The Arizona Department of Transportation Sustainable Transportation Program

Steven Olmsted and Katie Rodriguez
Environmental Planning, Arizona Department of Transportation, 1611 W. Jackson St. MD E502, Phoenix, AZ 85007

Sustainable Transportation

The ADOT Approach

Though many states and local public agencies are encouraging and implementing sustainability plans or efforts, integration of an entire sustainable transportation program inside a state Department of Transportation (DOT) can be a particularly complex undertaking. Traditional planning, design, and construction dynamics, where any given discipline is focused solely on their respective area of expertise, is not always conducive to adopting and/or integrating a collaborative sustainable process. Among these challenges, developing a state DOT sustainable transportation program from the ground up, that encompasses an agency wide approach including administration, project planning, design, construction and systems operations and maintenance, is a daunting effort. Establishing a process to operationalize such a far reaching sustainable transportation program that properly reflects these new and novel economic, social, and environmental considerations and maintains executive management buy-in, was experimental at the state DOT level. The Arizona Department of Transportation (ADOT) presented their initial experience with sustainability tools and process identification at the 2015 Transportation Research Board Annual Meeting. Since that time, ADOT has made measurable inroads in understanding the sustainability playing field from a total transportation system approach including: the publishing of a Complete Transportation Guidebook, the launch of a Sustainable Pavement Systems Program, partnerships with major universities, funding some of the first in the nation sustainable-specific Life Cycle Analysis (LCA) and Life Cycle Cost Analysis (LCCA), Environmental Product Declarations (EPDs), and continuing an Excellence in Sustainable Practice award program.

How is sustainable transportation defined at ADOT?

ADOT's Sustainable Transportation Program

Arizona’s transportation infrastructure is spread over 114,000 square miles, operates from sea level to 8,000 feet, and withstands temperatures that range from below 0°F to over 120°F. Maintaining optimum health and performance of this infrastructure is critical to Arizona’s economic vitality, quality of life, and natural and built environments. ADOT recognizes the critical need to plan and prioritize resources more efficiently in order to maintain and operate a robust, economically beneficial transportation network. Through continuous improvement practices, ADOT strives to strategically invest resources to achieve the highest possible return. ADOT also recognizes, in regard to investment and return dynamics, the importance of delivering transportation solutions in a more sustainable manner to achieve economic, social, and environmental goals. ADOT has moved from the early stages of identifying sustainable strategies to operationalizing a sustainable transportation program into core administrative, planning, design, construction, operations, and maintenance activities.

ADOT’s Sustainability Process Identification

The three primary principles of sustainability revolve around achieving an efficient, well-balanced use of economic, social, and environmental resources commonly known as the triple bottom line. In theory, this allows for proper use of funding while attracting all potential project needs. A sustainable highway, for example, will not only incorporate the need for mobility and transportation accessibility but also provide a low impact, livable, livable, and environmental protection. The window of opportunity to fulfill all that is desired before a project’s completion requires extensive coordination not only within a core group of individuals delivering the project but also those who are affected by the project development process.

Sustainable Transportation Program

The ADOT Sustainable Transportation Working Group (STWG) developed the above framework with the intention of further initiating the concept of the Operational Focus Areas (OFA). This would be comprised of 37 (thirty-seven) currently active OO areas of focus to implement into the program. OFA’s were selected for one of 3 reasons: 1) there was a true operational need, 2) it aligned with the agency’s Strategic Focus Areas (SFA), which is essentially ADOT’s agency mission, and 3) it could contribute to both Arizona and the national state of the practice in connection to sustainable transportation.

Sustainability Process Identification

The most effective use of resources in this day and age is one in which multiple objectives are achieved, and the methods which lead to those outcomes are documentable and repeatable. In order to develop a step ladder approach to the project delivery process, the meticulous progression of identifying and prioritizing what is a reasonable universe of sustainable considerations within ADOT was a necessary conversation to be had. Through the participation of champions, who initiated the open discussion, and executive management, ADOT developed the Milestones Framework, consisting of 13 (thirteen) milestones, ultimately aiding in the sustainable transportation building process and the introduction of sustainability inside a state DOT.

ADOT Sustainable Transportation Program Milestones Framework

Operational Focus Areas

Net Benefit of the Process

Beyond the preliminary benefit of satisfying the 37 Milestones and the 37 OFA’s, the process lead to a series of direct and indirect outcomes.

Concluding Thoughts...

The concept of constructability for highway projects is as old as the engineering design, and construction process. Over the years many organizations, including ADOT, practiced elements of a constructability program, but did not formalize the program with a name. For almost 100 years ADOT and its predecessor, the Arizona Highway Department, submitted plans for review, conducted field reviews and received construction feedback. What ADOT has attempted to do is evolve this time tested process by encouraging people from diverse cultural backgrounds, with potentially different goals and technical expertise, to work together effectively in an ever-increasingly complex world propelled by limited resources and funding availability. ADOT’s Sustainable Transportation Program, now entering its seventh year of implementation, is evolving a reflective extension of the above mentioned constructability evolution.

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