

A New Center is Born

The nation's transportation system is entering a critical period. With debates about the future funding of this system likely to dominate most transportation policy discussions over the next several years, and with increasing demands being placed on this system, the time is right for the research and professional interaction that will inform the decisions that have to be made.



The Georgia Transportation Institute (GTI) was established over 11 years ago as an organization that would coordinate and act as a focal point for transportation research in the State of Georgia. The lead institution is the Georgia Institute of Technology (GT), with affiliated members including Albany State University, Clark-Atlanta University (HBCU), Georgia Southern University, Georgia State University, Southern Polytechnic and State University, and the University of Georgia. The Georgia Transportation Institute with Georgia Tech as the lead institution is the administrative home for the new Georgia Transportation Institute/University Transportation Center (GTI/UTC).

A Center theme was selected to position the GTI University Transportation Center to contribute to the national debates on the future of transportation through research, education and technology transfer activities focused on a theme of "investing in the national transportation system: economic growth, system productivity and finance." For many years, transportation professionals have argued that "solving" the transportation problem in the United States requires a multidisciplinary approach ... only to find that most studies approach the problem solely from the perspective of economics, public policy, finance, engineering, or planning. In reality, the challenge facing the United States in providing a transportation system that meets national needs really requires an integrated approach. Economic growth will result in substantial pressure on the ability of the system to handle passenger and freight demands. Market pressures for enhanced transportation productivity (e.g., just-in-time deliveries) will focus attention on system bottlenecks and thus on the investment strategies that are needed to keep pace with productivity improvements in the rest of the world. And the ability of both the public and private sectors to address any of these issues will depend on the availability of funding. What are innovative funding sources for investing in the future of the nation's transportation system? And what are the linkages between different finance strategies and economic growth and transportation system productivity? These important issues frame the important contributions of the University Transportation Center at Georgia Tech.

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GTI/UTC's strategic objectives are tailored to advance the USDOT strategic objectives in research, development and technology transfer. They include the following:

- Conduct multi-disciplinary research on topics relating to the relationship among economic development, productivity and finance
- Disseminate research results and other products of the UTC to the transportation community
- Promote transportation education and professional development on topics relating to economic development, system productivity and finance
- Establish a central point of contact (e.g., through a web site or list serve) for materials relating to investment in the national transportation system
- Promote diversity in the workforce through active recruitment of women and minority students into degree programs.
- Act as a national resource for the debates and discussions that focus on the evolving national transportation program



The framework that GTI/UTC will use to address and execute the strategic objectives includes the following elements:

- Part of GTI/UTC's general strategy will seek to identify and address real problems and opportunities in the Atlanta metropolitan area that reflect national issues. The state is facing tremendous growth in population and employment; it has the busiest airport in the world; it has a port with the fastest growth rate in the movement of containers (Savannah); it has the largest concentration of distribution and warehousing activities east of the Mississippi River (Fulton Industrial Park in Atlanta); it has some of the nation's worst congestion in the Atlanta metropolitan area; and it is one of the first states to embrace public private partnerships as an investment strategy for the nation's road system." Thus, GTI will capitalize on this excellent laboratory for examining issues of importance to the rest of the nation, and the international community.
- GTI/UTC will draw upon the core competences and unique resources and research/education skills of UTC university members in accomplishing these objectives. The universities and colleges represented in the Center provide nationally-known expertise in engineering and technology (Georgia Tech, Georgia Southern University, and Southern Polytechnic & State University); economics (University of Georgia, Georgia State University and Georgia Tech); finance (Georgia State University and Georgia Tech); planning (Georgia State University and Georgia Tech); freight and logistics planning (Georgia Tech and Georgia Southern University); and public policy (Georgia Tech, University of Georgia, Clark-Atlanta University and Georgia State University). In addition, Georgia Tech, Georgia Southern University, Georgia State University and the University of Georgia have excellent professional development and training facilities that will be available for continuing education of transportation professionals in the southeastern United States and, in the case of Georgia Tech and the University of Georgia, nationally and internationally.

GTI/UTC intends to integrate the expertise available from these multiple disciplines to generate new knowledge and expertise to solve problems and address opportunities at the confluence of transportation, economics, system productivity and finance.

- GTI/UTC is very well situated to impact academic and practitioner communities both nationally and internationally. Given the existing global economy and the importance of developing professionals who are internationally literate and knowledgeable, GTI-UTC will build upon its tradition of cooperating with international transportation agencies, and universities, including international topics in courses, workshops and symposia, continued participation of students and faculty in international workshops, and the hosting of professional development visits from international delegations. GTI/UTC will provide technology transfer mechanism to facilitate the use of research results in practice. Traditional mechanisms such as faculty and student presentations at local, national and international conferences and symposia, reports, peer-reviewed journal publications, the newsletter and annual report, website, seminar series all provide





established mechanisms for technology transfer. GTI/UTC will also work closely with practitioners through periodic research workshops to develop a research agenda that meets the needs of the transportation community. Georgia Tech also has one of the largest continuing education and distance learning programs in the nation, available to support technology transfer of the Center's products. Partnerships are being established with major professional organizations (such as the American Association of State Highway and Transportation Officials, Association of Metropolitan Planning Organizations, National Association of Regional Councils, American Public Transportation Association, etc.) to promote opportunities for information dissemination at their professional meetings, as well as create opportunities for input from these groups.

With demands on the nation's and state's transportation system likely to increase dramatically over the next several decades, leadership is needed now to establish the foundation for an effective transportation system in years to come. Transportation research has a role to play in establishing this foundation. Much of the impasse in transportation policy today is associated with an unwillingness on the part of elected officials to raise taxes or consider other options to pay for transportation—not really a researchable issue for transportation researchers. However, transportation research can provide important information on the alternative options available for financing the transportation system, on more efficient and effective approaches to managing capital programs, on the types of analysis tools and methods that can be used to provide more useful information on future performance of the transportation system, on new materials and construction methods that will make current investments more long-lasting, and on understanding the dynamics of travel growth and behavior that will be responding to socio-demographic changes in the population.

GTI/UTC will provide leadership to the transportation community in the southeastern region, nationwide and internationally in the area of its theme. An important aspect of this will be the development of leaders with the capabilities for addressing systemic transportation problems that demand multidisciplinary skills, in keeping with the Center theme. The application of multidisciplinary research, education and technology transfer resources on the relationship among economic growth, system productivity and finance will distinguish the activities and products of the GTI/UTC. The education and technology transfer programs will serve as important conduits for research results to be disseminated to the next generation of transportation professionals as well as current practitioners.

Michael D. Meyer, P.E.
Professor and Director
GTI/UTC

Administrator Brubaker Visits GTI/UTC

Mr. Paul Brubaker, Administrator of the Research and Innovative Technologies Administration of the U.S. Department of Transportation visited GTI/UTC to discuss the current state of research on alternative energy sources and fuels. Mr. Brubaker met with several researchers in the area of hydrogen fuels, biofuels, Georgia Tech's Strategic Energy Initiative, and use of instrumented vehicles to monitor vehicle performance and travel behavior.

Mr. Brubaker also met with eight graduate students from GTI/UTC over lunch where the discussion focused on federal transportation policy and future issues likely to affect the national transportation system.



<http://www.rita.dot.gov>

GTI/UTC Co-Sponsors FTA Region IV Conference



The Region IV Federal Transit Administration (FTA) Conference - *Route to Success...Today and Beyond* - was held May 28-30 in Atlanta, Georgia. Over 280 attendees from the Southeast came to Atlanta for the 3-day conference to learn about FTA programs and best practices in the transit industry. The Region IV FTA conference was a joint effort of the Georgia Transportation Institute/University Transportation Center (GTI/UTC) and the Region IV FTA office. It was the first time in seven years a conference of this magnitude had been held in Region IV. Professor Michael D. Meyer, Director of GTI/UTC, moderated the opening session which included comments from Sherry Little, Deputy Administrator of FTA, Dr. Gena Abraham, Commissioner of the Georgia Department of Transportation, Dr. Beverly Scott, General Manager/CEO of MARTA, and Sam Olens, Chairman Cobb County Board of Commissioners and the Atlanta Regional Commission. Dr. Yvette Taylor, Region IV Administrator of FTA, also provided comments.

MARTA General Manager/CEO Beverly A. Scott joined with other regional and state transportation officials in welcoming participants to the conference. "We were pleased to share our experiences with this great group of transit professionals and learn more about their successful initiatives," said MARTA General Manager/CEO Beverly A. Scott. "It is important to us within the transit industry to both listen and share information with our sister transit agencies, and understand the latest best practices to better serve our customers. This conference gave us an excellent opportunity for quality professional exchange."

The conference included sessions on a variety of topics including NEPA, Grant Programs, FTA Regulations, bus safety, grant-making, transit financing, regionalism, human capital, sustainability, and university research in transit. A ridership symposium on the first day highlighted innovative ridership initiatives undertaken by transit agencies throughout Region IV. The Southeast Transit Achievements and Recognition (STAR) awards luncheon was held on the second day of the conference to reward transit agencies who had gone above and beyond to serve the transit public. A Transit Security & Emergency Preparedness tabletop exercise helped transit agencies to consider what to do in an emergency situation to facilitate transportation.

An Executive Track, specifically designed for transit General Managers, provided a forum for GMs to talk about specific issues they face in leading transit agencies. The topics ranged from human capital to Federal Reauthorization, to regionalism.

Twenty students from GTI/UTC institutions had a unique opportunity to sit down with Deputy Administrator Sherry Little to voice their concerns about public transportation and the challenges that face the nation. These students played an instrumental role in organizing and managing the conference.

The last day of the conference, participants had the opportunity to participate in a technical tour of the MARTA system. The tour included an overview of Lindbergh City Center, MARTA's flagship live-work-play development located on 47 acres around the Lindbergh Center rail station. The development is on track to include over 1.2 million square feet of office space and 1,000 residential units. In addition, participants received an in depth overview of the innovative Breeze fare collection system and observed it in operation at the Lindbergh Center rail station. Staff also provided a tour of MARTA's state-of-the-art maintenance and operations facility Armour Yard, which features an environmentally sustainable design.



James Wagner, graduate student in Georgia Tech's Transportation Program, gives Dr. Gena Abraham, Commissioner of the Georgia Department of Transportation, a certificate of appreciation from the Federal Transit Administration

GTI-University Transportation Center Participates in Organizing Megaregions and Transportation Symposium

Megaregions are networks of metropolitan centers and their surrounding areas that have environmental, economic and infrastructure relationships. These metropolitan agglomerations currently host a significant portion of the country's population, economic activity and global connections. As a result, they also struggle with intense traffic congestion and a challenging environment, both physically and financially, in which to respond to new transportation needs. How should America structure transportation and infrastructure investment and an appropriate policy framework to respond to continuous and geographically focused population growth, spreading traffic congestion, natural resource depletion and the loss of economic competitiveness in the global economy?



To address these questions, the Center for Quality Growth and Regional Development (CQGRD) at Georgia Tech hosted a Megaregions and Transportation Symposium on June 20, 2008, in Atlanta, GA. Diverse experts in the field of planning and transportation were asked to participate. Featured speakers included Emil Frankel, Director of Transportation Policy at the Bipartisan Policy Center and former U.S. Assistant Secretary for Transportation Policy of the U.S. Department of Transportation; Professor Chang-Chun Feng, Department of Urban and Regional Planning, Peking University, Beijing, China; Professor Michael Meyer, Civil and Environmental Engineering, Georgia Tech; Petra Todorovich, Director, America 2050, Regional Plan Association; and Catherine L. Ross, Ph.D., Harry West Professor and Director of the CQGRD.

The information gathered will ultimately help outline a strategy for exploring the potential of the megaregion as a value-added structure that will guide national transportation policy and investment, while explicitly addressing the relationships among demographic change, land resources, infrastructure investment and economic development. This outline will examine mechanisms to plan for, finance and supply infrastructure that reinforces the competitiveness of current leading economic regions, while simultaneously linking to rural areas and under-performing regions that often experience only the negative externalities of economic growth. The results of this project will have implications for the practice, policy and study of transportation planning and will be particularly useful to elected officials as they prepare to outline a national strategy for transportation reauthorization in 2009.

GTI/UTC Enters Into Intern Agreement With MARTA

Recognizing that attracting new professional talent to the transit industry will be critical to the future success of public transit, GTI/UTC has entered into an agreement with the Metropolitan Atlanta Regional Transit Authority (MARTA) to sponsor student internships at the transit agency. The agreement stipulates that the GTI/UTC and MARTA will pay half of the salary for the interns. This past summer six students worked as interns at MARTA, two undergraduate students and four graduate students. The interns worked in MARTA's engineering, operations, planning and general manager's offices. Several of the interns will be continuing their work during their academic year.

This is the first time that MARTA has entered into a formal internship agreement with a local university. As noted by Dr. Michael D. Meyer, Director of the GTI/UTC, "without the resources provided by the University Transportation Center grant, it is highly doubtful that MARTA and the Georgia Transportation Institute could have reached agreement on a program that would support so many students. This program has already been a huge success, and it will likely only get better in the future."

GTI/UTC and Georgia DOT Begin Innovative Program to Attract Future Transportation Professionals

At a time when the demand for qualified transportation professionals is at an all-time high, fewer students are pursuing advanced degrees in the transportation field. And it seems likely that with the rates of growth in population, urbanization and the need for infrastructure expansion and renewal continuing to increase over the next several decades, the shortage of transportation professionals could become even more acute in the future. If the transportation engineering profession is to meet the needs of a growing society that is very much dependent on a functioning transportation system, it must take steps to encourage and motivate students to enter transportation as a professional career.

Meeting future transportation engineering challenges requires sound and practical exposure to such areas as geometric design, traffic operations, ITS applications, transportation planning, etc. - an exposure that first starts in graduate school. The Georgia Transportation Institute/University Transportation Center (GTI/UTC) and Georgia Department of Transportation, in partnership with Georgia-based private companies and professional organizations, have established a scholarship program aimed at attracting the best and brightest students to a transportation graduate degree program. Named "Transportation Engineers of the Future", this scholarship program is designed to encourage students to obtain a masters degree in transportation and to increase the number of talented professionals with advanced degrees serving the needs of Georgia, this scholarship program will completely pay for a student's cost in the degree program in Georgia Tech's graduate transportation program. In return for this scholarship, the student will commit to working with GDOT for three years.



Chester Thomas, the first graduate of the Transportation Engineers of the Future Program, receives congratulations from Dr. Gena Abraham, Commissioner of the Georgia Department of Transportation

A portion of the student's stipend is funded by the GTI/UTC with the majority of student support coming from the Transportation Engineers of the Future program.

Having a highly qualified GDOT workforce is very important to GDOT, but equally important to the private sector, which relies on GDOT for guidance and direction. The overall long term goal is to encourage more students to enter the transportation industry as a career, whether they work at GDOT, FHWA, local governments or in the private sector.

Qualified students must have completed or be currently enrolled in an accredited undergraduate engineering program and meet the admissions requirements for a masters degree in civil engineering at Georgia Tech. Two students have already graduated from this program, with four more admitted.

GTI/UTC Selects First Round of Research Projects

The first round of GTI/UTC research projects have been identified through a refereed selection process. The projects, selected based on merit as well as their connection to the theme of the center, include:

Best Practices in Selecting Performance Measures and Standards for Effective Asset Management – Professor Adjo Amekudzi, PI

Much of the literature addressing performance measurement in investment decision making for highway and other modal transportation systems indicates the need for guidance on *identifying appropriate performance standards* for investment decision making; some of the literature indicates a need for guidance on *selecting appropriate measures*, including customer satisfaction in selecting performance measures. In particular, there are benefits to be gained if decision makers can answer such questions as the following: (I) What are appropriate performance targets in each performance category? (II) How would system benefits change if the performance targets were reduced slightly? What would be the associated cost reductions? (III) How are these changes likely to affect customer satisfaction? (IV) What matrix of targets (for the different performance categories) is likely to result in increased customer satisfaction with relatively changes in costs? (V) What are the risks of setting performance standards based on historical practice without any cogent analysis?

The objectives of this research are twofold: to assess and provide guidance on factors that should influence the selection of effective performance measures for asset management from engineering, customer satisfaction and economic development perspectives; and on factors that should influence the selection of performance targets. The final product will be a report that provides step-by-step guidance on selecting performance measures and targets for a range of investment objectives for highway and other modal systems; as well as the best practices, analytical tools and data available to facilitate the determination or improvement of performance measures and targets.

The Guidebook produced by this research will provide step-by-step guidance to transportation agencies, e.g. DOTs, on how to select superior performance targets to achieve objectives for the highway and other modal systems; criteria to evaluate the effectiveness of performance measurement systems, and documentation on the best practices, analytical tools and data available for setting effective performance targets. The product will help agencies to systematically review existing performance targets that have been set by historical practice in order to determine whether superior targets can be adopted to increase customer satisfaction while reducing costs.

Real Time Estimation of Arterial Travel Time and Operational Measures through Integration of Real Time Fixed Sensor Data and Simulation – Professors Richard Fujimoto, Michael Hunter, and Jorge Laval

A number of research efforts have examined means to estimate and predict various performance measures of signalized arterials from point sensor data. Upon examining the existing arterial travel-time estimation models one recognizes that despite their on-line, real-time potential, which has not been realized as yet, these models could not be implemented in the field either due to their input data requirements or unsatisfactory test performance. The goal of this research is to build upon these efforts and overcome these issues through the use of a real-time data driven simulation approach. Such a system should be able to use input data from loop detectors and/or video detection systems to estimate and predict, in real-time, various arterial performance measures including travel time.

The specific objectives of this research are to determine the feasibility of integrating real-time data and simulation and to conduct a field test of the proposed methodology on a target corridor. Additionally, as part of the real-time simulation calibration and prediction effort the benefit of real time probe vehicle data will be explored (e.g. GPS instrumented vehicles, cellular probe data, etc.). The ability to include probe vehicle data in the field test will be subject to probe vehicle data availability.

As stated the goal of this research effort is to integrate real world sensor data with a traffic simulation, with the aim of mirroring the current conditions on an arterial roadway for improved system monitoring. After successfully capturing current conditions, future performance may then be predicted by exporting system states from the real-time roadway simulation to client simulation models that run faster than real-time. The following conceptual framework illustrates this approach.

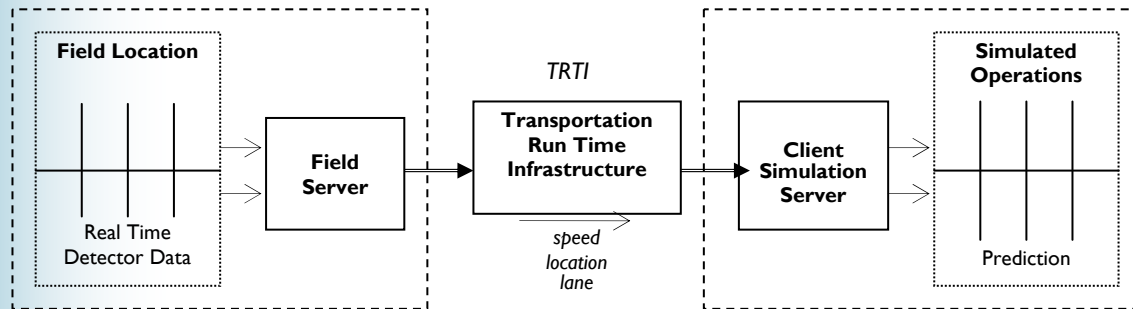


Figure 1: Conceptual Framework

To implement this framework the research team envisions a series of tasks that will not only provide the foundation for future traffic prediction work but also provide key lessons on the path to successful delivery of current roadway conditions in real time. The proposed study will examine the challenges of integrating real-time data and simulation, and include a field test of the proposed methodology on a target corridor. This research will begin with the modeling of uncongested traffic conditions. Initial investigation into congested conditions is also anticipated, however, in-depth modeling into all possible congestion sources (over capacity demand, bottlenecks, incidents, intersection blockage due to spillback, etc.) may not be captured. Additional modeling to further advance simulation under congested conditions is anticipated as part of future research efforts, contingent on the outcome of this effort. Additionally, in this effort, reliable, ordered communications are assumed. Follow-on efforts will explore the impact of communication loss and message delays. The stated objectives will be accomplished through the following tasks: 1) review of real time simulation literature, 2) development of a federated simulation test bed, 3) federation of real time detector data streams with a simulation, 4) development of real time data driven simulation algorithms, 5) Investigation of potential of non-typical detector placements, 6) field test implementation, and 7) the development of a method for real time presentation of arterial performance.

Impact of the Location of New Schools on Transportation Infrastructure and Finance - Professors Michael Meyer and Catherine Ross, Co-PIs

The rapid development of many of the nation's urban areas, especially the Atlanta metropolitan area, will place significant pressure on the urban transportation system. One of the most important factors in influencing urban growth patterns is likely to be the location of schools. Many of the rapidly growing suburban counties of Atlanta, for example, open five to seven new schools each year. No research has been undertaken on the influence that school locations have on local congestion and more broadly on development patterns. This is an important need, especially in high-growth states like Georgia where we will experience some of the fastest population growth rates in the nation over the next several decades. Given the recent past in school locations and the rapid growth that followed, there is a great deal of evidence abstracted from the Georgia experience that can be measured and utilized to establish the school location/new development relationship.

The major objective of the proposed research is to identify the relationship between new school location and urban development patterns. This objective includes understanding the rationale for school location decisions, examining historical data on such decisions and resulting residential and commercial development, investigating school location and local congestion levels, and developing recommendations for school siting decisions that consider transportation implications more fully. This research will identify up to 10 school boards in the fastest growing regions of the state of Georgia, and interview school board officials on their decision making process. Recent experience with school location decisions will be used to illustrate the important factors in school siting. An interview protocol will be developed that high-

lights the most important information desired from the school officials, and interviews will be conducted with both school board members as well as the technical staff responsible for supporting the school siting process.

It is expected that this research will show that school locations have significant impact on local highway congestion and that the financing of new schools through the local sales tax process affects a local jurisdiction's ability to fund transportation projects through similar means. This research will provide evidence to this expectation, and make suggestions as to how school location guidelines should include the consideration of broader implications.

Sustainable Mobility: Meaning and Application to State DOTs – Professors Catherine Ross and Michael Meyer

Transportation officials have been dealing with environmental issues for decades in the context of project impacts. However, in recent years, many states have begun to examine a much broader construct for transportation system benefits and impacts, generally called sustainable mobility. For example, states such as California, Oregon, Minnesota, and Washington have organized many of their policies and plans around such a construct. This broader concept relates to such topics as climate change, other changing environmental conditions such as water shortages, development patterns, fuel consumption, "green" economic development, and mode choice. An example of one element of such a concept is the environmental stewardship initiative that AASHTO supported several years ago. Over the longer term sustainable mobility could very well be one of the key policy directions that most state DOTs adopt in delivering their services. There is a strong need to understand what is meant by sustainable mobility and its implications to state DOTs.

The major objective of the proposed research is to identify the key dimensions of sustainable mobility as it is evolving in the United States and in several other countries. The project will critically assess these dimensions from the perspective of how they might relate to a state DOT. The four major tasks associated with this project include: conducting a literature review, developing a sustainable mobility policy framework for a state DOT, applying this policy framework to a generic state DOT, and generalizing the results to other state DOTs.



GTI/UTC Scholarships Awarded

The first round of GTI/UTC scholarships were award during the spring semester. The scholarship program recognizes outstanding students whose accomplishments and proposed research indicates a strong likelihood of success in accomplishing stated research goals. The first GTI/UTC scholarship winners included:

Laurel Paget-Seekins - Ms. Seekins is a Ph.D. student with a strong background in planning, public policy and community participation. She is examining the equity implications of transit service provision with particular focus on transit riders. Laurel was a 2008 Eno Fellow.

Brandon Denny - Mr. Denny is a masters student in civil engineering with an interest in transportation planning and policy. His research is examining the linkage between security considerations and the transportation planning process.

Christopher Lindsey – Mr. Lindsey is a masters student who has been examining the role of freight transportation in the context of transportation decision making. His research is assessing the current state-of-practice in incorporating freight concerns into the transportation planning process, and how this process can be made more conducive for considering freight-related issues.

The GTI/UTC scholarship program will fund between three and five students each year, with special consideration given to research ideas that do not have funding from more traditional sources.



GTI/UTC

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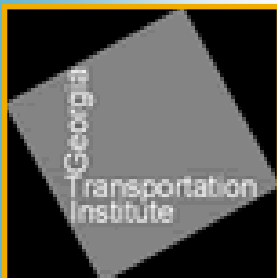
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GTI/UTC Sponsors Luncheon Seminar Series

The Georgia Transportation Institute/University Transportation Center inaugurated a guest luncheon seminar series beginning in 2008. The purpose of the seminar series is to promote an exchange of information among the transportation professional and research community in the GTI/UTC region and top researchers in the nation. Speakers and the titles of their talks during the spring semester included:

- Professor Frank Koppelman, Northwestern University: "Advances in Discrete Choice Modeling"
- Professor C. Michael Walton, University of Texas: "Funding Tomorrow's Transportation Systems"
- Professor Sue McNeil, University of Delaware: "Agent-Based Models as an Insight into Managing Pavement Assets"
- Professor Hani Mahmassani, Northwestern University: "Dynamic Pricing, Managed Lanes and Integrated Corridor Management"
- Dr. Joe Zietsman, Texas Transportation Institute: "Implementing Sustainable Transportation at State DOT's"

The seminars have been very successful in attracting a diverse group of scholars and practitioners from the GTI/UTC community as well as from Georgia transportation professionals.

The University Transportation Center at the Georgia Transportation Institute (GTI/UTC) is committed to developing into a Center of excellence providing high-quality leadership on research, education and technology transfer to address issues related to transportation system productivity (including both passenger travel and freight of all modes), economic growth, and finance.

GTI/UTC works with local, state and regional agencies to identify research problems that support their needs and identify opportunities for them to advance to the next level; educate a new generation of students who well versed in art of multidisciplinary thinking and problem solution, collaborating effectively in teams to tackle problems with systems dimensions; provide continuing education opportunities to keep practitioners at the cutting edge of systems methodologies and technologies with transportation applications; and provide technology transfer resources to disseminate knowledge.

