SHRP Project C10
*Partnership to Develop an Integrated, Advanced Travel Demand Model and a Fine-Grained, Time-Sensitive Network*

*presented to*
Third International Conference on Innovations in Travel Modeling

*presented by*
Thomas Rossi
Cambridge Systematics, Inc.

May 10, 2010

Transportation leadership you can trust.
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Project Goals and Objectives

- Improve modeling process to address policy and investment questions
- Facilitate further development, deployment, and application of procedures
- Make operational an advanced travel demand model integrated with a fine-grained, time-dependent network
Secondary objectives

• Produce a portable, transferable product
• Incorporate products from related SHRP projects
• Incorporate travel time reliability into the modeling capabilities
• Demonstrate the application of outputs of the integrated model to estimate greenhouse gas emissions using MOVES
• Demonstrate the dynamic integrated model set in a real-world environment on selected policies
The Team

- Cambridge Systematics, Inc.
- Sacramento Area Council of Governments
- University of Arizona
- University of Illinois, Chicago
- Sonoma Technology, Inc.
- Fehr and Peers
Our Approach

- Implement this approach by integrating an activity based model (SACSIM) with a traffic microsimulation model, DynusT
- Link individual person records with vehicle and transit trips in the microsimulation
- SACSIM is parcel based
- Simulate transit tours
- Incorporate model enhancements (e.g. reliability)
- Direct interface between DynusT and MOVES
- Use software development professionals for the programming of the integrated model
Integrated Modeling Approach

Long-Range Planning Mode

- **SACSIM**
  - Long-Term Model (Location, Auto Ownership, etc.)
  - Daily Activity Pattern Generation and Scheduling

- **MOVES**
  - Parcel-to-Parcel Travel Time, Cost, Accessibility, and Reliability Measures

- **DynusT**
  - Multimodal, Multiresolution Traffic Simulation
  - Multimodal, Dynamic Traffic-Transit Assignment

- Initial Skim Transit Network
  - Transit Schedule
  - Other Trip Attributes
  - Truck OD Policies
Integrated Modeling Approach (continued)
Issues in Model Design and implementation

- Incorporation of reliability
- Distributed values of time
- Use of tours in traffic simulation
- Treatment of transit
- Travel time resolution and feedback process
Treatment of Transit (Bus and Light Rail)

- **Transit passengers**
  - Identified in SACSIM (origins, destinations, departure times)
  - Routed in DynusT

- **Transit vehicles**
  - Simulated directly in DynusT based on timetable information
  - Assigned to their specific paths

- **Integration**
  - Passengers assigned to board specific vehicles identified in the timetable
  - Multi-path assignment
Travel Time Resolution and Feedback Process

Questions regarding feeding level-of-service information from DynusT to SACSIM…
  • For inputs to DAYSIM, use link data or vehicle trajectories?
  • Level of temporal resolution

Options
  • Detailed 30-minute Skims from DynusT
  • Detailed 30-minute Skims using existing program (CUBE Voyager)
  • Broad time period skims using existing program
Open Source Software

- SACSIM source code is already released as open source
- DynusT has also been released as open source
- All new software will be property of NAS
- Therefore, entire source code for the new integrated model will be publicly available
Software Approach

- Users will access the modeling software using web browser
- Software is being developed using an iterative, incremental methodology
- First software iteration to be completed this week using small-scale test network
Content for Iterations 1, 2, and 3

Skims → DAYSIM → Activities/Trips/Tours → DynusT → Network Performance

Travel Times (by Time of Day) → MOVEs

Vehicle Trip and Speed Information → MOVEs

Trucks and External Trips → MOVEs

Air Quality and Vehicle Fleet Inputs → MOVEs
Outreach

- SHRP C10 Project Portal - www.shrp2c10.org
  - Project status reports
  - Software for download
  - Input and output data files
  - Technical reports (when approved)
  - Community forums

- Complete documentation and user’s manual

- Presentations at conferences and meetings
Welcome to the SHRP 2 C10 Community

Welcome to the project website for project C10 of the second Strategic Highway Research Program (SHRP 2). This site is an information and communication hub for the project, serving C10 project participants, the project panel, and interested observers from the transportation community. As the project progresses, the site will deliver project updates, technical reports, and interim and final versions of open-source software.

We invite you to participate in the project by reviewing these materials as they become available and by participating in the project forums. We also welcome your feedback on the structure and content of this site.

WHAT'S NEW:

Recent News

- The SHRP 2 Project C10 Website is now live!
  1/23/2009 9:00:00 AM
- SHRP 2 C10 Project Kickoff Meeting
  1/22/2009 10:00:00 AM

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