAC and public participated heavily in the identification of alternatives. Through this process, it was demonstrated that sensitive features were avoided and minimized to the extent possible. Commitments made during the NEPA process were honored during final design and construction.
- ◆ CSS concepts by project phase  
Planning - The use of the PAC and the multidiscipline team were essential in developing solutions, decision-making and communicating them to the public. The project has added lasting value and improved quality of life along those sections of the existing roadway that were bypassed, especially at two key regional attractions where conflicts between pedestrians and high traffic volumes have been eliminated: Sabbathday Lake Beach and Shaker Village. Planning and Project Development - The quality of life at the Shaker Village, a key regional cultural and community resource has also been enhanced by the project. Safety has been substantially improved within the Shaker Village as the Shakers and visitors to the historic landmark no longer have to cross Route 26 to access developed properties, conduct historical tours and other daily chores. Parking for the Sabbathday Lake Beach was located on the opposite side of Route 26 from the beach. The Preferred Alternative bypassed the beach and provided safe pedestrian access to this facility as well as improved storm water and other water quality issues associated with local aquifers and Sabbathday Lake. The purpose and needs statement was prepared with the assistance of the PAC followed by a request to identify and prioritize community goals for the project in order to make the project more reflective of the community's values and vision. Nine goals and nine needs were identified and prioritized by the PAC and public; as the project was developed, these goals and needs were periodically revisited to help ensure that the identified preferred alternative was developed reflective of the community's values and vision.
- ◆ Lessons learned  
The use of a PAC to facilitate the development of alternatives and the achievement of consensus on purpose and need were essential in completing construction without controversy for a project that had been stopped several times in the past. Even though there was a little more effort expended during the planning and project development process to take a CSS based approach, the process resulted in a decision that was accepted by the affected communities, was sustainable over time, and ultimately received faster approval for the project, leading to the construction of context sensitive transportation improvements that had been discussed for more than 40 years, but never implemented. As an additional outcome, feelings of greater public trust of MaineDOT were created that have carried over to other major projects and additional efficiencies and effectiveness that cannot be measured.

## CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.7
Seek broad-based public involvement	3.6
Use full range of communication methods	3.2
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.5
Address alternatives and all modes	3.4
Maintain environmental harmony	3.5
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.6
Consider a safe facility for users & community	3.6
Document project decisions	3.5
Track and meet all commitments	3.4
Create a lasting value for the community	3.6
Use all resources effectively (time & budget)	3.4

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

### Discussion on CSS principles

#### ◆ Project team's perspective

There were 13 respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principle with the lowest scores was "Use full range of communication methods" (3.2).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as design engineers, transportation planners, environmental scientists, and project managers. All were involved in the planning and design phases of the project and one was involved in the construction phase. Approximately one-half of the respondents were new to CSS with 0-3 years of experience, while most of the others had a longer experience (over 6 years). Finally, all respondents had more than 10 years of relevant experience.

As noted above, the only principle with the low score (3.2) indicates that the respondents believe that it was "barely" applied. There were no additional comments provided by the team member that scored this principle with the low score and thus no additional information to clarify the reasons for their low score could be provided. On the contrary, the comments of the other respondents indicated that several

methods for communicating with the public and stakeholders were utilized and most respondents believe that they were appropriate in reaching the targeted audience.

On the positive side, there are two principles that the team was in agreement that were highly met. These include the “Involve stakeholders” (3.7) and “Address community and social issues” (3.7). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed.

### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.6
Increased stakeholder/public participation compared to other projects	NA	3.4
Increased stakeholder/public participation	3.3	3.3
Increased stakeholder/public ownership	3.3	3.6
Increased stakeholder/public trust	3.4	3.5
Decreased costs for overall project delivery	NA	2.8
Decreased time for overall project delivery	NA	2.8
Improved predictability of project delivery	3.3	3.1
Improved project scoping	NA	3.1
Improved project budgeting	NA	3.2
Increased opportunities for partnering or shared funding or in-kind resources	3.2	3.1
Improved opportunities for joint use and development	3.0	3.4
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	3.3	3.3
Minimized overall impact to natural environment	3.5	3.3
Improved mobility for all users	3.8	3.5
Improved walkability	3.4	3.3
Improved bikeability	3.3	3.4
Improved safety (vehicles, pedestrians, and bikes)	3.7	3.5
Improved multi-modal options	3.2	2.8
Improved community satisfaction	3.5	3.7
Improved quality of life for community	3.5	3.6
Fit with local government land use plan	3.3	3.4

Improved speed management	3.7	3.3
Design features appropriate to context	3.3	3.4
Optimized maintenance and operations	NA	3.5
Minimized disruption	3.3	3.6
Increased risk management and liability protection	NA	3.7

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

Overall, both stakeholders and team members indicated that almost all benefits materialized as a result of the process followed. Almost all benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. Benefits that had high scores (equal or greater than 3.7, indicating that most of the participants strongly agree) include “Improved community satisfaction” and “increased risk management and liability protection” by the team members and “Improved safety” and “Improved speed management” by the stakeholders. These benefits indicate that the project resulted in a project that the community appreciates.

There are a few benefits that had a score below 3.0 that indicate that the respondents believe that the benefit was marginally materialized. These include “Decreased costs for overall project delivery”, “Decreased time for overall project delivery”, and “Improved multi-modal options”. These answers indicate that the respondents perceive that the process did not improve budget and time for the project delivery. It was not possible to further examine these pinions, since no data was provided to clarify and support these statements.

An examination of the common benefits scored by both the team members and the stakeholders revealed that for most cases these scores were very similar. Even in cases where the team gave a higher score, these differences were not large and it may be attributed to the fact that there were only six stakeholders that completed the survey. Therefore, any comparisons could be conducted cautiously.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.5	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.5
I am satisfied with the relationship I had with the interested public	NA	3.4
I am satisfied with the procedures and methods that allowed input to project decisions	3.5	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. The

differences noted between the team and stakeholders were small. Both groups showed a good level of satisfaction working with each other.

There is a difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. The team members showed a reasonable satisfaction, while most stakeholders showed a stronger agreement. The comments provided by both team members and stakeholders indicate that appropriate means for soliciting input were utilized.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.2	NA
My relationship with the stakeholders was best described as	NA	2.3
My relationship with the interested public was best described as	NA	2.1

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a similar perspective. The team members indicated that they viewed that relationship between more of a consultation, while the stakeholders viewed it more as providing direction in the process. The difference noted here is opposite to what one may expect where team members tend to view things slightly different and more optimistic than the stakeholders.

- ◆ Overall level of success

This is a project demonstrating the successful use of CSS processes to complete a project that was stopped several times in the past. The use of a PAC was instrumental in developing a solution that was agreeable to stakeholders and community and resulted in a timely completion of the project. The process has also helped MaineDOT to improve its trust by the public for other projects.



## FINAL CASE STUDY DOCUMENTATION

Title	US 131 S-Curve Replacement
Location	Grand Rapids, MI
Lead Agency	Michigan DOT
Contact Person	Art Green, Development Engineer, Grand Rapids TSC, 616-451-3091
Phase completed	Construction
Purpose and Need	The purpose of this project was to improve a section of US 131 due to safety and structural issues while minimizing disruption to community, addressing cultural and natural resources, and incorporating aesthetic treatments.

### CSS Qualities

- ◆ Project Team (make up)  
A multidisciplinary team was formed including planners, landscape architects, archaeologists, grant program managers, real estate staff, engineers, architects, biologists, and a geomorphologist.
- ◆ Stakeholders (make up, utilization, interaction)  
A stakeholder group was utilized including city elected officials, chamber of commerce, Grand Valley State University (GVSU), Ottawa Indian tribe, and the Grand Rapids Metropolitan Council. Through outreach, MDOT quickly built consensus around a build alternative. Direct coordination and collaboration took place with these stakeholder groups and the public. Multiple local meetings with stakeholders, including residents and business owners, were held to discuss design issues, detours, emergency services coordination, and business impacts during construction, scheduling, and impacts to the new GVSU downtown campus.
- ◆ Public involvement (types, documentation)  
MDOT communications staff gave hundreds of presentations to various civic groups and associations. They also met with major employers in the area to present transportation options for employees' commutes during construction. Options included staggered work schedules, additional bus routes, and temporary parking lots on the bus route to encourage commuters to use public transportation. Specific communication tools included: PowerPoint presentations; visualizations; facilitated discussions on aesthetics; public relations campaign; flyers / brochures; Newsletter; project web site; and toll free number for project updates.
- ◆ Design solution (process, modes and alternatives examined)  
The important design issues addressed the safety of the roadway. During alternatives development, MDOT considered straightening the curve entirely. Straightening the curve would have meant more building (some historic) demolition, increased cost, and disruption of a neighborhood on the verge of revitalization. After discussing these impacts with stakeholders, MDOT opted for an upgrade that would allow a 55 MPH speed limit without gutting the neighborhood. Safety concerns were addressed and incorporated through a collaborative planning process with key stakeholder groups. Community values regarding the importance of maintaining an economically viable downtown, the importance of aesthetics, and potential impacts to natural and cultural resources were assessed through ongoing intensive involvement with key stakeholder groups as well as meetings with the public, before and during the project. These values were incorporated in the final design by including additional improvements, such providing additional parking for a major downtown restaurant area from excess state owned property; constructing a walkway to accommodate

pedestrian movement and a transit stop between both sides of the GVSU campus; and landscaping and sidewalk improvements with the city and GSVU. Aesthetic, cultural, and natural resource values were assessed through ongoing intensive involvement with key stakeholder groups as well as public meetings.

- ◆ CSS concepts by project phase
 

MDOT selected an alternative that balanced the need for improved highway efficiency with the community's desire to maintain the urban landscape. The extensive and intensive planning and coordination with stakeholders resulted in a project that was planned, designed, and constructed in less than two years, thus completing the project ahead of schedule. The resulting replacement is a safer and more efficient roadway that will serve the community for decades. The new roadway is aesthetically compatible with downtown Grand Rapids and has spurred further community improvement. In addition, enhanced pedestrian access, and protected transit stop were included in an abandoned railroad underpass to connect GVSU buildings on either side of the freeway. Additional design considerations included providing space for a future trail along the river and under the S-Curve as well as providing improved parking areas for the city, the Van Andel Arena, and the Interurban Transit Partnership (ITP) under the bridges, as well as permanent signal improvements for the detour route.
- ◆ Lessons learned
 

A context sensitive approach led to a safer, aesthetically pleasing, more efficient freeway respectful of local land use that will serve the metropolitan area of Grand Rapids for generations. The public involvement process was critical to gaining the agreement of the community to use a total closure and detour, rather than partial closure during construction. Early and continuous stakeholder involvement resulted in smooth project implementation.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	3.8
Seek broad-based public involvement	3.4
Use full range of communication methods	3.6
Achieve consensus on purpose and need	3.4
Utilize full range of design choices	3.1
Address alternatives and all modes	3.0
Maintain environmental harmony	3.4
Address community & social issues	3.4
Address aesthetic treatments & enhancements	3.8
Consider a safe facility for users & community	3.9
Document project decisions	3.3
Track and meet all commitments	3.4
Create a lasting value for the community	3.6

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

There were 16 respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principles with the lowest scores were "Address alternatives and all modes" (3.0) and "Utilize full range of design choices" (3.1).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as design engineers, transportation planners, traffic engineers, public relations specialists, construction engineers, environmental scientists, cultural/historical specialists, geotechnical engineers, right of way specialists, and project managers. All were involved in the design phase of the project and several were involved in project planning and construction as well. There were at least two members that were involved in all phases of the project including long range planning. Approximately one-third of the respondents were new to CSS with 0-3 years of experience, while another third had a longer experience (over 6 years). Finally, all but two team members had more than 10 years of relevant experience.

As noted above, there were two principles that had a low score (3.0 and 3.1) indicating that these principles were "barely" applied. A further review of the comments provided by the team members that scored these principles with the low score did not provide any additional information to clarify the reasons for their low score.

On the positive side, there are four principles that the team was in agreement that were highly met. These include the "Consider a safe facility for users & community" (3.9), "Involve stakeholders" (3.8), "Address aesthetic treatments & enhancements" (3.8) and "Use of interdisciplinary teams" (3.7). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders and continuous and open communication with the public was discussed by several members and was noted as a significant lesson-learned from the process followed.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.1
Increased stakeholder/public participation compared to other projects	NA	3.4
Increased stakeholder/public participation	2.3	3.2
Increased stakeholder/public ownership	2.7	3.2
Increased stakeholder/public trust	2.7	3.3

Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	2.8
Improved predictability of project delivery	3.3	3.3
Improved project scoping	NA	2.9
Improved project budgeting	NA	2.5
Increased opportunities for partnering or shared funding or in-kind resources	2.3	2.9
Improved opportunities for joint use and development	3.5	2.7
Improved sustainable decisions and investments	NA	3.2
Improved environmental stewardship	NA	3.1
Minimized overall impact to human environment	2.7	3.2
Minimized overall impact to natural environment	3.5	3.1
Improved mobility for all users	3.3	3.7
Improved walkability	2.0	2.8
Improved bikeability	2.0	2.5
Improved safety (vehicles, pedestrians, and bikes)	3.3	3.5
Improved multi-modal options	2.7	2.8
Improved community satisfaction	3.3	3.4
Improved quality of life for community	3.3	3.3
Fit with local government land use plan	3.3	3.2
Improved speed management	3.0	3.3
Design features appropriate to context	3.3	3.2
Optimized maintenance and operations	NA	3.2
Minimized disruption	3.0	3.3
Increased risk management and liability protection	NA	3.4

#### Discussion on Benefit Values

##### ◆ Semi-Quantitative Benefits

Overall, both stakeholders and team members indicated that several benefits materialized as a result of the process followed. Most benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. There was only one benefit that had high score (equal or greater than 3.7, indicating that most of the participants strongly agree) that was “Improved mobility for all users”. This benefit indicates that the project improved mobility for the community and there is an agreement between team members and stakeholders on this aspect.

There are a few benefits that had a score below 3.0 indicating that the respondents believe that the benefit was marginally materialized. These include “Decreased costs for overall project delivery”, “Improved opportunities for joint use and development”, and “Improved project budgeting”. These answers indicate that the respondents

perceive that the process resulted in longer time and higher costs for the project and had no significant effects on the project scoping.

An apparent trend of the benefits materialized is the consistent difference between the perspective of the team and the stakeholders, where for all common benefits the team scored them higher. In general, these differences are not large and it may be attributed to the fact that there were only three stakeholders that completed the survey. Therefore, any comparisons could be conducted cautiously.

◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Several meetings with stakeholders in planning stage; a public hearing with 125 participants; stakeholder meetings before and during construction
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	
Minimized overall impact to human environment	
Minimized overall impact to natural environment	
Improved mobility for all users	
Improved walkability	Addition of 5-foot sidewalk
Improved bikeability	Addition of 8-foot bike lane
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	3.0	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. Again the team showed higher levels of satisfaction working with both stakeholders and public. The stakeholders also showed a reasonable level of satisfaction working with the team.

There is a difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. The team members showed a greater satisfaction with almost an even split between those who agreed and those who strongly agreed. On the other hand, the three stakeholders showed a split choice between agreeing and disagreeing and the comments provided did not allow for any further elaboration on this issue.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.3	NA
My relationship with the stakeholders was best described as	NA	2.7
My relationship with the interested public was best described as	NA	1.7

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a slightly different perspective. The team members indicated that they viewed their relationship with the stakeholders between consultation and partnership, while the stakeholders noted that it was a partnership. The team also viewed their relationship with the public between informational and consultation relationship, with more members considering as informational. The difference noted here is similar to what one may expect where team members tend to view things slightly different and more optimistic than the stakeholders.

- ◆ Overall level of success

This was an excellent use of CSS processes. The Michigan DOT worked very closely with stakeholders and the community to develop a mutually beneficial solution. There was cooperation with the community in the construction that allowed for a faster completion of the project.



## FINAL CASE STUDY DOCUMENTATION

Title	TH 61 North Shore Dr., Reconstruction
Location	Good Harbor Bay, Minnesota
Lead Agency	Minnesota DOT
Contact Person	Scott Bradley
Phase completed	Construction/Operations
Purpose and Need	The purpose of the project was to improve roadway safety and improve traffic flow by reconstructing a 2.0-mile section of Highway 61 along Lake Superior's Good Harbor Bay.

### CSS Qualities

- ◆ Project Team (make up)
 

The project team was primarily composed of the Minnesota DOT, with advisory and resource input from a wide range of stakeholders.
- ◆ Stakeholders (make up, utilization, interaction)
 

A balance was achieved for the goals and objectives of transportation interests, the community, environmental representatives, and stakeholders.
- ◆ Public involvement (types, documentation)
 

A context sensitive design was achieved through a proactive management approach and involvement of stakeholders without contentious public involvement.
- ◆ Design solution (process, modes and alternatives examined)
 

The project involved improving roadway safety and traffic flow while minimizing impact to the surrounding area.
- ◆ CSS concepts
 

Proactive project management and stakeholder involvement accomplished the following project benefits:

  - Enhance the scenic and visual qualities of the corridor
  - Preserve historic and traditional views and vistas from the highway
  - Preserve and enhance public access to the lakeshore
  - Avoid adverse impacts to residential and commercial property owners
  - Avoid adverse impacts to the environment and state parkland
  - Reduce erosion along the lakeshore and Cutface Creek
- ◆ Lessons learned
 

Consensus was reached in determining project purpose and need to balance transportation, community, and environmental objectives, as well as selecting a lower design speed appropriate for the project characteristics.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	3.3
Seek broad-based public involvement	3.7
Use full range of communication methods	3.3

Achieve consensus on purpose and need	3.7
Utilize full range of design choices	3.3
Address alternatives and all modes	3.3
Maintain environmental harmony	3.7
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.3
Track and meet all commitments	3.3
Create a lasting value for the community	3.7
Use all resources effectively (time & budget)	3.7

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

There was one survey completed and returned by the project team. The team member was an employee of the Minnesota DOT. The respondent expressed a relatively high opinion relative to the 15 CSS principles were applied.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.0
Increased stakeholder/public participation compared to other projects	NA	3.3
Increased stakeholder/public participation	--	3.0
Increased stakeholder/public ownership	--	3.7
Increased stakeholder/public trust	--	3.7
Decreased costs for overall project delivery	NA	3.5
Decreased time for overall project delivery	NA	3.5
Improved predictability of project delivery	--	3.3
Improved project scoping	NA	4.0
Improved project budgeting	NA	4.0
Increased opportunities for partnering or shared funding or in-kind resources	--	3.7
Improved opportunities for joint use and development	--	3.5
Improved sustainable decisions and investments	NA	3.3

Improved environmental stewardship	NA	3.7
Minimized overall impact to human environment	--	3.7
Minimized overall impact to natural environment	--	3.7
Improved mobility for all users	--	3.7
Improved walkability	--	3.7
Improved bikeability	--	3.5
Improved safety (vehicles, pedestrians, and bikes)	--	3.7
Improved multi-modal options	--	3.3
Improved community satisfaction	--	3.3
Improved quality of life for community	--	3.3
Fit with local government land use plan	--	3.5
Improved speed management	--	3.5
Design features appropriate to context	--	3.7
Optimized maintenance and operations	NA	3.5
Minimized disruption	--	3.7
Increased risk management and liability protection	NA	4.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

There were no responses from the stakeholders who received the survey, and only one response from a team member as noted in the previous section. The responder indicated a high level of approval for improved project scoping and budgeting, as well as increased risk management and liability protection related to the project. Other benefits resulting from the project as perceived by the project team were minimized impacts to the environment, both natural and human, as well as improved safety, increased mobility, and minimal disruption.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.5
I am satisfied with the relationship I had with the interested public	NA	3.5
I am satisfied with the procedures and methods that allowed input to project decisions	--	4.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempt to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. Without stakeholder responses, this comparison was not possible.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	3.7
My relationship with the interested public was best described as	NA	3.3

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. Without stakeholder responses, this comparison was not possible.

- ◆ Overall level of success  
A context sensitive design was achieved through a proactive management approach and involvement of stakeholders. There was one survey completed and returned by the project team, an employee of the Minnesota DOT. The respondent expressed a relatively high opinion regarding the 15 CSS principles. However, no stakeholder responses were returned, so any comparisons with the project team are not possible.



## FINAL CASE STUDY DOCUMENTATION

Title	State Route 69, Boulder Main Street Rehabilitation
Location	Boulder MT
Lead Agency	Montana DOT
Contact Person	
Phase completed	Construction
Purpose and Need	The purpose of this project was to address safety issues and citizens' needs along route 69. A bridge that would blend with the existing terrain was also part of the project.

### CSS Qualities

- ◆ Project Team (make up)  
A consultant was hired to design the project. Because the street ran through the historic district of Boulder, the consultant included a cultural resource specialist to assist in the research of the buildings in and around the construction area. Traffic engineers addressed the traffic issues and hydraulics specialists assisted us with addressing the drainage issues using the smallest grates which still provided the necessary drainage. Other team members included: electrical engineers to deal with the period lighting; bridge engineers to design an aesthetically pleasing yet structurally sound bridge; utility specialist to assist in locating utilities and modifying designs as appropriate to avoid utilities; and landscape architects and biologists to determine numbers and types of plantings for the area.
- ◆ Stakeholders (make up, utilization, interaction)  
The project's main stakeholders were the citizens of Boulder. In addition to these individuals, the need to address the concerns of the local business owners, Jefferson County residents, out of town visitors and truck drivers that drive through the town regularly was also recognized. The city also formed an advisory council which we used to assist in making decisions throughout the design process.
- ◆ Public involvement (types, documentation)  
Direct public meetings were set and the advisory council was used to identify and address public concerns and issues upfront. These meetings provided opportunities to address concerns and design compromises such as adding period lighting and landscaping into the plans. A plan for efficient construction was set up providing fewer disruptions to the community. During construction a meeting was held every Monday morning which was open to the public. The town's involvement decreased the amount of redesigns which plagues normal construction projects. Therefore time was saved and moved quickly through the construction process. Based on stakeholder input the size of the storm drain grates was reduced, areas within the median for individuals to plant flowers were provided, the town's Advisory Committee was able select street lights that match the historical nature of the town, one of the intersections was widened to accommodate the large trucks, and decorative concrete was placed on the bridge to blend into the existing terrain along the river. To demonstrate to the community how the project would affect the feel of their town, display boards were designed and presented at the various town meetings. We also provided updates to local newspapers and news agencies to assist us in spreading the information.
- ◆ Design solution (process, modes and alternatives examined)  
Various design issues were resolved in cooperation with the citizens and the advisory council. Citizens were provided with different options that addressed all of the

previously identified issues. Angle parking is an example of the compromises made by both the department and the citizens of Boulder. The local businesses did not want to reduce the parking available for their customers, however, to maintain angle parking, we would have to widen the road, which was cost prohibitive. Working with the advisory council and businesses it was demonstrated that parallel parking met both parking and safety needs of the community. The overall goal for the citizens of Boulder was to enhance the town's appearance, which was accomplished through landscaping and median treatments.

- ◆ CSS concepts by project phase  
This collaboration with the local agencies and the public allowed the full range of stakeholders to participate in a process resulting in a transportation facility that is considered a city design and is now a source of community pride. The overall benefit achieved is an aesthetic road that has improved the overall attractiveness of Boulder. Drainage within the city limits was improved, which has reduced problems with mud and dirt. The plantings of trees, bushes and shrubs within the project boundaries has improved air quality for the town as well as provided increased shade to pedestrians and the local storefronts.
- ◆ Lessons learned  
The early and continuous stakeholder involvement has been considered the key for the success of the project. Several complimentary letters have been received that support this.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	--
Involve stakeholders	--
Seek broad-based public involvement	3.0
Use full range of communication methods	3.0
Achieve consensus on purpose and need	--
Utilize full range of design choices	--
Address alternatives and all modes	--
Maintain environmental harmony	3.0
Address community & social issues	3.0
Address aesthetic treatments & enhancements	3.0
Consider a safe facility for users & community	3.0
Document project decisions	3.0
Track and meet all commitments	3.0
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree). The research team score will be estimated once the review is completed.

Discussion on CSS principles

- ◆ Project team's perspective

The survey was only completed by 1 respondent, the project leader. This response listed “strongly agree” with only one of the fifteen principles, “Create a lasting value for the community.” The principles “Address alternatives and all modes” and “Utilize full range of design choices” were two of the four receiving a ‘3’ or Agree. Additionally, “Document project decisions” and “Track and meet all commitments” also received the lower rating of Agree. Five of the principles were not responded too and the remaining nine principles were listed as agree.

CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	--
Increased stakeholder/public participation compared to other projects	NA	3.0
Increased stakeholder/public participation	--	--
Increased stakeholder/public ownership	--	--
Increased stakeholder/public trust	--	--
Decreased costs for overall project delivery	NA	--
Decreased time for overall project delivery	NA	--
Improved predictability of project delivery	--	3.0
Improved project scoping	NA	--
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	--	--
Improved opportunities for joint use and development	--	--
Improved sustainable decisions and investments	NA	--
Improved environmental stewardship	NA	3.0
Minimized overall impact to human environment	--	3.0
Minimized overall impact to natural environment	--	3.0
Improved mobility for all users	--	3.0
Improved walkability	--	4.0
Improved bikeability	--	4.0
Improved safety (vehicles, pedestrians, and bikes)	--	4.0
Improved multi-modal options	--	--
Improved community satisfaction	--	4.0
Improved quality of life for community	--	4.0
Fit with local government land use plan	--	--
Improved speed management	--	3.0
Design features appropriate to context	--	3.0
Optimized maintenance and operations	NA	2.0

Minimized disruption	--	3.0
Increased risk management and liability protection	NA	--

Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits  
The respondent only answered 15 of the 22 benefit questions. Of those answered, only one was described as “disagree, being the “Optimized maintenance and operations.” This may be due to a lack of the use of an interdisciplinary team, as this principle was skipped in the fulfillment of the survey as well. In addition, the project added many streetscape features that may have increased maintenance needs in the future.
- ◆ Quantitative Benefits  
There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.0
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	1.0
My relationship with the interested public was best described as	NA	1.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

No stakeholders completed the survey for this project, which does not allow for a comparison of project team member and stakeholder responses. It is interesting to note that the project leader had relatively high levels of satisfaction with their relationships with the stakeholders and public, while at the same time describing those both of those relationships as informational only.

- ◆ Overall level of success  
Direct public meetings were set and the advisory council was used to identify and address public concerns and issues upfront. The town’s involvement decreased the amount of redesigns which plagues normal construction projects. Based on stakeholder input the size of the storm drain grates was reduced, areas within the median for individuals to plant flowers were provided, the town’s Advisory Committee was able select street lights that match the historical nature of the town, one of the intersections was widened to accommodate the large trucks, and decorative concrete

was placed on the bridge to blend into the existing terrain along the river. This collaboration with the local agencies and the public allowed the full range of stakeholders to participate in a process resulting in a transportation facility that is considered a city design and is now a source of community pride. The early and continuous stakeholder involvement has been considered the key for the success of the project.

## FINAL CASE STUDY DOCUMENTATION

Title	NC Smith Creek Parkway (aka, Martin Luther King, Jr. Parkway)
Location	Adjacent to Cape Fear River in New Hanover Co., Wilmington, NC
Lead Agency	North Carolina Department of Transportation
Contact Person	Nya K. Boayue, PE
Phase Completed	Construction
Purpose and Need	Reduce traffic congestion by 25 percent (and crash rate) on Market Street in Wilmington and provide a continuous east-west link between US 74 and downtown Wilmington.

### CSS Qualities

- ◆ Project team (make up)  
The project team included: engineers, planners, environmentalists and historians.
- ◆ Stakeholders (make up, utilization, interaction)  
The numerous project stakeholders included: US Army Corps of Engineers, US Coast Guard, NC Division of Coastal Management, NC Dept. of Environmental Health and Natural Resources, NC Rail Division, Federal Aviation Administration, Wilmington Mayor and City Council, Metropolitan Planning Organization, City of Wilmington's Planning and Engineering Departments, and North Fourth Street Revitalization Group (aka, North 4<sup>th</sup> Partnership, Inc.).
- ◆ Public involvement (types, documentation)  
The public involvement program included extensive involvement with project vicinity residents and business owners.
- ◆ Design solution (process, modes and alternatives examined)  
Reaching a suitable solution required a high level of interaction among all participants: state (multiple agencies), city officials and agencies, federal agencies and a host business/industry and citizen group representatives.
- ◆ CSS concepts by project phase  
CSS concepts were used during planning, design and construction.
- ◆ Lessons learned  
The agency learned the absolute necessity of using an interdisciplinary team and that extensive interaction with stakeholders and the general public was required. The use of advanced visualization techniques was also required for both the project professionals and the public.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	3.0
Seek broad-based public involvement	--
Use full range of communication methods	--
Achieve consensus on purpose and need	3.0
Utilize full range of design choices	4.0

Address alternatives and all modes	3.0
Maintain environmental harmony	3.0
Address community & social issues	3.0
Address aesthetic treatments & enhancements	3.0
Consider a safe facility for users & community	4.0
Document project decisions	3.0
Track and meet all commitments	--
Create a lasting value for the community	3.0
Use all resources effectively (time & budget)	--

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

The representative of the project team that responded to the survey indicated strong agreement that the following principles were applied: Use of interdisciplinary teams; Utilize full range of design choices; and Consider a safe facility for users & community. It was further agreed by the respondent that all but four of the other CSS principles were pursued.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	--
Increased stakeholder/public participation compared to other projects	NA	--
Increased stakeholder/public participation	--	--
Increased stakeholder/public ownership	--	--
Increased stakeholder/public trust	--	--
Decreased costs for overall project delivery	NA	--
Decreased time for overall project delivery	NA	--
Improved predictability of project delivery	--	3.0
Improved project scoping	NA	--
Improved project budgeting	NA	--
Increased opportunities for partnering or shared funding or in-kind resources	--	--
Improved opportunities for joint use and development	--	3.0
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.0

Minimized overall impact to human environment	--	4.0
Minimized overall impact to natural environment	--	4.0
Improved mobility for all users	--	3.0
Improved walkability	--	2.0
Improved bikeability	--	1.0
Improved safety (vehicles, pedestrians, and bikes)	--	3.0
Improved multi-modal options	--	2.0
Improved community satisfaction	--	3.0
Improved quality of life for community	--	3.0
Fit with local government land use plan	--	--
Improved speed management	--	3.0
Design features appropriate to context	--	3.0
Optimized maintenance and operations	NA	3.0
Minimized disruption	--	4.0
Increased risk management and liability protection	NA	4.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits  
The NC highway agency respondent indicated that several benefits strongly accrued including: Minimized overall impact to human environment; Minimized overall impact to natural environment; Minimized disruption; and Increased risk management and liability protection. Some ten other benefits were judged to have accrued by being scored 3.0.
- ◆ Quantitative Benefits  
There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.0
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA

My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	1.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

With the lack of stakeholder responses the Arnstein comparison could not be completed.

#### Case Summary

- ◆ Major benefits

The major project benefits judged to have accrued include: Minimized overall impact to human environment; Minimized overall impact to natural environment; Minimized disruption; and Increased risk management and liability protection.

The North Carolina parkway project in Wilmington exemplifies the CSS principle – maintain environmental harmony. A complete redesign of the intended final two segments of the parkway was carried out to minimize the environmental impact to businesses as well as the wetland and to avoid hazardous materials fill sites. Several years had passed and the circumstances had changed regarding land use and environmental regulations since the first two segments had been designed and constructed. The planning and design groups worked with nearby critical industries to revise the previously planned alignment in order to minimize construction vibration. Alignment was also altered to avoid chemical production and waste areas and to accommodate an abandoned rail bed so as to preserve it for possible future use. Some parking enhancement was provided to an adjacent historic district. The roadway cross-section was changed in one segment to an elevated structure to minimize impact to the wetland adjacent to the Cape Fear River.

The project also exemplifies the CSS principle – consider community and social issues. Both the alignment and cross-section were changed from the earlier plans to accommodate two major industries that had since developed adjacent to the originally planned alignment. The alignment was further altered to avoid the possibility of hazardous wastes near a chemical storage facility. The alignment and overpass assured that an abandoned rail line bed would remain unobstructed for possible future urban rail use. The section adjacent to the downtown was designed to include land dedicated to parking near the historic area. An old magnolia in the path of the road near the point it connects with the existing Cape Fear Bridge was “preserved” in a unique way with community involvement that included using the wood to craft benches for the city’s museum and with the help of an arborist over 100 young saplings were reproduced to be placed in parks throughout the city.

- ◆ Lessons learned

The agency learned the necessity of using an interdisciplinary team and that interaction with stakeholders and the general public was required. The advantage of using advanced visualization techniques for both the project professionals and the public also became apparent.

- ◆ Overall level of success

This project has been viewed as a success by the NC highway agency and that success has been reported extensively in numerous articles and letters to the editor in the Wilmington Morning Star.

Note: this is considered a CSS legacy project with the last two of four segments being constructed by mid 2002. It was previously case studied and that extensive documentation was available for this research.



## FINAL CASE STUDY DOCUMENTATION

Title	Four Bears Bridge Replacement
Location	Ft. Berthoud Indian Reservation over Lake Sakakawea near New Town, North Dakota
Lead Agency	North Dakota DOT
Contact Person	Mike Kopp (ND DOT)
Phase completed	Maintenance and Operations
Purpose and Need	The existing Four Bears Bridge (ND 23) was narrow and could not accommodate existing traffic (functionally obsolete). The new Four Bears Bridge provided a modern bridge that eliminated restrictions posed by the earlier bridge. It also accommodated pedestrians and possessed aesthetic treatments that met needs of local Native American tribes in the area.

### CSS Qualities

- ◆ Project Team (make up)  
The ND DOT staff involved with this study included environmental, planning, design and construction officials. FHWA also participated in the project team. They teamed with several consulting firms (Kadimus, Lee & Jackson and Lichtenstein Consultants) and the bridge designer, Figg Engineering.
- ◆ Stakeholders (make up, utilization, interaction):  
Stakeholders included representatives of the three affiliated tribes of Native Americans inhabiting the Fort Berthoud Indian Reservation (Hidatsa, Mandan and Arikara). Also participating were representatives of local communities outside the reservation, the North Dakota Historic Society and other transportation users.
- ◆ Public involvement (types, documentation):  
Community meetings were held to inform the tribes and neighboring communities about the project. A charrette was held with a Cultural Advisory Committee (CAC) composed of the three tribes that provided input on aesthetic treatments to be used on the new bridge. Renderings were prepared to provide feedback from
- ◆ Design solution (process, modes and alternatives examined):  
A wide two-lane segmental concrete bridge was designed/constructed containing a pedestrian walkway. Some bridge elements (piers, pedestrian guardrails and lighting) were based upon input from the CAC. Native American art was placed on the side of the bridge (emblems of animals) and on the walkway (medallions) depicting the history and culture of the three affiliated tribes. The overall color of the bridge was selected to blend into the surrounding environment. Special night lighting was employed to highlight the Native American emblems on the side of the bridge.
- ◆ CSS concepts (by project phase)  
The design of the bridge included significant public (Native American) input. The existing bridge was kept in service until the new bridge was completed to maintain traffic.
- ◆ Lessons learned  
The project team believed that it was important to keep all stakeholders involved. Public involvement in decision making could be assigned to local community leaders in a committee format. Some people may object when a facility is tailored to an ethnic group. In this case, the public should be informed of the associated costs and what the enhancement is intended to achieve. Communications is important in CSS and

when dealing with Native Americans, it needs to be customized to address them. ND DOT benefited from having the Native Americans show them the enhancements necessary to make the bridge fit into their community. Early involvement of resource agencies helped with timely approvals. It took time to properly engage all the stakeholders and patience to listen to their input. It is also beneficial to provide stakeholders of a timeframe in which all project decisions must be made. Establishing a budget for enhancements is also useful to prevent runaway costs.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.9
Seek broad-based public involvement	4.0
Use full range of communication methods	3.3
Achieve consensus on purpose and need	3.1
Utilize full range of design choices	3.1
Address alternatives and all modes	3.2
Maintain environmental harmony	3.5
Address community & social issues	3.9
Address aesthetic treatments & enhancements	3.9
Consider a safe facility for users & community	3.6
Document project decisions	3.5
Track and meet all commitments	3.4
Create a lasting value for the community	3.9
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

### Discussion on CSS principles

- ◆ Project team's perspective

The project team included planners, design, structural and construction engineers a transportation enhancement coordinator (including 3 consultants) and an FHWA project engineer. Eight of those had more than 10 years experience in project development. Two had 4 to 6 years experience with CSS, two had more than 6 years experience with CSS while the other five team members had less than three years of CSS experience. The project team agreed that all CSS principles were applied. They were in strong agreement on the application of "Involve stakeholders", "Seek broad-based involvement", "Address community & social issues", Address aesthetic treatments & enhancements and "Create a lasting value for the community".

### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.4
Increased stakeholder/public participation compared to other projects	NA	3.6
Increased stakeholder/public participation	3.3	3.3
Increased stakeholder/public ownership	3.3	3.6
Increased stakeholder/public trust	3.3	3.5
Decreased costs for overall project delivery	NA	1.8
Decreased time for overall project delivery	NA	2.0
Improved predictability of project delivery	3.0	2.8
Improved project scoping	NA	3.4
Improved project budgeting	NA	2.6
Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.0
Improved opportunities for joint use and development	3.0	3.2
Improved sustainable decisions and investments	NA	2.8
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	3.5	3.0
Minimized overall impact to natural environment	3.5	3.1
Improved mobility for all users	3.8	3.3
Improved walkability	4.0	3.4
Improved bikeability	3.8	3.5
Improved safety (vehicles, pedestrians, and bikes)	4.0	3.5
Improved multi-modal options	3.7	2.7
Improved community satisfaction	3.8	3.8
Improved quality of life for community	3.5	3.4
Fit with local government land use plan	3.3	3.3
Improved speed management	3.8	3.3
Design features appropriate to context	3.8	3.6
Optimized maintenance and operations	NA	3.0
Minimized disruption	3.5	3.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The semi-quantitative benefits analysis had a balanced stakeholder/project team survey response (stakeholders-5; project team-9). In general, the stakeholder scores were equivalent or higher than those of the project team. The project team rankings for several benefits were low including: “Decreased costs for project delivery”, “Decreased time for project delivery”, “Improved predictability for project delivery”, “Improved project budgeting”, sustainable decisions and investments”, and “improved multi-modal options”.

◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.5	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	3.5	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.3	NA
My relationship with the stakeholders was best described as	NA	2.9
My relationship with the interested public was best described as	NA	1.6

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: Stakeholders provided direction; 3: Stakeholders partnered with DOT; 2: DOT consulted with stakeholders; and 1: DOT informed stakeholders).

◆ Overall level of success

In general this was a very successful CSS project. The project team seemed to be focused on the traditional issues of project scheduling/costs and oblivious to potential negative impacts off public opposition, especially by the Native Americans. The project team seemed to be less enamored of the positive outcomes of the project in terms of public/stakeholder satisfaction than the stakeholders.



## FINAL CASE STUDY DOCUMENTATION

Title	NM 14, Madrid to Cerrillos (Turquoise Trail), NM
Location	NM route 14 (major rural collector), a scenic byway (Turquoise Trail) between towns of Madrid and Cerrillos east of the Sandia Mountains
Lead Agency	New Mexico Department of Transportation
Contact Person	Joe J. Sanchez, PE (retired prior to completion of this case study)
Phase Completed	Construction
Purpose and Need	“...to reconstruct the roadway, which had exceeded its design life, to improve safety and operations”.

### CSS Qualities

- ◆ Project team (make up)  
The project team included: engineers, planners, cultural resource specialists, construction experts, landscape architects, archaeologists, and biologists which included consultant staff.
- ◆ Stakeholders (make up, utilization, interaction)  
State Historic Preservation Office, U.S. Army Corps of Engineers, Arizona Environmental Department, and Fish and Wildlife Service.
- ◆ Public involvement (types, documentation)  
The public involvement program included the establishment of an advisory committee used throughout the project delivery process. Working with the project team members the “NM 14 Citizen Advisory Committee” developed “14 Goals for NM 14” and Record of Agreement. According to the agency, emphasis was placed on a collaborative effort involving team members and the stakeholders from the very beginning of the project.
- ◆ Design solution (process, modes and alternatives examined)  
The design solution required that the character of the road continue as a national scenic byway through the rolling hills of sage brush.
- ◆ CSS concepts by project phase  
CSS was practiced throughout the project development process.
- ◆ Lessons learned  
The importance of early involvement and the use of a formalized project advisory committee was seen a model for future projects. The usefulness of agreeing to and documenting the project’s specific goals/objectives and preferred solutions was demonstrated.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.0
Involve stakeholders	3.0
Seek broad-based public involvement	3.0
Use full range of communication methods	3.0
Achieve consensus on purpose and need	3.0

Utilize full range of design choices	3.0
Address alternatives and all modes	3.0
Maintain environmental harmony	3.0
Address community & social issues	3.0
Address aesthetic treatments & enhancements	3.0
Consider a safe facility for users & community	3.0
Document project decisions	3.0
Track and meet all commitments	3.0
Create a lasting value for the community	3.0
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree). The research team score will be estimated once the review is completed.

#### Discussion on CSS principles

- ◆ Project team's perspective

The survey submitted by the agency representative indicated agreement that all the principles of CSS had been applied to this project. The NMDOT person responsible for the survey submission was a newly appointed CSS manager with a professional background in landscape architecture.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	--
Increased stakeholder/public participation compared to other projects	NA	--
Increased stakeholder/public participation	--	3.0
Increased stakeholder/public ownership	--	3.0
Increased stakeholder/public trust	--	3.0
Decreased costs for overall project delivery	NA	--
Decreased time for overall project delivery	NA	--
Improved predictability of project delivery	--	--
Improved project scoping	NA	3.0
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	--	--
Improved opportunities for joint use and development	--	3.0
Improved sustainable decisions and investments	NA	--

Improved environmental stewardship	NA	3.0
Minimized overall impact to human environment	--	3.0
Minimized overall impact to natural environment	--	3.0
Improved mobility for all users	--	3.0
Improved walkability	--	--
Improved bikeability	--	3.0
Improved safety (vehicles, pedestrians, and bikes)	--	3.0
Improved multi-modal options	--	--
Improved community satisfaction	--	3.0
Improved quality of life for community	--	3.0
Fit with local government land use plan	--	3.0
Improved speed management	--	3.0
Design features appropriate to context	--	3.0
Optimized maintenance and operations	NA	3.0
Minimized disruption	--	3.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits  
The NMDOT maintains that benefits accrued for a majority of the benefit categories.
- ◆ Quantitative Benefits  
There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.0
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	1.0

My relationship with the interested public was best described as	NA	2.0
--	----	-----

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

With the lack of stakeholder responses the Arnstein comparison could not be completed. It is interesting to note that the NMDOT relationship to stakeholders was viewed as “informational” and that their relationship to the public was viewed as “consultant”.

#### Case Summary

- ◆ Major benefits  
The agency indicated that some 20 benefits out of a listing of 27 had accrued.
- ◆ Lessons learned  
The importance of early involvement and the use of a formalized project advisory committee was seen a model for future projects. The usefulness of agreeing to and documenting the project’s specific goals/objectives, preferred solutions and detail treatments was demonstrated.
- ◆ Overall level of success  
The project has been judged a success in terms of the solution’s fit with the environment and the maintenance, if not enhancement, of the roadway’s scenic byway character (see photo below).



## FINAL CASE STUDY DOCUMENTATION

Title	Euclid Corridor Transportation Project
Location	Cleveland, Ohio
Lead Agency	Greater Cleveland Regional Transit Authority
Contact Person	Danielle Willis, Project Officer
Phase completed	Under construction for a 12/08 operational start-up.
Purpose and Need	<p>The Greater Cleveland Regional Transit Authority (GCRTA) is embarking upon a unique and exciting transit system improvement project. The \$200 million plus project offers the third transit system alternative in the region that will give customers faster, frequent and first class service. With a total of 9.38 miles of improvements the project will connect the regions two largest employment districts - the downtown central business and University Circle to the Windermere Rapid Transit Station in East Cleveland.</p>

The Euclid Corridor Transportation Project (ECTP) is the Transportation System Management (TSM) alternative to what was originally proposed as a subway light rail project to alleviate slow travel patterns and bus operations in the corridor, which was averaging only 5.5 miles per hour. In fact, the current roadway configuration, poor pavement condition, mixed traffic flow, parallel parking, antiquated traffic signal system, frequent stops and long dwell times associated with fare collection and boarding all resulted in slow and inefficient bus service provided in this corridor. These same factors contribute to bus “bunching” and irregularity of service frequencies. Multiple routes and stops in the same block make the use of public transit confusing to existing and prospective customers. The current conditions do not promote public transit and are hindering economic development and investment in the corridor.

The ECTP as constructed will improve service to GCRTA customers through increased service frequency, reduced travel time and the inclusion of significant customer amenities. The project will increase transit system efficiency, promote long-term economic, community development, and improve the image of public transportation.

Within this transit operation, a network of consolidated ADA compliant median stations, similar to RTA’s light rail system will be available, which will feature level boarding and off-board fare collection. In addition to exclusive transit lanes, other amenities include precision docking, traffic signal prioritization, strategically placed stations, real time passenger information, enhanced service frequency and corridor “branding.” The waiting environments at stations will be improved with integrated public art, signage, interactive, touch screen kiosks and enhanced pedestrian friendly amenities. Bicycle lanes connecting the two major universities, Cleveland State and Case Western Reserve, will also incorporate a multi-modal approach to the design. In addition to roadway improvements, streetscape and irrigation landscape

improvements will be accomplished from building face to face including over 1500 trees, sidewalk and curb replacements and unique brick paver designs.

The project has already been the catalyst for economic development and significant investment in the revitalization of Euclid Avenue. Over \$400 million of mixed-use developments have occurred throughout the entire length of the project and within every neighborhood. More than \$2 billion dollars of investment and 13,000 new jobs will occur by the completion of the project.

#### CSS Qualities

- ◆ Project Team (make up)  
Project teams consist of key personnel who are directly responsible for the day –to-day operations including executive personnel; consultants, contractors; RTA support staff; and major stakeholders to track the progress and impacts of the project.

The day-to- day operational staff consists of an Executive Staff including CEO, External/Governmental Affairs; Deputy General Manager of Engineering/Project Management; Project Manager; and Project Officer.

In addition day-to-day key staffing includes Deputy Project Managers for the following areas Engineering & Design, Planning & Urban Design, Construction Management; Quality Assurance, Project Controls; Real Estate; Vehicle Acquisition; and Safety. Each Deputy Project Manager utilizes a support staff with backgrounds in civil, electrical, & structural engineering; urban design, financing, budgeting, scheduling, vehicle operations, project management, safety certification and construction inspection. Resident Engineers also are used to oversee each construction contractor for roadway, streetscape, public art, station design, lighting and communication projects.

Consultants in the areas of environmental, architecture, landscape, public art, preliminary and final design, construction management, roadway, safety certification, vehicle design, value engineering, budget analysis, land acquisition, and legal have all been utilized throughout phases of the project.

RTA support staff including legal, auditing, finance, accounting, procurement, transit operations, scheduling, strategic planning, transit police, operation training, facility maintenance and marketing departments have been used as needed to assist with the development, progression of project completion.

- ◆ Stakeholders (make up, utilization, interaction)  
Major stakeholders consist of governmental and elected officials, property and business owners along the corridor, corporate businesses, economic and community development organizations, civic, social and human service groups who continue to have an invested interest in the growth and development of the Cleveland area. Up to 75 organizations have served on the Euclid Corridor Committee to review and approve the project phases prior to construction. A smaller group of community development corporations, business alliances and elected officials have continued to follow the completion of the project during construction and acts as a liaison to the public –at – large to support RTA’s efforts to complete the ECTP. Their efforts have allowed RTA to maximize its communication and marketing efforts to promote the initiatives and benefits of the project.
- ◆ Public involvement/CSS concepts by project phase (types, documentation)  
Over 2100 community and one-on-one meetings have been conducted throughout the project phases to inform, engage and educate the public-at-large about the

ECTP. Prior to final design completion a series of design charettes and community input meetings were conducted to allow participation and comments on the overall design and social impact. All information and comments were recorded and included in the final environmental determination to select a locally preferred alternative analysis (LPA). Once the LPA was selected the Euclid Corridor Committee and various community representatives continued to meet with the Project Officer and RTA External Affairs to gain updates and input about the project progression.

To ensure that the public-at-large continues to receive effective information a Public Involvement Plan was developed to assist with RTA's educational and public awareness campaign. Its intent is to:

- Educate key audiences and other interested parties about the ECTP;
- Encourage public participation by providing multiple opportunities and vehicles for public input and the opportunity to review project stages;
- Build public trust and address community concerns about the project;
- Build consensus and support for the ECTP throughout project stages.

The Public Involvement Plan is comprised of the following strategies:

- Media Communications Network
- Community Outreach
- Marketing

Some communication tools that are being used includes:

- Website (ECTP website; linked to more than 25 community websites)
  - Quarterly newsletters
  - Flyers/Handouts
  - Speakers Bureau/Presentations
  - Traveling Marketing Displays (kiosks/booths at various locations along corridor)
  - Storefront Banners (Includes key project messages)
  - Project Video (Daily seen at local conferences, hotels, convention bureau, websites, etc)
  - Cross Marketing Information (Updates in forms of articles, construction updates, progress photos in corporate, civic, City Council, development newsletters, etc.)
  - Construction Phone Hotline
  - Construction e-mail alerts (Over 1200 member persons and organizations)
  - Media Alerts to local print, radio and tv stations
  - Community Involvement Handbooks
  - Project Brochures
  - Navigational Cards (List businesses names in each district along corridor and map to direct cars, patrons through construction sites)
  - Special Business signage campaign ("Support local businesses while Euclid Avenue is Under Construction;" "Way to Shopping is behind the orange barrels;" )
  - List of business specials, coupons, events listed in all transit material and electronic newsletters
  - Messages on local message boards (Playhouse Square; Ideastream)
  - "What you need to know during construction" cards displayed at participating Drop-in Centers
  - Community Update Meetings/Community Fairs
- ◆ Design solution (process, modes and alternatives examined)  
During the conceptual design, environmental, and preliminary engineering phases the Project team conducted numerous meetings to assess the social, transportation,

economic and environmental impacts of the project in order to select a locally preferred alternative. The Transportation System Management (TSM) alternative was selected. The Study Team consisted of the Euclid Corridor Committee, locally elected officials, Ohio Department of Transportation, Northeast Ohio Area-wide Coordinating Agency, business and neighborhood residents who were directly impacted by the project to take the responsibility of representing the community as an Evaluating Committee.

Meetings were held throughout seven districts impacted by the project. The Study Team presented each design elements and restrictions to show the possibilities and opportunities to create a “Great Street,” along Euclid Avenue again. Each district comments were recorded and presented at follow-up meetings to gain acceptance for completion. Once consensus was met the drawings and comments were presented to the City of Cleveland Design Committee and Planning Commission for approval. The consensus and overall community involvement placed the ECTP in the position to be a viable regional project.

◆ Lessons learned

Public Involvement and community input has been an essential component throughout the planning, development and construction phases of the project. By allowing meaningful dialogue with the community in strategic locations and formats, the RTA was able to capture a broad and direct audience to create on-going dialogue and consensus for the construction of the Euclid Corridor Transportation Project. It was very important to establish an Evaluating Committee and Study Team to represent the community in smaller meetings to review comments made by the public-at-large. Fact Sheets and Dialogues were updated and available for community review to keep the public informed of all discussions. Focus groups such as clergy, social, medical, human service, senior, ADAS and other groups were also targeted, especially if their organization or members were directly impacted by the project. It allowed the Study Team to gain a better perspective of the needs of these groups and community. The final environmental determination, economic benefits, and investment were easier to market the opportunities and benefits of the project due to the creative public involvement and community participation.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	4.0
Seek broad-based public involvement	4.0
Use full range of communication methods	4.0
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.5
Address alternatives and all modes	4.0
Maintain environmental harmony	3.5
Address community & social issues	3.5
Address aesthetic treatments & enhancements	3.5
Consider a safe facility for users & community	3.5

Document project decisions	4.0
Track and meet all commitments	3.5
Create a lasting value for the community	3.5
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective

There were two respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principle with the lowest score was "Use all resources effectively" (3.0).

The project included an interdisciplinary team that covered all anticipated (required) areas. The responses received came from the project managers who were involved in all phases of the project and had a long CSS experience (over 6 years) and more than 10 years of relevant experience.

As noted above, there was one principle that had a score lower than 3.5 indicating that the principle was applied but at a lower agreement level among the respondents. A further review of the comments provided by the team members that scored this principle with the low score did not provide any additional information to clarify the reasons for their low score.

On the positive side, there are six principles that the team was in agreement that were highly met. These include the "Use an interdisciplinary team", "Involve stakeholders", "Seek broad-based public involvement", "Use full range of communication methods", "Address all alternatives and all modes", and "Document project decisions" (all had a score of 4.0). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders was discussed by respondents as well as the value of documentation of decisions and the multistep communication process.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.5
Increased stakeholder/public participation compared to other projects	NA	3.5
Increased stakeholder/public participation	3.0	3.5
Increased stakeholder/public ownership	2.6	3.5
Increased stakeholder/public trust	2.4	3.5
Decreased costs for overall project delivery	NA	--
Decreased time for overall project delivery	NA	2.0

Improved predictability of project delivery	2.3	--
Improved project scoping	NA	3.5
Improved project budgeting	NA	2.5
Increased opportunities for partnering or shared funding or in-kind resources	2.8	3.0
Improved opportunities for joint use and development	3.1	4.0
Improved sustainable decisions and investments	NA	4.0
Improved environmental stewardship	NA	3.5
Minimized overall impact to human environment	2.1	3.0
Minimized overall impact to natural environment	3.1	3.0
Improved mobility for all users	2.9	3.5
Improved walkability	3.4	3.5
Improved bikeability	3.3	3.5
Improved safety (vehicles, pedestrians, and bikes)	3.4	3.0
Improved multi-modal options	3.4	3.5
Improved community satisfaction	2.8	3.5
Improved quality of life for community	3.3	3.5
Fit with local government land use plan	3.3	3.5
Improved speed management	3.3	3.5
Design features appropriate to context	3.3	3.5
Optimized maintenance and operations	NA	4.0
Minimized disruption	2.1	2.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

Overall, both stakeholders and team members indicated that almost all benefits materialized as a result of the process followed. Almost all benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. Benefits that had high scores (equal or greater than 3.7, indicating that most of the participants strongly agree) include “Improved opportunity for joint use and development” and “Improved sustainable decisions and investments” by the team members. However, the stakeholders had significantly lower scores than those noted by the team in all benefits and there was none over the 3.7 score. The scores for the benefits by the stakeholders may indicate that the project had mixed results as viewed by the community.

There are several benefits that had a score below 3.0, especially by the stakeholders, that indicate that the respondents believe that the benefit was marginally materialized. These include “Decreased costs for overall project delivery” and “Minimized disruptions” for the team. There were more benefits that scored low for the stakeholders including “Minimized overall impact to human environment”,

“Minimized disruption”, “Improved community satisfaction”, “Improved mobility for all users”, “Improved predictability of project delivery”, “Increased stakeholder/public trust and ownership”, and “Increased opportunities for partnering or shared funding or in-kind resources”. These answers indicate that the respondents perceive that the process did not provide a project that addressed the needs of the community, improved time for the project delivery or improved stakeholder and team interactions. Most stakeholder respondents noted that construction greatly disrupted pedestrians and sidewalks and that the project was not very well marketed or managed.

An examination of the common benefits scored by both the team members and the stakeholders revealed that for most cases the scores of the stakeholders were lower than those of the team indicating a difference of opinions between these two groups. It should be noted though that such comparisons should be conducted cautiously, since there were 10 stakeholder and two team member respondents.

- ◆ Quantitative Benefits  
There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.9	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.0
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	2.7	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. The team showed higher levels of satisfaction working with both stakeholders and public. The stakeholders also showed a reasonable level of satisfaction working with the team.

There is a difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. The team members showed a greater satisfaction than the stakeholders. On the other hand, the stakeholders showed a lower level of agreement and the comments provided did not allow for any further elaboration on this issue.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.3	NA
My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	2.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a slightly different perspective. The team members indicated that they viewed that relationship as a partnership, while the stakeholders noted that it was a consultation relationship. The difference noted here is similar to what one may expect where team members tend to view things slightly different and more optimistic than the stakeholders.

- ◆ Overall level of success

The project is a successful use of CSS processes. Without the close cooperation of the project team with the community and stakeholders the project would not have been completed. The use of extensive and customized public involvement was instrumental in completing the project. The project is a successful TSM solution that improves mobility and created economic growth throughout the corridor.



## FINAL CASE STUDY DOCUMENTATION

Title	Eastern Corridor
Location	Southwestern, OH
Lead Agency	Ohio DOT
Contact Person	Diana Martin
Phase completed	Planning
Purpose and Need	The Eastern Corridor Project was conducted to address the growing needs of the eastern Cincinnati metropolitan area by integrating multi-modal solutions, land use planning and environmental stewardship. Through innovative and collaborative partnerships, 19 political jurisdictions have agreed to pursue a balanced transportation plan that encompasses highway, bus, rail transit, bike, pedestrian and local network projects.

### CSS Qualities

- ◆ Project Team  
The project team took a holistic approach that included looking at economic forecasting, land use, preliminary engineering, environmental green infrastructure and economic development. By having the project Stakeholder Committee unanimously agree on a common vision for land use, the transportation plan as well as the other disciplinary plans were developed with one common vision in mind.
- ◆ Stakeholders  
The Eastern Corridor project has six funding sponsors that represent 19 separate political jurisdictions in the corridor in a home rule state without enabling/compulsory planning legislation. This project turned used the premise of home rule to empower each jurisdiction to make good decisions for their community. Working together, these separate entities were convinced that their best interests were served when they approached decision-making from a regional perspective that acknowledged interdependencies and a shared future. Private institutions have also been encouraged to provide leadership because one of the guiding principles of the project is that it must be market driven to be financially feasible and fit within development and institutional plans that are critical to its success.
- ◆ Public Involvement  
The large project study area (approximately 70 square miles) meant that a sizeable amount of stakeholders would be involved in the planning and development process. The communication tools included:
  - Public Workshops and Open Houses
  - A Scientific Telephone Survey of stakeholders
  - A Website open for comments and input
  - 30 Stakeholder Committee Meetings
  - A Vision Group that was subdivided by geographical region
  - Approximately 400 small group meetings with local jurisdictions, interest groups, etc.
- ◆ Design Solution  
Through innovative and collaborative partnerships, 19 political jurisdictions have agreed to pursue a balanced transportation plan that encompasses highway, bus, rail transit, bike, pedestrian and local network projects. These decisions were made using economic and transportation analyses that estimate the plan will increase

transit use by 5 percent, reduce vehicle miles traveled by 50 million and increase the gross regional product by \$23 billion.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.8
Involve stakeholders	3.9
Seek broad-based public involvement	4.0
Use full range of communication methods	3.9
Achieve consensus on purpose and need	3.6
Utilize full range of design choices	3.9
Address alternatives and all modes	3.9
Maintain environmental harmony	3.5
Address community & social issues	3.6
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.9
Document project decisions	3.8
Track and meet all commitments	3.4
Create a lasting value for the community	3.4
Use all resources effectively (time & budget)	2.8

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

- ◆ Project team's perspective  
Examining the evaluation of the principles involved in the project by the Project Manager and Project Team, it is evident that the public involvement aspects of the project were highly regarded by the project team. All principles associated with outreach including Involve Stakeholders, Seek Broad-based Public Involvement, and Use Full range of Communication methods was rated at either a 3.9 or 4.0 indicating that team members, "Strongly Agreed" that these principles were applied. This project utilized a wide range of avenues to provide information to the public and solicit comments. Activities throughout the project including the use of various groups including a 58 member task force, a vision group, and individual groups to direct activities within various focus groups of the study area. In addition, numerous open houses, community workshops and feedback channels including mail, email, websites, and project hotlines were established. The project also maintained a project office in the study area to provide information to interested parties and developed a speakers bureau to meet provide informational presentations for various interested parties or groups in the study area. A full list of public involvement activities is provided below.

Based on the effort for information and involvement outreach included in this project it is evident that the project team did an extraordinary job of reaching out to

stakeholders and general public. This is also evident in the similar evaluation of the stakeholder/public participation, ownership and trust by both the stakeholders and project team as discussed below.

Somewhat surprising in the evaluation is the lower score attributed to “Achieve Consensus on Purpose and Need.” This principle was rated at 3.6 still indicating that the project team either agreed or strongly agreed that the project had achieved consensus. However, the decrease compared to the outreach activities may indicate that achieving a consensus is a much more difficult activity than contacting and identifying the concerns of all involved or impacted.

The project team also rated all design aspects of the project such as maintain environmental harmony, and addressing community and social issues as agree or strongly agree. The only value that was not rated as agree or strongly agree was “Use all resources effectively (Time and Budget).” This may be an indication of budgetary or programming issues experienced by the project which are uncontrollable by the project team. Another potential factor could be that the project went well beyond needed activities providing more effort or certain aspects for a diminishing return in achieving consensus on purpose and need etc.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.5
Increased stakeholder/public participation compared to other projects	NA	3.6
Increased stakeholder/public participation	3.0	3.5
Increased stakeholder/public ownership	3.5	3.5
Increased stakeholder/public trust	3.5	3.1
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	1.7
Improved predictability of project delivery	1.0	2.1
Improved project scoping	NA	2.9
Improved project budgeting	NA	2.2
Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.1
Improved opportunities for joint use and development	3.0	3.1
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.5
Minimized overall impact to human environment	2.0	3.4
Minimized overall impact to natural environment	2.0	3.4
Improved mobility for all users	2.5	3.6
Improved walkability	1.5	3.4
Improved bikeability	2.0	3.4
Improved safety (vehicles, pedestrians, and bikes)	2.0	3.4

Improved multi-modal options	--	3.8
Improved community satisfaction	1.0	3.3
Improved quality of life for community	2.0	3.4
Fit with local government land use plan	2.5	3.6
Improved speed management	3.0	3.0
Design features appropriate to context	2.0	3.4
Optimized maintenance and operations	NA	3.0
Minimized disruption	--	3.0
Increased risk management and liability protection	NA	3.3

#### Discussion on Benefit Values

- ◆ Project team's perspective

Of all the potential benefits for the project, stakeholders and project team members only agreed on one benefit "Increased stakeholder/public participation ownership and trust". This benefit is a fundamental benefit of three principles that were applied well as documented by the project team, Involve stakeholders, Use full range of communication methods and Achieve Consensus on Purpose and Need. The extraordinary efforts of the project team in these areas as discussed above are directly attributed to achieving the high level of stakeholder/public participation ownership and trust indicated by the survey.

Project scoping, costs, and delivery (Benefits 6-10) were all rated as disagree or strongly disagree. The only benefit rated by both the project team and the stakeholders was "Improved Predictability of Project Delivery." While both were rated as negative agreements, the stakeholders all rated the project as strongly disagree. This may be attributed to the low implementation of the principle to "Use all resources effectively," which was rated disagree by the project team. Decreased costs and time for overall project delivery are fundamental or primary benefits of this principle. However, decreased costs and time, as well as Improved predictability of project delivery are also primary benefits of seeking broad based public involvement. For this case in particular project interruptions may not necessarily be due to opposition from the public, but rather from monetary constraints due to the size and scope of the project.

As the project team rated all principles involving project execution as agree or strongly agree, it is easily understood that they also rated the associated benefits (Benefits 15-27) as strongly agree or disagree. Surprising is the fact that project stakeholders rated each of these benefits as disagree or strongly disagree, except for one "Improved speed management." Overall it appears that project stakeholders do not feel that impacts were minimized not mobility improved. With stakeholders rating "Improved Community Satisfaction as "Strongly Disagree." This is surprising considering the high level of agreement on achieving increased participation, ownership and trust. While some of the disparity in answers may be attributed to a frustration over limited implementation, it also may identify a disconnect between public involvement activities and incorporating those into the project process, or even indicative of a resulting compromise by all parties where no one wins.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.5	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.4
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	2.5	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.5	NA
My relationship with the stakeholders was best described as	NA	2.9
My relationship with the interested public was best described as	NA	2.6

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

Responses to the relationship between the stakeholders/public and project team all indicate relative agreement in that the relationship was somewhere between a consultation and partnership. This relationship has been identified as the preferred approach to project planning through various research. However, what is surprising is that despite this agreement on the type of relationship, stakeholders appear to be dissatisfied with the relationship while project team members are satisfied. Similarly, stakeholders appear to be somewhat dissatisfied with the methods in place to allow input, though they rated increased participation ownership and trust as being achieved in the study.

◆ Overall level of success

The project team took a holistic approach that included looking at economic forecasting, land use, preliminary engineering, environmental green infrastructure and economic development. By having the project Stakeholder Committee unanimously agree on a common vision for land use, the transportation plan as well as the other disciplinary plans were developed with one common vision in mind. Through innovative and collaborative partnerships, 19 political jurisdictions have agreed to pursue a balanced transportation plan that encompasses highway, bus, rail transit, bike, pedestrian and local network projects. These decisions were made using economic and transportation analyses that estimate the plan will increase transit use by 5 percent, reduce vehicle miles traveled by 50 million and increase the gross regional product by \$23 billion.



## FINAL CASE STUDY DOCUMENTATION

Title	Mon/Fayette Expressway, PA
Location	Allegheny County, PA
Lead Agency	Pennsylvania Turnpike Commission
Contact Person	Frank Kempf, Assistant Chief Engineer - Design
Phase completed	Currently in Final Design
Purpose and Need	<p>The purpose of this project is to provide safe, efficient transportation improvements that will complement the regional transportation network, enhance the accessibility to both social services and industrial development sites located along the Monongahela River Valley, and to relieve traffic on the congested local roadways in southeastern and eastern Allegheny County.</p>

The Final Design phase involves the refinement of the Selected Alternative, the development of a Right-of-Way (ROW) Plan, ROW acquisition, and preparation of detailed Plans, Specifications and Estimates (PS&E) that ultimately will be used to construct the Expressway. To facilitate this process, the Pennsylvania Turnpike Commission (PTC) has divided the proposed 24-mile Expressway into 13 design sections to ensure the proper engineering expertise is available for the various components of the Expressway. Each design section has its own consultant team to address the design challenges and specific circumstances of the communities in that area.

### CSS Qualities

- ◆ Project Team  
The project team includes a diverse range of experts including highway engineers, environmental, cultural and resource professionals, public involvement specialists, landscape and urban designers, and right-of-way and construction specialists.
- ◆ Stakeholders (make up, utilization, interaction)  
During the final design phase of the project, the Pennsylvania Turnpike Commission anticipated the formation of five Design Advisory Teams (DATs), one in each of the most densely populated communities within the Mon/Fayette PA Route 51 to I-376 project area. Seven of the thirteen design sections include DATs. The DAT communities include Dravosburg, Turtle Creek, Braddock/Rankin/Swissvale (includes two design sections), Nine Mile Run and Glenwood to Bates Street (includes two design sections).

The Design Advisory Teams (DATs) were formed to ensure that final design is compatible with the communities' goals and plans. Each DAT is composed of 15 to 20 community stakeholders (residents, local government officials, agency and special interest representatives and economic development professionals), and five to six technical team representatives (highway engineers, environmental, cultural and resource professionals, public involvement specialists, landscape and urban designers, and right-of-way and construction specialists).

Issues resolved through DAT consensus are thoroughly documented in decision chronicles that become the public record of how the DAT resolved an issue. A comprehensive list of design issues was defined by the Environmental Impact

Statement and revised with additions by the Design Advisory Teams. DATs meet approximately once per month to deliberate and decide on design issues. In addition, special committee or individual meetings may occur to address special efforts, issues or concerns.

The Pennsylvania Turnpike Commission retained an independent group (Olszak Management Consulting, Inc.- Olszak) to act as neutral facilitators. The role of this group is provide facilitation, coordination and oversight of the entire DAT process and to evaluate its results.

◆ Public involvement (types, documentation)

In accepting their role as a DAT member, individuals agreed to represent and exchange information with their constituents. This information exchange occurs in a number of ways including

- Hosting DAT meetings that are open to the public. (Note: Three DAT's chose to host open DAT meetings. One DAT chose to host open DAT meetings every other month. One DAT chose not to host open meetings due to their community's history with disruptive community members.)
- Hosting a toll free number (at Olszak's offices) and posting information (DAT member contact information, meeting times and locations, meeting summaries and DAT progress) on the public side of the DAT website,
- Submitting press releases to local newspapers that summarizes the DAT's progress,
- Hosting periodic public events at municipal meetings, festivals, and local venues in order to showcase DAT decisions and progress,
- Creating opportunities for exchange through members' formal and informal networks, and
- Participating in speaking engagements with various groups such as special interest groups, government officials, and local business groups.

Public involvement activities are tracked and documented by Olszak.

◆ Design solution (process, modes and alternatives examined)

The number of identified issues, per DAT, ranges from 18-46. These issues include major design issues relating to the footprint of the expressway, the configuration of interchanges, the height of bridges, storm water management issues, noise issues and pedestrian issues to name a few. Balancing stakeholder agendas is challenging, particularly in the very urbanized area of the project. Final design is not yet complete. Multiple renderings of design options have been routinely employed to examine major design issues such as initial profile options, road and bridge elevations, bridge deck superstructures, community cohesiveness enhancement, recreation and opportunities and optional pier placement scenarios. In addition, each DAT is considering ancillary community development opportunities (economic and community development and revitalization) that can be facilitated through design. The DAT, in turn, engages a multitude of additional community stakeholders in further pursuing these opportunities.

◆ CSS concepts by project phase

As a project that embodies a holistic approach to highway design, the Mon-Fayette Expressway DAT process places a strong emphasis on CSS principles including interdisciplinary teams and stakeholder involvement. The application of CSS principles is being evaluated through strategically built-in elements which provide opportunities to document measurable processes and outcomes. The research framework utilizes nine project-level performance measures and also includes a second set of standards derived from a report issued by the TRB's Committee for Public Involvement in Transportation (CPIT). Evaluation data related to these standards will be compiled as a more specific and complete component of the CSS "Public Engagement" (No. 2) performance measure. Ten CPIT measures, referred to as Indicators of Success, will be applied to the DAT process. They are as follows:

- Accessibility to the Decision-Making Process
- Diversity of views represented
- Opportunities for Participation
- Integration of Concerns
- Information Exchange
- Project Efficiency
- Project/Decision Acceptability
- Mutual Learning
- Mutual Respect
- Cost Avoidance
- ◆ Lessons learned
 

The Final Design process and evaluation of the Design Advisory Team process is not yet complete. It is anticipated that a preliminary assessment of the process and outcomes evaluation will be complete by mid 2007.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.6
Involve stakeholders	3.6
Seek broad-based public involvement	3.7
Use full range of communication methods	3.5
Achieve consensus on purpose and need	3.2
Utilize full range of design choices	3.4
Address alternatives and all modes	3.4
Maintain environmental harmony	3.2
Address community & social issues	3.6
Address aesthetic treatments & enhancements	3.4
Consider a safe facility for users & community	3.7
Document project decisions	3.7
Track and meet all commitments	3.4
Create a lasting value for the community	3.4
Use all resources effectively (time & budget)	3.1

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Discussion on CSS principles

- ◆ Project team's perspective
 

There were 32 respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principles with the lowest scores were "Use all resources effectively" (3.1), "Achieve consensus on purpose and need" (3.2) and "Maintain environmental harmony" (3.2).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have exceptionally well. The responses received came from team members who identified themselves as transportation planners, design engineers, structural engineers, public relations specialists, construction engineers, environmental scientists, historic preservation specialists, safety engineers, program managers, and project managers. All were involved in the design phase of the project and approximately half of the respondents were involved in project planning. The project is going to construction soon, so no other phases were involved. Approximately one-half of the respondents had long experience with CSS (over 6 years) while the remaining were evenly split between those with little experience (0-3 years) and some experience (3-6 years). Finally, all team members had more than 10 years of relevant experience.

As noted above, there were three principles that had a low score (3.1 and 3.2) that indicates that these principles were “barely” applied. A further review of the comments provided by the team members that scored these principles with the low score did not provide any additional information to clarify the reasons for their low score. On the issue of using all resources effectively, no additional insight could be provided, since there were no comments provided by the team members that could clarify this issue.

On the positive side, there are three principles that the team was in agreement that were highly met. These include the “Seek broad-based public involvement” (3.7), “Consider a safe facility for all users” (3.7) and “Document project decisions” (3.7). This strong agreement was also highlighted in several of the comments provided. In particular, the public involvement and input sought was discussed by several members and was noted as a significant lesson-learned from the process followed.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.4
Increased stakeholder/public participation compared to other projects	NA	3.4
Increased stakeholder/public participation	3.0	3.4
Increased stakeholder/public ownership	2.9	3.5
Increased stakeholder/public trust	2.8	3.4
Decreased costs for overall project delivery	NA	2.3
Decreased time for overall project delivery	NA	2.3
Improved predictability of project delivery	2.0	2.5
Improved project scoping	NA	2.7
Improved project budgeting	NA	2.5
Increased opportunities for partnering or shared funding or in-kind resources	2.4	2.7
Improved opportunities for joint use and development	2.7	3.3

Improved sustainable decisions and investments	NA	3.1
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	2.6	3.2
Minimized overall impact to natural environment	2.6	3.2
Improved mobility for all users	2.7	3.4
Improved walkability	2.2	3.3
Improved bikeability	2.4	3.2
Improved safety (vehicles, pedestrians, and bikes)	2.4	3.4
Improved multi-modal options	2.4	3.0
Improved community satisfaction	2.5	3.2
Improved quality of life for community	2.3	3.1
Fit with local government land use plan	2.6	3.0
Improved speed management	2.5	3.1
Design features appropriate to context	2.5	3.3
Optimized maintenance and operations	NA	3.2
Minimized disruption	2.5	2.9
Increased risk management and liability protection	NA	2.9

#### Discussion on Benefit Values

##### ◆ Semi-Quantitative Benefits

Overall, team members indicated that several benefits materialized as a result of the process followed. On the contrary, the scores for the stakeholders indicate that most of the benefits were not materialized, since most had a score below 3.0. Team members scored three-fourths of the benefits with a score greater than 3.0 indicating that they at least agree that the benefit was achieved. The highest score benefits received was 3.5 indicating almost an even split between participants who strongly agree and agree. The benefit with this score was “Increased stakeholder/public ownership” while four benefits had a score of 3.4 including “Improved stakeholder/public feedback”, “Increases stakeholder/public participation compared to other projects”, “Increased stakeholder/public participation”, and “Improved safety”. These benefits indicate that the process followed resulted in a better public involvement and interaction level. For the stakeholder, the only benefit with a high score was that of “Increased stakeholder/public participation” (3.0), indicating at least an agreement on this benefit between team and stakeholders/public.

There are several benefits that had a score below 3.0 that indicate that the respondents believe that the benefit was marginally materialized. For the team members, the lowest scores were noted of the benefits of “Decreased costs for overall project delivery (2.3)”, “Decreased time for overall project delivery (2.3)”, “Improved predictability of project delivery (2.5)” and “Improved project budgeting (2.5)”. For the stakeholders, most benefits had a score below 3.0 and the benefits with the lowest scores were “Improved predictability of project delivery (2.0)”, “Improved walkability (2.2.)” and “Improved quality of life for community (2.3)”. These answers indicate that the respondents perceive that the process resulted in longer

time and higher costs for the project and had no significant effects on predictability neither of the completion nor in its budgeting and scoping. The stakeholder scores on the walkability and quality of life for the community are noteworthy, since they express a negative sentiment towards the project. An issue that needs to be addressed here is the fact that the project was in preliminary design when the survey was conducted and this may have a bearing on the answers provided. It could be hypothesized that, typically, CSS projects require greater initial investment that may result in longer times for completing the project phases and could affect the predictability of the project delivery time. However, it is anticipated that such efforts will bear results in the later phases when most of the issues to be considered and addressed would have been already resolved.

An apparent trend of the benefits materialized is the consistent difference between the perspective of the team and the stakeholders, where for all common benefits the team scored them higher. In general, these differences are large (range between 0.5 and 0.8) and given the sample size of the participants may be significant. The comments provided by the stakeholder showed concerns with the potential funding of the project, the input solicitation by the public on design, and the implementation of bicycle and pedestrian facilities.

◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Several meetings well documented with records of attendance and issues discussed as well as follow up actions
Decreased costs for overall project delivery	
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	
Minimized overall impact to human environment	
Minimized overall impact to natural environment	
Improved mobility for all users	
Improved walkability	
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	

Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

The data supports the semi-quantitative results noted in the public involvement and stakeholder participation processes. The data indicates that the high scores for these benefits noted are indeed true. As noted above, the project is still in the preliminary design and as such no other data on benefits was available.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.3	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.4
I am satisfied with the relationship I had with the interested public	NA	3.4
I am satisfied with the procedures and methods that allowed input to project decisions	3.2	3.4

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. Again the team showed higher levels of satisfaction working with both stakeholders and public. The stakeholders also showed a reasonable level of satisfaction working with the team.

There is a small difference of opinion regarding the level of satisfaction between the team and stakeholders regarding the means with which input was included in the project. The team members showed a greater satisfaction with almost an even split between those who agreed and those who strongly agreed. On the other hand, the stakeholders had a smaller number of participants noting strong agreement, while there were a few that disagreed. The comments provided noted that there was no clear indication of how their input was used or valued.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.6	NA
My relationship with the stakeholders was best described as	NA	2.9
My relationship with the interested public was best described as	NA	2.3

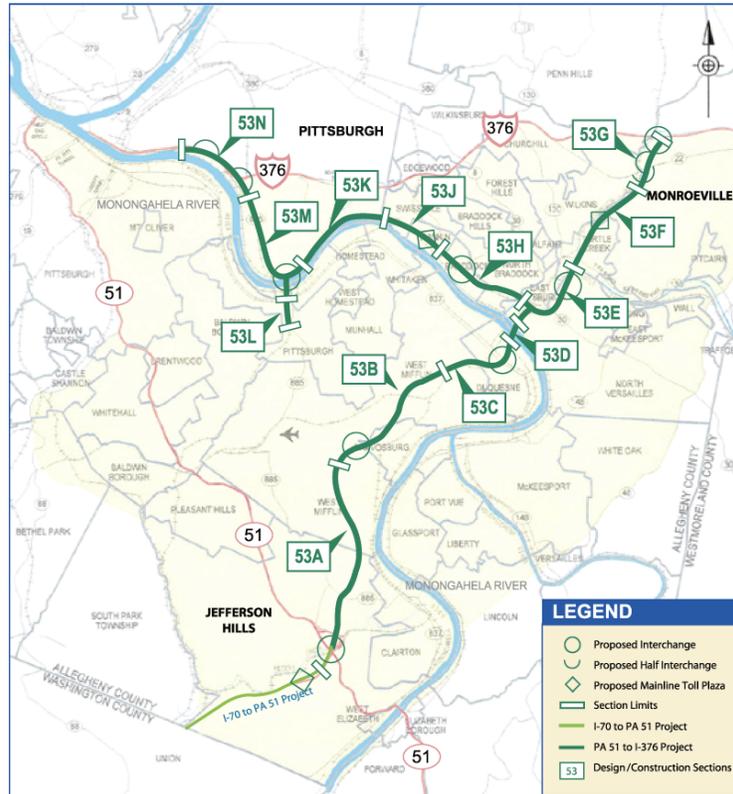
Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The question on the level of relationship between team and stakeholders showed again a slightly different perspective. The team members indicated that they viewed that relationship between consultation and partnership, while the stakeholders noted that it was more a consultation relationship. An interesting aspect of this scoring is the lower score that the relationship between team and public received, indicating a different level of relationship and interaction than the one between the team and stakeholders. The difference noted here is similar to what one may expect where team members tend to view things slightly different

and more optimistic than the stakeholders. An interesting observation is that there were nine team members that viewed their relationship with stakeholders as letting them provide direction. Likewise, there were eight stakeholders that noted that they were allowed to provide direction, indicating that both stakeholders and team members share similar experiences.

- ◆ Overall level of success  
 This phase of the project is a successful use of CSS processes. A significantly large number of stakeholders and team members have been involved in the process. A large effort has been devoted in identifying and documenting project commitments.

### PROJECT AREA MAP



## FINAL CASE STUDY DOCUMENTATION

Title	Cooper River Bridge Replacement Project
Location	Charleston Harbor, SC
Lead Agency	South Carolina DOT
Contact Person	Charles Dwyer
Phase completed	Construction/Maintenance
Purpose and Need	The purpose of the project was to replace two existing functionally obsolete truss bridges crossing the Cooper River in Charleston Harbor. The new structure would need to 1) Increase the capacity of US 17 over the Cooper River, 2) Improved traffic safety 3) Reduce the frequency and costs of the major bridge maintenance activities and 4) Increase the vertical and horizontal navigational clearances on the Cooper River.

### CSS Qualities

- ◆ **Project Team**  
To assess community impacts and provide ideas on how to reduce them, SCDOT assembled a committee consisting of representatives of the various sections of SCDOT as well as the FHWA, the contractor, and consultants.

The sensitivity of the community in which this project was to be constructed led the SCDOT to assign a senior member of the staff to work full-time on just this one project. The Director of Engineering was available in the project office to meet with local leaders, resource/regulatory agency officials, project staff and members of the public. This full-time dedication meant that commitments could be tracked to fulfillment in the project office.

- ◆ **Stakeholders**  
Resource/regulatory agency involvement was done through an inter-agency task force. This task force was assigned to communicate and resolve permit issues during both the permit application and the construction process. This task force concept was important to the success of the use of design-build for a project of this magnitude. Without a task force meeting, many agency concerns may have taken much longer to resolve, holding up either the procurement process or the construction itself.

Use of non-governmental organizations was important to getting the most out of the bridge. An example is the bicycle/pedestrian lane. Once it was known the lane was included in the scope to be built, the SCDOT formed an ad hoc committee with representatives of the local municipalities as well as local running and bicycle clubs. This provided a design that would meet as many needs as possible within the twelve-foot share width being built.

- ◆ **Public Involvement**  
A grassroots effort that included schoolchildren and bumper stickers showcased the community's wish for bicycle and pedestrian facilities on the new bridge. Unsure about the available funding, the SCDOT was able to include this scope into the context of the bridge. Now that the bridge is open, you can see upwards of two hundred people using the hiker/biker lane at any given time. This lane is safely separated from vehicular traffic by a concrete barrier and provides the only views of

Charleston available to the public at an elevation of two hundred feet above the harbor.

In addition to numerous public meetings, the SCDOT hired a community liaison to reach out and assess the desires of this community to off-set the impacts of the project. SCDOT also prepared a video rendering for the impacted community. This video showed how the major thoroughfare through the community would remain pedestrian friendly.

◆ Design Solution

The historic nature of Charleston led the SCDOT to find ways to construct a signature bridge through the design-build process. During public meetings, the community was able to select a bridge design—the diamond shaped towers—that fit their desire for a pleasing bridge. Based on input from a grassroots effort, a separate pedestrian and bicycle facility was also included on the project. This process resulted in the construction of North America’s longest cable stay span over the Cooper River in Charleston Harbor.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	4.0
Seek broad-based public involvement	4.0
Use full range of communication methods	4.0
Achieve consensus on purpose and need	4.0
Utilize full range of design choices	3.0
Address alternatives and all modes	3.0
Maintain environmental harmony	4.0
Address community & social issues	4.0
Address aesthetic treatments & enhancements	4.0
Consider a safe facility for users & community	4.0
Document project decisions	3.0
Track and meet all commitments	3.0
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	4.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Discussion on CSS principles

◆ Project team’s perspective

The survey was only completed by 1 respondent, the project leader. This response listed “strongly agree” with eleven of the fifteen principles being applied, and “agree” with the remaining four. The principles “Address alternatives and all modes” and “Utilize full range of design choices” were two of the four receiving a ‘3’ or Agree.

Additionally, “Document project decisions” and “Track and meet all commitments” also received the lower rating of Agree.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	4.0
Increased stakeholder/public participation compared to other projects	NA	4.0
Increased stakeholder/public participation	--	4.0
Increased stakeholder/public ownership	--	4.0
Increased stakeholder/public trust	--	4.0
Decreased costs for overall project delivery	NA	4.0
Decreased time for overall project delivery	NA	4.0
Improved predictability of project delivery	--	3.0
Improved project scoping	NA	3.0
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	--	3.0
Improved opportunities for joint use and development	--	3.0
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.0
Minimized overall impact to human environment	--	3.0
Minimized overall impact to natural environment	--	3.0
Improved mobility for all users	--	4.0
Improved walkability	--	4.0
Improved bikeability	--	4.0
Improved safety (vehicles, pedestrians, and bikes)	--	4.0
Improved multi-modal options	--	3.0
Improved community satisfaction	--	4.0
Improved quality of life for community	--	3.0
Fit with local government land use plan	--	--
Improved speed management	--	2.0
Design features appropriate to context	--	4.0
Optimized maintenance and operations	NA	3.0
Minimized disruption	--	3.0

Increased risk management and liability protection	NA	3.0
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Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

Overall, the respondent agreed or strongly agreed that the project achieved all identified benefits with one exception. That one benefit that was disagreed is “improved speed management.” The benefit may not have been achieved as it was not a primary goal of the project which focused solely on a bridge replacement.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	4.0
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	2.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

No stakeholders completed the survey for this project, which does not allow for a comparison of project team member and stakeholder responses. It is interesting to note that the project team had relatively high levels of satisfaction with their relationships with the stakeholders and public, while at the same time describing those relationships relatively low compared to other projects studied. The stakeholder relationship was identified as between a consultative and partnership, while the public relationship was described as between informational and consultative.

- ◆ Overall level of success

The Director of Engineering was available in the project office to meet with local leaders, resource/regulatory agency officials, project staff and members of the public. This full-time dedication meant that commitments could be tracked to fulfillment in the project office. A grassroots effort showcased the community’s wish for bicycle and pedestrian facilities on the new bridge. Now that the bridge is open, you can see upwards of two hundred people using the hiker/biker lane at any given time. The historic nature of Charleston led the SCDOT to find ways to construct a signature bridge through the design-build process. During public meetings, the community was

able to select a bridge design—the diamond shaped towers—that fit their desire for a pleasing bridge. This process resulted in the construction of North America’s longest cable stay span over the Cooper River in Charleston Harbor.



## FINAL CASE STUDY DOCUMENTATION

Title	SR 73/US 321 Gateway Project
Location	Gatlinburg, Tennessee
Lead Agency	Tennessee DOT
Contact Person	Ed Cole
Phase completed	Construction/Operation
Purpose and Need	The purpose of this project was to retrofit a five-lane section of roadway with extensive retaining walls into a context sensitive “gateway” approach into Gatlinburg, Tennessee. This retrofit was in response to a public discontent for a reconstruction project that did not blend into the natural setting of area near a national park.

### CSS Qualities

- ◆ Project Team (make up)  
The project team was led by representatives of the Tennessee DOT, with support services provided by consultants. Consultants from the firm of PBS&J were employed to provide facilitation with the citizens’ resource team and to develop context sensitive solutions for the project after consensus was reached between the DOT and the resource team. Landscape architects developed numerous renderings of the proposed project revisions as part of the public meeting presentation. A muralist painted example concrete panels to demonstrate the view expected for the retaining walls after project completion.
- ◆ Stakeholders (make up, utilization, interaction)  
A 15-member multi-disciplinary citizen’s resource team (Community Based Resource Team - CBRT) was established to provide guidance to TDOT and design specialists to insure a parkway theme that blended into the scenic surroundings, and not compete with the natural environment. The team operated through a consensus process and the consultant facilitation did an excellent job of managing the process and developing a “team spirit” throughout. The team collected information for their own decision-making through design and landscape experts, provided by TDOT and the consultant. The team also held meetings to inform and gather information from the public to assist them in the design concept.
- ◆ Public involvement (types, documentation)  
Eight team meetings were held by the Tennessee DOT in conjunction with the Community Based Resource Team, with the assistance of design specialists. In addition, a public workshop was held to present the resource team findings and preliminary recommendations to the public.
- ◆ Design solution (process, modes and alternatives examined)  
Flexibility in the design process resulted in transportation needs (increased capacity, etc.) being addressed with the recommended modifications without any design exceptions. Safety was not compromised with the new design, and was expected to be enhanced with the adoption of the median boulevard concept with turn lanes and major intersections. Some limited number of right-of-way tracts have only right in, right out access, but the impacts to these parcels was not significant.
- ◆ CSS concepts  
The project was initiated to retrofit a five-lane roadway section, with extensive retaining walls deemed to be inconsistent with the context of the project area. Final recommendations included integration of themed signage, strategic placement and used of native plant species, and creative treatment of the retaining wall and parapet

wall surfaces. To create a parkway experience, the addition of a landscaped median coupled with reduced lane widths and a reduced speed limit. Naturalized plantings of native grasses and shrubs in the median and along the walls provided a framework for a contextual solution.

◆ Lessons learned

All parties to the CSS process viewed the end result to be a very efficient use of time and resources. The process had positive impacts on the design of the adjacent section of roadway. Use of the CSS process had the effect of reducing project development time and cost on adjacent and other future projects, resulting in a net savings in cost and time to the Tennessee Department of Transportation (TDOT).

The community was pleased that the implemented project changes will forever reflect lasting value to the community. They were so pleased that they expressed willingness to properly maintain the landscaping on the project to assure lasting value. Since tourism is a major driver to the local economy, specific hardscape “theme elements” were developed that could easily be added within the corridor after project completion. Hardscape elements were inspired by local use of stone, and by landscape and signage for the Great Smoky Mountains National Park.

It was determined that although the CSS process was used to retrofit an unaccepted project into the community, the final product was anticipated to truly enhance the area, not simply be acceptable to the community.

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.6
Involve stakeholders	3.9
Seek broad-based public involvement	3.9
Use full range of communication methods	3.8
Achieve consensus on purpose and need	3.9
Utilize full range of design choices	3.4
Address alternatives and all modes	3.3
Maintain environmental harmony	3.7
Address community & social issues	3.6
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.9
Track and meet all commitments	3.3
Create a lasting value for the community	3.7
Use all resources effectively (time & budget)	3.4

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

## Discussion of CSS principles

### ◆ Project team's perspective

There were six surveys completed and returned by the project team. These team members were TDOT employees and design consultants. There was relatively high agreement with opinions by all respondents that the 15 CSS principles were applied. This project exemplified stakeholder involvement through the Community Based Resource Team and the survey results supported that involvement with a score of 3.9 for "Involve stakeholders", "Seek broad-based public involvement", "Achieve consensus on purpose and need", and "Document project decisions". Also receiving high scores were the principles related to communication methods, environmental harmony, aesthetic treatments, creating a safe facility, and lasting value for the community. The lowest scores were 3.3 and were associated with "Address alternatives and all modes" and "Track and meet all commitments".

There were eight workshops conducted by the TDOT in conjunction with the Community Based Resource Team and several design specialists. The purpose of the workshops was to establish project goals and to develop a consistent design to create a parkway theme along the corridor. Results from the Team consensus were presented at a public workshop and became the guiding principles for the project.

## CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.4
Increased stakeholder/public participation compared to other projects	NA	3.4
Increased stakeholder/public participation	3.3	3.3
Increased stakeholder/public ownership	3.6	3.9
Increased stakeholder/public trust	3.6	3.6
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	2.5
Improved predictability of project delivery	2.7	2.6
Improved project scoping	NA	2.8
Improved project budgeting	NA	2.5
Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.5
Improved opportunities for joint use and development	2.8	2.8
Improved sustainable decisions and investments	NA	3.2
Improved environmental stewardship	NA	3.4
Minimized overall impact to human environment	2.8	3.4
Minimized overall impact to natural environment	3.3	3.6
Improved mobility for all users	3.2	3.3

Improved walkability	3.4	3.5
Improved bikeability	3.4	3.5
Improved safety (vehicles, pedestrians, and bikes)	3.4	3.6
Improved multi-modal options	3.3	2.8
Improved community satisfaction	3.7	3.6
Improved quality of life for community	3.9	3.5
Fit with local government land use plan	3.9	3.3
Improved speed management	3.1	3.5
Design features appropriate to context	3.4	3.6
Optimized maintenance and operations	NA	3.2
Minimized disruption	3.0	3.2
Increased risk management and liability protection	NA	2.8

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

As noted in the discussion of CSS principles, this project focused on stakeholder involvement and development of partnership between the DOT and the Community Based Resource Team. The ultimate goal was to create a context sensitive project with minimal effect to the natural environment. Results from the survey of stakeholder and team members indicated the success of focusing on this partnership to develop a project compatible with the natural environment and public expectations. There were nine responses from the stakeholder group and their opinions were generally consistent with those of the project team. The highest level of agreement, and likewise the highest scores were representative of CSS benefits that were related to stakeholder and public involvement and/or interaction with the DOT. Other benefits that received high scores from both the stakeholders and the project team included attention to the natural environment, walkability, bikeability, and improved community satisfaction and quality of life. It is noteworthy that the highest scores (3.9 from the stakeholders) were for “Improved quality of life for the community” and “Fit with local government and land use plan”.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	7 public meetings between TNDOT and CBRT; 1 public workshop; 1 close-out meeting
Decreased costs for overall project delivery	Estimated cost; Total cost: \$35.2 million
Decreased time for overall project delivery	Stakeholder meetings held between 5-17-04 and 11-22-04; close-out meeting on 2-23-05; CSS enhancements extended

	project 18 months
Improved predictability of project delivery	
Improved project scoping	CSS change order: \$3.1 million
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	City of Gatlinburg was provided \$1 million for landscaping (\$350,000 match); City maintenance
Improved environmental stewardship	Planting appropriate to soil moisture conditions; Trash removal provisions
Minimized overall impact to human environment	
Minimized overall impact to natural environment	Deer fencing was provided to minimize deer kill;
Improved mobility for all users	
Improved walkability	
Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	Landscaping design to enhance sight distance; Softwood dwarf trees used; Boulders prohibited;
Improved multi-modal options	
Improved speed management	Lane width decreased from 12 to 11 feet; Raised landscaped median; Decreased speed limit from 40 to 35 mph
Optimized maintenance and operations	City of Gatlinburg assumed maintenance responsibilities; No sod to minimize mowing and irrigation; Plantings requiring minimal trimming
Minimized disruption	
Increased risk management and liability protection	

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.7	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	3.6
I am satisfied with the procedures and methods that allowed input to project decisions	3.6	3.9

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempt to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. There did not appear to be a significant difference between the views of stakeholders in their relationship with the project team (rating of 3.7) as compared to the relationship views of project team members with stakeholders (rating of 4.0). Also, satisfaction levels of the stakeholders and the project team in their perception of procedures and methods that allowed input into project decisions was similar (3.6 for stakeholders and 3.9 for project team members).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.0	NA
My relationship with the stakeholders was best described as	NA	3.0
My relationship with the interested public was best described as	NA	2.4

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

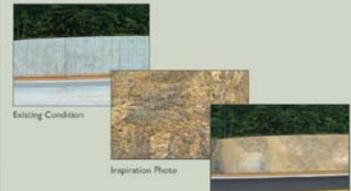
The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. There did appear to be feeling of serving in a participation role when the stakeholders described their relationship with the project team. Similarly, the project team best described their relationship as that of participation when describing their relationship with stakeholders. Project team members described their relationship with the public as a combination of consultation and participation. This appears to be consistent with the impression that was described earlier when the role of the community resource team was noted to function as a proactive partnership; and therefore unlike the role required with the public where more direct guidance and input is required.

- ◆ Overall level of success  
Flexibility in the design process resulted in transportation needs (increased safety and capacity, etc.) being addressed with the recommended modifications without any design exceptions. All parties to the CSS process viewed the end result to be a very efficient use of time and resources. Use of the CSS process had the effect of reducing project development time and cost on adjacent and other future projects, resulting in a net savings in cost and time to the Tennessee Department of Transportation (TDOT). It was determined that although the CSS process was used to retrofit a project considered unacceptable by the community, the final product truly enhanced the reconstructed roadway entering into a national park area and was embraced by the community.



**EXISTING RETAINING WALLS**

Controversy over several TDOT projects throughout the state gave impetus to the Governor's race of 2002. When Governor Phil Bredesen was elected in November of that year, he and his newly appointed commissioner, Gerald Nicely, targeted 15 projects based largely on comments the Governor had received during the campaign. They then charged the UT Center for Transportation Research with a detailed review of each project, including a series of "listening sessions" around the state. Based on UT's findings, Commissioner Nicely directed that the project move forward, but with "considerable modifications" to the original plan and with the initiation of a context sensitive solutions process.



**WALL TREATMENTS**



**RESOURCE TEAM MEETINGS**

In keeping with the context sensitive solutions process, a resource team was assembled to include community members, area interest groups, and local government representatives and to involve the appropriate technical disciplines. TDOT then retained PBS&J to facilitate the resource team and to provide design expertise. The resource team's goal was to reach consensus regarding retrofit solutions for Phase I of the project, which was nearing construction completion. The design solution included enhancement of the existing constructed elements to "blend" with the natural surroundings. The real challenge was to derive safe, affordable, and maintainable solutions that could be implemented while respecting the initial construction investment.



**CORRIDOR VISUALIZATION**



**THEME ELEMENTS**

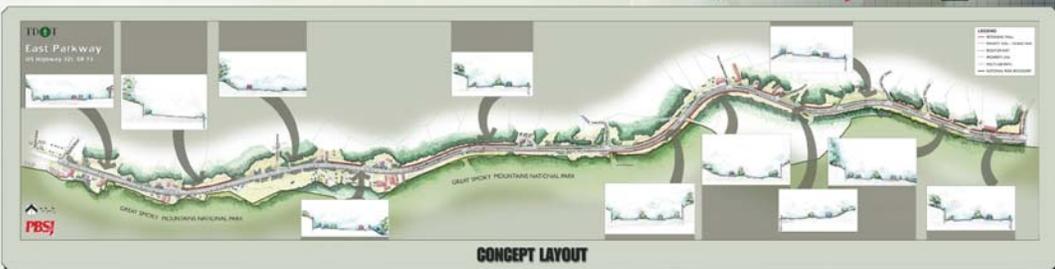
Since tourism is a major driver to the local economy, specific hardscape "theme elements" were developed that could easily be added within the corridor after project completion. Hardscape elements were inspired by local use of stone and by landscape and signage for the Great Smoky Mountains National Park.

The final recommendations integrate themed signage, strategic placement and use of native plant species, and a creative treatment of the retaining wall and parapet wall surfaces. To create a "parkway" experience, the addition of a median coupled with reduced lane widths was recommended. Naturalized plantings of native grasses and shrubs in the median and along the walls provided a framework for a contextual solution.

**CONTEXT SENSITIVE SOLUTIONS**

**STATE ROUTE 73 ( US 321 )**

GATLINBURG, TENNESSEE



**CONCEPT LAYOUT**

## FINAL CASE STUDY DOCUMENTATION

Title	FM 1120 Low Water Crossing, Real County, Texas
Location	Real County, Texas
Lead Agency	Texas DOT
Contact Person	Mary Perez
Phase completed	Construction/Operation
Purpose and Need	The purpose of this project was to replace a low water crossing over the Frio River quickly and with minimum impact on the recreational visitors and the water quality. The crossing was in need of replacement due to a series of floods that had undermined the integrity of the structure.

### CSS Qualities

- ◆ Project Team (make up)  
Since timing was important several agencies and entities came together in an extraordinary effort to approve this project quickly. The San Angelo District worked closely with TxDOT's Environmental Affairs Division, Bridge Division, Junction Area Office, the Leakey Maintenance Office, and the contractor, Earth Builders Inc. The Texas Historical Commission approved the cultural resources permits in a timely manner. The United States Corps of Engineers, Fort Worth District, expedited necessary permits.
- ◆ Stakeholders (make up, utilization, interaction)  
The District worked closely with the TxDOT's Environmental Affairs Division relying on the expertise of archeologists and historians who conducted field surveys. The District completed biological surveys and obtained the U.S. Army Corps of Engineers permit for the new bridge. All appropriate clearances were approved and all needed permits were put in place in a timely manner.
- ◆ Public involvement (types, documentation)  
The public, including local residents, community leaders and businessmen were fully in favor of the project because of its importance to the local tourist industry. The District provided open information to the public using public notices and meetings under given guidelines, and responded to their concerns. The local population was in complete agreement with the importance of replacing the crossing in an environmentally sensitive and timely manner and voiced its approval of the project.
- ◆ Design solution (process, modes and alternatives examined)  
There was no negative impact to downstream areas during construction. Impacts at the site were minimal with only two trees removed instead of the nine from the original, standard plan. The flood damage to the old structure was carefully studied and new design elements were incorporated into the new crossing creating a more efficient, stronger structure. Floods are a recurrent event, so the structure will be monitored as needed for damage.
- ◆ CSS concepts  
A multimedia approach, including photography, computer graphics, on site assessments and text descriptions were used to pre-visualize design solutions. It was of the utmost importance to have a very clear and thorough design to use in the field to avoid negative impacts on a delicate eco-region. Using these visualization techniques assured the creation of an efficient design that met the safety and environmental criteria during construction.

- ◆ Lessons learned  
The biggest disruption was the length of time the road was closed. The San Angelo District shortened the time by expediting the planning and construction. Construction started in October 2002 and was complete by July 2003. Since the majority of the construction was done in the winter months, which is the off season, there was less impact on tourism reducing negative effects on the local economy. There was no negative impact to downstream areas during construction. Impacts at the site were minimal with only two trees removed instead of the nine from the original, standard plan. The flood damage to the old structure was carefully studied and new design elements were incorporated into the new crossing creating a more efficient, stronger structure.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.7
Involve stakeholders	2.7
Seek broad-based public involvement	3.0
Use full range of communication methods	3.0
Achieve consensus on purpose and need	4.0
Utilize full range of design choices	3.7
Address alternatives and all modes	3.0
Maintain environmental harmony	3.7
Address community & social issues	3.7
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.0
Track and meet all commitments	3.3
Create a lasting value for the community	3.3
Use all resources effectively (time & budget)	3.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

### Discussion on CSS principles

- ◆ Project team's perspective  
There were two surveys completed and returned by the project team. These team members were both employees of the Texas DOT. There was relatively high agreement with opinions by all respondents that nearly all of the 15 CSS principles were applied. The only principle with a score less than 3.0 was "Involve stakeholders". This appears to be related to the fast track of work activities for the project that may have resulted in less intense involvement of stakeholders than could have occurred if there had been more scheduled involvement. Survey results also supported task accomplishment orientation of the project that produced a score of 4.0 for "Achieve consensus on purpose and need".

## CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	4.0
Increased stakeholder/public participation compared to other projects	NA	4.0
Increased stakeholder/public participation	--	3.0
Increased stakeholder/public ownership	--	3.0
Increased stakeholder/public trust	--	3.0
Decreased costs for overall project delivery	NA	2.0
Decreased time for overall project delivery	NA	3.0
Improved predictability of project delivery	--	3.3
Improved project scoping	NA	3.3
Improved project budgeting	NA	NA
Increased opportunities for partnering or shared funding or in-kind resources	--	3.0
Improved opportunities for joint use and development	--	--
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.7
Minimized overall impact to human environment	--	3.7
Minimized overall impact to natural environment	--	3.7
Improved mobility for all users	--	3.7
Improved walkability	--	3.0
Improved bikeability	--	3.0
Improved safety (vehicles, pedestrians, and bikes)	--	3.7
Improved multi-modal options	--	1.0
Improved community satisfaction	--	3.3
Improved quality of life for community	--	3.3
Fit with local government land use plan	--	3.3
Improved speed management	--	3.0
Design features appropriate to context	--	3.3
Optimized maintenance and operations	NA	3.5
Minimized disruption	--	3.7
Increased risk management and liability protection	NA	3.0

Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

This project was intended to replace a low water crossing over the Frio River quickly and with minimum impact on the recreational visitors and the water quality. The crossing was in need of replacement due to a series of floods that had undermined the integrity of the structure. Time and scheduling were critical to the success of the project, as well as concerns for impacts on the delicate environment in and near the crossing. Appropriate attention was given to the public’s access and use of the associated recreational areas in the vicinity of the crossing. Impacted stakeholders were involved to assure clearances and permits were obtained in a timely manner. However, there were no responses from the stakeholders who received the survey, and only two responses from team members as noted in the previous section. The two responders indicated a high degree of public feedback and participation related to the project. Other benefits resulting from the project as perceived by the project team were minimized impacts to the environment, both natural and human, as well as improved safety, increased mobility, and minimal disruption.

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.7
I am satisfied with the relationship I had with the interested public	NA	3.3
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.7

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempt to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. Without stakeholder responses, this comparison was not possible.

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	2.0
My relationship with the interested public was best described as	NA	1.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. Without stakeholder responses, this comparison was not possible.

◆ Overall level of success

Since timing was important several agencies and entities came together in an extraordinary effort to approve this project quickly. A multimedia approach, including photography, computer graphics, onsite assessments and text descriptions were used to pre-visualize design solutions. It was of the utmost importance to have a very clear and thorough design to use in the field to avoid negative impacts on a delicate eco-region. Using these visualization techniques assured the creation of an efficient design that met the safety and environmental criteria during construction. The local population was in complete agreement with the importance of replacing the crossing in an environmentally sensitive and timely manner and voiced its approval of the project.



Completed low-water crossing, FM 1120 at the Frio River, looking upstream.

## FINAL CASE STUDY DOCUMENTATION

Title	12300 South Design Build Project, Draper and Riverton, Utah
Location	Draper and Riverton, Utah
Lead Agency	Utah DOT
Contact Person	Angelo Papastamos, CSS Director
Phase completed	Construction/Operation
Purpose and Need	The purpose of this project was to reconstruct a six-mile section of urban arterial to address capacity and safety issues, in addition to providing a stimulation to the local economy.

### CSS Qualities

- ◆ Project Team  
UDOT formed a Design-Build Selection Team including Draper City and Riverton City in the development of the contract specifications. The UDOT led selection team awarded the 12300 South Project to GRW Design-Builders. GRW entered into the project knowing that through cohesive teamwork and dedication to CSS the project could be successfully completed in three years with the support of the communities.
- ◆ Stakeholders and Public Involvement  
Two Community Coordination Committees were created for Draper City and Riverton City and consisted of residents, community leaders, business owners, and city officials. Each CCC was allocated \$400,000 for landscaping and aesthetic improvements that best represented their community.

Six neighborhood groups were created to effectively listen and respond to the unique needs and concerns of the citizens. GRW met with each group throughout the project to discuss access issues, road restrictions, utility interruption, noise, landscaping, and aesthetics. The CCC was empowered to award up to \$2M in incentive to the Contractor based on certain criteria.

The involvement of the community was instrumental in incorporating all landscape and aesthetic treatments that highlighted the natural, historical, and present characteristics of the cities of Draper and Riverton.

- ◆ Design solution (process, modes and alternatives examined)  
The 12300 South DB Project minimized disruption to the community by implementing UDOT's first "turn-key" right-of-way program. Approximately 350 property ownerships, 950 individual parcels, and the relocation of 60 business and residences were affected by the construction. UDOT assembled a team of experienced professionals to assist project personnel, local governments and community groups with solving problems of property owners and tenants. The group's focus and innovative solutions increased the public's positive perception of the project and UDOT.
- ◆ CSS concepts  
Wetland impacts for three projects, including the 12300 South project, were combined into meaningful wetland mitigation along the Jordan River. Fifteen acres of property were purchased along the river to allow the Jordan River to meander naturally, producing a more natural environment for wetlands and wildlife habitat.

Draper and Riverton Cities were given a total of \$400,000 to lessen historical impacts in their communities by renovating structures of historical significance along the corridor.

◆ Lessons Learned

To help measure the overall success of the project, UDOT conducted a post-construction survey to measure the public’s view of the project. Below are two quotes about the success of the project:

- “This is a beautiful project...this corridor makes me feel proud of our communities and what has been done here”  
Draper City Mayor Darrel Smith“
- UDOT no longer measures the success of our projects based solely on how well they serve motorists. “

UDOT Executive Director, John Njord

Costs and time for project delivery were greatly accelerated. If you measure costs and time, compared to what would have happened, without CSS and Design-Build, the project saved an enormous amount of money (50M-100M). If you measure costs to the original budget (horse & buggy thinking), the project went over budget (17M).

CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.8
Involve stakeholders	4.0
Seek broad-based public involvement	3.8
Use full range of communication methods	3.8
Achieve consensus on purpose and need	3.4
Utilize full range of design choices	3.0
Address alternatives and all modes	3.0
Maintain environmental harmony	3.7
Address community & social issues	3.8
Address aesthetic treatments & enhancements	4.0
Consider a safe facility for users & community	4.0
Document project decisions	4.0
Track and meet all commitments	4.0
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.7

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Discussion on CSS principles

◆ Project team’s perspective

There were 5 responses to the survey from project team members. All of the scores represented a high level of agreement with the exception of “Utilize full range of design choices” and “Address alternatives and all modes” (scores of 3.0 from the scale of 4.0). There was consensus opinion of “strongly agree” for the principles related to stakeholder involvement, aesthetic treatments and enhancements, consider

a safe facility, document project decisions, track and meet all commitments, and create lasting value for the community. These results indicate unusually favorably opinions from the project team regarding the previously noted principles.

The Utah Department of Transportation set the tone for the project team that fostered teamwork, attention to detail, and a commitment to take every opportunity to meet the needs of the community. The project was awarded to a consortium of design builders and this team was able to interact effectively with the Community Coordination Committees that were created from residence and business owners within each city. These committees were empowered to make decisions on items such as landscape improvements and other aesthetic improvements for their community. Additionally, the committees were empowered to award \$2 million in contractor incentives for efforts regarding public involvement and maintenance of traffic.

### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	4.0
Increased stakeholder/public participation compared to other projects	NA	3.8
Increased stakeholder/public participation	3.0	3.4
Increased stakeholder/public ownership	3.0	3.8
Increased stakeholder/public trust	4.0	3.8
Decreased costs for overall project delivery	NA	3.0
Decreased time for overall project delivery	NA	3.6
Improved predictability of project delivery	3.0	3.8
Improved project scoping	NA	3.4
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	3.0	4.0
Improved opportunities for joint use and development	--	3.8
Improved sustainable decisions and investments	NA	3.8
Improved environmental stewardship	NA	3.2
Minimized overall impact to human environment	3.0	3.4
Minimized overall impact to natural environment	3.0	3.6
Improved mobility for all users	4.0	3.8
Improved walkability	4.0	3.8
Improved bikeability	4.0	3.8
Improved safety (vehicles, pedestrians, and bikes)	4.0	4.0
Improved multi-modal options	3.0	2.8

Improved community satisfaction	3.0	3.8
Improved quality of life for community	4.0	3.8
Fit with local government land use plan	3.0	3.8
Improved speed management	3.0	3.6
Design features appropriate to context	4.0	4.0
Optimized maintenance and operations	NA	3.6
Minimized disruption	3.0	3.6
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

##### ◆ Semi-Quantitative Benefits

In addition to the five project team members responding to the survey, there was only one stakeholder that responded. For all benefits where a stakeholder opinion was offered, the results indicated either “agree” or “strongly agree”. There were several benefits that were considered to be most favorable in terms of agreement by both the single stakeholder and the five team members. Those benefits included: “Increased stakeholder public/trust”, “Improved mobility for all users”, “Improved walkability”, “Improved bikeability”, “Improved safety”, “Improved quality of life for community”, and Design features appropriate to context”.

##### ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	
Decreased costs for overall project delivery	Estimated: \$65.5 million Actual: \$87.5 million
Decreased time for overall project delivery	
Improved predictability of project delivery	
Improved project scoping	88 change orders at cost of \$22 million
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	
Improved environmental stewardship	Change Order No. 2 to relocate Warr Trail – environmental commitment
Minimized overall impact to human environment	\$400,000 provided for cities to lessen historical impacts to community
Minimized overall impact to natural environment	Purchased 15 acres along Jordan River for wetland mitigation
Improved mobility for all users	
Improved walkability	

Improved bikeability	
Improved safety (vehicles, pedestrians, and bikes)	
Improved multi-modal options	
Improved speed management	Speed studies show 85 <sup>th</sup> above speed limit
Optimized maintenance and operations	Minimal costs for maintenance since 2005 completion
Minimized disruption	
Increased risk management and liability protection	

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	4.0
I am satisfied with the relationship I had with the interested public	NA	3.8
I am satisfied with the procedures and methods that allowed input to project decisions	3.0	4.0

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempts to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. There was a difference between the views of the stakeholder in their relationship with the project team (rating of 3.0 - agree) as compared to the relationship views of project team members with stakeholders (rating of 4.0 – strongly agree) and project team members' view of their relationship with the interested public (rating of 3.8). Also, satisfaction levels of the stakeholders and the project team in their perception of procedures and methods that allowed input into project decisions was different (3.0 for the stakeholder and 3.9 for project team members).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	4.0	NA
My relationship with the stakeholders was best described as	NA	3.2
My relationship with the interested public was best described as	NA	3.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. There did appear to be feeling of providing direction and control by the stakeholder when describing their relationship with the project team. In contrast, the project team best described their relationships as primarily that of participation relative to stakeholders and the interested public. This appears to reflect the significant roles that were

given to the two Community Coordination Committees representing Draper City and Riverton City.

- ◆ Overall level of success

Six neighborhood groups were created to effectively listen and respond to the unique needs and concerns of the citizens. The involvement of the community was instrumental in incorporating all landscape and aesthetic treatments that highlighted the natural, historical, and present characteristics of the cities of Draper and Riverton. UDOT assembled a team of experienced professionals to assist project personnel, local governments and community groups with solving problems of property owners and tenants. The group's focus and innovative solutions increased the public's positive perception of the project and UDOT.



## FINAL CASE STUDY DOCUMENTATION

Title	SR 99 Pacific Hwy South Reconstruction, Des Moines, WA
Location	Des Moines, Washington
Lead Agency	Washington State DOT
Contact Person	Samih Shilbayeh
Phase completed	Construction/Operations
Purpose and Need	The purpose of the project was to improve vehicular and pedestrian safety, reduce congestion, and improve mobility.

### CSS Qualities

- ◆ The project team was led by CH2M Hill and integrated environmental planning, landscape design, urban design, highway design, right-of-way acquisition, and public involvement throughout all phases of the project.
- ◆ With shared safety and liability concerns, the city of Des Moines and the Washington State DOT worked together to develop solutions.
- ◆ The design team involved community, utilities, business owners, neighboring cities, and other stakeholders early in the process.
- ◆ The project team collaborated with the local pedestrian safety committee to develop viable and affordable solutions to pedestrian safety problems.
- ◆ The median area was designed to provide an aesthetic treatment of trees and other streetscape applications, while providing a refuge for pedestrians and u-turn opportunities at appropriate intervals.
- ◆ A team chartering meeting resulted in a Vision Statement that guided the project through design and construction.
- ◆ A public involvement and informational campaign included mailings, news releases, and open houses to engage and share information with the community.
- ◆ Numerous tools were used to communicate with the public, business and property owners, and decision makers. Included were a facilitated workshop, a drive-through video, graphic display boards, traffic simulations, and computer visualizations.
- ◆ Landscaping and gateway treatments gave the community the sense of identity which connected them to the waterfront area, as well as providing a comfortable welcome setting for visitors and patrons.
- ◆ Congestion was reduced through the addition of new lanes and improved multi-modal facilities.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.5
Involve stakeholders	3.5
Seek broad-based public involvement	3.5
Use full range of communication methods	3.3
Achieve consensus on purpose and need	3.0

Utilize full range of design choices	3.3
Address alternatives and all modes	3.5
Maintain environmental harmony	3.5
Address community & social issues	3.0
Address aesthetic treatments & enhancements	3.5
Consider a safe facility for users & community	3.8
Document project decisions	3.8
Track and meet all commitments	3.3
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.8

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree). The research team score will be estimated once the review is completed.

#### Discussion on CSS principles

- ◆ Project team's perspective

Four project team members responded to the survey. All of fifteen principles achieved a score of at least 3 (Agree). The lowest rated principle was "Achieve consensus on purpose and need." This may be indicative of the single stakeholder respondent who indicated they were not satisfied with the relationship they had with the project team. Despite the reduced level of agreement on the purpose and need, it was strongly felt that the project created a lasting value for the community as this principle received a rating of 4 (Strongly agree) from all respondents.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation compared to other projects	NA	3.0
Increased stakeholder/public participation	2.0	3.3
Increased stakeholder/public ownership	--	3.3
Increased stakeholder/public trust	--	3.7
Decreased costs for overall project delivery	NA	3.0
Decreased time for overall project delivery	NA	3.3
Improved predictability of project delivery	3.0	3.3
Improved project scoping	NA	3.3
Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	3.0	3.3

Improved opportunities for joint use and development	3.0	3.5
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.7
Minimized overall impact to human environment	3.0	3.0
Minimized overall impact to natural environment	3.0	3.3
Improved mobility for all users	3.0	3.3
Improved walkability	3.0	3.3
Improved bikeability	3.0	3.7
Improved safety (vehicles, pedestrians, and bikes)	--	4.0
Improved multi-modal options	3.0	4.0
Improved community satisfaction	3.0	3.3
Improved quality of life for community	--	3.7
Fit with local government land use plan	3.0	3.7
Improved speed management	3.0	3.3
Design features appropriate to context	3.0	3.7
Optimized maintenance and operations	NA	3.0
Minimized disruption	3.0	3.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits
 

Only one stakeholder responded to the survey to allow for comparison to project team member responses. In general both the project team and the stakeholder agreed that the majority of benefits were achieved on the project, though project team member ratings were higher than those assigned by the stakeholder. One area of disagreement was increased stakeholder/public participation in which the stakeholder agreed, while the project team rated the benefit as Agree (3.3). Additionally the stakeholder responded unknown to increased stakeholder/public ownership and trust, which were rated agree (3.0) by the project team.
- ◆ Quantitative Benefits
 

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.
- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	2.0	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.0

I am satisfied with the procedures and methods that allowed input to project decisions	2.0	3.3
--	-----	-----

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	3.0	NA
My relationship with the stakeholders was best described as	NA	2.3
My relationship with the interested public was best described as	NA	2.0

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

Examining the Arnstein questions above, similar disagreement can be seen between the project team and the project stakeholders. While the project team rated their satisfaction with the stakeholders and public as relatively high (3.3 and 3.0, respectively), the stakeholder was not satisfied with the relationship giving a rating of 2.0 (disagree). Interestingly the stakeholder described the relationship with the project team as a partnership, while the project team described the relationship with both the stakeholders and the public as consultative (2.0 and 2.3, respectively).

- ◆ Overall level of success

With shared safety and liability concerns, the city of Des Moines and the Washington State DOT worked together to develop solutions. The design team involved community, utilities, business owners, neighboring cities, and other stakeholders early in the process. The project team collaborated with the local pedestrian safety committee to develop viable and affordable solutions to pedestrian safety problems. A team chartering meeting resulted in a Vision Statement that guided the project through design and construction. Landscaping and gateway treatments gave the community the sense of identity which connected them to the waterfront area, as well as providing a comfortable welcome setting for visitors and patrons. Congestion was reduced through the addition of new lanes and improved multi-modal facilities. In general both the project team and the stakeholder agreed that the majority of benefits were achieved on the project, though project team member ratings were higher than those assigned by the stakeholder.



## FINAL CASE STUDY DOCUMENTATION

Title	Bridgeport Way Reconstruction
Location	University Place, WA
Lead Agency	Washington DOT and City of University Place
Contact Person	
Phase completed	Construction
Purpose and Need	The purpose of this project was to address the safety concerns due to the high number of crashes over the past years. At the same time it was viewed essential to the vision statement of the City Council that aimed in improving the quality of life in the community by creating a town center. The goal of the project is to develop Bridgeport Way as a corridor that will improve traffic safety, increase the mobility and cohesiveness of the community, enhance the appearance of the corridor, and control traffic growth.

### CSS Qualities

- ◆ Project Team (make up)  
A team comprised of members from transportation, planning, and funding agencies were involved including the Washington DOT, FHWA, Puget Sound Regional Council, and Washington State Public Works Board.
- ◆ Stakeholders (make up, utilization, interaction)  
The Chamber of Commerce was a stakeholder involved in the entire process. Tacoma Power, the local electric utility company, was also involved and participated in the project by funding 50 percent of the cost for placing the power lines underground. The City of University Place Council was also involved extensively in the entire process.
- ◆ Public involvement (types, documentation)  
An extensive public involvement process was initiated to solicit input on how the street should be redesigned. The process utilized design charrettes, public meetings, open houses, meetings with neighborhood groups, and one-to-one meetings. A design charrette was completed with citizen participation to develop potential design alternatives for Bridgeport Way. There were two sessions, one for adults and a second for high school students. To notify the public regarding the meetings, newspaper notices were printed, fliers to all property owners in University Place were delivered, and posters were placed in City Hall, supermarkets, banks, library, fast food locations, and other places. Overhang signs were placed along Bridgeport Way as additional means of increasing public awareness. A representative of the City government visited each property owner along Bridgeport Way.
- ◆ Design solution (process, modes and alternatives examined)  
The use of flared intersections to accommodate U-turns for long vehicles at signalized intersections due to the use of the divided median to improve access management and reduce traffic crashes. The final design included landscaped median with specially designed streetlights; planter strips along the entire corridor with streetlights matching the median lights; and bike lanes along the entire corridor. Mid-block pedestrian crossings with in-pavement flashing lights at two mid-block crosswalks were also used. Because of reduced driver compliance over time and five vehicle-pedestrian collisions, the in-pavement lights are being replaced in Summer 2002 with pedestrian traffic signals. The utility wires were placed underground to enhance aesthetic appearance of the roadway. The use of a single corridor for all

modes of transportation, i.e. passenger cars, public transportation, bicyclists, and pedestrians was achieved.

- ◆ CSS concepts by project phase  
The development of a town center and a main street that would promote a walkable community was the main objective of the council. Most of the council members were behind the idea of redeveloping Bridgeport Way in such a manner that would enhance the quality of life of the community. The continuous solicitation of ideas and comments from the public was considered essential in the development of a design that would be accepted by the community. The City Council was committed to involve the public and the business community throughout the process and they spent several nights and meetings discussing the various alternatives.
- ◆ Lessons learned  
A major emphasis of the project was public involvement and solicitation of comments from all stakeholders throughout the entire process. The strong commitment by the City Council to develop a town center and sense of community played an important role in completing this project. The flexibility and open mindedness of the Council to develop a demonstration project for roundabouts indicated to the public and the stakeholders that their opinion is valued and is seriously considered. This level of trust between the government and the public has helped the more efficient completion and acceptance of other transportation related projects. The involvement of the area business owners from the outset of the project has been beneficial.

#### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	3.8
Involve stakeholders	4.0
Seek broad-based public involvement	4.0
Use full range of communication methods	3.5
Achieve consensus on purpose and need	3.5
Utilize full range of design choices	3.3
Address alternatives and all modes	3.8
Maintain environmental harmony	3.5
Address community & social issues	3.5
Address aesthetic treatments & enhancements	3.8
Consider a safe facility for users & community	3.8
Document project decisions	3.8
Track and meet all commitments	3.5
Create a lasting value for the community	3.8
Use all resources effectively (time & budget)	3.5

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

#### Discussion on CSS principles

- ◆ Project team's perspective  
There were four respondents that were considered as team members, including the responses of the person identified as the team leader. The project team indicated that in general all principles were present, since all had a score of 3.0 or greater (i.e. agreed that at least the principle was there). The principle with the lowest score was "Utilize full range of design choices" (3.3).

The project included an interdisciplinary team that covered all anticipated (required) areas and it seemed to have worked well. The responses received came from team members who identified themselves as transportation planners, design engineers, community planners, construction engineers, and traffic engineers. All were involved in the planning and design phases of the project and two were involved in the construction phase as well. Almost all respondents had a long CSS experience (over 6 years). Finally, all team members had more than 10 years of relevant experience.

As noted above, there was one principle that had a score lower than 3.5 indicating that the principle was applied but at a lower agreement level among the respondents. A further review of the comments provided by the team members that scored this principle with the low score did not provide any additional information to clarify the reasons for their low score. On the contrary, the meeting minutes show that several attempts were made to evaluate alternative designs and the council constructed a demonstration project (roundabout) at another location to demonstrate the value of the alternative.

On the positive side, there are two principles that the team was in agreement that were highly met. These include the "Involve stakeholders" (4.0) and "Seek broad-based public involvement" (4.0). This strong agreement was also highlighted in several of the comments provided. In particular, the involvement of the stakeholders was discussed by several members and was noted as a significant lesson-learned from the process followed. The development of a multistep public involvement process that engaged property owners, community members, and city council representatives was also noted as a strong influence and lesson learned by the process.

#### CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.3
Increased stakeholder/public participation compared to other projects	NA	3.3
Increased stakeholder/public participation	--	3.0
Increased stakeholder/public ownership	--	3.5
Increased stakeholder/public trust	--	3.5
Decreased costs for overall project delivery	NA	3.0
Decreased time for overall project delivery	NA	3.0
Improved predictability of project delivery	--	3.3
Improved project scoping	NA	4.0

Improved project budgeting	NA	3.0
Increased opportunities for partnering or shared funding or in-kind resources	--	3.5
Improved opportunities for joint use and development	--	3.5
Improved sustainable decisions and investments	NA	3.3
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	--	3.5
Minimized overall impact to natural environment	--	3.5
Improved mobility for all users	--	4.0
Improved walkability	--	3.8
Improved bikeability	--	3.8
Improved safety (vehicles, pedestrians, and bikes)	--	3.8
Improved multi-modal options	--	3.8
Improved community satisfaction	--	3.5
Improved quality of life for community	--	3.8
Fit with local government land use plan	--	3.5
Improved speed management	--	3.3
Design features appropriate to context	--	3.5
Optimized maintenance and operations	NA	3.7
Minimized disruption	--	3.5
Increased risk management and liability protection	NA	3.5

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

The survey was completed only by team members who indicated that all benefits materialized as a result of the process followed. All benefits have a score greater than 3.0 indicating that the survey participants at least agree that the benefit was achieved. Benefits that had high scores (equal or greater than 3.7, indicating that most of the participants strongly agree) include “Improved project scoping”, “Improved mobility for all users”, “Improved walkability and bikeability”, “Improved safety”, “Improved quality of life for the community”, and “Optimized maintenance operations”. These benefits indicate that the project resulted in a better environment for the community.

Overall, this was a positive view of the benefits materialized and the project was considered as generating benefits due to the process followed. It should be noted here that even though there is a great agreement among the four team members that completed the survey, the results should be viewed cautiously and any comparisons could be conducted with care.

- ◆ Quantitative Benefits

In addition to the semi-quantitative scores obtained above, the following quantitative metrics were obtained for some of the benefits.

CSS Benefit	Metrics
Increased stakeholder/public participation	Stakeholder meeting in planning; a 100-person charette to identify possible design options; a forum to discuss charett choices; and four neighborhood meetings to finalize design
Decreased costs for overall project delivery	Price approximately the same
Decreased time for overall project delivery	Project completed within allotted time
Improved predictability of project delivery	
Improved project scoping	
Improved project budgeting	
Increased opportunities for partnering or shared funding or in-kind resources	Cost-share with Tacoma Power splitting 50/50 cost for underground power lines
Improved environmental stewardship	
Minimized overall impact to human environment	
Minimized overall impact to natural environment	
Improved mobility for all users	1 mile of bike lanes and sidewalks in both directions of traffic
Improved walkability	1 mile of 10-foot sidewalk both directions; added midblock crossing with pedestrian signal
Improved bikeability	1 mile of 7-foot bike lanes on both directions of traffic
Improved safety (vehicles, pedestrians, and bikes)	Driveway crashes reduced from 19 per year to 8 a year after project was completed
Improved multi-modal options	
Improved speed management	Operating speed reduced by 1.9 mph
Optimized maintenance and operations	
Minimized disruption	
Increased risk management and liability protection	

The data supports the semi-quantitative results noted in the previous table and indicates that the high scores for the various improvements noted are indeed true. However, the available data repotes the perception for those benefits that had the lower scores (3.0). There were no change orders and scope changes submitted for the project indicating that the budgeting and scoping of the project was appropriate. Moreover, the time for the completion of the project remained on target thus not increasing the delivery time. Moreover, the perceived notion of

lack of speed management was not founded, since the study conducted on operating speeds indicates a 1.9 mph reduction.

◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	--	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.5
I am satisfied with the relationship I had with the interested public	NA	3.5
I am satisfied with the procedures and methods that allowed input to project decisions	--	3.5

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	--	NA
My relationship with the stakeholders was best described as	NA	2.8
My relationship with the interested public was best described as	NA	2.8

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

This section evaluates the relative view and perceptions between the stakeholders and the team to determine whether both have the same experience and level of satisfaction. However, in this case this was not possible due to the lack of stakeholder responses. The team showed high levels of satisfaction working with both stakeholders and public. The question on the level of relationship between team and stakeholders showed that team members viewed that relationship as letting stakeholders to provide direction.

◆ Overall level of success

This is a successful use of CSS processes. The commitment of the local government to use innovative designs and communication techniques paid off in delivering a very successful project.



## FINAL CASE STUDY DOCUMENTATION

Title	Cody-Yellowstone Highway Project, Wyoming
Location	US 14/16/20 Cody to Yellowstone Park Entrance
Lead Agency	Wyoming DOT
Contact Person	Bob Bonds
Phase completed	Construction
Purpose and Need	The purpose of this project was to address safety and capacity issues, with improved geometrics. Environmental and cultural enhancements were also included in the project.

### CSS Qualities

- ◆ Project Team (make up)  
Members of the Interdisciplinary Team and the Advisory Committee included the U.S. Forest Service, Wyoming Game and Fish, Northwest Resource Council, Park County, Greater Yellowstone Coalition, Cody Chamber of Commerce, and others. Facilitation of the Interdisciplinary Team was performed by the NEPA consultant, WYDOT, and FHWA. The Advisory Team was facilitated by WYDOT. The project incorporated the Interdisciplinary Team during the planning, scoping, and NEPA phases, and an Advisory Committee during the design and construction phases.
- ◆ Stakeholders (make up, utilization, interaction)  
The Advisory Committee was involved with identifying specific objectives of each planning circumstance, providing recommendations on how to further reduce impacts during the planning and design phases, making suggestions for alleviating environmental and traffic flow concerns during construction, reviewing recommendations and guidelines related to various design and environmental features, and participating in decisions regarding construction sequencing to minimize disruption to tourist, commuter, and commercial traffic.
- ◆ Public involvement (types, documentation)  
WYDOT incorporated video imaging early in the design phase of the project to help non-highway personnel and residents visualize the completed project. Several public meetings were held as well as weekly work review sessions during project construction. Daily announcements were made during rock blasting and other road closure operations. The community was kept informed by radio and brochures. The Advisory Committee planned and determined times for road closures during the heavy tourist season. An environmental training video and grizzly bear video were used to inform and educate state, federal, and contractor employees prior to working on the project.
- ◆ Design solution (process, modes and alternatives examined)  
The project involved geometric upgrades for a heavily traveled tourist and recreational corridor, while preserving environmental and aesthetic features. Transportation needs were addressed by adding shoulders, passing lanes, clear zones, turning lanes, replacing bridges and flattening substandard curves allowing for a safer driving experience during heavy tourist seasons.
- ◆ CSS concepts  
The project included constructing five retaining walls in order to prevent intruding into the North Fork of the Shoshone River, extensive rock cuts and elimination of drill marks, obliterating the existing road, and 27.5 miles of road reconstruction adjacent to grizzly bear habitat. Access to a sensitive cultural resource was improved, data from archeological sites were retrieved, wetlands were reconstructed, four new

interpretative centers were constructed, and temporary stream crossings were constructed without disturbing existing channel bottoms. A U.S Forest Service landscape architect was employed, as well as an environmental compliance officer to insure environmental sensitivity.

- ◆ Lessons learned

The conservation easement obtained as mitigation for the project helped preserve many acres from future development. Environmental and visual features were enhanced by the project, including rock cuts, re-vegetated slopes, reclaiming old road cut slopes, closing and reclaiming locally pioneered roads, habitat enhancement paid by the WYDOT and implemented by the USFS, river enhancements using rock structures, relocating trailheads away from grizzly bear habitat, and closing a campground in grizzly bear habitat and reclaiming it into wetland.

### CSS Principles

CSS Principle	Project Team
Use of interdisciplinary teams	4.0
Involve stakeholders	4.0
Seek broad-based public involvement	3.3
Use full range of communication methods	3.0
Achieve consensus on purpose and need	3.3
Utilize full range of design choices	2.7
Address alternatives and all modes	3.0
Maintain environmental harmony	3.3
Address community & social issues	3.3
Address aesthetic treatments & enhancements	3.7
Consider a safe facility for users & community	3.7
Document project decisions	3.3
Track and meet all commitments	3.3
Create a lasting value for the community	4.0
Use all resources effectively (time & budget)	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

### Discussion on CSS principles

- ◆ Project team's perspective

There were two surveys completed and returned by the project team. These team members were both from the Wyoming DOT. Both respondents gave the highest rating to "Use of interdisciplinary teams", "Involve stakeholders", and "Create lasting value for the community". Also receiving high ratings were "Address aesthetic

treatments and enhancements” and “Consider a safe facility for users and community”. These high scores on opinions of agreement with application of principles were consistent with the reconstruction of a major route that was within a national forest and the gateway into Yellowstone National Park. There was clearly a need to include the views and input from an interdisciplinary team and a wide range of stakeholders. The lowest score was for “Utilize full range of design choices”, followed by “Use full range of communication methods” and “Address alternatives and all modes”.

## CSS Benefits

CSS Benefit	Measured	
	Stakeh.	Team
Improved stakeholder/public feedback	NA	3.0
Increased stakeholder/public participation compared to other projects	NA	3.3
Increased stakeholder/public participation	3.3	2.3
Increased stakeholder/public ownership	3.5	2.7
Increased stakeholder/public trust	3.5	3.0
Decreased costs for overall project delivery	NA	2.3
Decreased time for overall project delivery	NA	2.3
Improved predictability of project delivery	3.7	3.0
Improved project scoping	NA	3.0
Improved project budgeting	NA	2.5
Increased opportunities for partnering or shared funding or in-kind resources	3.7	3.0
Improved opportunities for joint use and development	3.3	3.0
Improved sustainable decisions and investments	NA	3.0
Improved environmental stewardship	NA	3.3
Minimized overall impact to human environment	3.7	3.7
Minimized overall impact to natural environment	3.3	3.3
Improved mobility for all users	3.8	3.7
Improved walkability	3.3	2.7
Improved bikeability	3.0	3.3
Improved safety (vehicles, pedestrians, and bikes)	3.8	3.0
Improved multi-modal options	3.0	2.0
Improved community satisfaction	3.3	3.0
Improved quality of life for community	3.7	3.0
Fit with local government land use plan	3.0	3.0

Improved speed management	2.3	2.0
Design features appropriate to context	3.0	3.3
Optimized maintenance and operations	NA	3.0
Minimized disruption	3.3	3.0
Increased risk management and liability protection	NA	3.0

#### Discussion on Benefit Values

- ◆ Semi-Quantitative Benefits

This project's objectives were to bring the facility up to current design standards, while preserving the environmentally sensitive features of the valley corridor leading into Yellowstone National Park. There was significant effort made to include a full range of stakeholders to insure proper attention to the environmental and aesthetic features.

Results from the survey of stakeholder and team members indicated a relatively high degree of success when attempting to balance the need for safety improvements with the environmental and aesthetic expectations. There were three responses from stakeholders, in addition to the two project team responses. Opinion scores indicated that the stakeholders and project team were in general agreement on some benefit assessments, while divergent on others. Benefits with the highest scores and highest level of agreement included "Minimized overall impact to the human environment" and "Improved mobility for all users". Scores that were high for stakeholders, but somewhat lower for project team respondents included "benefits related to increased stakeholder/public participation, ownership, and trust. The lowest scores mutual to stakeholders and project team members were for "Improved speed management".

- ◆ Quantitative Benefits

There was no additional information provided to the research team to be utilized in the development of quantifiable benefits.

- ◆ Arnstein comparison

Arnstein Questions Part 1	Stakeh.	Team
I am satisfied with the relationship we had with project team	3.5	NA
I am satisfied with the relationship I had with the stakeholders	NA	3.3
I am satisfied with the relationship I had with the interested public	NA	3.0
I am satisfied with the procedures and methods that allowed input to project decisions	3.5	3.3

Note: The project team and stakeholder scores are based on the survey results of a 4.0 scale (4: strongly agree; 3: agree; 2: disagree; and 1: strongly disagree).

The first four questions of the Arnstein comparison section attempt to evaluate the relative view and perceptions of the project team versus the view and perceptions of the stakeholders. There did not appear to be a significant difference between the views of stakeholders in their relationship with the project team (rating of 3.5) as compared to the relationship views of project team members with stakeholders (rating of 3.3). Also, satisfaction levels of the stakeholders and the project team in their perception of procedures and methods that allowed input into project decisions was similar (3.5 for stakeholders and 3.3 for project team members).

Arnstein Questions Part 2	Stakeh.	Team
My relationship with the project team was best described as	2.8	NA
My relationship with the stakeholders was best described as	NA	1.7
My relationship with the interested public was best described as	NA	1.7

Note: The project team and stakeholder rankings are based on the survey results of a 4.0 scale (4: They allowed us to provide direction; 3: We established a partnership; 2: We established a consultation relationship; and 1: We established an informational relationship).

The last three questions of the Arnstein comparison were opinions of relationship roles of the stakeholders with project team members and the role of project team members with the stakeholders and the public. There appeared to be a feeling of serving in a combination consultation and participation role when the stakeholders described their relationship with the project team. The project team best described their relationship as that of consultation and information sharing when describing their relationship with stakeholders and the public.

- ◆ Overall level of success  
WYDOT incorporated video imaging early in the design phase of the project to help non-highway personnel and residents visualize the completed project. Results from the survey of stakeholder and team members indicated a relatively high degree of success when attempting to balance the need for safety improvements with the environmental and aesthetic expectations for a roadway entering into Yellowstone National Park.

