Our Mission

The mission of the National Center for Intermodal Transportation is to promote the development of a safe and efficient national intermodal transportation system.

The NCIT focus on the design and development of planning methodologies and tools, technology, and human resources needed to improve intermodal connectivity, reduce congestion and improve the capacity and capability of the workforce to meet the challenges of the increasingly complex transportation system. Congestion, competition, capacity, and conservation challenge the US transportation system but can be addressed with by a 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.

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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 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.
Recent Research Seminars and Workshops

**Hours of Service Workshop:** The NCIT hosted a two day workshop and conference titled, “Alertness Strategies in the Rail Industry - Managing the Challenges of 24-hour Operations”. This workshop was held in Washington DC on Wednesday November 14th and Thursday November 15th 2007 at Gallaudet University. Presentations by Drs. Sherry, Blenky, Banks, and Folkard (see photo) highlighted the important issues in changing the railroad hours of service legislation. Employee alertness and the development of effective Fatigue Management Plans is an important safety consideration in our 24/7 society. This workshop explored the components of effective Fatigue Management Plans from the perspective of recognized world leaders from the research community together with representatives from rail management, rail labor and the government.

**Transportation Mobility, Safety, and Security:** The National Center for Intermodal Transportation and the Federal Transit Administration hosted a two-day workshop at the University of Denver Campus on May 16th and 17th 2007. This workshop discussed "Transportation Mobility, Safety, and Security Research and Development Issues". Key personnel of the Federal Transit Administration, the local and regional transit administrators, and notable regional academic and research personnel, came together to discuss the research agenda to be addressed in the near future. This was an opportunity to shape future transit research and to form partnerships that can address problems of interest to the transit community. Attendees heard presentations and perspectives from the Federal Transit Administration, University Transportation Centers, and Regional Transportation experts on the following topics: Operational Issues in Transit (Bus and Rail), Transit-Oriented and Joint Development, and Safety and Security Issues in Transit.

**Transportation Seminar:** The National Center for Intermodal Transportation hosted a one day seminar on *Occupational Health Psychology* at the University of Denver on June 26th 2007. This seminar was well attended by professionals and students alike. Dr. Denny Holland from the Union Pacific Railroad made a presentation the UP Occupational Health Program. In addition research presentations on the following topics were made: Men’s Depression in the Transportation Industry, Work Related Traumatic Events and Sleep Difficulties, Best Practices and Policies When Responding to Trespassing and Grade Crossing Critical Incidents: A Report on the Responses of Five Railroad Carriers, Experiential Avoidance and Intrusive Thoughts, and Employee Resilience in a Stressful Work Environment. Attendees discussed the current scientific literature, research findings, and future research directions.

**National Transportation Week:** On Thursday May 17th 2007 a Luncheon for National Transportation Week was held at the University of Denver. The Keynote Speaker for this event was Mr. Craig R. Lentzsch, Chairman and CEO of Coach America and a member of the Intermodal Transportation Institute’s Board of Directors. During this event Marjorie Alexander, President of the Women’s Transportation Seminar in Colorado, gave a speech in recognition of National Transportation Week. There were also presentations of the 2007 Intermodal Outreach Award and the 2007 DTC Scholarship Award.
Scientific Presentations and Papers at Conferences


**International Society of Traumatic Stress Studies**, Baltimore MD, November 2007: Several researchers from the University of Denver presented at this conference on the topic of “Stress Reactions following involvement in Grade Crossing Accidents”. Authors included Nazanin Bahraini, Andy Fields, Trent Elliott, Eric Prager, and Patrick Sherry.


**The American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) Meeting**, Seattle WA, August 2007: The RAC was designed to promote quality and excellence in research and in the application of research findings to improve state transportation systems. Patrick Sherry attended this meeting and discussed how state DOT research needs could be met by forming collaborations with University Transportation Centers.

**The American Psychological Association Annual Conference**, San Francisco CA, August 2007: Research conducted by Patrick Sherry and his team examining the effects of accidents on the health of transportation workers was presented at this prestigious conference.


**Systemics, Cybernetics and Informatics Conference**, Orlando Florida, July 2006: Research conducted by Ekşioğlu, Jain, and Ekşioğlu investigating “A Heuristic Approach for the Flowshop Problem with Due Dates and Release Times”.
Research Reports

Journal Articles


Book Chapters


Externally Funded Research Projects

- **Impact of Fatigue on Intermodal Switching Operations ($46,000)**
  Professor Sherry received a grant from the US DOT Federal Railroad Administration to study the effects of fatigue on switching operations in intermodal switch yards and facilities. The research is intended to develop a series of improved safety practices and training programs that will lead to safer operations and a reduction of accidents.

- **Simulation Model Pedestrian Traffic at Intermodal Facilities ($837,540)**
  Professor John Usher is the Principal Investigator for an $837,540 grant from the United States Department of Transportation. Professors Lesley Strawderman and Royce Bowden are also involved with the project. The focus of the research program will be on the development of methodologies and software algorithms necessary for realistic simulation of pedestrian traffic at intermodal connector facilities such as airports, subway terminals, and bus stations.

- **Improving Homeland Security on Inland Waterways ($441,000)**
  Industrial and Systems Engineering (ISE) Professor Mingzhou Jin is the Principal Investigator for a $441,000 grant from the United States Department of Homeland Security. The project is a joint effort between Mississippi State University (MSU) and the Oak Ridge National Lab. ISE Professors John Usher and Royce Bowden, Civil and Environmental Engineering Professor William McAnally, and Michael Parsons of the Institute for Clean Energy Technology are also involved with the project. The objective of the research program is to develop and field test a prototype system that provides more accurate, uniform, and timely data on hazardous cargo movements by barges, especially those certified as Certain Dangerous Cargo (CDC).

- **Using a Simulation Model to determine the Impact of Outsourcing on the Furniture Industry Supply Chain” ($62,352)**
  Dr. Burak Eksioglu, MSU Assistant Professor of ISE, is principal investigator of a grant from the U.S. Small Business Administration to study aspects of the furniture industry in Mississippi. The project will attempt to identifying the impact of outsourcing the manufacture of components and products on the performance of the furniture industry supply chain. The economic models created through this research will capture the key relationships among participants along the supply chain and the uncertainties related to lead time, defect rates, and customer demand in order to determine the true cost of outsourcing.

- **Communications During Natural and Willful Disasters ($250,000)**
  Professors Sandra Eksioglu and Burak Eksioglu of the Department of Industrial and Systems Engineering are Co-Principal Investigators for a $497,000 grant from the United States Department of Homeland Security. The project is a joint effort between Mississippi State University and the Oak Ridge National Laboratory. The objective of this research program is to develop a strategic plan for building, operating, and maintaining a robust, national emergency communications system that will assure reliable communications during disaster management operations.
Request for Proposals

The National Center for Intermodal Transportation recently issued a request for research proposals. 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 will be given to problem statements that fall under the following research areas:

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

Upcoming Events

Safety and Security Workshop: The National Center for Intermodal Transportation will be hosting a one day workshop and conference on Safety and Security issues in the 21st Century. This event will occur on Thursday February 21, 2008 at the University of Denver. This workshop will provide an opportunity for professionals from all modes to discuss the safety and security challenges that all modes of transportation face. Congressman Ed Perlmutter will be the keynote luncheon speaker.

Human Resources Executive Needs Assessment Workshop: The National Center for Intermodal Transportation will be hosting a one day workshop for Human Resource Professionals in March of 2008 at the University of Denver. This workshop will provide an opportunity for professionals from all modes to discuss the workforce challenges that are currently faced in the transportation industry. During this event, a Needs Assessment will be conducted to determine what changes in training and performance are needed to improve work productivity.

Identifying Reactions to Grade Crossing & Trespasser Accidents: The research team at University of Denver is engaged in ongoing research identifying the extent to which persons involved in critical incidents are adversely affected post incident. Two papers were presented in Baltimore and additional research is underway.

Effects of Fatigue on Switching Operations: The DU research team has an ongoing interest in applying the principles of behavior-based safety efforts on switching operations in intermodal terminals. Results of a recent investigation demonstrated the need to design additional training programs to improve operational safety and efficiency.

Leveraging the Freight Network: Tom Finkbiner and Ted Prince have published their white paper on ways to improve the intermodal freight policy and transportation network strategies. The unveiled their recommendations at the IANA Expo in Atlanta.
House Subcommittee Testimony

NCIT Testifies on US Transportation & Infrastructure: Dr. Patrick Sherry, PhD, co-director of the National Center for Intermodal Transportation (NCIT) and a Professor with the Intermodal Transportation Institute (ITI) at the University of Denver, addressed the US House of Representatives’ Committee on Transportation & Infrastructure on June 30, 2006. During his testimony he identified five major challenges facing the nation’s transportation system.

Sherry told the panel that congestion, competition, capacity, conservation and connectivity are the primary challenges facing the US transportation infrastructure today, and identified intermodal connectivity as the solution to the nation’s transportation problems.

“Without a national transportation policy with incentives to establish a seamless intermodal transportation system that would maximize interconnectedness while optimizing the cost efficiencies of the various modes of transportation, these problems will only further stress the US infrastructure in the years ahead,” he testified.

Sherry concluded that the solution to America’s growing transportation and security problems will come from the adoption of a truly intermodal transportation system that provides a seamless connection between two or more modes, while ensuring safe, secure, sustainable and cost effective transport for people and goods.

NCIT Addresses Congress on Fatigue in the Transportation Industry: Dr. Patrick Sherry, PhD, Co-Director of the National Center for Intermodal Transportation (NCIT) and a Professor with the Intermodal Transportation Institute (ITI) at the University of Denver, addressed the Transportation and Infrastructure Subcommittee on Railroads, Pipelines, and Hazardous Materials regarding fatigue in the rail industry on February 13, 2007.

Sherry’s testimony stressed the need for fatigue management plans to address concerns jointly developed by labor and management. As Sherry stated, “To fully address the fatigue issue, railroads should be required to establish fatigue countermeasure plans, evaluated by an independent scientific panel, that include an accountability mechanism”.