2010-11 Annual Report

MORGAN STATE UNIVERSITY NATIONAL CENTER
FOR TRANSPORTATION MANAGEMENT, RESEARCH & DEVELOPMENT




MORGAN STATE UNIVERSITY
GROWING THE FUTURE • LEADING THE WORLD

Transportation: A Key to Human and Economic Development

2010-11 ANNUAL REPORT

The 2010-11 Annual Report highlights research, educational, and outreach activities conducted by the National Transportation Center at Morgan State University from September 1, 2010, to August 31, 2011.

Located in Baltimore, Md., Morgan State University is a doctorate-granting and research-intensive public urban university.

The National Transportation Center (NTC) at Morgan State University is committed to transportation research and education that support the well-being and economic development of communities.

Theme

The NTC's theme is "Transportation: A Key to Human and Economic Development." The center's research examines how multi-modal surface transportation systems affect people, particularly in terms of socioeconomics, equity, efficiency, technology, the environment, and safety. As a complement to this theme, the center aims to increase the numbers of minorities and women in transportation careers.

History

The NTC is officially known as the Morgan State University National Center for Transportation Management, Research and Development. The center is part of the U.S. Department of Transportation's University Transportation Centers (UTC) Program. The NTC is also a member of the Council of University Transportation Centers.

The NTC was established by Congress under the Intermodal Surface Transportation Efficiency Act of 1991; reauthorized in 1998 by the Transportation Equity Act for the 21st Century; and reauthorized again in 2005 by the Safe, Accountable, Flexible, Efficient Transportation Equity Act—a Legacy for Users.

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Cover Photos

Top row (left to right): Grad student Gholamhossein Mazloomdoust explained an NTC-sponsored project to RITA representatives; on Feb. 17, U.S. Secretary of Transportation Ray LaHood promoted industry careers at a Morgan town hall; assistant professor Mansoureh Jeihani and students installed measurement tools for a project on traffic speed (photo by Dean DeLoatch); and an STI participant really "got into" an astronaut exhibit at NASA's Goddard Space Flight Center.

Large photo: An SHA employee "test drove" the new UC-Win Road driving simulator in Morgan's Department of Transportation and Urban Infrastructure Studies.

The four participants in this year's Teacher Transportation Institute (TTI) learned new methods to motivate their math and science students.

MANAGEMENT STRUCTURE

The NTC's director devises and manages programs, supervises the center's staff, and ensures that the center's objectives and contractual and financial responsibilities are met. The director also meets with representatives from the Research and Innovative Technology Administration (RITA) and other UTCs to share experiences and establish national priorities for transportation research and education.

The director leads the center under the guidance and direction of the Dean of the School of Engineering. The NTC Advisory Committee, which meets with the center's staff three times a year, also provides guidance and advice on the center's activities.

Four full-time staff members and two contractual employees support the NTC's programs. Morgan faculty and students are sometimes hired to fulfill specific project requirements. All employees report directly to the center director.

KEY PERSONNEL

Dr. Andrew Farkas
Director

Dr. Eugene DeLoatch
Dean of the School of Engineering

Anita Jones
Administrative Assistant

Dr. Hyeon-Shic Shin
Assistant Research Professor

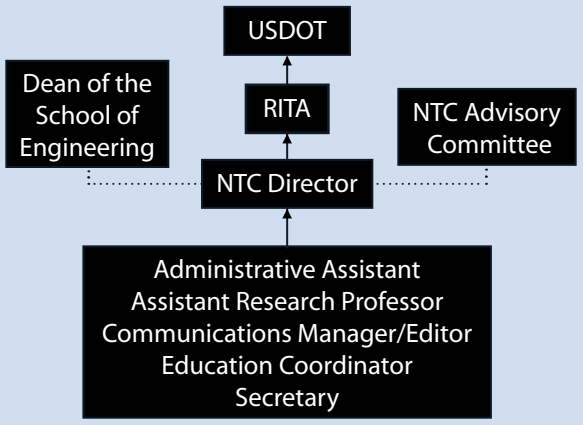
No Photo

Erica Johnson
Communications Manager/Editor

Valencia Baker
Education Coordinator

Sonia McDonald
Secretary

ORGANIZATIONAL CHART



NTC ADVISORY COMMITTEE

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Senior Liaison for Higher Education
Federal Highway Administration

Elizabeth Baker
Regional Administrator
National Highway Traffic Safety Administration

Nathan Beil
President
KCI Technologies

Nelson Castellanos
Division Administrator
Federal Highway Administration

Ricky DeGrafenreid
Director of Service Quality
Maryland Transit Administration

Ronald L. Freeland
Vice President
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Bob Garrett
Executive Assistant
Bureau of Municipal Services
Pennsylvania Department of Transportation

Gail McFadden-Roberts
Community Planner
Region 3
Federal Transit Administration

Adiele Nwankwo
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Central Region
PB Americas

Edward H. Power
Senior Vice President
HDR Engineering, Inc.

Richard Y. Woo
Director
Office of Policy & Research
Maryland State Highway Administration

Khalil Zaied
Director
Baltimore City Department of Transportation

Dr. Farkas (standing) addressed attendees at the May 6 research showcase for RITA Administrator Peter Appel.

THE NATIONAL CENTER FOR TRANSPORTATION MANAGEMENT, RESEARCH AND DEVELOPMENT—National Transportation Center (NTC) for short—is pleased to produce its fifth annual report under the current University Transportation Centers (UTC) grant. We are reporting on our grant year that ended on August 31, 2011, during which we completed five research projects and selected four new ones in addition to conducting the education and technology transfer activities described throughout the report.

Because two major initiatives occupied our time during the latter part of the grant year, and will be completed in the near future, I wanted to report on them to you. First, NTC has been planning and organizing a symposium on transportation in Maryland, scheduled for October 11, 2011. The intent of the symposium is to: (1) discuss the importance of transportation to the economy; (2) provide useful, factual information regarding transportation in Maryland and the nation; (3) explain alternatives for funding transportation infrastructure; and (4) engage a cross-section of leaders in a dialogue regarding the future of transportation.

Trust funds on the federal and state levels are nearly empty. Some have suggested that there is a lack of public support for transportation investments and raising user fees; others believe there is a lack of knowledge about the important role transportation plays in supporting economic growth and quality of life as well as the serious funding constraints on keeping infrastructure in good repair.

In previous comments I've noted that the public is generally unaware of transportation infrastructure's costs, benefits, economic impacts, and funding requirements. NTC, in keeping with its educational mission and in cooperation with other public and private sector organizations, is pleased to host a symposium to discuss these important topics. The symposium's keynote speaker is Hon. Ken Ulman, Howard County Executive and president of the Maryland Association of Counties. He has served on the Blue Ribbon Commission on Maryland Transportation Funding that is weighing

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Morgan and the NTC are working together to educate the public about the dangers of distracted driving.

©iStockphoto.com/TommL

options for funding on the state level. The luncheon speaker will be U.S. Rep. Elijah Cummings, who represents Maryland's 7th District. Congressman Cummings is a member of the House Transportation and Infrastructure Committee. There will be plenary and breakout sessions addressing many aspects of the economics, politics, and public relations of transportation funding.

Second, in February 2011 the university and NTC took on Secretary of Transportation Ray LaHood's challenge to initiate a student driver safety campaign, which in our case focuses on the state ban on texting and talking on hand-held phones effective October 1. Morgan State's president, David Wilson, has tasked the university's public relations office to spread the word to the campus community about the state bans. There will be e-mail blasts and a prominent post on Morgan's web site. Morgan personnel will compose a tip card that will be handed out to student organizations, make announcements at football games and other venues, solicit a student organization community service project, and organize a no-texting pledge program. Our federal partner, NHTSA, is working with minority-serving institutions on student transportation safety. Our state and city partners, Maryland Highway Safety Office and Baltimore City DOT, are producing and installing state highway signs (no texting, no hand held cell phone) on area roads. We decided to have a "press event" at the Maryland Transportation Symposium luncheon with Congressman Cummings. We will display the state highway sign that will be installed on three roads near the campus and at the campus parking garage.

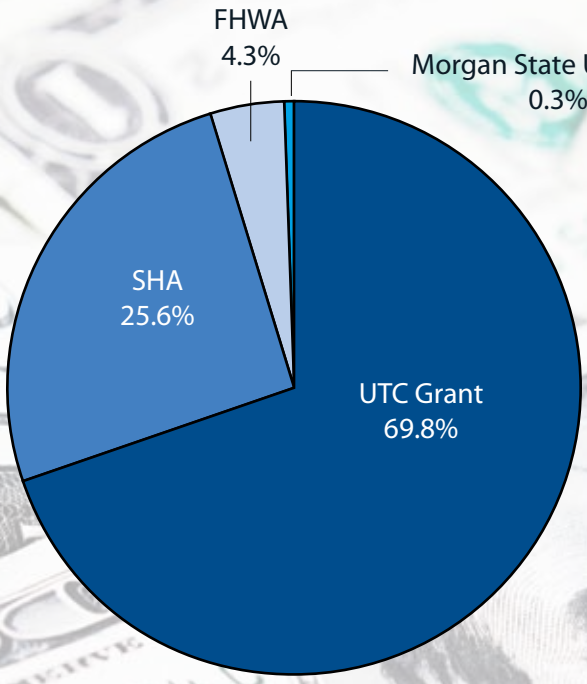
As a side note, in August I was honored to be appointed to the Maryland Electric Vehicle Infrastructure Council by Gov. Martin O'Malley to help the state plan and prepare for electric vehicles. The council plays an important role in coordinating state and local policies to promote electric vehicle ownership and expand the infrastructure needed to support it. We are already thinking about various research topics on electric vehicles and their infrastructure.

We have accomplished a great deal and have been in the midst of other important initiatives over the past year. Please take a close look at all that we have been doing.

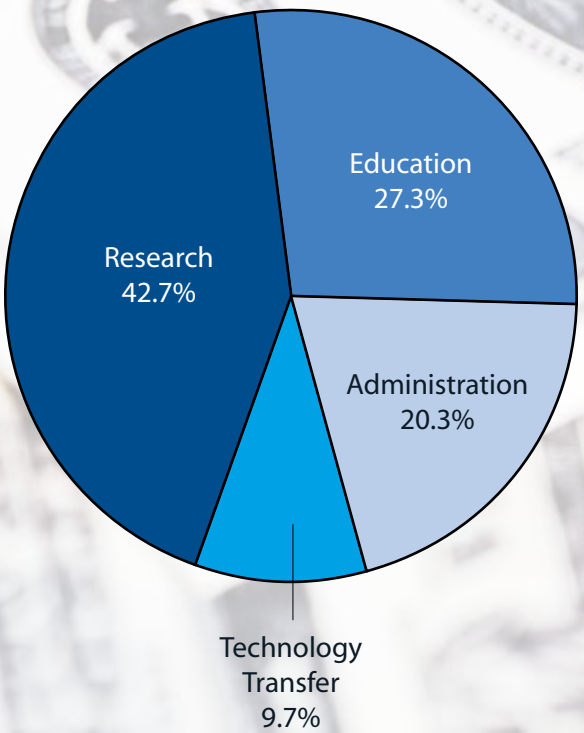
Dr. Andrew Farkas
Director
National Transportation Center

FUNDING AND EXPENDITURES

REVENUE
$1,432,337.60



EXPENDITURES
$1,441,524.88



EDUCATION

The STI curriculum featured four group research projects on industry careers.

During the field trip with the Association of Maryland Pilots, Erik Hamlet steered a ship in the Port of Baltimore.

"This whole experience has changed my whole summer, my whole outlook about where I wanna go. *At first, I really wasn't even thinking about doing transportation or getting into the engineering field.* ***And because of this program, I actually got a lot more interested in it."***

Erik Hamlet
STI Class of 2011

On July 29, the 2011 STI Awards Banquet honored the 20 high school students and four teachers who participated in the NTC's summer programs.

For 15 years, the Summer Transportation Institute (STI) has expanded students' understanding of math and science, and has introduced them to careers in transportation.

The Teacher Transportation Institute (TTI), now in its third year, shows educators how hands-on, transportation-related projects can complement math and science curriculums.

"Having been immersed in this program for two weeks really gave me a lot of ideas, and now I am so excited to face the coming school year," said Ferdinand Camarote, a chemistry teacher at Baltimore Rising Star Academy. "I am really excited that I have new information to share with my kids."

SUMMER TRANSPORTATION INSTITUTE

The students represented 15 high schools in the Baltimore area and one in the U.S. Virgin Islands. The four-week STI curriculum included 9 field trips, 6 research projects, and 3 modeling activities. The field trips complemented the classroom presentations and allowed students to see industry careers in action. The research projects enhanced the analytical skills that students will need in high school, college, and beyond. The modeling activities encouraged creativity and teamwork. All of the components covered transportation's various modes, safety issues, and infrastructure.

" I would recommend this to anybody," said STI participant Lacey Evans. "And if I could come back next year, I would."

STI counselor Folashade Shelton (left) and participant Lacey Evans (right) enjoyed the Port of Baltimore's views.

The exhibits at NASA's Goddard Space Flight Center electrified the STI participants.

Even game room activities involved transportation.

Among the five professionals who shared career advice were Ralign Wells, administrator of the Maryland Transit Administration; Eric Brown, an engineer with the Maryland State Highway Administration; and Dr. Anthony Saka, chair of Morgan's Department of Transportation and Urban Infrastructure Studies.

Dr. Saka's presentation resonated with Emarri Moore, a rising freshmen at Western High School who wants a career in civil or industrial engineering.

"[Dr. Saka] explained more about the field of engineering. Like really got into it, what you do and what you need to get there," Moore said.

The students also received safe driving lessons from the driving simulator recently purchased for Morgan's Department of Transportation and Urban Infrastructure Studies.

"I've never been driving when it's raining, so [the simulator] taught me about hydroplaning," said Erika Thompson, a student at New Town High School.

TEACHER TRANSPORTATION INSTITUTE

TTI focused on the math and science behind traffic circles.

"The TTI focused on roundabouts because even though [they are] designed to make intersections safer and more efficient for drivers, pedestrians and cyclists, [they are] an enigma to users," explained Val Baker, the NTC's education coordinator. "The TTI participants have become informed users of the roundabouts, [and] they have also become advocates for additional construction and can educate others on the purpose and use of roundabouts."

As a final project, the teachers built a model of a roundabout. They received professional engineering advice from the Baltimore Traffic Management Center and Kittleson & Associates, the international engineering and planning firm.

Each teacher earned a $300 stipend and six continuing education units, which can be used in the school system for promotion purposes.

"Words cannot express how this program has made a positive impact on me as a science leader," said Ferdinand Camarote.

STI BANQUET

The participants' remarks at the STI banquet proved the personal value of the programs, but the keynote speaker, Dawn Tucker-Thomas, illustrated the varied and lasting

Daily drills prepared students for the SAT.

Four students received awards for their leadership skills: (left to right) Erik Hamlet, Trieu Van Nguyen, Johana Gourdin, and Erika Thompson.

At the Goddard Space Flight Center, students received design tips for their model rockets.

"I learned a lot about myself."

Johana Gourdin
STI Class of 2011

career opportunities available in transportation.

Tucker-Thomas is a senior transportation specialist with the U.S. Department of Transportation, and an alum of Morgan's graduate program in transportation.

Tucker-Thomas spoke of the intentional and coincidental moments that shaped her career path.

When she graduated from Morgan in 1998, Rodney E. Slater, then U.S. Secretary of Transportation, gave the commencement address. In February, thirteen years later, Tucker-Thomas returned with the current secretary, Ray LaHood, to speak to students about transportation careers. (See page 12 for more information about Sec. LaHood's visit.)

"I know that when I was preparing to graduate from Morgan State University, that I hoped that my graduate degree would be more than just a paycheck, that I would be able to serve as a platform to other individuals to make changes within my community," she said.

Her 20-year career has included policy development; transportation planning and analysis; and aviation operations, security, and management. She credited the U.S. Department of Transportation with continuously providing her with learning opportunities, and she repeatedly encouraged students to take advantage of Morgan's educational resources.

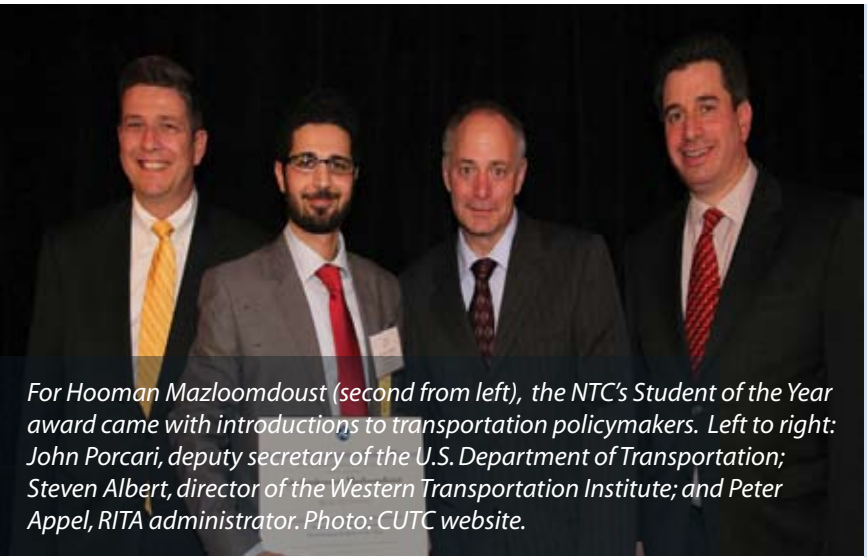
"Your teachers—the educators who are dedicated to transforming talented students and young professionals who are prepared to tackle real-world problems—are the greatest resource that you have," she told the 98 banquet attendees. "I encourage you to take full advantage of these wonderful opportunities and these individuals: learn from them, ask questions, seize opportunities ...I have been very fortunate in my transportation career to work for leaders in the aviation, highway, and other transportation fields. And I know all of you here today have the potential to become transportation leaders for tomorrow."

The TTI participants built a model of a roundabout.

Dawn Tucker-Thomas (left), the banquet's keynote speaker and a Morgan alum, was honored with a plaque. Val Baker (right), the NTC's education coordinator, presented the gift.

Roland Wilson, a regional program manager with the National Highway Traffic Safety Administration, was thanked for his support of the STI program.

The TTI Class of 2011: (from left to right) Rebecca Langomes, Marlon A. Canada, Ferdinand Camarote, and Fe C. Arenasa



For Hooman Mazloomdoust (second from left), the NTC's Student of the Year award came with introductions to transportation policymakers. Left to right: John Porcari, deputy secretary of the U.S. Department of Transportation; Steven Albert, director of the Western Transportation Institute; and Peter Appel, RITA administrator. Photo: CUTC website.

Gholamhossein "Hooman" Mazloomdoust, the NTC's 2011 Student of the Year, appreciated the networking opportunities that came with his award. The Student of the Year receives $1,000 and a trip to the TRB Annual Meeting. Mazloomdoust was inspired by many of the meeting's exhibits, sessions, and workshops.

"The most useful thing for me was the Eisenhower poster session because they were [done by] people my age, and I was talking to them and I could understand the projects," he said. "They were so excited about it, and I now have their business cards and they have mine."

2010-11 FELLOWS, INTERNS, AND SCHOLARSHIP RECIPIENTS

Eisenhower HBCU Fellows
Bimal Devkota
Ijeoma Marian
Gholamhossein Mazloomdoust
Amir Naeeni
Francis Udenta

Maryland State Highway Administration Summer Interns
Miguel Andrews
Jennifer Bohager
Tyra Collins
Siafa Grose
Jo'el Hall
Charles Kelly
Stephen King
Chante Nelson
Stacey Oriaifo
Daniel Savage

NTC Fellows
Myeisha Bell
Travis Johnson
Celine Kalembo
Natasha Koduah
Safieh Laaly
Anthony Mbakwe
Sheila Rivers
Naveed Shah

NTC Student of the Year
Gholamhossein Mazloomdoust

Transportation Systems Scholarship Recipients
Akeem Bryant
Lauren Campbell
Patrice Clark
Aaron Cooper
Harvey Diggs
Fathy Elgendi
Shawn Ellerbee
Nakisha Gaddy
Tamika Glenn
Fongoh Gwanvoma
Tavon Hawkins
Justin Isbell
Ashley Jones
Leslie Jones-Cook
Jonathan McCoy
Aaron McNeil
Danielle Nance
Lester Oates
Jordan Ogburn
Jamaal Patterson
Michael Sedgwick
Bakari Smith
Richard Stuller
Maurice Sylver
Nina Tambe
Ka'Ron Thomas
Nollan Thomas-White

*"...**Interning at SHA has been the most well-rounded experience.** I have had the academic side while I performed research. I have had the field experience while going on the road with the different crews. And lastly, I have gotten the chance to share my ideas through my main project."*

—**Jo'el Hall,** *SHA Intern*

Approximately 200 students, faculty members, and regional transportation professionals attended Sec. LaHood's town hall in Morgan's student center.

Steven Chu, U.S. Secretary of Energy

Peter Appel, RITA administrator

Three federal officials—including two Cabinet secretaries—visited Morgan during the NTC's 2010-11 grant year.

On Feb. 17, Ray LaHood, the secretary of the U.S. Department of Transportation (USDOT), promoted the Obama administration's efforts in transportation. Three weeks later, U.S. Secretary of Energy Steven Chu came to see Morgan's initiatives in science, technology, engineering, and math (STEM). On May 6, Peter Appel, the administrator of the Research and Innovative Technology Administration (RITA), met with students, faculty, researchers, and NTC advisory committee members in the School of Engineering.

LaHood Promotes Industry Careers

Sec. LaHood's visit included two events: a meeting with transportation undergraduate and graduate students and a campus-wide town hall.

At both events, Sec. LaHood drew parallels between President Obama's vision for high-speed rail and President Eisenhower's vision for the Interstate highway system.

"Study hard, work hard, get a good education because when you get out of school there's going to be a lot of opportunities in transportation because of the president's big, bold vision," LaHood said.

President Obama's proposed budget for 2012 included the first $50 billion of a six-year, $550 billion investment in the nation's transportation programs and infrastructure. Sec. LaHood said that the plan would take care of existing roads and bridges, connect 80 percent of America with high-speed intercity rail by the year 2036, and foster job growth.

"We know that transportation puts people to work. We know that," LaHood said. "We've proved it over the last two years [with the stimulus bill]: 15,000 projects; our friends and neighbors—65,000 of them or more—put to work. And some of those projects will continue this year. Hopefully, we pass the transportation bill. This is a great time to be in transportation."

Chu: Energize Science Education

According to the campus announcement, Sec. Chu's Mar. 10 visit was part of the Obama administration's

"Research is very important... *[it] gives you the data and empirical information to make your case for what we need to do. So* ***research has to be the foundation of everything we do at the Department of Transportation.*** *Whether it's safety or developing roads or developing bridges or developing high speed rail, it has to be based on good research. So we put a lot of emphasis on research.* ***We put a lot of emphasis on our partnerships with great schools like this and we'll continue to do that."***

Sec. Ray LaHood
U.S. Department of Transportation

ongoing commitment to STEM education and research at historically black institutions.

Chu's day began with a tour of the School of Engineering and Center for Advanced Energy Systems and Environmental Control. Chu's opening remarks at the town hall focused on the United States' new "Sputnik moment," the clean energy race.

His presentation showed how the United States is losing ground in scientific areas where it once led, and he announced two new Department of Energy initiatives that will help the country "out-innovate, out-educate, and out-build" the rest of the world. The Energy Efficiency and Renewable Energy Postdoctoral Fellowship Program will provide financial support and research opportunities to 20 doctoral candidates whose careers have focused on energy efficiency and renewable energy technology. The SunShot Initiative Fellowship Program is open to recent master's or doctoral graduates. Working in the Department of Energy's Solar Energy Technologies Program, the SunShot fellows will help develop innovations that will reduce the cost of solar energy systems.

"So we still have the opportunity to lead the world in clean energy and capture the jobs for this century," Chu said. "We need you, the students at Morgan State, to help win the energy race."

Appel: "I'm a big fan of the UTC program."

As RITA administrator, Peter Appel coordinates USDOT's research, education, and analysis programs. Those efforts include the University Transportation Centers program, which funds the NTC.

Appel's May 6 visit included a meeting with Dr. David Wilson, Morgan's president; a research showcase; lunch with NTC researchers and advisory committee members; and a student town hall on transportation careers.

Throughout his day at Morgan, Appel made a case for how focused research and collaboration ensures the effectiveness of any infrastructure investment.

"My favorite thing about transportation is—I like optimizing things," Appel said. "I like trying to figure out how to match up resources to make the best possible solutions. I look at transportation as one massive optimization problem."

Although the current budget environment is difficult, the administrator would like the UTC program to become bigger, more competitive, and aligned with USDOT's goals. He'd also like it to feature more collaboration and communication amongst centers.

That idea was the impetus for RITA's University Research Technology Transfer Day on April 6. Held in Washington, the event brought together 25 UTCs, including the NTC, who presented their projects to each other and USDOT officials.

"Synergy creates tremendous value as long as there is something in place that facilitates communication and collaboration," Appel said.

As this picture shows, the scenarios for the UC-Win/Road driving simulator can include rain and pedestrians.

Two students, Gholamhossein Mazloomdoust (left) and Anam Ardeshiri (right), are helping Dr. Mansoureh Jeihani (seated) program the simulator.

Richard Woo, NTC advisory committee member and director of SHA's Office of Policy & Research, test drove the simulator.

RESEARCH

NTC PURCHASES DRIVING SIMULATOR

With the NTC's financial support, Morgan's Department of Transportation and Urban Infrastructure Studies purchased a Forum 8 UC-Win/Road driving simulator. Dr. Mansoureh Jeihani championed the purchase and highlighted the machine's capabilities at a showcase on August 3.

"In order to have a good infrastructure for our research and teaching and educational purposes, we did buy a driving simulator," Dr. Jeihani said.

According to Dr. Jeihani, it is the only simulator in Maryland used exclusively for transportation research (others are used in medical and aviation training). Route-choice capability is the UC-Win/Road's defining characteristic.

"Other simulators have just a scenario and just one road, and [users] have to follow that one," Jeihani said. "But in this one, they don't have to follow. They can go right, left. They can choose the city or choose the highway. So in that way, we can research [what] has not been done so far."

The simulator hardware includes much of what's found on the driver's side of a car: steering wheel and ignition, gauges and meters, seat and seatbelt, accelerator and break, and center console and cup holders. Three screens stand-in for the windshield and side mirrors.

The simulator software, which can support a 20-by-20-mile network, can be customized. It can create a wide range of scenarios including crashes, fog, low traffic, pedestrians, and night driving. Dr. Jeihani and two students, Anam Ardeshiri and Gholamhossein Mazloomdoust, are in the process of recreating downtown Baltimore for the simulator. However, the process has been time consuming because of the learning curve and the scripts that must be written for each scenario, road, and building. When funding allows, the simulator will be equipped with a motion platform, which mimics the sensation of braking or rough pavement.

Research opportunities include the effects of texting while driving, rubbernecking, car-to-pedestrian accidents, weather-related driving behavior, and the effect of countdown traffic signals on traffic flow. Dr. Jeihani also plans to integrate the UC-Win/Road with a traffic simulator.

As Dr. Anthony Saka, chair of the Department of Transportation and Urban Infrastructure Studies, told the showcase attendees, "The sky is the limit and we can do a lot with this machine."

The UC-Win/Road simulator is in the newly established Travel Behavior Analysis Lab (Room SEB101 in the School of Engineering).

The NTC committed $615,807 to research activities during the 2010-11 grant year.

Dr. Mansoureh Jeihani's project **Evaluating the Effectiveness of Dynamic Speed Display Signs** *investigates whether the signs slow drivers. In October 2010, Dr. Jeihani and her research assistants installed tubes and counting devices on Perring Parkway (between Echodale Avenue and Northern Parkway) to track the speed of cars approaching and passing the devices. Photo by Dean Eugene DeLoatch.*

GRANT-YEAR INVESTIGATIONS

Of the five completed research projects supported by NTC, four were funded with the Maryland State Highway Administration (SHA).

Two—**Alternative Alignments Development and Evaluation for the US 220 Project in Maryland** and **A Social Network Analysis of Alcohol-Impaired Drivers in Maryland: An Egocentric Approach**—were collaborations with the University of Maryland, College Park, and relied on transportation modeling and statistical analyses.

The other two projects—**Life Cycle and Economic Efficiency Analysis Phase II: Durable Pavement Markings** and **A Comprehensive Engineering Analysis of Motorcycle Crashes in Maryland**—were conducted exclusively by Morgan State faculty and students. Both relied on the university's expertise in economic modeling and safety research.

The fifth project— **Second Parenthoods: The Influence of Custodial Care of Children among African-American Elderly on Their Travel Behavior and Transportation Needs** —was exclusively funded by the NTC as basic research. It involved principal investigators and students from two fields that are not traditionally related to transportation, sociology and psychology.

The NTC's recent focus on transportation's impact on aquatic ecology continues to benefit the university, the state, and the environment. Projects on this topic that were selected last year continue, and two new projects were selected this year.

Identification of Techniques to meet pH Standards during In-Stream Construction will identify techniques

that SHA can use to meet pH standards during in-stream bridge construction. **Evaluation of Waste Concrete Road Materials for Use in Oyster Aquaculture** examines whether concrete waste from road projects can be used as bottom-conditioning material for oyster aquaculture in the Chesapeake Bay.

Both aquatic ecology projects are SHA-funded. While they are led by Morgan's Estuarine Research Center, faculty and students from the Department of Civil Engineering are contributing.

In further cooperation with SHA, the NTC has begun a project on freight transportation's safety performance. **Maryland Motor Carrier Program Performance Enhancement** will add to the NTC's catalogue of safety investigations. The study analyzes the effects of different combinations of commercial vehicle inspection programs, inspections, and locations on reducing commercial vehicle-related fatalities and injuries.

Through its annual solicitation of research problem statements, SHA selected four projects from Morgan faculty for 2011-2012 SP&R funding:

- **Exploring Travelers' Behavior in Response to DMS Using a Driving Simulator**
- **Developing a Framework and Models for Transit-Oriented Development (TOD) Analysis**
- **Measuring Economic Contribution of Freight Industry to the Maryland Economy**
- **The Development of Local Calibration Factors for Implementing the Highway Safety Manual in Maryland**

The four projects provide continued acknowledgement of the NTC's extensive research expertise. All will require detailed proposals prior to start.

Final reports for completed projects and project descriptions for new and ongoing work can be found on the NTC's website at **www.morgan.edu/soe/ntc**

New Projects

Identification of Techniques to Meet pH Standards During In-Stream Construction
Principal Investigators (PIs): Dr. Mark Bundy and Dr. James G. Hunter
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP109B4D

Maryland Motor Carrier Program Performance Enhancement
PI: Dr. Hyeon-Shic Shin
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP708B4D

Evaluation of Waste Concrete Road Materials for Use in Oyster Aquaculture
PIs: Dr. Kelton L. Clark and Dr. James G. Hunter
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP109B4E

Ongoing Projects

Evaluating the Effectiveness of Dynamic Speed Display Signs
PI: Dr. Mansoureh Jeihani
Sponsoring Organization: NTC

Mathematical Model for Analyzing the Feasibility of Accelerated Rail Transit Operation: Focusing on Alternate Stations Stopping Service
PI: Dr. Young-Jae Lee
Sponsoring Organization: NTC

The Mediating Role of Motorists' Evaluation of Current Roadway Conditions in Determining Their Willingness to Pay for Future Improvements
PIs: Dr. Michael Callow and Dr. Nathan Austin
Sponsoring Organization: NTC

Susceptibility of Eastern Oyster Early Life Stages to Road Surface Polycyclic Aromatic Hydrocarbons (PAHs)
PIs: Dr. Chunlei Fan (Morgan State University Estuarine Research Center) and Dr. Randolph K. Larsen (St. Mary's College of Maryland)
Sponsoring Organization: NTC

Cumulative Impact of Developments on the Surrounding Roadways
PI: Dr. Mansoureh Jeihani
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP009B4R

Implementation of the Concrete Maturity Meter for Maryland
PI: Dr. Robert Johnson
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP708B4K

Completed Projects

Alternative Alignments Development and Evaluation for the US 220 Project in Maryland
PIs: Dr. Min-wook Kang, Dr. Manoj K. Jha, Shaghayeh Shariat, Dr. Paul M. Schonfeld (University of Maryland, College Park), and Zun "Grace" Wang (University of Maryland, College Park)
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP009B49

Summary: This project used the highway alignment optimization (HAO) model to find the alternative alignments for the Maryland section of existing US 220. The best

alternative alignment was 17.93 miles long. The total estimated cost for the alternative was $624 million, 80 percent of which were earthwork-related costs. A bridge structure also accounted for a large fraction of the total cost. The right-of-way cost was relatively small because of the low property values in the mountainous project area. Because this case study did not consider user, contingency, and utility relocation costs, the total cost may have been underestimated.

A Social Network Analysis of Alcohol-Impaired Drivers in Maryland: An Egocentric Approach
PIs: Dr. Ashraf Ahmed, Dr. Andrew Farkas, and Dr. Kenneth Beck (University of Maryland, College Park)
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP808B4E

Summary: The research was based on the hypothesis that personal, household, and relationship characteristics influence human behavior. The study focused on 163 first-time DUI offenders and 82 friends of DUI offenders. Both groups were surveyed about their personal and household characteristics, relationships, drinking patterns, and drinking decisions on the night of the citation. The results showed that DUI offenders and their friends had similar driving, drinking, and social patterns. Both the DUI offenders and their friends had people in their social networks who received previous DUI citations and engaged in risky driving. However, both groups also encouraged each other to drink less. The size of a social network affected the context of the drinking behavior and the number of traffic violations. The results suggest that intervention programs should involve the friends of DUI offenders to reduce recidivism.

Life Cycle and Economic Efficiency Analysis Phase II: Durable Pavement Markings
PI: Dr. Young-Jae Lee
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP808B4P

Summary: This project compared the durability and economic efficiency of inlaid tape and thermoplastic under different weather and traffic conditions. Inlaid tape's estimated life cycle was longer than thermoplastic's, but thermoplastic's lower cost made it the most economical material for all conditions. The results are based on three to four years of data collection.

Second Parenthoods: The Influence of Custodial Care of Children Among African-American Elderly on Their Travel Behavior and Transportation Needs
PIs: Dr. Robert J. Smith and Dr. Stella L. Hargett
Sponsoring Organization: NTC
Contract/Grant Number: 0608-002

Summary: This study reports the demographics, travel patterns, and transportation needs of elderly African Americans who participated in the 2001-02 National Household Travel Survey. Of all households, female-headed households were most disadvantaged in terms of education, residential location, and medical conditions that affected travel behaviors and transportation needs.

A Comprehensive Engineering Analysis of Motorcycle Crashes in Maryland
PIs: Dr. Mansoureh Jeihani, Gholamhossein Mazloomdoust, and Keivan Ghoseiri
Sponsoring Organizations: NTC and SHA
Contract/Grant Number: SP909B4J

Summary: Of the motorcycle crashes in Maryland from 1998 to 2007, most occurred on state roads with no access control and speed limits of 40-55 mph. These roads—which can be classified as urban other-principal arterials, urban minor arterials, or urban collectors—had good or fair surfaces. They were mostly undivided, two-way roads with two through, marked lanes and no auxiliary lanes. The crashes usually happened during the day when weather conditions were sunny or cloudy and the road surface was dry. The crashes, which were most often single-vehicle collisions, occurred when the motorcycle was moving straight at a constant speed far from an intersection. The majority of motorcycle drivers were male.

RESEARCH IN ACTION

RESULTS USED BY STAKEHOLDERS

Four completed NTC projects have provided SHA with valuable information that could help improve Maryland roads, when fully implemented.

Alternative Alignments Development and Evaluation for the US 220 Project in Maryland explored alternative alignments within a 4,000 foot-wide buffer of US 220 from I-68 near Lavale, Maryland to the West Virginia state line near McCoole, Maryland. It analyzed various alternative alignments within the project limit at a planning level of detail, evaluated them based on important decision criteria, and found the best alternative alignments for the highway.

A Social Network Analysis of Alcohol-Impaired Drivers in Maryland: An Egocentric Approach examined the personal, household, and social structural attributes of alcohol-impaired drivers in Maryland to determine how social networks influence behavior of drivers caught for DUI. Members of social networks influenced drivers in some positive ways. The implications for state intervention programs could result in reduced drunk-driver crashes.

Life Cycle and Economic Efficiency Analysis Phase II: Durable Pavement Markings analyzed the life cycle and economic efficiency of inlaid tape and thermoplastic in order to find the most economical product for pavement marking materials' under specific traffic and weather conditions. The results suggested that specific materials should be applied for specific weather and traffic conditions. Although inlaid tape had a longer life cycle than thermoplastic, thermoplastic's lower cost made it the more economical material for all conditions.

A Comprehensive Engineering Analysis of Motorcycle Crashes in Maryland showed that area type, median type, speed limit, average annual daily traffic (AADT), international roughness index (IRI), and the number of through lanes affect the number of motorcycle crashes on Maryland road segments. Interestingly, government control and shoulder type were shown to have no significant impact on the number of motorcycle crashes. Engineers and safety officials can use this study's results to develop solutions for identified road safety deficiencies.

CONFERENCE PRESENTATIONS

The Persistence of Risky Driving Behavior of First-Time DUI Recipients in Maryland: Evidence from a Study of Egocentric Social Network
Dr. Ashraf Ahmed
The First International Conference on Theory and Applications of Statistics
Dhaka University, Bangladesh
December 26-28, 2010

Estimation of Non-Recurring Post-Incident Traffic Recovery Time for Different Flow Regimes: Comparing Shock Wave Theory and Simulation Modeling
Dr. Mansoureh Jeihani, Petronella James, and Dr. Anthony Saka
90th Transportation Research Board Annual Meeting
Washington, D.C.
January 23-27, 2011

Cumulative Impact of Developments on Surrounding Roadways' Traffic
Anita Narh-Dometey and Dr. Mansoureh Jeihani
90th Transportation Research Board Annual Meeting
Washington, D.C.
January 23-27, 2011

Estimation of Non-Recurring Traffic Recovery Time for Different Flow Regimes
Dr. Mansoureh Jeihani, Petronella James, and Dr. Anthony Saka
Morgan State University Innovation Day
Annapolis, MD
February 10, 2011

A Statistical Analysis of Motorcycle Crashes in Maryland
Dr. Mansoureh Jeihani and Gholamhossein Mazloomdoust
Morgan State University Innovation Day
Annapolis, MD
February 10, 2011

Estimation of Non-Recurring Post-Incident Traffic Recovery Time for Different Flow Regimes
Dr. Mansoureh Jeihani, Petronella James, and Dr. Anthony Saka
RITA University Research Technology Transfer Day
Washington, D.C.
April 6, 2011

A Statistical Analysis of Motorcycle Crashes in Maryland
Dr. Mansoureh Jeihani and Gholamhossein Mazloomdoust
Northeast Decision Sciences Institute 2011 Annual Conference
Montreal, Canada
April 14-16, 2011

Cumulative Traffic Impact Study
Dr. Mansoureh Jeihani
Northeast Decision Sciences Institute 2011 Annual Conference
Montreal, Canada
April 14-16, 2011

PUBLISHED ARTICLES

Accelerated Incident Detection Across Transportation Networks Using Vehicle Kinetics and Support Vector Machine (SVM) in Cooperation with Infrastructure Agents
Dr. Mansoureh Jeihani, Youngchang Ma

(IEM, Inc.), Mashrur Chowdhury (Clemson), and Ryan Fries (Southern Illinois University, Edwardsville)
IET Intelligent Transportation Systems, 2010, Volume 4 (Issue 4)

Do Retirement Housing Developments Make Fewer Trips Than Regular Housing?
Dr. Mansoureh Jeihani and Ricardo Camilo
ITE Journal, June 2011, Volume 81 (Issue 6)

Selected Performance Indicators for the National Transportation Center at Morgan State University

RESEARCH SELECTION

Number of research projects that are funded by the NTC's grant: 4
Number of those projects that are
basic research: 1
advanced research: 2
applied research: 3

Total budget for the projects listed above: $615,807

RESEARCH PERFORMANCE

Number of research papers presented at academic/professional meetings that are based on NTC-funded projects: 10

EDUCATION

Number of students participating in transportation research projects: 11

HUMAN RESOURCES

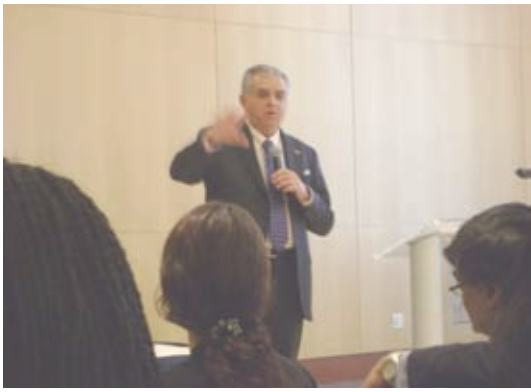
Number of students enrolled in advanced degree programs in engineering, transportation, architecture, landscape architecture, and city and regional planning:
179 master's, 47 doctoral

Number of graduates with degrees in transportation-related concentrations:
39 master's, 2 doctoral

TECHNOLOGY TRANSFER

Number of transportation seminars, symposia, or distance-learning classes conducted by the NTC for transportation professionals: 6

Number of transportation professionals participating in those events: 264



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