



# National Center for Intermodal Transportation

*A Partnership Between the University of Denver and Mississippi State*



# *NCIT Annual Report*

*June 1, 2006- May 31, 2008*

[ncit.msstate.edu](http://ncit.msstate.edu)

*Innovators in intermodal transportation education, research, and technology transfer.*

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## *A Message from the Directors*

**NCIT**'s annual report for the FY year 2006 – 2008 reflects the activity over the past two years since re-authorization of the UTC funding under SAFETE-LU in 2005. Due to a number of technical issues DOT funding was not released to the grantees until June 2006. Following the release of funding NCIT prepared its strategic plan which was submitted on March 8, 2007 and formally accepted by DOT on June 21, 2007. Since that time we have been working expeditiously with our stakeholders and staff to identify and fund research projects consistent with our theme and the DOT strategic plan. Following the call for proposals released in late 2007 we have selected 14 projects for funding.

**NCIT**'s focus on improving the safety and efficiency in the nation's intermodal transportation system is essential to ensuring our continued economic development and quality of life. Addressing the critical issues of congestion, competition, connectivity, and coordination through the promotion of a safe and efficient intermodal transportation system align NCIT's mission with the strategic goals of DOT. Accordingly, in addition to our research efforts we are also engaged in education, outreach and technology transfer activities.

**NCIT** has been in the fore-front of providing timely educational technology transfer activities. Professor Eksioglu's teaching award speaks to this focus. In addition to supporting the educational programs at our respective Universities, the *Safety, Security and Mobility Workshop* identified key issues and opinions of thinkers and policy makers in the field. Our *Intermodal Safety & Security Workshop* featured Congressman Ed Perlmutter who challenged researchers and academia to identify ways to measure the effects of security legislation and funding. A workshop on the *Identification of Executive Competencies* provided a roadmap for further training, education and development activities for our nation's managers, executives and officials charged with managing the complex intermodal system.

**NCIT** research efforts include analyzing the impact of intermodal facilities in the design of supply chains for biorefineries, investigating the role of intermodal transportation systems in emergency management, analyzing the impact of crisis conditions on the performance of intermodal facilities, designing distribution networks for the automotive industry, developing measures of resilience for intermodal systems, and developing a model for location of intermodal terminals and corridors. All of these will aide public planners, communities and transportation carriers in making decisions and using public funds. In addition, understanding the collaboration between regional governmental bodies and economic development relative to transit oriented development will also be beneficial to transportation professionals throughout the U.S. Overall, these research studies promise to contribute to improving the intermodal transportation system of the United States.

Please take the time to review our efforts outlined in this 2006-2008 annual report.

**Patrick Sherry, Ph.D.**  
NCIT Co-Director  
University of Denver

**Burak Eksioglu, Ph.D.**  
NCIT Co-Director  
Mississippi State University

## *The NCIT Theme*



The theme of NCIT is to promote the development of a safe and efficient national intermodal transportation system.

**NCIT** focuses on the assessment, design, and development of planning methodologies and tools, technology, and human resources needed to improve intermodal connectivity, capacity and to reduce congestion in our nation's transportation system. The NCIT also seeks to improve the capacity and capability of the workforce to meet the challenges of the increasingly complex passenger and freight transportation system. Congestion, competition, capacity, and conservation are the major challenges facing the US transportation system that can be met with the adoption of a serious commitment to intermodalism. The intermodal point-of-view involves looking at how individual modes can be connected, governed, and managed as a seamless and sustainable transportation system. That is, the fundamental objective of intermodalism is not to optimize a single mode of transportation but to integrate the modes into an optimal, sustainable, and ethical system. Such a system should promote efficiency, safety, mobility, economic growth and trade, national security, protection of the natural environment, and enhancement of human welfare. Intermodal systems also play an important role under crisis conditions such as: evacuations from coastal areas under hurricane threat; evacuation of metropolitan areas affected by earthquake, industrial accidents, or terrorist attacks; relief services to communities affected by disaster; highway closures due to fires, landslides, and accidents; recovery operations in devastated areas; and restoration of transport services after serious disruption. In providing solutions for such crisis situations, the NCIT will also benefit day-to-day transportation, which shares with crisis conditions the characteristics of congestion, highway safety hazards, and incident identification and response needs. The integration of the individual modes into a seamless intermodal system has been a national transportation policy since the promulgation of the Transportation Act of 1940.

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# Management Structure



The NCIT partnership between, the University of Denver and Mississippi State University, incorporates the expertise reflected in the multiple disciplines and fields of study within each university. The two Universities have agreed to share equally in the Technical and Program management of the center. In general terms, the two institutions operate independently but collaborate to develop research and educational programs that benefit the transportation industry as a whole.

The NCIT Co-Directors Professor Patrick Sherry of the University of Denver and Professor Burak Eksioglu of Mississippi State University have overall responsibility for the Center's activities. They are responsible for implementing the NCIT Strategic Plan and ensuring compliance with all UTRC rules and regulations. The Co-Directors meet regularly with their Assistant Directors and the NCIT support staff to ensure that all administrative requirements are met and for planning and executing research, education, and technology transfer activities.

An *NCIT Research Advisory Committee*, comprised of experts in the field of intermodal transportation, has been established to review and advise the Co-Directors on submitted formal proposals for NCIT research funding. In addition, this committee helps to identify additional projects that would be of benefit to the Center and the field of intermodalism as a whole. Finally, these members also evaluate completed research to determine acceptability for publication by NCIT in monograph form and for presentation at NCIT sponsored conferences.

An *NCIT Outreach Committee* comprised of leaders in transportation from both the private and the public sectors has also been organized to enhance the public awareness, understanding, and appreciation of intermodal transportation through technology transfer activities. This group provides advice and counsel on the development of activities that enhance our outreach to the needs of the community.

## *NCIT Staff*



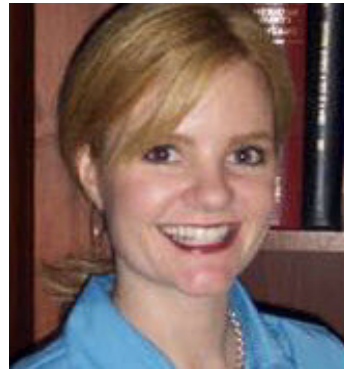
**Burak Eksioglu, Ph.D.**  
MSU Co-Director, NCIT  
Assistant Professor  
Industrial and Systems Engineering



**Patrick Sherry, Ph.D.**  
DU Co-Director, NCIT  
Associate Professor  
Intermodal Transportation Institute



**Royce Bowden, Ph.D.**  
MSU Assistant Director, NCIT  
Professor & Head  
Industrial & Systems Engineering



**Karen Philbrick, Ph.D.**  
DU Assistant Director, NCIT  
Adjunct Professor  
University of Denver

## *NCIT Staff*



### **Sandra Eksioglu, Ph.D.**

MSU NCIT Human Resources and Diversity Coordinator  
Assistant Professor  
Industrial and Systems Engineering

### **Andrew Goetz, Ph.D.**

DU NCIT Advisor  
Intermodal Transportation Institute Faculty  
Professor & Chair, Department of Geography

### **Mingzhou Jin, Ph.D.**

MSU NCIT Technology Transfer Coordinator  
Associate Professor  
Industrial and Systems Engineering

### **Joe Szyliowicz, Ph.D.**

DU NCIT Mentor and Advisor  
Intermodal Transportation Institute Co-Founder  
Professor, Graduate School of International Studies

### **Li Zhang, Ph.D.**

MSU NCIT Research Selection  
Assistant Professor  
General Library

## Scientific Advisory Committee



**Ray Balentine, P.E., PLS**  
Senior Transportation Manager  
Wilbur Smith Associates

**Steven K. Edwards, P.E., P.S.**  
Director, Office of Intermodal Planning  
Mississippi Department of Transportation

**Dennis W. Holland, Ph.D.**  
Director, Occupational Health Psychology  
Union Pacific Railroad

**Ronald Hynes**  
Deputy Associate Administrator  
Research, Demonstration and Innovation  
Federal Transit Administration

**Jake Kononov, P.E., Ph.D.**  
Director of Research and Development  
Colorado Department of Transportation

**Alan Lindsey**  
General Director of Safety & Rules BNSF Railway (*former*)  
Transportation Consultant

**John Obenberger, Ph.D.**  
Preconstruction Team Leader  
Department of Infrastructure  
Federal Highway Administration

**G. Don Taylor, Ph.D., P.E.**  
Charles O. Gordon Professor and Department Head  
Grado Dept. of Industrial and Systems Engineering

## *NCIT Outreach Committee*

**Ronald Akromis**

Regional Sales Manager  
Navajo Express

**Marjorie Alexander**

President, WTS  
Women in Transportation

**David Beckhouse**

Community Planner  
Federal Transit Administration

**Greg Dunnell**

Vice President, Electronic Services  
Wabtec Corporation

**Alan Edwards**

Special Agent  
FAA Hazardous Materials Branch

**Cathy Johnson**

Intermodal Transportation Institute  
University of Denver

**Nadine Lee**

The Regional Transportation District

**Glen March**

Career and Technical Educations  
Coordinator  
Douglas County Schools

**Raza Minhas**

Vice President Sales & Marketing  
Denney Transport

**Severin Oudet**

Sales Support Manager  
APL

**Jacqueline Rainey**

Manager, Flight Operations  
United Airlines

**Debby Ramirez**

State Advisor  
Future Business Leaders of America

**Lynda Siegel**

Consultant  
JP Morgan Chase

**Paul Smith**

President  
Smith Railway Consulting

**David Terada**

First Transit

**Andrew Strabala**

Manager  
FAA Hazardous Materials Branch

# Financial Report

**NCIT** funding sources for Grant Year 1 (June 1, 2006 to May 31, 2007) and Grant Year 2 (June 1, 2007 to May 31, 2008) totaled \$4,298,437. During these two grant years the University Transportation Research Center (UTCR) funding allocated to NCIT totaled \$1,094,500 (Y1=\$544,500 & Y2=\$ 550,000). External funding of research projects totaled \$3,203,937. Combined funding from both sources totaled \$4,298,437. For Grant Year 1 and Grant Year 2 25.5% of NCIT total funding was contributed by the USDOT UTRC and other sources account for the remaining 74.5%.

**Table 1. Sources of NCIT Funding.**

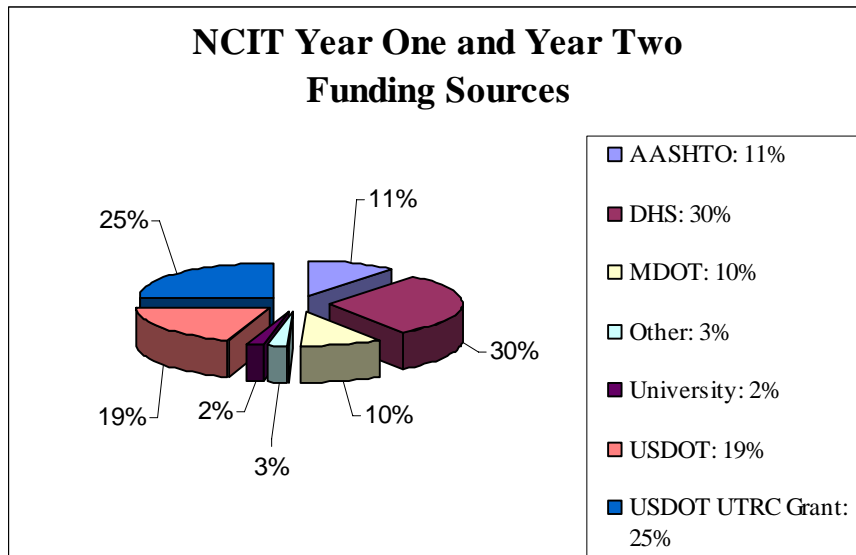
Source	Amount
USDOT: Other	\$837,540.00
USDOT: UTRC Grant	\$1,094,500
Mississippi Department of Transportation	\$422,000.00
US Department of Homeland Security	\$1,282,479.00
Mississippi State University	\$80,589.00
Webster County Development Council	\$50,000.00
US Small Business Administration	\$62,352.00
Private Organizations	\$5,000.00
AASHTO*	\$463,977.00
<b>Total</b>	<b>\$4,298,437.00</b>

\*American Association of State Highway and Transportation Officials.

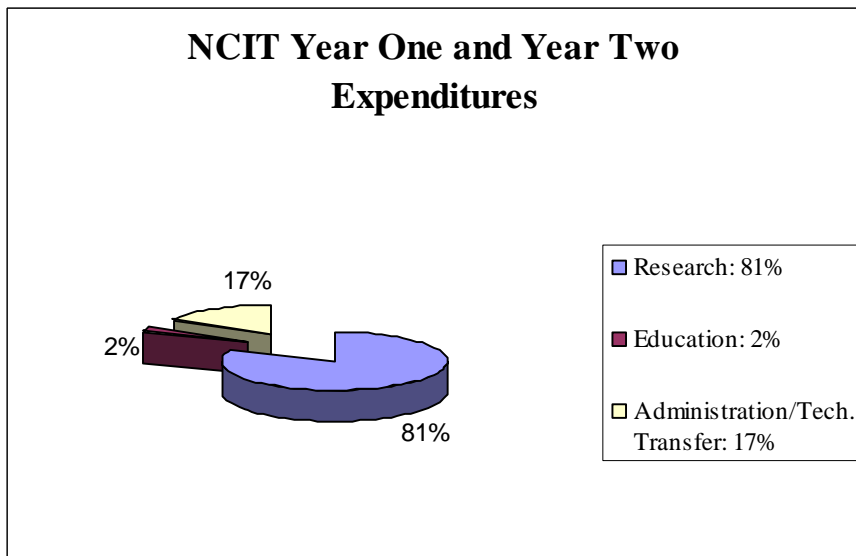
As can be seen a significant amount of the funds that support research at the NCIT are obtained from external sources. The Mississippi Department of Transportation and the US Department of Homeland Security contributed \$1,704,479.00 which accounted for 40% of the total funding. Put another way, a total of \$2,182,371.00 or 51% of funds come from Federal sources and \$1,021,566.00 or 24% come from non-federal sources. The relative breakdown in terms of percentage contribution is also shown in Figure 1. NCIT expenditures are shown in Figure 2. As can be seen the overwhelming majority was expended in research, followed by technology transfer/administration, and education. The picture is clearly augmented by expenditures as a result of the externally funded projects.

**Table 2. Expenditures Grant Y1 & Y2.**

Expenditures	Amount
Research	\$3,495,227.00
Education & Outreach	\$75,594.00
Administration & Technology Transfer	\$727,616.00
<b>Total</b>	<b>\$4,298,437.00</b>



**Figure 1. Sources of NCIT Funding Year 1 and Year 2.**



**Figure 2. NCIT Expenditures Y1 & Y2.**

# Research Program



**NCIT**'s research goal incorporates the expertise reflected in the multiple disciplines and fields of study within each of the partner universities, including business, education, engineering, occupational psychology, law, and science. The collaboration and the commitment of the two universities to NCIT and its mission and goals is intended to produce significant contributions to the body of knowledge of intermodal transportation and to the public awareness and information of the benefits of an integrated intermodal system for the movement of both passenger and freight for the 21<sup>st</sup> Century.

Based on the research strengths of DU and MSU and on the input from industry experts and government transportation officials, the following comprise NCIT's research agenda:

## Research Agenda

- **Intermodal Policy:** the present state of intermodal transportation research, policies, and practice. Identify and recommend needed changes and improvements in policy legislation and regulations.
- **Intermodal Workforce Development:** the development of methodologies and strategies for addressing human factor issues, leadership development, recruitment of new professionals and the retention of existing personnel for the safe and efficient management of the national intermodal transportation system.
- **Intermodal Economic Impact and Development:** the development of methodologies for analyzing the impact of intermodal systems on the local and national economy.
- **Intermodal Transportation System Performance Modeling and Assessment:** the development of methodologies for modeling and assessing intermodal transportation systems. Investigations of the financial and economic models associated with and underpinning the intermodal transportation system infrastructure development and implementation.
- **Intermodal Transportation System Planning and Design:** the development of methodologies for optimizing intermodal transportation systems.
- **Intermodal Terminal Operation:** the development of methodologies and strategies for designing and operating intermodal terminals to include such topics as facility layout, inventory management, resource allocation, and labor utilization.
- **Intermodal Safety and Security:** the development of methodologies and strategies for enhancing the safety and security of the intermodal transportation system.
- **Impact of Intermodal Transportation on Distribution System Design:** the development of methodologies and strategies for analyzing the impact of intermodal systems on the supply chain design of various industries such as automotive, furniture, bioenergy, healthcare industries.
- **Intermodal Transportation Systems Role in Crisis Conditions:** the development of methodologies and strategies for analyzing the impact of intermodal and/or transit systems in evacuation of urban areas and relief services to communities affected by disasters.

Accordingly NCIT has developed a **research selection** and a **research performance** goal to implement our overall research program. The research selection goal is reflected in the development of our research proposal peer review process. NCIT instituted a systematic process for engaging the academic community, transportation industry experts, and government transportation officials in the evaluation and the review of submitted proposals requesting NCIT funding for intermodal transportation research. A formal request for proposals (RFP) grant request form was prepared and an NCIT Research Advisory Committee was established (see page 9).

Individuals were eligible to apply as principal investigators for NCIT research projects by submitting Problem Statements. Formal Proposals were then solicited upon approval of the Problem Statement. To ensure a total quality focus, all Problem Statements and Formal Proposals identified the users or customers of the findings and how these individuals or agencies would participate in the research.

Because NCIT is funded to promote research in the development, planning, design, improvement, and assessment of a safe, secure, and efficient intermodal transportation system for passengers and freight, priority was given to problem statements that fell under the following research areas:

- Impact of Intermodal Transportation on Distribution System Design
- Intermodal Safety and Security
- Intermodal Policy
- Intermodal Economic Impact and Development
- Intermodal Workforce Development
- Intermodal Transportation Systems Role in Crisis Conditions

The Problem Statement was intended to pre-qualify proposed projects before the submittal of a Formal Proposal. The following items were addressed in the one-page Problem Statement: relationship of the project to intermodal transportation, including modes of transportation affected, research problem description and objectives, and application of research.

**NCIT's** Research Performance Goal is to produce significant contributions to the literature in intermodal transportation through an ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field to advance the body of knowledge in transportation. Since we have just completed the first round of research awards, and the peer reviewed publication process is somewhat lengthy, we will report on our progress in this area in subsequent annual reports.

## Research Program Status

**NCIT** received sixteen research proposals and of these, fourteen received funding. The following research projects represent the Grant Year One and Year Two research awards:

### New Research Projects

- 1. A Review of Suggested Improvements to the Intermodal Transportation System**  
*Principal Investigators:* Ted Prince Intermodal Transportation Institute, and Tom Finkbiner, Intermodal Transportation Institute, Patrick Sherry, Ph.D., University of Denver.
- 2. A Simulation Model to Analyze the Impact of Crisis Conditions on the Performance of Port Operations**  
*Principal Investigators:* Burak Eksioglu, Ph.D., Sandra Eksioglu, Ph.D., Albert Allen, Ph.D., and Albert Myles, Ph.D., Mississippi State University.
- 3. An Evaluation of Air Rail Passenger Intermodal Access at US Airports**  
*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Tim Vowles, Ph.D., Colorado State University.
- 4. Analysis of the Regulatory, Operational, and Economic Feasibility of combined Passenger and Freight Intermodal Operations.**  
*Principal Investigators:* Gregg Baxter, San Joaquin Valley RTD and Patrick Sherry, Ph.D. University of Denver.
- 5. Analyzing the Impact of Intermodal Facilities to the Design of Supply Chains for Biorefineries**  
*Principal Investigators:* Sandra Eksioglu, Ph.D and Daniel Petrolia, Ph.D., Mississippi State University.
- 6. Demonstration of Global Supply Chains with Intermodal Transportation and Decision Support for Small and Medium Business**  
*Principal Investigators:* Mingzhou Jin, Ph.D. and Li Zhang, Ph.D., Mississippi State University.
- 7. Development of a Model for Intermodal Corridor and Terminal Operation and Placement**  
*Principal Investigators:* Wilbey Whit, CSX Intermodal, Jacksonville, FL. and Patrick Sherry, Ph.D., University of Denver.

**8. Evaluating Transit Oriented Development in Denver, Colorado**

*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Keith Ratner, Ph.D., Salem State College.

**9. Identification of a Competency Model for the Recruitment, Retention, & Development of Intermodal Transportation Workers**

*Principal Investigators:* Patrick Sherry, Ph.D., Rob Durr, M.A., and Karen Philbrick, Ph.D. University of Denver.

**10. Intermodal Transportation Systems for Asian Goods to U.S. via Mexico: An Analysis**

*Principal Investigators:* Burak Eksioglu, Ph.D., Mississippi State University, Ismail Capar, Ph.D., Texas A&M, Arunachalam Narayanan, Ph.D., Texas A&M.

**11. Regional Collaboration in Transport Infrastructure Provision**

*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Andrew Jonas, Ph.D., Hull University.

**12. The Framework of Calculating the Measures of Resilience for Intermodal Transportation Systems**

*Principal Investigators:* Li Zhang, Ph.D. and Mingzhou Jin, Ph.D., Mississippi State University.

**13. The Health and Safety Effects of Accidents on Intermodal Transportation Workers**

*Principal Investigators:* Karen Philbrick, Ph.D. and Patrick Sherry, Ph.D., University of Denver.

**14. The Role of Intermodal Transportation in Humanitarian Supply Chains**

*Principal Investigators:* Lesley Strawderman, Ph.D. and Burak Eksioglu, Ph.D., Mississippi State University.



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## *Highlights of New Research Projects*

### **A Review of Suggested Improvements to the Intermodal Transportation System**

*Principal Investigators:* Ted Prince Intermodal Transportation Institute, and Tom Finkbiner, Intermodal Transportation Institute, and Patrick Sherry, Ph.D., University of Denver.

#### ***Project Objectives***

The objectives of this research will be to provide an in-depth review and identification of recommendations from key business and policy leaders as to ways to improve the design, efficiency and infrastructure of the national intermodal transportation system. Recommendations from national executives will be used to form the basis of the various policy recommendations which will then be reviewed in depth. A final review of the recommended actions will be made and published.

### **A Simulation Model to Analyze the Impact of Crisis Conditions on the Performance of Port Operations**

*Principal Investigators:* Burak Eksioglu, Ph.D., Sandra Eksioglu, Ph.D., Albert Allen, Ph.D., and Albert Myles, Ph.D., Mississippi State University.

#### ***Project Objectives***

The main objective of this study is to identify the impact of crisis conditions, such as hurricanes, on the performance of port operations. This objective will be achieved by pursuing two specific aims: Identify and assess the current port operations under crisis conditions. Determine what kind of back-up plans do companies (e.g. grain and soil, automotive, and furniture companies) have to overcome such crisis conditions. Identify alternative routes/ports for those companies who regularly use the port currently affected by the crisis. In order to perform the analysis we will build a discrete-event simulation model. The model will capture the relationship between different players in the supply chain; and reflect the uncertainties related to lead time and customer demand. We will focus on the ports in the gulf coast.

## **An Evaluation of Air Rail Passenger Intermodal Access at US Airports**

*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Tim Vowles, Ph.D., Colorado State University.

### ***Project Objectives***

The objectives of this research will be to provide an in-depth analysis of air-rail intermodal connections at US airports. From this analysis we hope to explain which airports have the preeminent air-rail connections and provide insight into best practices for other airports to pursue when creating or improving their air-rail connections in the future. The goal of this project is to assess the quality of intermodal linkages at US airports by developing and testing a typology of air-rail intermodal access. Even though airports may claim they have air-rail connections, there is a wide range in the quality of those linkages and connections. Quality will be defined by the characteristics of the connection and system including but not limited to number of destinations served, scale and scope of the rail system, geographic extent of the system serving the airport, and users of the air-rail systems. By quantifying these distinctions through a comprehensive survey analysis we expect to clarify those airports having truly embraced air-rail intermodal connectivity as part of their urban transit system.

## **Analysis of the Regulatory, Operational, & Economic Feasibility of Combined Passenger and Freight Intermodal Operations.**

*Principal Investigators:* Gregg Baxter, San Joaquin Valley RTD and Patrick Sherry, Ph.D. University of Denver.

### ***Project Objectives***

The objectives of this research will be to provide an in-depth review and analysis of the regulatory, operational, structural and economic identification of the key factors and issues affecting the development of combined passenger and freight intermodal operations. There has been no previous published research on this topic. However, several locations around the country have considered or are considering this effort. The economic viability and feasibility of the project must be considered to determine whether it is cost effective. Second, the operational challenges of combing these operations must be reviewed. Finally, when all of the above have been reviewed all regulatory issues must be identified and addressed. Significant roadblocks to the development of these projects stem from the FRA regulations that present major obstacles to the implementation of this approach. The present project will provide an overview of the issues faced in each of these areas. The proposed research would seek to identify a list of key parameters that could be used in deciding on the economic and operational viability of such projects. Recommendations as to how to address the regulatory issues will also be provided.

## **Analyzing the Impact of Intermodal Facilities to the Design of Supply Chains for Biorefineries**

*Principal Investigators:* Sandra Eksioglu, Ph.D and Daniel Petrolia, Ph.D., Mississippi State University.

### ***Project Objectives***

The main purpose of this project is to analyze the impact of intermodal facilities in the design of supply chains for biofuel production facilities. This objective will be attained by pursuing two specific aims: (a) Build mathematical models that will be used to design the in-bound and out-bound supply chain of a biorefinery. This model will take as an input (i) location of existing intermodal facilities and their capacity; (ii) the geographical distribution of biomass feedstock and demand for biofuels, feedstock production yield, and (iii) production, transportation and inventory costs. (b) Compare supply chain designs that take advantage of intermodal facilities with the ones that do not. The comparison of alternative designs will be performed with respect to logistics costs and supply uncertainties. The performance of each design will be tested in a number of scenarios. We anticipate that locating a production plant close to an intermodal facility, will allow for economical in-bound and out-bound transportation options and reduce the risk of biomass supply.

## **Demonstration of Global Supply Chains with Intermodal Transportation and Decision Support for Small and Medium Business**

*Principal Investigators:* Mingzhou Jin, Ph.D. and Li Zhang, Ph.D., Mississippi State University.

### ***Project Objective***

The objective of this research is to develop a model with geospatial information to simulate a typical global supply chain faced by a small/medium business in the United States for professional training, academic education, and decision support. The model will include three transportation modes, ocean steamship lines, railways, and highways along a global supply chain from overseas suppliers to the company and then to final customers. The model will incorporate the operational data collected from local manufacturing companies and third-party logistics providers and relative geospatial information. The simulation model will include major steps and issues in all three transportation modes and their connections. The model is expected to visually display the impact of intermodal transportation on global supply chain management and serve as an educational tool to help small/medium business and college students understand intermodal transportation and global supply chains. The model can be tailored for one specific company and provide decision support for evaluating different supply chain alternatives and conduct trade-off study.

## **Development of a Model for Intermodal Corridor and Terminal Operation and Placement**

*Principal Investigators:* Wilbey Whit, CSX Intermodal, Jacksonville, FL and Patrick Sherry, Ph.D., University of Denver.

### ***Project Objectives***

The objectives of this research will be to provide an in-depth review and identification of the key factors in development of a Model for the Intermodal Corridor and Terminal Operation and Placement in order to identify ways to improve the intermodal transportation system from the perspective of both intermodal terminal operators and urban and community intermodal transportation planners. The proposed research would seek to identify a list of key parameters that could be used in deciding on the economic and operational viability of such projects. A final review of the recommended actions will be made and published. Currently, communities around the country make frequent requests of transportation companies to develop intermodal terminals in their area. Similarly, transportation carriers often find themselves deciding on whether to build or develop terminals in specific locations. These requests and projects presuppose the viability of an intermodal corridor. Presently, there is no model available to attempt to optimize the size, structure, configuration, and economic viability of such a terminal or corridor. Industry experts indicate that such a tool would be useful across the industry for both public and private sector applications.

## **Evaluating Transit Oriented Development in Denver, Colorado**

*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Keith Ratner, Ph.D., Salem State College.

### ***Project Objectives***

The objectives of this project are to evaluate TOD development in Denver to determine its overall regional impact and see if it is meeting its stated goals. During this project, already completed TOD development in Denver will be evaluated and a baseline for the future analyses of the impact of TOD development will be created. The goal of this project is to establish a baseline to help gauge the impact of transit-oriented development (TOD) in Denver in response to the development of the Regional Transportation District (RTD) light and commuter rail transit system. This baseline will be set for both the recently opened Southwest and Southeast light rail corridors as well as the new corridors proposed in the RTD FasTracks initiative. Issues such as the influence of TOD on transit ridership and total trip generation will be analyzed. TOD's impact on traffic congestion, environmental quality, and energy consumption will also be evaluated. Different scales of analysis will be conducted from the station and corridor levels to the county and district levels. Comparisons of development in transit and non-transit nodes and corridors will also be done.

## **Identification of a Competency Model for the Recruitment, Retention, & Development of Intermodal Transportation Workers**

*Principal Investigators:* Patrick Sherry, Ph.D., Rob Durr, M.A., and Karen Philbrick, Ph.D. University of Denver.

### ***Project Objectives***

The objective of this research project will be to develop a detailed and valid model of the managerial and executive competencies that are need to recruit assess train and develop the next generation of executives and managers that will guide the intermodal transportation industry. Research in other industries has shown that the use of well validated assessment instrument can add significantly to the accuracy in selection and evaluation of potential candidates as well as their long term success in the industry. The development of a competency model will allow training units for various intermodal organizations to more efficiently utilize their available training dollars in the development of key personnel. Finally, by identify in these key competencies HR departments in the various organizations will be able to more effectively recruit for the key competencies needed to work in these organizations. The development of this model will contribute to the development of key recommendations needed to ensure enhanced and continued productivity in the industry.

## **Intermodal Transportation Systems for Asian Goods to U.S. via Mexico: An Analysis**

*Principal Investigators:* Burak Eksioglu, Ph.D., Mississippi State University, Ismail Capar, Ph.D., Texas A&M, Arunachalam Narayanan, Ph.D., Texas A&M.

### ***Project Objective***

The objective of our research is to investigate the potential advantages of importing Asian goods into the US through Mexico as opposed to bringing them in through ports in western United States. Ports located in California are the most commonly used entry points for products imported from China and other Asian countries. However, companies have two major concerns when using ports in California. The first issue is the capacity of ports. The port of Los Angeles, the busiest port in America (70% of the Asian imports through western United States arrive through Los Angeles/Long Beach), has reached its saturation point. As a result, ships have to wait offshore up to 14 days during the peak months (July to December). Waiting offshore not only increases lead time but also increases the cost of goods because it costs an average of \$300,000 a week in salaries and fuel to operate a ship. The second issue is the congested highway traffic and over-burdened rail traffic in California. The objective of our research is to quantify the benefits of these potential advantages of importing Asian goods into the US through Mexico as opposed to bringing them in through ports in western United States.

## Regional Collaboration in Transport Infrastructure Provision

*Principal Investigators:* Andy Goetz, Ph.D., University of Denver and Andrew Jonas, Ph.D., Hull University.

### *Project Objectives*

Through surveys and interviews of key participants in Denver's FasTracks rail transit project, a case study of regional collaboration shall be conducted, focusing in particular upon mechanisms of inter- and intra-metropolitan cooperation and co-ordination in support of funding for large infrastructure projects. This project will examine how regional collaboration was achieved in the case of Denver's FasTracks rail transit program, a 120-mile extension of light and commuter rail in six corridors throughout the Denver metropolitan area to be completed over the next ten years. An impressive coalition of local governments, state and federal government, metropolitan economic development organizations, the business community, advocacy groups, and the general public was forged to provide financial support for the \$6.1 billion project, now underway. The project also assesses conditions for the long-term sustainability of regional collaboration behind the FasTracks program, including whether it could serve as a model for other metropolitan areas confronted by the same issues.

## The Framework of Calculating the Measures of Resilience for Intermodal Transportation Systems

*Principal Investigators:* Li Zhang, Ph.D. and Mingzhou Jin, Ph.D., Mississippi State University.

### *Project Objective*

The objective of this research is to develop a framework of calculating the measures of resilience (MORs) for intermodal transportation systems. To accomplish the objective, the following four specific aims are expected to be achieved: 1) Define measures of resilience of intermodal transportation systems, 2) Propose a framework to calculate the proposed MORs, 3) Case study of MORs in the recovery of Mississippi Gulf Coast after Hurricane Katrina, and 4) Demonstrate the enhancement strategies of the MORs. In this research, a unified framework of MORs will be developed for all transportation modes from the perspective of system users. Network-wide intermodal travel time and Level of Service (LOS) are selected as major performance indices for intermodal transportation. The percentages of performance indices that drop after a disaster are defined as MORs. Three key data, travel time, Level of Service (LOS) and OD (origin-destination) flows, are needed for using the proposed framework before and after disasters. The above process will be reviewed in a case study using the Mississippi Gulf Coast. How to improve MORs in the Mississippi Gulf Coast will also be discussed. The final report will summarize the framework and procedures to use the framework and provide guidelines for further studies.

## **The Health and Safety Effects of Accidents on Intermodal Transportation Workers**

*Principal Investigators:* Karen Philbrick, Ph.D. and Patrick Sherry, Ph.D., University of Denver.

### ***Project Objectives***

The objectives of this research will be to provide an in-depth assessment and identification of possible effects of involvement in work related accidents and critical incidents on subsequent performance of critical job tasks and overall productivity of persons in the intermodal transportation industry. In addition, it is hoped that an assessment of the key issues relative to the costs that can accrue due to the long term effect of involvement in traumatic accidents will be determined based on a statistical modeling of the numbers and types of accidents relative to the types of activities required. The understanding of the long term effects of non-fatal traumatic accidents and injuries are not fully understood in terms of their impact on work related performance and efficiency. Some writers feel that there is a loss of alertness, vigilance, and awareness on the part of some individuals involved in these types of accidents. This will lead to the development of a model of safety risks and potential preventative activities and training programs as well as a real estimate of the long term, not just the immediate consequences of work related accidents. Recommendations from these studies will be used to advise various groups on the key training and prevention activities that will later be needed to ensure enhanced and continued productivity.

## **The Role of Intermodal Transportation in Humanitarian Supply Chains**

*Principal Investigators:* Lesley Strawderman, Ph.D. and Burak Eksioglu, Ph.D, Mississippi State University.

### ***Project Objective***

The main objective of this study is to identify the role and impact of intermodal transportation on the performance of response and recovery operations following a disaster. This objective will be achieved by pursuing two specific aims: 1) Identify and assess the current response operations. Determine how (if at all) and why humanitarian organizations utilize different modes of transportation to move the goods and personnel effectively and efficiently in responding to and recovering from a disaster. 2) Identify factors that will potentially improve the attractiveness of using intermodal transportation. Some of the tools developed for commercial supply chains can be used in humanitarian supply chains, but there are differences in the two types of systems, such as the motivation for streamlining processes. Thus, there is an urgent need to understand better how to make humanitarian supply chains more effective and efficient. The proposed study is a step towards understanding how intermodal transportation might help improve the disaster response and recovery operations through the use of focus groups, surveys, and interviews with disaster relief agencies.

## Completed Research Projects

Prior to the beginning of this grant in 2006 NCIT had completed a number of research projects begun during the funding of NCIT from TEA – 21 during the years 2000-2003. These are listed here for historical purposes. These projects have not been funded from the current UTC grant.

1. Albert A.J., & Couvillion, W.C. (2001). The Use of Intermodal Information Technologies by Intermodal Ports and Terminals Serving Agriculture in Mississippi. *NCIT Final Report.*
2. Bowden, R., Carmichael, G.E., Rutledge Connery, N., Dempsey, P.S., Szyliowicz, J.S., Watt, W.J., & Zhang, W. (2001). A New Transportation Agenda for America in the Aftermath of 11 September 2001. *NCIT White Paper.*
3. Bowden, R., Gadiraju, S.R., Reginelli, G., Avery, C., & Cassady, C.R. Improving the Operation of Overnight Intermodal Cargo Terminals Using Simulation and Optimization. *NCIT Final Report.*
4. Cassady, C.R. LeMay, S.A., Schneider, K., Starks, D., & Chai, P. Cost of Ownership Modeling for Support Equipment at Intermodal Transportation Terminals. *NCIT Final Report.*
5. Couvillion, W.C., & Allen, A. (2001). Mississippi's Industrial Gulf Ports. *NCIT Final Report.*
6. Couvillion, W.C., Allen, A., Parrish, D. Planning for Intermodal Facilities and Infrastructure Changes to Enhance Traffic Flow in Southern Mississippi. *NCIT Final Report.*
7. Dempsey, P.S. (2000). The Law of Intermodal Transportation: What It Was, What It Is, What It Should Be. *NCIT Final Report.*
8. Dempsey, P.S. (2003). The New Federal Security Regime: Intermodal Passenger Transportation. *NCIT Final Report.*
9. Donovan, A. Intermodal Transportation in Historical Perspective. *NCIT Final Report.*
10. Goetz, A.R., Szyliowicz, J.S., Vowles, T.M., & Taylor, G.S. (2004). Assessing Intermodal Transportation Planning At State Departments Of Transportation. *NCIT Final Report.*
11. Goetz, A.R., Vowles, T.M. Progress in Intermodal Passenger Transportation: Private Sector Initiatives. *NCIT Final Report.*
12. Graham, D.W., Cassady, C.R., Bowden, R.O., & LeMay, S.A. Modeling Transportation Systems: Establishing a Common Language. *NCIT Final Report.*

13. Holguín-Veras, J., & Paaswell, R.E. New York Regional Intermodal Freight Transportation Planning: Institutional Challenges. *NCIT Final Report.*
14. Jervell, J.B., Perl, A., Sherry, P., Szyliowicz, J.S. Intermodal Education in Comparative Perspective. *NCIT Final Report.*
15. Jin, M., & Walden, C.T. Intermodal Transportation System Performance Assessment Model and Decision Tool. *NCIT Final Report.*
16. Jones, W.B., Cassady, C.R., Bowden, R.O. Developing a Standard Definition of Intermodal Transportation. *NCIT Final Report.*
17. LeMay, S.A., Cassady, R., Withee, J., & Viator, J. Tracking and Positioning Software: A Market Need, Value, and Cost Analysis. *NCIT Final Report.*
18. Ostlund, S., & Brown, K. (2003). Guidelines for Graphic Representation to Facilitate Public Involvement. *NCIT Final Report.*
19. Perl, A. (2003). Reconnecting America: Redesigning Transportation Policy to Enable Intermodal Intercity Travel. *NCIT Final Report.*
20. Philbrick, K.E., & Sherry, P. (2004). Perceptions of the Intermodal Transportation Industry Related to Recruitment and Retention of Human Resources. *NCIT Final Report.*
21. Sherry, P. (2005). Assessment of Fatigue in Train and Engine Employees of the Union Pacific Railroad in the San Antonio Area. *NCIT Report.*
22. Sherry, P. (2007). Fatigue in the Railroad Industry: Testimony Delivered to the House Committee on Transportation and Infrastructure Subcommittee on Railroads, Pipelines, and Hazardous Materials.
23. Sherry, P., & Philbrick, K.E. (2004). The Effects of Individualized Actigraph Feedback on Fatigue Management in Railroad Engineers. *NCIT Final Report.*
24. Sherry, P. Szyliowicz, J., & Crumpton-Young, L.L. (2002). Individual Fatigue Countermeasures in Intermodal Passenger Transportation. *NCIT Final Report.*
25. Sherry, P., Szyliowicz, J., Goetz, A., & McCarley, P. (2006). A Case Study of the Intermodal Issues Facing the Puget Sound Region and the Port of Seattle. *NCIT Report.*
26. Smith, J.D., Cassady, C.R., Bowden, R.O., & Ainsworth, L. Optimizing Delta and Pine Land Company's Bag Seed Distribution. *NCIT Final Report.*
27. Szyliowicz, J.S. Intermodalism: The Challenge and the Promise. *NCIT Final Report.*

28. Tan, A.C., & Bowden, R.O. (2004). The Virtual Intermodal Transportation System (VITS). *NCIT Final Report*.
29. Yevdokimov, Y.V. Measuring Economic Benefits of Intermodal Transportation. *NCIT Final Report*.
30. Zhang, Y., & Wu, D. Development of Trustworthy Intermodal Traffic Measurement. *NCIT Final Report*.
31. Zhang, Y., Bowden, R.O., & Allen, A.J. (2003). Intermodal Freight Transportation Planning Using Commodity Flow Data. *NCIT Final Report*.

## *Education Program*

**NCIT's** goal is to promote a multidisciplinary program of coursework and experiential learning that reinforces intermodal transportation. NCIT engages in a number of activities designed to promote its education and outreach goals. NCIT participates in educational programs in intermodal transportation that incorporate the multidisciplinary nature of intermodal transportation, draw upon the resources of each university, utilize modern educational technologies, and develop effective professionals in intermodal transportation.

### *The ENO Leadership Development Conference*

**NCIT** and the Intermodal Transportation Institute (ITI) at the University of Denver were very pleased to have a candidate selected to participate in the prestigious ENO Leadership Development Conference in Washington, DC. ITI masters graduate **Chad Thomas, Director of Intermodal Business Development with JB Hunt Transport Services, Inc.**, was selected along with 20 other of the top transportation graduate students from across the country to join the week-long conference. This conference brings together the full-spectrum of transportation policymaking perspectives to highlight key issues facing today's transportation leaders. The ENO conference included presentations, discussions, and debates from lawmakers and industry veterans focused on policymaking.

“With the coming expiration of SAFETEA-LU in October 2009, it is a perfect time to become engaged in this process to better understand the problems facing transportation infrastructure, funding and the economically critical movement of people and goods,” commented Thomas about his experience. ITI board member Stephen D. Van Beek named president and CEO of the ENO Transportation Foundation earlier in 2008, led students through the dynamic and interactive program, which concluded at a formal reception with a speech by legendary transportation writer Don Phillips and the bestowing of status as “ENO Fellow” upon the student participants. “The ENO conference was an excellent complement to the studies just completed in the ITI masters program. I could not be happier about the experience” said Thomas.



The ENO Transportation Foundation was created and endowed by William Phelps Eno (1858-1945). The foundation cultivates creative and visionary leadership for the transportation sector by identifying emerging transportation issues and accelerating the consideration of steps to address them. Foundation programs cover all modes of transportation, public and private sectors, and carriers as well as passengers and shippers. To enhance its effectiveness, the foundation often conducts its activities in partnership with others in government, industry, or academia.

## *Excellence in Teaching*

### **Professor Burak Eksioglu NCIT Co-Director Wins National Teaching Award**



**Dr. Burak Eksioglu**, NCIT Co-Director, received the Institute of Industrial Engineers (IIE) 2008 Award for Excellence in the Teaching of Operations Research. The award was presented to him at the international conference in Vancouver, British Columbia, Canada. Dr. Eksioglu has provided leadership in ISE through his dedicated service as the chair of the Operations Research and Statistics Technical Committee. The Committee is responsible for defining the content for both the undergraduate and graduate course offerings in operations research. Professor Eksioglu has built a reputation with both undergraduate and graduate students as an effective educator, blending the use of advanced instructional technologies with proven pedagogic methods. His instruction in the operations research arena is exemplary, and students tell us that they highly value his courses. We could not agree more with the students. Dr. Eksioglu is most deserving of the IIE 2008 Award for Excellence in the Teaching of Operations Research.

# *ITI Intermodal Transportation Management Executive Masters Program*

**NCIT** continues its support for the ITI Masters of Science in Intermodal Transportation Management degree that focuses on both the passenger and the freight industries. This program offers an interdisciplinary curriculum delivered as integrated modules. Incorporated within the program are an Intermodal Business Planning Project, a Personal Leadership Development Strategy, and a Travel Seminar to an area with intermodal facilities.

### *ITI Masters Program Curriculum:*

- Leadership and Management
- Intermodal Freight & Passenger Transportation
- Global Supply Chain Management
- Transportation Law and Regulations
- Transportation Financial Strategies
- Transportation Economics
- Transportation Marketing Tools
- Global Trade
- Quantitative Management Tools
- Leadership Development Planning Project
- Intermodal Business Planning Project



*ITI Hong Kong  
International Travel Seminar*

Among the companies who contribute to the program through lectures and other materials are:

- |                               |                                   |
|-------------------------------|-----------------------------------|
| ▪ Federal Express Corporation | ▪ Sound Transit                   |
| ▪ Canadian National Railway   | ▪ Fox Group Holdings of Australia |
| ▪ Quality Distribution        | ▪ Kansas City Southern Railroad   |
| ▪ JB Hunt Transport Services  | ▪ Distribution Technologies, Inc. |
| ▪ Hub Group                   | ▪ OmniTRAX                        |
| ▪ Greyhound Lines, Inc.       | ▪ BNSF Railway                    |
| ▪ Coach America               | ▪ Maersk                          |

# Technology Transfer Program

NCIT's goal is to ensure the availability of research results to potential users in a form that can be directly implemented, utilized, or otherwise applied. NCIT maintains a program for communicating information about its research and educational activities to intermodal transportation professionals and government officials, the transportation research community (including students), and the general public. NCIT conducts Intermodal transportation seminars, symposia, and educational programs for researchers, students, public servants, practicing transportation professionals, and the public.

## *Asian Pacific Economic Cooperation: Intermodal Skills Workshop*

Professors Patrick Sherry & Karen Philbrick conducted a one week seminar delivered to the Ministry of Transportation of the Philippines on the topic of Intermodal Transportation. The seminar provided information on 1) new and emerging technologies and software employed in the intermodal transportation industry; 2) training on how to evaluate the cost/benefits associated with different modes of transportation; 3) training on the skills needed to improve communication, conflict management, and leadership in intermodal transportation; 4) examples of current management practices in the field of intermodal transportation; 5) an overview of the concepts needed to design a safe and secure intermodal transportation system and 6) a discussion of key ethical and legal issues relevant to intermodal transportation.



Intermodal Skills Course Participants



Prof. Sherry & Philbrick  
Intermodal Skills Instructors

## *Identification of Executive Competencies in the Intermodal Industry*

The NCIT research agenda prioritizes workforce development for the intermodal transportation industry as an essential initiative. Accordingly, NCIT convened a one day workshop for Human Resource Executives in the Intermodal Industry in February of 2008 at the University of Denver to address the emerging issues in this area.

This workshop provided an opportunity for professionals and academic researchers from the industry to discuss and help prioritize funding and research efforts. A similar project was initiated by FHWA in 1999 and also in 2002 to identify the workforce development needs of the state DOTs and Transit agencies whose results were disseminated in a monograph entitled *The Work Force Challenge* published by TRB. However, prior to this workshop, no efforts had been made to address the specific needs of the intermodal industry.

During the NCIT February workshop, a Needs Assessment and Problem Statement generation activity was conducted to determine what programmatic efforts in training, development, and performance enhancement are needed to improve recruitment, training, and retention of qualified workers and professionals as well as enhancing workforce productivity and efficiency.

Attendees of this workshop identified nine key training needs that need to be addressed in order to produce high functioning employees in the intermodal transportation industry. These included:

1. Strategic Thinking Training
2. Leadership Skills Training
3. Analytical Skills Training
4. Marketing Skills Training
5. Technical Skills Training
6. Business Management Skills Training
7. Communication Skills Training
8. Financial Skills Training
9. Cultural Awareness Training

During the course of this workshop each of the nine training needs were discussed and operationally defined to include a description of attributes. In addition, the participants offered constructive feedback on the ITI Masters program course offerings and marketing approaches to Bill Zaranka and Cathy Johnson.

The next workshop is scheduled for October of 2008 and HR executives from all modes will be invited to participate.

## *Intermodal Safety & Security Workshop*

With transportation security and infrastructure among the top national concerns, Director Patrick Sherry of the National Center for Intermodal Transportation, in conjunction with Director Denver Tolliver of the Mountain Plains Consortium, hosted leading experts for an Intermodal Transportation Safety and Security Workshop in February of 2008.

U.S. Representative Ed Perlmutter, a member of the U.S. House Committee on Homeland Security, and retired Major General Mason Whitney, Director of the Governor's Office of Homeland Security, were among the experts who presented at this workshop.



Congressman Ed Perlmutter



Major General Mason  
Whitney



Mr. Ronald Hynes, FTA



Mr. David Bassett, TSA

Congressman Perlmutter delivered the keynote address, entitled "Life, Liberty and the Pursuit of Security," while Whitney presented on "Transportation and Homeland Security." Other presenters included Ronald Hynes, Deputy Associate Administrator for the Federal Transit Administration's Office of Research, Demonstration and Innovation, David Bassett, Federal Security Director for the Transportation Security Administration, and other leading experts.

Topics discussed included:

- The Difference between Safety and Security
  - FTA's Role in Promoting Safety and Security in Public Transportation
  - Current Security Laws and Programs
  - Special Needs Evacuation Planning
  - Homeland Security Education: Implications for Transportation Airport Security
  - Improving Commercial Vehicle Safety at the Border
  - Container Security
  - Air Cargo Security
  - Transit Security
  - Intermodal Security in the 21<sup>st</sup> Century

These presentations are available on the NCIT website at <http://ncit.msstate.edu/>

## *National Transportation Week Workshop*

**NCIT** hosted its annual National Transportation Week luncheon and workshop in May of 2007 and May of 2008. Coordinated and hosted by NCIT, this annual luncheon/workshop is a collaborative effort by the transportation and logistics organizations in Colorado, including the Women's Transportation Seminar, the Denver Transportation Club, Delta Nu Alpha, Council of Logistics Management, and ITI.

The National Center for Intermodal Transportation and the Intermodal Transportation Institute co-hosted a luncheon and workshop in celebration of National Transportation Week in May of 2007. This workshop addressed "Transportation Mobility, Safety, and Security" and featured Ron Hynes, Deputy Associate Administrator of Research, Demonstration and Innovation For the Federal Transit Administration. Craig Lensch, CEO of COACH Bus Loans, also addressed this group of transportation professionals, focusing his comments on improving transportation mobility through intermodal passenger transportation.

Again in celebration of National Transportation Week, NCIT and ITI hosted a workshop titled, "\$\$\$ Show Me the Money \$\$\$: The Transportation Funding Crisis and Possible Solutions" which garnered a great deal of media attention and excitement among transportation professionals.



*Lynda Seigel  
accepted the 2008  
NCIT /ITI Intermodal Outreach Award*

*\*Pictured with NCIT Co-Director, Professor  
Patrick Sherry(left)*

Russell George, Executive Director of the Colorado Department of Transportation (CDOT), delivered the keynote address, titled "The State of Transportation in Colorado in 2008: A Report Card". During his presentation he told attendees that he is encouraged that lawmakers, the media and Colorado residents have started talking about the massive needs facing Colorado's roads, airports and rail services in the 21<sup>st</sup> Century.

Transportation planning issues were addressed by Carla Perez, Senior Transportation Advisor to Governor Bill Ritter; Jason Longsdorf of the Denver Union Station Management Team discussed the development of Union Station and intermodal connectivity issues; NCIT Director, Professor Patrick Sherry, discussed the need to include workforce development in the infrastructure planning process, and OmniTRAX analyst Nathan Henderson discussed transportation capital, capacity, and pricing.

The luncheon culminated with the presentation of the 2008 NCIT and ITI Intermodal Outreach Award, presented to Paul E. Smith, President of Smith Railway Consulting, and Lynda Seigel, Consultant to JP Morgan Chase. These individuals were chosen for this award because of their commitment and dedication to transportation education and outreach activities.

*Paul Smith accepted the 2008  
NCIT/ITI Intermodal Outreach Award*

*\*Pictured with NCIT Co-Director,  
Professor Patrick Sherry(left)*



## NCIT Participation in *Operation Stimulus 2008: Colorado's 27th Annual Transportation Forum*

NCIT, in collaboration with ITI, had a booth at Operation Stimulus, an annual transportation forum. The focus was “Sustainable Logistics in the 21st Century” and it was attended by over 250 industry professionals, educators, and university and high school students. NCIT displayed its publications and distributed its brochure on transportation career opportunities as well as answered questions on both internships and careers in intermodal transportation.

## *Transportation Mobility, Safety, and Security Workshop*

DU NCIT Director Patrick Sherry, in conjunction with the Federal Transit Administration, hosted a two day workshop with transportation professionals and leading experts in May of 2007. Ms. Lisa Colbert, Program Manager USDOT Federal Transit Administration, kicked off this timely event by welcoming attendees who heard presentations on Rail and Bus Operational Issues; Transit Oriented and Joint Development; and Rail and Bus Safety and Security Issues in Transit. Presentations were given by the following leading experts:

**Mr. Ronald Hynes, Acting Associate Administrator**  
for Research, Demonstration, and Innovation  
USDOT Federal Transit Administration

**Dr. Denver Tolliver, Director**  
The Mountain-Plains Consortium  
North Dakota State University

**Mr. Tyler Garcia, Assistant Director**  
Operations Planning, Utah Transit Authority

**Mr. Terry Rosapep, Acting Regional Administrator, Region 8**  
USDOT Federal Transit Administration

**Dr. Keith Ratner, Associate Professor**  
Geography Department  
Salem State College

**Mr. Clarence "Cal" Marsella**  
General Manager and CEO  
Regional Transportation District  
Denver, Colorado

**Mr. Michael Taborn, Director**  
Office of Transit Safety and Security  
USDDOT Federal Transit Administration

**Dr. Patrick Sherry, Director**  
National Center for Intermodal Transportation  
University of Denver

**Mr. Dave Genova, Director**  
Safety & Security RTD  
Regional Transportation District  
Denver, Colorado

## *Transportation Seminars*

NCIT has been very active in hosting a number of transportation seminars, symposia, and workshops for transportation professionals. In addition to those events discussed above, the table below highlights other transportation activities that NCIT has hosted.

<b>Title</b>	<b>Presenter</b>
Automotive Distribution Network Design: A Perspective from Mississippi.	Dr. Sandra D. Eksioglu, Department of Industrial and Systems Engineering, Mississippi State University.
Coordinated Inventory and Transportation Decisions in a Two-stage Supply Chain.	Dr. Ismail Capar, Industrial and Systems Engineering, Mississippi State University.
Current status of Intermodal Freight Transportation in USA.	Dr. Patrick Sherry, NCIT, University of Denver. Invited Address APEC TPT in Manila Phillipines.
Cutting-Stock Problems in the Wood Processing Industry.	Dr. Yahya Fathi, Professor, Department of Industrial and Systems Engineering at North Carolina State University.
Integrated Asset Replacement and Utilization Decisions.	Dr. Joseph C. Hartman, Industrial and Systems Engineering, Lehigh University.
Depression, Support, and Safety: Prevalence and Implications for Male Railroad Workers.	Dr. Patrick Sherry and Mr. Andy Fields, National Center for Intermodal Transportation, University of Denver.
Integrated Warehouse Location and Inventory Decisions in Three-Tier Distribution Systems.	Dr. Burcu Keskin, Assistant Professor, Department of Information Systems, Statistics, and Management Science, University of Alabama.
Intermodal Competition in US Soybean Exports.	Dr. Won W. Koo, Chamber of Commerce Distinguished Professor and Director - Center for Agricultural Policy and Trade Studies, Department of Agribusiness and Applied Economics, North Dakota State University.
Non-Cooperative Outsourcing Games.	Dr. George L. Vairaktarakis, Associate Professor, Case Western Reserve University.
Overview of the Department of Agricultural Economics.	Dr. Albert Allen, Department of Agricultural Economics, Mississippi State University.
Rural Workzone Traffic Flow Characteristics.	Turner Fairbank Highway Research Center, Federal Highway Administration, McLean, VA.
Surprising Designs for Unit-Load Warehouses.	Dr. Kevin Gue, Industrial and Systems Engineering, Auburn University.
Transportation Security.	Dr. Patricia S. Hu, Director, Center for Transportation Analysis, Oak Ridge National Laboratory at NTRC, Knoxville, TN

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