

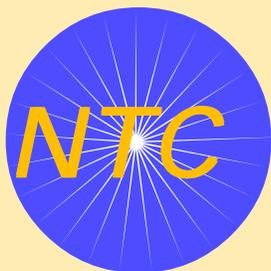
NTC TODAY

National Transportation Center at Morgan State University

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In this issue

- *Farkas appointed NTC Director, p. 1*
- *Program Director's Perspective, p. 2*
- *1999 STI Concludes Successful Program, p. 3*
- *Summer Research Report on Electronic Toll Study, p. 4*
- *Summer Research Report on Intermodal Personalized Transit Study, p. 5*
- *Update on CVISN Research Projects, p. 6*
- *CTS Begins 20th Year of Graduate Education in Transportation, p. 7*



Farkas Named NTC Director

Dr. Andrew Farkas was recently appointed National Transportation Center (NTC) Director, effective August 9, 1999. Dr. Farkas had been serving as the NTC's Interim Director and has been a faculty member at Morgan State since 1983. In addition, Dr. Farkas is Acting Director of the Center for Transportation Studies (CTS), which administers the Master of Science in Transportation program at Morgan State.



Dr. Andrew Farkas, NTC Director

A 1997 recipient of a Distinguished Scholar in Transportation award from Albany State University, Dr. Farkas has made research contributions in the areas of transportation planning and management, benefit-cost analyses, and the environmental impact of transportation policy. As NTC Direc-

tor, Dr. Farkas will seek to expand the NTC's research scope into a diverse and sustainable program. Dr. Farkas's vision for the future of the NTC is offered in the "New Horizons" column on page 2 of this issue of *NTC Today*.

Faculty Concluding Research Projects

Morgan State researchers are concluding work on the diverse projects funded by the NTC Summer Research Grants program. This issue of *NTC Today* features detailed accounts of two of the summer projects in articles authored by the researchers. Beyond the featured projects on intermodal personalized transit and the effect of electronic toll collection on reducing emissions, the 1999 Summer Research Grants program funded research on soil quality and road degradation, innovative uses of magnetic materials in transportation, and the impact of deregulation on the trucking industry.

In the coming months, researchers will publish final technical reports and present their findings to the wider university and transportation communities at the 2nd Annual NTC Research Symposium in February.

The purpose of the Summer Research Grants program is to facilitate interdisciplinary transportation research at Morgan State. Given that this year's projects involve researchers from the diverse fields of physics, information systems, civil engineering, accounting, and finance, the program is undoubtedly fulfilling its mission.

NEW HORIZONS

NTC Looks Forward to Continued Growth

*By Dr. Andrew Farkas,
NTC Director*

There have been several developments of note regarding the National Transportation Center at Morgan State University. The NTC recently had its strategic plan approved by the U.S. Department of Transportation, ensuring federal support of approximately one million dollars annually for the next few years. Now that state funds matching a large portion of the federal grant are in place as well, the NTC is able to develop a more sustainable program of research, education, and technology transfer.

Research Program

The NTC will continue to develop an applied research program that is

second-to-none for a university of Morgan's size and adheres to the theme of the center, Transportation: A Key to Human and Economic Development. The research program will foster development of a larger cadre of faculty and student researchers, expert in various fields of urban transportation. The NTC has been disseminating transportation research products over the years, but we will market the research program more aggressively to potential matching partners. This should lead to additional research opportunities and sources of funding.

The NTC has been investing heavily in faculty and student development in support of research. The NTC will expand the faculty summer research grants program, initiated last year, into annual research grants for faculty and students. We will announce the details of the program to the campus community soon. The NTC has already en-

hanced the transportation-related media collections at Soper Library to support research and education activities.

Student Opportunities

The NTC will expand the scope of financial aid to students in transportation-related programs through increased funding of internships, assistantships, and scholarships. The NTC will coordinate financial aid with graduate and undergraduate recruitment and admissions. In keeping with this effort, the NTC will continue to co-administer the Maryland Department of Transportation (MDOT) internship program for Morgan students and seek additional internship opportunities.

Collaborative Openings

As you can see, we have an ambitious agenda, but we're already well on the way to completing it. Please contact me, if you believe that any of our activities may compliment what you are doing or have in mind. I'm sure that by working together, we can accomplish much more.

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Visit the NTC Web Site

The NTC web site (www.eng.morgan.edu/~ntc) is continually updated and improved. Under the direction of student web master Emeka Obi, the site will undergo a general enhancement in the coming months. As in the past, the site will contain PDF versions of final technical reports and other NTC publications.

Recent additions to the NTC web site include an updated NTC Directory and a PDF version of the 1999 STI final report.

STI



OUTREACH

NTC Hosts Successful STI at Morgan State

The 1999 Summer Transportation Institute (STI) concluded in July after a successful four-week program. Under the leadership of STI Program Coordinator Joyce Trussell, STI participants engaged in a wide range of experiences, including guest speakers and field trips to transportation-related sites. The goal of the STI program at Morgan State is to encourage promising Baltimore-area high school students to consider careers in transportation.

Program Overview

The STI is a four-week program that introduces ninth and tenth grade students to the opportunities available in the transportation industry. 1999 was the third consecutive year Morgan State has hosted a program. Among the highlights of the 1999 STI were trips to Goddard Space Flight Center, BWI Airport, and the Mildred Belle Living Classroom. The final field trip was a day-long excursion to the new Six Flags America amusement park in Upper Marlboro, Maryland.

The program enabled participants to discuss transportation issues with professions and government officials. STI participants were present at the commissioning ceremony of the *USCGC Alex Haley*, which afforded many with the opportunity to meet US Secretary of Transportation Rodney Slater and other dignitaries.

Award Recipients

The 1999 STI concluded with an awards banquet that featured Con-

gressman Elijah Cummings D-MD, 7th C.D.) as the keynote speaker. Congressman Cummings, who is a member of the House Transportation Committee, delivered an inspirational address that will further serve to motivate STI participants toward future success. As in previous years, several program sponsors presented awards for outstanding achievement to STI participants. Award recipients for the 1999 STI are as follows:

United State Department of Transportation/Federal Highway Administration Outstanding Achievement Award, Presented to **Lauren Epps**

United State Department of Transportation/Federal Highway Administration Outstanding Achievement Award, Presented to **Leonard Moore**

Maryland Department of Transportation Outstanding Achievement Award, Presented to **Dami Martins**

National Transportation Center Director's Award for Excellence, Presented to **Katryna Burs**



STI Program Coordinator Joyce Trussell and U.S. Secretary of Transportation Rodney Slater at Coast Guard Ceremony

STI 2000

Beyond the agencies sponsoring awards, many sponsors contributed to the success of the 1999 STI. The



STI participants on board the Mildred Belle

Mass Transit Administration (MTA) generously provided bus passes for

continued on p. 8

Summer



Research

ETC Technology Holds Promise for Emissions Reduction

*By Dr. Anthony Saka
and Dr. Dennis Agboh*

According to the criteria established in Title I of the Clean Air Act Amendments (CAAA) of 1990, the Baltimore area is a severe ozone non-attainment area. Consequently, the area is mandated to aggressively embark on effective mitigation measures through the State Implementation Plan (SIP) as commitment to meet the National Ambient Air Quality Standard (NAAQS) attainment deadlines. The Baltimore area has been undertaking stringent inspection and maintenance (I/M) programs in conjunction with other transportation control measures (e.g., transportation demand management, inter-modal transportation, and the use of intelligent transportation systems [ITS] technologies) in order to meet the challenge of conforming to requirements of the CAAA.

ETC Deployment

One aspect of congestion mitigation that is very promising is the use of electronic toll collection (ETC), which belongs to the aforementioned ITS technology group. An increasing number of areas, particularly the non-attainment areas of the country, are currently embracing this innovative technology.

The State of Maryland has recently deployed ETC technology, popularly known as M-Tag, at the existing toll facilities (Fort McHenry Tunnel, Harbor Tunnel, and Key Bridge) in the Baltimore area. The use of ETC

has been credited with a substantial increase in throughput, which translates to mean less traffic congestion at toll facilities and hence less air pollution. However, the potential impact of the use of M-Tag on the mobile emissions has not been extensively investigated for the Baltimore Metropolitan Area.

Currently, 4 of the 24 toll lanes at the Fort McHenry Tunnel toll facility, 2 of the 14 toll lanes at the Harbor Tunnel toll facility, and 2 of the 12 toll lanes at the Key Bridge toll facility are exclusively used for M-Tag. It is estimated from field observations that approximately 28 percent of the rush-hour commuters use the designated M-Tag tollbooths at the Fort McHenry Tunnel toll plaza.

Objectives & findings

The primary objective of the study described here was to estimate from a combination of empirical data and micro-simulation the potential reduction of mobile emissions such as hydrocarbon (HC), carbon monoxide (CO), and nitrogen oxide (NO_x) attributable to the use of ETC technology in the Baltimore area. Specifically, this study investigated the potential impact of the use of M-Tag on the average travel time and on the mobile emissions rates at the Fort McHenry Tunnel toll plaza, which serves a peak hourly volume of



ETC lanes at Baltimore toll plazas decrease emissions

approximately 8700 vehicles per hour.

The following deductions were made from the Fort McHenry Tunnel toll plaza study:

The maximum throughput (effective capacity) of manned tollbooth and M-Tag tollbooth were estimated to be approximately 408 vph/tollbooth and 1,025 vph/tollbooth, respectively;

The changes in estimated mobile emissions rates (for pre M-Tag and current M-Tag deployment level) range from 16% decrease for NO_x to over 44% decrease for HC and CO.

The study described here is expected to motivate a more extensive study that will investigate the aggregated impacts of M-Tag usage at all the toll plazas in the Baltimore Metropolitan Area and, possibly, to quantify the overall impact of M-Tag deployment on the regional air quality.

Dr. Anthony Saka (CTS) and Dr. Dennis Agboh (Information Systems) are both MSU faculty members

Summer



Research

Intermodal Personalized Transit Bibliography In Progress

By Dr. Rodney Stump

Throughout the Baltimore-Washington D.C. metropolitan region, use of the private automobile dominates personal travel, as it does nationally. Alternative public transportation modes include bus, commuter rail, demand response (via passenger cars, vans, or motor buses), heavy rail, light rail, paratransit, taxi, and van services. Multiple personal transportation modes are sometimes combined for trips within the region, such as those that involve the region's commuter and light rail systems coordinated with fixed route bus service, or intercity trips that pass through intermodal hubs, such as Penn Station and Baltimore-Washington International Airport.

However, the majority of these transportation services, when used individually or jointly, do not provide flexible door-to-door service. Even if individuals take it upon themselves to utilize multi-modal transportation, the burden is on users to align their trips with fixed transit schedules, self-schedule by contacting several entities to ensure coordination among modes, and/or payment of multiple fares for each mode used on a given trip.

The net result is that most individuals and households in the region continue to use the private automobile. However, road congestion is already a constant component of most trips within the region, resulting in considerably lengthened travel times for work commutes, routine shopping and

errands, and visits to entertainment/tourist venues, family, or friends. Furthermore, projected increases in licensed drivers and the general population, ongoing shifts of population and employment to the suburbs, and the increasing difficulty in maintaining roadway infrastructure mean that transportation problems will continue to be compounded if the heavy reliance on private automobiles continues into the new millennium.

IPT Overview

The concept of *intermodal personalized transit* (IPT) is a potential response to these issues. It is envisioned as a collaborative public-private network that would provide riders with scheduled and spontaneous point-to-point transportation, thus mimicking the flexibility of personal autos while mitigating some of the economic and social costs of mobility related to this dominant personal transportation mode. Conceivably, this personalized transit concept will allow riders to make one call, pay one fare, and, where necessary, experience seamless exchanges among multiple transportation modes to travel door-to-door from origin to destination. Technologically, this concept is expected to rely on closely coordinated information and logistics systems.

Research Objectives

The purpose of the recently completed research was to survey the plethora of secondary transportation information

sources to compile a bibliography of relevant published (and work-in-progress) articles and studies, conference proceedings, and databases.

Research Findings

The resulting bibliography is intended to foster thoughtful discussion of the concept of intermodal personalized transit and facilitate product development activities by the following means:

- identifying intermodal personal transportation projects that are in the planning stages, presently underway, or have been abandoned domestically and internationally;
- learning more about consumers' perceptions, attitudes, and behaviors related to personal and public transportation;
- determining the existence and availability of databases that document consumers' transportation habits that can be used to profile and segment consumers by their transportation habits and preferences.

Collectively, this information will be of use to public and private transportation officials and other interested parties in preliminary evaluations of the intermodal personalized transit concept.

Dr. Rodney Stump is an Assistant Professor in the Department of Business Administration at Morgan State



Research for Two Summer CVISN Projects Concluding

Productive applied research continues to be conducted under the NTC's largest current project, the Commercial Vehicle Information Systems and Networks (CVISN) program. Pending peer review and proposal approval, new CVISN research projects will commence at Morgan State this fall. Over the summer months, research was conducted on two significant CVISN projects. The first concerns the feasibility of studying the effects of commercial vehicle size and weight on road safety. Research for this project was completed in July, followed by the limited distribution of an interim research report. The second project concerns a safety assurance evaluation of the Maryland Motor Carrier Program. The report on this research is nearing completion. Overviews of both CVISN summer projects are provided below.

Safety Assurance Evaluation

*By Dr. Sanjay Bapna
and Dr. Jigish Zaveri*

The recently completed research evaluated the safety assurance activities of Maryland's Roadside Enforcement Program due to the current implementation of CVISN-related computer and communications systems used to collect and distribute safety-related data. The safety-related activities mainly include the commercial vehicle and driver inspections at roadside weigh/inspection facilities and by roving crews in Maryland, and the collection and distribution of inspections. This study involved examining the following safety-related activities:

- Electronic collection of inspection data at roadside inspection facilities;
- Transmission of inspection data from roadside inspection facilities;
- Distribution of safety information to computers at the roadside.

The following criteria were evaluated for both electronic and manual inspections: throughput of commercial vehicles being inspected; efficiency and effectiveness of commercial vehicle and driver inspections in Maryland; availability of safety inspection data in a timely manner; driver and inspector satisfaction with the inspection process; completeness and accuracy of inspection reports; and the efficiency of uploading inspection data.

Size/Weight Feasibility Study

*By Dr. Randall Reed
and Dr. Young-Jae Lee*

The relationship between commercial vehicle size and weight and highway safety is important for two reasons. The first is that it is an important component of road safety. Knowledge of the accident rate of a particular class of truck, size of truck, or weight of truck can be instrumental in determining policy to make roads safer. Without this information, policy is made by guesswork rather than on the basis of empirical facts. The second reason such information is important is that the only way to evaluate new policy toward size/weight of trucks is to compare the anticipated results of the policy with the current safety results on the road. Without information about the relationship between size/weight and safety, it is not possible to predict future results about safety when policy changes.

Commercial vehicles make up a sizeable percentage of the traffic on our highways today. As such, it is important to understand the composition of this fleet and how the composition is related to safety matters. There are many different types of trucks that haul many different weights. The purpose of the recently completed research was to outline the means of obtaining a great deal of information about the relationship between freight vehicle fleet composition and safety. Unlike past studies, we did not concern ourselves with the relative

continued on p. 8

CTS



Update

CTS Celebrates Twentieth Anniversary

Founded in 1979, the Center for Transportation Studies (CTS) is commencing its twentieth year of offering the Master of Science in Transportation at Morgan State. In recent months, new personnel have been enlisted who will strengthen the program in the future.

New Faculty

Two new faculty members began teaching CTS courses in the spring semester. Dr. Young-Jae Lee, who holds a Ph.D. in Transportation Engineering from the University of Pennsylvania, teaches courses in physical distribution and computer-aided highway engineering and design. In addition, Dr. Lee collaborated with fellow new CTS faculty member Dr. Randall Reed on a CVISN-related research project this past summer. This research is discussed in detail on p. 6 of this issue of *NTC Today*.

Dr. Reed, who holds a Ph.D. in Economics from Northwestern University, teaches courses in transportation economics, transportation policy, and supervised research.

Student Recruitment

With the support of Student Coordinator Joyce Trussell, the CTS has commenced a vigorous student recruitment initiative. CTS advertisements have appeared in local publications such as *Port of Baltimore* and *UR Baltimore*. In addition, Ms. Trussell has begun marketing the program to transportation-related industries in the Baltimore Metropolitan Area. The deadline for admission into the graduate program for the spring semester is November 1st.

Student Opportunities

The CTS will be accepting applications for the Maryland Department of Transportation (MDOT) Internship Program through November 5, 1999. The program provides an opportunity for students enrolled in transportation-related graduate programs to gain practical experience in transportation planning and management. Program participants will work part time during the academic year and full time during the summer. For additional information, please contact Alice Williams or Dr. Andrew Farkas at (443)885-3348. For information on other NTC financial aid initiatives, please contact Joyce Trussell at (443) 885-4813.

TRAC Program

With the support of the CTS and NTC, Morgan State civil engineering students are currently participating in the Transportation Research Activities Center Program (TRAC). TRAC student interns visit participating secondary schools to introduce civil engineering and transportation careers to students through existing math, science, technology, and social studies courses. After completing a one-day training course on program concepts and objectives, TRAC interns visit at least one class per school each month. The TRAC student intern program is a unique approach to supplementing existing school curricula through activities facilitated by students currently enrolled in university civil engineering programs.



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www.morgan.edu/catalog/graduate/programs/tranmast.htm

STI continued from p. 3

students using public transit to commute to and from the program, and the MTA also provided buses for many of the STI field trips. In addition, MTA offered a tour of its facilities, enabling students to witness the coordination of a complex public transit network.

To continue to grow, the STI needs to enlist additional sponsors for next year's program. Given that the purpose of the program is to recruit the individuals who will form the next generation of transportation professionals, entities that invest in the STI are investing in their own future.

For information concerning how individuals, agencies, and companies can contribute to the 2000 STI, please use the contact information below:

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Feasibility Study continued from p. 6
safety of trucks compared to cars. Instead, we focused on the relative safety of different types of commercial vehicles, with the ultimate objective of influencing commercial vehicle fleet composition in terms that improve highway safety.

The future study we propose requires a significant amount of data. Some of the data are easily obtained while others are much more difficult. The scope of the study will, at least in

part, be determined by the data collection methodology employed. While studies can be done with aggregate data, the most useful information is obtained from a study that uses an arrival process methodology. Despite its data requirement, this is the only methodology that meets the criteria of assessing the impact of size/weight of commercial vehicles on the road and also assessing the potential impact of an increase in the statutory limit on vehicle weights.



STI participants engaged in active learning on wetlands tour

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