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

Project Goals and Objectives

- **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

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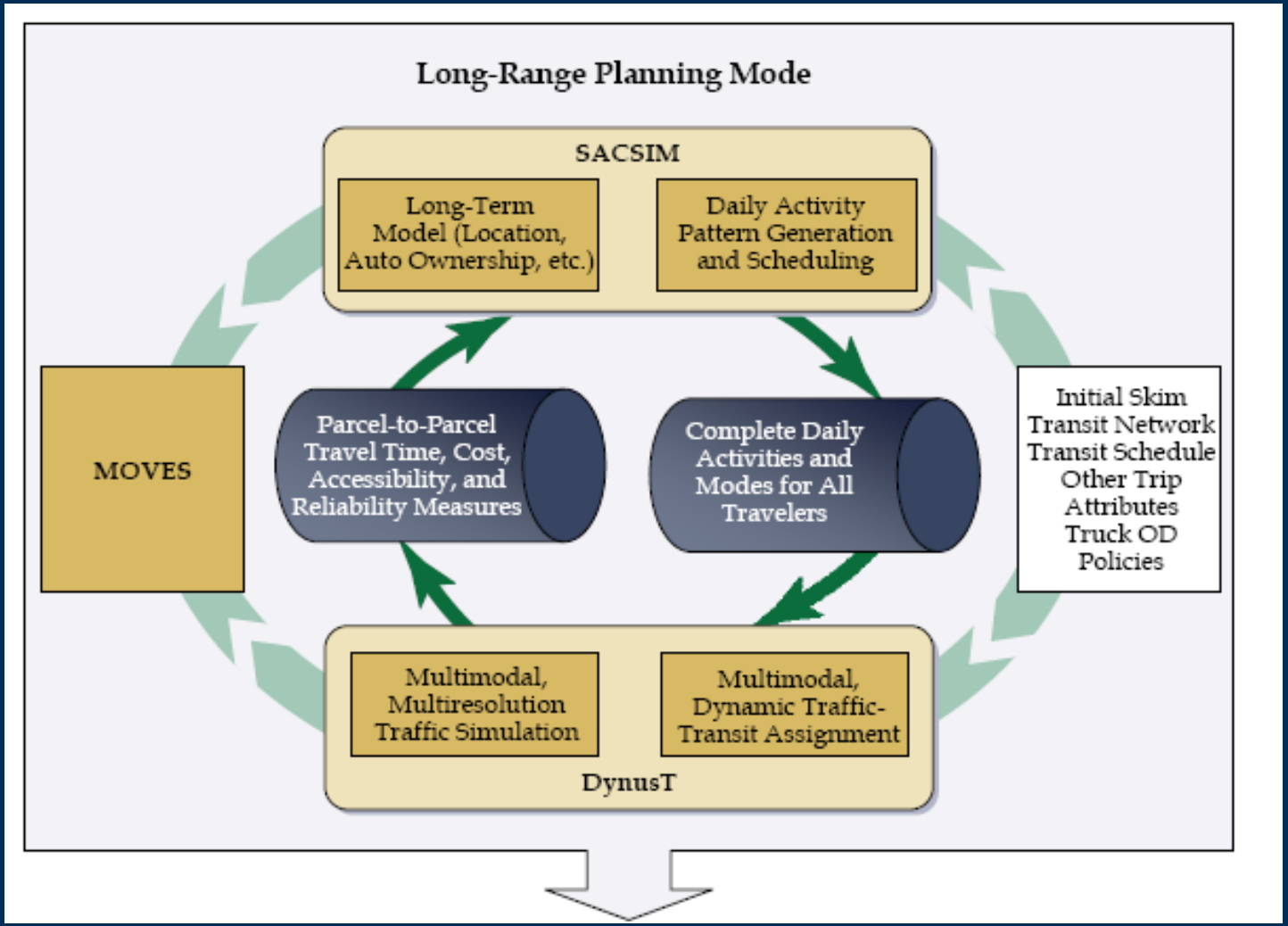
Our Approach

- 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



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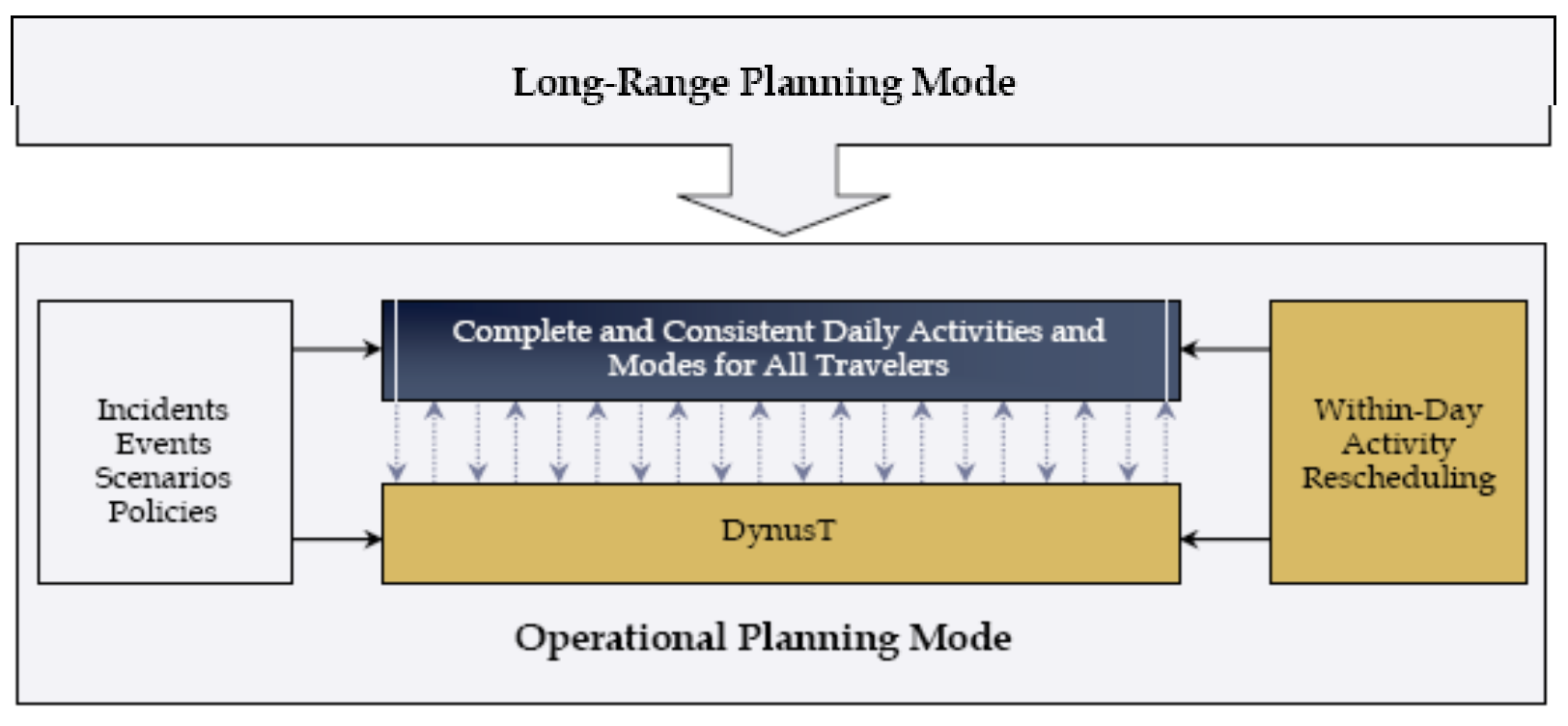
Integrated Modeling Approach (continued)



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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

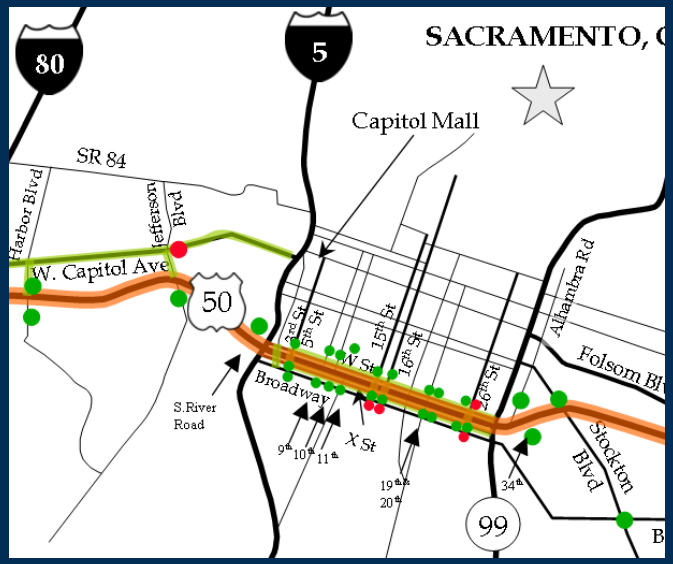
- Questions regarding feeding level-of-service information from DynusT to SACSIM…
  - For inputs to DAYSIM, use link data or vehicle trajectories?
  - Level of temporal resolution
- Options
  - Detailed 30-minute Skims from DynusT
  - Detailed 30-minute Skims using existing program (CUBE Voyager)
  - 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



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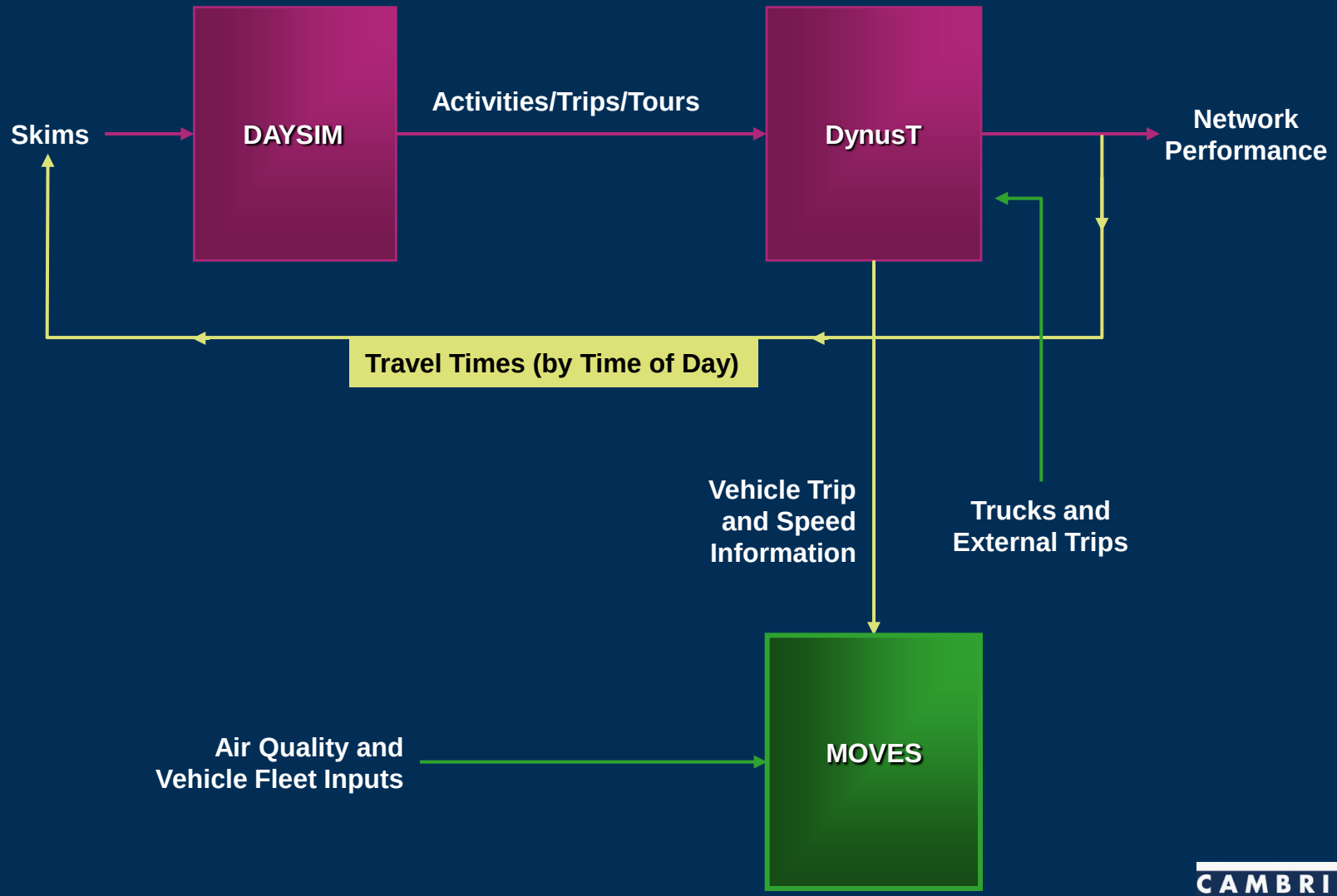
Content for Iterations 1, 2, and 3



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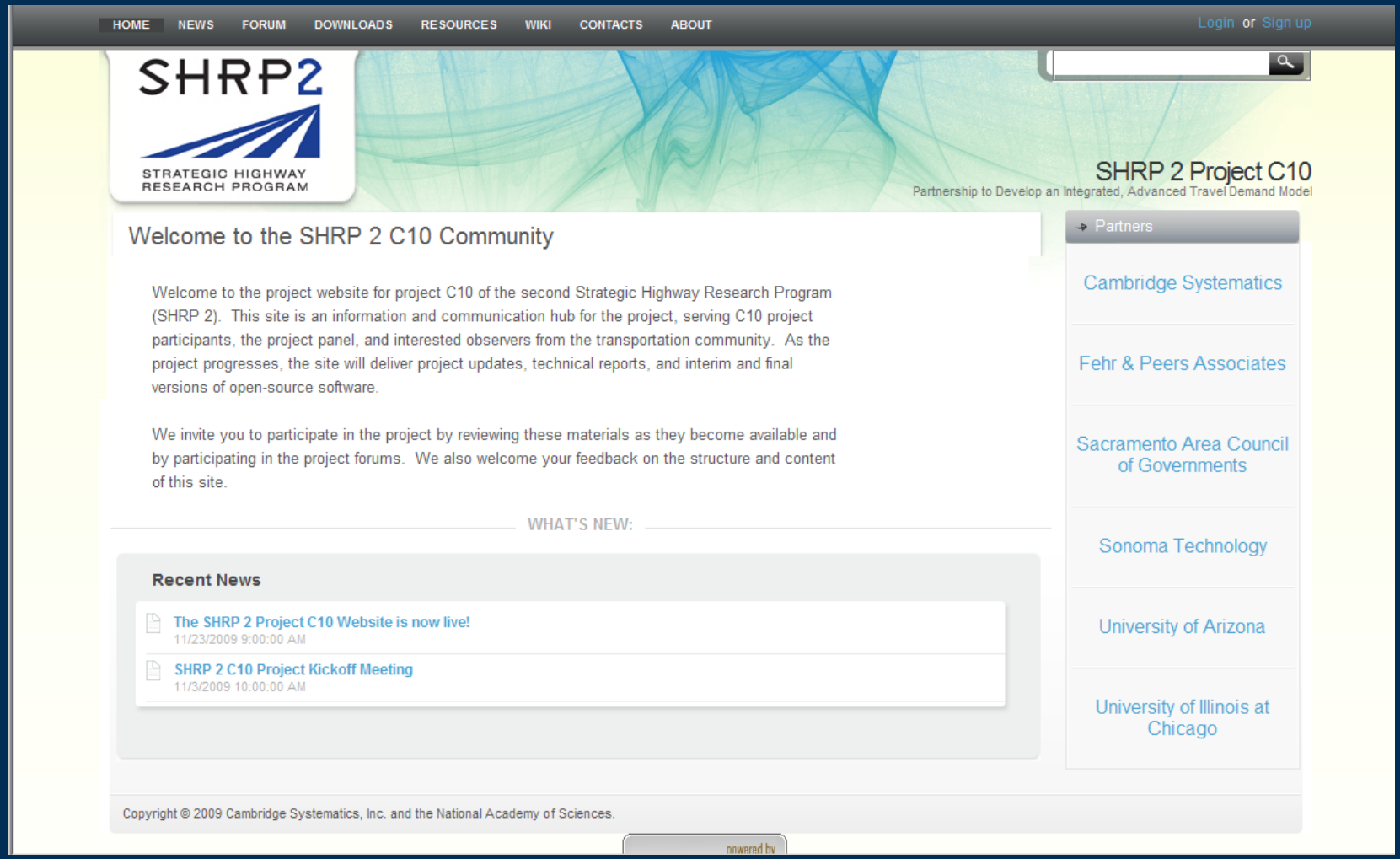
Outreach

- 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

C10 Web Portal



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