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UNIVERSITY OF MINNESOTA

CENTER FOR TRANSPORTATION STUDIES

Transportation Education E-News



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Introducing the *Transportation Education E-News*

Welcome to the first issue of the *Transportation Education E-News*, a semiannual electronic newsletter from the Center for Transportation Studies at the University of Minnesota.

The *Transportation Education E-News* is designed to inform university faculty of tools, initiatives, and activities for improving transportation education, especially in the field of transportation engineering. This newsletter is sponsored by the [Center for Transportation Studies](#), the [Intelligent Transportation Systems Institute](#), and the [STREET](#) (Strategic Transportation for Realistic Engineering Education and Training) project.



STREET project developing transportation simulation modules for classroom use



[STREET](#) (Strategic Transportation for Realistic Engineering Education and Training) is a project focused on developing a set of Web-based simulation modules and other learning tools designed for use in introductory undergraduate transportation engineering courses. The modules are also suitable for upper-division transportation courses and cover a variety of topics fundamental to the practice of transportation engineering, including travel demand modeling, geometric design, traffic

flow, and traffic signal control.

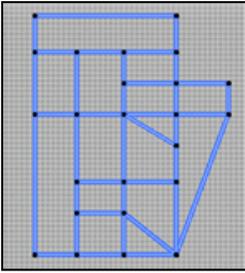
The web-based modules developed as part of the STREET project are designed to be user-friendly and to complement a [wikibook on the Fundamentals of Transportation](#). The modules will be tested in the curricula of a number of undergraduate transportation engineering courses at various universities. To date, more than a dozen faculty members have agreed to incorporate STREET into their teaching curricula.

The STREET project is funded by the National Science Foundation with matching support from the Intelligent Transportation Systems (ITS) Institute at the University of Minnesota.

- ◆ [More about STREET](#)



Online simulation module for transportation planning helps civil engineering students



The practice of transportation engineering education tends to be limited by the ability to offer students a hands-on, interactive experience with the types of tools that are used for solving real-world transportation problems. While some commercial software packages exist for certain analytical tasks such as travel demand forecasting, signal timing and traffic simulation, they often involve rather steep learning curves, limiting their value as educational tools, and can be expensive to implement in a classroom setting.

Associate professor **David Levinson** and his students at the University of Minnesota's [Department of Civil Engineering](#) have developed an online simulation model for transportation planning called the Agent-Based Demand and Assignment Model (ADAM). ADAM is intended for classroom use as a tool for introducing students to the fundamental concepts of travel forecasting in a user-friendly, interactive format. It was first tested in a classroom setting in an introductory transportation engineering course

at the University of Minnesota.

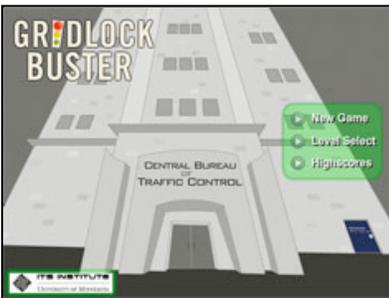
The structure of ADAM incorporates three types of agents: nodes, links, and travelers. Nodes and links represent characteristics of the road network itself, while travelers represent a separate class of agents whose activities (such as searching for employment) lead to trip-making on the network. Each iteration of the model results in a converged pattern of network flows, from which measures of effectiveness, such as vehicle-kilometers of travel, vehicle-hours of travel and network accessibility, can be calculated.

Students can modify a network by changing its attributes, such as capacity or speed, or its topology. Attributes of trip-makers, such as willingness to travel and sensitivity to travel cost, can also be modified to simulate different responses to travel conditions. These characteristics make the ADAM simulator a unique and flexible learning tool to introduce students to the practice of transportation planning.

- ◆ [More about ADAM](#)
- ◆ [A paper describing the model and its application in an educational setting](#) (942 KB PDF)



New online game explores world of traffic management



A new traffic control game developed by the [Intelligent Transportation Systems \(ITS\) Institute at the University of Minnesota](#) and Web Courseworks lets high school students try their hand at working in the engineering and transportation field.

"[Gridlock Buster](#)" is a traffic control game that incorporates tools and ideas that traffic control engineers use in their everyday work. Players must pass a series of levels while acquiring specific skills for controlling the traffic and ensuring that delays don't get out of hand. For example, a player might need to manage a high volume of traffic passing through an intersection, where long lines form if vehicles don't get enough green-light time. The more drivers are delayed, the more frustrated they get—causing the game's "frustration meter" to rise. Sound effects and animation simulate cars honking and drivers' fists shaking to illustrate the realistic results of backed-up traffic queues.

The game is based on work by **Chen-Fu Liao**, the ITS Institute's education systems engineer. The goal is to provide a fun way to engage students in the traffic engineering field, teach what is involved in traffic grid management, and make transportation interesting and relevant.

A presentation on Gridlock Buster will be included in a session titled "Enhancing Students' Understanding of Core Concepts in Transportation" at the Transportation Research Board Annual Meeting on Monday, January 11, at 3:45 p.m. at the Hilton.

The ITS Institute is also sponsoring a "Train the Trainer" webinar for educators to learn how to use Gridlock Buster in the classroom. David Glick of David B. Glick & Associates, LLC, the developer of high school curriculum for the ITS Institute, will present the webinar, scheduled for February 23, 2010 from 3:00 p.m. - 4:00 p.m. CST. Further details will be available on the [Gridlock Buster Web page](#).

- ◆ [Gridlock Buster Web page](#)



Transportation education conference summary and upcoming meetings

In June 2009, sixty educators and practitioners gathered for two days in Portland, Oregon to learn about new innovations in transportation engineering education, to learn how to map the learning domain for the introductory transportation engineering course and to generate more active learning environments for this course, and to identify high priority areas in which the group could continue to contribute to the improvement of transportation engineering education. Working groups were formed to address the following key issues:

1. Map the learning domain, key learning outcomes, taxonomies, and core concepts for the introductory course in

transportation engineering.

2. Create a transportation concepts inventory and identify misconceptions for this introductory course.
3. Develop a curriculum to support new teaching methods and publish materials on a wiki site for this course.
4. Develop a student competition for transportation engineers.

A session to review the work of the first group will be held during the annual meeting of the Transportation Research Board, on Saturday, January 9th, from 9:00 a.m. to 3:00 p.m. Space is limited; please contact Michael Kyte, University of Idaho, at mkyte@uidaho.edu, for more information.

A continuation of this workshop will also be held as part of the ITE Annual Meeting in Vancouver, British Columbia in August 2010.

—Michael Kyte, University of Idaho



TRB Transportation Education and Training Committee activities at TRB Annual Meeting

The transportation industry is facing a workforce crisis. The current and emerging transportation system needs people with skills in management, administration, policy, planning, engineering, construction, operations, and maintenance. Addressing this issue is a priority for the Transportation Research Board (TRB).

Over the past four years, the TRB Transportation Education and Training Committee, in association with a number of other committees, have sponsored an Annual Meeting workshop, Building the 21st Century Workforce: Creating a National Strategy. The developers of the workshops strive to involve the many others in the transportation industry—governments at many levels, industry and professional associations, the academic community, labor unions, and consultants—who also have made workforce development a focus.

As in the past, this year's workshop will be held at the TRB Annual Meeting on Thursday, January 14, 2010. The objective of this workshop is to continue, and build on, discussions from past workshops. However, while earlier workshops were focused on challenges and strategies at the national and state levels, this year the workshop will expand the focus to recruitment, retention, and training issues at the regional/local planning agency levels. **Jane Hayse** of the Atlanta Regional Commission (ARC) and **Huey Dugas** of the Capital Regional Planning Commission in Baton Rouge will kick-start discussions by providing their thoughts and views, followed by an extended open discussion session. Subsequently, we will hear reports of ongoing and planned national transportation work force development activities from RITA/UTC.

Complementing the workshop will be two paper sessions and a poster session organized by the Transportation Education and Training Committee, all on Monday, January 11.

- ◆ Session 317 - Recruitment and Training Strategies for the Transportation Work Force (1:30 p.m.)
- ◆ Poster Session 333 - Innovation in Transportation Education, (2:30 p.m.)
- ◆ Session 366 - Enhancing Student's Understanding of Core Concepts in Transportation (3:45 p.m.)

Anyone interested in getting involved with the committee activities is welcome to attend the Committee Business Meeting on Tuesday, January 12, at 10:15 a.m.-noon at the Hilton. Among other things, Aliyah Horton, who is the chair of our web development/maintenance sub-committee, will present information about a Web site being developed as a repository for professionals and students interested in obtaining information on workforce issues, needs, and development activities.

For further information, contact the co-chairs of the TRB Transportation Education and Training Committee: Greg Benz (benz@pbworld.com) and Chandra Bhat (bhat@mail.utexas.edu).

—Greg Benz and Chandra Bhat



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More Information

Center for Transportation Studies Acting Director: Laurie McGinnis
CTS Assistant Director for Education and Outreach: Gina Baas
Associate Professor, Civil Engineering and Richard P. Braun/CTS Chair in Transportation Engineering: David Levinson
Assistant Professor, Civil Engineering: Henry Liu
Program Coordinator: Shawn Haag
Managing Editor: Pamela J. Snopl
Graphic Designer: Cadie Adhikary

Center for Transportation Studies
University of Minnesota
511 Washington Ave. S.E.
Minneapolis, MN 55455
612-626-1077
612-625-6381 (fax)
www.cts.umn.edu

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