Foreword
Nagui M. Rouphail, PhD
ITRE Director

It is my pleasure to present this 2004 Annual Activity Report of the Institute for Transportation Research and Education (ITRE). During this year, the success of our staff, affiliated faculty and students at NC State gives us reason to be proud of all of our accomplishments, particularly in these lean years where many state agencies, including ours, are facing sustained cuts in their state appropriated funds.

You will find many bright spots in this report. We have experienced tremendous growth in staff, with fourteen new employees hired in the past year. Our annual expenditures have bounced back from a slight drop last year, to nearly $7.2M, a 9% increase over the previous year. We are moving forward on our goal to increase our national visibility, evidenced by a substantial increase in project awards from FHWA, EPA, NIH and NCHRP/TCRP, among others. ITRE’s students and staff will have a strong presence at the TRB 2005 Annual Meeting, with 12 papers accepted for presentation, a record number. Finally, we are proud to have provided record support for 30 graduate and undergraduate students this year, who were engaged in our research and technical assistance studies.

While we are justifiably proud of our accomplishments this year, we are very cognizant of the challenges ahead. As an Institute, we will continue to probe for opportunities in new and exciting areas of transportation, and to provide our staff and students with a work environment that enhances their creativity and builds a strong team that can stay competitive in the years ahead.

Nagui M. Rouphail, PhD
ITRE Director
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Annual Activity Report - 2004

Institute for Transportation Research and Education (ITRE)
North Carolina State University

This report summarizes ITRE's activities for the year 2004. The report first provides background information on the Institute's history, mission, goals and objectives. This is followed by an overview of the status of ITRE finances, personnel and technical activities conducted over the past year. Overall, despite the continuing decline in state support funds in the past few years, ITRE has been able to maintain and expand its programmatic activities and add staff and space. This is a testimony to the level of dedication and work ethic of the entire staff in these difficult economic times.

Center Description
The Institute for Transportation Research and Education (ITRE) is an inter-institutional center of the University of North Carolina system. Chartered by the North Carolina General assembly in 1978, ITRE carries out research, training and technical support activities in the area of surface transportation for a host of national, state, and local clients to address the nation's critical transportation issues. ITRE is committed to leadership in the study of surface transportation issues through the fostering of analytical thinking, integrating technology in education and research, serving as a catalyst for problem solving, and cultivating professionals and students dedicated to excellence in transportation.

Currently, ITRE is organized into six program areas covering highway systems, municipal technical services, North Carolina local technical assistance, public transportation, pupil (school) transportation, and transportation and the environment. A high-level organizational chart is shown in Exhibit I.

Summary of ITRE Goals:
ITRE's 2002 strategic plan has set forth five major institute-wide goals:
1. Increase national visibility.
2. Conduct and disseminate research that impacts the transportation community.
3. Sustain and enhance educational opportunities to improve the knowledge and skills of transportation professionals.
4. Strengthen the relationship and gain recognition within the University System.
5. Provide superior technical assistance.

These goals are currently being achieved through various objectives, such as increased national exposure through conference presentations, published research and outreach efforts, increased national project awards, continuing training efforts on a national, regional and state level, and promoting collaboration with the department of Civil Engineering faculty at North Carolina State University and the UNC System.

This report provides a glimpse of this year's activities and accomplishments in reaching these goals and objectives. More information about ITRE's programs and staff are available through ITRE's home page: http://www.itre.ncsu.edu
Exhibit I - ITRE High-Level Organization Flow Chart
By Primary Program Areas

Nagui Rouphail, PhD
Director

Linda Lancaster
Director
Finance and Contracts

Robert Foyle
Associate Director

John Fisher, PhD
Director
Center for Transportation and the Environment

James Martin
Director
Municipal Technical Services

Robert Foyle
Director
Highway Systems

Debra Collins
Thomas Cook
Co-Directors
Public Transportation

James Martin
Director
North Carolina Local Technical Assistance

Jeffrey Tsai
Director
Pupil Transportation
Summary of ITRE’s Finances
In the 2003-2004 Academic Year, ITRE had approximately 48 people on staff and generated nearly $7.2M in expenditures, a 9% increase over the previous fiscal year. ITRE has maintained and broadened the ongoing research and training activities under the direction of Dr. Nagui Rouphail, who was appointed as the permanent ITRE Director in January 2002. ITRE’s expenditures broken down by funding source are depicted in Exhibit II.

Exhibit II - Fiscal Expenditures

Overall, about 6% of all expenditures represent State Support appropriations to ITRE related to administration, with additional operations support of 4% coming from Indirect Cost Return. State and Federal Contracts total 49% of all activity, with state expenditures (41%) limited to those projects with North Carolina State Government agencies. Sales and Service activity (9%) is mostly from registration fees for training workshops. Pass-Through projects to other departments at NCSU (26%) and other UNC universities (6%) are similar in volume to the previous year. Other Contracts (less than 1%) include project activity primarily for municipalities and also include funding from other states or the private sector.
Exhibit III provides a comparison of ITRE’s annual expenditures over the past 6 years. With continuing budget reductions ITRE has managed to increase its funding for the fiscal year. This is a positive sign of growth for the institute and shows a slow but steady recovery.
State resources are increasingly coming under budget constraints and continuing reductions, it is of utmost importance that state-supported institutes and centers demonstrate that they are providing a good return on the state investment. One way to measure the return on investment is by calculating the ratio of annual expenditures divided by state support dollars. Currently, the UNC Office of the President desires a ratio of 4.0 or higher.

**Exhibit IV** shows two plots. The top (blue) plot is the ratio of total annual expenditures divided by ITRE’s state appropriations. These expenditures include all pass-through research projects (internal to NCSU and external to other universities) and our portion of collected indirect costs distributed back to ITRE based on the previous year’s expenditures. The lower (red) plot excludes all pass-through projects from annual expenditures when calculating the ratio. In both cases, the graph shows a clear indication of the Institute’s cost effectiveness from the University and the State of North Carolina perspectives, with a current ratio of in-house expenditures in excess of 10:1 for the last fiscal year.
**Summary of Personnel Activities**

In the year 2004, ITRE created eleven new positions and hired a total of fourteen staff members. Exhibit V outlines the personnel changes for 2003-04 by program group.

### Exhibit V - Personnel Activities in 2004

<table>
<thead>
<tr>
<th>Program Group</th>
<th>Number of New positions</th>
<th>Number of new hires</th>
<th>New Program Areas</th>
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<tbody>
<tr>
<td>General Administration</td>
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<tr>
<td>CTE</td>
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<td>NC LTAP</td>
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<td>MTSP</td>
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<td>1</td>
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<tr>
<td>Public Transportation</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Pupil Transportation</td>
<td>2</td>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>14</strong></td>
<td></td>
</tr>
</tbody>
</table>
Summary of Technical Activities
ITRE’s Web site includes research and training directories that enable the user to search for specific ITRE activities. To explore our Web site for these activities go directly to each of these directory pages:
http://www.itre.ncsu.edu/ITREmain/research_directory.html
http://www.itre.ncsu.edu/ITREmain/training_directory.html

ITRE’s current research and education activities at the national, state and local levels are listed below:

National Research and Development
Research efforts at ITRE are quite significant. There are thirty-one national-level projects listed below that are carried out by various program groups at the Institute.

CONVERGE—Where Transportation and the Environment Meet: Public Education Project That Chronicles the Transportation/Environmental Relationship Throughout American History
Sponsors: USDOT, FHWA, USEPA, Office of Transportation and Air Quality (J. Martin and K. McDermott) http://www.converge.ncsu.edu

Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Visual Disabilities (NCHRP 3-78)
Sponsors: NCHRP and HSRC (N. Rouphail)

CTE National Teleconference Series
Sponsor: USDOT (K. McDermott)

Design and Operations of Shared-Use Paths
Sponsor: Federal Highway Administration (J. Hummer, CE Dept., NCSU; and N. Rouphail)

Development of a Community Impact Assessment National Training Course
Sponsor: Federal Highway Administration (L. Lane and J. Martin)

Development of a Graduate-Level Context Sensitive Solutions Course Module
Sponsor: Federal Highway Administration (J. D’Ignazio)

Development of Standardized Urban/Suburban School Bus Driving Cycle
Sponsor: Advanced Energy Corporation (J. Tsai)

Distinguished Lecture on Transportation and Public Health
Sponsor: USDOT (K. McDermott)

Domestic Scan of Wetland Mitigation Programs
Sponsor: Federal Highway Administration (K. McDermott)

Identification of Traffic Control Devices for Mobile Work Zone Operations
Sponsors: New Jersey Department of Transportation and CUNY (N. Rouphail)
Impacts of Sea Level Rise and Changing Hydrology on Transportation Infrastructure
Sponsor: USDOT, et al. (J. Fisher and J. Martin)

In-Vehicle Energy and Emissions Information Systems
Sponsor: National Science Foundation (N. Rouphail and H.C. Frey)

International Conference on Ecology and Transportation (ICOET)
Sponsors: Federal Highway Administration (FHWA) in cooperation with other governmental and non-governmental organizations (J. Martin)
http://www.itre.ncsu.edu/cte/icoet

Impacts of Global Climate Change on Transportation
Sponsor: USDOT (J. Martin)

Listserv Moderation for the Ohio transit lists
Sponsor: Ohio Department of Transportation, Office of Transit (T. Cook)

Local Technical Assistance Program
Sponsors: Federal Highway Administration (FHWA) and NCDOT (J. Martin)

Monitoring, Analyzing, and Reporting on Environmental Streamlining Pilot Projects
Environmental Streamlining Pilot Projects NCHRP 25-24
Sponsors: Vannasse Hangen Brustlin (prime) and National Academy of Sciences (J. Martin)
http://www.TransStreamNet.org

Multi-Modal Level of Service for Urban Streets NCHRP 3-70
Sponsor: NCHRP; Subcontractor to Dowling and Associates, et al. (N. Rouphail)

Municipal Technical Service Projects
Sponsors: Individual municipalities (J. Martin)

National Association for State Directors of Pupil Transportation Services (NASDPTS) Web Site
Sponsor: NASDPTS (Jeff Tsai and L. Vandiford-Hobbs)

Pedestrian Analysis and Modeling at Roundabouts
Sponsors: UNC-CH Highway Safety Research Center and National Institute of Health (N. Rouphail)

Process and Communication Improvement Study for the Louisiana Department of Transportation and Development
Sponsor: LADOTD (J. D’Ignazio)

Regional Development, Population Trend and Technology Change Impacts on Future Air Pollution Emissions, 2006-STAR-B1
Sponsors: EPA and UNC-Chapel Hill (N. Rouphail)

Strategies to Increase Coordination of Transportation Services for the Transportation Disadvantaged TCRP H-30
Sponsors: Multisystems, Inc. (prime) and National Academy of Sciences (T. Cook)
Support Services for the U.S. Domestic Scan on Successful Wetland Mitigation Programs
Sponsor: Federal Highway Administration (K. McDermott)

TCRP J-7: Synthesis of Information Related to Transit Problems Strategic Planning and Management in Transit Agencies (SH-04)
Sponsor: Transit Cooperative Research Program (J. Lawrie)

Web site construction and hosting of the 14th National Conference on School Transportation
Sponsor: NASDPTS (J. Tsai)

Wildlife, Fisheries, and Transportation Web Gateway
Sponsor: USDOT (K. McDermott)
http://www.itre.ncsu.edu/cte/gateway/index.html
State of North Carolina and Local Research and Development

Statewide projects in North Carolina were conducted mostly in conjunction with the NC Department of Transportation and with local municipalities. This year was a particularly successful year for attracting sponsored research from state agencies. Some of these activities include:

**Analysis and Testing of a Bridge Deck Reinforced with GFRP Rebars**
Sponsor: NCDOT (Pass-through to J. Gergely, UNCC and R. Foyle)

**Annual Update to the Alternative-Fueled, Low Emissions Bus Purchase Plan**
Sponsor: NCDOT PTD (T. Cook)

**Bicycle and Pedestrian Maps**
Sponsor: NCDOT Bicycle and Pedestrian Division (T. Cook)

**City of Monroe, North Carolina Transit Study**
Sponsor: Parsons, Brinckerhoff, Quade & Douglas, Inc. (T. Cook)

**The Connection Between Land-Use and Transportation in Land-Use Plans**
Sponsor: NCDOT (Pass-through to D. Rodriguez, UNC-CH and R. Foyle)

**Concrete Diffusion Coefficients and Existing Chloride Exposure in North Carolina**
Sponsor: NCDOT (Pass-through to J. Gergely, UNC-C and R. Foyle)

**Context Sensitive Solutions Summer Academy and Internship Program**
Sponsor: NCDOT (J. Martin)

**Context Sensitive Solutions Training**
Sponsor: NCDOT (J. Martin)

**Develop Distance Learning Materials – Phase IV**
Sponsor: NCDOT (T. Brown, Jr.)

**Development of an Administrative Policies and Procedures Handbook, Accessible Raleigh Transportation (ART)**
Sponsor: City of Raleigh, NC (T. Cook)

**Development of an Earth Pressure Model for Design of Retaining Structures in Piedmont Soils**
Sponsor: NCDOT (Pass-through to B. Anderson, UNCC and R. Foyle)

**Distinguished Speaker Series**
Sponsors: USDOT and NCDOT (K. McDermott)
http://www.itre.ncsu.edu/cte/DSS.html

**Division Street and Driveway Access Handbook Training**
Sponsor: NCDOT (R. Foyle)
Ecological Assessment of a Wetlands Mitigation Bank - Phase III  
Sponsor: NCDOT (Pass-through to K. Moorhead, UNCA and R. Foyle)

Eco-System Enhancement Program  
Sponsor: NCDOT (J. Martin)

Effects of Increased U-Turns at Intersections on Divided Facilities and Median Divided versus Five-Lane Undivided Benefits  
Sponsor: NCDOT (J. Hummer, CE Dept, NCSU, and R. Foyle)

An Evaluation of Hemolymph Extraction as a Non-Lethal Sampling Method for Genetic Identification of Freshwater Mussel Species in Southeastern North Carolina  
Sponsor: NCDOT (Pass-through to A. Wilbur, UNCW and R. Foyle)

Evaluation and Implementation of BMPs for NCDOT’s Highway and Industrial Facilities  
Sponsor: NCDOT (Pass-through to J. Wu, UNC-C and R. Foyle)

Expanding the Use of Photo Enforcement to Enhance Traffic Safety in North Carolina  
Sponsor: NCDOT GHSP (J. Hummer, CE Dept., NCSU and C. Cunningham)

Facilitate NCDOT Research Administration  
Sponsor: NCDOT (R. Foyle)

False Capacity for Lane Drops  
Sponsor: NCDOT (J. Hummer, CE Dept., NCSU and N. Rouphail)

Feasibility of Using Compressive Strength Test Results for Acceptance Testing of Concrete Pavements  
Sponsor: NCDOT (Pass-through to J. Chen, NCA&T and R. Foyle)

Guidebook for Bike and Pedestrian Policies, Procedures, and Laws  
Sponsor: NCDOT Bicycle and Pedestrian Division (T. Cook)

Highway Safety Research Center (HSRC) Heavy Vehicle Crash Study  
Partnered with UNC-CH Highway Safety Research Center  
Sponsor: NCDOT-DMV (J. Martin)

Interstate-40 Reversal Operational Traffic Analysis  
Sponsor: NCDOT (Billy Williams, CE Dept., NCSU and N. Rouphail)

Interstate-40 Value Pricing Assessment  
Sponsor: FHWA (Pass-through to J. Benjamin, NCA&T and R. Foyle)

Identification of North Carolina School-Related Motor Vehicle Crash Injuries  
Sponsor: NCDOT Governor’s Highway Safety Program (J. Tsai)
Integrated Planning for School and Community
For 16 Local Education Agencies in 2004
Sponsors: individual school districts (J. Tsai and M. Miller)

Integrating Systems Planning and Project Development in NC
Sponsor: NCDOT (J. Martin)

Maintenance Technical Assistance Services for NCDOT
Sponsor: NCDOT (T. Baughman)

Method to Estimate Non-Point Source Pollutant Loadings from North Carolina Highways
Sponsor: NCDOT (Pass-through to C. Allan, UNC-C and R. Foyle)

NCDOT Workplace Diversity Study
Sponsor: NCDOT (R. Foyle and J. Johnson, Jr., UNC-CH)

NCDOT Maintenance Technical Assistance Program
Sponsor: NCDOT (T. Baughman)

NCDOT Process Improvement Study
Sponsor: NCDOT (J. D’Ignazio)

NCDOT Technical Training Needs Research and Implementation Support
Sponsor: NCDOT (R. Foyle)

North Carolina Air Quality Roundtables
Sponsors: USDOT and NCDOT (J. D’Ignazio)
http://www.itre.ncsu.edu/cte/NCAirQuality/index.html

North Carolina Level of Service Software Program
Sponsor: NCDOT (R. Foyle and N. Rouphail)

North Carolina School Bus Safety Web Enhancement
Sponsor: NCDPI (J. Tsai and L. Vandiford-Hobbs)

North Carolina Training and Technical Assistance Support for Child Transportation and Children with Special Needs
Sponsor: NCDOT Governor’s Highway Safety Program (J. Tsai)

Operational Evaluation of Emissions and Fuel Cell Use of B20 versus Diesel Vehicles.
Sponsor: NCDOT (H. C. Frey and N. Rouphail)

Outreach Support Activities for NCDOT Research Program
Sponsor: NCDOT (R. Foyle)

Pavement Management System Data Link to Centerline for the Town of Nags Head, NC
Sponsor: Town of Nags Head, NC (J. Martin)
Private Sector Partnerships with Pavement Management  
Sponsors: State of North Carolina municipalities (J. Martin)

Professional Enhancement Program  
Sponsor: NCDOT (T. Brown, J.r.)

Rail Intern Program  
Sponsor: NCDOT Rail Division (T. Cook)

Regionalizing Public Transportation Services  
Sponsor: NCDOT Public Transportation Division (T. Cook)

Support Services for the NC Ecosystem Enhancement Program  
Sponsor: NCDOT (D. Robinson and J. Martin)

Technical Support for the Transportation Information Management System (TIMS)  
Sponsor: NCDPI (A. Michael and J. Tsai)

Teach Fundamental Engineering Principles Program  
Sponsor: NCDOT (T. Falkie)

Technology Transfer of NCDOT Environmental Research  
Sponsors: USDOT and NCDOT (K. McDermott)  
http://www.itre.ncsu.edu/cte/cterip.html

TOG/UTAP 2002-2003  
Provides technical assistance, preparation and implementation of NC Technology Plan, and technical support to NC transit systems.  
Sponsor: NCDOT Public Transportation Division (D. Collins)

Traffic Signal Training and Testing Center-Site Development  
Sponsor: NCDOT GHSP (R. Foyle and C. Cunningham)

Transit Grant Information System (TGIS)  
Sponsor: Ohio Department of Transportation, Office of Transit (T. Cook)

Transportation Demand Management (TDM)  
This effort is in response to Senate Bill 953 and the air quality reductions expected by Fiscal 2009.  
Sponsor: NCDOT Public Transportation Division (D. Collins)

Triangle Regional Model Service Bureau  
Sponsors: NCDOT, TTA, CAMPO, and DCHC MPO (R. Foyle and L. Huntsinger)

Use of Performance Standards and Measures for Public Transportation Systems  
Sponsor: NCDOT (T. Cook)

Video of NCDOT Environmental Stewardship Initiatives  
Sponsor: NCDOT (K. McDermott and J. Martin)

Work Zone Safety Training for SCDOT  
Sponsor: SCDOT (T. Baughman)
Recent Presentations
Several presentations will be made at the January 2005 meeting of the Transportation Research Board (TRB), as well as other national and state conferences.

**Calibrating and Validating Deterministic Traffic Models: Application to HCM Control Delay at Signalized Intersections (05-0941)**
*TRB, Washington, D.C., 2005*
Rui Miguel Batista Paulo, University of Bristol, United Kingdom
Jiong Lin, ITRE, North Carolina State University
Nagui M. Roupail, ITRE, North Carolina State University
Jerome Sacks, National Institute of Statistical Sciences

**Context-Sensitive Solutions in Planning Process: North Carolina's Experience (05-1273)**
*TRB, Washington, D.C., 2005*
Janet D'Ignazio, ITRE, North Carolina State University

**Discussion of North Carolina Air Quality Roundtable (P05-0353)**
*TRB, Washington, D.C., 2005*
Janet D'Ignazio, ITRE, North Carolina State University

**Economic Impact of Investments in Bicycle Facilities: Case Study of North Carolina Northern Outer Banks (05-1399)**
*TRB, Washington, D.C., 2005*
Mary Paul Meletiou, ITRE, North Carolina State University

**Environmental Considerations in System Planning (P05-0104)**
*TRB, Washington, D.C., 2005*
Janet D'Ignazio, ITRE, North Carolina State University

**Lane Utilization Prediction Models for Lane-Drop Intersections (05-1717)**
*TRB, Washington, D.C., 2005*
Jae-Joon Lee, ITRE, North Carolina State University
Nagui M. Roupail, ITRE, North Carolina State University
Joseph E. Hummer, North Carolina State University

**Measuring and Modeling Emissions Effects for Toll Facilities (05-1617)**
*TRB, Washington, D.C., 2005*
Margarida Cabrita Coelho, Instituto Superior Técnico, Portugal
Tiago Lopes Farias, Instituto Superior Técnico, Portugal
Nagui M. Roupail, ITRE, North Carolina State University
Operational Analysis of Shared-Use Paths: Data Collection and Model Validation (05-2377)
TRB, Washington, D.C., 2005
Joseph E. Hummer, North Carolina State University
Nagui M. Rouphail, ITRE, North Carolina State University
Joseph S. Milazzo, Regional Transportation Alliance

Operational and Safety Effects of U-Turns at Signalized Intersections (05-0879)
TRB, Washington, D.C., 2005
Daniel Lance Carter, University of North Carolina, Chapel Hill
Joseph E. Hummer, North Carolina State University
Robert Foyle, ITRE, North Carolina State University

Training Experience for Context-Sensitive Solutions (P05-0896)
TRB, Washington, D.C., 2005
Teresa Townsend, ITRE, North Carolina State University

Use of Strategic Planning in Transit (05-1236)
TRB, Washington, D.C., 2005
Judson Lawrie, ITRE, North Carolina State University

Student Enrollment Projection and Demographics
2004 N.C. Educational Facility and Planners Conference, Charlotte, N.C., January 2004
Jeff Tsai, North Carolina State University
Refereed Papers (published or in press)


Summary of Education/Training and Outreach
ITRE’s combined training activities educated more than 10,000 individuals this year. Some of the education opportunities included Work Zone Safety, offering 240 workshops; the Center for Transportation and the Environment’s (CTE) National Teleconference Series and Context Sensitive Solutions Design classes; the Local Technical Assistance Program, offering 45 workshops to local government employees; and training classes through the Public Transportation Group, GIS and Pupil Transportation Group. The Public Transportation Group conducts approximately 35 courses at ITRE and additional classes off-site. The Highway Systems Group provides training on Maintenance Technical Assistance, Professional Enhancement and Fundamentals of Engineering Principles program. These programs have always had a good track record and operate close to capacity. Software has been purchased in hopes of providing more distance education opportunities in the future. Training areas are depicted in Exhibit VI.

Exhibit VI - Summary of Training Activities in 2004

<table>
<thead>
<tr>
<th>Program Area</th>
<th>Training/ Workshops in 2004</th>
<th>Total Instruction Hours per Session</th>
<th>Sessions Offered</th>
<th>Total Hours</th>
<th>Attendees</th>
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<tbody>
<tr>
<td><strong>ITRE</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Transportation Founders Fund Speaker Series</td>
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<td></td>
<td>Dr. Michael Walton (3/16/2004)</td>
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<td>1</td>
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<td>50</td>
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<td>Dr. Robert Paaswell (11/11/2004)</td>
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<td>1</td>
<td>2</td>
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<tr>
<td><strong>CTE</strong></td>
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<td></td>
<td>Context Sensitive Solutions</td>
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<td>19</td>
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<td></td>
<td>Teleconference Series</td>
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<td>5</td>
<td>15</td>
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<td><strong>Highway Systems</strong></td>
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<td>Asphalt Pavement Maintenance</td>
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<td>15</td>
<td>120</td>
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<td>Drainage</td>
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<td>20</td>
<td>160</td>
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<td>FEP Program for NCDOT Employees</td>
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<td>Fundamentals of Engineering (FE) Review</td>
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<td>FE Review - Night</td>
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<td>Flagger Training</td>
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<td>196</td>
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<td>Flagging - Instructor</td>
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<td>Guardrail Design, Installation &amp; Maintenance</td>
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<td>14</td>
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<td>Highway Capacity Manual - Planning</td>
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<td>Highway Engineering Concepts (HEC)</td>
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Marketing/ Public Relations Outreach in 2004

Press releases/advisories/stories communicated to media:

- Total news releases sent including 2 media advisories: 34
- Media outlets responded to 11 news releases which resulted in 15 known appearances in publications where ITRE was cited.
- Media advisories concerning research studies have resulted in television station contact for interviews. WRAL-TV and News 14 Carolina aired stories about ITRE’s red light running camera research study. ITRE was also cited on the stations’ Web sites. A direct link to ITRE’s Web site also appeared with one of these postings.
- 52 articles were published citing ITRE, ITRE research, or an ITRE program/staff member. More articles may have been published without our knowledge as we aren't able to track all publications of the media outlets we contact.

In 2004, ITRE was cited in the following media outlets and publications:

Arizona Daily Star (AZ)
Artba.org (National)
Asheboro Courier Tribune (NC)
Charlotte Observer (NC)
Durham Herald-Sun (NC)
Fayetteville Observer (NC)
Jacksonville Daily News (NC)
MIX 101.5 FM (NC)
NCDOT’s “Pathways to Prosperity” Newsletter (in Secretary Tippett’s Message) (NC)
NCSU Bulletin/Bulletin Online/NCSU News (NC)
News & Observer (NC)
News 14 Carolina TV (NC)
Outer Banks Sentinel (NC)
School Bus Fleet Magazine (National)
School Transportation News (National)
The Daily Dispatch (Henderson, NC)
The Sun News (Myrtle Beach, SC)
Transportation Research Board (National)
Triangle Business Journal (NC)
Virginian-Pilot (VA)
WRAL-TV (NC)
WUNC 91.5 FM– NPR News (NC)
And other hometown/local newspapers for Road Scholar Awards
Conference Exhibits in 2004

Center for Transportation and Environment
- 2004 TRB Annual Meeting, Washington, DC
- 2004 TRB Midyear Meeting, San Diego, California
- 4th National Community Impact Assessment Workshop, Portland, Maine
- North Carolina Statewide MPO Conference, Wilmington, North Carolina
- 2004 Distinguished Speakers Series Lecture, Raleigh, North Carolina
- FHWA Environmental Conference, Alexandria, Virginia
- AASHTO-SCOE Annual Meeting, Snowbird, Utah
- Institute for Transportation Engineers Annual Meeting, Lake Buena Vista, Florida
- NC Smart Growth Alliance Summit, New Bern, North Carolina

NC LTAP
- American Public Works Association, North Carolina Chapter Annual Meeting, Greensboro, North Carolina
- American Public Works Association, North Carolina Chapter Streets Division Annual Conference, Hickory, North Carolina

Pupil Transportation Group
- Virginia Association of School Superintendents, 2004 Annual Conference, Roanoke, Virginia
- Southeast Regional Council for Educational Facility Planners International, Savannah, Georgia
- National Council for Educational Facility Planners International, Atlanta, Georgia
- North Carolina Educational Facility Planners Conference, Charlotte, North Carolina
Student Support

ITRE projects have supported a large number of students from various disciplines and universities over the past five years. The table below summarizes our track record on student support, indicating a surge in graduate student involvement at ITRE.

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Undergraduate 2004
- Chris Vaughan
- Martin Holland
- Stephen Reuschle
- Bryan Hough
- Ryan Hough
- Corey Vernier
- April Schmeige-Fosmore
- William Brian Phillips
- Jonathan Lewis
- Christina Settle
- Brian Lamar Phillips

Graduate 2004
- Kosok Chae
- Bahong Wan
- Jae-Joon Lee
- Jiong Lin
- Jin Ki Eom
- Liza Runey
- Bastian Schroeder
- Rajit Ramkumar
- Jason Havel
- Jason Lundberg
- Saeed Abolhosseini
- Adena Messenger
- Margarida Coelho
- Jeremy Scott
- Jaepil Moon
- John Guenther
- Ashley Britt
- Jin Huang
- Stacie Phillips

As seen above, the past three fiscal years have seen a significant increase in the students we are supporting through our projects. This is a result of ITRE making a conscious effort in seeking ways to involve students in our activities. Many of the students are seeking careers in transportation, and we are glad to provide an environment where transportation research and education is seen as a rewarding career.

Students have come from the following 17 degree programs:

- Biology
- Business
- Civil Engineering
- Communication
- Computer Science
- Ecology
- English
- Environmental Management
- Forestry
- Management
- Mathematics
- Natural Sciences
- Political Science
- Public Administration
- Sociology
- Transportation Planning
- Wetland Ecology
Appendix – Summary of Program Areas

Center for Transportation and the Environment

- As a U.S. Department of Transportation university transportation center of excellence, the Center for Transportation and the Environment (CTE) conducts research, education, and technology transfer activities that seek to mitigate the impacts of surface transportation on the environment. CTE’s mission is national in scope, although CTE co-sponsors activities and makes its services available at the local, state, and regional levels as well. CTE has provided over a decade of service to transportation and environmental professionals and has played a pivotal role in developing the next generation of professionals who will be charged with meeting future mobility needs in an environmentally sound manner.

Highway Systems Group

- The Highway Systems Group developed out of the early research and development efforts in the 1980's on projects for the Division of Highways of NCDOT. Today's efforts expand upon that base of knowledge to include focus areas such as: Highway Safety, Transportation Policy, Traffic Operations, Work Zone Safety, Maintenance Operations, Professional Development Training, and Professional Engineering Review.

Municipal Technical Services Program

- The Municipal Technical Services Program (MTSP) at ITRE is comprised of 4 technical staff members that provide a wide range of technical services to state and local governments throughout the Mid-Atlantic region.

NC Local Technical Assistance Program

- The Federal Highway Administration (FHWA) established the North Carolina Local Technical Assistance Program in 1982. The NC LTAP center plays a leading role in helping state and local government agencies assess and apply new transportation technologies through a broad spectrum of highway research, training and transportation planning activities.

North Carolina’s LTAP Program offers four primary types of assistance:

- Training Workshops
- Technical Materials
- Technical Information Services
- Quarterly Newsletters
Public Transportation Group

- The Public Transportation Group (PTG) is responsible for research, training, and technical assistance in the area of public transportation. Activities focus on the following transportation modes:
  - urban fixed-route and paratransit
  - rural demand-responsive transit
  - passenger rail
  - bicycle and pedestrian
  - taxicab and livery

PTG pursues practical applications that can have immediate benefits to increasing efficiencies in transit operations and positively impact service and transportation choices for the passenger.

Pupil Transportation Group

- The mission of the Pupil Transportation Group is to apply transportation engineering principles and technology to the operation and management of multi-modal school transportation in order to provide for safe and efficient transportation of school children. The key to the success of the pupil transportation group is its partnership with local education agencies, state agencies, universities, national associations, and private industries.

Triangle Regional Model Service Bureau

- The purpose of the Triangle Regional Model Service Bureau at ITRE is to provide transportation modeling expertise to the Capital Area Metropolitan Planning Organization (CAMPO), the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), the Triangle Transit Authority (TTA), and the North Carolina Department of Transportation (NCDOT) to support each agency’s needs in meeting the requirements in Section 134, Title 23, U.S. Code, NC General Statutes 136-66, and the 1990 Clean Air Act. This work includes, but is not limited to: (1) design and development of state-of-the-practice multimodal travel demand models; and (2) integration of GIS tools and technologies into supply side forecasting, demand side forecasting, and transportation plan development.