CTE
Annual Report
2002-03

Editor:
Kathryn P. McDermott
Technology Transfer Director

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Center Mission

To conduct innovative programs of research, education, and technology transfer that seek to mitigate the impacts of surface transportation on the environment

www.itre.ncsu.edu/cte

CTE is an activity of the University Transportation Centers Program, administered by the Research and Special Programs Administration of the United States Department of Transportation.
Director’s Message

This 2002-03 annual report marks CTE’s final year of funding from the University Transportation Centers (UTC) Program through the Transportation Equity Act of the 21st Century (TEA-21). CTE looks forward to the opportunity to re-establish its role as a UTC in the next federal transportation reauthorization.

In the meantime, I am pleased to report that CTE will continue to serve the transportation and environmental community. Congress recently provided funding for CTE’s operations in the 2003 Appropriations Resolution, and the North Carolina Department of Transportation has agreed to supplement these federal dollars. We are sincerely grateful to our many customers and partners who have helped to ensure the continuation of CTE’s core programs and services over the next two years.

Although CTE had to operate within leaner budget constraints, the past year yielded many accomplishments, which are listed in this annual report.

We invite you to read about our work, and to call upon us any time if we can assist you in your efforts to provide safe, efficient transportation with environmental excellence.

John S. Fisher, P.E., Ph.D.

Financial Report

The Center for Transportation and the Environment’s total annual operating budget for 2002-03 was $1.967 million. The U.S. Department of Transportation provided $983,500 through the University Transportation Centers Program. The North Carolina Department of Transportation provided the full state match requirement of $983,500. The annual budget was allocated accordingly:

- Administrative: 7%
- Research: 41%
- Education: 26%
- Technology Transfer: 26%
Management Structure

CTE is a national university transportation center of excellence, funded by the Research and Special Programs Administration (RSPA) of the U.S. Department of Transportation (USDOT), with match support provided by the North Carolina Department of Transportation (NCDOT).

The center is administered by North Carolina State University (NCSU), and is one of 60 centers, institutes, and laboratories on campus that report to the Office of the Vice Chancellor for Research and Graduate Studies. The center is located on NCSU Centennial Campus in the offices of the Institute for Transportation Research and Education (ITRE).

CTE’s research, education, and technology transfer programs are guided by the center’s advisory committee, which provides input on all program activities. The CTE technical committee provides input on the center’s education activities, in particular, the selection of CTE graduate research fellows. In addition, ITRE’s advisory council receives regular updates on CTE’s activities and provides input at the request of CTE’s director, Dr. John S. Fisher, P.E.

CTE Advisory Committee

Mr. James C. Codell, III
Secretary, Kentucky Transportation Cabinet
Chair, AASHTO Committee on the Environment
Frankfort, KY

Ms. Janet D’Ignazio
Chief Planning & Environment Officer
North Carolina Department of Transportation
Raleigh, NC

Dr. Gorman Gilbert, P.E.
Director, Oklahoma Transportation Center
Oklahoma State University
Stillwater, OK

Dr. Thomas D. Larson, P.E.
President, Vision-Strategy
Lemont, PA

Dr. Russ Lea
Associate Vice President for Research
University of North Carolina General Administration
Chapel Hill, NC

Mr. Lyndo Tippett (Chair)
Secretary of Transportation
North Carolina DOT
Raleigh, NC

Dr. Jay Messer
Senior Scientist
National Exposure & Assessment Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, NC

Len A. Sanderson, P.E.
State Highway Administrator
North Carolina DOT
Raleigh, NC

Mr. James Shrouds
Director, Office of the Natural & Human Environment
Federal Highway Administration
U.S. Department of Transportation
Washington, DC

Robert E. Skinner
Executive Director
Transportation Research Board
Washington, DC
CTE Technical Committee

Dr. Moy Biswas, P.E.
State Research & Analysis Engineer
North Carolina DOT
Raleigh, NC

Ms. Carol Cutshall
Chair, TRB Environmental Analysis Committee
Director, Bureau of Environment
Wisconsin DOT
Madison, WI

Mr. Wayne W. Kober
President, Wayne W. Kober, Inc.
Dillsburgh, PA

Dr. Jay Messer
Senior Scientist
National Exposure & Assessment Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, NC

ITRE Council

Dr. John Cameron
President, TransTech Management, Inc.
Greensboro, NC

Dr. Eugene Conti, Jr.
Chief Deputy Secretary of Transportation
North Carolina DOT
Raleigh, NC

Mr. Thomas F. Darden
Founder/Co-Chair
Cherokee Sanford Group
Raleigh, NC

Mr. Richard L. Daugherty
Executive Director, NC State University Research Corporation
Raleigh, NC

Sen. Wib Gulley (D - NC 13th District)
Attorney
Durham, NC

Mr. Tommy Harrelson
Business and Government Lobbyist
North Carolina General Assembly
Raleigh, NC

Dr. Edd Hauser, P.E.
Director, Office of Transportation Policy Studies
University of North Carolina at Charlotte
Charlotte, NC

Dr. Thomas D. Larson, P.E.
President, Vision-Strategy
Lemont, PA

Dr. H. Douglas Robertson, P.E.
Director, The University of North Carolina Highway Safety Research Center
Chapel Hill, NC

Dr. Nagui Rouphail, P.E. (Chair)
Director, Institute for Transportation Research and Education
NC State University
Raleigh, NC

Mr. Lyndo Tippett
Secretary of Transportation
North Carolina DOT
Raleigh, NC

Mr. C. Ed Vick, Jr., P.E., AICP
President, Kimley-Horn and Associates, Inc.
Raleigh, NC
Staff List

Dr. John S. Fisher, P.E.
Director

Mr. James B. Martin, P.E.
Associate Director

Ms. Janet L. Myers, J.D.
Senior Fellow

Ms. Kathryn P. McDermott, M.A.
Technology Transfer Director

Ms. Lynn D. Coryell, B.A.
Program Specialist

Ms. Lisa M. Terwilliger, B.A.
Program Specialist

Ms. Carey McCrackan, B.S.
Webcast Coordinator

Ms. Ayesha Peppers, A.B.
Administrative Assistant

Ms. Kimberly Yandora, B.S.
Graduate Research Assistant

Ms. Lisa Mettam, M.B.A.
Web Developer

Ms. Lucy Reid, M.L.S.
Information Specialist
Research Program

CTE partners with the North Carolina Department of Transportation to conduct a joint environmental research program. This partnership was established in 1998 following CTE’s reauthorization in the Transportation Equity Act for the 21st Century (TEA-21). Since then CTE and NCDOT have supported 25 projects with a total budget of more than $6.2 million.

The CTE-NCDOT partnership has generated significant research results in various environmental areas, including air quality, water quality, wetlands mitigation, vegetation management, and wildlife management. In addition, the program has involved the active participation of more than 115 students and 29 faculty, representing numerous academic disciplines throughout the University of North Carolina system and Duke University.

For more information on the program and research projects, please visit CTE’s web site at: www.itre.ncsu.edu/cte/cterip.html.

Contact: Katie McDermott, CTE Technology Transfer Director, (919) 515-8034 or kpm@unity.ncsu.edu

NEW PROJECTS

The following research projects were awarded during the 2002-03 performance period.

Develop a Methodology to Estimate Non-Point Source Pollutant Loadings from NC Highways (Project HWY-2003-17)
Performing Organization: University of North Carolina at Charlotte
Principal Investigator: Dr. Craig J. Allan (Geography and Earth Sciences) and Dr. Jy Wu (Civil Engineering)
Period: July 1, 2002 - December 31, 2003

Ecological Assessment of a Wetlands Mitigation Bank in Western North Carolina: Post-Restoration Assessment (Project HWY-2003-18)
Performing Organization: University of North Carolina at Asheville
Principal Investigators: Drs. Kevin Moorhead, Irene Rossell, Barbara Reynolds, C. Reed Rossell, Jr. (Environmental Sciences), and James Petranka (Biology)
Period: July 1, 2002 - June 30, 2004

Evaluation and Implementation of BMPs for NCDOT’s Highway and Industrial Facilities (Project HWY-2003-19)
Performing Organization: UNC-Charlotte
Principal Investigator: Dr. Jy Wu (Civil Engineering)
Period: July 1, 2002 - December 31, 2004
ONGOING PROJECTS

The following research projects are either in progress or in the draft final report stage.

Assessment and Prediction of the Effects of Highways on Population Ecological and Genetic Properties of Selected Faunal Groups: The Consequences of Breakup and Isolation (Project HWY-2001-14)
Performing Organization: University of North Carolina at Chapel Hill
Principal Investigator: Dr. Alan E. Stiven
Period: July 1, 2000 – June 30, 2002 (draft final report under review)
Budget: $171,019 (FY2001: $90,401) (FY2002: $80,618)

Assessment of the Groundwater Flows at Juniper Bay and their Impact on the Surrounding Area (Project HWY 2002-19)
Performing Organization: NC State University
Principal Investigator(s): Dr. Rodney L. Huffman, Dr. Michael J. Vepraskas
Period: May 1, 2002 - April 30, 2005

Assessment of the Impact of Highway Runoff on the Health of Freshwater Mussels in North Carolina Streams (Project HWY-2001-13)
Performing Organization: NC State University
Principal Investigator: Dr. Jay Levine
Period: July 1, 2000 – December 31, 2002 (draft final report in preparation)

Coastal Highway Vulnerability (Project HWY-2002-05)
Performing Organization: NC State University
Principal Investigator: Dr. Margery Overton
Period: July 1, 2001 – June 30, 2003 (draft summary of final results under review)

Determine Status of Threatened Species (dwarf flowered heartleaf) (Project HWY-2002-04)
Performing Organization: Appalachian State University
Principal Investigator: Dr. Zack Murrell
Period: July 1, 2001 – June 30, 2003 (draft final report in preparation)

Development of Methods to Determine Lateral Effects of Highway Drainage Systems on Wetland Hydrology (Project HWY-0871)
Performing Organization: NC State University
Principal Investigator: Dr. R. Wayne Skaggs
Period: October 1, 2000 – September 30, 2003

Distribution of Freshwater Mussel Populations in Relationship to Crossing Structures (Project HWY-2001-10)
Performing Organization: NC State University
Principal Investigator: Dr. Jay Levine
Period: July 1, 2000 – December 31, 2002 (draft final report in preparation)
Budget: $182,710 (FY2001: $95,971) (FY2002: $86,739)

The work of NCSU researchers involved in Project HWY-2001-13, Assessment of the Impact of Highway Runoff on the Health of Freshwater Mussels, was recently featured in the NCSU publication Perspectives (Summer 2003)
**Effects of Shading from Bridges on Estuarine Wetlands (Project HWY-2001-12)**  
Performing Organization: NC State University  
Principal Investigator: Dr. Stephen W. Broome  
Period: July 1, 2000 – June 30, 2003 (draft final report under review)  

**Evaluating BMPs for Treating Stormwater and Wastewater from NCDOT's Highways, Industrial Facilities, and Borrow Pits (Project HWY-2001-07)**  
Performing Organization: NC State University  
Principal Investigator: Dr. Daniel E. Line  
Period: July 1, 2000 – March 31, 2003 (extended to March 31, 2004, due to carry-over funds)  

**Functional Assessment of the Effects of Highway Construction on Coastal North Carolina Wetlands (Project HWY-1999-7)**  
Performing Organization: Duke University  
Principal Investigator(s): Dr. Curt Richardson, Dr. Neal Flanagan  
Period: April 1, 1999 – March 31, 2001 (draft final report under review)  

**Methodology to Assess Soil, Hydrologic and Site Parameters that Affect Wetland Restoration Success (Project HWY-2001-09)**  
Performing Organization: NC State University  
Principal Investigator: Dr. Michael J. Vepraskas  

**Vegetation Management Under Guardrails for North Carolina Roadsides (Project HWY-2001-06)**  
Performing Organization: NC State University  
Principal Investigator: Dr. Fred H. Yelverton  
Period: July 1, 2000 – June 30, 2003 (draft final report in preparation)  

**COMPLETED PROJECTS**

The following represents a cumulative listing of CTE-NCDOT research projects completed during the TEA-21 authorization period. Final reports and other project details are located on the CTE website at [www.itre.ncsu.edu/cte/cterip.html](http://www.itre.ncsu.edu/cte/cterip.html).

**Assessment and Management of Roadside Wildlife on I-40 in North Carolina**
Performing Organization: UNC-Wilmington  
Principal Investigator: Dr. Eric Bolen  
Period: January 1, 1997 - December 31, 1998  
Budget: $42,552

**Developing Guidelines for the Use of Visualization in Project Design and Public Review (Project HWY-1998-9)**  
Performing Organization: UNC-Chapel Hill, Highway Safety Research Center  
Principal Investigator: Dr. Ron Hughes  
Period: July 1, 1997 - December 31, 1999  
Budget: $77,727

**Ecological Assessment of a Wetlands Mitigation Bank in Western North Carolina—Phase I: Baseline Ecological Conditions and Initial Restoration Efforts**
Performing Organization: UNC-Asheville  
Principal Investigator: Dr. Kevin Moorhead  
Period: May 1, 1999 – September 30, 2001  
Budget: $75,883
**Emissions Reduction Through Better Traffic Management (Project HWY-1999-8)**
Performing Organization: NC State University  
Principal Investigator(s): Dr. Christopher Frey, Dr. Nagui Rouphail  
Period: April 1, 1999 – June 30, 2001  

**Erosional Scour in Coastal Sounds of Northeastern North Carolina (Project HWY-1998-4)**
Performing Organization: East Carolina University  
Principal Investigator: Dr. Stanley Riggs  
Period: July 1, 1997 - June 30, 1999  

**Evaluation of the Effectiveness of Existing NCDOT Wetland Mitigation Sites (Project HWY-1999-10)**
Performing Organization: East Carolina University  
Principal Investigator(s): Dr. Mark Brinson, Dr. Richard Rheinhardt  
Period: April 1, 1999 – June 30, 2001  

**Increased Options for Weed Management in the North Carolina Wildflower Program (Project HWY-1999-12)**
Performing Organization: NC State University  
Principal Investigator(s): Dr. Fred Yelverton  
Period: April 1, 1999 – June 30, 2002  

**Low Light Impediments to Fish Migration with Particular Emphasis on River Herring (Project HWY-1998-3)**
Performing Organization: UNC-Wilmington, Center for Marine Science Research  
Principal Investigator: Dr. Mary Moser  
Period: January 1, 1997 - June 30, 1999  
Budget: $179,844

Performing Organization: NC State University  
Principal Investigator: Dr. Arthur Bruneau  
Period: July 1, 1998 - June 30, 2000  

**Measures to Reduce Erosion and Turbidity in Construction Site Runoff (Project HWY-2001-05)**
Performing Organization: NC State University  
Principal Investigator: Dr. Robert A. McLaughlin  
Period: July 1, 2000 – June 30, 2002  

**Occurrence of Gasoline Oxygenates in Stormwater Runoff**
Performing Organization: NC State University  
Principal Investigator: Dr. Robert Borden  
Period: September 1, 1998 – August 31, 1999  
Budget: $45,000

**Sampling and Testing of Stormwater Runoff from North Carolina Highways (Project HWY-1999-6)**
Performing Organization: UNC-Charlotte  
Principal Investigator(s): Dr. Jy Wu  
Period: October 1, 1998 – March 30, 2001  

**Two-Stage Evaluation of NCDOT Stream Mitigation Practices (Project HWY-1999-9)**
Stage I – Synthesis of Stream Mitigation Practices  
Stage II – Development of Criteria for Effective Mitigation  
Performing Organization: NC State University  
Principal Investigator(s): Dr. Greg Jennings  
Period: April 1, 1999 – March 31, 2001  
Budget: $97,131 (FY1999: $9,713) (FY2000: $87,418)

*The Bolen, Borden, and Moorhead (Phase I) projects were initiated and funded by monies from CTE’s federal grant under the Intermodal Surface Transportation Efficiency Act (ISTEA). They are listed here because their performance periods overlapped with the TEA-21 grant period, and NCDOT was actively involved in their development.*
Education Program

The primary objective of CTE’s education program has been to encourage students of diverse academic disciplines to participate in transportation and environmental research and to consider potential careers in the field. During 2002-03 CTE expanded its education program to address the professional development needs of practitioners.

Throughout the ISTEA and TEA-21 grant periods, CTE has supported 30 graduate research fellows at North Carolina universities, and 48 summer scholars selected competitively from universities throughout the country. In addition, CTE has facilitated the participation of hundreds of undergraduate and graduate students in its research and technology transfer programs. CTE looks forward to continuing these efforts in the years ahead to help develop the next generation workforce.

One of CTE’s newest priorities is the expansion of its continuing education programs for current and prospective transportation and environmental professionals. This year, CTE initiated discussions with training providers, potential customers, and others who may become partners in the development and delivery of the education program. One result of those discussions is a new agreement between CTE and NCDOT to develop a multi-day course on Context Sensitive Solutions.

ENVIRONMENTAL TRAINING PROGRAM

With additional funding from the North Carolina Department of Transportation, CTE developed a new three-day course on Context Sensitive Solutions (CSS) for NCDOT staff. Course topics include environmental, public involvement, and design considerations in transportation facility planning, project development, construction, and operations. CTE conducted the pilot course in February 2003. Four additional sessions followed through June 2003, and to date 200 NCDOT staff have been trained. The plan is to train over 2,000 transportation department employees over the next two years, and eventually to invite additional participation from the staff of sister resource agencies and private sector companies. CTE plans to continue to develop new training upon request for NCDOT and other transportation and environmental agencies, using both traditional classroom and distance-learning approaches.

Contact: James Martin, CTE Associate Director, (919) 515-8620 or jbm@unity.ncsu.edu

Enlightening!

This course allowed me to "see" beyond my discipline. I am proud that NCDOT has already been implementing CSS in our projects.

Workshop Participant
Summer Scholars Program

Twelve students representing environmental studies and civil engineering disciplines spent two weeks studying the environmental aspects of surface transportation development during CTE’s summer scholars program, July 22-31, 2002.

The CTE summer scholars program is conducted annually to introduce college juniors and seniors of diverse academic disciplines to the environmental aspects of surface transportation development.

While in North Carolina, the students visited numerous research laboratories and mitigation sites, including the NCDOT Lengyl wetland mitigation site in the historic riverfront community of New Bern. They were also introduced to geographic information systems (GIS) and global positioning system (GPS) technologies and applications, and received presentations on public/private sector career opportunities in the transportation and environmental field.

In Durham, New Hampshire, the students participated in the TRB Midyear Workshop of the Environmental Analysis in Transportation Committee (A1F02). There they met the practitioners and decision makers who are driving new transportation and environmental research and policy innovations. Many of the students obtained leads for career opportunities within transportation agencies.

CTE commends this year’s summer scholars on their accomplishments to date and wishes them the best in their future careers. In addition, the center thanks North Carolina DOT and the many organizations and agencies that have participated in this program through the years by sharing their professional and technological expertise with the next generation of professionals.

Contact: James Martin, CTE Associate Director, (919) 515-8620 or jbm@unity.ncsu.edu

Graduate Research Fellowships

CTE’s graduate research fellowship program provides $15,000 research stipends each year to graduate students in North Carolina universities who have a demonstrated research interest in transportation and the environment. CTE awarded five 2002-03 fellowships to the following students, each of whom has provided a summary of the research that the CTE fellowship helped support (next page). The students were recognized at an October 2002 dinner reception, featuring a keynote address by Ms. Janet D’Ignazio, NCDOT chief planning and environment officer.

- Jason Dorn, P.E., Ph.D. Candidate, Civil Engineering, North Carolina State University
- Tanya Kunberger, E.I.T., Ph.D. Candidate, Civil Engineering, NC State University
- Andrea Wade Oswald, M.S. Candidate, Forestry, NC State University
- Amy Poe, Ph.D. Candidate, Marine Sciences, University of North Carolina at Chapel Hill
- Pamela Schooler, P.E., Ph.D. Candidate, Civil Engineering, NC State University
As a CTE research fellow, I have continued my investigations in developing improved systems analytic techniques for watershed management and their integration into convenient frameworks to support decision-making. Activities completed in the past year have included (1) the development of a new technique for performing modeling to generate alternatives (MGA), (2) the integration of uncertainty analysis tools within the Multimedia Integrated Modeling Systems (MIMS) framework, and (3) the exploration of innovative techniques for performing multi-objective optimization. MGA is a systems analytic technique that allows for the consideration of unmodeled objectives when performing optimization through exploration of the inferior region. The goal of MGA is to present decision-makers with a small set of alternative solutions that are good with respect to the modeled objectives and are maximally different from one another in the decision space. The technique developed for performing MGA is referred to as the "Team MGA" algorithm. It uses genetic algorithms (GA) to search for the optimal solution to the original problem while also searching for a handful of good alternatives. The technique has been shown to be effective for various test problems. Application to a real-world watershed management problem is planned. Other activities completed in the past year include the integration of model uncertainty analysis tools within the Multimedia Integrated Modeling System (MIMS) framework under development by EPA. MIMS is a modeling framework that supports the composition, application, and evaluation of systems of models. MIMS is intended to support a wide range of models and complex applications and make such activities easier. The inclusion of traditional uncertainty analysis tools (e.g., Monte Carlo sampling) will hopefully stimulate modelers to perform such analyses and report to the decision makers the uncertainty associated with model results. Finally, the CTE research fellowship provided me with the opportunity to explore and analyze a variety of existing techniques for performing multi-objective optimization. The result of this analysis is a concept for a new technique for performing multi-objective optimization. This new technique is currently being developed.

Publications and Presentations:


Student of the Year Award
Jason Dorn was named the 2002-03 CTE Student of the Year. He was recognized at a reception with other university transportation center student winners at the January 2003 Transportation Research Board Meeting in Washington, DC. CTE congratulates Jason Dorn for his exceptional research work and academic achievements in the area of decision support tools for watershed management!
Tanya Kunberger, E.I.T.
Ph.D. Candidate, Civil Engineering
North Carolina State University

Temperature Effect of Desorption Kinetics of Petroleum Constituents on Various Soils

Runoff from highway construction and repair materials, in addition to the inevitable vehicular traffic and subsequent petroleum constituent spills, create a complex environmental impact on the subsurface environment underlying highway systems the world over. Constituents detrimental to the environment are transported by rainfall runoff, enter the subsurface and can either sorb to the soil or leach to the groundwater. Although leached portions are customarily detected and addressed, the sorbed phase often goes untreated due to the difficulty and time-consuming nature of the remediation process. My dissertation research aims at investigating the benefits of decreased viscosity and increased mobilization and volatilization associated with increased temperatures, while incorporating a more cost-effective remediation scheme than that of steam stripping. To this end, I am researching the effects of more moderate temperatures on the desorption kinetics of petroleum constituents on various soils. This type of remediation is defined as low temperature thermal desorption (LTTD), and focuses on temperatures less than 80°C. Incorporation of these moderate temperatures will be accomplished by utilizing a delivery system termed Well Injection Depth Extraction (WIDE), which incorporates prefabricated vertical wells (PVWs) for the in situ remediation of dense non-aqueous phase liquids (DNAPLs), light non-aqueous phase liquids (LNAPLs), and radioactive metals. The advantages of the WIDE technology are its applicability to low hydraulic conductivity (k = 10^-3 to 10^-8 cm/s) soils, the ability to target depth specific zones, and shortened contaminant removal pathways, with subsequent reduction in remediation time, due to relatively close PVW installation spacing. Research to date has consisted of an extensive literature review of current remediation technologies, and the benefits and limitations of each, batch testing of various soils and different contamination concentrations and multiple desorption temperatures, field testing of the WIDE system on a former air force base (AFB) contaminated with jet fuel, and computer modeling of WIDE system operation for comparison with field data and subsequent application to future testing. Results from WIDE testing on the former AFB will be presented at the Soil and Rock America 2003 conference, as well as being included in conference proceedings.

Andrea Wade Oswald
M.S. Candidate, Forestry
North Carolina State University

The Ecological Character of Headwaters Streams in Central North Carolina

The purpose of this study is to determine the character of ephemeral and intermittent streams and to compare these streams to the perennial stream reaches to which they discharge. Data will be collected on the hydrologic, biologic, and geomorphic characteristics of headwater streams. Eight study catchments have been established in undisturbed, forested watersheds of the Piedmont of North Carolina. Sixty-five reaches have been staked, and 58 stream stage monitoring wells have been installed. Four manual rain gauges and four tipping bucket rain gauges with data loggers have been installed in close proximity to the study...
sites. Hydrologic data from the stage wells and rain gauges are being collected on a weekly basis. First-year benthic macroinvertebrate sampling is complete. Seasonal sampling of 33 of the 60 reaches occurred in September 2002, January 2003, and May 2003. Dave Penrose and Larry Eaton of the NC Division of Water Quality presented results from the September 2002 and January 2003 samples at the North American Benthological Society's annual conference in Athens, Georgia, in May 2003. Second year sampling will begin in September 2003. Initial geomorphic data has been collected and mapped on one study catchment. Val Garcia presented results at the annual Water Resources Research Conference in Raleigh, North Carolina, in April 2003. Additional geomorphic data collection is scheduled for fall 2003.

Amy Poe
Ph.D. Candidate, Marine Sciences
University of North Carolina at Chapel Hill

**Effectiveness of a Constructed Wetland in Removing Nutrients, Sediments, and Pathogens from Agricultural Runoff**

A 25-acre wetland has been constructed on the Open Grounds Farm in eastern North Carolina. The purpose of the constructed wetland is to remove nutrients, sediments, and pathogens in agricultural runoff. My research examines the effectiveness of a constructed wetland at removing nitrogen from agricultural runoff and compares its biogeochemical function to that of a natural wetland. I am investigating the time scales at which constructed wetlands are able to function like natural wetlands. Data from January through December of 2002 show the constructed wetland is effective at the removal of nutrients with 40% nitrate, 36% ammonium and 9% phosphorus removal. Denitrification plays an important role in nitrogen removal in both the constructed and natural wetland study sites. In the constructed wetland, nitrogen removal via denitrification is controlled by the timing and concentration of nitrate pulses associated with rain events. Currently, I am investigating how organic carbon affects denitrification rates and determining if the constructed wetland is carbon limited as compared to a natural wetland. I have made oral presentations of my research findings at the Southeastern Estuarine Conference in Atlantic Beach, NC, in March 2003, and at the Water Resources Research Institute Meeting in Raleigh in April 2003, and I will be attending the Estuarine Research Federation Conference, Seattle, Washington, in September 2003. I am on the planning committee for the Fourth National Conference on Constructed Wetlands/BMP's and Coastal Water Protection Meeting, taking place June 23-25 2003, in Wilmington, NC. Additionally, I have a paper in press entitled "Quantifying Denitrification in a Constructed Wetland Receiving Agricultural Runoff," which will be published in December of 2003 in the journal *Wetlands*.

Pamela Schooler, P.E.
Ph.D. Candidate, Civil Engineering
North Carolina State University

**Measuring and Modeling BMP Effectiveness for Treating Stormwater from Highways**

Data from the National Urban Runoff Program (NURP) conducted by the USEPA and USGS and the FHWA’s evaluation of runoff from highways in
the 1970s and 1980s, indicated that urban stormwater runoff was contributing significant levels of pollutants to the nation’s waters, thus warranting its control. However, these federal investigations also indicated that there was insufficient data available to evaluate the effectiveness of various runoff control practices. My research aims to efficiently combine resources to: (1) evaluate stormwater BMP monitoring data that has been collected in compliance with the NCDOT’s NPDES permit issued in 1998; (2) report the effectiveness of selected proprietary BMPs in the reduction of pollutants discharged from a system and in the attenuation of stormwater flow rates and volumes discharged into the environment; and (3) convert a state-of-the-practice methods evaluation into a state-of-the-art tool for planners and designers nationwide by calibrating and verifying models used in the assessment and management of highway runoff and the protection of the quality of receiving waters. I started work with Dan Line of the NCSU Water Quality Group to install and maintain rainfall and runoff monitoring equipment to measure parameters such as rates, volumes, and constituent or pollutant loadings, of the flows in and out of three distinct NCDOT highway stormwater controls or BMPs. Monitoring for this study concludes after recording 12 months of data. I also started work within my department to develop a physically based calibrated and verified model to (1) determine the effects on water quality as the result of magnitudes, locations, and combinations of control options; (2) provide input to receiving water quality analysis; and (3) provide input to economic analyses. Future work entails performing a statistical analysis of the data to develop an independent empirical model for gauging and predicting BMP effectiveness as well as presenting and publishing our findings. Moreover, as a CTE Research Fellow, I have been actuated into a vast network of transportation and environmental professionals who share my passion for "smart growth" and provide continuous inspiration and support. Mitigating the environmental impacts of land development is challenging. The CTE network makes it achievable! Thanks!

Students Supported As CTE Graduate Research Fellows (1994-2003)

<table>
<thead>
<tr>
<th>Name</th>
<th>Field</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Jane Almon</td>
<td>Forestry (Restoration Ecology)</td>
<td>North Carolina State University</td>
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<tr>
<td>Kelly Beissel</td>
<td>Forestry (Water Resources)</td>
<td>North Carolina State University</td>
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<tr>
<td>Francis Biasi</td>
<td>Landscape Ecology</td>
<td>Duke University</td>
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<td>Thomas Blue</td>
<td>Civil Engineering</td>
<td>North Carolina State University</td>
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<td>Gregory Bruland</td>
<td>Wetland Ecology</td>
<td>Duke University</td>
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<td>Calvin Chow</td>
<td>Regional Planning</td>
<td>University of North Carolina - Chapel Hill</td>
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<td>Thomas Dabolt</td>
<td>Environmental Management</td>
<td>North Carolina State University</td>
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<td>Jason Dorn*</td>
<td>Civil Engineering</td>
<td>North Carolina State University</td>
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<td>Audrey de Nazelle*</td>
<td>Environmental Sciences &amp; Engineering, School of Public Health</td>
<td>UNC-Chapel Hill</td>
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<tr>
<td>Karl Faser</td>
<td>Biology</td>
<td>East Carolina University</td>
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<td>Anne Goode</td>
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<td>Kevin Gaines</td>
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<td>Carl Heald</td>
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<td>Tanya Kunberger</td>
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<td>Jeffrey Masten*</td>
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<td>Andrea Wade Oswald</td>
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<td>Duncan Quinn</td>
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<td>Marie Venner</td>
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<td>Kim White</td>
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<td>Kimberly Yandora*</td>
<td>Natural Resources (Hydrology)</td>
<td>North Carolina State University</td>
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<td>Vanessa Zoe Morin</td>
<td>Environmental Management</td>
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* Student-of-the-Year Award Recipients
Where Are They Now?

CTE Interviews Former CTE Graduate Fellow Vanessa Zoe Morin

Q You were a CTE graduate research fellow in 2000-01. What attracted you to the program?

The CTE Graduate Research Fellows program provided the opportunity to initiate a dialogue with (and, at times, debate) public officials and private developers interested in pursuing a proposed transportation alignment for the Triangle Transit Authority in North Carolina. My focus included a review of various transit technologies and the potential impacts on water resources. I am intrigued by the dynamics of policy, the factors that underlie the establishment of policy, and why particular factors are chosen. These underlying factors are critical in understanding policy dynamics because they impact the validity of information brought to the table. I am a policy analyst who "sees" linkages in areas that often are not unified or connected: urban land use policies, community-based management, and environmental stewardship to name a few.

Q What kind of research work did your CTE fellowship help support, and how has that experience shaped your understanding of the relationship between transportation and the environment, and related issues?

I presented my findings in July 2001 to the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Technical Coordinating Committee, Durham, NC. My position is that Bus Rapid Transit or Light Rail Transit are different transit technologies that can be comparable in promoting land values and redevelopment opportunities. Due to the existing experience with Light Rail Transit systems, Light Rail Transit does generate significant land values compared to Bus Rapid Transit.

Q How did your CTE fellowship help you define your career interests?

I have been extremely fortunate with the positions I have held since I graduated because those positions parallel and draw upon my experience preparing, researching, and writing for my CTE Fellowship. I had a grant-funded position for a year with the Voorhees Transportation Policy Institute, Voorhees Transportation Center, Rutgers University, Bloustein School of Planning and Public Policy, as a research analyst. I also have consulted for the New Jersey Chapter--National Association of Industrial and Office Properties. I am continuing to pursue research on the built environment. My educational and employment opportunities have allowed me to advance research on diverse land use subjects that significantly overlap.

Q What are you doing now professionally, and how does it relate to transportation?

I work as a research analyst for the Office of Smart Growth within the New Jersey Department of Community Affairs. The Office staffs the State Planning Commission, a body created by legislation and committed to maintaining the "cross-acceptance process." The process insures a cooperative planning approach that involves the full participation of state, county, and local governments in the preparation, adoption, and implementation of the New Jersey State Development and Redevelopment Plan. The Office also staffs the Brownfields Redevelopment Task Force and the Brownfields Interagency Team. I have been responsible for drafting presentations on a variety of Smart Growth issues for the New Jersey Department of Community Affairs Commissioner.
and the Office of Smart Growth Executive Director. I also review and draft the State Planning Rules as well as prepare the New Jersey Urban Infill and Greenhomes Design Guidelines for municipalities and developers. I have worked on four major projects, one of which is directly related to transportation: *Facts and Myths About Transportation and Corporate Office Location in New Jersey* (Rutgers University, Bloustein School of Planning and Public Policy, Voorhees Transportation Center, Voorhees Transportation Policy Institute.) This project, which is still in progress, required that I interview various New Jersey transportation management associations and employees to understand the various commuting and related attributes of New Jersey workers. At one on-site visit, I was able to survey over a 150 participants. The steps required to make this on-site visit involved collaboration with several Institutes at Rutgers, for example, the Eagleton Institute, which helped to create an appropriate survey instrument.

**Q** To what extent did your CTE fellowship help prepare you for your current position?

The CTE fellowship played a significant role in transitioning me from the academic world to my career because I developed the skill sets necessary to pursue my interest in understanding the policy and practical implications of transportation investments and environmental impacts. The CTE fellowship focused my interest in environmental and transportation/land use interrelationships. This led me to pursue a degree in environmental management from Duke and, ultimately, to my current Smart Growth research position.

**Q** How do you see your career path evolving over the next five to ten years, and to what extent will transportation interests remain part of it?

There is no doubt that transportation will continue to remain an important part of my core interest as my career progresses over the next ten years. Transportation is a key factor influencing market choices which, in turn, shapes policy decisions regarding the use of land, whether dealing with master plans, zoning ordinances, state regulations, redevelopment projects (including brownfields) and environmental impacts. As I prepare my personal "Five Year Career Path Plan," my goals include working for a research foundation at a senior level or as a consultant advising on the development and testing of key attributes that influence public and private sector choices on the use and reuse of land.

**Q** What do you find most fascinating about a career related to transportation?

There is both an immediacy and a long-term impact that the field of transportation embodies that I find fascinating and intellectually stimulating. On the one hand, transportation is part of your everyday life (e.g., commuting to/from work). It can set the tone for the entire day: "Traffic was a mess today" is a common refrain from colleagues or "How did you get to work today?" is another common comment. Auto insurance, mass transit availability, parking availability, traffic noise, pollution, road maintenance and growing road rage are but some of the factors that add or detract from one's daily life. On the other hand, a key point of fascination for me is the interplay between the "now" state of affairs and future conditions. I am especially interested in

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“I am intrigued by the dynamics of policy, the factors that underlie the establishment of policy, and why particular factors are chosen.”

Vanessa Zoe Morin, Former CTE Graduate Fellow
understanding the variety of public and private sector decisions that have long-term impacts and that influence the degree to which one's future daily commuting experience is positive or negative.

Q Most challenging?

In general and on a personal level, what's most challenging is finding constructive ways to assert my viewpoint this early in my career while, at the same time, recognizing the fact that I am still continuing to assimilate new and increasing depths of knowledge from the subject experts I encounter within and beyond this office. My CTE fellowship and other training has prepared me for the challenge, and I'm enjoying the process of testing and strengthening my core knowledge base. In terms of subject matter, the intricate dynamics of the transportation and land use relationship (at the policy, planning, political and public outreach levels) are particularly challenging to me. The whole is clearly more than the sum of its parts.

Q What role do you hope to play in the evolving relationship between transportation, planning, and the environment?

I would like to become a subject matter expert and create a dynamic field of land use research management. This would be an overarching discipline that would establish the framework for uncovering the principles for interrelating transportation, environment, and land use.

Q What can the transportation industry do to attract more students?

It would be helpful to look to other countries in answering this question. For example, in Germany, where I spent one year with the Rutgers University Junior Year Study Abroad Program, the transportation system plays an integral role in everyday life, be it pedestrian, bicycles, mass transit, or automobiles. Although I am an adamant car-lover, I survived a year without my car because the transportation system was efficient and accessible enough for me to travel within the city and to other destinations like Paris or Milan (both 8 hours by train). In addition, there is a close research relationship between government and the private sector. The government encourages sharing of research and participates in the costs. This leads to the rapid development and deployment of new technologies and opens more fields of interest for potential transportation professionals. In addition, it is important to define the broad umbrella that comprises the transportation industry, as there is no one holistic transportation field. It consists of planners and engineers, as well as product and service suppliers and manufacturers. Therefore, it is essential that all levels of the transportation system are working together.

Q What would you advise students considering a career in this area?

Jamie Lerner, former Mayor of Curitiba and current Governor of Paraná, Brazil, states: "any city, large or small, can be a Curitiba . . . we should rediscover the city as an instrument of change." My CTE Fellowship paper, North Carolina's New Hope Creek Corridor: A Model for the Transit-Land Use Connection, used the Curitiba model to show how transit-land use connection really works. It takes a determined charismatic leader to move forward a concept of better transit-land use connections. Curitiba is not only a city with an innovative, world-renowned transit system, with a transit ridership of 1.4 million passengers per day, but it is also a sustainable city. Greenspace is less than one acre per person (population is 1.6 million). Jamie Lerner has also combined social and economic policy that ensures a better quality of life for Curitiba residents.

Q Any final thoughts that you would like to share with our readers?

As I look outside the window from my seventh-floor office building in downtown Trenton, I see what can be construed as the apparent mismatch
between transportation and land use. However, I also see a viable opportunity to champion the transit-land use connection in specific redevelopment opportunities in Trenton. These redevelopment opportunities might include daylighting Mill Hill Creek near state buildings, constructing market-rate housing along the waterfront and near state buildings, and creating a pedestrian-friendly boulevard along an existing local highway. My advice would be to seek out opportunities where the apparent transit-land use connections are not obvious and attempt to build partnerships so that the various constituents can be brought to the table to review seemingly unconnected linkages in order to create clear-stated policies. I have experienced instances where assumptions are made based on particular views of the world without verification of facts: "what" we do must be based on "why" and must have at its core a clear, unbiased problem statement that is objectively analyzed and tested.

Profile of Vanessa Zoe Morin

Academic Credentials
• Master of Environmental Management, May 2001, Nicholas School of the Environment, Duke University
  Master's project: Hazardous waste site remediation and environmental justice: chromium pollution in a New Jersey public housing project
• Bachelor of Science, magna cum laude, May 1999, Douglass College, Rutgers University

Professional Affiliations/Memberships
• Phi Beta Kappa
• Phi Sigma Iota
• Golden Key National Honor Society

Honors/Awards
• North Carolina State University's Center for Transportation and the Environment Fellow 2000-2001: North Carolina's New Hope Creek Corridor: A Model for the Transit-Land Use Connection
• Mabel Smith Douglass Honors Thesis 1999: The eastern migrant monarch butterfly and the United States' responsibility in co-management for environmental protection of the milkweed plant.
• Rodig-Maxwell Scholarship for a one-year study at the University of Constance, Germany, 1996-1997
• Weiss-Shirley Scholarship for a report on urban issues, 1998

Publications

Presentations
• New Jersey Workforce Transportation Study. On-site visit: Merck, Whitehouse Station; Dun & Bradstreet, Parsippany; Mack-Cali, Jersey City; and 101 Hudson Street, Jersey City. Website access: American Institute of Certified Public Accountant's, Jersey City; Fred Alger & Company, Inc., Jersey City; J.P. Morgan Chase Bank Inc., Jersey City; PR Newswire Association Inc, Jersey City. May 2002 - August 2002.

For more information on CTE’s Education Program:
Contact: James Martin, CTE Associate Director, (919) 515-8620 or jbm@unity.ncsu.edu
Technology Transfer Program

The objective of CTE’s technology transfer program is to facilitate enhanced communication and coordination among transportation and environmental professionals. This objective is achieved by finding ways to improve professionals’ access to information on current research applications, best practices, and policies; and to foster information sharing and relationship building.

CTE uses satellite videoconferencing and web-based technologies as key instruments for meeting this objective. These technologies continue to serve as the building blocks of the center’s future programs and services. For more information on CTE’s technology transfer program, please visit the web site at www.itre.ncsu.edu/cte/tech-transfer.html.

Contact: Katie McDermott, CTE Technology Transfer Director, (919) 515-8034 or kpm@unity.ncsu.edu

Workshops and Conferences

Wildlife Crossing Structures Field Course
September 10-12, 2002 (Banff, Albert, Canada)

CTE co-sponsored the Wildlife Crossing Structures Field Course, conducted at the Marriott Residence Inn in Canmore, Alberta (Canada), in cooperation with the Federal Highway Administration, the USDA Forest Service, and the Western Transportation Institute at Montana State University. The course drew a total of 55 participants, representing primarily FHWA headquarters and division offices as well as state transportation agencies.

The objectives of the three-day course, which included a field trip into Banff National Park to view crossing structures in place along the Parks Canada Highway, were to discuss:

• Wildlife crossing structure considerations (e.g., planning, permitting and streamlining, cost, placement, design and landscaping, maintenance, monitoring and effectiveness)
• How to incorporate wildlife mitigation techniques into transportation programs
• How to "spread the word" about promising techniques, planning practices, and successful interdisciplinary partnerships

While the workshop introduced practical strategies for mitigating the negative impacts of transportation infrastructure on ecosystems, the
long-term goal of the workshop (and related efforts) is to develop safe, efficient transportation within natural landscapes that are ecologically, socially, and economically sound. One step toward accomplishing this is to incorporate ecological considerations earlier into the transportation planning process in order to minimize the "road effect zone" and its impacts on natural landscapes. In addition, coordination with land use management priorities (public and non-public) remains a significant factor toward achieving long-term sustainability.

The UTC grant enabled CTE to participate in the program, to provide a presentation on related CTE technology transfer efforts, to collect still images and video of the classroom lectures and field trips, and to develop a web summary of the workshop, which was promoted through various agency listservs, newsletters, and web sites. The summary is located on CTE's Wildlife, Fisheries, and Transportation Web Gateway. To view the site (and related video clips and photo gallery), go to www.itre.ncsu.edu/cte/gateway/banff_index.html.

**North Carolina Air Quality Air Quality Roundtable: Golden Circle Preview**

November 18, 2002 (Raleigh, NC)

The award-winning North Carolina Air Quality Roundtable, first assembled in May 2001, continued its efforts to develop methods for improving the understanding of North Carolina's decision-makers and the general public about transportation conformity.

On November 18, 2002, CTE hosted the roundtable meeting of the “Gold Circle” members. The purpose of this meeting was to assemble those individuals who are to become critical partners to NCDOT and NCDENR in their efforts to educate elected officials and local decision makers about the implications of EPA’s new standards for ozone and particulate matter on North Carolina’s transportation programs.

The meeting included 20+ representatives from various stakeholder organizations in North Carolina and was videoconferenced from Raleigh, NC, to sites in Hickory, NC, and Virginia DOT.

The NC Air Quality Roundtable invites representatives from seventeen stakeholder organizations to participate in the proceedings. Included among the invited stakeholder groups are FHWA, USEPA, NC League of Municipalities, metropolitan planning organizations and local public agencies, NC Governor’s Office, NC Trucking Association, NC Independent Garage Owners Association, NC Department of Commerce, and environmental organizations. NC State University researchers involved with the transportation aspects of air quality and CTE graduate fellows are included in the meetings as well.

Detailed descriptions of the Roundtable meetings and results are available at the Roundtable web site, www.itre.ncsu.edu/cte/NCAirQuality, which CTE created and maintains for Roundtable participants and other states interested in initiating similar efforts to help achieve transportation conformity.
North Carolina Wildlife Habitat Connectivity Workshops
January 7, March 24, May 29, 2003 (Raleigh, NC)

Following on the heels of North Carolina’s award-winning Merger-01 Redesign Process and the continued development of the Ecosystem Enhancement Program, a small, inter-agency work group formed in January 2003 to explore opportunities for building a statewide wildlife habitat connectivity plan that would help improve environmental decision making related to transportation planning and project development. Critical terrestrial habitats were a missing link in a variety of efforts underway to protect and enhance North Carolina’s natural resources. Currently, the North Carolina Department of Environment and Natural Resources has been charged with leading the development of a statewide conservation plan that will identify critical natural land and water resources in eight eco-regions throughout the state. North Carolina DOT, which has already made significant progress in identifying wetlands and high quality water resources, approached DENR about the possibility of partnering to identify critical terrestrial wildlife habitats (and other environmental data) that would eventually be integrated into the statewide conservation plan. To date, three workshops have been conducted with involvement from NCDOT, NCDENR, NC Wildlife Resources Commission, US Forest Service, US Fish and Wildlife Service, US Environmental Protection Agency, and US Army Corps of Engineers. CTE’s role in this effort has been to organize the meeting logistics, document the proceedings of each session, and moderate a listserv exclusive to work group members.

One North Carolina Naturally Conference
April 16, 2003 (Raleigh, NC)

CTE was a financial sponsor of the One North Carolina Naturally Conference, conducted by the NC Department of Environment and Natural Resources. The conference, which drew more than 500 attendees statewide, introduced NCDENR’s efforts to develop a statewide conservation plan of North Carolina’s critical natural land and water resources. CTE is working with the NC Department of Transportation and other agencies to help integrate environmental data into the conservation plan that will lead to improved decision making about current and future transportation development in the state. For more information: www.ehnr.state.nc.us/officeofconservation/pages/events.html

NC State University Graduate Research Spring Symposium
April 25, 2003 (Raleigh, NC)

CTE was a financial sponsor of the NCSU Water Resources and Environmental Engineering (WREE) Graduate Spring Symposium, which featured Dr. William F. Hunt, Visiting Senior Scientist, NCSU Department of Statistics, on the topic, “Dealing with Environmental Terrorism: Lessons from the Kuwait Oil Fires, Reconciling, Modeling, and Monitoring Data.” The symposium drew more than 100 attendees.

Southern Environmental Leadership Summit
May 19-21, 2003 (Raleigh, NC)

CTE was a financial sponsor of NCDOT’s Southern Environmental Leadership Summit, which involved more than 400 participants from the southeastern region of the country, who met to share current information about projects and policies that are leading to improved transportation and environmental stewardship, decision making, and project delivery. For more information: www.ncdot.org/sels/
Upcoming Events in 2003-04:

Midyear Workshop of the TRB A1F02 Environmental Analysis in Transportation Committee
July 14-18, 2003, Wilmington, NC

International Conference on Ecology and Transportation: Making Connections
August 24-29, 2003, Lake Placid, NY

NATIONAL TELECONFERENCE SERIES

The CTE National Teleconference Series (NTS) provides a unique service to transportation and environmental professionals. The series offers an annual schedule of satellite-based broadcasts (with web simulcasts) featuring expert panels that address emerging transportation and environmental issues of national concern with a diverse audience of government, non-government, university, and private sector representatives.

Since the series began in 1994, CTE has conducted 28 broadcasts that have reached more than 12,000 students, practitioners, and decision makers through a downlink network that contains more than 250 sites, including the U.S. Environmental Protection Agency’s Air Pollution Distance Learning Network.

CTE scheduled two NTS broadcasts during the 2002-03 period. For more information on CTE’s teleconference series, including access to previous broadcasts, please visit the center’s web site at www.itre.ncsu.edu/cte/cte-teleconference.html.

Invasive Species in Transportation Rights of Way: You Wouldn’t Plant Kudzu, Would You?
Satellite & Web Broadcast: October 15, 2002

On October 15, 2002, CTE conducted the national satellite broadcast and web simulcast of Invasive Species in Transportation Rights of Way in cooperation with the Federal Highway Administration. FHWA Headquarters restoration ecologist Bonnie Harper-Lore moderated the three-hour program, which was produced at NC State University’s television studios. The live broadcast drew 104 downlink participants and 135 web participants. An additional 115 hits to the archived webcast were documented after the conference, and 90 copies of the videotape have been distributed. For more information: www.itre.ncsu.edu/cte/2002teleconferences.html

Lessons Learned in Environmental Stewardship: Effecting Organizational Change
Web Broadcast: April 16, 2003

The AASHTO Center for Environmental Excellence partnered with CTE to produce AASHTO-CEE’s first exclusive webcast, Lessons Learned in Environmental Stewardship, on April 16. The purpose of the two-hour webcast was to engage a panel of experienced transportation managers from four states to discuss their experiences with implementing environmental stewardship programs that have led to cultural changes throughout their organizations. These managers shared in practical terms how their agencies are accomplishing this change. The webcast drew 212 web participants. An additional 831 hits were made to the webcast archive, and 94 videotapes have been distributed. For more information, please visit the AASHTO Environmental Stewardship Demonstration Program website, hosted by CTE, at: www.itre.ncsu.edu/AASHTO/stewardship/webcast.asp
Partnership with USEPA’s Air Futures / Air Toxics Now Program

As a result of its extensive web broadcast experience, CTE for the past two years has served as the webcast provider for the US Environmental Protection Agency’s Air Toxics Now and Air Futures web broadcasts.

Air Toxics Now is a quarterly news program that supports implementation of EPA’s Air Toxics Program. Air Futures is developed by EPA in cooperation with tribal, state, and local air pollution control agency personnel to explore the future direction of the national air quality program. As webcast provider, CTE streams the live webcasts and helps to facilitate distribution of the program beyond EPA’s traditional environmental audience to the larger transportation community. In particular, the program has become a resource for the CTE-hosted, award-winning North Carolina Air Quality Roundtable and can be accessed from the Air Quality Roundtable web site at www.itre.ncsu.edu/cte/NCAirQuality/.

During the 2002-03 period, CTE web streamed three Air Toxics Now broadcasts on July 23 and November 26, 2002, and March 26, 2003; and one Air Futures broadcast on October 17, 2002. An average of 150 web participants access the one-hour webcasts. In addition, a total of 1,564 hits have been tracked on the Air Toxics Now and Air Futures webcast archive, also hosted on CTE’s web site.

CTE-NCDOT Environmental Research Program

CTE’s technology transfer program helps to promote the research findings and activities of the principal investigators of projects supported by the CTE-NCDOT joint environmental research program (www.itre.ncsu.edu/cte/cterip.html). Typically, research projects nearing their completion dates are featured in the “Research Profile” section of the CTE News & Notes newsletter. In addition, CTE coordinates the distribution of final research reports to USDOT and other transportation research libraries. During 2002-03, two final project reports were completed and packaged for distribution:

- Increased Options for Weed Management in North Carolina’s Wildflower Program (Dr. Fred Yelverton, NC State University)
- Measures to Reduce Erosion and Turbidity in Construction Site Runoff (Dr. Robert McLaughlin, NC State University)

To date, the program has awarded 25 environmental research projects with a budget of more than $6.2 million to a multi-disciplinary team of principal investigators. The program has involved the participation of 115 undergraduate and graduate students, and has generated more than 26 conference presentations, 8 journal articles, and several masters’ theses and doctoral dissertations.

Research Databases on the Web

CTE maintains on its website three databases that contain research information of interest to transportation and environmental professionals:

Wildlife Ecology and Transportation Database

Accessible through CTE’s Wildlife, Fisheries, and Transportation Web Gateway (www.itre.ncsu.edu/cte/gateway/index.html), this keyword-searchable database contains more than 1,200 records of published research and web sites related to wildlife, fisheries, and transportation. The records, many of which contain complete abstracts, are pulled from more than 12 published databases for which CTE has copyright clearance, including TRB’s Transportation Research Information
Service (TRIS), TRANSPORT, BIOSYS, and Zoological Record. The database is updated quarterly and contains abstracts from the papers featured in the proceedings of the International Conference on Ecology and Transportation (ICOET).

During 2002-03, CTE entered into an agreement with the Federal Highway Administration to compile the results of its November 2001 European Scan Tour of Wildlife Crossing Structures for presentation on the WFT Gateway. This effort included the development of an extensive bibliography of the research documents collected on the tour, which were also added to the wildlife and transportation research database. (www.itre.ncsu.edu/cte/gateway/scantour_index.html)

**Environmental Research In Progress (EnvRIP) Database**

Since 1997, CTE’s EnvRIP project has provided professionals with easy access to in-progress transportation and environmental research under way at federal and state agencies, universities, and non-government organizations. Research information included in the database is organized according to the research areas outlined by the TRB Environmental Analysis in Transportation Committee and other sponsors of the Environmental Research Needs Conference, which has been conducted every five years since 1991. CTE recently completed a major update to EnvRIP in preparation for the March 2002 research needs conference. The web database, with more than 1,000 records, is accessible on CTE’s website (www.itre.ncsu.edu/cte/envripmenu.htm). However, CTE plans to phase out EnvRIP over the next calendar year and integrate its results with TRB’s new Transportation Research In Progress (TRIP) database, which includes excellent documentation of environmental, as well as other, research in progress of interest to transportation agencies: http://rip.trb.org/.

**FHWA Transportation and Environmental Research Program (TERP) Database**

CTE developed and hosts the web database that tracks active and complete projects funded by FHWA’s environmental research program since 1990. The database will undergo a major update in 2003-04. It is keyword searchable and currently located at: http://itre.ncsu.edu/fhwa-erp/.

**ADDITIONAL WEB SITES HOSTED BY CTE**

- **Wildlife, Fisheries, and Transportation Web Gateway** (www.itre.ncsu.edu/cte/gateway/index.html)
  Provides information on research applications, best practices, educational opportunities, and current events related to ecology and transportation.

- **CONVERGE: Where Transportation and the Environment Meet** (www.converge.ncsu.edu)
  Chronicles the relationship between transportation and the environment throughout America’s history and profiles current topics of interest to professionals, students, and educators.

- **TransStreamNet** (www.transstreamnet.org/)
  Presents the results of National Cooperative Highway Research Project 25-24, which features pilot projects on environmental streamlining in progress at state transportation departments.
AASHTO Stewardship Demonstration Program
(www.stewardship.transportation.org)
Showcases demonstration projects and promotes information sharing about environmental stewardship concepts and best practices among transportation agencies. An activity of the AASHTO Center for Environmental Excellence.

Transportation Research Board Environmental Committee Sites
(http://itre.ncsu.edu/cte/partners.htm)
- A1F02, Environmental Analysis in Transportation
- A1F05, Historic and Archaeological Preservation
- A1F07, Waste Management in Transportation

In addition to website development and hosting, CTE also moderates several listservs as part of its technology transfer objective to facilitate enhanced communication:

TransEnviro: promotes discussion and information sharing about a broad range of environmental topics related to transportation.

WFTLISTSERV: promotes discussion and information sharing about wildlife, fisheries, and transportation issues.

CTEWBICAST: provides scheduling information and technical assistance to participants of the web simulcasts of CTE’s national teleconference series.

A1F05 Listserv: facilitates discussion among members and friends of the Transportation Research Board Committee on Historic and Archaeological Preservation in Transportation.

CTE PUBLICATIONS

CTE publishes a quarterly newsletter, CTE News & Notes, for members of its mailing list. The newsletter provides an update of center activities and related events. The most recent issue is available online at: www.itre.ncsu.edu/cte/newsnotes/nnsummer03.html.

As lead organizer for the International Conference on Ecology and Transportation, CTE also publishes the proceedings for this annual event, which contains more than 100 technical papers and abstracts. The 2001 proceedings is currently online (and the 2003 proceedings soon to be published) at: www.itre.ncsu.edu/cte/icoet/.

Through its partnership with North Carolina Department of Transportation’s environmental research program, CTE maintains keyword-searchable PDF versions of final project reports on the website at: www.itre.ncsu.edu/cte/cterip.html.

Additional information about CTE publications is located on the center website at: www.itre.ncsu.edu/cte/ctepubs.htm.