

Updating Capacity Research in SHRP 2

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Delivering better highway projects faster begins with a new perspective on preconstruction; building consensus into early project phases helps deliver transportation enhancements that align with community goals and visions and avoids delay that can arise from conflict. The objective of Capacity research in SHRP 2 is to develop tools for systematically integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity. At this writing, nearly all of the projects in the Capacity research plan are either active or complete. This document highlights some of the emerging products. The project numbers appear in brackets. A chart at the end lists the complete project names. The full Capacity research plan and the complete project descriptions are available on the Capacity web page: www.TRB.org/SHRP2/Capacity.

Collaborative Decision Making

Web-Based Resources

Transportation for Communities—Advancing Projects through Partnerships (TCAPP) is the primary product on this topic [C01]. Its focus is on how to manage projects cooperatively and how to accomplish more in planning phases that will hold up farther downstream in alternative selection and environmental review. The scope extends from the earliest stages of long-range planning through a Record of Decision in the environmental review process. TCAPP will contain products from 11 Capacity projects. Among these are tools to analyze how ‘smart growth’ policies contribute to trip reduction [C16] and strategies for assessing when in the planning process transportation policy can yield benefits to greenhouse gas reductions and energy consumption [C09]. In October 2010, SHRP 2 hosted workshops in Massachusetts, Minnesota, Colorado, and Washington State to test the feasibility of using the SHRP 2 strategies for assessing greenhouse gas emissions and energy consumption in real-world situations [C09]. Findings will be published in 2011. You can find TCAPP at www.transportationforcommunities.com.

Two other web resources to facilitate collaborative decision making are also available now: (1) The *Performance Measurement Framework for Highway Capacity Decision Making* [C02] is a library of performance measures for nontraditional metrics of highway performance and (2) *Transportation—Visioning for Communities* (T-VIZ) [C08] is a guide for effectively aligning transportation investments with community visions. A webinar held on May 25th explored the process of visioning in T-Viz. Both web resources are available on the TCAPP home page.

Publications: Research Report and Case Studies

The first Capacity research report was published in July 2009. SHRP 2 Research Report S2-C02-RR: *Performance Measurement Framework for Highway Capacity Decision Making* [C02] is a companion product to the web-based library of performance measures. It is available online as a PDF and in hardcopy through the TRB bookstore. A series of case studies that highlight how collaboration can be incorporated into transportation decision making have been conducted [C01]

and all 23 *Case Studies in Collaboration* are now published on the SHRP 2 website and will be included in TCAPP.

Pilot Tests

Pilot tests are currently under way with four public agencies [C18]: (1) Pikes Peak Area Council of Governments, (2) Puget Sound Regional Council, (3) Minnesota Department of Transportation, and (4) Washington State Department of Transportation. These projects will test the content and functionality of TCAPP; apply the collaborative decision-making principles and practices and assess how well they work; test any of the attributes of Capacity projects C01, C02, C03, C08, and C09 alone or in combinations; and provide an independent evaluation that will be used to improve TCAPP.

Economic Impacts

Web Tool

SHRP 2 developed a web tool to assess the economic impacts of transportation projects: *Transportation Project Impact Case Studies* (T-PICS) [C03]. T-PICS contains a database of 100 case studies of built transportation projects, including pre- and post-project data regarding their impacts on the economy. The system contains information for highway-related projects, including freight and passenger intermodal facilities. You can find T-PICS at <http://www.tpics.us> and on the TCAPP site: <http://transportationforcommunities.com/t-pics/>.

More Products

SHRP 2 is also developing a practitioner's handbook for estimating the changes in the economic systems of an affected area by a transportation project [C03]. Improved economic analysis tools and statistical models that accommodate GIS data and result in transparent analysis are being created [C11]. These products will provide highway capacity planners in state transportation agencies and metropolitan planning organizations the ability to more easily assess the likely long-term economic impacts of proposed highway projects.

Public-Private Partnerships and Pricing

Products

A guide is being written for considering private funding, public-private partnerships, and nonstandard procurements during planning and environmental review of highway projects [C12]. The guide will examine how and when private entities enter the public highway delivery process and link those events to decision points in the Decision Guide. The findings will be delivered through TCAPP as well as in a published report.

Many public-private partnerships involve tolls. A related project [C04] developed mathematical descriptions of highway user responses to pricing, congestion, and travel

time reliability that can be incorporated into various travel demand modeling systems. Projects C10A & B are incorporating the findings of C04 to address modeling of highway alternatives that include tolls.

Integrating Conservation Planning, Highway Planning, and Environmental Review

Products

Guidelines and model agreements to support integrating conservation, planning, and environmental permitting into an ecosystem approach are being developed [C06A]. Web-based templates for conducting ecological assessments and developing ecosystem services crediting are being designed [C06B].

Pilot Tests

SHRP 2 is conducting pilot tests of the ecological methods for integrating environmental concerns into transportation planning [C21]. Four public agencies are testing the Integrated Ecological Conservation and Transportation Planning Framework on real projects. Colorado State University and Colorado DOT will use the framework on an I-287 upgrade in Park County [C21A]. The Rogue River Council of Governments in southern Oregon will test the first three steps of the framework through the development of GIS-based data system [C21B]. The University of California Davis and the California DOT will test the utility of the tools during the early stages of a corridor planning effort for California SR 37 near the city of Vallejo and the Napa River [C21C]. West Virginia University and the West Virginia Division of Highways will broadly apply the ecological approach to planned highway expansions in the state [C21D]. The feedback from the pilots will be used to modify research and help guide implementation.

Advanced Modeling and Networks

Products

SHRP 2 is developing advanced modeling tools sensitive to the reciprocal interplay of traveler behavior and transportation network conditions, including mode choice options [C10]. These dynamic integrated models will also link to EPA's MOVES model so greenhouse gas and air quality implications can be analyzed.

Partnerships

SHRP 2 has partnered with two urban areas to develop advanced models and networks, testing different features and using different software: Jacksonville, Florida [C10A], and Sacramento, California [C10B]. SHRP 2 will apply the integrated models to policy questions in each area to test their effectiveness and will report human and computing resources required. In 2011, C10A was modified to test the transferability of

SHRP 2 Capacity Projects*

PROJECT NUMBER	PROJECT TITLE
Collaborative Decision Making	
*C01	A Framework for Collaborative Decision Making on Additions to Highway Capacity
*C02	A Systems-Based Performance Measurement Framework for Highway Capacity Decision Making
*C03	Interactions between Transportation Capacity, Economic Systems, and Land Use merged with Integrating Economic Considerations in Project Development
*C08	Community Visioning Approach to Support the SHRP 2 Collaborative Decision-Making Framework for Additions to Highway Capacity
*C09	Incorporating Greenhouse Gas Emissions Into the Collaborative Decision-Making Process
*C16	The Effect of Smart Growth Policies on Travel Demand
C18A	Washington Department of Transportation: SR 509 Extension
C18B	Puget Sound Regional Council: Project Prioritization System
C18C	Minnesota Department of Transportation: Complete Streets Plan for Grand Rapids
C18D	Pikes Peak COG: Long-Range Plan Update with Resource Agencies
*C19	Add Expedited-Schedule Case Studies to the Collaborative Decision-Making Framework Data Base
C22	Prepare a Decision Makers Guide to the Collaborative Decision Making Framework
Economic Impacts	
C03	Interactions between Transportation Capacity, Economic Systems, and Land Use merged with Integrating Economic Considerations in Project Development
C11	Development of Improved Economic Analysis Tools Based on Recommendations from C03
Public-Private Partnerships and Pricing	
C04	Improving Our Understanding of How Highway Congestion and Pricing Affect Travel Demand
*C12	The Effect of Public-Private Partnerships and Non-Traditional Procurement Processes on Highway Planning, Environmental Review, and Collaborative Decision Making
Integrating Conservation Planning, Highway Planning, and Environmental Review	
*C06A	Integration of Conservation, Highway Planning, and Environmental Permitting Environmental Permitting Using an Outcome-Based Ecosystem Approach
*C06B	Integration of Conservation, Highway Planning, and Environmental Permitting Through Development of an Outcome-Based Ecosystem-Scale Approach and Corresponding Credit System
C21	Pilot Test the C06 A&B Approaches to Environmental Protection
C21A	Colorado State University & Colorado DOT: I-287 upgrade
C21B	Rogue River Council of Governments (Oregon): Environmental Database
C21C	UC Davis and CALTRANS District 4: State Road 37 Corridor Study
C21D	West Virginia University & West Virginia DOH: Apply Ecological Approach to Planned Highway Expansions
Advanced Modeling and Networks	
C10A	Partnership to Develop an Integrated, Advanced Travel Demand Model and a Fine-grained, Time-Sensitive Network (Jacksonville, Florida). Test transferability of parameters to Tampa.
C10B	Partnership to Develop an Integrated Advanced Travel Demand Model with Mode Choice Capability and Fine-Grained, Time-Sensitive Networks (Sacramento, California)
Operations to Improve Capacity and Reliability	
C04	Improving Our Understanding of How Highway Congestion and Pricing Affect Travel Demand
C05	Understanding the Contribution of Operations, Technology, and Design to Meeting Highway Capacity Needs
Freight	
*C15	Integrating Freight Consideration into Collaborative Decision Making for Additions to Highway Capacity
C20	Freight Demand Modeling and Data Improvement Strategic Plan

*Projects with an asterisk are or will be included in TCAPP. Projects C13, C14, and C17 were cancelled.

PROJECT NUMBER	PROJECT TITLE
Implementation	
C31	TCAPP Maintenance, Management, and User Services Plan
C32	T-PICS Management Plan and Outreach
C33	Pilot Projects to Validate the Results of T-PICS
C34	Workshops on the Application of SHRP 2 Project C06 Products to the Environmental Aspects of Transportation Planning
C35	Test Transferability of Advanced, Activity Based Travel Demand Forecasting Model Parameters among Metropolitan Planning Areas with Similar Characteristics
C36	Showcase the SHRP 2 Freight Data and Modeling Road Map at the TRB Future Data Conference
C37	Marketing and Outreach Plan for TCAPP
C38	Support for TRB Innovations and Planning Applications Conferences

activity-based model parameters from Jacksonville to Tampa. Both projects are expected to conclude in February 2012.

Operations to Improve Capacity and Reliability

Products

Analysis methods and tools have been created for selecting operations, technology, and design strategies that enhance freeway and arterial capacity [C05]. The products employ simulation techniques because the effectiveness of strategies is shown to be network dependent.

Freight

Products

SHRP 2 is creating a guide on how transportation agencies can best incorporate the needs of private sector freight stakeholders, including shippers, receivers, logistics service providers, and carriers, into the planning process for new highway capacity [C15]. In addition, SHRP 2 is preparing a strategic plan and a research “road map” that will help guide dramatic improvements in freight demand forecasting models and the data needed to support them [C20].

Moving Toward Implementation

Capacity has initiated eight activities intended to move research products closer to implementation. These activities involve providing funds to operate websites, respond to user feedback, pilot test products, and conduct outreach. Project C31 provides for operating, maintaining, and upgrading TCAPP until it is handed off to its final sponsor at the end of SHRP 2. Project C32 does the same for TPICS, a case-study-based method for assessing the economic impact of transportation projects, and C33 will vet the method against traditional assessment methods to see if the results are comparable. C34 provides for outreach on ecological (landscape/ watershed) approaches to conservation and mitigation (C06A&B) and a multi-agency implementation workshop. A similar workshop is planned for implementing the freight data and modeling roadmap (C36). Project C35 tests the transferability of model parameters, which would significantly lower modeling costs. The dynamic integrated travel demand model being pilot tested in Jacksonville, Florida (C10A) will be tested in Tampa. Project C37 will develop a marketing strategy for implementing TCAPP and Project C38 provides support to future TRB conferences to showcase SHRP 2 modeling products. It is anticipated that additional pilot tests and other product improvement projects will be initiated over the next year.

CAPACITY TECHNICAL COORDINATING COMMITTEE

Neil J. Pedersen, Maryland State Highway Administration (Retired); Mark Van Port Fleet, Michigan Department of Transportation; Kome Ajise, California Department of Transportation; Mike Bruff, North Carolina Department of Transportation; Jacquelyn D. Grimshaw, Center for Neighborhood Technology; Kris Hoellen, The Conservation Fund; Carolyn H. Ismart, Florida Department of Transportation (Retired); Randy Iwasaki, Contra Cost Transportation Authority; Thomas J. Kane, Thomas J Kane Consulting; Keith L. Killough, Arizona Department of Transportation; T. Keith Lawton, Keith Lawton Consulting, Inc.; Edward A. Mierzejewski, Gannett Fleming, Inc.; Joseph L. Schofer, Northwestern University; Barry Seymour, Delaware Valley Regional Planning Commission; John V. Thomas, Environmental Protection Agency; Mary Lynn Tischer, Federal Highway Administration; Gary Toth, Project for Public Spaces; Jeff Welch, Knoxville Regional Transportation Planning Organization; Doug Woodall, Texas Department of Transportation; Janet P. Oakley, American Association of State Highway and Transportation Officials; David Yang and Joe Conway, Federal Highway Administration; Nanda Srinivasan and Martine A. Micozzi, Transportation Research Board

SHRP 2 STAFF

Stephen J. Andrie, Chief Program Officer; David J. Plazak, Senior Program Officer; Jo Allen Gause, Senior Program Officer; Jo Ann Coleman, Senior Program Assistant