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Making Mobility Improvements a Community Asset: Transportation Improvements Using Context-Sensitive Solutions

Final Report

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16. Abstract

Major mobility improvements are often desired and even sought after by the communities which they serve. Any opposition to such projects usually occurs at the local level from very vocal citizenry. This opposition can cause delays, redesign, increased costs, and sometimes leaves a tarnished image for the sponsoring agency. Even though environmental analyses were added to the project development process to enable a response process for many of the objections, opposition (and potential delays and costs) continues, especially for major improvement projects.

Context-sensitive solutions (CSS) grew out of a national symposium (Thinking Beyond the Pavement) to develop an approach to help make major mobility improvements more compatible, more supportive and more acceptable to communities. Use of the CSS approach—involving stakeholders in project development from the beginning—was included in SAFETEA-LU as a policy. However, implementation at the state level has been inconsistent, and a 2007 audit of states showed that DOTs of only nine states (plus District of Columbia) have integrated CSS into their ongoing processes, while 15 state DOTs had yet to start.

This project was developed to disseminate knowledge, experiences, and reasons for use and benefits of CSS through university courses and technology transfer to facilitate its use by agencies and practitioners in gaining community acceptance of mobility improvement projects.

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Making Mobility Improvements a Community Asset: Transportation Improvements Using Context-Sensitive Solutions

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DISCLAIMER

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EXECUTIVE SUMMARY

Major mobility improvements are often desired and even sought after by the communities which they serve. Opposition to such projects usually occurs at the local level from very vocal citizenry. This opposition can cause delays, redesign, increased costs, and sometimes leaves a tarnished image for the sponsoring agency. Even though environmental analyses were added to the project development process to enable a response process for many of the objections, opposition (and potential delays and costs) continues, especially for major improvement projects.

Context-sensitive solutions (CSS) grew out of a national symposium (Thinking Beyond the Pavement) to develop an approach to help make major mobility improvements more compatible, more supportive, and more acceptable to communities. Use of the CSS approach—involving stakeholders in project development from the beginning—was included in SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) as a policy. However, implementation at the state level has been inconsistent, and a 2007 audit of state departments of transportation (DOT) showed that only nine states (plus District of Columbia) have integrated CSS into their ongoing processes, while 15 state DOTs had yet to make a real start.

This project was developed to disseminate knowledge, experiences, reason for use and benefits of CSS through university courses and technology transfer to facilitate its use by agencies and practitioners in gaining community acceptance of mobility improvement projects. The materials developed consisted of:

- Twelve case studies of projects that successfully employed the CSS approach and process and often additional design flexibility also encouraged as part of CSS.
- Fourteen presentations of varying lengths explaining and demonstrating the benefits of CSS and gathered about 40 more from other presenters at a series of workshops co-sponsored with the Federal Highway Administration (FHWA).
- A university graduate course to provide students with a working knowledge of CSS so they would be ready to use it upon entering the workforce.

The 12 case studies produced in this project provide a wide variety of examples of successful use of CSS, often as a way to approach the most challenging conditions, such as public opposition and very complex needs that extend beyond transportation needs and into neighborhood, business, and other needs.

As this project approached initiation, the project team was approached by the Texas Division office of FHWA to co-sponsor a series of 1-day CSS workshops throughout Texas. Presentation material was to vary according to interests or issues in each area where the workshops would be delivered. This project both aided and was benefited by presentations made by the Texas Transportation Institute (TTI) and others as well as the discussions that transpired during the workshops. Discussions and feedback provided good insight to the factors causing CSS to be so slowly integrated into state DOT practice as well as in local agencies.

TTI/UTCM also co-sponsored with FHWA and North Carolina State University's Center for Transportation and Environmental Research the first in a series of national CSS dialogs. These were opportunities for agencies and practitioners to discuss their experiences using CSS and to provide suggestions on what more is needed to facilitate integration of CSS into common use for transportation project development.

The preparation of materials and discussions during workshops and other interactions pointed toward some definite conclusions:

- CSS can be very beneficial to project sponsors as well as project corridor or area stakeholders and the public.
- CSS is not well understood by many prospective users.
- Some agencies are wary of CSS, thinking it will just add cost and time to projects, and may lead to loss of decision control.
- Some agencies view CSS as another federal “unfunded mandate.”
- Some agencies or administrators would prefer little change from “tried and proven” approaches.
- Like many new things, CSS is not widely used unless agency and project development directors direct that it be used.
- Those agencies and consultants that have used CSS concur that it helps gain stakeholder and community acceptance by addressing widely varying issues and needs from the outset.
- Those same proponents verify that the CSS process can save time and money in later stages of a project by avoiding disputes and late revisions.
- Some people who are uncertain about CSS see the value of CSS when shown successful examples similar to difficult projects they have recently undertaken; when choosing material to show audiences, prior knowledge of recent tough or unsuccessful projects will help a presenter select successful projects that can convince the audience of the value of CSS.
- Stakeholders and the public generally like CSS because it gives them an opportunity to participate constructively from the outset and they get a broader range of issues and needs discussed and addressed; projects usually also include features that better support the community’s or project area’s non-transportation needs.
- Most designers and nearly all stakeholders appreciate the design flexibility used in CSS projects.

The bottom line is that agencies, their directors, and project development directors and managers need to be educated about the advantages and benefits of the CSS approach. Moreover, they also need training on how to use it. There is very little that is totally new. CSS is little more than an efficient repackaging of processes and tools that are and have been used successfully for a long time (more by local agencies) for projects with overlapping transportation and community objectives, values, and issues.

CSS can become common in use by transportation agencies at all levels. The easiest and fastest way would be for CSS to become required for any project using federal funds. Unless and until that happens, more and better outreach and education—especially aimed at agency directors and design or project development directors—will be most effective. Starting with difficult or controversial projects may be the best way for an agency to realize quick benefits. That has been the entry for many agencies so far.

1. PROBLEM AND NEED

CONVENTIONAL PROJECT DEVELOPMENT

Mobility improvements are generated out of what is often called a project development process. The project development process generally consists of several general steps:

1. Needs identification.
2. Concept development.
3. Environmental analysis.
4. Preliminary design.
5. Final design.
6. Construction/implementation.

These general steps, plus many additional component steps were developed over the many decades since the building of transportation improvements and became common and the federal government became a major source of funding for those improvements. Over the years the process has become more complex and broader. Perhaps the biggest change since World War II has been the addition of environmental requirements. These requirements, which have evolved over almost a half century, now require any project funded with federal funds (and in Texas with funds from the Texas Department of Transportation [TxDOT]) to be put through an environmental analysis as specified under the National Environmental Policy Act (NEPA).

NEPA stipulates that a number of widely varied environmental and socioeconomic factors be considered as plans for a transportation improvement are developed. One of those factors is consistency of the proposed transportation improvement with other local plans. NEPA also requires a public involvement program for the project development process to be able to acquire suggestions, concerns, and other input that can benefit the project and reduce adverse impacts on the community.

The conventional project development approach is carried out by or for the sponsoring agency. That agency is normally the one that has jurisdictional responsibility for the facility being improved or built. For example, a state highway is under the jurisdiction of a state department of transportation. A transit station is under the jurisdiction of a local or regional transit authority. That agency (or a consultant team hired by the agency) usually develops the project design by going through a project development process.

The conventional project development process has started with the identification of an implementation project that is part of an agency transportation plan. Sometimes it is an entire road or other project. Other times it may be an operable portion of such a project (such as a 2-mile section of a long term 10-mile improvement). The project development process usually considers at least an operable segment (one that can function even if the rest of the project is not implemented), but often includes the entire project at least through concept development.

The first two general steps of the project development process—needs identification and concept development—are when the project is actually defined and takes shape. That is when the basic location, alignment, and major design scope are determined. The project is then refined and more detail is added through subsequent steps. This includes changes or additions to address any environmental impacts that may arise from the proposed project.

PROJECT DEVELOPMENT PROBLEMS

In some instances the changes result from reviews by local agencies or public inputs from the public involvement process. Occasionally changes occur because the local agency does not approve or accept the proposed project design. On rare occasions law suits initiated by opposing individuals or organizations may cause a change to be made or the project to be stopped.

Project changes that are made during project design refinement as part of the project development process can be made efficiently and are an expected part of the project development process. However, public or agency dissatisfaction that causes a project development process to back up or even start over costs money and time and can delay a project to the point when it falls off an agency's improvement program. The result of long delays is almost always significant increase in project implementation cost. Occasionally a project may even be cancelled. These last results—long delays, major cost increases, and terminated projects—also give the sponsoring agency poor public image, at least related to the project. This tarnished image may make it more difficult to gain public acceptance for subsequent projects.

Most transportation agencies are successful getting a majority of projects through the project development process without undue delays. Most projects are accepted by the public, or at least without major objections. However, as projects get larger, they draw more attention and scrutiny. The same is true of projects that affect residential neighborhoods, business districts, parks, and other areas or locations that local interests feel strongly should not be touched or need to be dealt with sensitively.

With the advent of both NEPA and increasing public involvement requirements, project development has become more transparent and stakeholders affected by proposed projects have demanded more input to some projects. When that input is not possible or is not fully addressed, local opposition often forms and makes project approval much more difficult. Public trust of the agency also declines.

No agency likes to have its projects delayed by local opposition. No agency feels good about one of its projects being criticized for adversely affecting an area or local feature. Certainly no agency enjoys bad press and community relations because one of its projects appears so negatively to the local community that the agency itself is criticized for insensitivity (or worse). More importantly, all agencies want their projects to be productive and beneficial to an area.

PROJECT DEVELOPMENT PROCESS NEEDS

Over time transportation agencies have determined from their experiences that the conventional process can work, but it often does not work. Some agencies have had so many controversies associated with proposed projects that nearly all significant projects that add routes or capacity are looked at with concern by stakeholders, the public, or both. The resulting process's inefficiencies and costs as well as public image caused some agencies to look for a better way to consistently approach projects that could produce better results and more consistent stakeholder and public acceptance.

This was not a new problem. Cities had long faced similar situations in conjunction with urban redevelopment projects and changes to urban streets, particularly in business districts and residential neighborhoods. Cities had long solicited more active, constructive input for their project definition processes in order to gain better public acceptance, although street improvements frequently were still developed under a conventional process. Cities were perhaps more sensitive because their elected officials were more closely connected with project decisions (certainly final approval and funding approval). However, the same conditions had not affected state DOTs very widely until the 1980s. Transit agencies proposing rail projects also faced frequent opposition.

By the late 1990s, the combination of NEPA requirements and frequency of public opposition was causing both state and local agencies to reconsider their approach to transportation project development. More and more agencies increased public involvement frequency and outreach efforts. However, it was usually in the form of public meetings and hearings where the public was given the opportunity to react to project proposals at some point in the project development process. Results were a little better, but still not as good as were hoped. Opposition still developed.

Thinking Beyond the Pavement

In 1998, a conference was held in Maryland to discuss what was called "Thinking Beyond the Pavement." The proposed approach considered both the transportation project and its surrounds—including activities—as what needed to be addressed from the beginning. Project objectives were to include not just transportation improvements, but also objectives for the abutting and surrounding area. The thinking behind this approach was that if the entire area or corridor scope was considered, that the transportation improvement could contribute to improvement of the area/corridor as well as mobility. That might or might not expand the scope of the transportation project, but it would make it more compatible with and supportive of the area.

Design flexibility was also considered to be part of the need and solutions for projects with complex needs. While the American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design for Highways and Streets* contains a lot of flexibility, state and local agencies have adopted or adapted its guidelines into a standards form with much more limited flexibility.[1] It was felt that the flexibility inherent in the AASHTO design guide should be emphasized and that it could help make some projects more compatible with their surroundings.

Context Sensitivity and Context-Sensitive Solutions

A more general approach evolved out of the thinking of that 1998 conference. The approach was to consider the context of the area into which the transportation improvement was to be inserted and to include the transportation facility as part of that context. The context was to include both form (e.g., massing, density, design, and appearance) and function (e.g., connectivity, activities) that were or would be in the affected area. Integrating all of the needs and considering the

[1] *Policy on Geometric Design for Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), Washington, D.C., 2004.

existing and desired characteristics could yield a context driven approach to developing concepts for transportation improvements. The needs and objectives were to be drawn from the area stakeholders as well as agency technical analyses.

The term context-sensitive solutions was given to such an approach. It considers both form and function and both transportation and other community features as part of the concept. However, that does not mean that the transportation project becomes responsible for improving everything in the context. It does point toward the need to make the transportation project contribute to those improvements by making place for their accommodation within the transportation right of way and to be compatible with existing and/or proposed non-transportation improvements.

CSS PRINCIPLES

The "Thinking Beyond the Pavement" conference developed some basic principles that have since been refined by a joint committee of AASHTO and FHWA. Those core CSS principles apply to transportation processes, outcomes, and decision-making. The principles are:[2]

1. Strive toward a shared stakeholder vision to provide a basis for decisions.
2. Demonstrate a comprehensive understanding of contexts.
3. Foster continuing communication and collaboration to achieve consensus.
4. Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments.

CSS PROCESS CHARACTERISTICS

The same committee outlined 12 desirable characteristics of a CSS process that:

1. Establishes an interdisciplinary team early, including a full range of stakeholders, with skills based on the needs of the transportation activity.
2. Seeks to understand the landscape, the community, valued resources, and the role of all appropriate modes of transportation in each unique context before developing engineering solutions.
3. Communicates early and continuously with all stakeholders in an open, honest, and respectful manner, and tailors public involvement to the context and phase.
4. Utilizes a clearly defined decision-making process.
5. Tracks and honors commitments through the life cycle of projects.
6. Involves a full range of stakeholders (including transportation officials) in all phases of a transportation program.
7. Clearly defines the purpose and seeks consensus on the shared stakeholder vision and scope of projects and activities, while incorporating transportation, community, and environmental elements.
8. Secures commitments to the process from local leaders.
9. Tailors the transportation development process to the circumstances and uses a process that examines multiple alternatives, including all appropriate modes of transportation, and results in consensus.

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[2] *Results of Joint AASHTO/FHWA Context Sensitive Solutions Strategic Planning Process,* Summary Report, Federal Highway Administration, Washington, DC, March 2007.

10. Encourages agency and stakeholder participants to jointly monitor how well the agreed-upon process is working, to improve it as needed, and when completed, to identify any lessons learned.
11. Encourages mutually supportive and coordinated multimodal transportation and land-use decisions.
12. Draws upon a full range of communication and visualization tools to better inform stakeholders, encourage dialogue, and increase credibility of the process.

The CSS project development process can and will vary from context to context and project to project. However, the same or similar characteristics should be incorporated into each one.

CSS OUTCOMES

The AASHTO/FHWA committee also identified outcomes that should result from a CSS process. Those outcomes:

1. Are in harmony with the community and preserve the environmental, scenic, aesthetic, historic, and natural resource values of the area.
2. Are safe for all users.
3. Solve problems that are agreed upon by a full range of stakeholders
4. Meet or exceed the expectations of both designers and stakeholders, thereby adding lasting value to the community, the environment, and the transportation system.
5. Demonstrate effective and efficient use of resources (people, time, budget,) among all parties.

The sum total of the principles, characteristics, and outcomes are that the project should be generated from objectives and other constructive input from the stakeholders involved in the project areas and that the project should be compatible with and supportive of other parts, activities, and projects in the affected area.

CSS BENEFITS

If the CSS process is used, a number of benefits can result. Some of those benefits can include:[3]

1. Improved predictability of project delivery.
2. Improved project scoping and budgeting.
3. Improved long term decisions and investments.
4. Improved environmental stewardship.
5. Optimized maintenance and operations.
6. Increased risk management and liability protection.
7. Improved stakeholder/public feedback.
8. Increased stakeholder/public participation, ownership, and trust.
9. Decreased costs for overall project delivery.
10. Decreased time for overall project delivery.
11. Increased partnering opportunities.
12. Minimized overall impact to human and natural environment.

[3] Nikiforos Stamatiadis, *Context Sensitive Solutions: Quantification of the Benefits in Transportation*, NCHRP Report 642, Transportation Research Board, Washington, D.C. 2009.

13. Improved mobility for users.
14. Improved walkability and bikeability.
15. Improved safety (vehicles, pedestrians, and bikes).
16. Improved multi-modal options (including transit).
17. Improved community satisfaction.
18. Improved quality of life for community.
19. Improved speed management.
20. Design features appropriate to context.
21. Minimized construction related disruption.
22. Improved opportunities for economic development.

CSS PROCESS APPLICATIONS

CSS is applicable to just about any transportation improvement that could impact the area into which it is implemented. There are no size or scope criteria. It is simply a matter of whether or not there will be a recognizable impact—positive or negative. For example, widening a road could have a recognizable impact. Resurfacing an existing road would not.

In general, it is advisable to use the CSS process for any project that will result in change, especially where any of the following may result or be an issue:

- Change in transportation function.
- Local objectives related to context or project may be in conflict.
- Transportation project is part of a neighborhood change.
- Aesthetics will likely change.
- Compatibility may be an issue.
- Sustainability of the transportation project or affected area is likely to be an issue.
- Project is complex (any size).
- Project is large.
- Public acceptance (short or long term; local or areawide) is uncertain.

WHO SHOULD USE THE CSS PROCESS

The CSS process will be beneficial to any agency or other organization considering a project that may affect or be perceived to affect the stakeholders or the area in which the project will be implemented. This could include both public agencies and private property owners or developers.

The groups that should use the CSS process are:

- Implementers.
    - State DOTs.
    - Regional DOTs.
    - County, city, other local DOTs.
    - Toll road agencies.
    - Transit agencies.
    - Multimodal transportation authorities.
    - Special transportation districts.
    - Developers.

- Planners.
    - From above implementing agencies.
    - Metropolitan Planning Organizations (MPOs).
    - Regional Planning Organizations (RPOs).
    - Local agency planning departments.
    - Redevelopment authorities.
- Partners.
    - Cooperating agencies.
    - Special purpose agencies and districts.
    - Funding organizations.

CURRENT CSS USE

CSS is currently encouraged by the FHWA as a matter of policy. Use of the CSS approach—design flexibility and involving stakeholders in project development from the beginning—was included in SAFETEA-LU as a policy (Title 6, Section 6008). However, implementation at the state level has been inconsistent, and a 2007 audit of states showed that only nine states (plus the District of Columbia) have integrated CSS into their ongoing processes, while 15 states, including Texas, have yet to make a real start.

There is no federal regulation or requirement specifying that CSS must be used. At the state level, some states (e.g., Massachusetts, Kentucky, Texas, Maryland, Pennsylvania, and Minnesota) have included it in policies or manuals in one form or another. For example, Texas has included the process by reference to public involvement and references to specific CSS reference documents.[4] The Massachusetts DOT revised its project development and design manual to reflect both process and increased design flexibility.[5] Although many states have used the CSS process or something similar, most states do not use it widely in general practice even the majority of states have some kind of statement or general policy that CSS should or may be employed.

Many local agencies have used informal or formal processes that are generally similar to CSS. Most early uses were for redevelopment and community development projects for which community input was sought to help direct the project. In most such cases, the sponsoring agencies did not have a complete idea of what should be done, so they asked stakeholders and the general public. Sometimes public charrettes were used to develop a project concept. Design flexibility often found its ways into these projects, sometimes because the projects being designed were so different than what had been previously built in a given jurisdiction. However, few local jurisdictions were found to have anything resembling a formal policy on using CSS processes.

In the past few years, a "Complete Streets" movement has arisen.[6] Complete Streets provide for and safely accommodate all modes and all users. Complete Streets advocates context-sensitive approaches and especially design flexibility. Some cities have adopted a complete streets policy.

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[4] *Project Development Process Manual*, Texas Department of Transportation, Austin, Texas, June 2009.
[5] *Project Development and Design Guide*, Massachusetts Highway Department, Boston, Massachusetts, January 2006.
[6] National Complete Streets Coalition, Washington, D.C., www.completestreets.org.

Now it is over a decade since the Thinking Beyond the Pavement conference took place and about a decade since FHWA encouraged the use of CSS. FHWA and others have sponsored outreach and training. Additional resources have been developed to explain both process and design flexibility. Yet very few agencies have made CSS a formal part of everyday practice.

The principal authors have used the CSS process and have found it to be very helpful to develop projects that respond to both simple and complex needs and concerns. In speaking with transportation professionals for the purposes of this project and others, it was clear that a wide variety of project designers and managers have used parts or most of the CSS approach and found it very helpful, especially where project needs are complex and/or when stakeholder and public interest were high.

However, why is CSS not yet common practice in transportation agencies across the country? Several explanations have been given or have become apparent to the authors, including:

- CSS is not legislatively required.
- CSS is not required by federal or state regulation.
- Agency or design directors consider CSS another federal "unfunded mandate."
- CSS appears to increase project development expense by adding more front end activity, mainly to the public involvement process that many already feel uncomfortable with.
- The "old way" works; why change it?
- Inertia; it takes a lot of effort and energy to affect change, especially in large (state) agencies.
- Agencies have an incomplete understanding of what CSS entails.
- CSS appears to reduce the control that the sponsoring agencies has over the project outcome.
- There is fear that flexible design will either increase agency liability or greatly increase the number of design exceptions that must be processed.

NEED

Hence, it continues to become clearer all the time that regular use of the CSS approach would benefit virtually any agency that undertakes transportation improvements of all but the smallest sizes. That is use of CSS as the process for project development should be normal, everyday practice.

This project has responded to part of the needs for increased use of CSS by developing materials and completing some pilot deliveries of materials that could be used to reduce fears of CSS and also increase preparation of and comfort by design professionals to use CSS. The need appeared to include:

- Factual information describing what CSS actually is and the expected outcomes, as well as what is not intended.
- Description of benefits in a manner relevant to the particular agency or type of person.
- Show that most agencies already use parts of the CSS approach (although not regularly or comprehensively.

- Possibly most important, provide examples of successes using the CSS process or design flexibility and stakeholder input, including examples of benefits to the sponsoring agency.
- Address other fears that agencies, directors, or design staffs have.

The project team, with input from many practitioners, decided to accomplish these needs by assembling presentations that could be taken to a variety of audiences. The presentations needed to have components that could be assembled in almost any combination to respond to a particular audience's needs. The remainder of this report describes the materials that were assembled and the pilot deliveries that were attempted and completed.

2. APPROACH

This project took a direct approach to developing the desired material. First an outline was developed that could address the greatest needs. Several needs were identified by the project team after a number of discussions with transportation professionals involved in project development.

TOPICS TO BE ADDRESSED

The topics of need most frequently identified by agencies and practitioners were:

- Briefly define CSS.
- Describe the origins of CSS.
- Identify common benefits of CSS.
- List the users and uses of CSS.
- Determine why CSS is not being more widely used.
- Analyze reasons for non-use and develop simple responses that can overcome those reasons.
- Find good examples to demonstrate CSS successes.
- Demonstrate how the results of the examples can be transferred to other users (by specific project case or user).
- Develop presentation material to communicate the above.

In addition, the researchers realized that a more comprehensive coverage of CSS, how it works, and how it can be used for various types of projects would be needed for those who have little or no knowledge of CSS or are users who will want to apply it to their own project development processes.

The above list of material also fit this second group's needs. In addition, more complete descriptions of how CSS works and a description of the project development process were also needed.

WORKSHOPS AND PRESENTATIONS

By the time this project started, the project team had already begun receiving requests to make presentations and partner with FHWA to conduct workshops in throughout Texas. FHWA's reason for putting on workshops was to facilitate and expedite incorporation of CSS into regular practice.

The researchers and the FHWA's Texas division office agreed to partner to put on approximately three 1-day workshops each year where there was local interest from TxDOT district offices, MPOs, or cities or other local agencies. The content was designed to touch on all or most of the above topics, but also to add two important items that would vary from location to location:

- Address issues or topics requested by local partners.
- Include local examples of projects that followed CSS.

The FHWA role was to seek requests from MPOs and TxDOT district offices. FHWA was also to work with the local partner on logistics and to coordinate discussions on program, speakers, etc. TTI was to assemble material for portions of the workshop to be presented by the TTI project team, to work with other presenters to create a total workshop program that would meet the local agency needs as well as to satisfy FHWA's objectives.

FHWA's Atlanta resource center participated in the first workshop by providing background material and a presenter. Although the same person participated in a few subsequent workshops, the full responsibility for FHWA material was shifted to the division office. The resource center office continued to provide material on request and to answer some of questions that arose. These 1-day workshops were presented in nine locations in Texas over three fiscal years. There was an additional ½-day workshop that was sponsored by the North Central Texas Council of Governments (NCTCOG) following a 1-day workshop for the same agency.

Table 1 shows the workshops that were presented after the time that this project was conceived. It was recognized at the outset that this project could add substantially to the available material, which was fairly limited at the outset. In addition, it was also clear that the local material presented in each workshop would add to the total available information, especially CSS applications and successes.

Table 1. Outreach/Dissemination Activities.

Date	Location	Sponsors: FHWA	Local MPO	TTI	TxDOT	Other[1]
1-Day Workshops						
2006-10-13	Nashville, Tn (1/2 day)					Tennessee ASCE
2006-11-16	Boulder, Co					CNU
2007-3-20	Corpus Christi, Tx	x	x	x	x	
2007-6-13	Arlington, Tx	x	x	x		
2007-6-28	Arlington, Tx (1/2 day)	x	x	x		Assn of Texas MPOs
2007-8-20	El Paso, Tx	x	x	x	x	
2007-11-8	Ottawa, On					Ontario Prof Planners Inst
2007-12-5	Lubbock, Tx	x		x	x	
2008-2-1	Denver, Co (1/2 day)					City of Denver, Denver CNU
2008-5-15	Austin, Tx	x		x	x	
2008-6-25	Hidalgo County, Tx	x	x	x		
2008-6-27	San Antonio, Tx	x		x	x	
2009-4-2	Houston, Tx	x	x	x	x	
2009-5-4	Bryan, Tx	x	x	x		
2009-6-11	Texarkana, Tx	x	x	x		
2010-7-29	San Antonio, Tx (1/2 day)					City of San Antonio, local WTS, ITE
2010-12-9	Lansing, Mi					Michigan CNU
Seminars/Webinars						
2006-8-8	Seminar – Orlando, Fl (1 day)	x				ITE
2006-11-2	Webinar – international	x				ITE
2010-3-30	Webinar-national					Project for Public Spaces
2010-7-28	Webinar – internal (national)					CH_2MHill, Inc.
Discussion Circles						
2006-8-8	Milwaukee	x				ITE
2007-8-3	Pittsburgh					ITE
Presentations						
2005-1-11	Washington, DC					TRB
2006-1-9	Washington, DC					TRB
2006-3-21	San Antonio, Tx	x				ITE
2006-4-26	San Antonio, Tx					APA
2007-1-23	Washington, DC (2)					TRB
2008-8-19	Anaheim, Ca					ITE
2009-8-8	San Antonio, Tx					ITE

[1] APA = America Planning Association; ASCE = American Society of Civil Engineers; CNU = Congress for the New Urbanism; ITE = Institute of Transportation Engineers; TRB = Transportation Research Board; WTS = Women's Transportation Seminar

The first workshop in Corpus Christi, Texas, was different than any of the subsequent workshops. The Corpus Christi MPO was about to embark on early project development for projects in two major corridors. The projects were expected to be challenging and possibly contentious if not handled sensitively. CSS was seen as a way to approach project development. The first part of the agenda was devoted to describing CSS, how it relates to the NEPA process, and also some project successes using the CSS approach. The second part emphasized the applications for one of the two corridors, known issues, and how the MPO and TxDOT could start off the projects. Some TxDOT tools were also discussed as part of this workshop.

Table 2 shows the agenda that was used as a basis for the workshop. However, the discussion of the upcoming corridors was started during lunch and most of the subsequent parts of the agenda addressed how parts of the CSS approach could be used for development of the SH 361 project.

Table 2. Corpus Christi Workshop Agenda.

CSS Briefing for Corpus Christi MPO & TXDOT
March 20, 2007
Agenda

10:30–11:00: Intro to CSS

11:00–11:30: What other States and MPOs are doing in CSS

11:30–Noon: Round robin on lessons learned from successful TxDOT projects:

- TxDOT safety rest area program
- US 75 Central Expressway in Dallas
- Dallas High Five
- Houston's Green Ribbon Program
- North Central Expressway reconstruction
- MOPAC Expy
- Capital of Texas Highway

Noon–1:00: Lunch

1:00–1:45: Environmental Justice and Community Impact Assessment considerations in CSS

1:45–2:15: CSS in Planning

2:15–3:00: Brian Bochner - summary of the Institute of Transportation Engineers' (ITE) *Context-Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities.*

3:00–3:15 Break

3:15–4:00 Brian Bochner (and Jim Schutt) conclude – includes discussion on TxDOT Aesthetics Master Plan for Corpus Christi District

4:00–4:30 – Project Briefing on SH 361 and group discussion of ways to successfully implement CSS.

After completion of the Corpus Christi workshop the sponsors (FHWA and TTI) decided to revamp the agenda. Much of the detailed history and background of CSS was eliminated. So was material on environmental justice unless requested by local sponsors. More emphasis and time was devoted to local projects where there were projects to discuss.

Except for Hidalgo County, the subsequent workshops did not focus on upcoming projects. Local sponsor partners chose to feature projects that were either complete or well into the project development process. Some were recently completed and local sponsors wanted to show them off. Others were somewhere in project development. However, virtually all projects discussed were using or had used CSS in some adapted form that fit the particular project.

The second workshop was held in Arlington, Texas. It featured quite a different agenda (see Table 3), including early comments by the chairman of the Texas House of Representatives Transportation Committee enthusiastically supporting use of CSS. This agenda was too ambitious and some of the afternoon items were skipped in favor of discussion. The 3–5 p.m. follow-up discussion was to answer questions that NCTCOG staff and others had encountered as they used or discussed CSS. Over 80 people attended this workshop, too many to permit active discussion, which is what occurred.

Table 3. Arlington Agenda – First Workshop.

AGENDA
Context-Sensitive Solutions Workshop
North Central Texas Council of Governments
Arlington, Texas
June 13, 2007, 8:00 a.m.–3:00 p.m.

8:05–8:10: Mike Sims – Welcome and Introductions
8:10–8:20: **(1)** Mike Sims – Regional Transportation Issues and Context-Sensitive Solutions
8:20–8:35: **(2)** Rep. Mike Krusee – The bigger picture - state perspective on local transportation reforms
8:35–8:50: **(3)** Scott Polikov – Trends in CSS effectiveness for economic development
8:50–9:00: Questions for Rep. Krusee, Scott Polikov, and Mike Sims
9:00–9:25: **(4)** K. Lynn Berry – What is CSS?

- Definition (and what CSS is *not*)
- How do we do CSS (simplistic version)
- How does CSS relate to existing practices
- What does CSS do for agencies

9:25–9:45: CSS Examples

- **(5)** Brian Bochner – I-30 reconstruction – downtown Ft. Worth
- **(6)** Kimberly Phillips – 3 bridges project in Arlington

9:45–10:00: Discussion
10:00–10:10: Break
10:10–10:40: **(7)** Brian Bochner – How does CSS change by project and situation
10:40–11:10: **(8)** K. Lynn Berry – What is the CSS process

- Historical background
- Relationship with NEPA
- Other key CSS background and policy
- Use of multidisciplinary teams
- Steps of the typical CSS process (and benefits of each) (compress to 6–8 steps?)

Table 3. Arlington Agenda – First Workshop (Continued).

11:10–11:30: Discussion:
• Comparison of CSS process to participants' existing processes
• Past experiences with projects
  o Successful
  o Controversial
  o With significant public involvement
11:30–1:00: Lunch
1:00–1:15: **(9)** K. Lynn Berry – CSS pros, cons, benefits
1:15–1:45: **(10)** Kimberly Phillips – Example – anatomy of a CSS process – The district landscape and aesthetic master plans
• Presentation – break down the process into parts
  o defining the process
  o assembling the committee
  o educating the public (committee)
  o participation process
  o tool to implement aesthetics
• The district landscape and aesthetic master plans
• Discussion
1:45–2:00: **(11)** Brian Bochner – CSS and the developer's approach to roads serving their proposed developments
• Presentation
• Discussion
2:00–2:40: **(12)** Brian Bochner – CSS for designing major urban thoroughfares
• Presentation
• Discussion
2:40–2:55: Discussion
• What additional information is needed to enable agencies to increase use of CSS
2:55–3:00: K. Lynn Berry/Brian Bochner – Summary
• Why CSS should be pursued
• CSS resources
 	
3:00–5:00: Informal discussion of CSS in NCTCOG area

The following FHWA-TTI workshop was held in El Paso, Texas. For this workshop the local sponsors requested presentations about transit corridor projects in Texas that had used a CSS process. The MPO, TxDOT, and local transit agency were approaching such a project and were interested in how CSS might help them successfully plan their project. Discussions were incorporated into each segment so it would not be cut short at the end. With about 25 participants, this workshop was about the right size for active discussion and questions.

Table 4. El Paso Workshop Agenda.

AGENDA
Context-Sensitive Solutions Workshop
El Paso MPO
El Paso, Texas
August 28, 2007, 9:00 a.m.–4:30 p.m.

9:00–9:15: (1) Welcome and Introductions (Roy Gilyard, MPO)

9:45–10:15: (2) What is CSS? (K. Lynn Berry, FHWA)

10:15–10:30: Break

10:30–11:45: CSS Examples

- (3) Past local projects (Kimberly Phillips, TTI) (15–20 min.)
- (4) Current local projects (Jorge Gomez, TxDOT) (15–20 min.)
- (5) Successful projects from elsewhere (Brian Bochner, TTI) (15–20 min.)

11:45–1:00: Lunch

1:00–2:30: (6) CSS for designing major urban thoroughfares (Brian Bochner)

2:30–2:45: Break

2:45–3:15: (7) TxDOT and El Paso aesthetic and landscape master plans and corridor plans (Kimberly Phillips)

3:15–4:15: CSS and street transit projects

- (8) Houston MetroRail and Main Street corridor (Jennifer Ostlind, City of Houston) (30 min.)
- (9) Ft. Worth Houston & Throckmorton bus streets (Brian Bochner) (15 min.)
- (9) San Antonio transit streets (Brian Bochner) (15 min.)

4:15–4:30: (10) Discussion – What additional information is needed to enable agencies to increase use of CSS

Speakers:

- Roy Gilyard, El Paso MPO
- K. Lynn Berry, Federal Highway Administration, Atlanta Resource Center
- Kimberly Phillips, Texas Transportation Institute
- Jorge Gomez, Texas Department of Transportation, El Paso District
- Brian Bochner, Texas Transportation Institute
- Jennifer Ostlind, City of Houston, Planning Department

Most of the rest of the FHWA-TTI sponsored projects used a similar agenda. While the local projects varied greatly, the agenda organization and time allocations were similar unless the local sponsor requested something different. Table 5 shows the San Antonio agenda, which is typical of most. In most workshops the discussions extended longer than expected. Usually one of the final presentations was dropped, usually the one on how CSS process changes from project to project. In a few instances the discussion continued well beyond the announced ending time.

Table 5. Austin Workshop Agenda.

Agenda

WORKSHOP ON CONTEXT-SENSITIVE SOLUTIONS (CSS)

TxDOT, 200 E. Riverside Drive, Austin, TX
May 15, 2008
(9:00 a.m.–3:30 p.m.)

- Self-Introductions (5 min.)
- Introduction to CSS (Kirk Fauver, FHWA) (30 min.)
- CSS pros, cons, benefits (Kirk Fauver, FHWA) (20 min.)

Break

- Past CSS successes and experiences
  1. Texas and beyond (Brian Bochner, TTI) (30 min.)
  2. Texas landscape master plans (Beverly Storey, TTI) (20 min.)
  3. Local projects (e.g., Central Texas projects) (Brian Bochner; Mark Herber, TxDOT) (10–20 min.)
- New CSS guidelines: FHWA/EPA/ITE/CNU **"***Context-Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities"* (Brian Bochner, TTI**)** (30 min.)

Lunch (On Your Own)

- CSS and Major Central Texas Developments
  1. Mueller Airport Redevelopment Plan (Jana McCann of ROMA, Master Design Consultant for Mueller Redevelopment) (20 min.)
  2. Austin area Transit-Oriented Development (Meg Merritt, TOD Planner, Capital Metro; Sonya Lopez- Principal Planner, Neighborhood Planning & Zoning Department, City of Austin) (20 min.)
  3. Burnet North and Central Park Transportation Land Use Development Plans (Gary Bellomy, Land Design Studio, 20 min.)
  4. Envision Central Texas – Transportation Plans for Future Growth (Sally Campbell, Executive Director, 20 min.)
- Other Local Issues/Discussion
  1. How does CSS change by project and situation? (Brian Bochner) (20 min.)
  2. US 183A and US 290E toll roads (Mario Espinoza, CTRMA) (20 min.)
  3. Close-out discussion about how to potentially use CSS locally for proposed transportation improvement projects (All, led by Brian and Kirk) (30 min.)

Table 6 shows the agenda used for the Houston, Texas workshop. This agenda was one of the few that focused major attention on upcoming projects. The intent was to discuss the approach and receive any suggestion the participants might care to offer. Future projects can benefit from better processes, so discussion of future projects had been a priority for FHWA and TTI.

Table 6. Houston Workshop Agenda.

Agenda

WORKSHOP ON CONTEXT-SENSITIVE SOLUTIONS (CSS)

Houston-Galveston Area Council
3555 Timmons, Room A
Thursday, April 2, 2009
9:00 a.m.–4 p.m.

- (10 min.) Introductions
- (20) Introduction to CSS (Kirk Fauver, FHWA)
- (10) CSS pros, cons, and benefits (Kirk Fauver, FHWA)
- (20) CSS in the project development process (Beverly Storey, TTI)
- (90–120±) Past successes with CSS
    - Houston area, Texas, and beyond (Beverly Storey, TTI)
    - Katy Freeway (Tanya McWashington, Parsons Brinkerhoff)
    - The Woodlands – roads, waterway, and meeting the vision in a context-sensitive manner (Robert Heineman, The Woodlands Operating Company)
- (20–30) TxDOT landscape master plans (Beverly Storey, TTI)

Sponsored Lunch with presentation by lunch sponsor – Implementing CSS for Project Success (Becky Blatnica, Parsons Brinkerhoff)

- (30–45) CSS in designing major urban thoroughfares (Beverly Storey, TTI)
- (120±) Upcoming projects and CSS opportunities; presentation and discussion about the CSS process in each (invite 3–4)
    - Grand Parkway segments in developed and natural areas (David Gornet, Grand Parkway Association)
        - Developed areas
        - Brazoria County natural areas
    - Collaboration in development and street improvements in downtown Houston (Bob Eury, Downtown Management District)
    - MetroRail system extensions (Kimberly Slaughter, Metro)
        - Extensions
        - TODs
        - Changes to make planning process more collaborative
    - US 290 corridor improvement plan (Larry Blackburn, TxDOT)
    - Developing multimodal transportation along highways – a stakeholder view (Clark Martinson, Energy Corridor District)
- (15–30) Closing discussion – deriving more benefits to our communities using CSS (open discussion)

Collected Presentations

Appendix Table A-1 contains a list of presentations made at the nine FHWA/TTI workshops that were approved by their presenter for posting on a TTI SharePoint® site. The list omits duplicates of presentations made at multiple workshops. The listed presentations are available from UTCM through www.slideshare.net (under design).

Making Other Presentations

Users who wish to assemble a presentation or workshop of just about any length can select presentations from among those listed in Appendix Table A-1. This can be done including or excluding the introductory presentations on CSS. Users are encouraged to customize the presentations to meet their needs and time constraints. Most slides should be self explanatory for those familiar with CSS. However, not all project slides will be as easily interpreted. Users may contact the principal authors for more information on specific presentations.

Other Project Team Outreach Activities

The project team received requests for other workshops and presentations on CSS. These are listed in Table 1. A few specifically related to a CSS design guide developed partly by members of the project team. The first edition had been published as a proposed recommended practice of the Institute of Transportation Engineers (ITE) prepared in partnership with the Congress for the New Urbanism (CNU), FHWA, and the U.S. Environmental Protection Agency (EPA). It was titled *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Livable Communities.*[7] ITE had solicited user comments on that edition with the intent of publishing a possibly revised version as a final recommended practice based on user input. The project team offered to make appearances at conferences or other venues to discuss the document and any user suggestions. Two examples are the user discussion circles shown in Table 1. These discussions involved 25–30 people and mostly involved the CSS process and design flexibility. However, relative to this project, the input was used to identify and address user interests, concerns, and understandings and misunderstandings. Later, as the revised version of the report was evolving, there was interest in hearing about reactions and changes and how they might affect the CSS approach. A few presentations were made on that subject, but again, it was a good opportunity to get a better feel for CSS-related successes and issues.

The project team also received requests for webinar instruction on CSS, usually but not always related to the ITE/CNU design guide, which was republished in 2010 as *Designing Walkable Thoroughfares: A Context Sensitive Approach.*[8] The webinars were usually 1½ hours involving two presenters and extended questions and answers.

Early in 2010, North Carolina State University's Center for Transportation and the Environment (CTE), with sponsorship from FHWA, invited TTI and UTCM to co-sponsor one of five national dialog workshops on CSS. The objective was to exchange experiences and issues and to provide feedback on CSS to FHWA. TTI served on the steering committee for the dialog series and UTCM and TTI partnered with TxDOT to host the first workshop in Austin, Texas. Speakers

[7] *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Livable Communities,* Institute of Transportation Engineers and Congress for the New Urbanism, Washington, D.C., March 2006.
[8] *Designing Walkable Thoroughfares: A Context Sensitive Approach*, Institute of Transportation Engineers and Congress for the New Urbanism, Washington, D.C., March 2010.

from Texas, the region, and around the country shared CSS-related experiences and discussed new efforts to implement CSS. TTI also moderated a panel discussion on next steps for integrating CSS into common practice. More outreach and additional training for DOT staffs were one of the steps identified. The Austin dialog was subsequently used as a model for the following four dialog workshops in other parts of the country.

UNIVERSITY COURSE

The university graduate level course was developed as a three credit hour 10 week summer course that would meet once per week for 4 hours. Summer was judged by the Civil Engineering/Transportation Engineering and Urban Planning Departments to be the time when the course could best fit into the existing class schedule at that time. The basic outline was created using two approaches:

- The course outline for a North Carolina State University (NCSU) course prepared for FHWA.
- A list of topics developed by the project team based on its experience using CSS and questions and requests for explanation the team members received in early workshops and other CSS-related activities.

Material was drawn from many sources. The course was developed so it could be presented using PowerPoint® supplemented by exercises that can be rolled out on plan sheets or large size paper so class teams can work together on them. While course content about what CSS is and how to use it, the content also includes numerous examples in photo and sketch form so students see what the CSS process and resulting designs can look.

Table 7 contains the course outline. It also lists the reading sources (current to 2009) and assignments. The course included a class project that would count for almost half of the course grade. The project was to be formulated around a site convenient to campus that students could easily visit and for which sufficient information could be easily gathered from local agencies. The experience of doing the project was to resemble what students might experience doing their first CSS project. The project selected for the Texas A&M class was a grade separation for which there was a previous schematic design. The assignment was to develop a CSS approach, to conduct a mock charrette to identify objects and issues, to develop a project concept, and to develop a simplified schematic “design” for whatever they thought the project should be. The class was to do the charrette as a whole and the rest of the project in small groups of students (number depending on class size).

Table 7. University Course Syllabus (Partial).

TEXAS A&M UNIVERSITY	SYLLABUS
Course title and number	CVEN 689 - Context Sensitive Solutions in Transportation Planning, Environmental Analysis and Design
Term (e.g., Fall 200X)	Summer 2009
Meeting times and location	TBD (one 4 hour class per week)

Course Description and Prerequisites

Course Description: This course focuses on the concept of context sensitive solutions (CSS) as applied to planning, analyzing environmental impacts, and design of transportation facilities. It is particularly oriented toward CSS applications to facilitate community acceptance of mobility improvement projects. Students will learn how to build consensus, make transportation facilities compatible and supportive of transportation and other local objectives, the environment, and the surrounding area. The course will focus on the concepts of CSS in a lecture and discussion format, book and other readings, and review of relevant literature on the subject. This classic approach will be complimented with some exercises to illustrate specific principles involved in the subject matter.

Course Format: The course will be organized in a typical lecture/discussion format. Topics to be covered in the course are arranged by week. Students are expected to have completed the assigned readings at the time of class. Each class period will include substantial discussion, with a focus on examples and implications of written materials. Discussions will focus policy and design implications associated with the concept of context sensitive solutions.

Prerequisites: Graduate standing in Urban Planning, Transportation Engineering, or a related program.

Learning Outcomes or Course Objectives

At the conclusion of this course, each student should be able to perform the following:

- Provide an overview of CSS concepts and applications for transportation and related facilities.
- Apply these concepts to the planning and design process of transportation and related facilities.

Textbook and/or Resource Material

No textbook

Assigned readings in:

1. AASHTO, *Guide for Achieving Flexibility in Highway Design*, July 2004.
2. AASHTO, *A Policy on Geometric Design of Highways and Streets*, 2004.
3. FHWA, *Flexibility in Highway Design*, 1997 http://www.fhwa.dot.gov/environment/flex/.
4. ITE, *Context Sensitive Solutions in Designing Major Urban Thoroughfares in Walkable Communities*, March 2006 http://www.ite.org/bookstore/RP036.pdf.
5. NCHRP 480, *A Guide to Best Practices for Achieving Context Sensitive Solutions*, 2002. http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_480.pdf.
6. MassHighways, *Project Development and Design Guide*, 2006. http://www.mhd.state.ma.us/default.asp?pgid=content/designGuide&sid=about.
7. Delaware Valley Regional Planning Commission, *Smart Transportation Guidebook*, 2008.
8. TxDOT Landscape and Aesthetic Design Manual, 2007. http://onlinemanuals.txdot.gov/txdotmanuals/lad/index.htm.
9. Others to be determined.

Table 7. University Course Syllabus (Partial) (Continued).

Course Topics, Calendar of Activities, Major Assignment Dates		
10 week version; 1 class per week		
Week (Class) Number	**Topics**	**Required Reading**
1a – Introduction 1b – Exercise	• What is CSS? History of CSS, current FHWA initiatives, examples of roads and context integration • Course introduction/overview/ expectations • Class project assignment - students' favorite streets (and why) for next class • Students' favorite streets and why • CSS defined – integration of stakeholder objectives • Benefits of CSS	NCHRP Report 480, Forward, Section A *Context Sensitive Solutions in Designing Major Urban Thoroughfares in Walkable Communities,* Chapters 1, 2.
2a – Project development defined 2b – CSS and environmental analysis	• Whose objectives are considered? • CSS role • Stakeholder roles and involvement • NEPA and how it relates to CSS • Environmental impact areas • CSS as proactive way to address environmental considerations	*Context Sensitive Solutions in Designing Major Urban Thoroughfares in Walkable Communities,* Chapter 2 *Guide for Achieving Flexibility in Highway Design,* Sections 1.1 to 1.3 NCHRP Report 480, Section E
3a – Creating a context sensitive solution – what does it take, who does it, and why? 3b – The context – physical and social	• Characteristics of a successful context sensitive solution • CSS project needs • Multidisciplinary project teaming • Components of context – physical characteristics • Components of Context – social and economic characteristics	NCHRP Report 480, Sections C, D *Smart Transportation Guidebook* , Chapter 4 *Context Sensitive Solutions in Designing Major Urban Thoroughfares in Walkable Communities*, Chapter 4
4a – Constructive involvement of stakeholders	• Who are the stakeholders and types? • Importance of involvement • Methods for involvement (workshop, charrette, focus group, meetings, 1-on-1, newsletters, etc.) • Problems, issues, needs, considerations, objectives, opportunities • What constitutes a need?	*Guide for Achieving Flexibility in Highway Design,* Section 2

Table 7. University Course Syllabus (Partial) (Continued).

4b – Mock CSS project startup workshop or charrette 4c – Class project assignment	• Purpose/need • Team • Stakeholder involvement process (structure per needs, collaborative, tools) • Public relations (guest speaker) • Describe project and make assignments	
5 a – Making a project multimodal 5b – Placemaking with CSS	• Defining multimodal and applicability • What makes a "complete street?" • What is appropriate? • What is "sense of place" and placemaking? • Components and applicability • Techniques	*Context Sensitive Solutions in Designing Major Urban Thoroughfares in Walkable Communities*, p. 21 text box, Chapter 3
6 – Developing a compatible, supportive design	• Process • Identifying needs, objectives, opportunities, constraints, alternatives • How to make a design compatible, supportive • Flexibility, creativity • Evaluation, performance measures, criteria • Selection • Exercise	NCHRP Report 480, Section F, management structure, alternatives development, alternatives screening subsections
7a – CSS in construction, operations, maintenance 7b – Discussions about class term project	• How CSS relates to construction, operations, maintenance • Optimizing CSS considerations • Student questions about term project in response to material presented to date • Instructor clarifications	None
8 – CSS project checklist and the approval process and using CSS in practice	• Review of CSS process and design components • Deciding when to use what pieces • CSS and the project approval process • Does CSS facilitate the approval process?	Handout from previous class
9 – CSS examples and class critiques	• Class critique CSS examples • Work in class on projects	None
10 – Presentation of class projects with discussion	Student presentations and class discussion	None

The course was offered twice in consecutive years. However, graduate program class schedules were very tight and neither summer drew enough students (five) to conduct the course. The materials are available from UTCM through www.slideshare.net (under design).

3. FINDINGS AND TOOLS DEVELOPMENT

This project was not intended to produce a primer on CSS in report form. The primer that was produced is in the form of the university graduate course. Much of the material for the course was drawn from the www.contextsensitivesolutions.org website, particularly from sources available via links to other websites.

RESPONSES TO CONCERNS ABOUT USING CSS

Chapter 1 included a list of reasons given to the project team for not using CSS. Some may look valid on first look, but should not be considered barriers for using CSS. The following are perceptions expressed and real facts associated with each based on conversations with other practitioners:

1. *CSS is not legislatively required.* True, but neither are most practices we now use in project development. Most are part of larger requirements. In that way, the CSS process describes how parts of the project development process should be carried out. Remember that FHWA policy does encourage use of CSS.
2. *CSS is not required by federal or state regulation*. Same answer.
3. *Agency or design directors consider CSS another federal "unfunded mandat*e." CSS is a way to conduct portions of the project development process. It is not an addition to that process. In addition, the use of CSS does not have to increase project development cost, especially for projects of significant size. CSS can also reduce or eliminate the need for project revisions after draft NEPA documents because it identifies many of those needs up front.
4. *CSS appears to increase project development expense by adding more front end activity, mainly to the public involvement process that many already feel uncomfortable with.* CSS converts the public involvement process from passive to active aimed at increasing early stakeholder buy-in. It reduces the chance of later opposition and resulting project changes. Hence, it transfers some of the activity and resource needs from late in the project to early in the project. It also moves the later project surprises to the early stages.
5. *The "old way" works; why change it*? Yes, it usually works for smaller projects and for those resulting in little or no change or in rural areas. But how many significant projects are completed so they are initially widely accepted, do not encounter delays to respond to stakeholder objections, and are successful at meeting local objectives for the area in addition to the transportation project? Are nearly all of the agency's projects popular with the community?
6. *Inertia; it takes a lot of effort and energy to affect change, especially in large (state) agencies.* True. It requires direction from the top and follow-up at the project development management levels. Training is available from FHWA resources and many local sources, too. Technical guides are also available.
7. *Agencies have an incomplete understanding of what CSS entails.* True, but this can be overcome with training and discussions available through FHWA division personnel or resource centers. Other sources are available through the CSS website (www.contextsensitivesolutions.org), which is sponsored by FHWA.

8. *CSS appears to reduce the control that the sponsoring agencies has over the project outcome.* The sponsoring agency still has final decision authority. Input from others may be more.
9. *There is fear that flexible design will either increase agency liability or greatly increase the number of design exceptions that must be processed.* The design guides produced by or for FHWA, AASHTO, and the Transit Cooperative Research Program (TCRP) are all sponsored by the federal DOT or a standards making organization. They are consistent with the flexibility included in the AASHTO design policy. They can be used as design justification if a design exception is needed. Keep in mind that state and local design manuals and standards often are subsets (no or reduced design flexibility) of what is included in AASHTO design policy. Furthermore, regardless of standards, policies, or guidelines used, a designer is professionally responsible for evaluating every design situation based on the applicable conditions, then making the right decisions. It is no different whether one relies on an agency's standards or criteria within a range of another organization's guidelines.

CASE STUDY EXAMPLES

One major effort that was anticipated was the assembly of case study examples of well-executed and successful CSS projects. The project team determined at the outset that the projects should be complete and implemented so that there would be proof that the project was accepted and implemented and well accepted after implementation. That presented a dilemma: CSS only came about as a term and a FHWA policy about a decade ago. Project development—especially for major projects—often takes over 10 years. Hence, a major CSS project started the day after the Thinking Beyond the Pavement conference—even one that has been expedited—may just be finishing construction, and many may be far from entering construction due to fund shortages, right of way acquisition, and other reasons.

The project team decided to seek projects that were complete and which were known to have used CSS approaches. The team knew of several and located others. The objective was to select projects that would make good examples in Texas. That made Texas project preferential, but not required.

Three primary types of information sources were used:

- Internet search engines and websites, including the CSS website.
- Interviews of people who had direct involvement in the projects.
- Documentation available from those interviewed.

Most projects on the CSS website at the time were not local to Texas or of the type that might interest most people involved in project development. Some projects had little information available and sources were not listed.[9] TxDOT was asked for a list of its CSS projects. There was such a list gathered from TxDOT districts, but some were projects with extra aesthetic enhancements rather than true CSS projects that had gone through a CSS type of process. Nevertheless, TxDOT does have some outstanding examples of true CSS projects. For those projects the project team sought out TxDOT staff (present or former) that had been involved in

[9] The CSS website now has a large number of good case studies obtained through the 2009–2010 CSS Dialog project sponsored by FHWA.

those projects from close to the beginning. The best constructed CSS examples had actually gone through project development in the 1980s and early 1990s and had been completed in the five years preceding this project. One was just being completed. With the early retirements so frequent at TxDOT, it was challenging to find someone who had been senior enough to understand the entire process and remembered some of the process or design development details. The same was true for many other projects and agencies. However, the project team was successful in pulling together some good examples. They are described in the following sections of this chapter.

Project 1 – I-30/I-35W Interchange and Lancaster Boulevard, Ft. Worth, Texas

Overview

The I-30/I-35W interchange is located on the southern fringe of Ft. Worth's Central Business District (CBD). I-30 was originally constructed in the 1950s and was the first freeway to be built in Ft. Worth. West of I-35, I-30 was an elevated structure constructed over the median of Lancaster Boulevard. I-30 served as a major access route to downtown Ft. Worth as well as serving east-west traffic through the region. The original alignment of I-30 was located between the historic Texas & Pacific (T&P) railroad station, the T&P Railroad headquarters, and the Ft. Worth post office to the south and the Ft. Worth Water Gardens park to the north.

The area primarily contains commercial uses, but also contains some industrial, institutional, governmental, residential, and parkland uses. The T&P Railroad (subsequently merged into the Missouri Pacific and then the Union Pacific Railroads) runs parallel to I-30 and south of the T&P buildings (see Figure 1). This railroad was part of the rail system that was the primary source of industrial development. The T&P railroad station was served by passenger trains until the 1960s. In addition to main east-west rail lines, there were also yards south of the T&P buildings.

Subsequent to the decline in passenger service, the station building still housed railroad staff for many years. The warehouse to the west was also used. In between those buildings was and is the main Ft. Worth post office.

By the 1980s, the I-30/I-35W interchange and segment to the west had become a severely congested bottleneck. It also had some structural deficiencies. Its 1950 design criteria were outmoded and a safety concern resulting from a high number of crashes. Due to these deficiencies, TxDOT initiated planning to improve the interchange and I-30 immediately west of the interchange. Funding for the project was shared by the FHWA and the State of Texas.

During this same period, revitalization of downtown Ft. Worth had begun. Numerous buildings in Sundance Square were rehabilitated and reoccupied by contemporary businesses. There was interest in rehabilitating the two main T&P buildings south of I-30.

TxDOT's initially proposed improvement included modification of ramps in the interchange and widening the elevated structure to permit more freeway lanes. The structure was to essentially cover the full width of Lancaster Boulevard. This would have brought the structure almost to the Water Garden on the north and much closer to the T&P buildings and post office on the south.

Issues and Concerns

Opposition to the original elevated proposal was strong and ultimately a group filed a lawsuit to challenge the environmental impact statement claiming that consideration of alternatives had been insufficient. The plaintiffs did not contest the need for improvements. The plaintiffs prevailed and TxDOT endeavored to start over with a new process. At the same time, citizens were concerned about impacts that the new interchange would have on the surrounding Market Building Complex, T&P Railroad Complex, the main post office, and the Ft. Worth Water Gardens.

TxDOT originally proposed widening the elevated structure over Lancaster Boulevard. However, stakeholders raised concerns over the impacts that design would have on the surrounding historical properties and the Water Gardens. Aesthetic concerns over the proposal were also prevalent, as elevated freeway structures were unpopular during this period. Lancaster was dominated by the underside of the elevated structure and was a rather unsightly area to traverse. TxDOT had proposed the widened elevated configuration because it was most cost-effective, required minimal right of way and was easiest for maintaining traffic during construction.

CSS Process and Timeline of Major Events

TxDOT started the planning, environmental, and design process over deciding to involve the stakeholders in a proactive and constructive role. Since the plaintiffs and most other stakeholders supported the ideas of improving I-30 and the interchange, it was felt that the challenge was to find a suitable alternative. Stakeholders were actively involved. Initially a facilitator was used to make sure all participants could discuss their issues and objectives and provide input in a manner that would lead to development of principles, concepts, and ultimately alternative improvements. Major events occurred as follows:

- <u>Initial improvement proposal:</u>
  - January 1978 – Project concept conference held for all entities interested in I-30/I-35W interchange and freeway expansions.
  - 1979 – Public meetings held to present expansion schematics.
  - Fall 1979–Winter 1980 – Survey of historical properties prepared.
  - May 1981 – Public information meeting on the freeway expansion presented to the Advisory Council on Historic Preservation.
  - June 1981 – Ft. Worth City Council considers the effects the proposal will have on historical and park amenities within the project area.
  - 1983 – National Trust for Historic Preservation, I-Care, and other local organizations file a successful lawsuit in federal court requesting that the Environmental Impact Statement contain more consideration of roadway design alternatives that avoid historic structures. The lawsuit also claimed that impacts were too great on historic properties to the south of I-30 and the Ft. Worth Water Gardens to the north.

- <u>Second project development effort:</u>
  - 1985–1987 – The “I-30 Working Group” was convened to discuss issues, develop principles, and consider more alternatives for the freeway expansions through facilitated charrettes and brainstorming sessions. The group contained representatives from TxDOT, I-Care, the City of Ft. Worth, Ft. Worth business leaders, and TxDOT

consultants. Meetings were also held with concerned citizens and organizations. Many alternatives were discussed.

- 1986–1987 – Twelve to 14 design alternatives were presented to the Working Group and at public meetings. Comments and suggestions were invited. Alternatives included elevated and depressed alignments along Lancaster Boulevard and elevated/at-grade alignments along the Vickery/T&P Railroad corridor to the south of Lancaster Boulevard. Public input was encouraged. Design alternatives were extensively evaluated by the I-30 Working Group based on community acceptance, cost, safety, traffic, environmental impacts, and social impacts.
- October 1987 – Four finalist alternatives were presented at a public meeting. Overwhelming support was shown for the "Vickery Alternative," which provided most of I-30 west of the interchange to be at grade south of the T&P buildings. It was felt that impacts on historic structures and the Water Gardens would be least with this alternative. The design re-aligned the west leg of I-30 800 ft south to the Vickery/T&P Railroad corridor, enabling the elevated structure over Lancaster Boulevard to be removed (Figure 1). Lancaster was to be rebuilt as a conventional boulevard leaving land for redevelopment along Lancaster. The realignment also provided the opportunity to fully replace the existing I-30/I-35 interchange with fully directional ramps having the desired current design criteria.

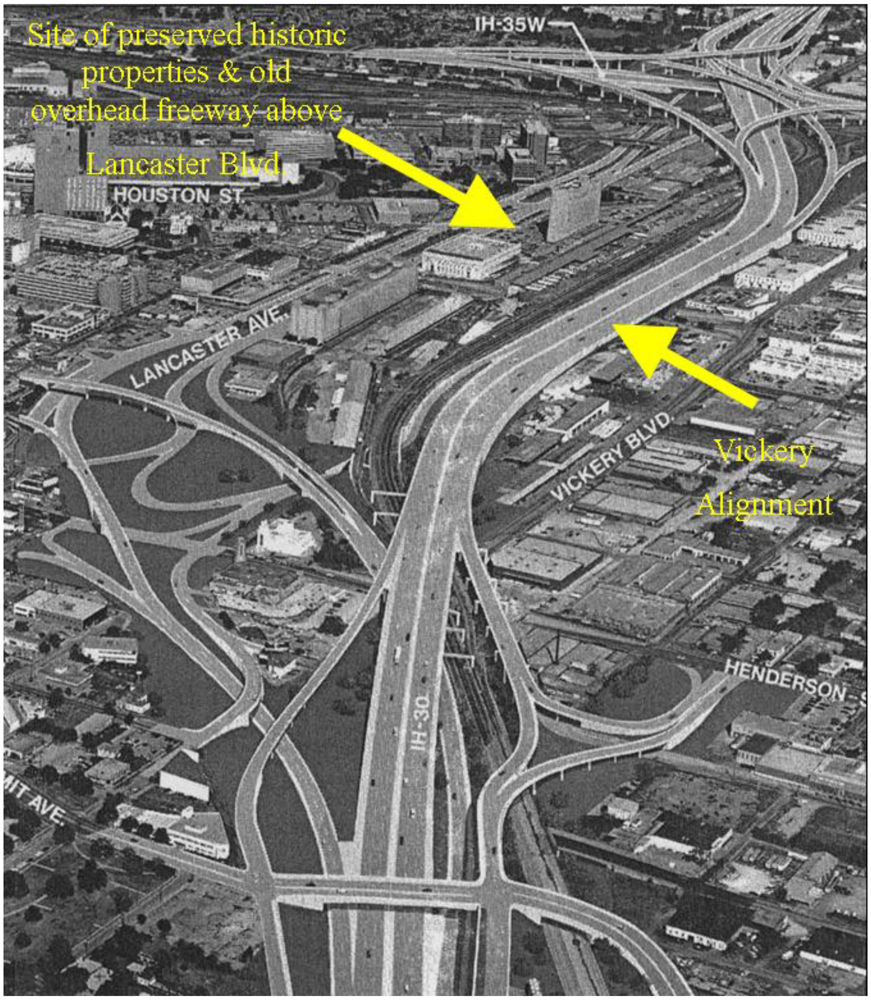

Figure 1. Vickery Alignment of the I-30/I-35 Interchange
Source: SDH&PT & FHWA 1991).

Notable CSS Outcomes/Key CSS Practices and Features

As a result of extensive collaborative effort within the I-30 Working Group and also involvement of other citizens, the Vickery Alternative design was ultimately selected, funded, designed, and constructed. Notable CSS outcomes and key CSS practices and features of the project include:

- True stakeholder involvement occurred in the project development process from identification of objectives, values, and issues through design development and selection of the preferred alternative to final design, all in a very open process.
- Facilitated charrettes and brainstorming workshops.
- The extensive design evaluation process performed by the multidisciplinary I-30 Working Group consisting of agency and citizen stakeholders in order to minimize adverse impacts to historic structures and the Ft. Worth Water Gardens and to capitalize on redevelopment opportunities on the south end of downtown.
- The re-alignment of the freeways and the I-30/I-35W interchange to avoid the T&P Railroad Complex, the main post office, and the Ft. Worth Water Gardens.
- The widespread endorsement of the project by federal, state, and local agencies; business leaders; historic preservationists; and other community individuals.

- The subsequent re-development of Lancaster Boulevard to connect the CBD to western and eastern portions of Ft. Worth. The old T&P station and headquarters building is now used as residential lofts (Figures 2 and 3).
- Development sites along the north side of Lancaster created by the relocation of I-30 and the decrease in Lancaster right of way width.

Figure 2. Before and After Photos of the U.S. Post Office Façade on Lancaster Boulevard.
Source, left: http://www.durangotexas.com/eyesontexas/fortworth/downtown.htm; Source, right: Texas Transportation Institute

Figure 3. New Lofts Building Next to Old T&P Railroad Station Building.
Source: Texas Transportation Institute

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Project 2 – North Central Expressway/High Five Interchange, Dallas, Texas

Overview

By the 1980s the Dallas area, specifically its northern suburbs, was burgeoning rapidly. As with most growing regions, traffic congestion was becoming increasingly apparent. The original North Central Expressway (US 75) facility was constructed in the 1950s, but it quickly reached its design capacity due to the rapid growth of the northern regions of Dallas. By the late 1970s, the North Central Expressway (NCE) was in need of considerable upgrades. TxDOT initiated initial planning to upgrade the NCE in the 1970s and proposed a double-deck expressway within the existing right of way. This was opposed by adjacent property owners and the community. For several years no viable options were found for a major improvement to the NCE.

In the early 1980s, a North Central Task Force was created. It consisted of a variety of stakeholders along the corridor, including TxDOT, the cities along the corridor, Dallas Area Rapid Transit (DART), property owners, business leaders, and other public and private interests. The task force initiated the North Central Project (NCP) to address concerns of the 10-mile corridor. The task force used the CSS approach to identify transportation and other objectives and values for the corridor and then a project concept. Whereas the alternatives previously considered included at grade and double deck options, the task force alternatives also looked at depressed and tunnel-types of options. A comprehensive set of evaluation criteria were used to reflect the objectives and concerns.

During the development of a plan for NCE, DART proposed rail transit routes along part of the expressway due to a high concentration of residential and business areas along the freeway. A portion of the proposed alignment was along the NCE. Part of the challenge was to find a way to accommodate the rail line within or adjacent to the NCE facility.

The interchange between US 75 and I-635 (LBJ Freeway) was initially to be completed as part of the NCE improvements. However, its cost and complexity caused it to be deferred until adequate funding became available and coordination could be satisfactorily arranged. This occurred after the completion of rest of the North Central Expressway. The High Five Interchange, named for the five level junction construction was completed in 2006. The High Five project complemented design and collaboration efforts made in the North Central Expressway efforts. Both the North Central Expressway and the LBJ Freeway remain vital economic links in the Dallas/Ft. Worth metropolitan complex, and remain primary commuter routes for the region.

Issues and Concerns

Before reconstruction of the North Central Expressway, traffic volumes had more than doubled the design volumes. Traffic congestion had become a major source of frustration for citizens of the area. During development of improvement options, several concerns over anticipated design and construction impacts were voiced by stakeholders, including:

- Noise impacts.
- Visual and aesthetic impacts.
- Maintenance of traffic flow during construction.
- ROW acquisitions.

For the High Five Interchange, stakeholder concerns were the same as the concerns associated with the North Central Expressway. Maintenance of traffic was an especially critical issue. At this point, drivers, residents, and businesses had already endured the construction hassles from the NCE construction, and were wary of facing another 5 years of additional delays. By this time, nearly a million vehicles were traversing the interchange daily. Project leaders had to address these additional concerns. Additionally, there were several existing design deficiencies at the US 75/I-635 interchange, including:

- A bottleneck from the newly widened 8-lane US 75 to the non-upgraded 4-lane section through the interchange.
- Confusing left hand exit lanes.
- Obsolete, low capacity loop ramps and a 3-level modified partial cloverleaf interchange that limited multi-directional flow.
- Dead end frontage roads.

Process and Notable Outcomes

In the 1970s, TxDOT developed several proposals for elevated and widened lanes to reduce traffic congestion. These were met with opposition by members of the public because of visual, air quality, environmental, and ROW acquisition concerns. Local and state consensus could not be developed, despite the agreement on the need for additional capacity. In 1984, at the initiative of the chamber of commerce transportation committee, the North Central Task Force (NCTF) was created and convened. The NCTF contained a multi-disciplinary team of planners, architects, engineers, public agency representatives, elected officials, businesses, and residents. The NCTF contained three sub-committees: technical, community, and policy. The Dallas Mayor and the DART Board of Directors appointed members of the Citizens Advisory Committee (CAC). The CAC led the community sub-committee and received feedback from communities, businesses, residents, and other users of the NC Expressway. A Technical Liaison Committee (TLC) coordinated efforts among agencies with implementation powers, including the City of Dallas and other communities of the corridor, TxDOT, DART, and the North Central Texas Council of Government (NCTCOG). Figure 4 shows the NCTF organization.

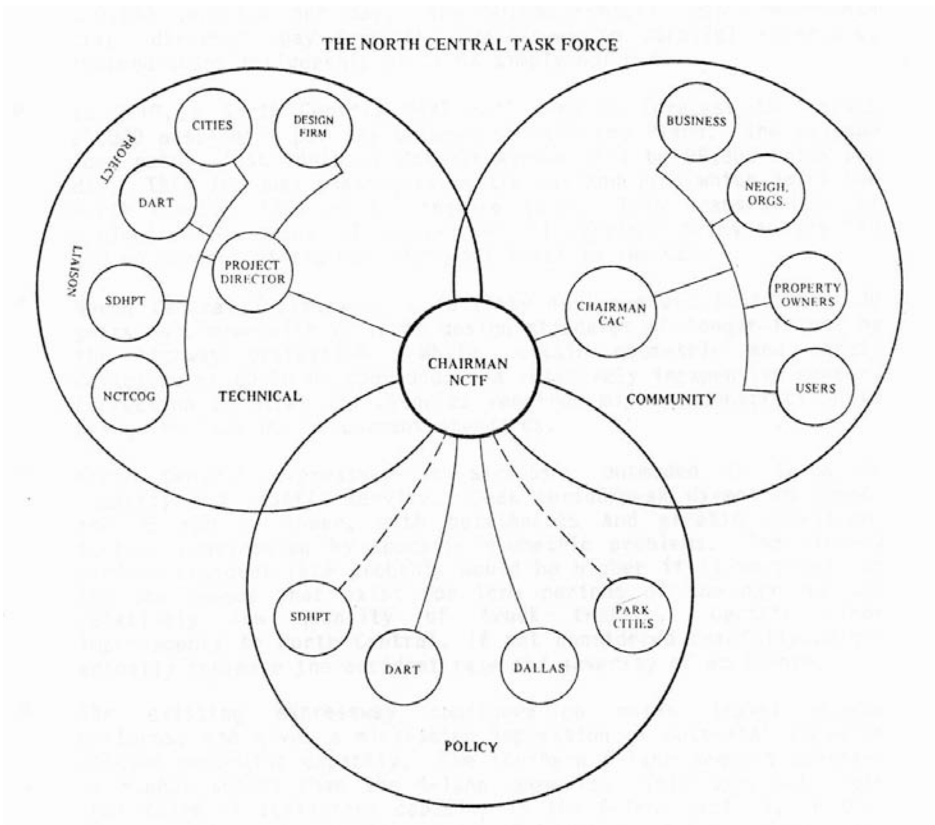

Figure 4. North Central Task Force (NCTF) Organization.
Source: NCTF Milestone Report 2.

Beginning in 1984, the NCTF met over a 12-month period to propose, discuss, review, and decide upon several design alternatives for the North Central Expressway. The NCTF collaborated in a CSS fashion, as the NCTF Chairman and TxDOT worked closely with local elected officials, business members, and adjacent communities to determine the best design alternative for all stakeholders.

The team completed the planning and design of the corridor in several phases. First, the task force analyzed existing traffic data, physical features, and land use patterns. Evaluation frameworks were developed for use with the CAC to help analyze the different roadway alternatives. The criteria included transportation service; economic, social, and environmental impacts; construction and operating costs; and implementation and funding matters.

Next, a wide variety of design options were considered for the NC Expressway. All options were methodically identified and evaluated based on the previously developed evaluation criteria. Project leaders received input from the CAC throughout the design process. Design alternatives included at-grade, depressed, below, and above grade alignments; double-deck designs; and different rail accommodations including bored tunnels, median alignments, and parallel rail lines were considered and evaluated.

The final design of the North Central Expressway was the result of the collaborative CSS efforts of the North Central Task Force. The decision was made to completely reconstruct the freeway to obtain current design and safety criteria and to provide the necessary vehicular capacity.

Configurations of the final design include an 8-lane highway with auxiliary lanes between ramps for merging, diverging, and weaving. In the middle and southern segments, a below-grade alignment is incorporated with bored tunnels under the expressway to accommodate the North Central (and later) Garland DART lines (Figure 5). This configuration resulted from limited ROW, and community and environmental impacts. In the northern segments, the DART line runs parallel to the corridor on an abandoned rail right of way. Noise walls are incorporated into many sections of the roadway to also limit community impacts. The DART line was constructed prior to the freeway construction, thereby giving commuters travel alternatives during construction periods. In 1985, the design concept was approved by the City of Dallas, other surrounding communities, and TxDOT.

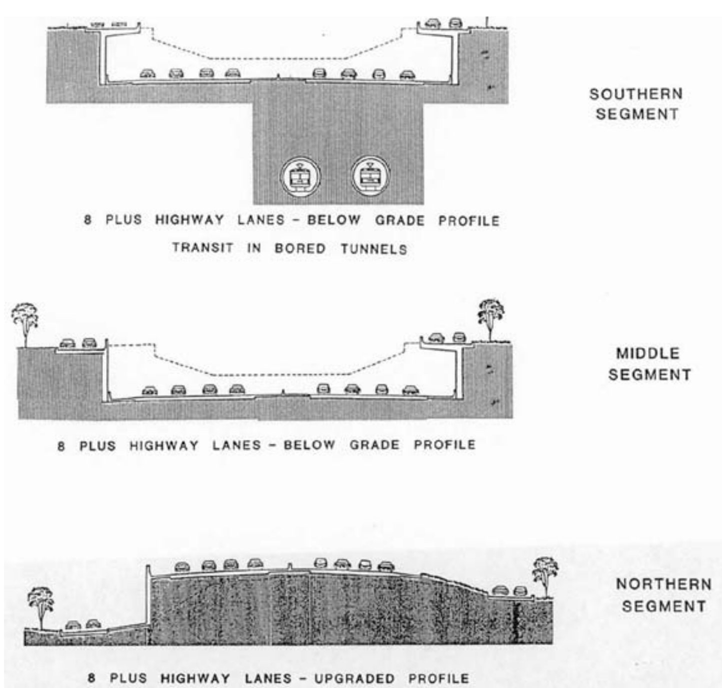

Figure 5. Typical Cross-Sections of the NC Expressway Segments.

Source: North Central Project files

As part of the design, an extensive amenities package was developed during the design phases in order to integrate the roadway into its urban context. This North Central Urban Design Program was led by a special task force, the North Central Amenities Task Force (NCATF), consisting of architects, landscape architects, and engineers. The task force developed amenity proposals for presentation to the public for input and approval. Notable amenities include (see Figures 6, 7, and 8):

- Color and texture treatments of retaining walls, cantilevers, bridges, medians, appurtenances, signage, and lighting of the expressway and contiguous streetscapes.
- The incorporation of planters in retaining and noise walls.
- The placement of sidewalks along frontage roads and cross bridges to accommodate non-motorized traffic.
- Extensive landscaping of the surrounding corridor.
- The use of bollards along sidewalks to distinguish between the pedestrian and vehicular realms.

Figure 6. Example of Aesthetic Amenities (Mockingbird Lane at NC Expressway).
Source: http://www.texasfreeway.com/Dallas/photos/us75/us75.shtml

Figure 7. NC Expressway, Looking South in Depressed Section.
Source: http://www.texasfreeway.com/Dallas/photos/us75/us75.shtml

Figure 8. Art Incorporation in the High Five Interchange.
http://www.nctcog.org/trans/sustdev/landuse/css/8High-Five%20Example.pdf

Many efforts were made to ensure that construction of the expressway proceeded in a timely manner, and that traffic flow was maintained during this period. Construction was carefully sequenced and contractors received financial incentives for rapid construction and penalties for late completions. Public relations campaigns promoted ridesharing and variable work schedules, while traffic signal system timing was modified to expedite traffic on parallel streets and parallel bus services were offered. The use of innovative construction technologies such as early strength concrete and pre-cast bridges and walls aided rapid construction.

In the subsequent design and construction of the High Five Interchange, many of the above techniques and features were incorporated to ensure favorable designs and rapid construction. Pre-cast bridge segments, nighttime construction, modified traffic controls, contractor incentives/disincentives, lane rentals, and the use of a cutting edge bridge segment erector helped the reduce the project time (Figure 9). Only one contractor was hired for the High Five interchange reconstruction, which helped streamline the process and save time.

Capital improvements by surrounding businesses were also coordinated with roadway construction. The public was informed of the project through various media, scheduled one-on-one meetings, and through a project website. Final designs contained additional lanes, contiguous frontage roads, the incorporation of conventional right-hand exits, and the incorporation of direct access connections in place of old cloverleaf designs. HOV lanes were also incorporated into the High Five Interchange, and many aesthetic considerations were incorporated into designs.

Figure 9. Segment Erector Technology.
Source: http://www.urbantransport-technology.com/projects/dallas_1/dallas_19.html

Extensive partnerships were essential to the success of both the North Central Expressway and the High Five projects. City, county, federal governments, MPO, businesses, and citizen volunteers all collaborated and found roadway solutions in cooperative and a timely manner that would have been difficult without such partnerships. Most people were satisfied with the manner traffic flow was maintained during construction periods, and most were happy with the overall outcomes of the North Central Expressway and the High Five Interchange. Figure 10 shows the completed High Five Interchange.

Figure 10. Completed I-635-US 75 (High Five) Interchange.
http://www.nctcog.org/trans/sustdev/landuse/css/8High-Five%20Example.pdf

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Project 3 – State Highway 130, Central Texas

Overview

The Dallas-Austin-San Antonio corridor is growing rapidly in population and development. I-35 serves as the main artery through this corridor and beyond. As the corridor has developed and as corridor trade has increased, I-35 has become congested. Just about the entire corridor between north of Austin and San Antonio is subjected to congestion during parts of the day, some segments with several hours of congestion each day.

The Texas State Highway (SH) 130 project was initiated due to the growing congestion in this corridor. SH 130 runs parallel to and east of I-35. One purpose of SH 130 was to serve as a bypass around Austin and San Antonio. The first sections to open extend from north of Austin to south of Austin. The next phase of construction is extending SH 130 south to I-10 at Seguin east of San Antonio. The SH 130 project is part of the Central Texas Turnpike System (CTTS), a series of toll road projects in central Texas. These include improvements to SH 45N and the Loop 1 Extension (both north of Austin).

The north section of SH 130 is a 89-mile, 4-lane controlled access highway running north/south from Williamson County north of Georgetown, Texas, to I-10 in Seguin, Texas (Figure 11). The south section extends farther south to I-10 east of San Antonio. The project was funded using revenue bonds to be repaid with toll revenues, plus federal, state, and local funding.

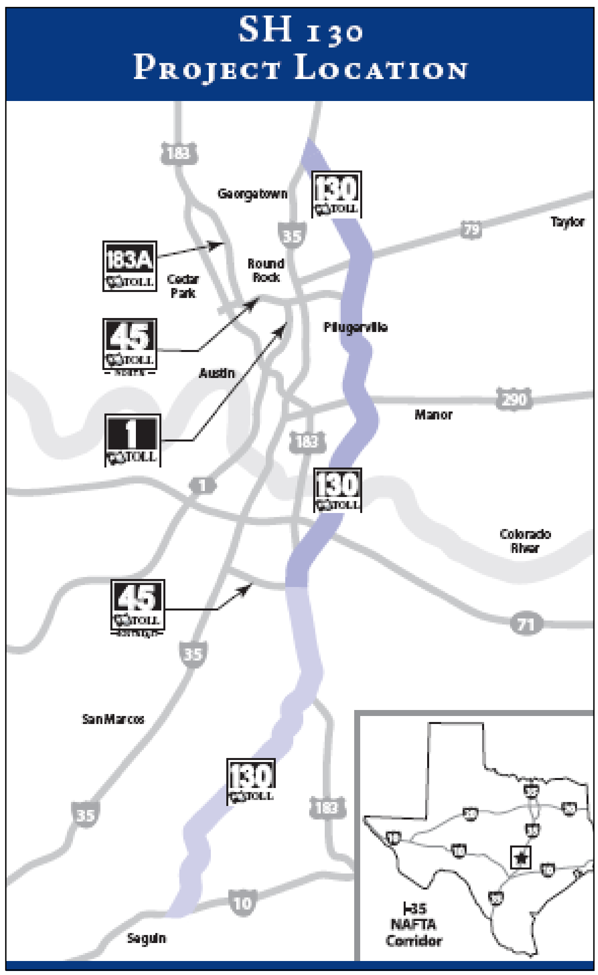

Figure 11. SH 130 and the CTTS Project Area.
Source: http://www.sh130.com/

CSS Process and Notable CSS Outcomes

Project leaders solicited design input from cities, counties, businesses, and residents of the corridor at the CSS-like Aesthetics Charrette in fall 2002. At the Aesthetics Charrette, stakeholders provided input, feedback, and ideas for aesthetic design amenities for bridges, sound walls, lighting, and landscaping. Project officials also requested stakeholder input on historic property mitigation techniques. In addition, input was sought from local agencies and stakeholders on future plans and needs.

Aesthetic treatments incorporated regional icons of the Texas Hill Country and the Blackland Prairie, including Texas wildflowers and native trees. Down-facing lighting lenses were incorporated to limit light pollution. Project designers also incorporated depressed toll plazas to satiate stakeholder noise and aesthetic concerns. A sound barrier was incorporated in parts of the project corridor. Figures 12 and 13 illustrate some of the appearance features selected for the SH 130 theme.

Figure 12. Appearance Features on Bridge and Sign Structures.
Source: http://www.sh130.com/

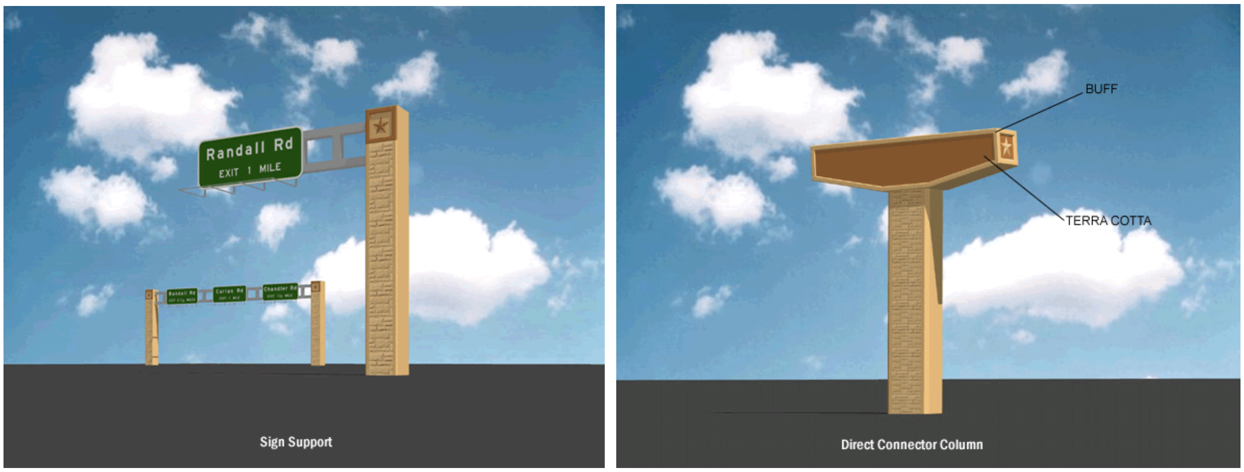

Figure 13. Prototypical Appearance Features on SH 130 Structures.
Source: http://www.sh130.com/

At the request of stakeholders, the SH 130 design plans also were developed to support current and future local street construction in accordance with local transportation plans. For example, SH 130 overpasses were built over future street alignments. Future rail, bike trails, and pedestrian paths were also provided. These provisions were made to give better accessibility and connectivity. Construction of the north section SH 130 began in 2003, and all segments in the 49 mile Phases I and II were completed in 2009. The south section of about 40 miles is currently under construction.

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Project 4 – Mopac 1, Austin, Texas

Overview, Issues, and Concerns

As with many 1960s-era freeways, the Mopac Expressway (Texas Loop 1) in Austin, Texas, has begun to show signs of growing congestion and safety concerns, particularly in the central section's bottleneck. Mopac's design features have also become outdated, for example, its narrow shoulders. Therefore, the TxDOT initiated the Mopac 1 Project to address these issues. The Mopac 1 Project area includes the 11-mile stretch from FM 734 (Parmer Lane) to the Cesar Chavez intersection west of downtown (Figure 14).

Figure 14. Map of the Mopac 1 Project Area.
Source: MoPac 1 Project Facts #1, TxDOT, Fall 2006

The Mopac 1 Project was originally initiated to add capacity. However, the project has faced some specific challenges and stakeholder concerns that constitute special considerations. Numerous objectives and issues have been raised and addressed by both TxDOT and community leaders throughout much of the project. Some of these are:

- Working within the urban context, with most of the surrounding land fully developed.
- Limiting cut-through traffic in surrounding neighborhoods.
- Limiting traffic impacts on surrounding roadways.
- Keeping freeway improvements within existing right of way.
- Noise concerns.
- Safety concerns.
- Increasing congestion.
- Aesthetic concerns.
- Air and water quality concerns.
- Rail accommodations, including future commuter rail.

- Pedestrian and bicycle accommodations.

CSS Process and Notable CSS Outcomes

The existing Mopac Expressway north of Lady Bird Lake was built in the 1960s, where extensive right of way had to be acquired, fostering dissent from citizens adjacent to the project area. Over time citizens also began to voice concerns over the traffic and noise impacts to surrounding neighborhoods along Mopac. In the 1980s, Mopac began showing normal signs of increasing traffic and congestion. TxDOT initiated preliminary planning for improvements and reconstruction during this period. When it appeared that the capacity improvements would require additional right of way, citizens also began to voice additional concerns over right of way acquisitions.

In 2000, the TxDOT Mopac 1 Team initiated the Loop 1/US 183 Improvement Study.
In 2001, TxDOT presented the project proposals to the Capital Area Metropolitan Planning Organization (CAMPO). TxDOT proposed a greatly widened facility that would have required extensive additional right of way. The Mopac Neighborhood Association Coalition (MONAC) and other citizens (about 900 people) attended a meeting in opposition to the TxDOT proposal.

TxDOT subsequently decided the project needed a more collaborative, CSS-based approach. After this meeting, CAMPO also created the Loop 1/US 183 Systems Analysis Special Committee to review the TxDOT proposals, and make comments and recommendations on the TxDOT plans. This committee contained CAMPO representatives, TxDOT representatives, and neighborhood representatives. A technical team was also formed, including an urban planner, a landscape architect, a rail transit expert, transportation engineers, a noise/vibration expert, and a public involvement expert.

The *Technical Team Report* recommended a more open, CSS-type process. It also concluded that mobility along Mopac could be improved within the existing right of way, and that the freeway can accommodate commuter rail along the existing Union Pacific Railroad that is adjacent to or within the Mopac right of way. In addition, sound walls, pedestrian and bike accommodations, and traffic calming devices were recommended. CAMPO and the City of Austin adopted these recommendations.

In 2005, the *CAMPO Mobility 2030 Plan* also recommended a CSS-based approach for planning the Mopac 1 Project. Subsequently, TxDOT cancelled the old design and initiated the new Mopac 1 Project. An Aesthetics Advisory Committee (AAC) was formed to develop TxDOT guidelines for the Mopac 1 design while remaining within TxDOT budgetary and maintenance limits. The AAC consisted of representatives from the Austin State School, the Texas Historical Commission (THC), the City of Austin, the TxDOT Mopac 1 Project Manager, the TxDOT District Landscape Architect, and other community members.

The committee met once a month for approximately six months, and produced the *Aesthetic Advisory Committee Summary* in 2007. Input from the committee and the public was used to develop project alternatives, including features beyond just capacity improvements. The project concept and plan was developed collaboratively. It expands the freeway's capacity almost entirely within existing right of way (see Figure 15 for sample cross-section) and includes recommendations for aesthetic amenities throughout the Mopac 1 corridor such as pavement and wall textures, color schemes, artwork themes, landscaping specifications, and lighting types. Some renderings of the proposed designs can be seen in Figures 16 and 17.

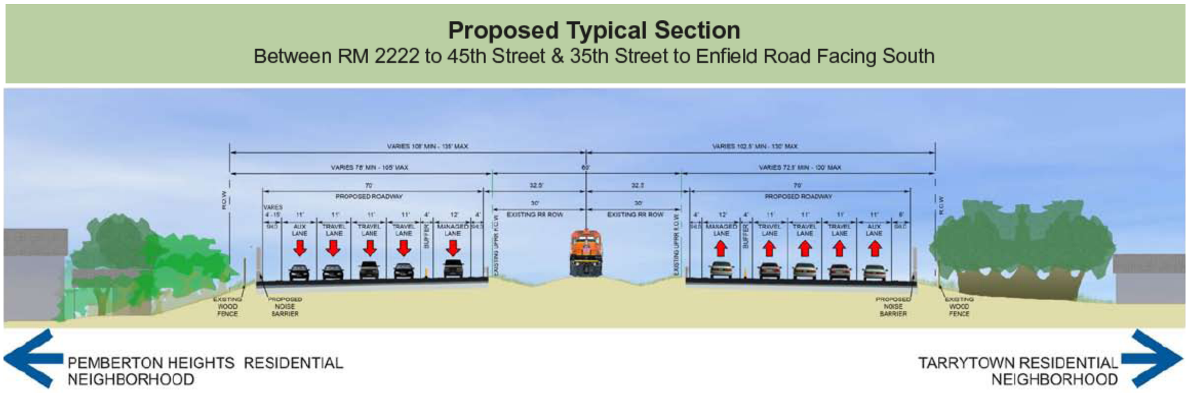

Figure 15. Map of the Mopac 1 Project Area.
Source: ftp://ftp.dot.state.tx.us/pub/txdot-info/aus/mopac1/express_issue_02.pdf

Figure 16. Mopac 1 Design Rendering Overview.
Source: ftp://ftp.dot.state.tx.us/pub/txdot-info/library/projects/austin/perspective1.pdf

Proposed Roadway Rendering
Perspective View Between RM 2222 & 45th Street Facing South

Figure 17. Mopac 1 Proposed Alignment.

Source: ftp://ftp.dot.state.tx.us/pub/txdot-info/aus/mopac1/express_issue_02.pdf

At the time this information was gathered, the project was in a final public comment period. MONAC and local business communities now largely support the project. Some notable changes and practices include:

- Freeway improvements are now being kept within the existing right of way through the use of managed lanes and realignments.
- Shoulder lanes in some portions of the roadway will be usable by buses that have difficulty merging onto the freeway.
- Coordination with Amtrak and with the Austin-San Antonio Intermunicipal Rail District is being pursued in order to accommodate of potential future transit.
- Sound walls are being incorporated into the Mopac 1 design. Noise barrier design will reflect community values with artwork, architectural treatments, and landscaping will be considered). The AAC will help determine the look of the sound walls on the public side, while neighborhood residents will help determine the look of the sound walls from the private side.
- Neighborhoods within historic districts will incorporate noise walls that are compatible with historic characters with input from the THC and the City of Austin Historic Officer.
- Sample noise walls were available for public viewing at the TxDOT campus in Austin.
- Noise workshops were held in early 2008 where residents adjacent to noise walls voted on sound wall designs.

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Project 5 – Cooper River Bridge, Charleston/Mt. Pleasant, South Carolina

Overview

The Charleston/Mt. Pleasant region of South Carolina is a major southeastern United States urban area. It also attracts hundreds of thousands of visitors each year. The two cities are connected by the Cooper River Bridge.

The need for this connection was originally recognized in the early 20th century when the Grace Memorial Bridge was constructed. This bridge was opened in 1929. In 1966, the Pearman Bridge, which ran parallel to the Grace Memorial Bridge, was opened to carry northbound traffic, while the Grace Memorial Bridge carried southbound traffic.

By the later part of the 20th century, both bridges were experiencing congestion, safety, and maintenance issues. The South Carolina Department of Transportation (SCDOT) initiated efforts to construct a new bridge. The Cooper River Bridge, also known as the Arthur Ravenel, Jr. Bridge, replaced the Grace and Pearman bridges and was opened to traffic in 2005 to link Charleston and Mt. Pleasant (Figure 17). The new 8-lane Cooper River Bridge was the largest infrastructure project in SCDOT history. The new structure contains four vehicle lanes running in each direction separated by a median.

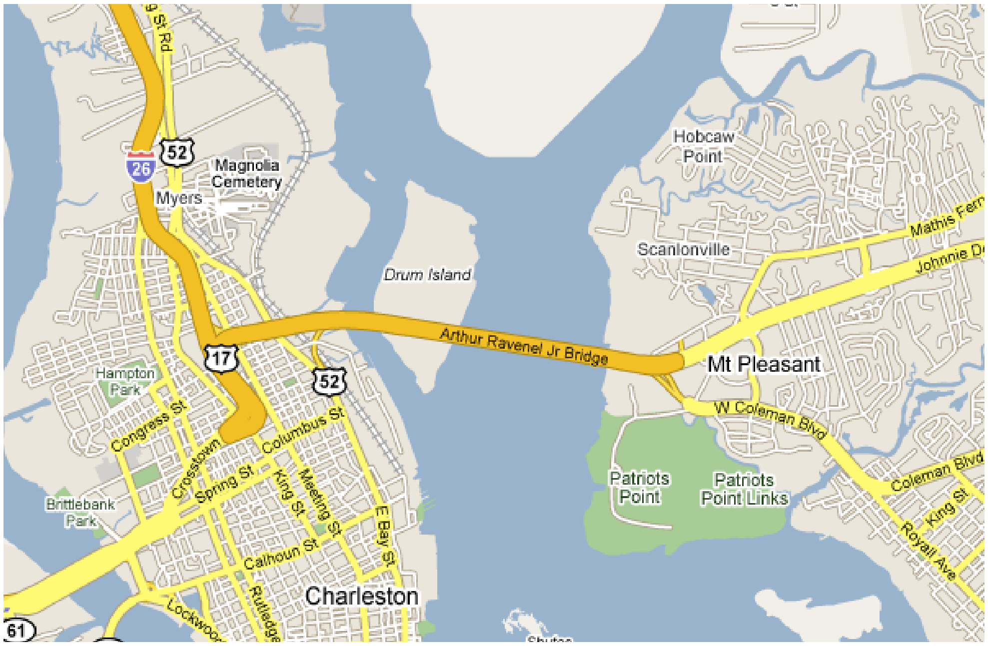

Figure 17. Map of the Cooper River Bridge Project Area.
Source: http://maps.google.com/

The massive undertaking would not have been possible without extensive inter-agency partnerships and the CSS-type engagement of citizens and stakeholders. The endeavor was funded by the South Carolina Infrastructure Bank, FHWA, SCDOT, Charleston County, and the South Carolina State Ports Authority. Construction began in 2001 and was completed in 2005 and also followed the design/build process.

The project included the construction of the 2.5-mile bridge and the two approaches and adjacent interchanges. The resulting bridge incorporates many unique aesthetic and functional design features that resulted from stakeholder input. In addition, many notable practices were followed during and after construction of the Cooper River Bridge that took into account the surrounding community objectives and concerns and environmental contexts in a CSS manner.

Issues and Concerns

By the 1990s, the Grace and Pearman Bridges were rapidly reaching the culmination of their functional life spans. In 1979, an 8-ton limit had been established for the Grace Memorial Bridge due to significant structural deterioration. The deteriorating conditions of these bridges, obsolete design standards, increasing maintenance costs, and increasing traffic demands of the region necessitated the need for the construction of a new bridge between Charleston and Mt. Pleasant. Outdated design standards included 10-ft lanes, steep grades, insufficient vertical clearances for large vessels, and the lack of shoulders and medians.

CSS Process and Notable CSS Outcomes

SCDOT partnered with many stakeholders while undertaking the Cooper River Bridge design and construction. Early CSS-like collaboration with local municipalities, agencies, and citizens remained crucial to the project's success. The South Carolina division of the FHWA collaborated with community members and the City of Charleston to create environmental and community mitigation and compatibility plans.

SCDOT and the FHWA received extensive design input from a number of different engineers, designers, planners, and members of surrounding communities throughout the project's planning, design, and construction phases. At several public work sessions, the community chose the diamond tower design alternative. In addition, local activists, through grassroots campaigns, secured the incorporation of pedestrian and bike paths to the bridge design.

A public outreach campaign, including a website, newsletters, and other media releases, kept stakeholders informed of the project. Hundreds of presentations about the project were given to local schools, organizations, and community members. Because of the project's design/build process, inter-agency partnerships were essential in order to expedite the environmental permitting process, which was a SCDOT goal. An inter-agency task force was formed by the SCDOT to work through the permitting process, and as a result, no regulatory compliance predicaments were encountered.

As a result of the collaborative nature of the Cooper River Bridge Project, a number of notable practices and design outcomes resulted, while costs remained within the project budget:

- An exemplary cable-stay design that remains true to the community objectives and stakeholder input from Charleston and Mt. Pleasant.
- The inclusion of community-approved diamond towers to support the cable stays (Figure 18).
- The incorporation of scenic overlooks with benches along the edge of the diamond towers.
- The incorporation of a 12-ft pedestrian and bicycle lane across the span of the bridge (Figure 19).
- Aesthetic treatments, including an architectural style to reflect the grace of the nearby municipalities, decorative bridge lighting, decorative hand railings and lampposts, pavement textures, and the omission of high-mast lighting (Figure 20).
- The inclusion of rock islands at the base of the bridge to protect the structure from ship collisions.
- The addition of ramps to surrounding interchanges due to inputs from local officials.
- Remaining sensitive to environmental amenities:
    - Sensitivity to extensive acreage of wetlands in the project area.
    - Installing silt fences during construction to reduce erosion.
    - Properly disposing of dredged material.
    - Portions of the old bridges were used to create fish reefs, with some of the areas being designated as Marine Protection Areas (MPAs).
    - Aesthetic bridge lighting is turned off during Loggerhead Sea Turtle nesting season.
    - Work with the Town of Mt. Pleasant to relocate displaced trees.
    - The incorporation of signage at the entrances and exits to the pedestrian/bike path to inform users about environmental efforts.
- Redevelopment of the land surrounding the old bridges:
    - In Mt. Pleasant, park and open spaces were created, and foundations from the Pearman Bridge were used to create a pier.

- In Charleston, improved drainage, affordable housing, parks, and other economic development opportunities will be created.

Figure 18. Cooper River Bridge Overhead Showing the Diamond Cable-Stay Design.
Source: http://ravenelbridge.net/small/jul_12_bridge_south_blog.jpg

Figure 19. Pedestrian and Bike Path Spanning the Cooper River Bridge.
Source: http://www.gcbl.org/system/files/cooper_river_thumb_0.jpg

Figure 20. Decorative Lighting of the Cooper River Bridge.
Source: http://www.freyssinetusa.com/images/freyssinet/lightbox/stay_cable_1.jpg

Key CSS Practices and Features

Key features of this project include:

- Early and continuous collaboration of project leaders with various stakeholders, including municipalities, agencies, and citizens, in order to develop environmental mitigations, community mitigations, and design schematics.
- The opportunity for area citizens to vote on the bridge tower design.
- The inclusion of the citizen-desired pedestrian and bicycle path.
- The inclusion of aesthetic treatments to the bridge design.
- Remaining sensitive to the community and environmental contexts throughout the project.
- A public outreach campaign to keep citizens informed about the Cooper River Bridge project.

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Project 6 – Paris Pike, Paris to Lexington, Kentucky

Overview, Issues, and Concerns

Paris Pike, US 27/68, is an excellent example of good highway design using the CSS approach. The final nature of the project did not come easily or quickly. It took the aid of a legal challenge and CSS principles to bring about the highway's completion.

The purpose of this project was to improve a 13-mile section of US 27/68 between Lexington and Paris, Kentucky. The need for this improvement was based on Paris Pike's importance in the regional transportation system, that is, its system linkage, its lack of sufficient capacity to adequately serve not only projected travel but also existing traffic demands, inadequate existing roadway geometrics and design features, safety considerations, and social demands.

The corridor is listed on the National Registry of Historic Places; Native American and early settlers utilized the passageway. Today, it serves commuters and residents of central Kentucky.

Figure 21. Map of the Paris Pike Project Area.
Source: http://maps.google.com and
http://iz.carnegiemnh.org/crayfish/country_pages/state_pages/kentucky.htm

Paris Pike is located within the heart of thoroughbred horse farm country in the Bluegrass region of Kentucky. Stakeholders felt it was important to keep this rural character, historical amenities, environmental concerns, safety concerns, aesthetical concerns, and increasing traffic congestion all remained project challenges. Many design deficiencies contributed to road's unsafe nature including inadequate clear zones, narrow lanes, lack of shoulders, poor sight distance, steep side slopes, and insufficient turning radii.

The Paris Pike project entailed the reconstruction and widening of a 2-lane highway to 4 lanes. Citizens and organizations near Paris Pike deemed the original design solutions by the Kentucky Transportation Cabinet (KYTC) inadequate in addressing environmental and historical issues. After an injunction issued in a lawsuit halted the project for 15 years, project leaders decided to approach the project using CSS. Kentucky was one of the original CSD FHWA pilot states to implement principles developed at the 1998 CSD “Thinking Beyond the Pavement” workshop. The Paris Pike project team went to extensive efforts to take the context of the roadway into account, and the resulting roadway remains characteristic of its rural Bluegrass context.

Process and Timeline of Events

The improvement of Paris Pike was originally conceived by the KYTC in the 1960s. In the 1970s, the KTC drafted a plan for a 4-lane highway with a 40-ft median. Citizens and organizations surrounding the proposed roadway found the design inadequate and opposed the design. A timeline of major events is as follows (Kentucky Transportation Center, 2008):

1. The Kentucky Transportation Cabinet conducted preliminary planning in the 1960s.
2. In the 1970s, the Kentucky Transportation Cabinet drafted a plan for a 4-lane highway with a 40-ft median. An Environmental Impact Statement (EIS) was issued by the KYTC and approved by FHWA in 1973.
3. In 1977, a civil lawsuit was filed in the U.S. District Court against the U.S. Department of Transportation and the Kentucky Department of Highways, resulting in a 1978 injunction that halted construction until historic amenities were better addressed in design.
4. Unable to continue, the project was cancelled by the KYTC in 1980.
5. After continuing congestion and a series of accidents, FHWA began working with the Kentucky State Historic Preservation Officer and the National Advisory Council on Historic Preservation to draft the 1991 Memorandum of Agreement (MOA) in order to satisfy Section 106 of the National Historic Preservation Act. The MOA was signed between the FHWA, the Kentucky State Historic Preservation Officer, and the National Advisory Council on Historic Preservation. This agreement contained design guidelines for Paris Pike that stipulated criteria for protecting historical and environmental amenities contained within the Paris Pike project area.
6. Subsequently, the Paris-Lexington Road Project Advisory Task Force (ATF) was formed to direct the project. Membership of the task force included the KYTC, FHWA, the Kentucky State Historic Preservation Officer, the Lexington-Fayette Urban County Government, Land and Nature Trust of the Bluegrass, Bluegrass Trust for Historic Preservation, Lexington Directions, the Bourbon County Magistrate, a citizen representative, a landscape architect, and a civil engineer.
7. Later in 1991, the FHWA issued a Record of Decision (ROD) approving the MOA, a Supplemental Environmental Impact Statement, and a Section 4(f) Statement.
8. In 1993, the court injunction was lifted. The project was ready to proceed to design stages.
9. A series of workshops, led by the ATF, were held with the community in several of the corridor segments, where stakeholders gave input on roadway design specifications. Contractors participated in the workshops as well, and newsletters were issued monthly for public outreach. Extensive documentation of existing historic features to the Historic American Building Survey and the Historic Engineering Record was conducted.
10. Paris Pike was constructed from 1997–2003.
11. In conjunction with the Paris Pike reconstrction project, the Paris Pike Corridor Commission was formed to review and permit land uses within 1,000 ft of the roadway. A “Small Area Plan” was also produced to regulate future land uses, stipulating the allowance of strictly agricultural development in the corridor.

Notable CSS Outcomes

As the result of extensive collaboration and historic and environmental sensitivity, the Paris Pike reconstruction project remains a consummate example of the benefits of CSS. Many notable features that took into account the rural, scenic, and historic contexts of the corridor resulted:

- Extensive inter-agency coordination during project planning and design.
- Involvement of adjacent landowners in the development of the project concept and design process, including hayrides to see and discuss specific issues and design proposals.
- The Advisory Task Force was a positive factor in re-establishing trust between the representatives of the public and the KYTC representatives and contractors.
- Marine silt loam topsoil, critical to horse farming and not available for purchase, was preserved. The soil was stripped, stockpiled, and replaced to its original thickness after drainage work was completed.
- Scenic outlook observation points were created along Paris Pike.
- Many undertakings were ensued in order to keep the roadway aesthetically pleasing:
    - Grass shoulders were incorporated (Figures 22).
    - Rusticated steel backed timber guardrails were utilized instead of traditional metal guardrails (Figure 23).
    - Manufactured stone veneer that matched indigenous stone was incorporated into the motif of retaining walls, bridge abutments, and bridge rails.
    - The winding nature of route was left unchanged by designing the road to move around hilly topography, instead of through it, without requiring design exceptions.
- Environmental concerns were taken into account:
    - Roadway realignment, median width reconfiguration, clear zone reconfigurations, and utility line easement modifications were assimilated to avoid old growth trees (Figure 24).
    - Other removed trees and vegetation were replanted when possible.
    - Additional native vegetation was planted in the corridor.
    - Running Buffalo Clover, an endangered plant within the Paris Pike corridor, was transplanted to a fenced easement.
    - Erosion control practices were followed.
    - Wetlands impacts were mitigated on a 5.5 acre site in a nearby county.
    - Environmental sensitivity to the construction processes used.
- Historic properties and structures were preserved:
    - The roadway was re-aligned to avoid historic structures (Figure 25).
    - Entrances to long-established horse farms were avoided when possible. If entrances had to be impacted, they were relocated and/or reconstructed to resemble the original entrances.
    - In 1999, the Kentucky Department of Transportation acquired and renovated the historic Civil-War era Wright Farmhouse near Paris. The house is now used as a visitor's center (Figure 26).
    - A 3.5-mile stretch of historic 1800-era dry-stone walls that had to be removed during construction were re-fabricated by skilled masons. The roadway was re-aligned to avoid impacting the remaining dry-stone walls (Figure 27).
    - Archeological site investigations were pursued.

Conclusions

In the 1960s, the Kentucky Department of Transportation designed a standard 4-lane highway that was familiar to the department's design staff. The extensive amount of context sensitive environmental and historical components was unprecedented and cumbersome. It took collaborative CSS solutions in order to produce a project for which all were content. A Kentucky Transportation Center survey found that Paris Pike project participants were satisfied with project outcomes and found their participation personally rewarding. The project has received praise from numerous highway officials and former adversaries. As a result of CSS, fewer change orders were issued for the project and the design and construction processes proceeded smoothly. All highway projects in Kentucky now follow CSS principles.

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Figure 22. Grass Shoulders along Paris Pike.
Source: http://www.tfhrc.gov/pubrds/03jul/images/irving6.jpg

Figure 23. Rusticated Guardrails.
Source: http://www.americanbyways.com/index.php?catid=16

Figure 24. Old Growth Trees Were Preserved in the Paris Pike Project.
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Figure 25. Roadway Re-Alignment to Miss Historic Properties.
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Figure 26. The Historic Wright House Was Preserved and Restored during Paris Pike Reconstruction.
Source: http://www.contextsensitivesolutions.org/content/case_studies/kentucky_paris/#

Figure 27. Historic Dry-Stone Walls Preserved or Re-Fabricated during the Paris Pike Project.
Source: http://www.contextsensitivesolutions.org/content/case_studies/kentucky_paris/#

Project 7 – SR 179, Greater Sedona, Arizona

Overview

The Greater Sedona region of Arizona has been heralded as one of the most beautiful places in America; this is the site of the pristine Arizona Red Rock country. It lies about 100 miles north of Phoenix. It is about halfway between Phoenix and the Grand Canyon in Yavapai and Coconino Counties (Figure 28). The region receives over 4 million visitors every year.

Figure 28. Map of the Arizona SR 179 Corridor.
Source: http://www.scenic179.com/

Most of the residents and visitors to the Sedona area use Arizona State Route (SR) 179 to access the region or circulate within it. The route was originally constructed in the 1930s for use by the U.S. Forest Service. As a result of the growth of the area, SR 179 became congested. Its important role in the area necessitated an improvement. Figure 28 shows SR 179 and the two segments making up the highway.

Issues and Concerns

Over time, the route has had numerous accidents and traffic congestion. Tourists tend to slow or even stop in the forest section to take in the vistas. However, this causes SR 179 to back up in both directions. Due to the scenic nature of that portion of SR 179, the conventional road widening solution was judged to be inappropriate for this context. In the late 1990s, the Arizona Department of Transportation (ADOT) proposed an expanded facility, but the proposal received opposition from citizens and local government officials. Therefore, ADOT initiated a CSS process to plan and reconstruct the 9-mile stretch of SR 179 from the Village of Oak Creek north to the City of Sedona. This route runs through the Coconino National Forest south of Sedona.

The CSS planning and stakeholder involvement stages occurred from August 2003 to December 2004. Construction began in the fall 2006 and is scheduled to be completed in 2010.

CSS Process

The Arizona SR 179 improvement project consists of three overall phases. Phase I included the CSS planning and design stages. Phase II consisted of final design, and Phase III includes construction. The corridor lies within the jurisdiction of seven agencies who became key project stakeholders:

- The Big Park Regional Coordinating Council (representing the Village of Oak Creek).
- Yavapai County.
- Coconino County.
- The City of Sedona.
- Coconino National Forest (CNF).
- FHWA.
- ADOT (and its hired technical and public outreach consultants).

ADOT initiated a needs-based implementation plan (NBIP), a CSS-like process, to address the issues and concerns of Arizona SR 179. An Executive Team, a Public Outreach Team, and a Project Management Team (all consisting of representatives from the above agencies) led the NBIP process. Several issues needed to be addressed in the NBIP Process:

- The existing roadway was a 2-lane, undivided roadway with sight distance limitations. The team had to address if it was desirable to retain the 2-lane configuration or to widen the highway.
- Little or no shoulders, turn lanes, or intersection control were available.
- The corridor remains in diverse contexts from urban, suburban, and rural wooded country that had to be considered in the project.
- The corridor traverses highly scenic landscapes, including the Coconino National Forest. Methods to preserve natural vistas while improving safety and capacity were to be addressed.
- Methods to accommodate pedestrians and bicyclists had to be generated.
- Methods to increasing safety and capacity had to be addressed.
- Methods of maintaining traffic flow during construction, especially in the Sedona business district, had to be determined.

The CSS-based NBIP process introduced these issues to stakeholders and assembled a team to improve SR 179. Numerous media outlets helped keep stakeholders and citizens up to date on the project process and helped solicit input. These outlets included a telephone hotline, a detailed website, newsletters, press releases, a project office, monthly "construction chats" open to the public during construction, and a speaker's bureau for interested community organizations. Additionally, project leaders regularly met with property owners adjacent to SR 179 to discuss project plans.

Eighteen months were dedicated to the planning and design of SR 179. At the inception of the project, public trust of ADOT was low and citizens had disapproved of the initial ADOT proposal for SR 179, which was felt to lack enough sensitivity to the surrounding contexts. ADOT then decided to approach the project in a more context-sensitive manner by organizing public education forums in October 2003. Presentations included information on mobility and road design, the economics effect of roads, and context sensitive solutions. This led the way for a series of three multi-stage charrettes from the fall of 2003 through spring 2004. Project leaders invited and encouraged the general public, including property owners, business owners, bike and pedestrian advocates, and environmentalists to participate in all charrettes.

Phase I of the AZ SR 179 Improvement Project consisted of the three charrettes. In Charrette 1, held in November 2003, stakeholders participated in ice-breakers, tours of the corridor, and identified desirable characteristics. These characteristics included:[10]

- Character.
- Context sensitivity.
- Economic sustainability.
- Environmental preservation.
- Mobility.
- Multimodality.
- Multiple purposes.
- Public safety.
- Regional coordination.
- Roadway footprint.
- Scenic beauty.
- Walkability.

In Charrette 2, held in January 2004, gaming workshops were held where stakeholders produced several design schematics for SR 179. In these workshops, game "pieces" were placed on an aerial corridor photograph "game board." Game pieces consisted of design elements such as bike lanes, pedestrian paths, vehicular lanes, traffic signals, roundabouts, turning lanes, wildlife corridors, scenic pullouts, and bus stops.

Between the culmination of Charrette 2 in January 2004 and beginning of Charrette 3 in May 2004, a series of screening workshops, educational forums, exhibits, and brown bag lunches were held with stakeholders in order to narrow down the planning concepts from Charrette 2 to three concepts. Some criteria used when evaluating design schematics included emergency

[10] Rauch, Ethan. (2005). Context-Sensitive Solution for Arizona State Route 179, *Transportation Research Record 1904*, Transportation Research Board, 2005. retrieved May 2, 2008, from http://trb.metapress.com/content/yl10378460v52006/fulltext.pdf.

vehicle access, engineering design standards, EIS mitigation undertakings, the project budget, the project schedule, retaining natural beauty, retaining corridor character, the accommodation of pedestrians and bicyclists, minimizing ROW acquisitions, minimizing light pollution, and the accommodation of wildlife. At Charrette 3 in May 2004, one preferred planning concept was selected from among three finalist planning concepts.

In addition to design concepts, the SR 179 Project produced two additional reports: the Corridor Management Plan (CMP), and the Access Management Plan (AMP). The CMP was a corridor environmental management plan intended to address grassroots efforts to preserve archaeological, cultural, historic, natural, scenic, and recreational amenities of the corridor, and to allow the community to apply for the designation of SR 179 as a National Scenic Byway. This CMP was developed with community based input. In the same time frame, ADOT prepared an AMP to address existing and future traffic access and land use needs along SR 179.

During Phase III of the SR 179 Improvement Project, a Design Advisory Panel (DAP) was formed for each of what became four design segments of SR 179. Twelve to 15 members were on each DAP, including one representative each from the Big Park Regional Coordinating Council, Yavapai County, Coconino County, the City of Sedona, Coconino National Forest, FHWA, and ADOT. DAP membership also included community volunteers representing various interests. The DAP met from August 2004 to November 2004 to complete final project designs, which integrated the information assembled during the Phase II charrettes.

Notable CSS Outcomes

After the above planning processes, the final design of Arizona SR 179 included many notable features that were the result of much collaborative effort, and represents designs upon which stakeholders were largely content. Major features of the process and the resulting design for improvements to SR 179 include:

- Multi-agency task forces.
- NBIP to carry on a CSS type of process.
- Extensive public and stakeholder participation.
- Series of charrettes to develop the concept and major features of the improvement plan.
- Stakeholder involvement in alternatives development and evaluation.
- Development of project concept and evaluation based on area objectives and concerns.
- Task force of representatives and members of the public to provide input during design process.
- Continuing interaction during construction.
- Dedicated turn lanes for increased mobility.
- The use of roundabouts to increase traffic flow at intersections but also manage speeds (Figure 29).
- Bicycle and pedestrian paths along the entire corridor (Figure 30).
- The addition of scenic pullovers and improvements to existing outlooks.
- Bifurcated lanes through the Coconino National Forest with passing lanes and two new bridges.
- An improved drainage system.
- Improved utility infrastructure, including underground placement of all power, phone, and cable lines.

- Curb and gutters along the roadway to prevent illegal side road turnoffs.
- Raised medians from 4–16 ft in width.

 

Figure 29. Roundabouts in SR 179, Left Is Proposed.
Source: http://www.scenic179.com/

Figure 30. Proposed Rendering of Sidewalks and Bike Paths along SR 179.
Source: http://www.scenic179.com/

In addition to the above improvements, several notable design features and project processes were incorporated into the design of SR 179, including:

- Plant salvage and landscaping throughout the project area.
- Construction sequencing to prevent excessive construction-induced traffic and contractor incentives/disincentives for rapid construction in the Sedona business district.
- The use of low level, International Dark Sky Association approved lighting throughout the project corridor.
- Opportunities for the inclusion of public art in the corridor.
- The careful protection and preservation of mature Sycamore trees adjacent to the Tlaquepaque arts and crafts village in Sedona.
- The inclusion of wildlife underpasses in coordination with the Arizona Game and Fish Department.

Conclusions

All in all, stakeholders were pleased with the manner in which the project was conducted. At the end of charrettes and other community affairs, evaluation forms were distributed to participants, which communicated an overall satisfaction. Several lessons were learned, including the need for facilitators, and effective communication. The definition of core values was found to be an effective team building exercise and helped to establish common ground. All stakeholders had copious opportunities to participate, resulting in a distinguished roadway.

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Project 8 – Woodrow Wilson Bridge Project, Washington, D.C., Metropolitan Area

Overview

The Woodrow Wilson Bridge (WWB), located within the Washington, D.C., metropolitan area, has been the source of much commuter frustration over congestion and delay the past decades. FHWA, the Virginia Department of Transportation (VDOT), the Maryland State Highway Administration (MSHA), and the District Department of Transportation (DDOT) initiated the Woodrow Wilson Bridge Project in order to help alleviate this frustration by reconstructing and widening the bridge and sections of I-495 including two interchanges on each side of the Potomac River.

The primary corridor of interest is a section of I-95/I-495, also known as the Capital Beltway. This corridor includes the Woodrow Wilson Bridge. Figures 31 and Figure 32 show the project area. The 7.5-mile corridor of I-95/I-495 extends between Virginia across the Potomac River and Maryland. The spotlight of the project is the replacement of the Woodrow Wilson Bridge structure with two parallel bridges. The first bridge was completed in 2006, and the second bridge was scheduled to be completed in the summer of 2008.[11] The entire project was slated to be completed in 2013.

Figure 31. WWB Project Area.
Source: (Douglas, Healy, Mohler, & Cleveland, 2004)

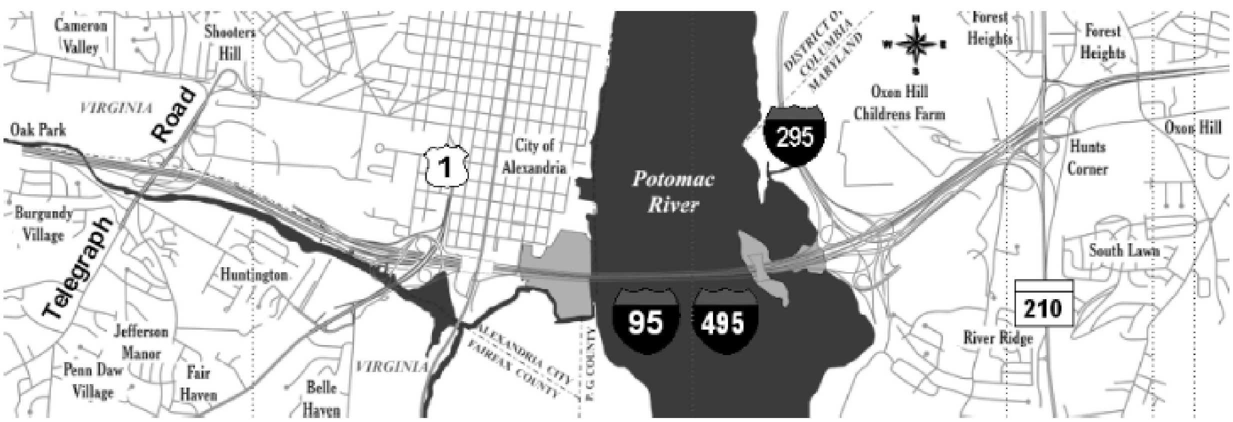

Figure 32. WWB Project Area.
Source: (Douglas et.al, 2004)

[11] Woodrow Wilson Bridge Project Team, Arpril 23, 2008, retrieved March 30, 2008, from Woodrow Wilson Bridge Project: http://www.wilsonbridge.com.

The new WWB will be 12 lanes; eight lanes are general purpose, two are merge/diverge lanes, two are express lanes, and two are future HOV/bus/ transit lanes. The second bridge will be 14 ft wider than the first to accommodate bike and pedestrian paths; this provision is also included in both interchanges on the Virginia and Maryland ends of the bridge. “Bump outs” will be provided as vantage points of Washington, D.C., the City of Alexandria, VA, and Prince George’s County, MD.[12]

Issues and Concerns

The original WWB was built in 1961 as part of I-495. It was designed to handle 75,000 vehicles per day. Eight years later, it was carrying 200,000 vehicles per day. Increased development in the Maryland and Virginia suburbs, and in Washington, D.C., contributed to increased traffic demands on the Woodrow Wilson Bridge and its surrounding interchanges. The WWB is projected to have 300,000 daily trips by 2020. Prior to the improvement project, the 8-lane Capital Beltway narrowed to the 6-lane WWB, creating a serious bottleneck. More than 60 percent of surveyed commuters along the WWB Project area spent more than 40 minutes on either morning or evening commutes prior to reconstruction efforts.

In 1988, the Federal Highway Administration initiated the Woodrow Wilson Bridge Improvement Study. The project faced early opposition from citizens in the project area. Some long-standing stakeholder concerns with the WWB Project included:

- Mitigating the loss of wetlands due to the WWB improvement.
- Mitigating the loss of park lands due to the WWB improvement.
- Addressing air quality concerns.
- Addressing water quality concerns.
- Addressing historic preservation concerns.
- Addressing adverse impacts to surrounding residences, schools, businesses, and cemeteries due to the WWB improvement.
- Addressing impacts to terrestrial and aquatic life, including the American Bald Eagle and the Short-nose Sturgeon.
- Ensuring effective monitoring of air, water, and noise impacts.
- Ensuring rail transit accommodation.
- Limiting visual barriers to citizens in Alexandria, Virginia.
- Mitigating the residential displacement.
- Traffic congestion alleviation.
- Aquatic vessel navigation of the Potomac Rover.
- Economic stability and viability of adjacent business.

Process

In the late 1980s and early 1990s, the proposed Woodrow Wilson Bridge Project faced considerable amounts of opposition. Subsequently, in 1992, a Coordination Committee was formed by the project leaders to address concerns in a CSS-like process. This committee

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[12] Woodrow Wilson Bridge (WWB) Center, The, *Ridesharing Initiative is Driven by 'Mission Possible' Campaign*, retrieved March 13, 2008, from *Connections*, Spring 2006, http://www.wilsonbridge.com/pdfs/newsletters/connections-04spring.pdf.

contained local, regional, state, and federal elected officials from Virginia, Maryland, and the District of Columbia. From 1993 to 1996, the Coordination Committee held meetings that were open to the public. In addition, citizen work groups, forums, meetings, and open houses were held to generate input. Finally, in 1997, the Final Environmental Impact Statement (FEIS) was produced by the project team, and subsequently the Federal Highway Administration issued a Record of Decision (ROD) approving the location and preliminary design of the project.

However, some stakeholders still did not feel that adequate consideration of impacts, including historic and environmental impacts, had been sufficiently considered in the FEIS process. In the *City of Alexandria v. Slater*, the U.S. District Court found that the Federal Highway Administration inadequately considered impacts, and that the Woodrow Wilson Bridge Project had violated the National Historic Preservation Act and Section 4(f) of the U.S. Department of Transportation Act. The Federal Highway Administration later appealed and won. Nevertheless, the Coordination Committee found the need to modify the mitigation plan and proceed with a Supplemental Environmental Impact Statement (SEIS) to better address stakeholder concerns.[13]

In the later months of 1997, work began on the SEIS. The Coordination Committee decided again to employ a CSS approach and to include as many stakeholders as possible, including the previous opponents of the FEIS. The stakeholders included residents, businesses, schools, environmental organizations, historic preservation advocates, bike and pedestrian advocates, and disability services advocates. Four Stakeholder Participation Panels (SPPs) were formed, encompassing the four interchanges of the project. From December 1997 through June 1998, the SPPs met with planners, engineers, and other project officials to give input on all project concerns and design specifications. These workshops were open to the general public. A facilitator kept the workshops on track, drafted panel conclusions, coordinated work with outside project officials, and coordinated public comment periods. Facilitators also worked with each of the panels to schedule topics according to the priorities and development of the overall project design schedule.[14]

Finally, the SPPs produced formal recommendations to the project Coordination Committee. SPP recommendations were subsequently presented at public information sessions. By this time, the SPPs had completed roughly 60 percent of their formal recommendations. After the sessions, the Stakeholder Participation Panels re-convened to address any further concerns raised at the public information sessions. In 2000, the SEIS was issued, followed by the issuance of a Record of Decision by the Federal Highway Administration. The WWB Project was then ready to proceed. Refer to Table 8 for a synopsis of major project events.

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[13] U.S. Environmental Protection Agency, *Federal Register Environmental Documents*, January 2, 2008, retrieved April 14, 2008, from Environmental Impact Statement: District of Columbia, Prince George's County, Maryland and City of Alexandria and Fairfax County, VA: http://www.epa.gov/fedrgstr/EPA-IMPACT/1999/July/Day-15/i18095.htm.

[14] Lynott, J., & Keever, D. B. (2000). *Public Involvement in Transportation Design Projects,* Science Applications International Corporation, Vienna, Virginia, 2000.

Table 8. Timeline of Major Events of the WWB Project.

Summary of Major Events in the WWB Project	
1992	Project Coordination Committee is formed
1993–1996	Open meetings, open houses, work groups, & forums held
1997	FEIS & FHWA ROD Issued
1997	Work on SEIS begins, SPPs formed
2000	SEIS & FHWA ROD Issues
2000	Construction begins

Notable Features and Practices

From the result of collaborative efforts, many notable design features, environmental considerations, historic preservation considerations, management practices, and outreach efforts are incorporated into the Woodrow Wilson Bridge Project.

Notable Design Features

The bridge incorporates an arched bridge concept, which complements other area bridges, and limits visual impairments to Alexandria and other adjacent jurisdictions (Figure 33). See Figures 34 and 35 for images of the completed portion of the WWB. Noise walls were included for the benefit of surrounding residents. In Maryland, the project acquired 0.1 acres of forestland from the Flintstone Elementary property, but gave 1.7 of adjacent land back to the school, which was previously owned by the MSHA.[15] Noise walls were also added adjacent to the school for the children's safety and comfort.

In coordination with the Washington Metropolitan Area Transit Authority (WMATA), rail and transit accommodations were included in the bridge design. Two lanes are reserved (cannot be used for anything else) for a future transitway that connects with the WMATA Metro rail system. Bike lanes, pedestrian lanes, and pedestrian-scaled lighting were integrated into the bridge and surrounding intersection designs. The bridge vistas on either side of the bridge have become popular attractions.

[15] Woodrow Wilson Bridge Project Team, Arpril 23, 2008, retrieved March 30, 2008, from Woodrow Wilson Bridge Project: http://www.wilsonbridge.com.

Figure 33. View of the WWB from Old Town Alexandria.
Source: WWB Project Team, 2008

Figure 34. Image of the Completed Portion of the Woodrow Wilson Bridge.
Source: WWB Project Team, 2008

Figure 35. Image of the Completed Portion of the Woodrow Wilson Bridge.
Source: WWB Project Team, 2008

Notable Environmental Mitigation Features

The Woodrow Wilson Bridge Project expended approximately 50 million dollars mitigating adverse environmental impacts (WWB Project Team, 2008). The Potomac River and its surrounding watershed suffered from environmental dilapidation prior to the WWB project. Numerous environmental initiatives have greatly improved the conditions of the area. Intensive environmental monitoring continues to be conducted throughout the project area.

The project created or preserved over 100 acres of wetlands to compensate for the 100 disturbed acres.[16] Additional aquatic vegetation was planted in several wetland areas in order to improve water quality and provide fish habitat. In addition, over 100 acres of riparian forest lands were created or preserved to compensate for impacted acres.

Dredged material from bridge construction was deposited 170 miles from the site at the Shirley Plantation in Weanack, Virginia. This dredged material helped to restore a strip-mined site into viable farmland.[17] Extensive care was taken by the project team to protect soil quality in the project area. Silt fences were installed in construction zones to prevent runoff into water bodies. In addition, underwater barriers surrounded bridge foundation construction to limit particulate dispersion, thus protecting water quality.

Rosalie Island, located west of Maryland, provides connections to pedestrian and bike paths, and is a sanctuary for Bald Eagle and fish habitats. The north side of the island serves as an 84 acre nature preserve for Bald Eagles. Time of year construction restrictions have been enacted in order to avoid Bald Eagle nesting seasons.[18]

Fish passageways were created in creeks and river tributaries throughout the project area, allowing fish to spawn upstream of previous man-made barriers. Approximately 15 million herring were also stocked in the Anacostia River Tributaries near the construction site. Additional construction time of year restrictions were established by the U.S. Army Corps of Engineers (ACOE), the Virginia Department of Environmental Quality (VDEQ), and the Maryland Department of the Environment (MDE) to avoid critical seasonal environmental processes such as wetland tidal fluctuations, fish breeding cycles, and aquatic vegetation life cycles. The National Marine Fisheries Service (NMFS) required the use of mechanical dredging, as opposed to hydrologic dredging, to protect Short-nose Sturgeon in the project area. Figure 36 depicts these environmental initiatives.

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[16] Woodrow Wilson Bridge (WWB) Center, The, *Construction Shifts Into High Gear With Start of Foundations*. *Connections*, Fall 2001, retrieved March 5, 2008, http://www.wilsonbridge.com/pdfs/newsletters/connections-01fall.pdf.

[17] Woodrow Wilson Bridge Project Team, Arpril 23, 2008, retrieved March 30, 2008, from Woodrow Wilson Bridge Project: http://www.wilsonbridge.com.

[18] Woodrow Wilson Bridge (WWB) Center, The, *Construction Shifts Into High Gear With Start of Foundations*. *Connections*, Fall 2001, retrieved March 5, 2008, http://www.wilsonbridge.com/pdfs/newsletters/connections-01fall.pdf.

Figure 36. Environmental Initiatives in WWB Project.
Source: WWB Project Team,2008

Notable Historic Preservation Features

Improvements were made to the historic Freedmen's Cemetery, St. Mary's Cemetery, Oxon Hill Farm, and Jones Point National Park. Environmental Assessments were prepared for the National Park Service by the Federal Highway Administration prior to project work near or at Jones Point Park. The Daughters of the American Revolution worked with the National Park Service and project officials to develop plans to preserve important amenities in Jones Point Park.

Notable Practices

Planned, efficient, community-focused construction scheduling was a high priority throughout the project. Time restrictions on haul routes were enacted to avoid peak traffic hours and nighttime hours. Hoses, sweepers, and water trucks were utilized to reduce construction dust. In addition, construction sound walls were placed in residential areas.

In Virginia, rental residents in the Hunting Terrace Towers were displaced through a compromise right of way alignment, which avoided historic Old Town Alexandria.[19] These residents were given rental relocation assistance, or matching payments for house down payments. Compensation was also received for moving costs.

Extensive efforts are made to engender lucidity and increase public project acceptance. A project newsletter, *Connections*, was issued periodically. In addition, the project has a frequently updated, informative website, news coverage of the project among various media, and e-mail list serve updates. In addition, open-house construction demonstrations were held, and informational signs are posted on construction site fencing.[20] Extensive public relations campaigns were launched, including commute alternative incentives, an essay contest to push the plunger for demolition of the old bridge, and various media advertising campaigns. Two frequently-visited project offices were open to the public and contained information on the project including design schematics.

Conclusions

All stakeholders involved in the Woodrow Wilson Bridge project seemed to agree on the need for new road infrastructure in the Washington, D.C., metropolitan area. Building processes on this commonality may have helped to better engender trust and cooperation among stakeholders. From there, stakeholders could negotiate design specifications and address concerns in a CSS manner.

Perhaps the greatest lesson that can be incorporated from the Woodrow Wilson Bridge Project is to include all stakeholders at the beginning of any major infrastructure improvement project, especially for one as massive as the Woodrow Wilson Bridge project. The project may have moved more smoothly and quickly from the beginning had the SPPs or similar groups been formed at the outset and started with the visioning of the project. The value of open communication and teamwork cannot be overestimated. Additionally, decision makers cannot

[19] Federal Highway Administration, The, *The Woodrow Wilson Bridge Project Record of Decision.* Maryland Division, 2000.

[20] Woodrow Wilson Bridge Project Team, Arpril 23, 2008, retrieved March 30, 2008, from Woodrow Wilson Bridge Project: http://www.wilsonbridge.com.

underrate the general public on their influence and resourcefulness. Citizen and stakeholder involvement throughout any public works project, large or small, is essential to successful outcomes.

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Project 9 – South Lake Shore Drive, Chicago, Illinois

Overview

In Chicago, North and South Lake Shore Drive (US 41) is a primary artery along the lakefront for residents and tourists. North Lake Shore Drive was reconstructed in the early 1990s, but South Lake Shore Drive (SLSD) was still in dire need for repair in the late 1990s. The Illinois Department of Transportation (IDOT) had recognized the need for SLSD improvements since the 1970s. However, initial opposition to the project resulted in an impasse until the late 1990s. By this time, South Lake Shore Drive had deteriorated road conditions, traffic congestion, and drainage problems. Partially due to the opposition and stakeholder dissatisfaction with the previous North Lake Shore Drive Project, and due to the perceived neglect of Chicago's south side; IDOT, the Chicago Department of Transportation (CDOT), and the Chicago Park District initiated a collaborative CSS approach to the South Lake Shore Drive Project.

The project area is entirely contained within the scenic lakefront Jackson and Burnham Parks. These parks are the source of much local pride, recreational, and tourist activity. The drive also provides an impressive view of the Chicago skyline. The project included the complete reconstruction of approximately 6 miles of roadway from 23rd Street at the I-55 interchange to 67th Street. Elements of the undertaking included complete reconstruction of the road including some realignments; the replacement of storm sewers, two bridges, a pedestrian underpass; the addition of landscape and streetscape amenities; and the addition of five new pedestrian underpasses (Figure 37). The project was funded by the Illinois FIRST program (state transportation funds), the City of Chicago, and the Federal Highway Administration.

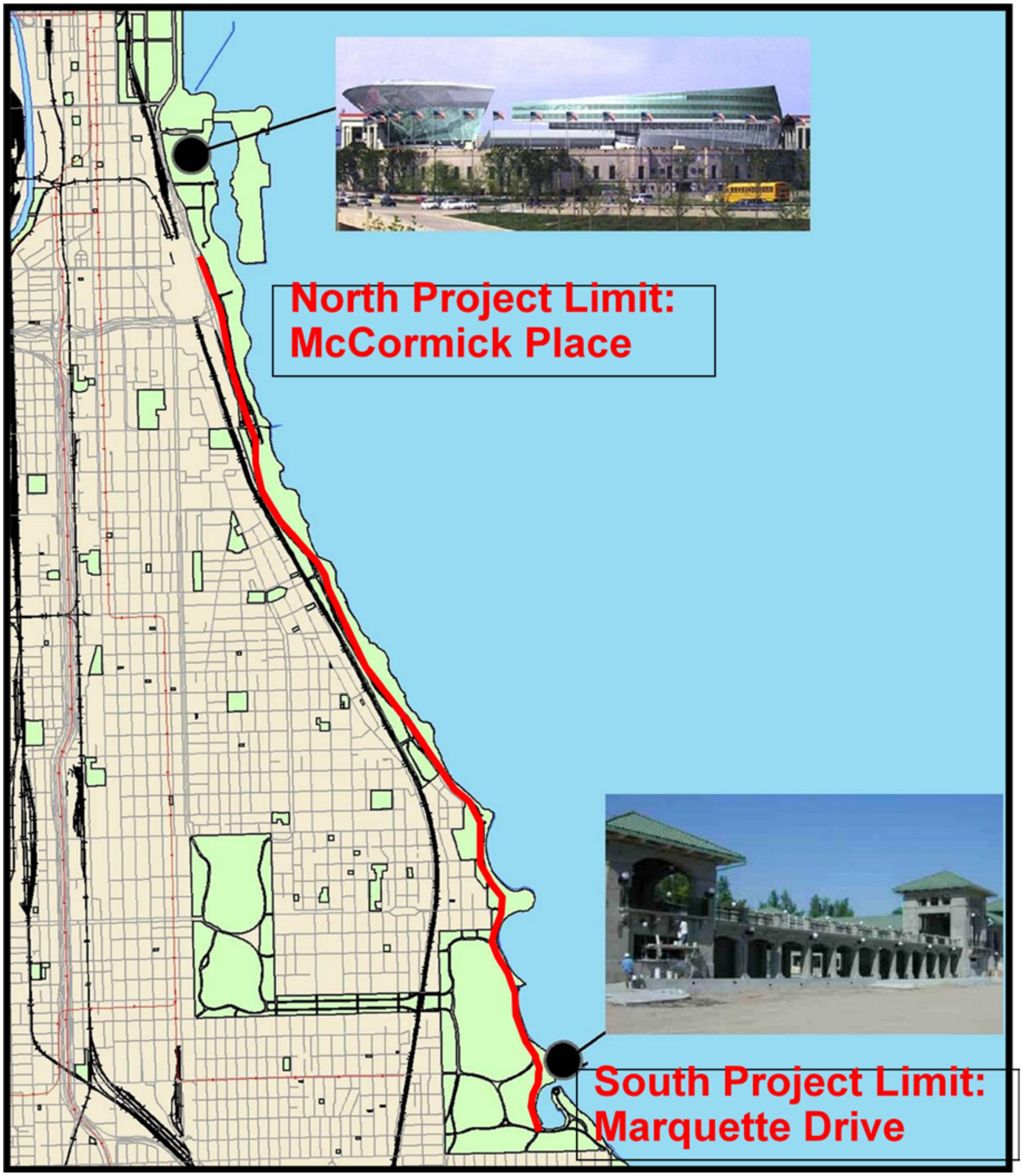

Figure 37. Map of the SLSD Project Area.
Source: City of Chicago et al.
http://www.contextsensitivesolutions.org/content/reading/southlakeshore/

Figure 38 shows the character of South lakeshore Drive, the lake shore, and the parks through which it runs.

Figure 38. South Lake Shore Drive.
Source: City of Chicago, IDOT, & Edwards & Kelcey
http://www.contextsensitivesolutions.org/content/reading/southlakeshore/

Issues and Concerns

Stakeholders were concerned about several issues and design features related to South Lake Shore Drive, including:

- The overall roadway appearance.
- Park impacts and tree removal due to SLSD construction.
- Landscaping.
- Streetscaping, including architectural features, lighting, and traffic calming devices.
- The water quality of Lake Michigan.
- Improving Chicago Transit Authority (CTA) access on SLSD.
- Traffic congestion.
- Deteriorating road conditions.
- Lack of ADA compliant facilities in the area.
- Lack of pedestrian and bike access from western neighborhoods, museums, cultural sites, schools, and hospitals to parks and beaches on the eastern side of South Lake Shore Drive.
- Circulation around the Museum of Science and Industry.

Process and Notable CSS Outcomes

In the late 1990s, a Citizen's Advisory Group (CAG) was convened to address the issues of South Lake Shore Drive. Members of relevant stakeholder groups were invited to participate in the process through inclusion on the CAG. While this was not a public event, no one was turned away who wished to participate. Stakeholders included elected officials, Friends of the Park, Friends of Lake Michigan, the Sierra Club, the City of Chicago Fire and Police Departments, other city service departments, University of Chicago representatives, McCormick Place representatives, the Museum of Science and Industry Representatives, Chicago Convention Center Representatives, and neighborhood organizations. All in all, over 30 organizations were represented in the CAG.

A 1½ day workshop was held at the inception of the planning and design phase of the project. At the workshop, 30–40 participants met on a Friday night, and enjoyed cocktails and hors d'oeuvres while envisioning the future of South Lake Shore Drive. People sketched concepts and learned commonalities, establishing a basis for common ground. On Saturday, a bus tour through the project area introduced stakeholders to existing conditions. Stakeholders were informed by IDOT and the City of Chicago about the design limitations of the project, including minimum AASHTO criteria. IDOT design criteria were to remain flexible for the SLSD project. In addition, CDOT made special efforts to ensure public knowledge of the SLSD project. Information brochures, flyers, media releases, signage in construction zones, and speaker's bureaus ensured project transparency.

The Citizen's Advisory Group participated in additional design stages, where approximately 12 meetings were held. Participants held roundtable discussions regarding project concerns and desired design features. Walks with project designers were taken, and explanations on project details were given. More specific design specifications were delineated, such as pavement textures and architectural amenities.

Public presentations were given after initial design stages to receive additional input for final designs. The group then met three more times during final design stages, and two times during construction, which began in 2001, and was largely completed by 2004. Some notable design features and practices resulting from the CSS process include:

- The addition of five ADA compliant pedestrian underpasses for access to Jackson and Burnham Parks at 57th Street, 59th Street, 63rd Street, and Marquette Drive; each underpass contains distinctive detailing, which reflects surrounding contexts (Figures 39–42).
- The addition of a boardwalk at the 57th Street Beach (Figure 39).
- The addition of a new north/south path through Jackson Park.
- The restoration of the historic Animal Bridge in Jackson Park.
- The rehabilitation of three bridges at 31st Street, 39th Street, and the Animal Bridge (Figures 42–44).
- The addition of bike paths.
- The incorporation of wide sidewalks.
- Slower design speeds.
- The installation of a new low flow, pollution reducing, drainage system spanning the entire SLSD length.
- Road alignments that avoided historical and environmental amenities.
- Contending with Section 4(f) regulations.
- Architectural treatments to the hardscape.
- Architecturally sensitive walls and landscaping to separate vehicular and non-motorized traffic.

- The elimination of 14 acres of paved areas for the addition of 14 acres of new green spaces in Jackson and Burnham Parks; vehicular lanes were narrowed and shoulders were eliminated (Figure 45).
- The landscaping of medians and pedestrian underpasses throughout the project area.
- The replacement of removed trees with an equal number of caliper inches of replacement trees.
- Landscaping with native, hardy, and bird-friendly vegetation.
- Improved CTA bus access, especially at 31st Street.
- During construction, park sensitivity was practiced, including the monitoring of water quality, erosion control fences, the restriction of construction within tree drip lines, recycling of construction materials, and fencing to define work zones.

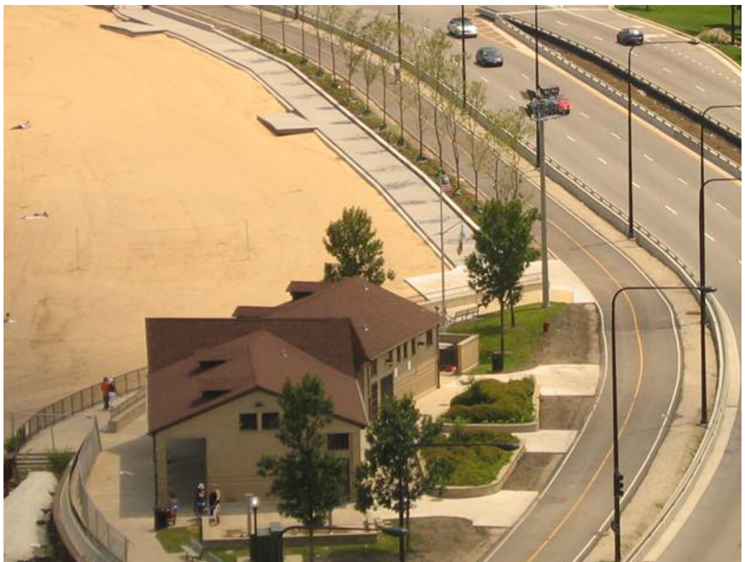

Figure 39. Boardwalk and Underpass at 57th Street Beach
Source: City of Chicago et al.

Figure 40. 59th Street Underpass
Source: City of Chicago et al.

Figure 41. 63rd Street Underpass
Source: City of Chicago et al.

Figure 42. Marquette Underpass
Source: City of Chicago et al

Figure 43. Animal Bridge.
Source: http://egov.cityofchicago.org/Transportation/lsd/schedule.html

Figure 44. 31st Street Bridge.
Source: http://egov.cityofchicago.org/Transportation/lsd/schedule.html

Figure 45. Before and After Photos of SLSD Depicting the Elimination of Shoulders and the Narrowing of Vehicle Lanes along SLSD
Source: City of Chicago et al.

As a result of the collaborative CSS approach, stakeholders were satisfied with the project outcomes. The planning and design phases took only 18 months. A more conventional project would have had wider ramps and travel lanes. Bicycle and pedestrian paths would not have been as wide, as numerous, or perhaps as elaborate. Stakeholders got the chance to hear a variety of opinions, and voice their own opinions and concerns. Initial planning and design costs were higher than some conventional projects, but savings were also incurred from the resulting planning and design efficiencies, and from the prevention of project retrofitting.

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Project 10 – Tri-Party Project, Downtown San Antonio, Texas

Overview

Downtown San Antonio is a viable tourist and nightlife attraction. However, in the 1980s, downtown San Antonio had significantly declined as a retail center for the city, and contained little healthy retail and commercial non-tourist attractions. Many retail businesses had moved to outlying shopping malls in the more affluent northern San Antonio. The city was struggling to attract new downtown tenants. The Riverwalk was thriving as a tourist, dining, and strolling destination. The City and the Downtown Owners Association (DOA) wanted to improve the downtown environment through street enhancements to help attract new businesses. VIA Metropolitan Transit (VIA) wanted at the same time to improve bus service to and through downtown and also make the transit patron walking and waiting environment more attractive.

Issues and Concerns

By the early 1980s, the main traffic carrying streets of downtown San Antonio had become congested. Some also had geometric discontinuities. Some had curb parking in some locations. In addition, pedestrians and transit users were not well accommodated. In the mid 1980s, VIA wanted to reconfigure Houston Street for "streetcar" (downtown circulator) use (see Figure 46), the City of San Antonio desired to improve vehicular traffic conditions, and the Downtown Owners Association wanted more pedestrian-oriented streetscape amenities and a more attractive business environment to attract more retail and office businesses.

Figure 46. VIA "Streetcar."
Source: TTI

Key CSS Features

The City, VIA, and DOA knew that project approval and funding would require all three agencies to participate in the planning, design and funding of the project. They also understood that other downtown stakeholders would have to be satisfied. They decided to take a partnership approach to the project and started with a Tri-Party cooperative agreement, combined committee structure, partnered funding. They established stakeholder committees and hired a project management firm to act as an independent project leader on their behalf. This helped keep the partners in equal positions since none of them had to lead. Other CSS features included:

- Public input and workshop process tailored to project scope and potential benefits and impacts.
- Project started with discussions of objectives, values and concerns and all participants had a say. They also had opportunities to suggest or request features for the planners to consider.
- Public input to master plan.
- Work with each abutting property owner and business on design details.
- Interest group input to historic and other important aspects (e.g., Alamo Plaza).
- Master plan and design to meet a variety of objectives from multiple stakeholders.
- Adaptive design to both objectives and variety of conditions.
- Different roles and priorities on different streets.

- Multimodal priorities and provisions.
- Design flexibility.
- Construction phasing to accommodate business, transit, traffic, and event objectives.

Process and Notable Outcomes

VIA, DOA, and the City of San Antonio collaborated on the Tri-Party Downtown Street Improvement Project, which involved the reconstruction of approximately 70 downtown San Antonio blocks, comprising of more than 5 miles of streets and 10 miles of sidewalks. The mayor of San Antonio appointed members to serve on three project implementation committees:

- Policy Committee – 3 each representatives from VIA (board members), the Downtown San Antonio Owners Association (board members), and the City of San Antonio City council members).
- Executive Committee – CEO of each organization.
- Technical Committee – VIA Director of Planning, City Assistant City Manager, DOA Executive Director.

The Downtown Owner's Association chaired the Policy Committee, the Executive Committee was chaired by the City Manager, and the Technical Committee was chaired by the VIA Planning Director. The Technical Committee reported to the Executive Committee, while the Executive Committee reported to the Policy Committee. The Policy Committee under direction from the mayor established what turned out to be a highly effective, consensus-building policy that no request or proposal was to be sent to the Policy Committee unless it represented consensus of members of Executive Committee. This helped the Tri-Party teams establish joint goals and reach agreements all types of issues.

The project started with a master plan developed with extensive public participation. The master plan developed the concept for the project. A design process developed the details. The project consisted of:

- Converting the Houston-Travis Street one-way pair to two-way streets, with Houston being narrowed to two lanes primarily for VIA streetcar service.
- Improving geometrics and traffic signal operation to increase capacity and operational efficiency on the Commerce-Market one-way pair, but removing curb parking so sidewalks could be widened.
- Improving selected intersections.
- Reconstructing the downtown core portions of several other streets that served bus routes.
- Reconstructing sidewalks on all project blocks to provide improved appearance, sidewalk amenities, bus stops and shelters, guide signing and related improvements.
- Reconstructing Alamo Street in front of Alamo Plaza and the bus stop there in a manner that was consistent with the Alamo's building materials and also to restore the integrity of the area in front of the Alamo (e.g., limestone pavers, no curbs (bollards), special pavers to designate location of original acequia (ground level water supply channel) that served the area (see Figures 47–49).

Figure 47. Alamo Plaza.
Source: TTI

Figure 48. Alamo Street at Alamo Plaza.
Source: TTI

Figure 49. Alamo Street Sidewalk Showing Alignment of Old Acequia that Carried Water to the Area.
Source: Ben Brewer

The Tri-Party team approached project design on a block-by-block basis. They worked individually with each property owner to customize the design to local needs and preferences (within a range of choices). This provided property owners and business proprietors with choices related to such details as tree species, pavement textures, streetlight types, parking configurations, and bus shelters locations.

At Alamo Plaza, the historical context was accommodated. Curbs were omitted from the design and replaced with bollards. Dark shale sidewalk pavers complemented the Alamo design. Trench drains were utilized in lieu of curb drains. Houston Street and Alamo Plaza now accommodate bus streetcar service and pedestrians with little vehicular traffic. Other streets contain linear transfer centers. City Ordinances were enacted to require utility companies to provide funding to the City of San Antonio so it could re-pave streets to fully restore the improved paving or amenities after any utility work to maintain street integrity.

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http://downtownsanantonio.org/
http://www.sanantonio.gov/
http://www.viainfo.net/

Project 11 – Culver Boulevard, Culver City, California

Overview, Issues, and Concerns

Culver City is a landlocked Los Angeles suburb southwest of central Los Angeles. Culver City has a population of approximately 40,000. Culver Boulevard remains one of the main traffic routes through the town, but it also has had historic roles over time. Culver Boulevard functioned as a main street in the early periods of the town, which was incorporated in 1917. Shortly thereafter, movie studio accommodation had become the primary economic base. Culver City still remains the locale of several theatres and movie studios; the city is known as "The Heart of Screenland."

At one point, Culver Boulevard was owned by Caltrans, but was later given to Culver City. Prior to World War II, the Pacific Electric Railroad ran down the center of Culver Boulevard as an interurban passenger railway. In the 1970s, Caltrans completed the I-10 (Santa Monica) freeway parallel to Culver Boulevard. The addition of this freeway and development elsewhere drew commercial development away from Culver Boulevard, leading Culver Boulevard into economic downturn. By the 1990s, Culver Boulevard suffered from traffic congestion and was in need of revitalization. The City of Culver City and the Culver City Redevelopment Agency joined to redevelop the 1.5-mile Culver Boulevard in the 1990s and decided to approach the project with a joint CSS-like process in order to restore the former glamour and movie studio appeal of the area.

CSS Process and Notable CSS Outcomes

In the late 1980s and early 1990s, Sony Pictures headquarters located on Culver Boulevard (Figure 50). Around this time, the City of Culver City initiated a revitalization effort for Culver

Boulevard. As part of this effort, the city decided it wanted to build a new City Hall and a new fire station on Culver Boulevard.

Figure 50. Sony Pictures Entertainment Located on Culver Boulevard.
Source: http://www.culvercity.org/info/harry_culver.asp?sec=arts

In the mid-1990s, the city initiated the CSS-like collaborative process. The project contained three distinct facets. Phase I entailed the revitalization of the central business area of Culver Boulevard. Phase II involved the reconstruction of the eastern portion of the street, while Phase III entailed streetscaping and the farther extension of the eastern portion. The last two phases were undertaken due to the success of the first. Construction of all projects was complete by 2008, and the area is well into redevelopment and is booming with new commercial and residential development.

During the planning and design stages of all three phases of reconstruction of Culver Boulevard, a CSS process was conducted. Businesses, residents, and other stakeholders provided input to project leaders on desired amenities at workshops and charrettes. Public presentations of the findings were then given to receive additional citizen input. Design configurations were then forwarded to the City Council, and most suggestions were accepted. Because the Phase I right of way contained the vacant Pacific Electric Railroad corridor, the stakeholders had the advantage of working with a relatively wide right of way. Some notable outcomes of the process include:

- Business, property owner, and other stakeholder involvement in developing the design concept, with input directed at helping redevelopment and revitalization of the area.
- Development of a movie-related theme expressed in features along the street.

- The incorporation of wide sidewalks, some as wide as 30 ft in the Phase I section, to make the area more walkable and to encourage pedestrianism and create a street café ambiance for restaurants of the area (Figures 51–53).
- Increased attractiveness for restaurants to boost the economic activity along Culver Boulevard.
- Raised medians for both pedestrian safety and aesthetics.
- The incorporation of planters and street trees to line the sidewalks.
- The inclusion of streetscaping amenities, including traffic signals, lighting, plazas, and benches.
- The new City Hall was given a movie studio façade to reflect the character of Culver City (Figure 54).
- The revitalization a bridge within the area consistent with the theme and look of the area.
- The realignment of the street and a major intersection to solve a congestion problem.
- The creation of a "Walk of Fame" that incorporated bollards; each bollard contains a movie filmed in Culver City and its director, actors, and actresses.

Figure 51. Culver Boulevard Streetscape.
Source: http://oneshotexhibition.org/blog/wp-content/uploads/2007/11/p1030221.JPG

Figure 52. Culver Boulevard Streetscape
Source: Kimley-Horn and Associates, Inc.

Figure 53. Culver Boulevard Streetscape and Pedestrian Friendly Crosswalks
Source: Kimley-Horn and Associates, Inc.

Figure 54. Culver City Hall's Movie Studio Type Façade.
Source: http://www.culvercity.org/info/harry_culver.asp?sec=arts

Key CSS Practices and Features

Among the CSS approach, practices, and features were:

- The establishment of a multi-disciplinary project team.
- The inclusion of businesses, residents, and other stakeholder inputs in design.
- The consideration of the existing and desired movie studio, restaurant, and retail contexts in design.
- The accommodation of multiple forms of transportation in design.

Information Sources

http://www.culvercity.org/info/history.asp?sec=arts
Bochner, Brian. (2008, May 8). Texas Transportation Institute. (A. Lehnert, Interviewer).
Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers, Washington, DC, March 2006.
Steaffens, Bob. (2008, May 30). Parsons. (B. Bochner, Interviewer).

Project 12 – The Central Freeway Replacement Project and the Octavia-Market Neighborhood Plan, San Francisco, California

Overview, Issues, and Concerns

Following the 1989 Loma Prieta earthquake that badly damaged the Central Freeway (US 101 in San Francisco), Caltrans established new seismic structural requirements for elevated freeways.

The most severely damaged (northernmost) segment connecting to Franklin and Gough Streets was demolished in 1992. The north end of the Central Freeway, a spur off I-80 and US 101, had to be reconstructed as a result of earthquake damage, the new seismic requirements, and increasing traffic congestion. Over a period of nine years between 1989 and 1998, the City of San Francisco, the San Francisco County Transportation Authority, and Caltrans endeavored to arrive at an acceptable plan to either reconstruct and strengthen the damaged freeway or remove a portion of the freeway.

After much deliberation and multiple public referenda, it was decided to tear down the northern section of the Central Freeway and terminate it at Market Street. The eight eliminated blocks of freeway north of Market Street (Figure 55) were replaced by surface streets that connected the new freeway terminus to both the east-west Fell Street and Oak Street couplet and the rest of the street system (Figures 56–57). The removal of the freeway and construction of Octavia Boulevard (Figure 58) also removed a jog in the Fell-Oak pair that double-loaded Franklin and Gough creating congestion in that section.[21]

Figure 55. The Former Central Freeway with Market Street on the Left and the Connector to the Fell-Oak Pair Veering Off to the Left.
Source: http://www.spur.org/files/u32/urb_0210_when_central.jpg

[21] *The Market and Octavia Neighborhood Plan: Draft for Public Review*, San Francisco Planning Department, December 2002, p. 132.

Figure 56. Overview Map of the Market/Octavia Neighborhood after Central Freeway Was Terminated at Market Street (Formerly Extended North to Fell and Oak Streets).
Source: http://maps.google.com

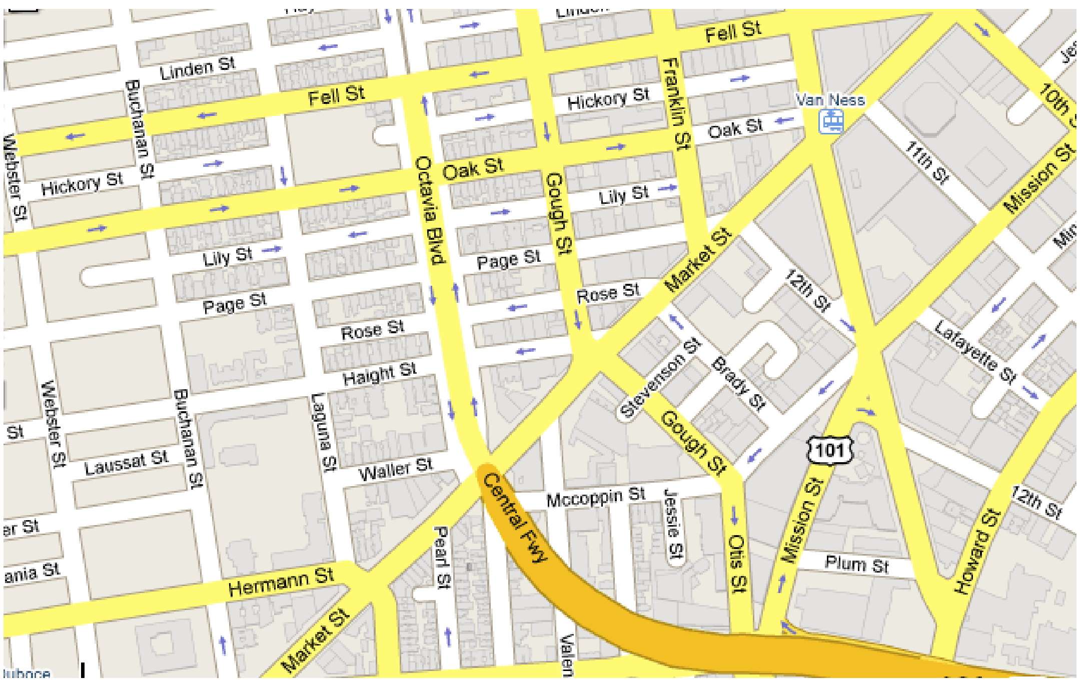


Figure 57. Overview Map of the Market/Octavia Neighborhood.
Source: http://maps.google.com/
http://repositories.cdlib.org/cgi/viewcontent.cgi?article=2248&context=ced/places

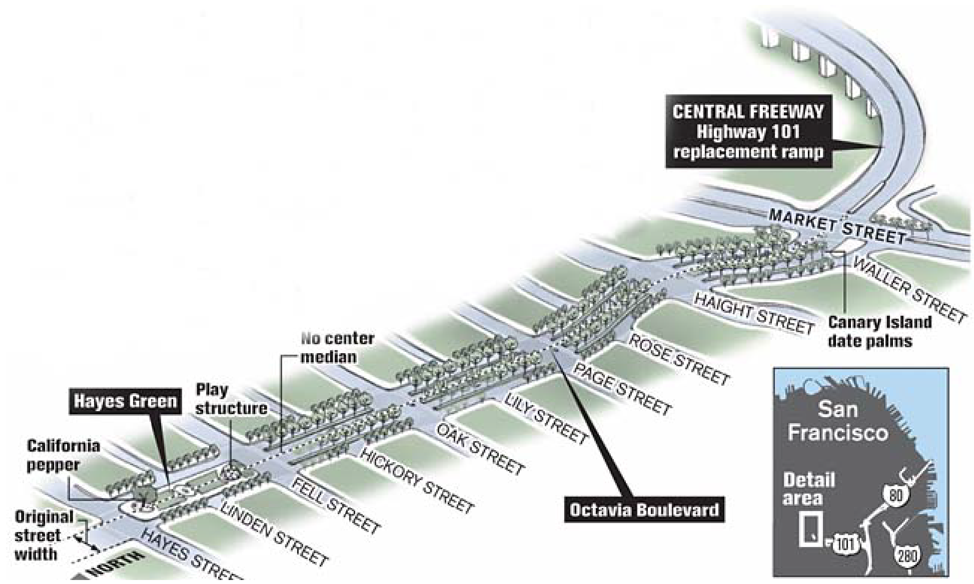


Figure 58. Octavia Boulevard, Looking South.
Source:
http://www.sfgate.com/cgibin/object/article?f=/c/a/2007/01/03/BAG4VNBUJM1.DTL&o=2

In separate but related efforts, the City decided to develop plans for both the main connector between the freeway and the Fell-Oak pair and a citizen-involved land use plan covering the former freeway right of way. The plan for what became the connector—Octavia Boulevard—evolved much more quickly due to the need for the connector (see Figure 58). *The Market and Octavia Neighborhood Plan* started in earnest in 2000, and was completed and adopted in 2008.

Notable CSS Outcomes and Timeline of Major Events

Caltrans once had an early freeway system plan for the City of San Francisco in which the Central Freeway was slated to connect the eastern portion of the city to the Golden Gate Bridge in northwest San Francisco. The first part of the central freeway was built from US 101 and I-80 to the Fell-Oak pair. However, after this and another elevated freeway were completed, a "freeway revolt" against elevated and other freeways followed, and in 1973 the city adopted a "transit first" policy. In 1998, voters confirmed this policy.

The freeway was damaged in the 1989 earthquake. It also damaged the elevated Embarcadero Freeway in downtown on the east side of San Francisco. The city and Caltrans decided to demolish the earthquake-damaged Embarcadero Freeway for financial reasons. This opened up the adjacent land to the waterfront, producing a lot of redevelopment along the corridor and other favorable results. This endeavor served as a precursor to the demolition of the north end of the Central Freeway.

Before the removal of the Central Freeway, Caltrans attempted to develop plans to repair it after the earthquake. Subsequently the city and Caltrans decided to rebuild the Central Freeway. However, the city decided subsequently to reconsider the plan, learning from the Embarcadero experience that there were more options than simply rebuilding.

The San Francisco Board of Supervisors then appointed a task force in the early 1990s to determine various alternatives to the Central Freeway. The task force proposed a multi-way boulevard concept in lieu of freeway replacement. The task force forwarded these concepts to the Board of Supervisors. However, the Board of Supervisors subsequently put the project on hold, unsure of how to approach the issue in the face dissenting opinions of the proposal. After extensive citizen involvement from neighborhood residents, a series of referenda finally enabled the city to proceed with the boulevard design. In March 2003, Caltrans demolished the Central Freeway north of Market Street and began the development of Octavia Boulevard. Content to forego construction and maintenance duties, Caltrans transferred the former freeway right of way to the city, including the surrounding land parcels. Proceeds from development of these parcels will help fund future construction and maintenance costs.

At this juncture, a 12 member Citizens Advisory Committee (CAC) was appointed by the San Francisco Board of Supervisors to delineate design details of Octavia Boulevard. The CAC contained Caltrans, the San Francisco Planning Department, the San Francisco Department of Parking and Traffic, neighborhood residents, biking and pedestrian advocates, architects, and other city officials. The CAC then passed desired designs to the San Francisco Department of Public Works, the department responsible for the final design and construction of Octavia Boulevard. Design details included landscaping, tree species allocation, sidewalk textures, and parking configurations. Notable outcomes of the project include:

- A 6-lane multi-way boulevard, including four central traffic lanes divided by a median, and two periphery access lanes separated from the central traffic lanes by medians (Figures 59–60).
- Extensive landscaping of the medians.
- Provision for pedestrians and bicyclists.
- The dispersal of traffic throughout the surrounding street grids, facilitated by the boulevard design.
- The northern culmination of the boulevard with the highly-utilized Patricia's Green Park.
- An architectural design contest for new buildings facing Octavia Boulevard, fostering community pride and the incorporation of unique styles.

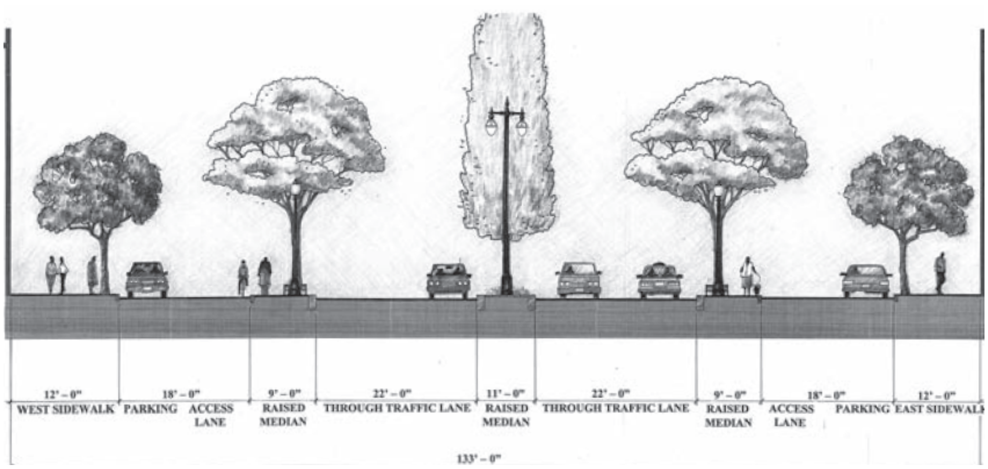


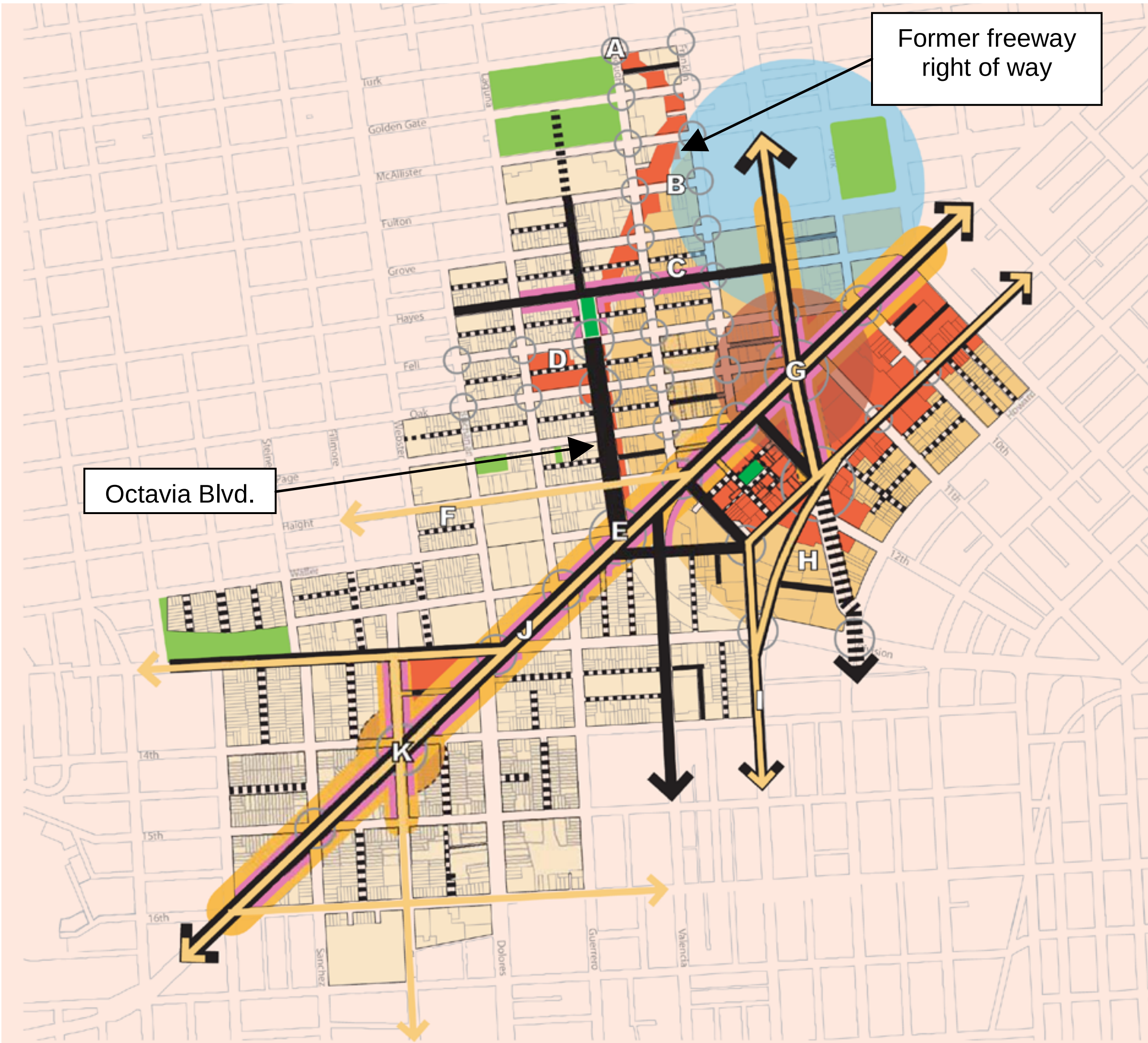
Figure 59. A Typical Cross-Section of Octavia Boulevard.
Source: http://repositories.cdlib.org/cgi/viewcontent.cgi?article=2248&context=ced/places

Figure 60. Octavia Boulevard.
Source: http://www.sfgov.org/site/sfdpw_page.asp?id=32258

All in all, stakeholders and officials the of the Octavia area agree that conditions are now much improved. The tree lined boulevard has helped foster civic, pedestrian, and bicycle friendly environments. Economic development has been encouraging, and the Hayes Valley Neighborhood is now prime real estate. The project has been well received by citizens of the area. Caltrans remained responsive to the voter's wishes, and an exemplary, award winning project resulted.

The Market/Octavia Neighborhood Plan

The motivation for the land use plan started with the freeway right of way, but was quickly expanded to a larger area after it was concluded that the removal of the freeway would initiate the redevelopment of a larger area. Early on it was decided that the area should be transit-oriented, and that the area should be walkable, keeping with the "transit first" mantra. The plan area was based on a convenient walking distance from the right of way and Market Street, adjusted to take in neighborhood subareas. Figure 61 shows the Market/Octavia Neighborhood Plan area.



Ⓐ Improve pedestrian safety on major traffic streets

Ⓑ Enhance the existing cluster of cultural and institutional uses in the Civic Center area

Ⓒ Improve the quality, vitality and accessibility of the area's neighborhood commercial streets

Ⓓ Support new mixed use residential development on the former freeway parcels

Ⓔ Create a network of civic streets and open spaces, with new parks, street improvements and extensive tree planting

Ⓕ Support residential infill within the fine-grained physical pattern of existing residential neighborhoods

Ⓖ Encourage high density housing and supporting uses close to the transit services on Van Ness and Market Streets

Ⓗ Create a new mixed-use residential neighborhood i the SoMa West area

Ⓘ Encourage more housing and intensified commercial activities along the area's core transit streets

Ⓙ Strengthen the role of Market Street as the city's cultural heart and most important transit street

Ⓚ Improve the intersection of Church and Market Streets as a major transit hub

Figure 61. Octavia-Market Neighborhood Plan Area and Framework Plan

Source: San Francisco Planning Department, 2010

The plan was developed through a community driven CSS process. Outreach was extensive. Many stakeholder groups were involved including residents, businesses, property owners, and other interested groups (e.g., bicycle, environmental, and historic preservation advocates). At least 15 community workshops, averaging about 100 participants, were held to discuss plan goals, develop plan concepts and options, zoning, potential impacts, and implementation methods. The key goals were:[22]

- Do not displace people—no homes should be lost.
- Encourage diverse and affordable housing.
- Create choices for movement—foster alternatives to the car.
- Make streets safe and attractive places to walk, bike, and meet.
- Repair and enhance the neighborhood's urban fabric—build on strengths.
- Provide for convenient neighborhood services.
- Value residences, shops, and active uses over automobile parking.
- Remove the Central Freeway and replace it with Octavia Boulevard.

Over time, the plan concept evolved with the help of several consultants (e.g., land use, economic, transit), the San Francisco Planning Department, and the surrounding neighborhoods. A transit-oriented development (TOD) concept was developed that will encourage walking and transit use while discouraging personal vehicle use. At the same time, it was decided to reconstruct the former street grid that had existed before the freeway was built to help diffuse and alleviate traffic.

The plan that was eventually adopted proposes new zoning for appropriate residential and commercial uses, streetscape and open space improvements, and places high-density land uses close to transit. The plan calls for the development of about 6,000 new dwelling units (DUs), plus commercial space. About 900 DUs will be on the former freeway right of way; the rest will be throughout the plan area. Many buildings will have ground floor commercial. Along Octavia Boulevard, all buildings will face Octavia. Parking will be limited, with a cap approximate to the previous minimum parking ratios (e.g., residential ratios of ¼ to ¾ space/DU), depending on zoning district and development size. Off-street parking facility widths along streets are very limited to encourage active block faces. Larger parking facilities and commercial developments are also required to provide additional spaces reserved for car-share vehicles in a manner similar to handicapped spaces.

The new zoning ordinance uses height instead of density to regulate development intensity. It also requires a minimum percentage of DUs to have two or more bedrooms (to prevent too many efficiencies and one-bedroom units). The plan calls for a percentage of the units to be affordable housing. Figure 62 shows the final land use plan.

[22] The *Market and Octavia Neighborhood Plan* (draft for public review), San Francisco Planning Department, December 2002, p. 3.

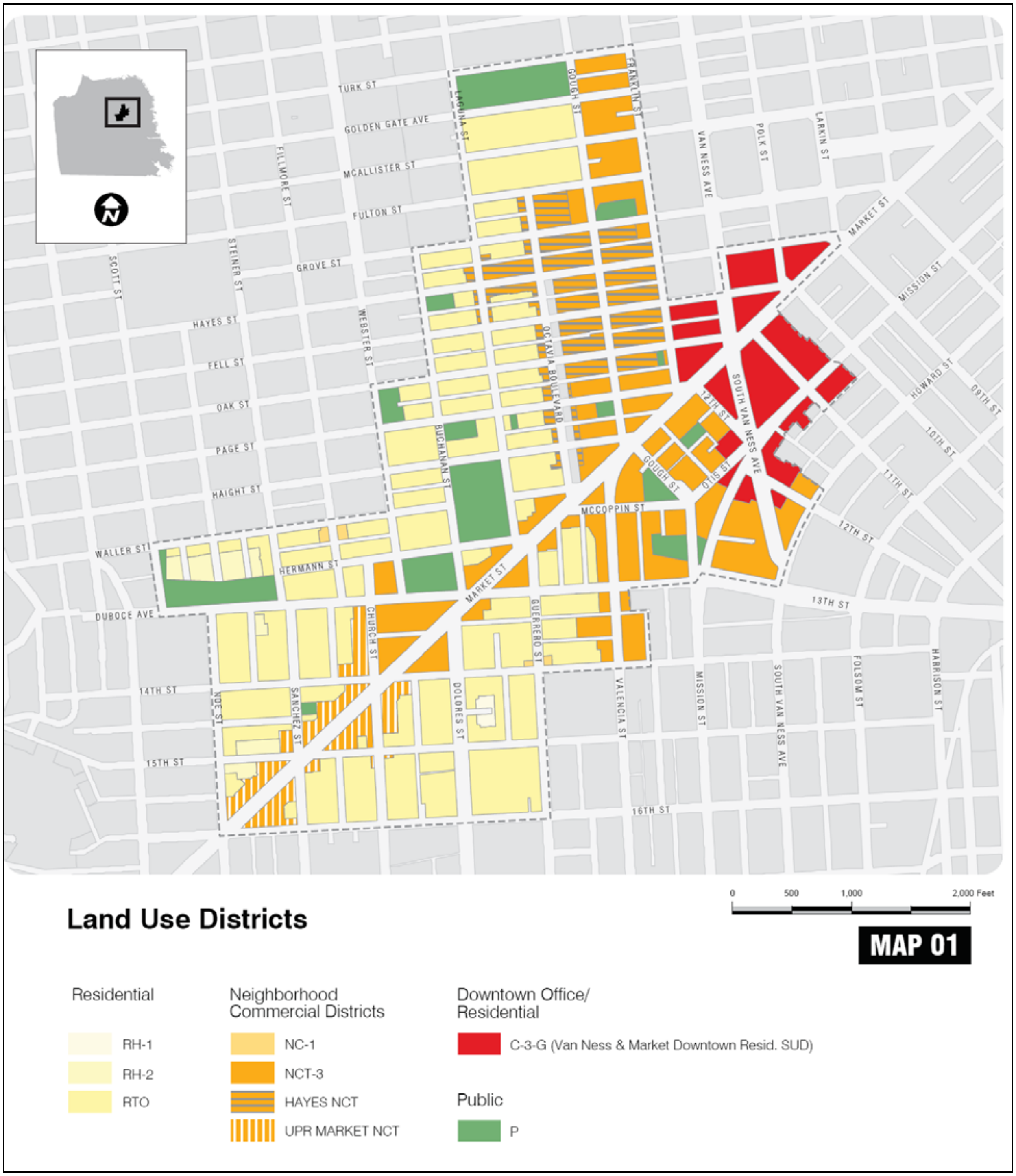


Figure 62. Market-Octavia Area Land Use Districts.
Source: San Francisco Planning Department

The City is using an RFP process to sell parcels of former freeway right of way to developers (approximately 23 parcels). This method includes extensive design guidelines and is used to encourage and ensure development that meets the intent of the plan. Some smaller parcels will be auctioned off. Due to the uncertainty about the final plan and zoning for the plan area and its subdistricts, most developers have held off on area redevelopment plans. However, there were apparently several projects that were waiting until formal plan and zoning ordinance adoption to submit plans. Plans approved so far for residential redevelopment have all included 100 or more DUs.

Planning and zoning ordinance development and adoption took about eight years, due to the complexity of the area, the number of stakeholders involved, and the number and variety of conditions, objectives, and issues affecting each of the numerous subdistricts within the plan area. Kearstin Dischinger, the city project manager for the area plan, said one lesson learned was that combining all the subdistricts and their different needs into one plan effort may have extended the planning period, but at the same time, it facilitated coordination. By using an open and participative process, the city received mostly positive and constructive input from the public even though they encountered some "no change" mentality from a few people. The collaborative CSS process produced a plan that generally met area objectives established by the stakeholders, although not every objective could be met in every area.

Key CSS Practices and Features

The most vital components of the CSS planning process included:

- The formation of a multidisciplinary task force to determine the original multi-way boulevard concept.
- The formation of the CAC to determine design details.
- The accommodation of multiple stakeholders with the inclusion of amenities such as bike lanes and transit facilities in designs.
- The formulation of the Market/Octavia neighborhood plan with the input from area citizens.

Information Sources

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http://www.sfgov.org/site/octavia_blvd_index.asp
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King, John, San Francisco Octavia Boulevard -- an urbane triumph: Few flaws found on test drive of city's newest entry route. *San Francisco Chronicle,* September 13, 2005, retrieved

March 3, 2008 from http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2005/09/13/BAGP6EMIOR1.DTL
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The Market and Octavia Neighborhood Plan, San Francisco Planning Department, undated, retrieved September 14, 2010 from http://www.sf-planning.org/ftp/files/Citywide/Market_Octavia/Market_and_Octavia_Area_Plan_2010.pdf
Better Neighborhoods 2002 Market/Octavia Study Area: Existing Conditions Report, San Francisco Planning Department, 2001, retrieved April 20, 2008 from http://www.sfgov.org/site/uploadedfiles/planning/neighborhoodplans/pdf/MO_TBR.pdf
Selna, Robert. (2008). Octavia Blvd. housing debate. *San Francisco Chronicle*. Retrieved March 3, 2008 from http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/02/26/BALMV8LBM.DTL
Ward, Jacob. (2005). Where the Highway Ends: San Francisco's New Boulevard Is Part Thoroughfare, Part Pathway, and Part Park *Metropolis Observed*. Retrieved March 3, 2008, from http://www.metropolismag.com/cda/story.php?artid=1433

Case Study Conclusions

This report describes 12 case studies that used CSS in a variety of different types of projects under several different circumstances. Perhaps no two are the same. However, the common thread through all of them was that in order to gain stakeholder consensus it was felt to be worth the effort to use a CSS process to develop the project objectives and concept, or at least major features of the project if the concept was already accepted. Some projects needed design flexibility in addition to the CSS process. Most used innovative (or certainly different) design features to help the projects meet the full objectives of both the transportation project and the adjacent area. Almost certainly none of the projects ended up being what might be considered a standard project for the sponsoring agency. In some cases the sponsors expressed the opinion that the CSS-generated project was better for the community (and frequently the sponsoring agency) than it might have been if just a standard approach was used.

The 12 projects should provide practitioners and decision makers with some precedents that they can rely on as examples of CSS successes. More such examples have recently been added to the www.contexctsenstivesolutions.org website.

PowerPoint® presentation slides have been developed for the case studies contained in this report. The presentation files typically consist of five to ten slides meant to be shown in a group of examples. Those files are available from the University Transportation Center for Mobility™'s website at http://utcm.tamu.edu and/or from Texas Transportation Institute.

UNIVERSITY COURSE ON CSS

The university graduate course was offered twice, for the summer sessions in 2008 and 2009. Texas A&M University requires a course to have at least five students. Neither offering drew as many as five students. Civil Engineering and Urban Planning faculty members felt that a crowded graduate student schedule with many popular and required courses during all school terms just did not leave open many options to enroll in extra classes. CSS was also not well understood by many of the students. In addition, a part process and part planning and design course may have fallen between areas of typical student interest.

CSS is an important concept for new professionals to understand. A few ways to generate more interest might include:

- Offer a one-class introductory guest lecture to urban planning and transportation planning and design classes.
- Offer presentations on CSS to student chapters of professional planning and engineering organizations (e.g., Institute of Transportation Engineers (ITE), American Planning Association (APA), American Society of Landscape Architects (ASLA), American Society of Civil Engineers (ASCE)).
- Make the presentations exciting using some of the case study examples to show how those with CSS skills can solve challenging problems and develop highly noteworthy, attractive, and even more popular projects.
- Revise the course syllabus to highlight what might be the most popular features for students.

4. CONCLUSIONS AND RECOMMENDATIONS

This project sought to develop and deliver information to explain and encourage the use context sensitive solutions in project development processes for transportation improvements. The materials developed consisted of:

- Case studies of projects that successfully employed the CSS approach and process and often additional design flexibility also encouraged as part of CSS.
- Presentations of varying lengths explaining and demonstrating the benefits of CSS.
- A university graduate course to provide students with a working knowledge of CSS so they would be ready to use it upon entering the workforce.

These materials were all developed. The 12 case studies produced in this project provide a wide variety of examples of successful use of CSS, often as a way to approach the most challenging conditions, such as public opposition and very complex needs that extend beyond transportation needs and into neighborhood, business, and other needs.

As this project approached initiation, the project team was approached by the Texas Division office of FHWA to co-sponsor a series of 1-day CSS workshops throughout Texas. Presentation material was to vary according to interests or issues in each area where the workshops would be delivered. This project both aided and was benefited by presentation made by TTI and others as well as the discussions that transpired during the workshops. Discussions and feedback provided good insight to the factors causing CSS to be so slowly integrated into state DOT practice as well as in local agencies.

The preparation of materials and discussions during workshops and other interactions pointed toward some definite conclusions:

- CSS can be very beneficial to project sponsors as well as project corridor or area stakeholders and the public.
- CSS is not well understood by many prospective users.
- Some agencies are wary of CSS, thinking it will just add cost and time to projects, and may lead to loss of decision control.
- Some agencies view CSS as another federal "unfunded mandate."
- Some agencies or administrators would prefer little change from "tried and proven" approaches.
- Like many new things, CSS is not widely used unless agency and project development directors direct that it be used.
- Those agencies and consultants that have used CSS concur that it helps gain stakeholder and community acceptance by addressing widely varying issues and needs from the outset.
- Those same proponents verify that the CSS process can save time and money in later stages of a project by avoiding disputes and late revisions.
- Some people who are uncertain about CSS see the value of CSS when shown successful examples similar to difficult projects they have recently undertaken; when choosing material to show audiences, prior knowledge of recent tough or unsuccessful projects will help a presenter select successful projects that can convince the audience of the value of CSS.
- Stakeholders and the public generally like CSS because it gives them an opportunity to participate constructively from the outset and they get a broader range of issues and needs discussed and addressed; projects usually also include features that better support the community's or project area's non-transportation needs.
- Most designers and nearly all stakeholders appreciate the design flexibility used in CSS projects.

The bottom line is that agencies, their directors, and project development directors and managers need to be educated about the advantages and benefits of the CSS approach. Moreover, they also need training on how to use it. There is very little that is totally new. CSS is little more than an efficient repackaging of processes and tools that are and have been used successfully for a long time (more by local agencies) for projects with overlapping transportation and community objectives, values, and issues.

CSS can become common in use by transportation agencies at all levels. The easiest and fastest way would be for CSS to become required for any project using federal funds. Unless and until that happens, more and better outreach and education—especially aimed at agency directors and design or project development directors—will be most effective. Starting with difficult or controversial projects may be the best way for an agency to realize quick benefits. That has been the entry for many agencies so far.

APPENDIX

Appendix Table A-1. FHWA/TTI Workshop Presentations[a, b]

Workshop	Presenter	Title/Subject
Arlington	Kessler	CSS in North Texas
	Berry	What is CSS?
	Bochner	I-30/35W reconstruction
	Phillips	Three bridges Arlington project
	Bochner	CSS changes by situation
	Berry	CSS process
	Berry	CSS pros, cons, benefits
	Storey	CSS examples – High 5 interchange and TxDOT district aesthetic master plans
	Bochner	CSS and developers
	Bochner	CSS in designing major urban thoroughfares
	Bochner	CSS summary
El Paso	Phillips	Past local CSS projects
	Gomez	Recent and current TxDOT CSS projects
	Bochner	Successful projects from elsewhere
	Phillips	TxDOT landscape and aesthetic master plans
	Ostlind	Houston transit corridor
	Bochner	Ft. Worth and San Antonio transit street projects
	Bochner	What is needed to implement CSS projects
Lubbock	Fauver	Introduction to CSS
	Storey	Lubbock master plan
	Warren	Lubbock area examples
Austin	Bochner	CSS successes in central Texas
	McCann	Mueller airport redevelopment
	Lopez-Merritt	Austin TODs
	Bellomy	North Burnett & Central Park development
	Campbell	Envision Texas
	Espinosa	US 183A and US 290E CTRMA
Hidalgo County	Roberts	South Texas CSS projects
	Ellman	River restoration projects
	Winton	Need for river restoration projects
San Antonio	Freisenhahn	TxDOT CSS examples
	Brewer	San Antonio downtown tri-party street improvements
	Hensley	Alamo Plaza revitalization (2 parts)

Workshop	Presenter	Title/Subject
	Vina	BRT for San Antonio
	Hammer	Brooks City Base
	Clear	City South
Houston	Bochner	Project development process
	McWashington	Katy Freeway
	Heineman	CSS in the Woodlands
	Blatnika	PB CSS experience
	Gornet	Grand Parkway and CSS
	Eury	Downtown transportation and CSS
	Slaughter	METRO solutions
	Blackburn	US 290 CSS
	Martinson	Energy Corridor District
Bryan	Jacob	TxDOT Bryan district projects
	White	CSS and user input
	Conlee	Bryan and CSS
	Jacob	Northgate
	Fulgham	Downtown Bryan
Texarkana	Lindholm	Rose Hill redevelopment project
	Lindholm	Texarkana HOPE VI project
	Johnson	Christus-St. Michaels
	McCaleb	US 82-Loop 14 project
	Simmons	US 82-FM 989 project

[a] includes only one version if similar presentation repeated at multiple workshops
[b] Includes presentations which for which permission was granted to post them for public use.

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