NTRCI University Transportation Center
Heavy Vehicle Review

Newsletter
Volume 1, Issue 1

National Transportation Research Center, Inc., 2360 Cherahala Blvd, Knoxville, TN 37932
Web site address: www.ntrci.org Phone number: 865.946.1200

Heavy Vehicle Safety, Security and Efficiency

Heavy vehicle research contributes to national transportation goals that include reducing truck-related fatalities, improving the flow of goods, improving transportation operational efficiency, and maintaining the trucking industry's economic viability.

The United States faces major challenges in meeting the ever-increasing demand for transportation goods and services while striving to minimize adverse energy, environmental, and economic impacts. More efficient transportation systems are vital to meet these challenges. NTRCI works to promote the development and deployment of advanced transportation technologies through research, testing and commercialization for the benefit of the transportation industry and our transportation systems.

Our approved strategic plan focuses on our theme of Heavy Vehicle Safety, Security and Efficiency.

Our efforts are aimed at improving the flow of goods and the interaction between heavy trucks and passenger vehicles as the inevitable increase in heavy truck traffic continues.

Inside This Issue

Benefits of Public/Private Research Partnerships

Innovative public-private partnerships have emerged as one important form of government support for accelerating the development of new technologies. These public-private collaborations can significantly expand the breadth and depth of technical expertise available to the individual partners, reduce the costs and risks of research and development, and bring new technologies to the marketplace faster.

As a crucial tool to address critical transportation and infrastructure needs, public-private partnerships enable federal, state and local government agencies to team with the private sector to finance, design, build and operate everything from road pavement materials and highway alert systems and to vehicle inspection stations.

Public-private partnerships work best when both public and private sectors invest equally in making the relationship a success. Former President Clinton said *"More than any other nation in the world, we rely on a partnership between our government and our public and private research universities to conduct research that improves our economy, health, and national security, while also training our future science and technology workforce. It is vitally important that this partnership be equitable and effective to sustain U.S. leadership across the frontiers of scientific knowledge."*

See *Public/Private Partnerships* page 2

"NTRCI – where the research world meets the real world"

From *Public/Private Partnerships* page 1

To be effective these partnerships need to reflect the interest of both parties in the end result of the research.

Meet the Staff

Joseph A. Petrolino

UTC Center Director
Vice President-Heavy Vehicle R&D

Joe came to NTRCI with twenty-eight years of multifaceted hands-on experience in both Corporate and US Department of Defense management, and documented successes in executive and program management of complex motor vehicle systems including engineering development, testing, contract management, sales and distribution (domestic and international), and production and logistics.

Joe spent three years as Instructor, Assistant Professor and Course Director in the Department of Engineering, United States Military Academy for Applied Mechanical Engineering courses.

As both the UTC Center Director and Vice President of Heavy Vehicle R&D at the National Transportation Research Center, Inc (NTRCI), a Tennessee based non-profit corporation chartered to enhance economic development, further transportation technology research and encourage transportation technology education. Joe is responsible for marketing and business development to the commercial transportation industry, creation of a heavy vehicle consortium in safety, emissions and human factors and for providing independent test and evaluation services to industry as well as transportation technology services to local and state governments. He also provides critical management oversight to NTRCI research projects.

David C. Rice

Contracts Manager

David has over thirty-five years of direct, hands-on experience in government prime contract and subcontract/purchasing administration and management. He has held increasingly responsible positions in the U.S. Air Force and private industry providing the full range of contract management and procurement activities in support of complex research, development, and testing and evaluation projects for various government agencies including DOD, DOE, DOT, EPA; industrial clients and partners; universities, and state and local government agencies. Contracting actions included prime contracts, subcontracts, cooperative agreements, grants and purchase orders valued between $500 and $500M+ depending on complexity.

Connie Smith-Holbert

Business Manager

Connie joined NTRCI in 2004 and has nearly 25 years of experience in business, finance and accounting roles as controller, accounting manager, auditor, marketing promotions specialist, and staffing manager. Ms. Smith was Controller for TAP, LLC, where she helped to build a small entrepreneurial corporate infrastructure to support growth from 3 to 50 people. Previously she held multiple executive positions in her 20-year career in the automotive industry where her responsibilities included the controllership function; strategic, operational and capital planning processes; and market, pricing and customer/product optimization analysis. Connie graduated from Strayer University with a BS degree in Accounting and she earned a secondary BS degree in Marketing from the University of Phoenix. She is a member of the American Society of Women Accountants, Institute of Management Accountants and the American Marketing Association.

Research Advisory Committee

Research proposals are reviewed by the UTC Center Director and the NTRCI Research Advisory Committee (RAC). The RAC is comprised of 5 members, one of whom must be an individual from the USDOT. The remaining members will be peers and other experts in the transportation field to be selected by the NTRCI Board of Directors from among both its directors and members of the public and private transportation industry.

RAC Chairman: A.A. (Tony) Metler

Tony Metler is retired from the trucking industry. During his more than 39 years in the industry, he performed virtually every job in the business, from changing oil in trucks while in high school to serving as principal stockholder, President, and Chairman of the Board of an interstate motor carrier operating in the U.S., Canada, and Mexico. He was affiliated with A.J. Metler Hauling and Rigging, Inc., and Ametco, Inc., of Knoxville, Tenn.

Mr. Metler has served as past President, Chairman of the Board, and on the Board of Directors of the Specialized Carriers and Rigging Assn., in Washington, D.C. He is currently Chairman of the Board for NTRCI.

He attended the College of Industrial Management at Tennessee Technological University, and he is a U.S. Army veteran.

Michael F. Trentacoste

Director, Office of Safety Research & Development, Federal Highway Administration

Michael Trentacoste is the Director, Office of Safety Research & Development for the Federal Highway Administration (FHWA) located at the Turner Fairbank Highway Research Center in McLean, VA. He directs a multi-disciplined staff of engineers, scientists, and research psychologists in the planning, coordination, and conduct of research & development, testing, and technology transfer.

During his twenty-nine year career with the US Department of Transportation, Mr. Trentacoste has led development of the national Commercial Driver License (CDL); designed the Agency's commercial truck and bus driver fatigue research studies; and directed FHWA's 500 federal motor carrier field investigative staff and $75 million commercial safety inspection grant program. He has managed programs dealing with Amtrak, high-speed rail initiatives, and rail safety.

Mr. Trentacoste is a graduate of Manhattan College in civil engineering and has an M.S. in Transportation from Northwestern University. He is a registered engineer in the State of New York.

Jeffrey L. Cornish

President/CEO of Performance Transportation Services (PTS)

PTS is the second largest transporter of new cars and trucks in the United States and is based in Wayne, Michigan.

Previously, Mr. Cornish was Senior Vice President-Finance, Chief Financial Officer and Chief Information Officer of Pilot Travel Centers, LLC, a national petroleum retailer and restaurant franchisee with operations in 38 states. Mr. Cornish was a key member of the management team that grew Pilot from $250 million to $7 billion in annual revenues over a span of 14 years.

See RAC on page 4

Prior to working with Pilot, Mr. Cornish served in several senior positions as an executive and consultant including Managing Director of Strategic Consulting Services at Coopers and Lybrand, and in a Senior Financial Management position at General Mills Restaurants.

He serves as a Commissioner of the Knoxville Metropolitan Airport Authority. He also is a Board Member of O2 Diesel, a development stage energy company in the ethanol industry, and of the National Transportation Research Center, Inc.

Mr. Cornish is a CPA and CMA, and holds a BS in Accounting from Penn State University and an MBA in Finance from Indiana University.

Fred D. Tompkins

President of the University of Tennessee Research Foundation (UTRF)

UTRF is a UT-affiliated not-for-profit corporation that supports research; harvests, manages, and markets intellectual property; encourages and supports entrepreneurial ventures; and drives economic development. He also serves as Associate Vice President for Research and Economic Development for The University of Tennessee System.

A licensed professional engineer in Tennessee, Tompkins has been a faculty member and administrator at UT since 1974. He serves on the governing boards of several economic development organizations and start-up technology companies and NTRCI.

Dr. Tompkins holds B.S. and Ph.D. degrees in agricultural engineering from The University of Tennessee. Prior to taking his present position in May 2003, Tompkins was serving as dean of UT's College of Engineering.

Edward C. Fox (Ted)

Division Director-Oak Ridge National Laboratory
Engineering Science and Technology Division

Ted has worked for 22 years in Oak Ridge conducting and managing research in nuclear and fossil power systems and developing new technologies. His research experience includes technical and engineering economic assessments of advanced power systems and development of combustion technologies.

He was a member of a team that conducted assessments of new program opportunities and assisted in the management transition from Union Carbide to the former Martin Marietta Corporation. Fox served for nine years as head of the division's Engineering Analysis Section, supervising research for the Nuclear Regulatory Commission's Nuclear Plant Aging Reactors and Severe Accident Technology programs as well as the evaluation of advanced nuclear reactors.
Fox earned bachelors and master's degrees in chemical engineering from the University of Idaho. He came to Oak Ridge after serving four years in the U.S. Navy, including one year in Vietnam.

To succeed as a team is to hold all of the members accountable for their expertise.

Mitchell Caplan
*CEO, E*Trade Group Inc.*

Research Selection Process

Research projects funded by the NTRCI UTC must meet the objectives of the USDOT to conduct research that supports the national strategy for surface transportation research; results in an increased number of Americans who are prepared to design, deploy and operate the complex transportation systems that will enhance America's competitiveness in the 21st century; and transfer technologies into practice that provide solutions to national transportation challenges.

The UTC Center Director and the Research Advisory Committee (RAC) review and evaluate the abstract proposals submitted in response to a Request for Proposals, and select those to be submitted as formal and complete proposals. Selected proposals should meet or exceed the following criteria: research must fall within the parameters of the NTRCI theme of "Heavy Vehicle Safety, Efficiency, and Security"; Research must address the strategic goals of the US DOT; and must address practical applications to solve US DOT problems. In other words, it must not be research for research purposes but must pass the "**so what**" test.

Research will get priority consideration that also does the following: Includes students as part of the research process; includes partnerships with, and cost share from private industry; and continues research started under other USDOT programs and projects.

Formal proposal submittals are reviewed and the UTC Center Director, with guidance from the RAC, selects those to be funded. Proposals spanning several years must be evaluated in terms of the long term goals and objectives of the NTRCI and its UTC.

The UTC Center Director and RAC review and evaluate the progress of each of the projects selected for funding during the course of its period of performance to ensure adequate progress is being made and actual costs are on track with the project budget. The RAC will assist in the review and provide comments on draft and final project reports.

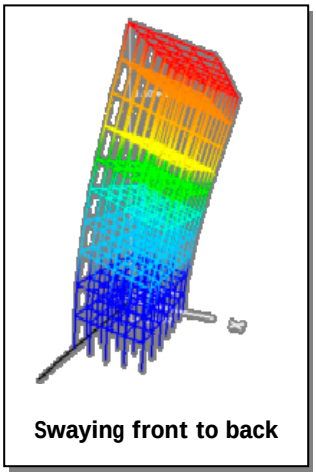
*"In other words it must not be research for research purposes but must pass the "**so what**" test."*

Current Research in Progress

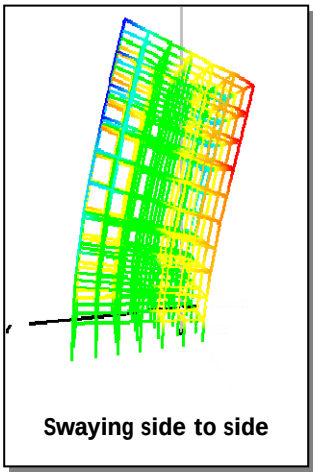
We received 26 proposals for the FY06 grant year. Final review of the proposals was conducted in January 2006 by the RAC. Eight projects were approved; six projects were selected for immediate funding in the FY06 grant year. One project was conditionally approved on obtaining private industry participation and two projects were tabled for resubmission in the next grant year because of technology changes in the industry driven by US DOT.

UO1 - Enhanced Finite Element Analysis of a Crash Model of Tractor Trailers

Most of the barriers used on US highways to mitigate the effect of run off the road incidents were designed for use with passenger vehicles and not heavy vehicles. The objective of this project is to validate and enhance computer models of a heavy vehicle (tractor – semi trailer combination) that will be used in finite element analysis, design, and evaluation of roadside safety hardware. This effort will enable the tractor-trailer model developed by the National Crash Analysis Center (NCAC) to provide more realistic results in predicting performance of vehicles and barriers in a crash, and significantly reduce the need for costly full-scale crash tests of expensive trucks similar to a model developed previously by NTRCI for single unit trucks. In addition, a User's Manual/Website will be developed to facilitate use of the model.



Swaying front to back



Swaying side to side

U02 - Heavy Truck Rollover Characterization

Analyze and determine the effects on rollover of a flat bed trailer using new generation wide base single tires. This project will increase the understanding of the interactions of vehicle load, tires, suspensions, vehicle types, vehicle stiffness (tractor and trailer), and roadway surfaces/tire interface on truck rollover events can contribute significantly to improving heavy truck safety. Such understanding can be applied to support the design and evaluation of new technologies such as wider axles, wider single tires, adaptive suspension systems, rollover warning systems, etc. It can also contribute to improving roadway design to

minimize the potential for truck rollover stemming from vehicle-highway interactions, and can contribute to more effective regulation aimed at reducing truck rollovers.

U03 - License Plate Recognition

This project will demonstrate the use of technology to enhance heavy vehicle monitoring and profiling to improve safety. The first objective is to test and implement a mobile heavy vehicle profiling technology to spot speeding, stolen, suspicious and substandard trucks at strategic locations. The second objective is to demonstrate a deployment scheme of the system without overtaxing local authorities.

U04 - Marine Containers on Chassis Safety Issues

This project is to investigate safety related problems involving chassis used for transporting marine containers on US highways. In recent years, much concern has arisen regarding the safety implications of allegedly substandard container chassis maintenance and inspection practices. This recognition is reflected in the recent effort to pass federal legislation mandating more effective container chassis inspection.

U05 - Traffic Signal Safety

This project will develop new traffic signal control logic to improve the safety of heavy vehicles on high speed approaches to signalized intersections using wireless communication between a heavy vehicle and a roadside traffic signal controller. The project will build on the Trusted Truck™ onboard computer system using the Vehicle Infrastructure Integration (VII) concept for deployment of communication technology between vehicles and roadside infrastructure. This technology for heavy vehicles can also be migrated to emergency responders.

U06 - Trusted Truck™ 2

This project builds on prior work to instrument a heavy tractor trailer with sensors on critical vehicle safety systems and transmitting that data to an inspection station to support the US DOT goal of developing a capability of wireless truck inspections to enhance highway safety.

NTRCI
NATIONAL TRANSPORTATION RESEARCH CENTER, INCORPORATED

Research Partners

Public Partners

- Federal Highway Administration
- Knox County Fleet Service Center
- Knoxville Regional Planning Organization
- National Highway Traffic Safety Administration
- United States Department of Energy

Private Partners

- Dana Corporation
- Econo Plug
- Fleet Tire
- Intercode Technologies
- Link Testing Laboratories
- Michelin America's Research & Development Corp.
- Michelin-Laurens Proving Grounds
- Safety Messenger
- Tennessee Trucking DBA Walker Trucking
- Volvo Technology of America
- Volvo Trucks of America
- Waste Connections

National Laboratory Partners

- Oak Ridge National Laboratory

Academic Partners

- Clemson University
- Pellissippi State Technical Community College
- The University of Michigan-Transportation Research Institute
- The University of Tennessee
- Western Michigan University

Non-Profit Partners

- Battelle Memorial Institute
- Transportation Research Center, Inc.
- UT-Battelle, LLC

Research Facilities

- NTRC Building

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2360 Cherahala Blvd, Knoxville, TN 37932
Phone: 865.946.1200 · Fax: 865.946.1212

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VISIT US AT:
WWW.NTRCI.ORG