



# MARYLAND

## NATIONAL TRANSPORTATION CENTER



## Program Progress Performance Report for National Transportation Centers



**PPPR #1: October 1, 2013 to March 31, 2014**

*Submitted by*  
**National Transportation Center @ Maryland**

**April 15, 2014**

*Prepared for:*  
**RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION  
U.S. DEPARTMENT OF TRANSPORTATION**



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# 1. PROGRAM INFORMATION

## **Program Progress Performance Report for National Transportation Centers**

U.S Department of Transportation  
Office of the Assistant Secretary for Research and Technology (OST-R)  
Federal Grant Number: DTRT13-G-UTC30

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### **Program**

National Center for Strategic Transportation Policies, Investments and Decisions  
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### **Submitted to**

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### **Signature of Submitting Official**





## 2. ACCOMPLISHMENTS

### 2.A. WHAT ARE THE MAJOR GOALS OF THE PROGRAM?

The National Center for Strategic Transportation Policies, Investments and Decisions at the University of Maryland, a national University Transportation Center, was founded in 2013 focusing on the U.S. Department of Transportation (DOT) strategic goal of “Economic Competitiveness”. The University of Maryland (UMD) consortium includes:

- Arizona State University (ASU)
- Louisiana State University (LSU)
- Morgan State University (MSU)
- North Carolina State University (NCSU)
- Old Dominion University (ODU) and the
- University of New Orleans

The National UTC aims to promote strategic transportation policies, investment, and decisions that bring lasting and equitable economic benefits to the U.S. and its citizens. The Center is concerned with the integrated operations and planning of all modes serving the nation’s passenger and freight transportation system, including the institutional issues associated with their management and investments. A balanced multi-modal approach will be used that considers freight and passenger travel mobility, reliability, and sustainability, as well as system operations during periods of both recurring and non-recurring incidents, including response to major emergencies. The modes in this theme include highway, transit, rail, and inter-modal interfaces including ports, terminals and airports. In particular, the center focuses on research, education, and technology transfer activities that can lead to (1) Freight efficiency for domestic shipping and for our international land, air, and sea ports; (2) Highway congestion mitigation with multi-modal strategies; and (3) Smart investments in intercity passenger travel facilities such as high speed rail. Major center activities are as following:

- **Advanced & Applied Research Promoting Economic Competitiveness:**

Our research activities are multimodal/intermodal and multidisciplinary in scope, with the aims of addressing nationally and regionally significant transportation issues pertinent to economic competitiveness and providing practice-ready solutions.

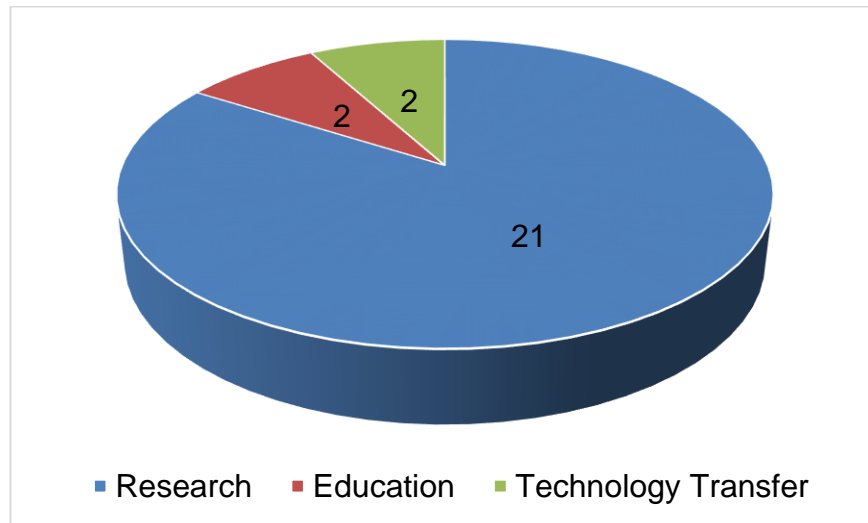
- **Education, Workforce Development, Technology Transfer, & Diversity:**

The consortium is committed to providing high-quality transportation education and workforce development programs for a broad and diverse audience. Center’s efforts will support the development of a critical transportation knowledge base and a transportation workforce that is prepared to design, deploy, operate, and maintain the complex transportation systems of the future.



## 2.B. WHAT WAS ACCOMPLISHED UNDER THESE GOALS?

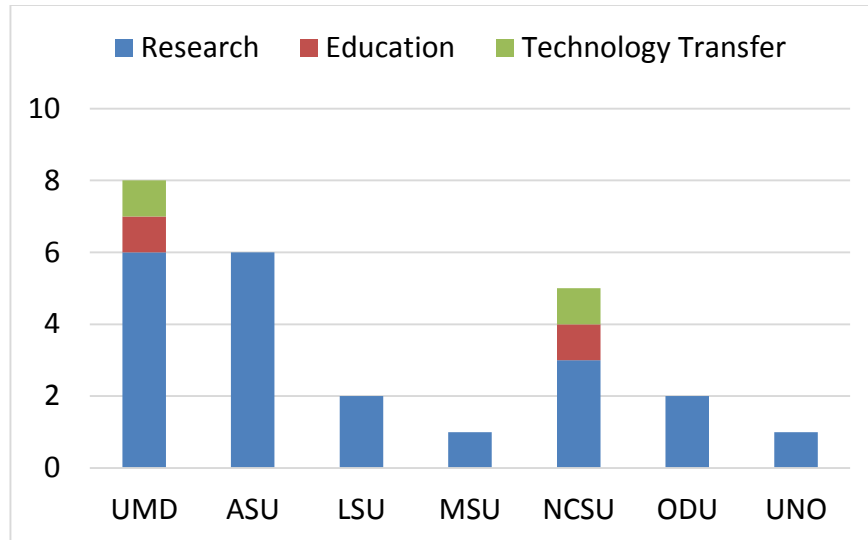
Accomplishments for the reported period are discussed below. After a careful review process by the research/education/technology transfer projects select committee, the center has awarded 21 research projects along with two educational and two technology transfer projects, see Figure 1.



**Figure 1. NTC Approval Projects Categories in 2014 Round.**

The NTC Project Information forms were sent out to Associate Directors in February, 2014, filled out by all P.I.s from member universities, and collected by the NTC Assistant Directors by March 1, 2014, including project title, university, principal investigator, PI contact information, funding source(s) and amounts provided (by each agency or organization), total project cost, agency ID or contract number, start and end dates, brief description of research project, implementation of research outcomes, impacts/benefits of implementation. The project information was posted on the NTC website as requested by RITA. All funded project in the 2014 round will be completed within one year with Quarterly Progress Reports submitted every three months and Final Reports submitted by December 3, 2014. The funded projects summary with respect to each member university is shown in Figure 2.

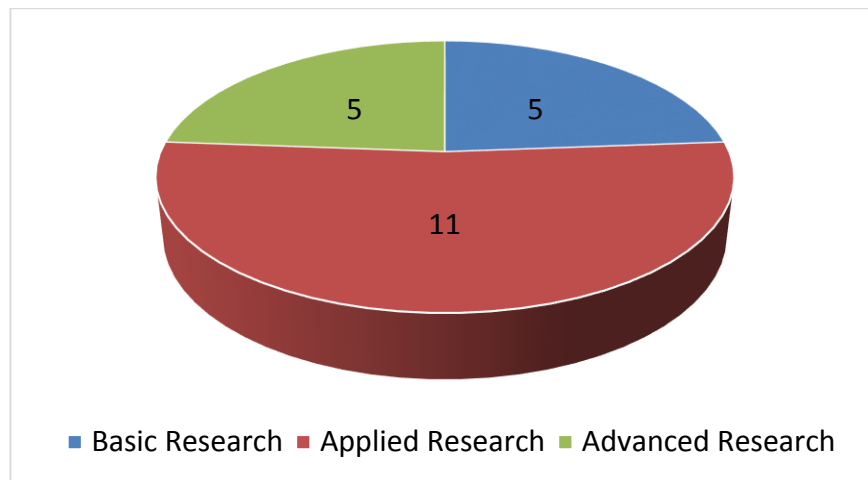
In the first round of awards, the center is sponsoring 24 PhD students, 1 master students and 11 undergraduate students. In addition to 25 principal investigators, 27 faculty/staff members/technical support consultants (not including P.I.) are involved in the projects. Accomplishments for the reported period are discussed below.



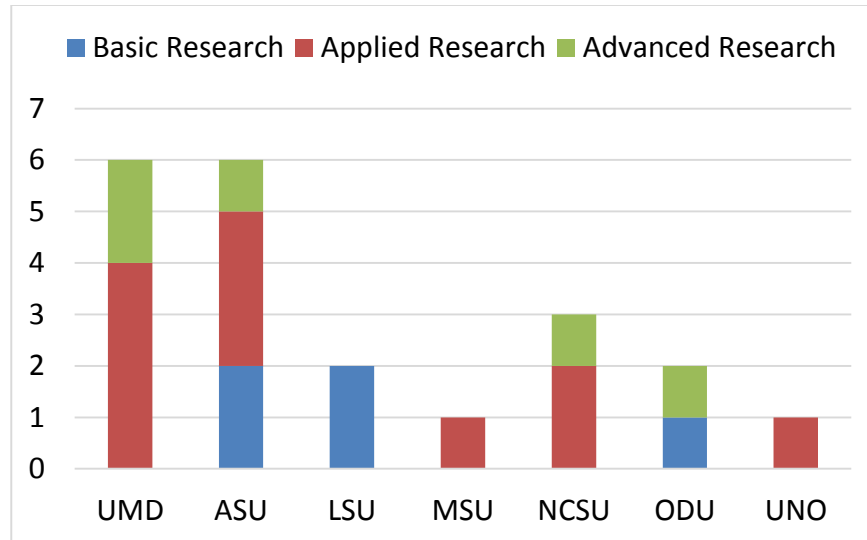
**Figure 2. Number of Projects Proposed by Each University and Funded by NTC.**

### **2.B.i. Research on Topics Relevant to Economic Competitiveness**

Figure 3 and Figure 4 show the member's participation in each research category: Basic, applied and advanced research.



**Figure 3. Research Projects Summary.**



**Figure 4. Number of Funded Research Projects of Each University.**

The NTC organizes its research activities in three major research topic areas – Domestic and U.S.-related International Freight Efficiency and Reliability, Congestion Mitigation with Multi-Modal Strategies, and Smart and Strategic Investments in High Speed Rail – to directly support the U.S. DOT strategic goal of Economic Competitiveness with consideration for other related strategic goals such as Safety and Sustainable Environment. Our research activities are multimodal/intermodal and multidisciplinary in scope. Based on the three research focusing areas of the center, faculties and research staff proposed a number of representative research projects in each domain. These projects cover a wide spectrum of transportation related topics including congestion mitigation, travel time reliability, climate change, work zone safety, connected vehicles and freight logistics.

The tight **relevance** to the center theme is a critical criterion in project selection. Some research highlights of funded proposals and their relationships to the center research focuses are presented as follows.

### **Domestic/U.S.-Related Freight Efficiency and Reliability (8 Projects)**

- The applied research project entitled “HOV Lane Performance Monitoring System” is relevant to the theme of the National Center by supporting the State of Maryland economy with improving the reliability of movement of people and goods.
- The advanced research project “Objective Decision-Making Tools for Infrastructure Investments to Combat Sea Level Rise” targets investments in capacity expansions of freight system and improves linkages between ports and the rail and highway systems.



- The applied research project “Efficiency and Reliability in Freight Transportation Systems” is intended to develop methods for improving the efficiency and reliability of freight transportation systems.
- The advanced research project “Impact of Freight Movement Trends on Highway Pavement Infrastructure” will provide both a “current state” analysis as well as establish a framework for future studies that may incorporate alternative or novel geometric design strategies or new materials technologies.
- The applied research project “Multi-layered Integrated Urban Freight Delivery Network – Phase I: Identification of Policy Preferences based on Qualitative and Conjoint Analyses” provide guidance on relevant last mile management policies that further improve efficiency of freight movement in urban areas.
- The applied research project “Efficiency and Reliability in Freight Transportation” develops a suite of reliability performance assessment tools that can be used by the federal government and state and local agencies to determine the freight reliability impacts of capacity investment and operational decisions.
- The advanced research project “Combining Different Data Sources to Predict Origin-Destinations and Flow Patterns for Trucks in Large Networks” develops algorithms can be utilized to support predicting truck flows between two WIM sites or other types of sites (e.g., vehicle classification sites) that collect vehicle-specific data where axle spacing is measured and recorded.
- The applied research project “Port City Challenges” focuses on two key topics relevant to the economic competitiveness of port cities: E-Navigation, and how investment decisions are made to move port freight inland.

## **Congestion Mitigation with Multi-Modal Strategies (9 Projects)**

- The applied research project entitled “Design and Implementation of a Detection, Control, and Warning System (DCWS) for Dilemma Zone Applications” intends to design a system to improve intersection safety and mitigate the congestion caused by non-recurrent congestion. The research products can also contribute to the prevention of traffic accidents at high-speed intersections.
- The basic research project “Behavioral Study for Managed Lane Pricing with Refund Option” will help engineers to better design and operate priced managed lanes—a prevailing form of road pricing in the U.S. for demand management and congestion mitigation.
- The research project “Congestion Mitigation Potential of Autonomous (Driverless) Vehicles: A Scenario-Based Approach” offers a conceptual framework capable of unraveling the complex set of interactions underlying the potential impacts of these technologies, and will thus help in accurately forecasting travel demand and network performance under a range of future vehicular technology scenarios.
- The applied research project “Evaluating and Calibrating Emission Impacts of Traffic Management Strategies through Simplified Emission Estimation Model and Mesoscopic Dynamic Traffic Simulators” focuses on the detailed evaluation of different traffic management strategies and systematical calibration of various traffic simulation parameters to improve the accuracy of emission impact estimation results, for medium and large scale networks.





- The basic research project “Quantifying the Effects of Manual Traffic Control on Evacuation Corridors” can lead to new corridor management techniques, which may decrease intersection delay during evacuations and special events.
- The basic research project “Development of a Simulation Test Bed for Connected Vehicles using the LSU Driving Simulator” leads to improvements vehicle safety and driver information technologies leading to an over reduction in the economic cost of traffic accidents and congestion.
- The applied research project “Validation of Travel Time Reliability Prediction from Probe Data” addresses the key task of validating the L08 methods, thereby facilitating broad based implementation of reliability performance prediction.
- The advanced research project “Vehicle Trajectory Tool (VTT): Application Pilot for AMS Test bed” explores a new sensing technology that produces high resolution vehicle data that has potential applications in the areas of safety, reliability, planning and operations.
- The basic research project “The Open Toll Lanes in a Connected Vehicle Environment: Development of New Pricing Strategies for a Highly Dynamic and Distributed System” supports the Connected Vehicle Initiative of the USDOT since the tolling system to be developed is for a system where vehicles can communicate with the infrastructure.

## Smart and Strategic Investments in High Speed Rail (4 Projects)

- The advanced research project entitled “U.S. National and Inter-Regional Travel Demand Analysis: Person-Level Microsimulation Model and Application to High-Speed Rail Demand Forecasting” represents the first attempt to develop a national long-distance travel demand model for high speed rail and national travel analysis. Findings from this funded research project can provide important insights and help guide federal and state to make decisions on high speed rail investment and design, as well as to research on long-distance passenger travel demand.
- The applied research project “Revenue Management and Operations Optimization for High Speed Rail” aims at enhancing organizational structures for the integrated management and operation of existing transportation railway infrastructure and facilities. It is coherent with USDOT Strategic Plan.
- The basic research project “Long-Distance Transportation Infrastructure in a Climate-Constrained Future: Reliable HSR Service for Economic Growth” can be used as a foundation for twenty-first century transportation infrastructure investment that balances environmental conditions with environmental impacts to meet mobility goals.
- The basic research project “Long-distance Transportation Infrastructure in a Climate-constrained Future: Reliable High-speed Rail Service for Economic Growth” develops a life cycle framework for prioritizing resiliency upgrades to high-speed rail (HSR) systems in the face of future climate change.

More details on can be found on the NTC’s website <http://ntc.umd.edu/research/projects>



## **2.B.ii. Education and Outreach**

Transportation researchers frequently struggle to effectively communicate research findings to practitioners, administrators, policy-makers and public officials. At the same time, these decision-makers are constantly seeking more and better information to help them understand the dynamics of transportation questions to design and implement projects and programs. This disconnect is attributable, in part, to the investment in time and training required to understand and interpret the results of technical analyses and to the typical format of research product deliverables. Yet the challenge is also a cultural one: while researchers strive to cultivate objectivity in order to communicate research results, they also must be prepared to recognize and respond to the normative, value-driven, and diverse needs of the audiences who are in a position to inform implementation with research findings.

To address this challenge, NTC@Maryland consortium member North Carolina State University (NCSU) proposes a series of four (4) live presentation and discussion webinars that will provide a high-profile venue for researchers to present selected research findings to a national and international audience, and also will provide the transportation research community with valuable information and insights on how to improve their skills in communicating research findings. The series will align with NTC's proposed technology transfer effort to "develop a technical seminar series featuring investigators at the consortium and invited speakers from other organizations" (National UTC proposal pages 3, 24). The series will also be a step beyond the typical research dissemination webinar to include a unique professional education component with the goal of increasing the relevance and practical impact of transportation research and the effectiveness of researchers in connecting with policy- and decision-makers.

This project creates a high-speed rail short course that can be used to teach professionals about the important details of designing and operating high speed rail systems as well as the policy issues involved.

On March 25th, 2014 Mr. James Martin of North Carolina State University visited the NTC@Maryland. During his visit, Mr. Martin toured the NTC facilities and meet with the faculty and staff on the NTC@Maryland to discuss the development of an online master's degree program in Transportation Engineering. In addition, Mr. Martin offered valuable insight into the planning of a conference on economic competitiveness. The staff at the NTC@Maryland looks forward to future collaboration with NCSU and all other partner universities.

Mr. Mark Franz, the Assistant Director of Outreach and Technology Transfer for the NTC@Maryland volunteered as a judge a Science Technology Engineering and Mathematics (STEM) Science Fair on Thursday, March 3. The event was hosted at the Imagine Andrews Public Charter School on Andrews Air Force Base in Maryland. Mr. Franz judged 3rd-5th grade science experiments to assist in determining the top three students in each grade that will represent Imagine Andrews in the Prince George's County STEM Science Fair.



## **2.C. WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROGRAM PROVIDED?**

The NTC@Maryland has been collaborating with the I-95 Corridor Coalition Freight Academy to explore the potential of enhancing the Academy with university resources. Upon meeting with the Freight Academy coordinator, Ms. MaryGrace Parker, the NTC@Maryland has formally submitted a technology transfer proposal with the objective of enhancing the quality and impact of the Freight Academy. The Academy will be held from April 27-May2, 2014 in New Brunswick, NJ. In accordance with the proposal tasks, the NTC@Maryland has been actively involved in selecting the awardees of scholarships for under-represented Freight Academy nominees. In addition, the NTC@Maryland is assisting in the development and selection of the final capstone projects. Once the Freight Academy begins, the NTC@Maryland will visit the event to assist the students in developing the problem statement and research plan for their capstone projects. This visit will also offer the opportunity for the NTC@Maryland to interact with participants and to gain first-hand experience on how the Freight Academy is operated. Finally, upon the completion of the capstone projects, the NTC@Maryland will assist in assessing the quality of each report.

In a related effort, the NTC@Maryland has reached out to the I-95 Corridor Coalition Operations Academy. This training event will be held on October 7-17, in Linthicum Heights, MD. The NTC@Maryland seeks to work with the Operations Academy to enhance the curriculum and to offer opportunities to under-represented applicants. Currently, the NTC@Maryland is working with representatives from the Operations Academy to assess the needs of the program and to define how the NTC@Maryland may assist in meeting those needs.

## **2.D. HOW HAVE THE RESULTS BEEN DISSEMINATED?**

NTC@Maryland plans to distribute its first quarterly electronic newsletter in April 2014. In addition to the newsletter, news items have been regularly posted on the website. These announcements can be viewed at <http://ntc.umd.edu/news/>



## **2.E. WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?**

By the end of the next reporting period, final research reports from the projects awarded in the first round are expected. The reports will be made available on the website and significant results will be included in the newsletter. The center will continue sponsoring seminars by inviting nationally and internationally recognized experts in the fields relevant to the center theme. During the next period seminars will be broadcasted on the web and also will be recorded to reach out to off-campus audience.

The NTC@Maryland is the sponsor of “Innovations in Travel Modeling - 2014” conference that will be held in Baltimore April 27-30, 2014. This conference series is the premier forum for sharing the latest developments in travel modeling, networking with fellow professionals, and identifying research and implementation challenges and issues associated with deploying cutting-edge computational methods to meet evolving planning contexts. The center is organizing a technology transfer program during the event through a port of Baltimore tour.

Our Center is also currently working with local partners such as the Maryland State Department of Transportation, Maryland State Highway Administration, and the DC Department of Transportation to establish joint student internship programs.





## 3. PRODUCTS

### 3.A. PRESENTATIONS

National Transportation Center at Maryland's researchers made more than 100 podium and poster presentations during the 93rd Transportation Research Annual Meeting that was held Jan 12-16, 2014 in Washington DC. The presentations covered a wide range of transportation topics including planning, Intelligent Transportation Systems, Big Data, Traffic, Safety, Reliability, Transit and Freight.

### 3.B. SEMINARS AND OTHER EVENTS

**NTC Reception 2014:** National Transportation Center at Maryland held its first reception on January 13, 2014 in Ping Pong Dim Sum restaurant in Washington DC. A large group of transportation professionals from both industry and academia attended the event.

**NTC Director's Meeting 2014:** Director, associate directors and administrative staff of the National Transportation Center at Maryland met after TRB Annual Meeting on January 16, 2014 to discuss center logistics, strategies and action plans. This is the largest meeting of member universities that NTC has held in the first three months after the center establishment. Representatives came from the University of Maryland, Arizona State University, Morgan State University, University of New Orleans, North Carolina State University, Louisiana State University and Old Dominion University attended the meeting.

**Seminar Series,** Routing and Scheduling for Restoration of Road Network Connectivity after a Disaster: Speaker Dr. Sibel Salman, College of Engineering, Koç University, Istanbul, November 21st, 2013.

**Seminar Series,** Avoiding bus bunching: Real-time control of buses, from research to the streets: Speaker Dr. Ricardo Giesen, Assistant Professor, Department of Transport Engineering and Logistics at Pontificia Universidad Católica de Chile, January 17, 2014.

**2014 Transportation Technology Legislative Fair:** NTC @ Maryland was an exhibitor in the 2014 Transportation Technology Legislative Fair, held on March 19, 2014 in Annapolis, MD. The purpose of this event was to inform the Maryland legislature about activities in technology as applied to transportation management and operations, and in particular how such technologies are being applied in Maryland.



## **4. PARTICIPANTS AND OTHER COLLABORATING ORGANIZATIONS**

### **4.A. PARTNERING ORGANIZATIONS PROVIDING**

- Maryland State Highway Administration, MDSHA
- Maryland Department of Transportation, MDOT
- North Carolina Department of Transportation, NCDOT
- I-95 Corridor Coalition

### **4.B. PARTNERING UNIVERSITIES**

- Arizona State University (ASU)
- Louisiana State University (LSU)
- Morgan State University (MSU)
- North Carolina State University (NCSU)
- Old Dominion University (ODU) and the
- University of New Orleans (UNO)

### **4.C. ADVISORY BOARD AND OTHER COLLABORATORS**

Our UTC is in the process of establishing an advisory board which will contain members from a variety of organizations and the private sector.

### **4.D. HAVE OTHER COLLABORATORS OR CONTACTS BEE INVOLVED?**

UNO, one of our member universities, recently signed a cooperation agreement with the Port of New Orleans.



## 5. IMPACT

### 5.A. WHAT IS THE IMPACT ON THE DEVELOPMENT OF THE PRINCIPAL DISCIPLINE(S) OF THE PROGRAM?

Projects selected in the first round have impact on several aspects of transportation policy making and decision making that contribute to the overall theme of economic competitiveness.

The efficiency and reliability of freight transportation system greatly affect the economic competitiveness of the U.S. and the standard of living of its citizens. One of the NTC projects studies challenges of a port city by investigating E-Navigation, and how investment decisions are made to move port freight inland. This research will provide insight to improve freight efficiency and reliability. It is anticipated that this research will result in policy alternatives that can be used to guide transportation investment decision making in both technological innovation and infrastructure improvements in port cities. Another project is intended to develop methods for improving the efficiency and reliability of freight transportation systems. The proposed methods are applicable to various freight transportation modes or multi-modal freight transportation systems. They are applicable to transportation systems at different scales, including international, national, regional and local. They are also applicable to freight operations within urban areas.

On the subject of high speed rail operations, an NTC project will investigate Revenue Management strategies (RM). Rail is considered the most energy efficient mode of surface transportation, and its role has become increasingly important around the world with ever growing concerns about the energy crisis and climate change. Implementing an RM strategy for railways is expected to contribute a significant lessening of this environment burden by making better use of the existing railway infrastructure. Moreover, efficient RM would allow the railway operator to generate more revenue from ticket sales and passengers with flexible demand would benefit from the discounted ticket in the off peak market. From another perspective, the lack of a capable long-distance passenger travel analysis tool in the U.S. has hindered the decision makers' and politicians' ability to systematically design and quantitatively evaluate the high speed rail. Long-distance passenger travel demand analysis has been an understudied area in transportation planning. As the nation and various states engage in funding transportation infrastructure improvements to meet future long-distance passenger travel demand, it is imperative to develop effective and practical data collection and modeling methods for long-distance passenger travel analysis. Microsimulation-based travel demand model based on existing and expected future data can contribute significantly to this field. NTC has awarded a project to make significant improvements in this area. The proposed project represents a more advanced academic research endeavor for high speed rail demand forecasting and national travel analysis. Findings



from this research project can provide important insight and help guide federal and state to make decisions on high speed rail investment and design, as well as to research on long-distance passenger travel demand.

Risk assessment is a key component in long term transportation decision making process. NTC is sponsoring projects to make significant improvements in this area. To combat the global problem of sea level rise, tools will be developed to account for all four phases of the disaster life cycle, from mitigation and preparedness to response and recovery. The tools will enable explicit management of risk along with related uncertainties. The multi-attribute nature of the problem and involvement of multiple stakeholders with oftentimes competing objectives will be considered. The resulting multi-factor decision-making tools will enable objective, multi-factor analysis to suggest where, when and to what level to make infrastructure investments. Another project will utilize naturalistic driving data to identify high-risk roadways and their impact on infrastructure investment. Over the long term it is theorized that this research may provide more accurate predictions for traffic accidents than ADT and potentially even the Highway Safety Manual.

On evacuation planning one of the NTC's projects is expected to result in innovative ways to manage evacuation corridors. Historically, improvements in emergency management and traffic operations have occurred through an evolutionary process with incremental changes made over long periods of time. The impact and benefits of this research to the management and operation of evacuation corridors will advance the state-of-knowledge making it possible to improve traffic management practices in the future.

Economic competitiveness calls for making more efficient use of existing systems and HOV lanes are a cost-effective solution to improve mobility. One NTC project focuses on developing an evaluation framework that fuses traffic and economic data from several sources to estimate key HOV facility indicators including their economic impact. Motivated by advancements in travel time measurement technologies, a pattern recognition algorithm for separating travel time on HOV and regular lanes will be developed. The outcomes will help making strategic decisions for both design and operation of HOV corridors.

## **5.B. WHAT IS THE IMPACT ON OTHER DISCIPLINES?**

NTC projects will have impact on other fields of transportation such as traffic engineering and reliability analysis. One of the projects will provide guidance on system design, implementation, and its effectiveness on mitigating the dilemma zone problem. Another research explores a new sensing technology that produces high resolution vehicle data that has potential applications in the areas of safety, reliability, planning and operations.





### **5.C. WHAT IS THE IMPACT ON THE DEVELOPMENT OF TRANSPORTATION WORKFORCE DEVELOPMENT?**

The webinar series will be of benefit to transportation researchers, federal and state DOT research program managers, TRB committee members, legislative staffers, sponsors/funders of research (e.g., TRB, AASHTO, NGOs), and staff of cities, counties, and states involved in transportation planning and project development who must bridge the distance between technical knowledge and normative processes in their day-to-day work. The series is expected to draw significant participation from practitioners across the U.S. and participation from international audiences.

### **5.D. WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL AND INFORMATION RESOURCES AT THE UNIVERSITY OR OTHER PARTNER INSTITUTIONS?**

None to report.

### **5.E. WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?**

None to report.

### **5.F. WHAT IS THE IMPACT ON SOCIETY BEYOND SCIENCE AND TECHNOLOGY?**

None to report.



## 6. CHANGES/PROBLEMS

None to report.

## 7. SPECIAL REPORTING REQUIREMENTS

- **Website:** Newly-designed website launched December 2013: <http://ntc.umd.edu/>
- **Directory of Key Personnel:** available on the program website: <http://ntc.umd.edu/staff>
- **Financial and Annual Share Reports:** The SF 425 requirements will be met by separate report.
- **Research Project Descriptions:** available on the program website: <http://ntc.umd.edu/research/projects>



# APPENDIX

## NTC @ Maryland Funded Projects, 2013-2014

University	Principle Investigator	Category	Funded Project Titles
UMD	Paul Schonfeld	Applied Research	Efficiency and reliability in freight transportation systems
	Ali Haghani	Applied Research	HOV lane performance monitoring system
	Gang-Len Chang	Applied Research	Design and Implementation of a Detection, Control, and Warning System (DCWS) for dilemma zone applications
	Elise Miller-Hooks	Advanced/Applied Research	Objective decision-making tools for infrastructure investments to combat sea level rise
	Cinzia Cirillo	Applied Research	Revenue management and operations optimization for high speed rail
	Mark Franz	Technology Transfer	Freight academy
	Tom Jacobs	Technology Transfer	Operations academy and regional traffic operations workshop series
	Xiqun Chen	Education	Summer and year-long student internship program
	Ali Haghani	Education	Online master's degree program in transportation engineering and planning: Phase one
	Lei Zhang	Advanced Research	U.S. national and inter-regional travel demand analysis: person-level microsimulation model and application to high-speed rail demand forecasting
ASU	Yingyan Lou	Basic Research	Behavioral study for managed lane pricing with refund option
	Mikhail V. Chester	Basic Research	Long-distance transportation infrastructure in a climate-constrained future: reliable HSR service for economic growth
	Ram M. Pendyala	Research	Congestion mitigation potential of autonomous (driverless) vehicles: A Scenario-Based Approach
	Mounir El Asmar	Research	Quantifying and benchmarking the delivery performance of U.S. Public-Private-Partnership (PPP) transportation projects
	Xuesong Zhou	Research	Evaluating and calibrating emission impacts of traffic management strategies through simplified emission estimation model and mesoscopic dynamic traffic simulators
	Shane Underwood	Advanced Research	Impact of freight movement trends on highway pavement infrastructure
LSU	Brian Wolshon	Basic Research	Quantifying the effects of manual traffic control on evacuation corridors
	Sherif Ishak	Basic Research	Development of a simulation test bed for connected vehicles using the LSU driving simulator
MSU	Hyeonshic Shin	Applied Research	Multi-layered integrated urban freight delivery network – Phase i: identification of policy preferences based on qualitative and conjoint analyses
NCSU	James Martin	Technology Transfer	Moving transportation research to practice: TPID webinar series
	George List	Applied Research	Efficiency and reliability in freight transportation
	George List	Education	High Speed Rail Short Course
	Billy M. Williams	Applied Research	Validation of travel time reliability prediction from probe data
	Nagui M. Rouphail	Advanced, Applied Research	Vehicle trajectory tool (VTT): Application pilot for AMS test bed
ODU	Mecit Cetin	Advanced Research	Combining different data sources to predict origin-destinations and flow patterns for trucks in large networks
	Mecit Cetin	Basic Research	Open toll lanes in a connected vehicle environment: development of new pricing strategies for a highly dynamic and distributed system
UNO	Bethany Stich	Applied Research	Port city challenges

