



Center for Environmental Excellence

Design Flexibility and Context Sensitive Solutions Workshop

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Introduction

The Center for Environmental Excellence at the American Association of State Highway and Transportation Officials (AASHTO) is a partnership with the Federal Highway Administration (FHWA) that promotes environmental stewardship and encourages innovative ways to streamline the transportation delivery process. The Center is designed to serve as a resource for transportation professionals seeking technical assistance, training, information exchange, partnership-building opportunities, and quick and easy access to environmental tools. Each year, the Center's Technical Working Group develops a work plan for the Center in collaboration with FHWA. As part of the 2019-2020 work plan, the Center was charged with conducting a Flexible Design Workshop and producing a summary report.

The Center organized and held a half-day workshop for practitioners on July 21, 2019 at the Joint Meeting of the AASHTO Council on Active Transportation (CAT) and the AASHTO Committee on Design (CoD) in Reno, Nevada. The workshop provided an opportunity for participants to discuss challenges associated with flexible design implementation; including gaps in training, technical assistance, and capacity building needs. The vast majority of the over 100 attendees were from State DOTs, although some participants came from the private sector, city DOTs, and educational institutions. This document summarizes the workshop by identifying major topics that were discussed during the facilitated roundtable sessions and report out and includes related resources for reference.

Opening Session

Melissa Savage, The Center for Environmental Excellence

Joyce Taylor, Maine DOT

Shari Schaftlein, FHWA

Faisal Hameed, EXP (TRB)

Nancy Boyd, WSP (TRB)

Joyce Taylor, the Chief Engineer at Maine DOT and vice-chair of the AASHTO Committee on Design, opened the workshop and discussed how the definitions of concepts like flexible design, context sensitive solutions, and context sensitive design have changed over time. From earlier working definitions of CSS, one can trace the strong continuity in subsequent evolving terms and definitions. This development is indicative of a larger evolution in the principles of flexible design/CSS/D.

AASHTO, its various committees, FHWA, and other organizations such as TRB and ITE have worked collaboratively to advance the practice of flexible design/CSS/D throughout this evolution. With the rise of connected and autonomous vehicles and micromobility, the way the industry addresses flexible design/CSS/D will continue to evolve. Shari Schafflein, Director of the Office of Human Environment at FHWA, echoed this sentiment in her opening remarks and discussed FHWA's recent activity around flexible design/CSS/D.

Dr. Faisal Hameed, Chair of the TRB Subcommittee on Context Sensitive Design/Solutions (AFB001), provided an overview of current topics that the Subcommittee is addressing. Nancy Boyd spoke on terms and definitions related to flexible design/CSS/D and barriers perceived in implementing flexible design/CSS/D.

Prevailing Themes

Attendees engaged in small group discussions with their peers during 1 ½ hour facilitated roundtable sessions. Facilitators guided attendees through a set of ten questions focused on flexible design and a volunteer note-taker captured the major points of the conversations. After the conclusion of the facilitated roundtables, a designated speaker from each table reported on the key takeaways from their group. Both the note sheets and the report outs have been used to prepare the summary document, which focuses on the prevailing themes related to flexible design that practitioners identified during the workshop.

1. Changing Workforce

The demographics of state DOT employees are changing. As an aging workforce moves into retirement, retirees take their institutional knowledge with them. At the same time, the next generation workforce needs to build this knowledge from scratch. New entrants into the transportation workforce provide agencies with an opportunity to shift their culture as today's civil engineers are being taught with a focus on multi-modal design methods, but organizational structure can be an impediment in integrating flexible design/CSS/D at their agencies. Aside from having different coursework, these new employees may have different training needs and preferences for receiving training (method, timing, etc.) and agencies will need to consider these elements when developing flexible design training programs.

2. Shifts in Culture and Thinking

Closely associated with demographic changes in the workforce, participants mentioned that they are undergoing significant changes in culture and ways of thinking within their agencies that impact flexible design. Roundtable discussions highlighted the need for support and tools as agencies undergo cultural and institutional changes. During this period of change, participants stressed the need to have “champions” at the executive level to integrate flexible design/CSS/D into the project development process. Traditional traffic performance measures and attitudes can be a challenge to larger flexible design/CSS/D implementations. “Champions” would insist that flexible design/CSS/D be the agency's default approach, endorsing change and engaging with decision-makers to gain support for flexible design/CSS/D. Where these champions sit within their agencies is critical for consistency's sake, given

staff turnover and status as political versus career appointees. With champions in place, thought leadership could trickle down across an agency and could be made part of a state DOT's philosophy. Participants also recommended that agencies need to take down silos and, when possible, build multidisciplinary and/or interagency teams to work collaboratively. Equally as important, participants discussed how licensing standards could support flexible design/CSS/D principles in CE coursework, indicating that interfacing with engineering schools to encourage mandatory flexible design courses into their curriculums would be beneficial to state DOTs in helping next generation engineers develop sound design thought and engineering judgment.

3. Focus on Moving People, not just Cars

Participants recognized that the transportation industry is shifting towards multi-modal design that requires flexible design incorporating all road users, not just cars. This change is beyond the shift in culture and thinking as explained above. There is a major need to address all users of a transportation system and to involve multi-modal aspects from the initial scoping of a project, considering land use contexts, determining how to balance the needs of these modes, and including multi-modal criteria in design.

4. Communication and Outreach

Improved communication and stakeholder outreach regarding flexible design will be critical as state DOTs meet a changing workforce and industry. Participants expressed the need for improved engagement with elected officials, decision-makers, staff, and the public, especially in instances where public interest conflicts with the agency. Utilizing social media channels may be helpful in boosting engagement with the public. Furthermore, two-way communication throughout the stages of project development between planners and designers was also suggested, including early coordination meetings and the development of well-defined purpose and need.

5. Training and Resources

Participants identified several areas in which more training and additional resources were needed regarding flexible design/CSS/D. More information is needed on the entire process of measuring benefits, which spans from identifying methods that determine how to measure benefits, to the best

way to measure them, and extends to communicating findings both internally and externally. Closely related, practitioners would like more information on how to measure benefits when comparing alternatives during analysis and asked for assistance in how to best measure the benefits of adding bike and pedestrian facilities. Participants also asked for details on how to incorporate other indicators such as public health, livability, and economic development into analysis. They expressed a need for better data: tools, metrics for what agencies value, and metrics for all modes as well as case study examples of pre-and post-analysis and templates for conducting such analyses.

Participants expressed the benefits of peer exchanges. Peer-to-peer opportunities are helpful in addressing challenges and opportunities in flexible design, and participants would like to see their agencies encourage cross-training and activities that link planners and designers more closely. Practitioners said they are looking forward to updated guidance documents, including the Green Book 8.

6. Funding and Financing

Several topics related to the funding and financing of practical design were discussed during the session. Participants expressed a need to be able to identify funding constraints and to obtain balanced funding. However, participants noted that data about funding can be flawed. When determining project financing, agencies need to identify funding sources but also need a reliable funding stream. Some practitioners noted the need for increased active transportation funding.

7. Performance-based Management

This topic has some overlap with the training and resources section, as agencies need data to measure the performance of flexible design elements. Participants noted the challenges of quantifying and measuring benefits across modes and the limited availability of measurement tools. To improve performance-based management from a flexible design/CSS/D perspective, there is a need for more studies, examples, frameworks, and/or templates focused on pre- and post-construction analysis. Conducting these analyses are also challenging, given time constraints, expected versus actual results, and that staff developing the next round of funded projects are doing system analysis to figure out where the project needs are and a follow up should be built into program management, which might be done by others in their organizations.

Next Steps

The seven themes mentioned above should not be considered as silos, but rather separate parts of a singular whole. In many cases, the themes also overlap or are closely related to others. To help agencies address some of the questions raised during the workshop, some potential next steps are included below:

- AASHTO – Identify states that are working closely with local educational institutions to train tomorrow’s engineers and share their experiences with the larger practitioner community in a case study.
- FHWA – Compile and disseminate frameworks or templates to aid in pre- and post-construction context analysis.
- TRB – Share any research that provides insight on how to incorporate indicators such as public health, livability, and economic development into alternatives analysis.

Annotated Resources List

AASHTO

The Center for Environmental Excellence’s website includes a subsection on Content Sensitive Solutions which includes case studies, key resources, and recent developments. Visitors to the website can also sign up for customized email updates related to new context sensitive solutions content. Regarding the topic Communication and Outreach, AASHTO conducts an annual poll of state DOT new media and social tools use. A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, often referred to as the Green Book, contains the current design research and practices for highway and street geometric design, including design flexibility.

FHWA

FHWA’s Office of Planning, Environment, and Realty hosts a Context Sensitive Solutions and Design website featuring background information, webinars, and other resources. In August 2018, FHWA released Summary Report: Using Context Sensitive Solutions to Achieve Context Sensitive Design - Technical Assistance and Virtual Peer Exchanges. This summary report provides insight into the state of the practice of CSS and includes best practice case studies and interviews with state DOTs.

NCHRP

Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners (NCHRP 8-125) – According to the project objectives, this research aims to “(1) identify KSAEEs and talent profiles for state, regional, and local transportation planners that are aligned with existing and emerging agency needs; and (2) provide guidance on how agencies can attract, develop, manage, and retain planning talent. The results of the research can inform university curricula and will assist directors of agency planning programs, human resource managers, and transportation agency leadership in attracting, developing, and retaining planning professionals for near- and long-term transportation agency needs.”