By Deborah Rosen
URITC Executive Director

The first half of 2010 found the URITC continuing to pursue its research, education and outreach activities. Our joint research program with Rhode Island Department of Transportation is taking shape. We spent the first six months of the year working on establishing the process to move this program forward. Combining two bureaucracies is no easy trick.

Eleven research problem statements were selected in spring 2010 for development into full proposals. These projects span a diverse list of disciplines including chemical, industrial, ocean and civil engineering, history, landscape architecture, accounting, supply chain management, natural resources and plant science. We look forward to completion of this selection cycle.

Workforce development continues to be a focal point of our educational and outreach activities. The newest additions to our workforce development activities were 1) the commissioning of curriculum pieces on the roads of Rhode Island for 4th graders and 2) the implementation of our 9th-12th grade teacher externship program. Both programs continue to build the pathway to transportation careers which the URITC and its partners are trying to create for Rhode Island students.

We recognize that just introducing students to the career opportunities in transportation is not enough. To continue to hold their interest, we need to interface with them as they move from elementary school to high school to an institution of higher education or into the workforce. By building a continuous stream of programs, we will have multiple touch points with budding transportation professionals to insure that they enter the workforce with the appropriate skill set.

We plan to add additional elements to our workforce development programs both in recruiting students into our careers, retraining individuals looking to change careers as well as professional development for those already in transportation occupations. Only with a concerted effort across all fronts can we be confident we will have the workforce necessary to tackle the transportation issues of tomorrow.

It cannot close without addressing the nature of our changing transportation landscape. There is a growing recognition that we can no longer afford to expand or even simply maintain the massive highway infrastructure.

- In December 2009, the Broward County metropolitan planning organization report indicated that public sentiment gathered through public hearings and surveys “favored transit over roadways by a margin of two to one.”
- Planners are doing the math: highway infrastructure projects consume massive amounts of money, while providing for bikers, walkers and transit is less expensive.
- There is growing evidence that young people are buying cars at a lower rate than their parents did at the same age.

As a reflection of these trends, the Obama administration is giving clear signals that transportation funding ought to be directed towards projects which promote “livability.” Focusing on livability means more transportation options for communities.

Closer to home, in a recent report released by the Urban Land Institute and the ULI Terwilliger Center for Workforce Housing, it was reported that Rhode Island households spend a greater share of their income on housing and transportation than most other households in the region.

As we face the challenge of crafting a new federal transportation bill, these trends must be taken into account. We also must realize that coordinated efforts across transportation modes will be imperative to these efforts. I encourage all who are involved in the transportation arena to become active participants in this process.
On May 20, the University of Rhode Island Transportation Center (URITC) held its 10th annual Transportation Week Breakfast. The event, held at the Radisson Airport Hotel in Warwick, R.I., attracted more than 100 members of the Rhode Island transportation community.

Robert Weygand, Chairman of the URITC Executive Board and Vice President of Administration at URI, welcomed the audience and spoke about the role the University plays in conducting transportation-related research and cultivating tomorrow’s transportation workforce.

After Michael Lewis, Director of the Rhode Island Department of Transportation (RIDOT), made a few opening remarks, Deborah Rosen, Executive Director of the URITC, provided an update on URITC research projects, workforce development activities and outreach initiatives.

The guest speaker was Marc Levitt, who gave a multi-media presentation on the history of Interstate 95 in Rhode Island. His research and presentation was sponsored by URITC.

Phillip Kydd, Acting Deputy Director of RIDOT, introduced the presenters of the sixth annual RIDOT Quality Awards. The following is a list of award recipients.

Transportation Innovation Award
Jeff Cathcart, URITC
Humberto Martinez, URITC

Transportation Highway Safety Award
Robert Murray, AAA of Southern New England

Transportation Pioneering Award
Mary L. Murray, RIDOT

Transportation Excellence Award
Rhode Island Public Transit Authority (RIPTA)
Rhode Island Bridge and Turnpike Authority (RIBTA)
Traffic Engineering Department of RIDOT
Employees of RIDOT

URITC Faculty Research Award
Chris Baxter, Ph.D., University of Rhode Island

From left: Phillip Kydd, RIDOT; Dan Berman, FHWA; Michael Lewis, RIDOT; Amy Pettine, RIPTA; Mary L. Murray, RIDOT; Humberto Martinez, URITC; Chris Baxter, URI; Robert Murray, AAA of Southern New England; Buddy Croft, RIBTA; Jeff Cathcart, URITC; Robert Roccio, RIDOT.
The History of I-95 and the Old Post Road

With so many exciting changes taking place to Rhode Island’s infrastructure in recent years and the near future, the URITC thought it would be a great time to take a look back at two of the most significant transportation projects in Rhode Island history: the creation of Interstate 95 and the Old Post Road.

The Center called upon the services of Marc Levitt, a local storyteller and filmmaker to produce two multi-media documentaries on how Rhode Islanders used to travel from town to town and across state lines before I-95 and Post Road were built and the impact the two projects had on the community and the economy.

Levitt’s tales predate the invention of the automobile and span generations before reaching modern times. Using historic photos, videos and music as a backdrop, Levitt chronicles how changes in transportation affected every community in Rhode Island.

NCCDC Teacher Externship Program

When a transportation construction project is underway, the physical labor involved is fairly obvious. What isn’t as apparent is how essential math, science, writing and verbal communications skills are to the success of the project.

This year, the National Construction Career Days Center (NCCDC) introduced a teacher externship program to expose educators to transportation jobs that apply the academic skills that they teach in the classroom. The program was sponsored by the URITC, Rhode Island Department of Transportation (RIDOT) and Federal Highway Administration (FHWA).

“This program was initiated because we realized that not all teachers know what careers in transportation require in the way of math, science and language skills,” said URITC Executive Director Deborah Rosen. “We wanted to get classroom teachers, particularly those teaching academic courses (i.e. Math, science, etc.) out in the field to experience the nature of work involved in transportation occupations.”

Participants spent 40 hours over a two-week period at a public works department, a transportation engineering consulting company, a construction company or at RIDOT.

“For some students there may be a disconnect between what is taught in the classroom and real world experiences,” said NCCDC Technical Advisor Jeff Cathcart. “A teacher who has gone through the externship program will be better equipped to explain how math, science and communication skills play an important role in the workplace.”
Chris Baxter Named Researcher of the Year

By Jessica Buffi
URITC Intern

The University of Rhode Island Transportation Center (URITC) selected Christopher Baxter as its 2009 Researcher of the Year. Baxter is an associate professor in URI’s Ocean, Civil and Environmental Engineering Departments. He has worked for the University for 10 years.

“Chris brings everything to the table. He is a top notch researcher, a great teacher and an excellent colleague who is always willing to consider new opportunities,” said URITC Executive Director Deborah Rosen. “His research in the realm of transportation has been extremely productive and he is highly respected by our transportation partners in industry.”

Baxter is recognized for his research achievements in numerous projects involving the liquefaction resistance of silts. The overall goal of the projects is to better understand the behavior of Providence silts under dynamic loading, such as what would occur during pile driving or during an earthquake.

“Silts are a difficult material to characterize and underlie much of downtown Providence. As such, they pose a problem for many geotechnical projects in the state,” Baxter explained. “This has been a great opportunity to work on both fundamental research and on a problem that is relevant to practicing engineers in Rhode Island.”

Baxter began work on the liquefaction resistance of silts in 2004 through grants provided by the URITC and Rhode Island Department of Transportation (RIDOT). One of his studies revealed a relationship between shear wave velocity and cyclic resistance for the Providence silts.

“We were able to show that practicing engineers can use standard field-based approaches to evaluate the liquefaction potential of these difficult soils,” Baxter said.

When asked his reaction to being named URITC Researcher of the Year, Baxter made sure to credit the people he works closely with for helping him achieve the award.

“I am honored to be recognized for my work to the geotechnical engineering community. My success comes from the hard work of my excellent graduate students,” Baxter said.

In addition to teaching college students, Baxter conducts learning labs each year at the URITC Engineering Career Day event for high school students.

“High school students have very little exposure to engineering and events like Engineering Career Day show the students how concepts in science and math can be used to solve real-world problems,” said Baxter. “My goal is to introduce the students to the study of soils and geotechnical engineering, and to get them enthusiastic about learning.”

The subject of Baxter’s current research projects include the settlement of adjacent ground due to pile driving in silts, the cyclic behavior of sands and clays related to offshore wind farms in Rhode Island, the relationship between shear wave velocity and effective stresses at failure for dilatant soils, and the development of load transfer curves for piles in silt.
2010 Research Projects

Title: Pervious Pavement Research Facility  
Project ID: 002595  
Principal Investigator: Vinka Craver

Summary
The construction of permeable parking, local (or low-volume) roads and bike paths as alternatives to impermeable surfaces has shown to be an effective method of stormwater source control. The main design criterion for infiltration systems has usually been the reduction of peak discharge through the retention of stormwater flow.

To date, although some effort has been directed toward the use of such systems for the treatment of retained pollutants, there has been little thought put into gaining a fundamental understanding of the chemical and microbiological processes taking place. In addition, winter maintenance practices have hindered the promotion of pervious concrete pavement.

Pervious research has demonstrated the ability of permeable pavement to retain suspended solids. Limited research has been conducted concerning water-purification properties of pervious concrete. Few studies examined the growth of microorganisms within pervious concrete by observing the consumption of the dissolved oxygen, however these studies have not been performed systematically and long-term. Additionally, no study has been performed using different type of soil amendments such as organically modified soils and nanomaterials-soil composites.

The proposed work will contribute with new information regarding the enhancement of the attenuation of the pollutant load in stormwater runoff in parking lots and local roads which require winter maintenance practices. This information has an important significance in coastal states, such as Rhode Island, since coastal systems are sensitive to this kind of contamination.

Project Update

Two projects recently funded by the URITC, “Feasibility Study to Increase Utilization at the Port of Davisville (Quonset, Rhode Island)” and “Davisville Port Feasibility Study: Part II” became a source of data used by the Quonset Development Corporation in their Transportation Investment Generating Economic Recovery (TIGER) grant application.

“What we were able to contribute was very detailed data that we believe made this application stand out from the over 1,400 proposals submitted under the TIGER program,” stated Professor James Kroes, lead principal investigator on these projects. “Evan Matthews, the Davisville Port Director, indicated that our unbiased, scientific approach to estimate container volume through Davisville was critical to obtaining this $23.9 million award.”

These two projects investigated issues associated with establishing and increasing the use of shipping containers to import and export goods into the Port of Davisville. Benefits quantified in these studies include: increased environmental sustainability, decreased highway infrastructure deterioration (port utilization will reduce the use of containers on road and rail), and economic benefits for local and regional importers and exporters.
SMILE Middle School Engineering Challenge

The 16th annual SMILE Engineering Challenge was held in the Memorial Union Ballroom at URI on April 9-10. The event was sponsored by the URITC and the Federal Highway Administration (FHWA).

SMILE is an acronym for Science and Math Investigative Learning Experiences. The event attracted 91 students from six middle schools, which included:
- Broad Rock Middle School (South Kingstown)
- Calcutt Middle School (Central Falls)
- Curtis Corner Middle School (South Kingstown)
- Davisville Middle School (North Kingstown)
- Deering Middle School (West Warwick)
- Woonsocket Middle School

This year’s Challenge required each team to construct a wind turbine that could produce as much voltage as possible. The students were given materials to build the tower and gearbox, but each team had to brainstorm, design, build and test the best combination of gears and the most efficient blades for their turbines. The participants had to “purchase” their blade materials without exceeding $2.1 million. URI students and volunteers from APC served as mentors.

Engineering Career Day

On May 21, 121 students from 10 Rhode Island high school programs attended the fourth annual Engineering Career Day at URI’s Kingston Campus.

Engineering Career Day was sponsored by the URITC, the Rhode Island Department of Transportation (RIDOT), the Federal Highway Administration (FHWA) and the Rhode Island Consulting Engineers (RICE).

Divided into four groups, the students learned about the many career options related to transportation engineering by rotating through four learning labs. The labs, which were led by industry professionals and URI faculty, included:
- Bridge and Geotechnical Engineering
- Highway and Traffic Engineering
- Surveys and Geographic Information Systems (GIS)
- Storm Water Management, Hazardous Materials, Environmental Planning

The following schools were represented:
- Blackstone Academy, Pawtucket
- East Providence Career & Tech. Center
- GAP Program/Talent Dev., Providence
- Middletown High School
- Mount Pleasant High School, Providence
- Newport Area Career & Tech. Center
- North Smithfield High School
- The College Crusade of RI
- Times 2 Academy, Providence
- Tolman High School, Pawtucket

RHODE ISLAND CONSTRUCTION CAREER DAYS

The 10th annual Rhode Island Construction Career Days (RICCD) event was held on May 19-20 at the Rhode Island Department of Transportation’s (RIDOT) mid-state facility in East Greenwich.

The event was attended by 729 students from 47 schools throughout the state. There were 30 pieces of construction equipment for the students to operate, including a jackhammer, backhoes, a bucket truck and welding torches. There were also 70 exhibitors present who shared information about transportation and construction careers. One of the most popular attraction was the URITC’s driving simulator.

A new addition to this year’s event was a bridge building competition. Teams built their bridges ahead of time using balsa wood and glue. While there was plenty of room for creativity, the teams had to follow the specifications for length and width. At the RICCD event, the bridges were weighed and put to the strength test. The teams that constructed the most efficient bridges were awarded trophies.

As always, the event was well-attended by volunteers from RIDOT, local public works departments, admissions staff of schools of higher education and staff of private construction and engineering firms. Also volunteering this year was the URI student chapter of the Society of Hispanic Professional Engineers (SHPE).

NATIONAL CONSTRUCTION CAREER DAYS CENTER

Following back-to-back years in which a record high 56 Construction Career Day events were held nationwide, 2010 is unfolding as another very successful year.

Joining the program for the first time is Idaho. Rather than start off small, as most states have done, Idaho hosted six events in the spring and have two more scheduled this fall.

One of the responsibilities of the NCCDC is to serve as a clearinghouse of information and images, so that local event organizers can share their success and learn from others. So far in 2010, photos from 16 events have been compiled and posted on the NCCDC website. There have also been 29 examples of forms, marketing pieces and articles from 2010 events added to the website.

At the URITC Transportation Week Breakfast on May 20, NCCDC technical advisors Jeff Cathcart and Humberto Martinez were recognized for their commitment to developing tomorrow’s construction workforce. To date, more than 360,000 students have attended CCD events, partly due to Jeff and Humberto’s many years of hard work and dedication.

Learn more about NCCDC at www.constructioncareerdays.us.
Rhode Island Technology Transfer Center

After conducting 104 workshops for state and local transportation and public works officials in 2009, the RI T2 Center has continued its commitment to offer quality training opportunities in the areas of workforce development, best practices and safety in 2010.

Here is a partial list of events and trainings held so far in 2010:
• OSHA 10
• Indoor Equipment Expo
• Chainsaws and Demolition Saws
• Amtrak Safety
• Discussion on New Year’s Day Storm
• Winter Operations
• Rhode Island Clean Diesel
• Using the Dig Safe System
• Discussion on Sharing Resources
• Salt Brine Show & Tell
• All About Asphalt Pavement
• Mower Safety
• Flagger Certification
• Introduction to Plan Reading

The OSHA 10 Roadway Construction Training was one of many workshops that were well-attended in the first half of 2010.