Semi-Annual Report
January 1, 2002 through June 30, 2002

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The first six months of 2002 saw the URI Transportation Center actively pursuing opportunities to advance transportation awareness in each of the three major activity areas for the Center.

In terms of education, the Center began offering the first set of courses under the partnership agreement with the National Highway Institute, the only such agreement in the nation. The courses are one to four day sessions aimed at transportation professionals in the New England region. We also expanded the course offerings on campus for students interested in transportation policy.

The Center's research program matured to the point that the majority of the initial research projects funded in Year One were completed just as the selection cycle for new projects was identifying the 13 new awards. It is particularly gratifying to observe third party participation from local communities in the research projects selected for awards.

The Transportation Center sponsored or cosponsored several major outreach events in the first two quarters. The Center cosponsored a Model Ports Conference, along with the US Coast Guard, the Rhode Island and Connecticut Sea Grant programs, and Roger Williams University.

The Transportation Center and the Brookings Institution began assessing the opportunities for multi jurisdictional transportation planning with a workshop cosponsored by the Slater Institute. We also sponsored a session on “Listening to our Customers” at the Northeast Association of State Transportation Officials (NASTO) meeting, held in Newport.

Finally, we sponsored our Second Annual National Transportation Week Breakfast, with a speaker addressing transportation security awareness.

Richard Horn, Executive Director
Although once considered a luxury item, cellular telephones have become commonplace in American cars. And if Americans have a love-affair with cellular phones, their first love was with the automobile. According to the National Highway Traffic Safety Administration, (NHTSA), U.S. drivers spend an average of 541 hours a year in the cars, and 54 percent of these drivers carry and use cell phones while they drive. Put these two loves together and some say it is an accident waiting to happen.

And cellular phones are not the only source of distraction. Electronic devices in cars are becoming more and more advanced. Eventually most cars will be equipped with such marvels as electronic navigation systems, email, games, internet - all potential distractions.

Although common sense tells us that a distracted driver is more likely to have a traffic accident, Dr. Manbir Sodhi in his URITC funded project “Multimodal Vehicle Display Design and Analysis” is using test equipment to monitor eye movement to quantify precisely how much and what kinds of distraction lead to traffic accidents.

Using eye and head movement sensors and cameras to collect data, Sodhi was able to track eyeball movement during test distractions.

In recent interviews with ABC News with Peter Jennings and on Good Morning America, Dr. Sodhi described his use of eye movement sensors and cameras that show just how distracted drivers become while talking on the phone or playing with the radio.

Along with the national television news exposure, Dr. Sodhi’s research has also appeared recently in BusinessWeek, Science Daily and the Providence Journal.

-120.1 Million Cell Phones are in use in the United States
-By 2005 there will be 1.26 Billion cell phones in use around the world
-Nearly 118,000 wireless calls are made each day to 911 and other emergency numbers from cell phones; more than 43 million annually.
-54 percent of drivers have wireless phones in their vehicles at all times

Source: National Highway Traffic Safety Administration (NHTSA)
Part A: Success Stories

From Ideas to Patents: Three URITC researchers apply for patents on their ideas.

Paints Change Color, Warn of Danger
Imagine driving over a bridge which could actually change color when the air temperature were to reach freezing. What about rubber tires which turn red when they are under-inflated? They’re not such crazy thoughts says URI professor and URITC researcher Dr. Brett Lucht, who along with his project team, has created an additive which when mixed with a paint or other composite displays changes in temperature by changing color.

In effect, the thermochromic coatings, plastics, or rubbers are thermal sensors that detect a change in temperature with optical or visual transformation. The thermochromic polymers can be incorporated into commercially available paints, plastics, and rubbers. The thermochromic paints can be applied in various manners including brush, sponge, roller, and airbrush and adhere strongly to paper, plastic, and painted metal surfaces.

It's a highly practical application of chemistry, and it's no surprise that such a novel and practical idea would invite commercial interest. Lucht and KM Scientific, the project’s external partner, recently submitted and signed a patent application and licensing agreement for the technology.

URITC 2001 - 536152
Development of Thermochromic Paints, Plastics, and Rubbers for Rapid Visual Assessment of Temperature

Water jets for snow and ice removal
Searching for the Perfect Mix
Another URITC researcher has developed an innovative way of removing snow and ice from road surfaces using high-pressure jetting technology and de-icing chemicals.

Dr. Taggart's research is looking at the combined use of jetting technologies and reduced use of de-icing agents. Because these chemicals are known to be hazardous to the environment, their use should be minimized. The researchers are exploring such variables as jet pressure, nozzle type, distance and chemical mix in hopes of finding the perfect mix where chemical use is at its minimum and ice-breaking power is maximized.

The device is being tested this Fall.

URITC 2001-536156
Development of an Advanced Pavement Deicing System
Innovative Water Treatment
Could Wood Chips Clean Roadway Runoff?

Vehicle exhaust, tire disintegration and brake dust are all products of surface transportation.

Although drivers seldom wonder where the water from roadway drains go, environmental scientists have long traced the combination of heavy metal particulates and petroleum hydrocarbons that often end up poisoning surface and ground water supplies.

Unlike other dirty water that is normally treated by a sewage treatment plant, the unique particulates found in urban and highway storm water runoff are both difficult and costly to remove from the water.

In an innovative approach, URITC Researcher Dr. Thomas Boving is studying how the use of wood filters can help remove these contaminants from the water.

Contaminated water is routed through the filters while in a retention pond, passing through several stages of filtration.

Initial laboratory research shows that the wood chips found in the filters are an effective means of filtering out the harmful contaminants, and the team is now experimenting with several wood species trying to maximize the effectiveness.

Dr. Boving filed a patent application in June.

A testing site is planned for the Gano Street retention pond at the on-ramp of Route 195 in Providence.

URITC 2001-536181
Wood Filters as an Innovative Treatment Method for Roadway Runoff Pollutants
Part A: Success Stories

“Homeland Security & Transportation”
Tad Widby, Parsons Brinckerhoff

May 13, 2002
Transportation Week Breakfast

As part of the 2002 National Transportation Week URITC invited Mr. Tad Widby of Parsons Brinckerhoff to speak on the topic of Homeland Security.

Mr. Widby reminded the audience that transportation systems make prime targets for attacks. The presentation highlighted how increased vigilance and coordination between agencies and information is critical in the unfortunate event of terrorism.

Along with better communications, Mr. Widby also spoke about increasing surveillance, increasing emergency response capabilities, and the isolation of key bridge and tunnel access.

The speaker also stressed the reality that no system is perfect, and decision-making must be strategic, systematic, and built on probabilities of attack and degree of likely impact.

National Transportation Week provides an opportunity for the transportation community to join together for greater awareness about the importance of transportation. National Transportation Week also focuses on making youth aware of transportation-related careers.

““The United States will become increasingly vulnerable to attack on the American homeland, and the US military superiority will not completely protect us …”
Hart-Rudman Commission—February 2001

More than 85 attendees from private & public agencies attended, including representatives from the RI State Police, Governor’s Office, RI Department of Transportation, RI Airport Corporation, and the RI Public Transit Authority.
Part A: Success Stories

Courses Educate Transportation Practitioners

The University of Rhode Island and the National Highway Institute (NHI) of the Federal Highway Administration (FHWA) will offer joint training and educational sessions to transportation practitioners in the Northeastern United States.

The mission of the National Highway Institute (NHI) is to provide proactive leadership, expertise, resources, and information to improve the quality of the U.S. highway system in order to enhance economic growth, quality of life, and the environment. The NHI develops and delivers training and education in cooperation with its partners to sustain and expand the transportation community's professional capacity in technologies and strategies thereby accelerating the implementation of the state-of-the-art and continuing to advance the state-of-the-practice.

The first URITC / NHI course took place in the Spring, and additional courses are scheduled for this Fall.
Part A: Success Stories

Improvements to the URITC Website
To respond to the need to provide better information to our stakeholders and the general public, the Center expanded and improved its website in a variety of ways.

The new URITC website features full descriptions of ongoing research projects, news, seminars and research opportunities, pulling information directly from a central, internal project management system.

The site also allows Center staff to update and maintain a calendar of events, frequently asked questions, news releases, email lists and project information and management, directly from the website itself.

Project investigators will soon be able to log in to check financial information for their projects directly, through an online administrative portal.

Increased Visibility for the Center
The URITC website now reports more than 200 unique visitors per week.

Connecting with Stakeholders
Subscribers to our email list receive notifications of awards, new projects, seminars and events.

Online Project Reporting
URITC Researchers log in to the URITC “Project Portal” where they can fill out various required project reports, including semi-annual report information.

Visit our website at http://www.uritc.uri.edu
Part B: Project Status

NEW PROJECTS FOR 2002

**Stretching Ability of Chip Seal Membranes**  
2002-536175 Dr. Milton Huston (URI Civil Engineering)

**Harnessing the Power of Relational Databases for Management of Geotechnical and Geologic Data**  
2002-536176 Professor Daniel Murray (URI Geosciences)

**Determining the Effectiveness of New Technology Data Collection Devices for Real-Time Transportation System Management**  
2002-536177 Dr. Christopher Hunter (URI Civil Engineering)

**Developing and Applying a Transportation Model for Aquidneck Island**  
2002-536178 Professor Farhad Atash (URI Community Planning)

**Integrated Transportation Pricing Strategy for Newport**  
2002-536179 Professor Timothy Tyrrell (URI Environmental and Natural Resource Economics)

**Development of Course on Bridge Management**  
2002-536180 Professor George Tsiatas (URI Civil Engineering)

**Wood Filters as an Innovative Treatment Method for Roadway Runoff Pollutants**  
2002-536181 Dr. Thomas Boving (URI Geosciences)

**RI DOT 2001 Bicycle Transportation User Survey Developing Intermodal Connections for the 21st Century**  
2002-536182 Professor R. Choudary Hanumara

**Development of Thermochromic Paints, Plastics, and Rubbers for Rapid Visual Assessment of Temperature**  
2002-536183 Dr. Brett Lucht (URI Chemistry)

**Dredging in a Changing Scientific and Regulatory Environment - Year 2**  
2002-536184 Professor Richard Burroughs (URI Environmental and Natural Resource Economics)

**Replacement of Chromate in Paints and Corrosion Protection Systems**  
2002-536XXX Dr. Mercedes Rivero-Hudiec (URI Chemistry)

**Mechanical Behavior of Recycled Asphalt Material Under Dynamic Loading Conditions**  
2002-536XXX Professor Martin Sadd (URI Mechanical Engineering)

**Application of a Multimodal Demand Simulation Model to Assess Container Transportation Policy Issues in the Northeast**  
2002-536XXX Professor Thomas Grigalunas (URI Environmental and Natural Resource Economics)
Part B: Project Status

ONGOING PROJECTS

Dredging in a Changing Scientific and Regulatory Environment
2001-536151 Professor Richard Burroughs

Development of Thermochromic Paints, Plastics, and Rubbers for Rapid Visual Assessment of Temperature
2001-536152 Dr. Brett Lucht

Field Study of Composite Piles in the Marine Environment
2001-536153 Dr. Christopher Baxter

Development of a Customer Satisfaction and Service Quality Measurement Method and Tool for the Rhode Island Public Transit Authority
2001-536154 Professor Albert Della Bitta

Contamination of Urban Lakes by Storm Runoff from Highway and Railway Drainage Systems
2001-536155 Professor John King

Development of an Advanced Pavement Deicing System
2001-536156 Dr. David Taggart

Investigation of Potential for Intermodalizing Paratransit in Rhode Island
2001-536157 Dr. Christopher Hunter

Replacement of Chromates in Paints and Corrosion Protection Systems
2001-536158 Dr. Mercedes Rivero-Hudec

Intelligent Traffic Anomaly Diagnosis Through the Integration of Diverse Information Sources
2001-536159 Dr. Joan Peckham

Processing of Cenosphere-Cement/Asphalt Composite Materials and Evaluation of their Mechanical and Acoustic Properties
2001-539160 Professor Arijit Bose

Driver Distraction and Detection
2001-536161 Dr. Manbir Sodhi

Creating Safe Transportation Options for College Students
2001-536162 Professor Norbert Mundorf

Comprehensive Framework for Sustainable Container Ports Development of US East Coast in the 21st Century
2001-536163 Professor Thomas Grigalunas

Effect of Microstructure on the Static and Dynamic Behavior of Recycled Asphalt Material
2001-536164 Professor Martin Sadd
Part B: Project Status

Re-Thinking the Region: Transportation Networks and Regional Competitiveness
2001-536168 Professor Maureen Moakley

Exploring Ways of Influencing Transport Behaviors by Using Telecommunications Technologies
2000-536131 Professor Nikhilesh Dholakia

Chemical Retention Capacity of a Newly Constructed Roadway Runoff Detention Pond System
2000-536132 Dr. Thomas Boving

Intermodal Transport of Petroleum Products - Smart Terminals
2000-536133 Dr. Winston Knight

High Order GPS Base Station and Web Delivery System
2000-536134 Professor Peter August

Replacement of Chromates in Paints and Corrosion Protection Systems
2000-536135 Dr. Mercedes Rivero-Hudec

Fiber Reinforcement of Concrete
2000-536136 Professor Richard Brown

A Web-based Core Library for Rhode Island
2000-536137 Dr. O. Don Hermes

Effect of Microstructure on the Static and Dynamic Behavior of Recycled Asphalt Materials
2000-536138 Professor Martin Sadd

TRANSMAP: An Integrated, Real Time Environmental Monitoring and Forecasting System for Highways and Waterways in RI
2000-536139 Dr. Malcolm Spaulding

Comprehensive Framework for Sustainable Container Ports Development of US East Coast in the 21st Century
2000-536140 Dr. Thomas Grigalunas

Implementation of a Highway Monitoring Program Utilizing Intelligent Transportation Systems (ITS)
2000-536141 Dr. Milton Huston

Moving Smart in Rhode Island
2000-536142 Dr. Joan Peckham

Inorganic and Organic Characterization of Dredged Sediments from the Proposed Quonset Point Channel in Narragansett Bay
2000-536143 Professor Raymond Wright

Performance Improvement And Measurement of Open-Graded Asphalt Mixes
2000-536144 Dr. Mohammad Faghri

Magnet and Induced Impacts of Quonset Container Port
2000-536145 Professor Ed Mazzi
Part B: Project Status

Red Light Running in Rhode Island
2000-536146 Dr. Christopher Hunter

Fiber Reinforcement of Concrete
1999-536101 Professor Richard Brown

Multi Modal Vehicle Display Design and Analysis
1999-536103 Professor Manbir Sodhi

Beneficial Uses of Dredge Material from the QPD Intermodal Port Terminal
1999-536104 Dr. Armand Silva

Development of an Advanced Bridge, Highway and Runway De-Icing System
1999-536107 Dr. David Taggart

Interactions of Transportation and Telecommunications Behaviors in relation to RIIR: Modeling the User Perspective
1999-536111 Dr. Nikhilesh Dholakia

1999-536113 Dr. David Shao

Smart Speed Bumps
1999-536114 Professor William Ohley

COMPLETED PROJECTS

TRANSMAP: An Integrated, Real Time Environmental Monitoring and Forecasting System for Highways and Waterways in RI
1999-536100 Professor Malcolm Spaulding COMPLETE

Geologic Transportation Maps for the 21st Century
1999-536102 Professor O.Don Hermes COMPLETE

The Design & Development of Information & Computer Systems for URITC
1999-536105 Dr. Joan Peckham COMPLETE

Comprehensive Framework for Sustainable Container Ports Development of US East Coast in the 21st Century
1999-536106 Dr. Thomas Grigalunas COMPLETE

Effect of Microstructure on the Static and Dynamic Behavior of Recycled Asphalt Material
1999-536108 Professor Martin Sadd COMPLETE

Modeling for Real-Time Traffic Control in the Rhode Island Intelligent Road
1999-536109 Professor William Palm COMPLETE

Using Cenospheres to Develop New Asphalt and Cement Based Concrete Materials
1999-536110 Professor Arun Shukla COMPLETE

Data Analysis and Detection Methods for Online Health Monitoring of Bridge Structures
1999-536112 Professor Sau-Lon Hu COMPLETE
Papers & Publications from January 1, 2002 to June 30, 2002

5/02  Presentation  “Uncertainty in Dredging Decisions: Diagnosis and Alternatives” at a meeting of the Coastal Society.

FY 2001 URITC 536152 Dr. Brett Lucht
Development of Thermochromic Paints, Plastics, and Rubbers for Rapid Visual Assessment of Temperature

Papers & Publications from January 1, 2002 to June 30, 2002

1/02  Success Story  Submitted PCT patent application on thermochromic polymers.

3/02  Presentation  “Investigation of the Thermochromic Properties of Polythiophenes Dispersed in Host Polymers” at National American Chemical Society Meeting.

FY 2001 URITC 536156 Dr. David Taggart
Development of an Advanced Pavement Deicing System

Papers & Publications from January 1, 2002 to June 30, 2002


FY 2001 URITC 536159 Dr. Joan Peckham, Dr. Christopher Hunter
Intelligent Traffic Anomaly Diagnosis Through the Integration of Diverse Information Sources

Papers & Publications from January 1, 2002 to June 30, 2002

2/02  Presentation  “Rhode Island Intelligent Traffic Anomaly Diagnosis System (RIITADS)” at URITC.

4/02  Presentation  “Strategies for Diagnosing Traffic Anomalies and Incidents & Predicting Travel Time in Rhode Island” at the RIDOT’s regular “Lunch and Learn” series.

FY 2000 URITC 536131 Dr. Nikhilesh Dholakia, Prof. Norbert Mundorf
Exploring Ways of Influencing Transport Behaviors by Using Telecommunications Technologies

Papers & Publications from January 1, 2002 to June 30, 2002

1/2002  Presentation of preliminary findings to external match partner, Fraunhofer-ISI in Karlsruhe, Germany.

5/2002  Publication  “Effects of the Internet and other Interactive Technologies” in the journal Perspectives of Media Effect. The article discusses the impact of information technology on virtual mobility and other aspects of daily life.

6/2002  Publication  of a book by Fraunhofer (the external sponsor of this project) that demonstrates partial transport substitution effects of online activities.

6/2002  Success Story  An invitation was extended to Dr. Dholakia and Dr. Mundorf to present findings to the BMW Foundation in Berlin, Germany for November 2002.
Papers & Publications from January 1, 2002 to June 30, 2002


Papers & Publications from January 1, 2002 to June 30, 2002

3/02  Presentation “A Web-based Core Library for Rhode Island” at Geological Society of America Meeting (Northeast Section)

5/02  Success Story Received funding from 1) the URI Transportation Center and 2) the RI Department of Transportation for a continuation of our work. The new project is titled "Harnessing the Power of Relational Databases."

Papers & Publications from January 1, 2002 to June 30, 2002


Papers & Publications from January 1, 2002 to June 30, 2002

1/02  Presentation at the Transportation Research Board Annual Meeting, Washington, DC.
### FY 2000 URITC 536142 Dr. Joan Peckham
Moving Smart in Rhode Island

#### Papers & Publications from January 1, 2002 to June 30, 2002

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### FY 1999 URITC 536107 Dr. David Taggart
Development of an Advanced Bridge, Highway and Runway De-icing System

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<td><em>Publication</em> &quot;Application of Jetting Technology to Pavement Deicing,&quot; accepted for publication in the Transportation Research Record.</td>
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