About the Cover

The beautiful photo of the new Pawtucket River Bridge featured on the cover was taken by Frank C. Grace of Trig Photography. The image is titled, “Bathed in Purple.”

On Sept. 5, a completion and naming ceremony for the new Pawtucket River Bridge took place on Taft Street, under the Division Street Bridge. From left, Pawtucket Mayor Donald Grebien, RIDOT Director Michael Lewis and Governor Lincoln Chafee.

On Sept. 7, the city held “First Lights Pawtucket,” a dedication and inaugural lighting of the bridge. The event showed off the bridge’s unique color changing lighting system of low voltage and long life LED lights. Similar to the lights on the dome of the Rhode Island State House, the colors can be coordinated with major holidays or local events.

The original Pawtucket River Bridge was built in 1958 (pictured at the bottom). Photos courtesy of RIDOT.
The URI Transportation Center was established in 1999 to conduct multidisciplinary education, research, technology transfer and outreach for surface transportation systems and advanced transportation infrastructure. The Center is one of 66 national centers funded under SAFETEA-LU.

An executive director manages the operations of the Center and an outreach director directs all technology transfer activities. The Center has an executive board, chaired by the URI Vice President for Administration, whose members represent the Center’s stakeholder groups.

**Theme:** Connectivity through Sustainable Transportation Systems.

**Mission:** To advance U.S. technology and expertise in the many disciplines composing transportation through the mechanisms of education, research, and technology transfer at a university-based center of excellence.

**National UTC Goals**

**Education:** a multidisciplinary program of course work and experiential learning that reinforces the transportation theme of the Center.

**Human Resources:** an increased number of students, faculty and staff who are attracted to and substantively involved in the undergraduate, graduate, and professional programs of the Center.

**Diversity:** students, faculty, and staff who reflect the growing diversity of the U.S. workforce and are substantively involved in the undergraduate, graduate, and professional programs of the Center.

**Research Selection:** an objective process for selecting and reviewing research that balances multiple objectives of the program.

**Research Performance:** an ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field to advance the body of knowledge in transportation.

**Technology Transfer:** availability of research results to potential users in a form that can be directly implemented, utilized, or otherwise applied.

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**Executive Board**

The URITC Executive Board is composed of the principal University and public sector stakeholders. The group provides advice to the President of URI and to the URITC Executive Director in terms of the goals and overall objectives of the Center’s programs.

**Robert Weygand, Chair**
URI Vice President, Administration

**Michael Lewis**
Director, RIDOT

**Mark M. Higgins**
Assoc. Dean, URI College of Business Admin.

**Phillip Kydd**
Assistant Director, RIDOT

**Raymond Wright**
Dean, URI College of Engineering

**Jared Rhodes**
Chief, RI Statewide Planning Program

**Kevin Smith**
President & CEO, Sustainable Supply Chain Consulting

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Scientific Research Grant Assist.

Neil Nachbar, Writer

Tory Perrotta
Senior Wordprocessing Typist

Gema Viñuales
Research Manager

**Consultant**

Jeff Cathcart
The URITC and RIDOT hosted the Transportation Research Forum on Nov. 1 at the Coastal Institute at URI’s Bay Campus in Narragansett. The event brought together URI researchers to share their areas of expertise and interest and RIDOT personnel to state which subjects they would like to see addressed through research.

The guest speaker was Stephen Pesci, who serves as Special Projects Director for Campus Planning at the University of New Hampshire, Durham Campus. The topic of Pesci’s presentation was “Evolving Sustainable Transportation Systems.”

In Pesci’s 10 years at UNH, he’s assisted in the adoption of new transportation policies; a redesigned fare-free transit system which provides over 1.3 million trips/year. Pesci has also helped secure over $12 million of federal transportation funding for projects including alternative fuel, transit, historic rail station renovation and Main Street improvements.

In hopes of working more closely together to solve some of Rhode Island’s biggest transportation challenges, URITC researchers shared their area of expertise and interest and RIDOT department heads conveyed their greatest needs when it comes to transportation research.

URI Associate Professor of Chemical Engineering Michael Greenfield discusses his area of expertise, as it relates to transportation research.

Keynote speaker Stephen Pesci of the University of New Hampshire shared some of the success stories and challenges of improving transportation infrastructure on around the UNH campus.

RIDOT Engineer Michael Penn calls upon researchers to explore solutions to transportation challenges in Rhode Island.
Norbert Mundorf’s in-depth research related to readiness for behavior change for commuting habits earned him the 2013 URITC Researcher of the Year award.

“Norbert is an advocate of sustainability in transportation, active communities and healthier lifestyles for commuters,” said URITC Executive Director Dr. Deborah Rosen. “He has a passion for reducing single occupancy vehicles and encouraging healthier commuting options.”

Mundorf was nominated for Researcher of the Year by Wendy Lucht, coordinator of the Ocean State Clean Cities Program at URI.

“With other researchers, Norbert is working on ways to encourage people in the state, and across the nation, to carpool, walk, bike, and take public transit instead of driving alone,” said Lucht. “He takes a cross-disciplinary approach toward his research and curriculum development. Communication is a very important component of encouraging healthier choices.”

Mundorf explained the connection between communication and transportation, particularly as it relates to transportation safety.

“In essence, transportation is a form of communication. It connects people,” stated Mundorf. “Safety and sustainability are primarily the results of human behavior and the choices we make. Technical and scientific considerations are critical for both, but ultimately humans are in the driver’s seat, no pun intended. We need to find ways to encourage desirable changes in safety and also in sustainable behavior.”

In the last couple of years, Mundorf has developed an interest in a field called Active Living.

“The goal of Active Living is to promote physical activity across communities,” explained Mundorf. “One very important factor in encouraging walking and biking is safety. Statistically, pedestrians and bike riders are much more vulnerable and likely to be victims of traffic injuries and fatalities than people driving an automobile.”

Most of Mundorf’s research over the last five years has focused on encouraging transportation alternatives.

“Many of my students at URI began to carpool or take public transportation. They also encouraged their friends to do so,” said Mundorf. “We developed messages and strategies that encouraged changes in the transportation behavior of broader constituencies, but lasting change also requires external changes, such as improved public transportation and things such as carpool parking lots, and meaningful financial incentives. So, we have taken important steps, but there are many more needed.”

In addition to Mundorf’s research projects and influence in the classroom, he’s also tried to make a difference in the community through URI’s Urban Initiative.

“We’re trying to identify ways in which transportation choices can improve the quality of life, health and social interactions in ethnically and socially diverse neighborhoods in Providence,” said Mundorf. “This has numerous dimensions, from access to healthy and local food, neighborhood design, to the promotion of walking, biking, and transit use among demographic segments. Needless to say that safety and security play a key role.”

Realizing how many state employees, including those who work at URI, drive to and from work alone, Mundorf has expressed an interest in changing those commuting habits.

“We are also working on a proposal to reduce vehicle miles traveled by state employees in Providence, Cranston and Kingston,” stated the professor. “It requires support by a number of state agencies, and we are trying to build the necessary alliances. URITC is pivotal in getting this project off the ground, both in terms of securing the necessary funding and helping us build the needed support network.”
For FY2013 (and those not previously reported)

**FY 2011**

**Peter August**

*Open Access to High Resolution Data for Transportation Planning in Rhode Island*


August, P. “High Resolution LiDAR Data for Rhode Island: Data, Applications and a Look Ahead.” Rhode Island Society of Professional Land Surveyors (RISPLS), September, 2013.

**Norbert Mundorf**

*Developing Tailored Intervention Technology for Alternative Transportation*


**FY2012**

**Rebecca Brown**

*Development of New Seed Mixes and Establishment of Guidelines for Roadside Grasses in Rhode Island*

Brown, Rebecca, “Improving Sustainability and Durability of Roadside Grasslands” presented at the URITC Forum October 1, 2013.


**Thomas Boving and Vinka Craver**

*Installation of Stormwater Management with Enhanced Tree Filter Systems*


**Research Publications & Presentations**

**FY2013**

**Will Green**

*Education Programming Grant: Green Design*

Green, W., “Using service learning design studios to create community connections and increase their value to stakeholders, clients and professional designers.” CELA – Council of Educators in Landscape Architecture Annual Meeting, Austin, TX, March 27-30, 2013.

**Douglas Hales**

*Port Competitiveness Symposium Grant*

Research Reports with multiple sources of funding:

Sources of funding: This research was funded by grants from the National Science Foundation and BP America, Inc., Rhode Island Department of Transportation, New England University Transportation Center, and the University of Rhode Island Transportation Center.


Sources of funding: National Science Foundation, Rhode Island Department of Transportation, University of Rhode Island Transportation Center.

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Varun Kasaraneni (left) and Laura Schifman test water samples taken next to a parking lot on the URI Kingston campus. The water was tested regularly as part of the “Installation of Stormwater Management with Enhanced Tree Filter Systems” research project. 

*Photo by Joe Giblin*
On May 15, the URITC hosted its 13th Annual Transportation Week Breakfast at the Airport Radisson in Warwick.

The keynote speaker was Michael Lewis. As the director of the Rhode Island Department of Transportation (RIDOT) and president of the American Association of State Highway and Transportation Officials (AASHTO), Lewis was able to provide a local and federal perspective on the state of transportation and infrastructure. The title of his presentation was “Transportation at a Crossroads – MAP-21 and Beyond or ‘What I Did on My Summer Vacation.’”

Following an overview of the URITC’s activities in the last year, URITC Executive Director Deborah Rosen presented the Center’s 2012 Researcher of the Year Award to Vinka Craver, Ph.D. An assistant professor in URI’s Civil and Environmental Engineering Departments, Craver was recognized for her research of wastewater treatment and sustainable transportation.

Dr. Rosen also presented the URITC Educator of the Year Award to Carol Engleander, the director of the SMILE program (Science and Math Integrative Learning Experiences). Engleander created the program in 1994. It now serves over 400 students and 36 educators.

Robert Weygand, Chairman of the URITC’s Executive Board and URI Vice President of Administration, was presented with a Lifetime Achievement Award by Dr. Rosen.

Phil Kydd, deputy director of RIDOT and URITC board member, presented RIDOT’s 9th Annual Quality Awards. The recipients were:

**Excellence Award**  
Response to Hurricane Sandy and the Blizzard of 2013  
- Barbara Breslin, FHWA  
- Employees of RIDOT’s Maintenance Division

**Quality Award**  
Rehabilitation of the Stillwater Viaduct Bridge No. 278  
- David Morgan, Project Manager  
- Mike Swift, Resident Engineer  
- Vanasse Hangen Bruslin, Inc., Designer  
- Northern Construction Services, Contractor

**Innovation Award**  
Murals/Highway Beautification Program  
- Jonathan Stevens  
- Three RIDOT employees  
- Gretchen Dow, Designer  
- David Macaulay, Designer  
- Anthony Russo, Designer

**Transportation Safety Award**  
Strategically Targeted Affordable Roadway Solutions C-1 Aquidneck  
- Sean Raymond, Project Manager  
- Terrance Mcilmail, Resident Engineer  
- Vanasse Hangen Bruslin, Inc., Designer/Consultant  
- Arden Engineering Consultants, LLC, Contractor

Dan Berman was recognized for close to 40 years of service to the Federal Highway Administration (FHWA). As the assistant division administrator at FHWA, he was instrumental in securing funding for many of the URITC’s programs.

The audience at the URITC’s annual breakfast represented many sectors of the transportation community, including local and state agencies and private contractors.
Close to 115 high school students from six schools participated in the URITC’s 7th Annual Engineering Career Day on May 17 at URI’s Kingston campus.

Divided into groups, the participants rotated through four learning labs: bridge and geotechnical engineering; traffic engineering and highway design; field survey, GIS and asset management; and water resources, environmental planning, hazardous materials and drainage.

For the second year, a bridge building contest was held. Students designed and constructed model bridges using balsa wood and glue according to the specification provided. The bridges were completed ahead of time and tested for strength at the event.

Working in pairs, students used bridge building software to learn about bridge design.

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

Using colored water, a student learned how and why different materials are used to control stormwater runoff.

With the assistance of engineers, students learned how to use surveying equipment.
The 13th annual Rhode Island Construction Career Days (RICCD) event was held April 24-25 at the Rhode Island Department of Transportation’s (RIDOT) facility in East Greenwich.

More than 1,2000 students from 66 schools and organizations across the state learned about the many career opportunities in construction from the exhibitors and by operating tools and heavy equipment.

Exhibitors represented state agencies, public works departments, private industry, police and fire departments, colleges and universities.

The 40-plus pieces of equipment the students got to work with included excavators, mini excavators, backhoes, man lifts, a paver, a roller, a snow plow truck, bucket trucks, a street sweeper, a line stripper, the jaws of life and jackhammers.

The students also received a hands-on introduction to welding, plumbing, electrical work, carpentry and sheet metal work. The URITC’s driving simulator tested their skills behind the wheel.

One of the most anticipated parts of RICCD was the bridge building competition. Over the two days, 40 model bridges were tested for strength. Trophies were awarded for first, second and third place each day.

Using balsa wood and glue, and specifications provided by the URITC, teams designed and constructed their bridges during or after school.

The RIDOT Bridge Maintenance Department showed students how to weld. Welding plays an important role in the construction and maintenance of our infrastructure.

For some schools, the bridge contest was the main reason for attending the event. In fact, some advanced physics and mathematics classes incorporated the competition into their curriculum.

Another highlight was the computer station, featuring the West Point Bridge Builder and Gridlock Buster programs. The Rhode Island Consulting Engineers (RICE) showed the students how to use the software.

RICCD is managed by the URITC and sponsored by RIDOT, the Federal Highway Administration (FHWA), RICE, the New England Laborers Union, the Construction Industries of Rhode Island and Beacon Mutual Insurance Company.

The winning team in the bridge building competition, from Scituate High School’s physics class, from left: Noah Maguire, Esteban Tamayo, John Kiernan, Morgan Colvin.

A student is timed as she saws off a piece of wood.
On March 22, 90 middle school students gathered at URI’s Memorial Union for the SMILE Transportation Engineering Challenge. SMILE is an acronym for Science and Math Investigative Learning Experiences.

The students represented five school districts: Central Falls, Pawtucket, South Kingstown, Warwick and Woonsocket. Rather than working with their classmates, the students were placed into groups with those from other schools.

The future engineers were tasked with designing, building and testing model wind turbines. The project taught the students about renewable energy and its potential effect on the environment.

Volunteers included URI students, RIDOT employees, and employees of Steere Engineering, Schneider Electric, Toray Plastics, Amgen, Eaton Aerospace and Meister Abrasives.

The SMILE program is in its 19th year. The program provides professional development to the SMILE teachers of each school throughout the year. The lesson plans and materials are also provided by SMILE.

On Oct. 16, SMILE received the Rhode Island Afterschool Plus Alliance (RIASPA) Lights On Afterschool Outstanding Youth Program award.
The ninth annual URITC Summer Transportation Institute (STI) was held for two 2-week sessions from July 1-12 and July 29 – Aug. 9 at the URI Kingston campus.

Representing diverse backgrounds, 29 middle school students learned about transportation careers and the respective education and training requirements.

Classroom instruction, guest speakers, field trips and hands-on projects were key components of the program.

Activities included:
• Introduction to bridges
• Computer bridge building contest
• Balsa wood bridge building contest
• Safety sessions at the Kingston Railway Station
• Writing in daily journals

Working in small groups, the students built model bridges using balsa wood and glue.

Early in the session, the students learn how to read a map, which came in handy on some of the field trips.

Duck boats were a great way for the students to see Boston and learn about multiple modes of transportation.

Students took turns using the URITC’s driving simulator.

As part of the enhancement program, the participants experienced a multi-modal trip on which they rode a commuter rail, a subway, a bus and walked.

At URI, the students visited dorms, classrooms and sports facilities, met staff and ate in a dining hall.
In 2013, the URITC hosted four summer academies for high school students: the Business Academy, the Construction Academy, the Engineering Academy and the Green Design Academy.

A total of 79 students from diverse backgrounds participated. Funding for the academies was provided by RIDOT through a FHWA grant.

Goals of the Summer Academies
These initiatives were designed to:
• give first-hand knowledge of transportation work
• provide many opportunities for mentoring by industry role models
• spread the message that the transportation sector offers many rewarding career options
• make students aware of necessary courses early enough in their education to be prepared to move on to a career or college with the right tool kit
• increase diversity in the transportation workforce

Construction Academy
A one-week Construction Academy for 15 high school sophomores, juniors, seniors and recent graduates took place July 15 – 19.

The curriculum included:
• OSHA 10-hour training for the construction industry
• Tour of Route 165 road reconstruction project
• Flagger certification
• Work zone safety training
• Introduction to heavy equipment and the construction trades
• Hands-on welding and electrical training
• Hands-on fire protection training
• Preparing for a job interview
• Completing a W-9 form and submitting a time sheet

Construction Academy students visited the RIDOT maintenance facility in Warwick, where they learned how street signs are made and received a hands-on lesson on welding.
Summer Academies

Business Academy
The Business Academy was attended by 13 high school freshmen, sophomores, juniors and seniors from July 22 – 26. The participants learned about all aspects of a company’s supply chain. Classroom instruction, guest speakers, field trips and hands-on training were key components of the program.

Activities included:
• Ropes Confidence Course Team Building Exercise
• Interactive Supply Chain Management Group Exercise
• Tour of an Ocean State Job Lot Distribution Center
• Tour of businesses along Narragansett Bay
• Tour of the Quonset Point Business Park and Port, including the Port of Davisville
• Transportation Team “Quiz” Competition

URI College of Engineering professor Chris Baxter taught students in the Engineering Academy about the qualities of different building materials.

Engineering Academy
Twenty high school freshmen, sophomores, juniors and seniors attended this academy from July 22 – 26.

The curriculum included:
• Tour of College of Engineering
• “How Do I Become an Engineer,” led by Ray Wright, Dean of URI’s College of Engineering
• “Speed Dating” with practicing engineers from the Rhode Island Consulting Engineers (RICE)
• Structural Engineering Lab
• Transportation Engineering Lab
• Environmental Engineering Lab
• Geotechnical Engineering Lab
• Tour of Transportation Management Center
• Tour of bridge construction in North Kingstown
• Tour of South Kingstown Wastewater Treatment Plant

Business Academy students visited the Ocean State Job Lot distribution center, where they learned about supply chain management.
Green Design Academy
The Green Design Academy was attended by 18 high school students from July 15-19.

Participants learned what sustainability means and how it influences the design of communities and landscapes.

Activities included:
- Tour of the URI botanical gardens
- Tour of a local nursery
- Bike tour of the South County Bike Trail
- Visit to a landscape architecture design firm in Boston
- Studying Rhode Island’s coastal ecology

Maritime-Freight Academy
Making its debut in 2013, the Maritime-Freight Academy was attended by 13 high school students from July 8-12.

Participants learned about careers in the maritime industry, specifically the transportation segment of the industry.

Activities included:
- AST&L, 10-hour training for the maritime industry
- Tour of companies that ships globally
- Harbor operations and safety training
- Vessel operations and safety training
- Maritime customs and global seaports
- Loading and unloading of automobiles at Quonset Point/Port of Davisville
- Hands-on vessel operation using a maritime simulator
2013 Student of the Year

Alesandra Morales Velez

In recognition of her commitment to transportation research and her academic accomplishments, the University of Rhode Island Transportation Center (URITC) selected Alesandra Morales Velez as its 2013 Outstanding Student of the Year.

Born and raised in Puerto Rico, Morales Velez will complete a PhD in Civil and Environmental Engineering from the University of Rhode Island next fall.

When Morales Velez found out that she had been named the 2013 Student of the Year, she was flattered.

“The award means that hard work pays off,” said Morales Velez. “It is such an honor for me to accept it.”

Morales Velez was nominated for the award by Chris Baxter, URI Professor of Civil and Environmental Engineering and Ocean Engineering.

Baxter cited the role Morales Velez played in securing a National Science Foundation award and her contributions to several research projects.

“For her master’s degree Morales Velez worked with crushed limestone aggregates (CLA) from Puerto Rico. This material is extensively used in civil engineering construction. Crushed limestone aggregates are commonly used in North America as fill material for road construction and embankments. They are traditionally considered a good to excellent quality mineral aggregate with adequate durability performance.

“The research involved evaluating durability characteristics, and possible short-term degradation, of two CLA materials mined from two different quarries in Puerto Rico representing different geologic formations,” explained Morales Velez. “The durability assessment consisted in tracking variations of mechanical properties of CLA samples tested after different periods of submergence in fresh and salt-water environments with a maximum submergence time of 150 days. The geotechnical tests included Slake durability, Los Angeles Abrasion, 1-D compression, and triaxial compression.”
The URITC’s Technology Transfer (T2) Center provided workforce development opportunities for public works and transportation practitioners throughout the year. Many classes took place at the T2 Center’s training facility in Warwick, but some were offered elsewhere.

In 2013, the Center held 76 workshops/events, including five National Highway Institute (NHI) classes. Class sizes ranged from 12 – 50.

Here is a partial list of the workshops that were held:

**Safety-Related**
- Highway Work Zone Safety
- Chain Saw Skills and Safety
- Bucket Truck Safety
- Landscaping Tool Safety
- Flagger Certification
- OSHA 10-Hour Construction

**Roundtable Discussions**
- Winter Operations
- Drug and Alcohol Testing for CDL Drivers

**Job Performance-Related**
- Managing Stormwater in Tough Budget Times
- Pavement Preservation
- Hands-on Welding
- Introduction to Snow Fighting
- Computer Training: Word, Excel, Access
- Elgin Sweeper Operations
- Handling Tree Debris Removal
- Preventing Sexual Harassment
- Customer Service

According to the feedback the URITC has received, the RI T2 Center workshops have been extremely helpful in improving skills, knowledge and safety.

“The combination of classroom safety instruction and hands-on experience in the T2 Center’s 20-hour welding training enabled each employee to apply what they learned to their everyday job,” said Dave Aucoin, Safety Compliance Coordinator of The Narragansett Bay Commission. “We’re fortunate to have such a great working relationship with the Thode Island T2 Center.”

The Backhoe Rhodeo and Snowplow Rhodeo were two of the featured events at the annual Outdoor Equipment Show, which draws hundreds of Rhode Island public works and transportation professionals each year.
Source of Funds as of 12/31/13

This chart represents the composition of funds committed for Grant Year 2012.

- State Grant: 81%
- Federal Grant: 15%
- University Match: 4%
- Third Party Match (industry and public sector partners): 0%

Use of Funds as of 12/31/13

This chart illustrates the composition of allocations against the total source of funds for Grant Year 2012.

- Outreach: 33%
- Education: 32%
- Administration: 13%
- Research: 1%
- Technical Assistance/Training: 21%
In 2013, new murals were unveiled along Route 95, as part of RIDOT’s efforts to improve the appearance along Rhode Island highways while discouraging vandalism and graffiti.

Above, left: This mural, created by artist Gretchen Dow Simpson, was completed in October. It is located along the southern end of the Pawtucket S curves on I-95, visible to northbound and southbound traffic. In October 2012, Dow Simpson completed a mural on the opposite side of the S curve of the inside of a historic sawmill.

Above, right: This mural by renowned children’s author and illustrator David Macaulay was completed in early June along I-95 near the State Offices exit in Providence.

Below: These two murals by Macaulay were unveiled in early October. They are facing drivers heading north on I-95 between Exits 7 and 8 in East Greenwich. Macaulay, a RISD faculty member and bestselling author, has designed two other murals along Rhode Island highways.