Center Theme and Mission

The Center for Transportation and the Environment conducts innovative programs of research, education and technology transfer that seek to mitigate the impacts of surface transportation on the environment.

CTE is an activity of the University Transportation Centers Program, administered by the Research and Innovative Technology Administration of the United States Department of Transportation. CTE is recognized as a national university transportation center of excellence.

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Message from the Director

This annual report describes the many research, education, and technology transfer activities for 2010-2011 of The Center for Transportation and the Environment. Since CTE was established in 1991 as a national center within the Institute for Transportation Research and Education at North Carolina State University, it has carried out numerous projects with agencies at the local, state, and national level.

Several project activities for this year were supported by the National Cooperative Highway Research Program. In the project NCHRP 25-25 Task 62, carried out in association with The Louis Berger Group, Inc., CTE researchers Leigh Lane and Ann Hartell led the work on two major tasks that focused on public outreach and designing the community contest for planning. Let me call your attention to one special product of that work, the online video produced by Eugene Murray that features Ann Hartell providing an overview of community contest tools. Another project, NCHRP 25-36, is addressing the impacts of land use strategies on travel behavior in small communities and rural areas.

Other initiatives include a “Sustainability Blueprint” study for the North Carolina Department of Transportation led by Leigh Lane to help institutionalize sustainable principles and practices. Another project carried out a statewide survey of bicycle and pedestrian issues. CTE also continued its close working relationship with the North Carolina Department of Transportation in its ongoing research program. Thirteen projects were completed or in progress, and they addressed topics ranging from assessing ecological impacts to stormwater management to bioenergy crop production along highway right-of-ways.

Our education program again includes a major focus on Context Sensitive Solutions and features the completion of a new phase of the CSS National Dialog supported by Federal Highway Administration. Descriptive materials and webcast recordings are available online as described below. Also, David Robinson has initiated a public information and engagement program for the NCDOT High-Speed Rail project, and Leigh Lane and James Martin are developing training programs for the NCDOT Complete Streets Initiative.

Finally, CTE has continued its focus on technology transfer activities, and program highlights include the CSS National Dialog: Continuing the Conversation webcast for FHWA and the planning for the 2011 International Conference on Ecology and Transportation to be held in Seattle.

After reviewing our report, please visit our website at www.cte.ncsu.edu and let us know if you would like more information about any of our efforts.

Sincerely,

E. Downey Brill, Jr., Ph.D.

E. Downey Brill, Jr., Ph.D.
Management Structure

CTE is administered by North Carolina State University, reporting to the Office of the Vice Chancellor for Research and Graduate Studies, and is one of over 60 research centers, institutes, and laboratories on campus. CTE is located on NCSU’s Centennial Campus in the offices of the Institute for Transportation Research and Education (ITRE).

The Center’s research, education, and technology transfer programs are guided by the CTE Advisory Committee, which provides valuable input on program activities. The committee is composed of representatives from government, academia, and non-profits. In addition, ITRE’s Advisory Council receives regular updates on CTE activities and provides input at the request of the Center’s director, Dr. E. Downey Brill, Jr.

CTE Advisory Committee 2010-2011

Eugene Conti, Jr., PhD  
Secretary  
North Carolina Department of Transportation  
Raleigh, NC

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Financial Report

The Center for Transportation and the Environment is funded by the Research and Innovative Technology Administration of the US Department of Transportation, with matching support from the North Carolina Department of Transportation.

CTE’s total annual operating budget for FY2010-2011 was $925,800. USDOT provided $462,900 through the University Transportation Centers Program. NCDOT provided the full state match requirement of $462,900 through its funding of CTE / NCDOT joint research projects.

FY2010-2011 Funding Sources

Federal Grant 50%

State DOT 50%

FY2010-2011 Expenditures

Admin 7%

Technology Transfer 18%

Research 50%

Education 25%

Research 18%
CTE's annual research activities include partnering with the North Carolina Department of Transportation to conduct a joint environmental research program. The partnership was established in 1998 following the Center’s reauthorization in the Transportation Equity Act for the 21st Century (TEA-21).

Each year the NCDOT Research and Development Unit requests research proposals addressing transportation needs from across the state. Representatives from CTE, the Institute for Transportation Research and Education (ITRE), and the Federal Highway Administration's NC Division Office serve on a technical advisory committee responsible for reviewing and selecting the research projects. Contracts for all project awards are administered by ITRE. CTE's director serves on each environmental research project committee which provides overall guidance to the principal investigator(s) and monitors their progress through project completion.

The CTE / NCDOT partnership has generated significant research results in various environmental areas, including air quality, water quality, wetlands mitigation, vegetation management, wildlife management, highway construction materials, and new technologies. During 2010-2011 the research program involved the active participation of more than 35 students and 19 university faculty representing many academic disciplines.

For more information on the program and research projects, please visit the CTE website at www.itre.ncsu.edu/cte/research.

New Projects
No new NCDOT environmental research projects were selected for CTE match during the 2010-2011 reporting period.

Completed Projects
The following research projects were completed and final reports issued during this reporting period. Reports and other project details are available on the CTE website, and through the Transportation Research Board (TRB) Transportation Research Information Services (TRIS) Database at http://trid.trb.org.

Effectiveness of Bear Crossings on I-26 in Madison County, North Carolina (HWY-2006-14)
Performing Organization: North Carolina State University
Principal Investigators: Dr. Richard A. Lancia, Dr. Phillip D. Doerr

Evaluation of Permeable Friction Course (PFC), Roadside Filter Strips, Dry Swales, and Wetland Swales for Treatment of Highway Stormwater Runoff (HWY-2007-21)
Performing Organization: North Carolina State University
Principal Investigator: Dr. William Hunt

Methodology to Assess Vegetation, Hydrologic & Soil Parameters that Affect Wetland Restoration Success (HWY-2008-16)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Mike J. Vepraskas

Propagation and Culture of Federally Listed Freshwater Mussel Species (HWY-2009-16)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Jay F. Levine
Period: July, 2008 – December, 2010
Effects of Highway Construction on Two Streams in Yancey County (HWY-2009-23)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Daniel E. Line
Period: August, 2008 – August, 2011

Monitoring of Prospective Bridge Deck Runoff BMPs: Bioretention and Bioswale (HWY-2009-29)
Performing Organization: North Carolina State University
Principal Investigator: Dr. William F. Hunt III
Period: July, 2009 – June, 2010

Ongoing Projects
The following research projects were in progress or in the draft final report stage during this reporting period.

Performing Organization: University of North Carolina at Charlotte
Principal Investigators: Dr. Craig Allan, Dr. Jy Wu

Evaluation of Nutrient Loading Rates and Effectiveness of Roadside Vegetative Connectivity for Managing Runoff from Secondary Roads (HWY-2007-04)
Performing Organization: University of North Carolina at Charlotte
Principal Investigators: Dr. Jy Wu, Dr. Craig Allan
Period: July, 2006 – August, 2009

Ongoing Maintenance and Enhancement of Precipitation Alert and Visualization Tool in Support of NCDOT's Storm Water Quality Monitoring (HWY-2007-20)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Sethu Raman
Period: July, 2006 – June, 2009

Effects of Highway Construction in Sedgefield Lakes and King’s Mill Continued (HWY-2008-17)
Performing Organization: North Carolina State University
Principal Investigators: Dr. Daniel E. Line, Dr. Jean Spooner

Assessment of Bioenergy Crop Production along NC Highway Right of Ways (HWY-2009-19)
Performing Organization: North Carolina State University
Principal Investigator: Matthew W. Veal
Period: March, 2009 – May, 2011

Claridge Nursery Stream Restoration Monitoring (HWY-2009-28)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Greg Jennings
Period: July, 2009 – June, 2010

Shoreline Monitoring at Oregon Inlet Terminal Groin (HWY-2011-31)
Performing Organization: North Carolina State University
Principal Investigator: Dr. Margery F. Overton
Period: August, 2010 – August, 2011
NCHRP Research Projects

The National Cooperative Highway Research Program (NCHRP), managed by the Transportation Research Board (TRB), conducts research in problem areas that affect highway planning, design, construction, operation, and maintenance nationwide. In 2010-2011 CTE researchers and staff contributed on several NCHRP project activities:

Improving Public Outreach for Transportation Projects by Use of Citizen Coalitions

Citizen coalitions can be an important resource for transportation agencies, providing convenient access to the public to facilitate meaningful engagement and improve public outreach during all phases of a transportation project. Working with citizen coalitions has become more important than ever with the increasing focus on creating transportation solutions that support livable and sustainable communities.

CTE senior research associate Leigh Lane, working with contractor The Louis Berger Group, Inc., led a NCHRP research project to help transportation agencies identify coalitions that can provide valuable input into the transportation decision-making process. The research would also help agencies more effectively engage stakeholders through the use of citizen coalition groups.

A key product of this research project, titled NCHRP 25-25 Task 62: Improving Public Outreach for Transportation Projects by Use of Citizen Coalitions, is an inventory of 85 coalitions involved in transportation policies, programs, and projects at various levels. The coalitions inventoried cover a range of topic areas including social equity, environmental protection, sustainable strategies, public health, air quality impacts, and historic and cultural preservation.

The project report provides transportation practitioners with an extensive inventory of coalitions they can engage to better support public outreach efforts, advice on how to identify other coalitions, effective strategies used by coalitions to engage their constituencies which transportation agencies can learn from, and advice on how to build long-term relationships with citizen coalition groups. The report shows practitioners how they can leverage the skills, expertise, political and social capital of citizen coalition groups to more effectively and efficiently solve transportation problems while supporting a good quality of life. The report is available online at http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25(62)_FR.pdf.

Defining Community Context in Transportation Project Planning and Development Process

CTE staff, collaborating again with The Louis Berger Group, Inc., is implementing a second NCHRP research project titled NCHRP 25-25 Task 69: Defining Community Context in Transportation Project Planning and Development Process. This research will provide practitioners with effective tools that can describe community context so that transportation decisions and projects can be catered to the goals and perception of the community. The research will also identify future needs in the area of context tool development.

To gather this information, CTE launched a new website to collect a wide range of tools from the various sectors of the community such as community development, historic preservation, and architecture. Community members can submit their tools on the project website at www.ite.ncsu.edu/cte/communitycontext.

Leigh Lane, CTE senior research associate and principal investigator on the project, is working closely with research associate, Ann Hartell, to inventory and evaluate the effectiveness of community context tools and techniques that are being used as part of the project planning and development processes. Nancy Bailey, web development specialist at CTE, is designing and programming the website.
Visitors to the website – which is open to members of public and private sector organizations, as well as transportation planning advocacy organizations – can view a brief video that introduces the concept of community context and provides examples of context tools. Produced by CTE distance learning specialist, Eugene Murray, the video features Ms. Hartell as the on-camera narrator and guide to using the website. The website also contains an online form that visitors can fill out to submit information about their tool.

NCHRP 25-25 is a support program for the American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment. The goal of this program, active since 2002, is to provide flexible, ongoing, quick-response research on environmental issues in transportation. Research has developed improvements to analytical methods, decision support tools, procedures, and techniques that have supported statewide and metropolitan transportation planning. CTE is pleased to add their support to the program. For more information visit the project website at www.itre.ncsu.edu/cte/communitycontext.

**Impacts of Land Use Strategies on Travel Behavior in Small Communities and Rural Areas**

CTE in June 2011 began working with fellow researchers at the University of North Carolina at Chapel Hill (UNC) and North Carolina State University (NCSU) on a project for the National Cooperative Highway Research Program. Titled **NCHRP 25-36: Impacts of Land Use Strategies on Travel Behavior in Small Communities and Rural Areas**, the research will focus on developing methods and assessing the impact of land use, development patterns, and related economic activities on travel behavior in small communities and rural areas. The research will also identify those land use-related conditions and strategies that have the greatest impacts on travel behavior.

UNC researcher Brian Morton is principal investigator on the project. CTE research associate Ann Hartell is task leader on Literature and Data Review for the project, working with NCSU colleagues Joe Huegy, Mei Ingram and Chao Wang at the Institute for Transportation Research and Education.

The results of the research will be used by transportation and community practitioners involved in planning for small communities and rural areas to evaluate and measure the impacts of transportation; settlement patterns; and development strategies on travel behavior, fuel consumption, and emissions. A final report is expected in Spring 2013. To learn more about the project visit the TRB website at http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.aspx?ProjectID=2987.
TRB Research Presentations

CTE senior research associate Leigh Lane was invited to present on several research topics at the 90th Annual Meeting of the Transportation Research Board (TRB) held January 23-27, 2011 in Washington, DC. Through the TRB, CTE research contributes to the national discourse on transportation and environmental issues and serves as an important resource for transportation-related decision-making. Lane’s research selected for presentation this year included:

- **Getting CSS off the Ground: FHWA’s Technical Assistance** — a podium presentation of the technical assistance provided to several state DOTs towards implementation of Context Sensitive Solutions (CSS) principles. This assistance included workshops, facilitated discussions, and customized sessions on various aspects of CSS. Lane, working with consultants from The Louis Berger Group, Inc., was one of the expert team members leading the technical assistance efforts in six states.

- **Livability in the Transportation Context** — Lane was the opening speaker in a session addressing the important relationship of livability and sustainability to transportation and the environment. The session provided an understanding of livability, sustainability and environmental considerations in transportation, and explored how these factors can be measured and applied.

- **NCHRP Project 25-25 Task 62: Improving Public Outreach for Transportation Projects by Use of Citizen Coalitions** — a poster presentation on the results of a National Cooperative Research Program (NCHRP) project to help transportation agencies identify citizen coalitions that can provide valuable insight and input into the transportation decision-making process, as well as help them more effectively and efficiently engage their stakeholders to better understand community interests and needs. Lane’s presentation illustrated how transportation practitioners can leverage the skills, expertise, political and social capital of citizen coalition groups to more effectively and efficiently solve transportation problems while supporting a good quality of life.

Context Sensitive Solutions: Linking Mobility with Community and Environmental Needs

A study on Context Sensitive Solutions (CSS) by CTE research associate Ann Hartell was invited for publication in the Spring 2011 issue of Carolina Planning, an academic journal produced by the University of North Carolina. The journal article titled “Transportation in North Carolina” presents selected case studies and commentary from Hartell and fellow members of the North Carolina Chapter of the American Planning Association. Hartell’s paper on “Context Sensitive Solutions: Linking Mobility with Community and Environmental Needs” is featured in the article.

Hartell’s research at CTE focuses on community impacts, social aspects of transportation, and the transportation decision-making process. In the journal article Hartell discusses the importance of CSS in guiding the design of highways, roadways and transportation facilities to fit within the character of the surrounding environment. CSS helps stakeholders involved with designing and implementing transportation improvements to understand the affected landscape, community, valued resources, and role of various modes of transportation in each unique context before developing engineering solutions. Hartell details the core CSS principles and how federal and state DOTs utilize CSS to implement projects within existing constraints.

Carolina Planning, published annually by the UNC Department of City and Regional Planning, is the oldest student-run planning publication in the country. Articles selected for the journal are written by academics and practitioners, covering a wide range of topics relevant to today’s planning challenges. For more information visit [http://carolinaplanning.unc.edu](http://carolinaplanning.unc.edu).
**NCDOT Sustainability Blueprint**

CTE is preparing a “Sustainability Blueprint” for the NC Department of Transportation to institutionalize sustainable principles and practices throughout all functions of NCDOT, including planning, project/program development, project delivery, and internal operations.

Led by CTE senior research associate Leigh Lane, the project began with an extensive review of state DOT policies and plans across the nation. The review identified and synthesized “best practices” in promoting sustainability and creating a framework for sustainable decision-making. The plan review yielded some interesting findings on the state of the practice in state DOT sustainability planning, which will be reported in a paper under development for submission to the Transportation Research Board by CTE graduate researcher Ted Mansfield and research associate Ann Hartell.

Following the review, CTE released an NCDOT-wide survey to identify existing sustainable practices and worked with departmental advisory groups to define four "focus areas" of sustainability. These focus areas will guide the identification of goals and strategies for the Sustainability Blueprint.

CTE is collaborating with Planning Communities, LLC, to conduct outreach both within and external to NCDOT in support of the Sustainability Blueprint. Through interactive focus group sessions with NCDOT employees, the project team is introducing the concept of sustainability, identifying existing NCDOT practices and programs that align with the four focus areas, and determining new strategies that could be promoted in the Sustainability Blueprint. Meetings and interviews with external partners – including MPOs/RPOs, councils of government, other state agencies, transit service providers, and private industry – are also being conducted to identify sustainable strategies and collaborative partnerships for implementation.

The outreach process will be completed in September 2011. The project team will prepare the final NCDOT Sustainability Blueprint which will provide a framework of goals, objectives, and strategies for the promotion of sustainable outcomes, as well as a set of performance measures to monitor implementation progress and effectiveness over time.

**Support for Statewide Survey of Bike/Ped Issues**

CTE research associate Ann Hartell assisted colleagues at the Institute for Transportation Research and Education (ITRE) in conducting a statewide public survey on bicycle and pedestrian issues. ITRE, working with the North Carolina DOT Division of Bicycle and Pedestrian Transportation, conducted the survey to identify key problems and prioritize safety issues within North Carolina’s bicycle and pedestrian network, and to determine the level of public support for future investment in the state’s bicycle and pedestrian infrastructure.

The project included two public involvement processes: a widely distributed public questionnaire which generated more than 16,000 responses, followed by a series of regional roundtables held across the state. Roundtable participants reached a consensus on the strategies to recommend to NCDOT through a process of priority voting. Hartell aided ITRE in facilitating and documenting several of the roundtables.

Supporting the North Carolina Ecosystem Enhancement Program

CTE’s longtime support for the North Carolina Ecosystem Enhancement Program (EEP) concluded in 2010-2011. Since EEP’s inception in 2003, CTE senior research associate Dr. David Robinson has worked closely with EEP staff to implement this nationally-recognized environmental mitigation program that also supports economic growth in the state. EEP is a unique partnership between the NCDOT, NC Department of Environment and Natural Resources, and the US Army Corps of Engineers. The program provides mitigation for NCDOT’s transportation infrastructure projects, and maintains hundreds of stream and wetland restoration, enhancement and conservation projects statewide. Robinson supported EEP in its strategic planning and database development to track and forecast project costs and budgets. He forecast the in-lieu fee programs for wetland, stream, nutrient offset and stream buffer mitigation. Robinson also provided analysis of proposed state and federal mitigation legislation, and determined the potential financial and organizational impacts on the program. Robinson’s long and successful tenure with EEP ended in March 2011 as he transitioned to a new role for CTE providing public information and engagement support to the NCDOT Rail Division. CTE is proud to have supported EEP in its efforts to preserve and protect wetlands, streams and riparian areas throughout North Carolina. For more information, visit the EEP website at www.nceep.net.

TRB Research Committees and Conference Participation

CTE in 2010-2011 continued its successful tenure of participation on committees of the Transportation Research Board (TRB) to contribute valued perspectives on current issues facing transportation and the environment. Center staff Downey Brill, James Martin, Leigh Lane and Ann Hartell served on several TRB committees noted below as well as participated in the TRB 2010 Annual Meeting. TRB committees facilitate the exchange of research information and results vital to improving the nation’s transportation systems. To learn more, visit the TRB website at www.trb.org.

- ADC10 Committee on Environmental Analysis and Transportation (D. Brill)
- ADC30 Committee on Transportation and Ecology (J. Martin)
- AHD 15 Maintenance and Operations Personnel (J. Martin)
- AD000 Planning and Environment Group (L. Lane)
- ADD00 Section – Social, Economic, and Cultural Issues (L. Lane, section chair)
- ADD20 Committee on Social and Economic Factors (A. Hartell)
- ADD20 Subcommittee on Community Impact Assessment (A. Hartell)
- ADD40 Committee on Transportation and Sustainability (L. Lane)
- ADD50 Committee on Environmental Justice (L. Lane; A. Hartell, friend)
- AFB50T Task Force on Context Sensitive Design/Solutions (L. Lane)
Transportation for Livable Communities Conference

A presentation by CTE researchers on community context was accepted for the Transportation for Livable Communities Conference held October 18–19, 2010 in Washington, DC. Organized by the Transportation Research Board and sponsored by the USDOT Research and Innovative Technology Administration, the conference brought together university researchers and transportation practitioners to share results, explore challenges, and identify future research on incorporating livability into transportation programs and projects.

Senior research associate Leigh Lane presented a poster, co-authored by research associate Ann Hartell, on “How to Define Community Context and Translate the Information into Indicators to Evaluate Different Transportation Solutions.” The presentation highlighted CTE’s work on three national highway research projects – two for the National Cooperative Highway Research Program (NCHRP) and one for the Strategic Highway Research Program (SHRP2) – which focused on understanding community quality of life considerations as part of transportation decision-making. The presentation provided useful information to both practitioners and researchers for defining community context, and to guide practitioners on quality of life considerations in creating livable communities through transportation investment.

CTE’s participation in the conference contributed to the development of a future transportation research agenda directed toward achieving livability, a major area of emphasis for USDOT. University transportation centers like CTE play a unique role in accomplishing the research agenda necessary to advance transportation for livable communities. For more information about the conference, visit www.trb.org/conferences/livability2010.aspx.
**Education Program**

Context Sensitive Solutions (CSS), a collaborative process for transportation planning and design, is a central focus of CTE's education program activities. CSS is an interdisciplinary approach which partners transportation professionals with regulatory agencies, local governments, citizens and other stakeholders to consider the total context within which a transportation project will exist and to achieve solutions that integrate the project with the environment and community it serves. Since 2003 CTE has been a nationally recognized expert and leader in CSS research and education.

In 2010-2011 CTE completed initial work on a federal initiative to further implement CSS principles into transportation planning across the country. The Center this year also supported undergraduate and graduate student research through internships and the CTE Student of the Year award, as well as civil engineering student activities through participation with the American Society of Civil Engineers and the Department of Civil, Construction and Environmental Engineering at North Carolina State University. CTE also began development on a new training program and public outreach project for the North Carolina Department of Transportation. More information about CTE's education program can be found at [www.itre.ncsu.edu/cte/education](http://www.itre.ncsu.edu/cte/education).

**Context Sensitive Solutions National Dialog**

CTE and the Federal Highway Administration (FHWA) in 2010-2011 completed the first phase of the Context Sensitive Solutions (CSS) National Dialog. The Dialog is facilitating an ongoing exchange of ideas and building momentum for wider implementation of CSS in the transportation industry. The project featured a series of five informational workshops held across the U.S from October 2009 to April 2010, four of which were also webcast live to a national audience who participated in the discussions with questions by email. Each workshop focused on a particular aspect of CSS and highlighted regional transportation projects and programs to illustrate CSS best practices and provide a springboard for further discussion and interaction. The workshops also featured discussion panels drawn from each host region. CTE and FHWA conducted a follow-up national webcast in August 2010 with updates to information presented at the regional workshops. The Dialog brought together over 1100 participants at the workshops and via webcasts, representing state DOTs; state, federal and local governments; and private companies as well as university affiliates and non-governmental organizations. CTE prepared a final report to FHWA about the project which is available on the CSS National Dialog website, along with all workshop materials and webcast recordings, at [www.cssnationaldialog.org](http://www.cssnationaldialog.org).

**Graduate and Undergraduate Internships**

CTE welcomed three student interns to its staff in 2010-2011. These outstanding individuals are making valuable contributions to CTE research and project activities:

Ted Mansfield is pursuing dual master’s degrees in city and regional planning and environmental engineering at the University of North Carolina at Chapel Hill. Mansfield works closely with CTE research staff on a number of projects. He recently contributed to the NCHRP 25-25 Task 69 project and is currently helping the North Carolina Department of Transportation develop an innovative sustainability plan. CTE’s work on transportation development, and the environmental strategies and consequences involved in that development, was very appealing to him as a graduate student “getting his feet wet in the field,” Mansfield says. “It’s a natural fit, because of the work I’m doing right now at UNC and my interests in general.” Mansfield holds a B.S. in Civil Engineering from New Mexico State University and plans to complete his graduate work in May 2012.
**Matt Watterson** is putting his skills to work on research for the North Carolina Department of Transportation’s sustainability blueprint process. He is part of a team working on sustainability indicators research as well as working on a project to inventory tools and methods to evaluate return on investment of sustainable practices. Watterson hopes his research work here at CTE will lead to greater application of the benefits in livability and long-term viability associated with such techniques as NCDOT implements their Sustainability Blueprint. A recent graduate of East Carolina University, Watterson holds a master’s degree in geography with a supplemental certificate in geographic information systems. His undergraduate work, also completed at East Carolina, was in urban and regional planning. The focus of his master’s thesis was on the application of sustainable principles to historic preservation-based heritage tourism in the downtown district of New Bern, North Carolina. Before coming to CTE, Watterson worked in both county and city level planning and GIS departments. He has been involved in several planning projects in North Carolina, including a land use study for the City of Wilson and the Ten Year Plan to End Homelessness for Pitt County.

**Esther Kagure Wamunyu** is part of the research team that is inventorying tools and methods for evaluating return on investment for sustainable practices as part of the North Carolina Department of Transportation’s sustainability blueprint process. She views this internship as an opportunity to make a contribution in the field of transportation and she hopes that her research at CTE will help in shaping the sustainability practices of NCDOT as well as DOTs in other parts of the world. An undergraduate student at Meredith College in Raleigh, Wamunyu is working toward a bachelor’s degree in mathematics. At Meredith, she is participating in an engineering dual degree program with North Carolina State University in which she is also enrolled in the College of Engineering where she is pursuing a degree in civil engineering. She expects to complete both degrees in 2013. In 2010, Wamunyu received the Banks Memorial Undergraduate Scholarship and Louise Moritz Molitoris Leadership Scholarship for Undergraduates from the North Carolina Triangle Chapter of Women in Transportation (WTS). She went on to be awarded the Banks Memorial Undergraduate Scholarship at the WTS International level. Wamunyu developed an interest in exploring the issues between land development and transportation infrastructure while living in Nairobi, Kenya, where traffic congestion is a serious problem during peak hours. Her career interests lie in planning and policy arenas that will help shape better land use and transportation decisions.

**Student of the Year**

Graduate researcher **Ted Mansfield** was selected as the CTE Student of the Year for 2010. CTE recognizes annually a graduate student within its research program whose academic work exemplifies outstanding research and leadership qualities in the transportation and environmental fields. Mansfield was honored by CTE at the annual University Transportation Centers awards banquet, held in January 2011 in concert with the Transportation Research Board Annual Meeting in Washington, DC.

Having interests in improving the integration of transportation and land use planning in order to create highly accessible, livable, and dynamic urban spaces makes Mansfield a good fit with the CTE projects he works with. His academic research has included an investigation of the causal linkages between urban form and local air quality, and an analysis of the ability of decentralized stormwater management to mitigate combined sewer overflows in highly urbanized areas.
ASCE Engineering Student Transportation Competition

CTE research associate Ann Hartell served as a judge for the transportation competition at the annual American Society of Civil Engineers (ASCE) Carolinas Conference, held April 14-16, 2011 at North Carolina State University (NCSU). Each year, the Carolinas Conference brings together engineering students from ASCE student chapters at colleges and universities throughout the southeast for a full day of contests including a concrete canoe, steel bridge design, and survey competitions.

Transportation teams were given information on a freeway interchange and were challenged to develop a conceptual design that demonstrated understanding of traffic engineering, cost-effective design, and vehicular, pedestrian and bicycle safety. Hartell joined colleagues from the Institute for Transportation Research and Education (ITRE) and NCSU Civil, Construction and Environmental Engineering faculty to judge the competition.

Engineering students from ten southeastern colleges and universities – North Carolina State University, Duke University, University of North Carolina at Charlotte, Trident College, Citadel Military Academy, Clemson University, Georgia Institute of Technology, North Carolina AT&T State University, University of South Carolina, and South Carolina State University – participated in the event.

The Citadel placed first in the transportation competition, while the Clemson University team earned top honors after scores from all the competitions were tallied.

Public Outreach for NCDOT High-Speed Rail Project

CTE senior research associate, Dr. David Robinson, in August 2010 began a new public information and engagement role for CTE as a community liaison officer to support the Rail Division of the North Carolina Department of Transportation (NCDOT). In his capacity as liaison officer, Dr. Robinson has hit the road to discuss the Southeast High Speed Rail Corridor (SHSRC) project with communities that have been affected by its implementation.

The SHSRC comes on the heels of a $545 million dollar grant awarded to the state for construction of a high-speed rail corridor from Charlotte to Washington, D.C., an area designated for rail construction by the U.S. Department of Transportation in 1992. The current windfall of funds has advanced the project to include minor to major rail upgrades and construction projects in eleven counties in the state, including Wake and Durham counties.

In his new role, Dr. Robinson will help foster and perpetuate positive reactions from those communities directly involved in the project, as well as serve as a knowledgeable representative of the project and its goals. His responsibilities include compiling and updating a directory of community contacts; developing and updating presentation materials on the various state-wide projects; compiling and updating project status reports; and establishing and maintaining communication with affected communities.

"As far as the Southeast High Speed Rail Corridor in North Carolina is concerned," Robinson says, “good public relations is considered to be as important as good engineering design and the availability of funds needed to implement the project.”

Dr. Robinson previously provided technical assistance to the NCDOT Ecosystem Enhancement Program (EEP), which oversees compensatory mitigation for wetland and stream habitats affected by state transportation projects. Robinson supported the EEP since 2003 to manage the implementation of its federal requirements. His new role as community liaison officer for the NCDOT Rail Division will conclude in July 2013. More information on the high-speed rail can be found at http://sehsr.org.
Engineering Students Explore NCDOT Passenger Rail Operations

In April 2011, twelve North Carolina State University engineering students from Dr. George List’s railroad engineering class in the Department of Civil, Construction and Environmental Engineering participated in a field tour of the North Carolina Department of Transportation’s Capital Rail Yard in Raleigh. Facilitated by CTE’s passenger rail researcher Dr. David Robinson, the tour was led by the NCDOT Rail Division’s facilities engineering staff.

During the two-hour field tour, the students were treated to close-up views of passenger cars in the routine maintenance shop, vintage passenger cars awaiting refurbishment in anticipation of service expansion in two years, several locomotives, as well as on-going construction improvements being made to the yard to improve capacity and efficiency.

The NCDOT Rail Division currently operates Amtrak’s “Piedmont” service of daily round trips between Charlotte and Raleigh, as well as financially supporting Amtrak’s daily “Carolinian” service between Charlotte and New York, which also serves Raleigh and other North Carolina cities. Since 2010 Dr. Robinson has served has corporate public outreach consultant to the NCDOT Rail Division to support the department’s passenger rail improvements, and as facilitator for engineering student experiences at NCDOT rail facilities.

Training Support for NCDOT Complete Streets Guidelines

Working with contractor PB Americas, Inc., CTE is supporting the North Carolina Department of Transportation in implementing its NCDOT Complete Streets Planning and Design Guidelines. CTE is developing a training program as well as providing expertise on website design and maintenance. Senior research associate Leigh Lane and web development specialist Nancy Bailey are guiding CTE’s task work on the project.

NCDOT adopted a "Complete Streets" policy in 2009 which directs the Department to consider and incorporate several modes of transportation when building new projects or making improvements to existing infrastructure. Under the policy, NCDOT will collaborate with cities, towns and community stakeholders to provide the transportation options needed to serve the community and complement the context of the area. NCDOT is developing planning and design guidelines to support the new policy.

CTE is taking the lead on all training related activities to implement the Complete Streets guidelines including development of a training approach and framework. This effort includes working with an NCDOT Advisory Team to identify learning goals and objectives that reflect the key messages and information communicated by the guidelines. CTE will develop the overall goals and objectives for educating NCDOT staff and their stakeholders on implementing the guidelines through all phases of transportation decision-making.

The products of this project will include a basic training class framework with learning modules linked to specific aspects of the Complete Streets guidelines. CTE will recommend a training program development and delivery plan that will help NCDOT budget appropriately for a training program that ensures institutionalizing the principles, concepts, strategies and procedures outlined in the guidelines. For more information about the project visit www.nc completes streets.org.

Center for Transportation and the Environment
Technology Transfer Program

CTE's technology transfer activities in 2010-2011 utilized both Web-based and traditional forums to connect students and practitioners with current information about transportation and environmental research and policy issues. Fostering communication and collaboration between transportation and environmental professionals is integral to the Center's mission. CTE is continually seeking technology transfer opportunities to increase and improve access to information on current research applications, best practices, and policies. For more information on the CTE technology transfer program, please visit the website at www.itre.ncsu.edu/cte/techtransfer.

National Broadcast Series Webcasts

CTE in 2010-2011 produced its forty-sixth webcast in the Center’s highly successful and long running annual series of teleconferences addressing emerging policy issues, research innovations, and best practices in transportation and the environment. Video archives and transcripts of these and past programs are available on the CTE website at www.itre.ncsu.edu/cte/techtransfer/teleconferences.

CSS National Dialog: Continuing the Conversation

CTE and the Federal Highway Administration (FHWA) in August 2010 followed up its well-attended series of Context Sensitive Solutions (CSS) National Dialog regional workshops with an equally successful national video webcast to close out the project. “Continuing the Conversation” drew over 500 registered participants to view the two-hour live webcast from studios in Raleigh, NC.

Produced by CTE, the program brought together FHWA staff and presenters from the regional workshops to discuss the opportunities and new approaches to applying CSS principles as part of the day-to-day work of transportation agencies. The presentations included updated information on case studies, emerging challenges, and new directions at local, state, and federal transportation agencies. The webcast also featured two interactive Q&A segments between presenters and participants submitting their questions by email.

Shari Schaftlein with FHWA’s Office of Project Development and Environmental Review moderated the webcast presentations and discussions. Panelists on the program included Thomas DiPaolo of MassDOT in Boston, MA; Robert Parish with SvR Design Company in Seattle, WA; Norman Steinman with the City of Charlotte, NC, Transportation Department; Rodney Vaughn from the FHWA Resource Center in Lakewood, CO; and Andrew Wiley-Schwartz of the New York City DOT Office of Long Term Planning and Sustainability.

The CSS National Dialog project, co-sponsored by CTE and FHWA, is an important component in FHWA’s efforts to deliver CSS concepts to practitioners, managers and stakeholders in the transportation field. During the Dialog’s two-year project period nearly 1000 participants have been engaged at regional workshops and via webcasts across the country. In October 2010 CTE delivered to FHWA its final report documenting the project and including a discussion of some of the main concepts addressed at the workshops and webcasts. To view the webcasts, workshop materials, final report, and to learn more about the CSS National Dialog, visit www.cssnationaldialog.org.
Conferences and Workshops

CTE annually co-sponsors and serves as lead organizer for professional development conferences and workshops that relate to the Center’s mission of mitigating the impacts of surface transportation development on the environment. During 2010-2011 the Center engaged in these activities:

Planning for ICOET 2011 Conference in Seattle

CTE conducted planning activities for the 2011 International Conference on Ecology and Transportation (ICOET), to be held August 21–25, 2011 in Seattle, WA. Over 500 transportation professionals and researchers from around the world – a record number for ICOET – are expected to attend. Washington State DOT Secretary Paula Hammond will provide opening remarks, and Dr. Mark Shaffer, National Climate Change Policy Advisor for the US Fish and Wildlife Service, will deliver the keynote address.

Held every two years, ICOET provides a forum for ecologists, highway planners, resource managers, and engineers from around the world to gather and share quality research and best management practices, address current issues, and find solutions to transportation and ecological concerns. This year’s conference theme of “Sustainability in Motion” focuses on moving toward transportation solutions that protect natural ecosystems while supporting our economy and communities.

Conference attendees, representing professionals from over 20 countries and Tribal Nations, will have the opportunity to attend over 20 educational sessions with more than 165 technical paper presentations and poster presentations. Focus areas for the conference program include wildlife, fisheries, wetlands, water quality and overall ecosystems as it relates to surface transportation development. Each topic area focuses on planning and building transportation systems that protect natural ecosystems and support our economy and local communities.

New for this year’s program are four facilitated sessions designed to engage conference participants in discussion of current and emerging issues faced by the transportation industry. Conference co-host Washington State DOT will also conduct three field trips for attendees, showcasing the nationally recognized work of the DOT and its partner organizations in the areas of Ecological Connectivity, Aquatic Ecosystems, and Sustainability in Urban Environments.

CTE is lead organizer and co-sponsor of ICOET and has been an integral part of the conference since its inception in 2001. ICOET is principally sponsored by the Federal Highway Administration and receives broad support from several federal resource agencies, state transportation agencies, universities, non-governmental organizations, and private consulting firms. For more information visit www.icoet.net.
USDOT University Research Technology Transfer Day

CTE’s nationally recognized research and technology transfer activities on Context Sensitive Solutions (CSS) was exhibited at the US Department of Transportation’s University Research Technology Transfer Day, held April 6, 2011, in Washington, DC. CTE associate director James Martin attended the event and presented the poster on “Context Sensitive Solutions: Equipping Transportation Professionals for The Challenge of Meeting Livability and Sustainability Goals.”

Organized by the University of Maryland and sponsored by the USDOT’s Research and Innovative Technology Administration (RITA), the one-day exhibition of prominent university transportation products highlighted the accomplishments and impacts of the USDOT’s college- and university-based research and education programs. In addition, the event showcased the transfer of technology from the university transportation programs in use at various federal, state and local agencies.

Nearly 30 research abstracts from university transportation centers across the country, including CTE, were selected for poster presentation at the event. Six of the projects presented in the poster session were also selected for podium sessions in which the researchers shared their experiences in bringing their research to practice. Attendees included researchers and students from 25 universities, the Federal Highway Administration, the Federal Aviation Administration, and state DOT personnel.

ASCE Conference Presentation on CSS

CTE research associate Ann Hartell in September 2010 was invited to speak at the North Carolina chapter of the American Society of Civil Engineers (ASCE) conference in Asheville, NC. The annual conference features speakers from the public, private, and academic sectors who are invited to present on the state of civil engineering in North Carolina.

Ms. Hartell gave a presentation on the Context Sensitive Solutions (CSS) National Dialog, a project that brings CSS principles to focus on both new and current national and regional transportation initiatives. CTE recently partnered with the Federal Highway Administration on the project to initiate a national exchange of information and ideas about CSS best practices. The project featured a series of one-day workshops and webcasts held in various locations across the US.

During her 75-minute session, Hartell also reviewed recent CSS activities and general resources available with regards to transportation engineering in North Carolina. She also highlighted a related national research project on “Community Context Tools for Transportation Decisions.” CTE is conducting this project for the National Highway Cooperative Research Program (NCHRP) to identify current tools and methods used for data collection about communities. These tools will be organized in a website clearinghouse to help engineers, planners, and other practitioners improve transportation planning and project decisions.
Climate Leadership Academy on Low Carbon Transportation

CTE research associate Ann Hartell traveled to Arlington, VA, to participate in the Climate Leadership Academy on Low Carbon Transportation as a member of a team from the City of Durham, NC. The Academy, held June 8-10, 2011, was sponsored by the Institute for Sustainable Communities, an outreach and engagement nonprofit.

Speakers and faculty at the three-day event included leading analysts and practitioners who discussed how to provide transit and nonmotorized transportation options through innovative funding partnerships, building local support, and integrating transportation planning with housing and economic development planning. Durham joined thirteen other cities and regions from across the country including Denver, CO; El Paso, TX; Johnson County, KS; the State of Maryland; Miami-Dade County, FL; the Twin Cities Region, MN; Portland, OR; and Seattle, WA.

In addition to Hartell, the Durham team consisted of John Tallmadge, Triangle Transit; Scott Whiteman, Durham City/County Planning Department; Joey Hopkins, NCDOT Division 5; and Ellen Beckmann, Durham-Chapel Hill-Carrboro MPO/City of Durham Transportation Department. The Durham team plans to incorporate an index that combines housing and transportation costs for households as a part of their transit planning in anticipation of the results of an upcoming transit sales tax referendum to support regional rail projects and improved bus service.

National Green Infrastructure Conference

CTE staff attended and exhibited at the inaugural 2011 National Green Infrastructure Conference, held February 23-25, 2011 in Shepherdstown, WV. The conference was organized by The Conservation Fund, a national nonprofit organization working to conserve land, train leaders and invest in conservation across the United States.

The conference brought together policymakers, practitioners, and on-the-ground implementers of green infrastructure practices and design from around the country. The program agenda featured nationally recognized speakers discussing key elements for success and lessons-learned in implementing green infrastructure strategies. Interactive breakout sessions explored techniques for planning and design of green infrastructure networks at various scales, applications, and geographies to achieve multiple benefits and on-the-ground results. Discussion and participation by all attendees was highly encouraged and facilitated.

CTE distance learning specialist Eugene Murray attended the immersive three-day event and to exhibit information about CTE’s research, education, and technology programs including the International Conference on Ecology and Transportation. Murray also assisted conference organizers with event photography to document the inaugural proceedings. The event served as an ideal opportunity to introduce professionals involved with green infrastructure to the related transportation and environmental issues addressed by CTE. For more information visit www.greeninfrastructure.net/GIC2011.
Environmental Communications Support

CTE provides on-going website hosting and maintenance for three environmental committees of the Transportation Research Board (TRB) to support their communications and planning activities. CTE also hosts and moderates several email listservs that facilitate information sharing among the committees, as well provide support for FHWA program activities and targeted communications for practitioners. In 2010-2011 the Center managed these environmental communications activities:

- TRB ADC10 Environmental Analysis in Transportation website
- TRB ADC30 Ecology and Transportation website
- TRB ADC50 Historic and Archaeological Preservation in Transportation website
- TRANSENVIRO – listserv for government officials, transportation and environmental professionals, and the public to informally exchange news about current research, discussion of problems and solutions, requests for advice and assistance, and announcements of upcoming conferences and events.
- WFTLISTSERV – listserv for officials, professionals, and public interest groups working in wildlife, fisheries, and transportation fields to exchange of information and ideas regarding new research applications, policy issues, best practices, and upcoming events. The listserv includes subscribers who are active in the International Conference on Ecology and Transportation (ICOET).
- ROADSIDES – listserv for transportation officials, scientists, practitioners, and university researchers working in vegetation management along highway corridors. Subscribers include professionals working in landscape, maintenance, environmental services, erosion control and turf establishment, noxious weeds and native plants to increase information-sharing and networking. The listserv supports the Federal Highway Administration’s Roadside Vegetation Program.
- TRANSARCH – listserv for cultural resource specialists, including archaeologists, historians, structural historians, and anthropologists, employed in transportation agencies. Subscribers share their individual knowledge, experience, and ideas on cultural resource problems with a nationwide audience of colleagues facing the same challenges. TransArch list members are restricted to staff of state, provincial, tribal, and county transportation agencies and to staff of the Federal Highway Administration.

More information and links to TRB committee websites can be found at www.itre.ncsu.edu/cte/trbpartners. For details on subscribing to the above listservs, visit www.itre.ncsu.edu/cte/lists.
Contact CTE

For more information about CTE, or to inquire about partnership opportunities, contact:

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