

Strategic Highway Research Program 2 (SHRP 2) Projects on Collaborative Decision Making and other Topics of Interest

Congress established the second Strategic Highway Research Program in the 2005 federal transportation bill—Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Known as SHRP 2, this is an applied research program, directed to four specific areas selected by their importance in the future of the nation’s transportation system. These four areas are safety, renewal (addresses aging infrastructure), reliability, and capacity. This newsletter will discuss the capacity focus area of SHRP 2.

The SHRP 2 Capacity Program is intended to “develop approaches and tools for systematically integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity” (TRB Special Report 260). The authorized scope extends from the early stages of the transportation planning process through project development. Since this is a highway-based program, its primary orientation is to find ways to better increase capacity on the highway system. However, this does not mean that the only research focus is about adding lanes or building new roads. Solutions such as influencing land use, pricing, and management and operation of the system are on the table and the subject of some of the research projects.

In total, \$18 million will be invested in up to 17 separate research projects initiated between 2006 and 2010. Five projects are currently active; two are currently out for proposal; and two more will be advertised in July of this year.

The 17 projects fall into four categories:

1. **Collaborative Decision Making Framework (CDMF):** How to improve the collaborative decision making process to bring in a wide range of non-transportation performance measures, starting in the planning process.
2. **Improved tools for traffic modeling, including providing data and research,** which will allow the industry to move beyond the crippling limitations of traditional Four-Step modeling to new activity-based models that will allow future decision makers to better incorporate factors such as walkability, mixed-use communities, transit, pricing options and operations.
3. **An ecological approach to surface transportation environment,** which will include how to better integrate highway planning with conservation and ecological and watershed planning.
4. **How highway investments affect economic development,** including induced land use, and vice versa.

A summary table of the full research program can be found at:

<http://onlinepubs.trsb.org/onlinepubs/shrp2/CapacityResearchPlan.pdf>

A detailed discussion of individual research projects can be found at:
<http://www.trb.org/SHRP2/ProjectDescriptions.asp?AID=80>

The **Collaborative Decision Making Framework (CDMF)** effort will combine the results of most, if not all, of the research projects in this category into one product. The primary target for this information is state DOTs and MPOs, however the CDMF will certainly have applications for any transportation agency that is managing substantial transportation investments.

The cornerstone of the CDMF will be the very first project that the SHRP 2 Capacity Committee authorized, "C01: A Framework for Collaborative Decision Making on Additions to Highway Capacity." The background for this product will be 16 case studies and 9 additional studies of best practices in transportation decision making. These case studies have been completed, and the Committee is considering releasing them separately as an early product with independent utility. A draft decision making process has already been created, and 30 to 50 key decision points across all levels of planning and project development and NEPA have already been laid out. On April 7, 2008, the Capacity Committee discussed issues such as the relationship between the stages of the process, the role of visioning, when and where NEPA should fit in, etc. This effort has just entered Phase 3 of its schedule, which will consist of a series of workshops with stakeholders to refine the steps and relationships.

Project C02 will be largely completed in the spring of 2008, and it will create a **Systems Based Performance Measurement Framework for Highway Capacity Decision Making**. This project has already developed draft non-transportation performance measures in the Environmental, Economic, Community and Cost areas, as well as broadened data on Transportation Measurements. When completed and approved, all of these measures will be showcased in a web-based tool available to anyone within or outside of the transportation industry.

Three additional research projects have also just begun.

C03 will have a budget of \$1.75 million and will research **Interactions between Transportation Capacity, Economic Subsystems and Land Use and Integration**. The project is intended to provide a resource to help determine the changes in the economic systems of an area impacted by a transportation investment. While there are already a number of analysis tools in existence, the transportation community is generally dissatisfied with them. In particular, there is a sense that more information is needed in the land use area, and also that the analysis tools have to become more user-friendly, so that results can be conveyed to decision makers and the public. The expected results of this project are:

- Evaluation of economic impact analysis methodologies;

- A typology of criteria which affect the economics of highway investments: section of country, urban, suburban, rural, very rural, ports, etc.;
- Improved tools to analyze primary, secondary and cumulative impacts;
- Case studies with case-based reasoning functions;
- Guidelines for communicating findings to the public and elected officials;
- Recommendations for incorporating findings into the CDMF.

C04 will invest \$1 million into **How Highway Congestion and Pricing Affect Travel Demand**. It will develop mathematical descriptions of highway user responses to congestion, travel time reliability, and pricing, in a form that can readily be incorporated to improve existing traffic models. C04 seeks to correct the fact that existing traffic models are poorly suited to account for behavior and preferences of highway users. For instance, early findings reveal that, contrary to how current models predict behavior, motorists do not value travel time in congestion versus uncongested conditions equally. In fact, the average motorist equates each minute of time spent in congestion as four minutes in free flow.

Additionally, the term “average motorists” hides tremendous diversity (age, gender, etc.) and heterogeneity of responses to congestion and tolls. To properly predict how motorists will respond to congested conditions or tolls the diversity of behavior in response to factors such as trip purpose, importance of a particular trip, time of day, total trip time, and actual price of the trip must be modeled. Current modeling practice does this poorly, if at all. This project will replace the existing uniform modeling constants with ones that are sensitive to variables related to congestion, travel time reliability, and pricing.

C05 is also funded at \$1 million, and involves **Understanding the Contribution of Operations, Technology and Design to Meeting Highway Capacity Needs**. Since experience shows that new road capacity cannot be provided at the same pace as growth in vehicular traffic and freight movement, ways to better manage road networks using improved operations, design and technology must be found. Operational tools such as variable speed limits, ramp metering, reversible lanes and network optimization will be researched. Vehicle technology such as navigation aids, radar and adaptive cruise control and collision avoidance will also be researched, as will deployment of better pre-trip and real-time information to drivers.

SHRP 2 is not waiting for the research program to end in 2013 to begin to strategize on implementation. “Homes” and owners for some of the products are already being sought, and dialogue is beginning with potential implementation partners such as TRB, AASHTO and AMPO. Barriers to implementation and the means to overcome them are being identified early on. Costs of both implementation and deployment are being researched to begin to lay the foundation for the upcoming “ask” to Congress and USDOT. Stay tuned...