

## 2010 Transportation Research Board Annual Meeting

**Event Number:** 545

**Event Title:** Protecting and Enhancing the Environment, Part 2: Management and Financial Challenges and Opportunities (Part 1, Session 488)

**Event Date:** Jan 12 2010 3:45PM- 5:30PM

**Event Location:** Shoreham, Congressional

### Event Description:

**Event Agenda:** This session explores the management and financial challenges/opportunities in advancing and/or incorporating environmental sustainability initiatives in the delivery of transportation-related projects, products and services. This session will provide both national and international perspectives.

### Sustainable Opportunities in the Design-Build Construction Process (P10-0981)

Design-build transportation projects have dramatically increased in popularity over the past several years throughout the United States. The increase in design-build projects has been related to shortened delivery schedules for fast track projects. Significant cost savings have been realized by reduced delivery times by using the design-build construction method which has become an increasingly important issue to State Departments of Transportation (DOTs) experiencing increased construction material costs (concrete, steel, gravel) along with lower project construction budgets. Historically, design-build projects were used on large projects with a short completion time suitable for toll projects or mass transit projects where a short delivery period was critical in achieving an early opening. State DOTs are now finding it advantageous to identify design-build projects for small to medium sized construction projects where the design objectives are straight forward and the complexity of environmental impacts and mitigation are low. Design-build projects are known to be both cost and time efficient in comparison to typical design-bid-build projects. Design-build differs from the traditional Design-Bid-Build delivery method in a variety of ways. Design-build is a project delivery method under which a project owner executes a single contract for both architectural/engineering services and construction. The fundamental element of design-build delivery remains that one entity assumes primary responsibility for design and construction of the project. With design-build, the State DOT typically completes 10 to 30 percent of the preliminary design before it is advertised and contracted to a design-build team for completion; unlike traditional Design-Bid-Build, where 100 percent of the project is designed in advance of the project advertisement. The design-build process represents a great opportunity and challenges to incorporate sustainability principles and concepts into a transportation project's design and construction and future operation and maintenance. The essence of a sustainable highway project can be defined as achieving improvements in the natural, built and social environments, while meeting the project's functional transportation requirements. This proactive definition used by FHWA and Caltrans takes into account the economic, environmental and community responsibilities of a project. The Colorado Department of Transportation, Region 6 has identified a medium sized transportation project (\$25M) suitable for a design-build process. The 120th Avenue Connection Project involves the development of a 4 lane road with a new alignment that spans over 3 miles and incorporates two bridges over US 36 within the City and County of Broomfield. The Project complements the creation of a new Regional Transportation District Park and Ride facility and a transportation orientated development. The Team of Ed Kraemer & Sons, HNTB and TerraLogic were selected to construct this design-build project with a construction start date of October 1, 2009. Collaborative management between environmental, design and construction engineering provides excellent opportunities toward integrating sustainability elements into the 120th Avenue Connection Project. The Kraemer, HNTB and TerraLogic team has conceptualized and will implement a sustainability

program that focuses on cost effective resource management, environmental enhancement, and community communication. The goal of integrating sustainability elements into the design-build process is to conserve and effectively manage the use of natural resources that is cost effective and environmentally protective in the short and long term. There are five main elements in the 120th Connection Sustainability Program: water conservation, material reuse and recycling, energy conservation and carbon footprint, environmental resource conservation and enhancement, and community coordination. The presentation at the Annual TRB Conference will discuss the sustainable design approach used by the Kraemer, HNTB and TerraLogic Team for a medium sized design-build project. The presentation will focus on the following areas: 1) characteristics of a design-build project, 2) sustainability program development, 3) goals, objectives and metrics to measure success, 4) sustainable actions/expected outcomes, and 5) interim results and lessons learned. The presentation will be interactive in nature and will engage TRB members on their experiences in sustainable design, construction and operation and maintenance.

**Presenters**

Hirsch, Art , TerraLogic