Integrating CSS in Planning and Project Development

CSS Quick Facts – Project Development

Project development implies a significant focus and investment in delivery of constructed projects. This includes identifying and refining the preferred alternative, achieving the final project approvals (including NEPA) and funding, and designing and building the project. CSS integration focuses on making detailed design decision, managing risks and building the project in response to its context.

Integrating CSS into Design

Integration of CSS principles into the development of design solutions is critical to project success. Stakeholder input becomes very meaningful and true environmental sensitivity is achieved only to the extent that the actual implemented solution is clearly influenced in a positive manner. Design professionals are responsible for the development of transportation design solutions; while other stakeholder can advise or suggest solutions. Within this technical framework success is achieved only if the following is understood:

- CSS is not about throwing away the book or rejecting published and accepted engineering technical guidance, criteria and design standards.
- CSS is about incorporating inputs from many stakeholders – both technical and non-technical.
- CSS is about weighing trade-offs among competing values.

Flexible Engineering Design

AASHTO, in their policy document *A Guide to Achieving Flexibility in Highway Design* provides practical guidance on what the term flexibility means for highway design professionals. Highway design, like many technical professions, is rule-based in nature. Important assumptions and inputs to a design that occur early in project development can have a profound effect on the outcome, as they establish the framework around which design proceeds. The most significant of these inputs for highway engineers are design speed, design level of service and design vehicle. Integration of community values and environmental concerns with engineering means that these factors should influence the design choices. Project designers have choices. Design speed, design level of service and design vehicles are all choices, not mandates.

Creativity in Design

Highway designers are taught to employ standard design solutions. Integrating CSS in a DOT does not mean abandoning the tools and assets that have proven their value over the years. It does mean placing them in their proper context and understanding their reasons and value. Standard designs and details represent solutions that have been found successful by the agencies that use them. The benefits of using standard solutions do not mean that non-standard or unique solutions are inappropriate, unsafe, or should not be tried. Were this the case agencies would never have implemented solutions that are accepted today (e.g., roundabouts, diverging diamond interchanges, triple left turns), but would not have been found ten years ago in design manuals

Creativity in highway engineering and design simply means not routinely applying the same solutions or approaches everywhere. There are many opportunities for creativity within the boundaries of the technical standards, policies and guidelines already in use. Creativity can also be fostered by re-directing attention of designers and decision-makers to thinking of performance-based solutions rather than physical or infrastructure descriptors.

Merely reframing how a problem is described can help achieve creative solutions. When traffic volumes increase and congestion occurs, highway engineers may describe the problem as “insufficient capacity”- a characterization that inevitably leads to solutions focused on adding lanes or their equivalent. If engineers and planners describe the problems as “person-trip demand exceeds the capacity of the facility during x hours of the day” the change in description can lead to additional solutions beyond increasing capacity. Solutions may include peak hour HOV or HOT lanes, signal synchronization and other IT strategies, congestion pricing, parking management, and so forth.

Honoring Commitments Made During Area-wide, Corridor and Sub-area Planning

The project development stage is where the plans and proposals developed during the planning stages become a reality. It includes final design of proposed improvements, including special features of importance to the community, and mitigation to address environmental and community concerns that surface during earlier planning stages. Designers need to be aware of commitments made in earlier stages to address them during the design and delivery stages. In addition, project planners need to maintain open and timely communication with the community so that community members are aware of the project development, any changes made in plans or other project elements. Communication may be through many of the same strategies used during the planning phases, but may include additional techniques to meet one-on-one with affected property owners, and strategies to inform the traveling public about construction detours and other activities.

Challenges or Barriers to CSS Integration in Design

Design Manuals – Many states have roadway design manuals that contain information taken from the AASHTO Green Book and adapt it for use by the DOT. In many cases AASHTO may specify a range of values or type of geometric treatments, but an individual state may narrow the range or translate it to one typical or standard design. Agencies looking to promote flexibility can revise their manual to allow for a fuller range of solutions.

Project Management – The manner in which projects are programmed, scheduled and managed can either inhibit or promote integration of CSS. Projects that involve multiple technical disciplines working interactively and external stakeholders are inherently complex to manage. Many agencies have historically advanced or promoted project managers from within the ranks of engineering disciplines. Their skill sets may be well-suited to managing certain areas of work, but they may lack the skills, awareness and understanding of areas outside their expertise. Agencies should review their project management and project development processes to remove barriers to success.

Changes in Project Staff and Division of Work – A barrier to integration of environmental and engineering is the practice, common in some states, of separating technical work completion for a given project and assigning it to different entities. Deliberate organizational or contractual separation of work that must be integrated can create barriers to effective CSS integration and risk for project success. While it is feasible, and often necessary, to make changes in staffing throughout the life of a project, effective CSS integration requires that project criteria and status are rigorously documented and communicated between and among designers and other stakeholders as transitions happen.

Internal CSS Integration Issues in Design – Most state DOTs manage work based on project location, size, funding source and other factors. Projects may be assigned to specific programs that are run out of the central office. It is common practice for states to be divided geographically by district or region. It is also common practice for certain core functions and State leadership to reside at the central office. Chief Engineers and their functions and support, statewide program leaders, and overall DOT leadership may be located at a central office separate from regional or district staff. Central office oversight functions are commonly used. To the extent that oversight becomes second-guessing, it can inhibit individual project progress as well as the overall credibility of the agency with local officials and stakeholders. This is particularly problematic when a solution is imposed by a central office edict that has been determined to be unworkable by local DOT staff. Overcoming this barrier may involve re-organization of functions, devolution of authority and responsibility, upgrading of training and skill development at the local level, re-assignment of internal technical experts to serve as roving internal consultants, and perhaps re-assignment of certain projects or project types deemed too sensitive, difficult or risky for a district to directly manage.