CTI PARTNERSHIPS ACROSS CAMPUS

In addition to Drs. Lisa Aultman-Hall, Norman Garrick and John Ivan of the transportation systems group, CTI works with faculty members in the structures and applied mechanics research groups as well as the environmental engineering program. Collaborations with Drs. Ramesh Maila, John DeWolf, Britt Holmén and Allison MacKay gave CTI and its associated graduate students a growing interdisciplinary focus in 2003-2004. The trend toward increased numbers of Ph.D. students, post doctoral fellows, and Masters degree students was evident in all groups associated with CTI. Our funding agencies, especially the Connecticut Department of Transportation, have actively encouraged interdisciplinary projects and CTI programs have included researchers from the Institute of Materials Science, Psychology, Educational Psychology, Geology, Statistics and Landscape Architecture over the past five years.

Dr. Norman Garrick - Fulbright Scholar

Dr. Norman W. Garrick is one of approximately 800 U.S. faculty and professionals who travel abroad to some 140 countries for the AY2004-5 through the Fulbright Scholar Program. Dr. Garrick will lecture in urban planning in Jamaica in collaboration with researchers at the University of the West Indies (Mona). Of particular interest is the role of transportation in fostering sustainable development and environmental stewardship. The research component of his work will focus on public transportation in Kingston. He will work to document the process of collapse and recovery of the transit system as a case study in understanding the role of local government and the international lending agencies in promoting different transportation and land use strategies.
New England University
Transportation Center (NEUTC)
Fellowship Recipients

Stephanie Syring - NEUTC Scholarship (Environmental pollutants and highway runoff)
Sylvia Zajac - Eisenhower Fellowship (see below)
Derek Vikara - NEUTC Scholarship (On-road vehicle emissions from CT Transit buses)
Patricia Padlo - NEUTC Scholarship (Young driver safety and graduated licensing)
Eric Jackson - NEUTC Scholarship (On-road vehicle emissions from automobiles)
Brian Baird - Graduate School Outstanding Scholar Award (see below)

Sylvia Zajac - Eisenhower Fellowship Recipient

Sylvia Zajac was one of 20 students nationwide to receive a prestigious Eisenhower Graduate Transportation Fellowship in 2004. She will receive three years of support while pursuing her doctorate. The fellowship is funded through the National Highway Institute by the U.S. Department of Transportation. Ms. Zajac received her B.S. in civil engineering and M.S. in transportation and urban engineering from the University of Connecticut in 1998 and 2000, respectively. From 2000 to 2003, she worked as a transportation planner and engineer for a local engineering firm. Her research involves a comparison of fatality rates at national and city levels to examine differences in transportation policy and design.

Brian Baird - UConn Outstanding Graduate Scholar

Brian Baird was one of 10 graduate students at the University of Connecticut to receive an Outstanding Graduate Student Scholar Award that includes a three-year scholarship. Mr. Baird's research has focused on how the automobile affects land use change in metropolitan areas. More recently, he has studied the effect of circumferential highways on a theoretical monocentric city. Mr. Baird states that his future research will likely focus on congestion pricing as a solution to metropolitan traffic congestion.

New Interdisciplinary Course

Dr. Britt Holmén, faculty member in Civil and Environmental Engineering, developed a new graduate course on Transportation and Air Quality. The class consisted of both civil engineering and environmental engineering students, creating a new and important interdisciplinary opportunity for graduate students. There are few comparable courses currently being taught in the United States. Course topics include air quality legislation, emissions controls, aggregate and disaggregate mobile source emissions models, field and laboratory emissions measurement techniques and roadway dispersion models.
Advisory Committees

CTI Steering Committee

Amir Paghri, Dean School of Engineering and Professor Mechanical Engineering Department
Lisa Aultman-Hall, Director CTI and Associate Professor Civil and Environmental Engineering Department
John DeWolf, Professor Civil and Environmental Engineering Department
Norman Garrick, Associate Professor Civil and Environmental Engineering Department
Ian Greenshields, Associate Dean of Academic Affairs School of Engineering and Associate Professor Computer Science and Engineering
John Ivan, Associate Professor Civil and Environmental Engineering Department and Associate Director CTI
Bahram Javidi, Professor Electrical and Computer Engineering Department
Kenneth Reifsnider, Professor Mechanical Engineering Department and Director Connecticut Global Fuel Cell Center
Donna Shea, Program Director Connecticut Technology Transfer Center

CT Advanced Pavement Laboratory Advisory Committee

Ernest Herrick (Chair), Executive Secretary CT Bituminous Concrete Producers Assn
Stephen J. Cooper, Pavement and Materials Engineer Connecticut - Federal Highway Administration
Alan R. Craig
Ronald J. Jones, Manager of Paving and Transportation Triax Connecticut, Inc.
Colleen A. Kissane, Pavement Management Engineer Connecticut Department of Transportation
Keith R. Lane, Director of Research and Materials Connecticut Department of Transportation
James Mahoney, Operations Manager Connecticut Advanced Pavement Laboratory (CAP Lab)
Fred Mello, Account Representative and Consultant to BASF Corporation
Ray Oneglia, Vice Chairman of the Board C & G Industries, Inc.
Leo P. Picard, Jr., President Mass Aggregate & Asphalt Pavement Assn. (MAAPA)
Jack Stephens, Professor Emeritus and Special Technical Advisor Connecticut Advanced Pavement Laboratory (CAP Lab)
Leo Stevens, Jr., Consultant
Terri Thompson, Transportation Supervising Engineer Connecticut Department of Transportation
Andrew Tierney, Director of Public Works Town of Hebron

Technology Transfer Center Advisory Committee

Richard Miller (Chair), City Engineer City of New Haven
Kathleen Bradford, General Supervisor Connecticut Department of Transportation
Barbara Breslin, Community Planner Connecticut - Federal Highway Administration
Robert Brown, Senior Engineer Connecticut Department of Transportation
William R. Brown, Traffic Operations Supervisor Town of Greenwich
Barbara Buddington, Executive Director Windham Regional Council of Governments
Mark Carlino, Director/Town Engineer Town of Hebron, Department of Public Works
David Demchak, Director of Management Services CT Interlocal Risk Management Authority (CIRMA)
David Gofstein (Vice Chair), Superintendent Town of Bloomfield, Department of Public Works
David Monckton, Director Town of Woodbridge, Department of Public Works
Brian Natwick, Project Engineer Connecticut Department of Transportation
Dionysia F. Oliveira, Transportation Engineer III Connecticut Department of Transportation
Susan Prosi, Senior Transportation Planner Southeastern Regional Planning Agency
James Sime, Manager for Research Connecticut Department of Transportation
Jack Stephens, Professor Emeritus and Special Technical Advisor Connecticut Advanced Pavement Laboratory (CAP Lab)
Frederick G. Thumm, Director Town of East Lyme, Department of Public Works
Mark M. Zessin, President Anchor Engineering Services, Inc.

Message from
Donna Shea, Program Director
CT Technology Transfer Center

2003-2004 has been an exciting time at the Technology Transfer Center with the implementation of the new Road Scholar Program and the continued success of our Road Master and Legal Traffic Authority programs. We continue our commitment to providing the highest level of service to our clients and remain focused on our goal of providing training and technical assistance to transportation personnel to help them build and maintain better, safer, and more cost-effective transportation facilities. We look forward to working with our clients and funding agencies to develop innovative approaches and solutions to these issues in the future.
Program Highlights

Technology Transfer Center

Provided 39 workshops to 3,500 participants from state agencies, local municipalities and the private sector who are involved in transportation planning, construction and maintenance.

Hosted the Technology Transfer Expo on campus for 650 visitors.

Established a formal training and outreach alliance with Connecticut OSHA. This alliance, focusing on safety, represents the first public sector agreement with this agency.

Established a new Safety Town loan program. This program is designed to teach elementary school children various aspects of pedestrian, bicycle and school bus safety.

Co-hosted the CT Construction Career Days for 1,200 high school juniors and seniors.

The CT Technology Transfer Center was one of four centers nationally selected to participate in the development of the new Local Technical Assistance Program (LTAP) performance measurement tools for the Federal Highway Administration.

Established an on-line resource library that contains 15,000 publications, videos and CD-ROMs for loan to state and local agencies in Connecticut.

The Technology Transfer Center also co-hosted the Women in Engineering Leadership Summit at UConn in May. The summit was attended by female leaders and several male participants from professional organizations, government, academic institutions and industry throughout the United States, Puerto Rico and Canada. The event was funded by the National Science Foundation’s ADVANCE program.
On January 1, 2004, James Mahoney was named Head Research Engineer and Operations Manager of the CAP Lab. Former Director and Professor Emeritus, Jack Stephens, remains on board as Special Technical Advisor. Mr. Mahoney and lab technician, John DaDalt, conducted four New England Transportation Technician Certification Courses (NETTCP) for pavement industry and transportation agency personnel. Scott Zinke recently joined the CAP Lab staff as a Research Assistant. Mr. Zinke received his B.S. degree in Civil and Environmental Engineering at UConn in May 2004.

James Mahoney
Head Research Engineer
and Operations Manager

Jack Stephens, Ph.D.
Professor Emeritus (CEE) and
Special Technical Advisor

Research Briefs

Evaluation of Pavement Crack Treatments - Hot Pour vs. Emulsified Materials

In cooperation with ConnDOT, FHWA and the Connecticut Cooperative Highway Research Program, the CAP Lab is investigating differences between crack treatment materials. Multiple test sections will be established using the different types of crack treatments. These test sections will be observed over a two-year period with performance evaluations conducted in the winter and summer for both years. Additional pavements treated in previous years will also be evaluated for performance of the different crack treatments.

Long Term Performance of Areas Exhibiting Thermal Segregation During Construction

In cooperation with ConnDOT and FHWA, the CAP Lab conducted a three-year study using thermal imaging technology to evaluate hot-mix asphalt pavements at the time of construction for thermal segregation. GPS coordinates were obtained whenever possible at the location where the thermal image was taken. The CAP Lab is starting a project to follow these thermally segregated areas through their service life to document the effects to the longevity of the pavements due to thermal segregation at the time of construction.
Other Programs

Connecticut Cooperative Highway Research Program
Joint Highway Research Advisory Council

The Connecticut Cooperative Highway Research Program (CCHR)P has been a continuing collaborative effort of the University of Connecticut and the Connecticut Department of Transportation since 1962. The program, administered through CTI, responds to the evolving complexity of the state’s transportation needs by focusing multidisciplinary resources on research needs. The Joint Highway Research Advisory Council (JHRAC) meets quarterly to monitor the program and establish research needs. JHRAC, guided by an external peer review process, awards funds each year for two to three new research projects. Funded activities in 2003-2004 included an update of the truck component of the state-wide planning model, comparison of emissions from transit buses with different propulsion systems and study of young drivers. Visit the CCHR website at http://www.cti.uconn.edu/th/research/crp_home.htm.

2003-2004 Final Reports


New England Transportation Consortium

The New England Transportation Consortium (NETC) is a cooperative effort of the transportation agencies and land grant universities of the six New England states. Under the direction of its Policy and Advisory Committees, NETC pools its financial, professional, and academic resources to research and develop improved methods of dealing with common problems. Under an agreement with NETC, the Connecticut Transportation Institute provides NETC's management. Funded research projects in 2003-2004 included: development of visualization techniques for more effective public presentations of transportation improvement projects, a synthesis of technology and practice relating to advanced composite materials for New England's highway infrastructure and the formulation of an approach for implementation of a 511 traveler information system for New England. Visit the NETC website at http://www.netc.uconn.edu.

2003-2004 Final Reports


Bridge Monitoring in Connecticut

The University of Connecticut and the Connecticut Department of Transportation have been involved in monitoring bridges in the state during the past two decades. We have learned how different bridges behave, provided information needed to determine current conditions and provided guidance for renovations. Currently, the research is implementing continuous bridge monitoring systems on a variety of bridges. The results will provide information that can assist in the management and safety of the state’s bridge infrastructure.

Dr. John T. DeWolf, P.I.  john.dewolf@uconn.edu

Freight Transportation Planning

This research addresses several areas of freight planning: optimal zone delineation, statewide traffic demand models, and nation-wide freight generation. A main premise of this research is that freight movement must be modeled at the national or continental level in addition to state and regional scales. This is necessitated by the geographic scale over which policy decisions, such as modal substitution and intermodal facility siting, must be made. The work has been funded through the Connecticut Department of Transportation, the New England University Transportation Center and USDOT. Dr. Lisa Aultman-Hall, P.I.  lisa.aultman-hall@uconn.edu

Safety of Shared-use Paths in Connecticut

This project involved the design of a shared-use path safety survey and its use on three facilities in Connecticut in the fall of 2002 and the summer of 2003. The objective was to collect self-reported information on collision and fall events, and travel exposure, so that estimates of crash rates could be developed for these paths. The analysis of the self-reported events and travel patterns provides complementary data that are not available from other sources and are needed to address safety concerns on these facilities. The sample size of 684 was sufficient only to develop aggregate crash rates. Dr. Lisa Aultman-Hall, P.I.  lisa.aultman-hall@uconn.edu

Designing Roads that Guide Drivers to Choose Safer Speeds

This project is aimed at learning how roadway geometry and the roadside environment influence actual travel speeds chosen by drivers, and, in turn, how actual travel speeds, along with these characteristics, influence the incidence of crashes. This research compares crash counts and observed speeds on roads in groups with similar geometric characteristics and roadside environments, controlling for the observed traffic volumes. This project will help to identify appropriate improvements to the roadway and/or roadside environment features that will reduce the travel speeds where necessary and improve the safety of the road location. Dr. John Ivan and Dr. Norman Garrick, P.I.s  john.ivan@uconn.edu; norman.garrick@uconn.edu

The Effect of Segment Characteristics on the Severity of Head-on Crashes on Two-Lane Rural Highways

Head-on crashes on two-lane rural highways are more likely to result in fatalities than other crash types. However, as many as 50 percent result in no fatalities. There is a great deal of literature documenting how characteristics of the vehicle, driver and occupants affect head-on crash severity, but very little about the characteristics of the road, the one thing, as traffic engineers, we can control. This project investigates how characteristics of two-lane rural highways affect the severity of head-on crashes, while controlling for characteristics of the vehicle, driver and occupants. The results will provide valuable information for highway safety engineers. Dr. John N. Ivan, P.I.  john.ivan@uconn.edu
Travel Route Choice Behavior

Data concerning the travel route choice behavior of automobile drivers are not frequently collected under real-world conditions. Between 2002 and 2003, the methods to extract route data from field-measured GPS data were developed under a grant from the National Science Foundation (NSF) and were key to facilitating this research project. The University of Connecticut and the New England University Transportation Center have supported this work. NSF recently awarded a three-year grant to extend the GPS-based route work to include vehicle emissions with the objective of developing real-world emission models. Dr. Lisa Aultman-Hall, P.I. lisa.aultman-hall@uconn.edu

Vehicle-Derived Particulate Matter

New research on transit bus and light-duty vehicle emissions is relatively unique because of the researcher's interest in real-world, on-road data collection. For example, we have designed sampling systems to enable real-time measurement of particle emissions from diesel and Connecticut's first two diesel hybrid-electric transit buses as the buses drive actual routes in Hartford. Three different bus routes, two fuels and the effects of diesel particulate filters on the particle emissions are being compared to help transit agencies evaluate the best solution for meeting tightening air quality standard emission targets. Dr. Britt A. Holmen, P.I. britt.holmen@uconn.edu

CTI Funding and Expenditures

2003-2004 Expenditures by Funding Source

- Federal: 9%
- State: 55%
- Local/Private: 36%

Total External Funding = $2,010,000.

2003-2004 Expenditures by CTI Program

- CAP Lab Research: 33%
- Other Research Projects: 27%
- Technology Transfer Center: 20%
- CCHR/P/NETC Programs Mgmt: 9%
- Graduate Scholarships: 9%