Welcome to the first issue of the University of Delaware University Transportation Center (UDUTC) newsletter! In this issue you will find information about our research and education programs as well as the many events we have planned or have already hosted.

We are pleased to have our UDUTC up and running, with our strategic plan approved in May 2007. Our theme “resiliency of transportation corridors” is timely, and we welcome the opportunity to interact with our colleagues both at UD and beyond.

Over the summer we solicited and reviewed research proposals and made awards to support faculty and graduate students. UDUTC received 12 proposals from 22 researchers representing five different colleges. We were able to fund six proposals from four different colleges to start in September 2007. These projects address a variety of transportation issues consistent with our theme. The grants also provide support for five research assistants from three different colleges in the University.

In the fall faculty and students participated in two forums initiated by centers we partner with at University of Delaware: the Institute for Public Administration (IPA) and the Delaware Center for Transportation (DCT). The IPA event was particularly timely, as the topic was “Anticipating 2025 in Northeast Corridor Transportation: Aerial, Highway, Marine, and Rail Technologies & Linkages” (see related article). The DCT-hosted “Transportation Education, Research and Security Forum” focused on developing an agenda for related transportation research, education and outreach. Breakout sessions addressed a variety of topics that are important to the UTC, and the forum summary will help to identify research opportunities for the UTC.

In this newsletter you will also see a list of the activities planned for the spring semester, including a distinguished lecture by Professor David Boyce of Northwestern University, and several brown-bag discussions focused on our ongoing research. We hope you will join us for some or all of these events and watch our website for updates on our activities. The next issue of the newsletter will include summaries of our current projects.

Sue McNeil
Professor of Civil and Environmental Engineering
University of Delaware
UTC Researcher Documents Link Between Freight Emissions and Health

by Diane S. Kukich

An article co-authored by UTC-affiliated faculty member James Corbett had already caused quite a stir in the medical, marine, and environmental communities by the time it appeared in print. Published in the advance web-release section of Environmental Science and Technology (the journal of the American Chemical Society), the article, to appear in print in ES&T’s December 15 issue, documents the link between pollution from marine vessels and heart and lung disease.

Corbett collaborated with James Winebrake, chair of the Department of Science, Technology and Society/Public Policy at Rochester Institute of Technology on the study, which correlates the global distribution of particulate matter released from the smoke stacks of ships to heart disease and lung cancer mortalities in adults. The interdisciplinary work is coauthored by leading atmospheric scientists from Duke University and the DLR-Institute of Atmospheric Physics as well as an RIT Public Policy graduate student.

The news has appeared on dozens of web sites, from EurekAlert, Innovationsreport.com, and SPACEDAILY.com to Medical News Today and Apria Healthcare, in locations ranging from Alaska to Armenia.

The results of the study indicate that approximately 60,000 people die prematurely around the world each year from cardiopulmonary diseases linked to shipping-related emissions. This first-ever global estimate is bounded by a range of 20,000 to more than 100,000 premature deaths. The findings of the study are timely, given that the International Maritime Organization is in the midst of discussion about the regulation of emissions from ships to mitigate impacts to human health and the environment.

“This study will help inform policymakers about some of the health impacts associated with ship emissions and the long-range transport of those emissions to population centers,” says Winebrake. “We now have a benchmark by which we can begin to evaluate the benefits of emission reduction policies.”

“Our work will help people decide at what scale action should be taken,” adds Corbett. “We want our analysis to enable richer dialogue among stakeholders about how to improve the environment and economic performance of our freight systems.”

An associate professor who is a marine policy expert in UD’s College of Marine and Earth Sciences, Corbett holds a joint appointment in the Department of Civil and Environmental Engineering. He currently has a UTC project focusing on the development of Delaware regional freight data for the Geographic Intermodal Freight Transportation (GIFT) Model. GIFT integrates three freight transport modes (road, rail, and water) in a single Geographic Information System network, which will allow users to conduct route analyses based on such network attributes as cost, time, distance, energy use, and emissions. This model facilitates a variety of research designs related to transportation infrastructure, freight mobility, and environmental stewardship.

“Freight transportation represents an economically important and fast-growing activity that threatens the resiliency of transportation corridors in many dimensions,” Corbett says. “Congestion and capacity issues are changing intermodal transportation operations, and increased freight volume adds stressors to energy and environmental impacts that require innovative management decisions. GIFT should help us make informed decisions about which mode to use in a given situation to achieve the best possible outcome.”

Corbett and colleagues recently published another article in ES&T on the policy cost-effectiveness of reducing sulfur emissions from ships using the Ship Traffic Energy and Environment Model (STEEM). “This program is an early example of what GIFT will be able to do for all freight modes,” Corbett says.

UDUTC Director Sue McNeil is pleased at the visibility Corbett’s work has brought to the University of Delaware and the UTC program. “Our center focuses on resiliency of transportation corridors,” she says. “The work done by Jim and his colleagues is important because corridor resiliency is dependent on so many diverse and interrelated factors including human health and environmental impacts. Their findings will help to shape marine policy, which will in turn affect other modes of freight transport and other aspects of corridor resiliency.”
Policy Forum Addresses Future of Northeast Transportation Corridor

UDUTC co-sponsored an invitation-only public-policy forum, “Anticipating 2025 in Northeast Corridor Transportation: Aerial, Highway, Marine, and Rail Technologies & Linkages,” which was hosted by the Institute for Public Administration. Held on September 25, 2007, the event was co-sponsored by the Delaware Department of Transportation (DelDOT) and the Delaware Center for Transportation (DCT).

The goal of the forum was to provide a framework for policymakers, planners, private-sector leaders, advocates, and scholars to address the future of transportation in the Northeast Corridor.

The program featured commissioned research papers by a number of well-respected experts in the field, including Kaan Ozbay (Rutgers University), William Anderson (Boston University), Allison de Cerreño (New York University), Thomas Wakeman (Stevens Institute of Technology), and Jean-Paul Rodrigue (Hofstra University).

“The IPA Forum was particularly timely and relevant to our UTC,” said Director Sue McNeil. “The presentations and papers document the issues for passenger and freight transportation in this important corridor. The papers also include important data, substantive analysis, and a rich policy discussion that will serve as resources for our ongoing and future projects.”

The forum concluded with a panel discussion focused on planning for technological change and intermodal linkage.

An enhanced podcast of the event can be accessed at http://www.ipa.udel.edu/infrastructure/NECorridorLinkages/podcast.html.

Course Description

A new course, CIEG 650 Urban Transportation Systems, was launched this semester. The course is co-taught by Professor Earle “Rusty” Lee and Professor Sue McNeil. This course or an equivalent is required of all UDUTC research assistants. The course covers the key elements of transportation systems analysis, policy, and economics and is intended to ensure that graduate students have a common vocabulary, a common understanding of transportation problems, and an awareness of the tools and data available to support research in transportation.

Eighteen students registered for the course this fall. Three are from outside Civil and Environmental Engineering, and eleven are seniors taking the course as an elective. The course has included guest lectures from Professor James Corbett of the College of Marine and Earth Studies on freight, Professor Alain Kornhauser of Princeton University on models for railroad operations, and Mr. Wolfgang Scherr from PTV Technologies of Wilmington on urban transportation models and simulation.

Alain Kornhauser Delivers DCT/UTC Distinguished Lecture

Professor Alain Kornhauser of Princeton University provided a dynamic lecture on Thursday, October 4. The distinguished lecture was co-sponsored by the Delaware Center for Transportation and UTC. Before the lecture, Professor Kornhauser treated the director of UTC to a web-accessible real-time trace of his journey from Princeton, New Jersey, to Newark, Delaware, as he timed his departure from Princeton with very little buffer time (the commonly used term to refer to the time that travelers allow for incidents, congestion, and other unforeseen events.) The trace was based on Co-Pilot-Live, GPS-based technology developed by Kornhauser to track vehicles.

Professor Kornhauser’s two-part lecture first described several applications of the GPS Route Guidance technology and the technology that makes it possible. Applications included the Gumball Rally, and attendees were given live demonstrations of the technology. The second part of the seminar focused on autonomous vehicle navigation and the efforts of a team of Princeton undergraduates to develop a vehicle for the DARPA 2005 Grand Challenge and 2007 Urban Challenge. Since the seminar, the Princeton team competed in the 2007 Urban Challenge, but unfortunately did not qualify for the finals due to a software bug. Ironically, this is also what prevented them from completing the course in the 2005 Grand Challenge.
Opportunities

Proposals for UDUCT Research Grants (funding for fall 2008) are due February 15. See http://www.udel.edu/UTC/Research.html for applications.

Limited resources are available for undergraduate support. Interested students or researchers should contract Sue McNeil at smcneil.udel.edu.

For graduate fellowships to be awarded for fall 2008. Application information will be available on the UDUTC website in early spring 2008.

UDUTC Faculty and Students to Participate in Annual TRB Meeting
A contingent of students and faculty will attend the Transportation Research Board Annual Meeting (http://www.trb.org), to be held from Sunday, January 12, through Thursday, January 16, in Washington, D.C. Presentations by UDUTC participants include the following:

Nii Attoh-Okine
◆ Higher-Order Neural Networks in Pavement Engineering Applications
◆ Graph Theory and Infrastructure Interdependencies (with Olufikayo Aderinlewo)

David Chapman
◆ Ferry-Based Estuarine, Coastal, and Ocean Observing Systems for Coastal Ecosystem Management

James Corbett
◆ Minimizing Energy and Environmental Impacts of Intermodal Freight Transport: Development and Application of a Geospatial Routing Tool

Arde Faghri
◆ Fluctuation and Seasonality of Hourly Traffic and Accuracy of Design Hourly Volume Estimates (with David M. Capparuccini and Robert E. Suarez)
◆ Application of Carsharing in Small Cities in the United States: Framework for Implementation and Analysis
◆ Evaluating Conversion of All-Way Stop-Controlled Intersections into Roundabouts

Dov Leshchinsky
◆ Behavior of Geocell-Reinforced Sand Under Vertical Load

Tricia Wachtendorf
◆ Analysis of Temporal Distribution of Requests for Critical Supplies After Hurricane Katrina (with Bethany Brown)

Upcoming Events

Wednesday, February 6, 2008, noon
Brown Bag Discussion: Megalopolis and Transportation Corridors: What it Means for our UDUTC, led by David Ames, Sue McNeil, Rebekah Gayley, and Michelle Oswald
302 DuPont Hall

Friday, February 15, 2008, 10:00 a.m.
UTC/CEE Seminar: Moving Freight to the High Road of Transportation Planning, Professor James Corbett, College of Marine and Earth Studies
302 DuPont Hall

Thursday, March 6, 2008, noon
Brown Bag Discussion: An Overview of the Delaware Freight Corridor, led by Jim Corbett and Amit Mokashi
302 DuPont Hall

Friday, March 21, 2008, 10:00 a.m.
DCT/UTC Distinguished Lecture: The Role of Computing in Urban Travel Forecasting: How Transportation Planning Practice Shaped Software and Software Impacted Transportation Planning Practice, Professor David Boyce, Northwestern University
106 Composites Manufacturing Science Lab

Wednesday, April 16, 2008, noon
Brown Bag Discussion: Transportation Organizations in the BOSFOLK Corridor, led by Robert Warren and Tim Soper
302 DuPont Hall

Tuesday, May 6, 2008, noon
Brown Bag Discussion: Resiliency of Transportation Infrastructure, led by Tracy DeLiberty, Joanne Nigg, Sue McNeil, and Silvana Croope
DRC Conference Room, 166 Graham Hall

Contact Us

Want to learn more about the UTC? Visit our website: http://www.ce.udel.edu/UTC/index.html

Want to be notified by email when UDUTC is sponsoring transportation-related events? Want to be notified about UDUTC funding opportunities or graduate fellowships? To be added to the email distribution list, send an email to Marietta Beach (marikka@udel.edu).