

# TRANSPORTATION

Building Jobs through  
Transportation

FOCUS Winter 2003  
Research

News and Information from the Rahall Transportation Institute



**Contents:**

- News.....p. 1, 3
- Plymale's Perspective.....p.2
- Research.....p.4
- Special Insert p5-8.
- Education.....p.9
- Technology

**Partner Schools:**



## SPECIAL INSERT: HIGHLIGHTS FROM THE INTELLIGENT TRANSPORTATION SYSTEMS TECHNOLOGY FAIR AT MARSHALL



### 'Railroad Conductor School' Prepares Next Generation of RR Workforce

by Lori Smith

Seventy percent of railroad conductors will reach retirement age during the next ten years. Fortunately, RTI is helping to train the railroad industry's next generation of conductors.

RTI, Marshall Community and Technical College (MCTC), the West Virginia Development Office and CSX Transportation have created the "Railroad Conductor Training Program" to prepare individuals to enter the railroad workforce. During this five-week training program

Continued on 3: Railroad Conductor

### Transportation Security Courses Help Industries Cope with Terrorist Threats

by Errin Jewell

In order to address the security education needs of transportation and fixed facility industries, including terrorist threats and attacks, RTI and Marshall Community and Technical College have developed the Transportation Security continuing education program.

"After September 11, 2002, the leaders of many American industries realized they are not prepared for potential terrorist attacks," Diana Long, MCTC Associate Provost for Workforce Development, said. "We designed the Transportation Security courses to fill the needs of businesses, government organizations and other facilities who need to assess their

Continued on 3: Transportation Security

### RTI Expands GIS Mapping of Hatfield-McCoy Trails in Southern W.Va.

by Lori Smith

Researchers from RTI are assisting the Hatfield McCoy Regional Recreation Authority in expanding the trail system's Geographic Information Systems (GIS) database of aerial maps and imagery.

"The Hatfield and McCoy Trail System is already an attractive travel destination to thousands of outdoor adventurers in West Virginia and beyond," Congressman Rahall said. "This effort provides the public the means to take full advantage of the beauty and promise that is southern West Virginia."

RTI director Bob Plymale added, "We're proud to supply a significant segment of southern West Virginia's rapidly growing tourism

Continued on 3: Hatfield-McCoy Trails

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## Plymale's Perspective: *The Director's Report*

"Research: the Heart of UTCs"



The Appalachian landscape is filled with majestic mountains, sparkling rivers and numerous other scenic wonders that are unparalleled in nature. Despite the beauty of these rugged physical features, its defining elements present many challenges to the area's economic development potential. In fact, many of the region's primary concerns stem from a lack of safe and efficient transportation infrastructure.

Finding solutions to these challenges requires hours of research and strategic thinking in which members of institutions such as the Rahall Transportation Institute are proud to participate.

Research activities are the heart of all 33 UTCs and the core of RTI's mission to "build jobs through transportation." RTI's research activities not only provide solutions to many of the transportation-related problems faced by the Appalachian region, but also help train the next generation of transportation professionals to enter the local workforce.

Since 1998, nearly 100 graduate and undergraduate students from colleges and universities in West Virginia have participated in activities that have directly contributed to RTI's success. These students work hard

to assist principal investigators from Marshall University and four partner schools (West Virginia University Institute of Technology, Southern West Virginia Community and Technical College, Mountain State University and Bluefield State College) in completing research, developing new technologies, disseminating research findings or introducing transportation careers and technologies to pre-K-12 students.

Appalachia is full of many valuable resources, the most significant being its citizens. The Rahall Transportation Institute looks forward to providing the next generation of transportation professionals not only with opportunities to participate in research projects that will help alleviate many of the economic problems faced by the Appalachian region, but also with job skills that allow them to contribute to the future growth of the area.

*Robert H. Plymale,*

## MUGC, WVU, RTI Offer Engineering Course CE

Engineers and consultants who provide design services or have design responsibilities to state and local jurisdictions may benefit from a new course offered by Marshall University College of Information Technology and Engineering, West Virginia University College of Engineering and Mineral Resources and RTI beginning Jan. 16, 2003.

CE 533 Geometric Design of Highways provides an overview of the theory and practice of geometric design of modern roadways. Topics include design controls, horizontal and vertical alignment, cross-section elements, sight distances, at-grade intersections and interchanges. The 2001 edition of the AASHTO policy on geometric design of highways and streets is the principle reference for the course. Roadway functional classes, from freeways to very low-volume local roads are considered and context sensitive design are addressed.

The course meets Thursdays from 3:30 to 6:20 p.m. at WVU in Morgantown and through an Interactive Video Link at Marshall University Graduate College in South Charleston.

Dr. Ronald W. Eck, P.E., Professor of Civil Engineering at WVU and Director of the West Virginia Transportation Technology Transfer Center, instructs the course.

Registration information is available at MUGC, South Charleston at (304) 746-2042 or [www.marshall.edu/cite](http://www.marshall.edu/cite) and WVU, Charleston Ex-



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Winter 2003

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From page 1: HOMELAND SECURITY

vulnerabilities and create or strengthen their security plans.”

Three levels of course clusters have been developed for the program. Level 1 courses provide basic information most organizations can use to make cost-effective vulnerability assessments and develop practical and affordable countermeasures. Level 2 courses inform industry leaders of government requirements and are specialized for industries including chemical or waterfront facilities. Level 3 courses share specialized information to niche audiences in smaller group formats.

Long said, “The Transportation Security courses will evolve to address the changing regulatory environment.” Current courses include: “Developing Useful Security Inspection Checklists,” “Security Assessments for Chemical Facilities,” “Waterfront Facility Assessments” and “Evaluating Security Technologies.” Other Transportation Security continuing education courses are being developed under the auspices of RTI’s recent designations as an Inland Port Security Institute through the Maritime Transportation Antiterrorism Act and as a National Maritime Enhancement Institute.

Each course is scheduled for specific dates beginning January 2003, but individual courses may be customized and delivered on-site or online. Enrollment is open for each course. Registration information, instructor credentials, schedules, course outlines and other information about the Transportation Security Program may be obtained by calling 304-696-6855 or visiting [www.marshall.edu/rti](http://www.marshall.edu/rti).

From page 1: Hatfield-McCoy Trails

industry with the necessary technology to improve the Hatfield McCoy Trail System and to equip its workforce with knowledge to maintain it.”

Mark Whitt, executive director of the Hatfield McCoy Regional Recreation Authority, said, “This is another great example of collaboration efforts by the Rahall Transportation Institute and the Hatfield McCoy Regional Recreation Authority to provide a quality trail system and continue to expand economic development and tourism projects throughout southern West Virginia. The GIS system will increase our staff’s capabilities tremendously by providing the equipment and resources to provide quality mapping of our projected trails.”

GIS is a powerful group of computer applications used to analyze and display geographically-related data. The objective of the partnership is to develop and implement three capabilities of GIS: integrating aerial imagery into the trail database, implementing new equipment in support of a GIS-based network and using a web-based GIS system to communicate trail information. RTI’s duties include converting existing maps into a GIS database, creating a digital inventory of unmapped trails, implementing equipment to support a GIS network, installing and training employees to operate the system and designing a user-friendly web page to publish the GIS data. RTI mappers expect to complete the project within two years.

More than 400 miles of recreational trails on private land in Logan, Boone and Mingo counties comprise the Hatfield McCoy Trail System, which will eventually consist of more than 2,000 miles in southern West Virginia, Kentucky and Virginia.

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Contributors: Robert Plymale, Barbara Roberts, Pam Hamilton

From page 1: RAILROAD

students spend eight hours a day in classrooms or on railroad equipment and learn basic railroading, safety, operating rules, signals, equipment and other topics essential for success as a conductor.

The “Railroad Conductor Training Program” consists of 200 hours of training plus job interviews and medical evaluations during the third and fourth weeks of training.

“This program will offer an excellent opportunity for men and women to be hired by a Class I railroad,” Ashley Burcham, Coordinator of the MCTC Railroad Training Program, said. “Railroad companies are looking for well-qualified, well-trained applicants and with our railroad program, we will be able to supply them with exactly what they need.”

More than 350 individuals have applied to the program since November 2002. The inaugural class of the Railroad Conductor Training Program began Jan. 27, 2003. For more information, contact Burcham at (304)525-8033 or [burcham8@marshall.edu](mailto:burcham8@marshall.edu).





## RTI, TVA to Improve Method of Estimating Flood Damages

by Lori Smith and Errin Jewell

Researchers from RTI and the Tennessee Valley Authority (TVA) have proposed a joint study effort designed to improve the methods of estimating which portion of flood damages involves transportation infrastructures.

The project's Principal Investigator, Mark Burton, explained the project, "Expected Flood Damages to Transportation Infrastructures as a Proportion of Total Event Costs: a Methodological Exploration," would be completed in three steps.

"First, we will complete an estimation of damage models based on existing data from the upper Mississippi basin," Burton said. "Then we will

conduct a survey in order to help us determine the most effective treatment of changing flood risks. Finally, we will project comprehensive examples of various types of economic impacts that flood damages may cause."

The project, which is estimated to be completed by January 31, 2003, is expected to improve flood damage assessment by enhancing the ability to estimate transportation infrastructure damages in proportion to the total amount of flood damages.

The relationship between flood characteristics and damages to transportation infrastructure is also important to residents of West Virginia. In West Virginia and Tennessee, it is possible to observe flood conditions with

markedly different characteristics. In either location, possible variations in flows may lead to a wide array of outcomes with regard to transportation infrastructure damages.

The TVA operates a variety of facilities throughout the whole of the Tennessee River watershed through which it affects the flows of both navigable and non-navigable waterways. Experience suggests the proportion of total event damages attributable to transportation infrastructure destruction may vary significantly based on the characteristics of individual floods. Specifically, floods that involve significant flows damage both transportation infrastructures and other structures.

## RTI, ARC, DOT Help Develop Statewide GIS System

by Lori Smith and Errin Jewell

RTI and the Appalachian Regional Commission (ARC) have teamed up to convert the contents of the "2002 Estimate of the Cost to Complete the Appalachian Development Highway System in the State of West Virginia, April 2002" into a format that will allow maps and data to be analyzed by Geographical Information Systems (GIS) Software.

"This project will result in a product that will display mapping and aerial photography strip maps, which can be related to estimate segments and their related tables as well as development status," Sean Litteral, Research Associate-GIS, Data/Technology Manager, said.

The project involves three specific tasks. The first major task involves creating a new, more accurate digital inventory of Appalachian Highway Development System (ADHS) corridors with National Map Accuracy Standards. The second task is to design integrated State ADHS maps complete with corridor strip maps following the April 2002 project for both types of maps. The third task is to query the data values for individual estimates provided by the project.

Litteral said, "The current research project will benefit West Virginia in two important ways. First, it will identify specific opportunities to make better use of the ADHS as an economic development tool. Secondly, the study will help the



State's policy makers view West Virginia's transportation challenges within the context of



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Winter 2003 Research



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## Intelligent Transportation Systems Technology Fair



*Top from left to right: Jason Conley; David Stewart, Bob Plymale, Jeff Paniati; Nick J. Rahall, II; Dan Angel; Fred Van Kirk; Charlotte Weber; David Lieving; John Ruddick. Below: Luncheon keynote speaker Jeff Paniati; Bottom: Congressman Nick J. Rahall, II.*

RTI, in conjunction with Congressman Nick Rahall, hosted the first Intelligent Transportation Systems (ITS) Technology Fair at the Marshall University Student Center, Monday, Oct. 7, 2002.

Leading ITS companies from throughout the United States exhibited their products and technologies during the event. Students and visitors had the opportunity to network and speak with appropriate exhibitors.

During a network luncheon sponsored by Verizon, Congressman Rahall, Marshall University President Dan Angel and ITS Joint Program Office Program Manager Jeff Paniati addressed the role of ITS Technology in current research.

Other events included an ITS panel discussion in which Michael Hicks, Moderator, MU Center for Business and Economic Research; Jason Conley, ITS America; Tom McChesney, Strictly Business Computer Systems, Inc.; and Richard Begley, RTI; spoke about RTI's future research projects and activities.



### Exhibitors:

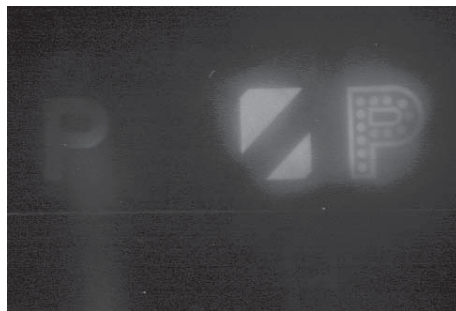
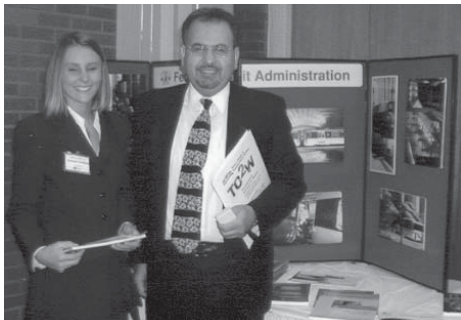
- Computer Recognition Systems, Cambridge, Md.
- Control Technologies, Stanford, Fla.
- Federal Highway Administration, Charleston, W.Va.
- Federal Transit Administration, Washington, D.C.
- Huntington District Corps of Engineers
- ITS America, Washington, D.C.
- ITS Mid-America, Columbus, Ohio
- Meadow River Enterprises, Inc., Lewisburg, W.Va.
- Navigation Technologies, Fairfax, Va.
- Quixote Transportation Safety, Chicago, Ill.
- Smartek Systems, Arnold, Md.
- Strictly Business Computer Systems, Inc., Huntington, W.Va.
- TRW, Kettering, Ohio
- The Transit Authority (TTA), Huntington, W.Va.
- MU Center for Business and Economic Research, Huntington, W.Va.
- MU College of Information Technology and Engineering, Huntington, W.Va.
- Marshall Community and Technical College, Huntington, W.Va.
- MU Forensic Science Center, Huntington, W.Va.







*ITS Technology Fair Exhibitors Clockwise from Top Left: Computer Recognition Systems; Navigation Technologies; Huntington District Corps of Engineers; Meadow River Enterprises; Federal Highway Administration; Quixote Transportation; Federal Transit Administration; Federal Highway Administration; Control Technologies*





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*ITS Technology Fair Exhibitors Clockwise from Top Left: ITS Mid-America; The Transit Authority; Marshall University College of Information Technology and Engineering; MU Center for Business and Economic*

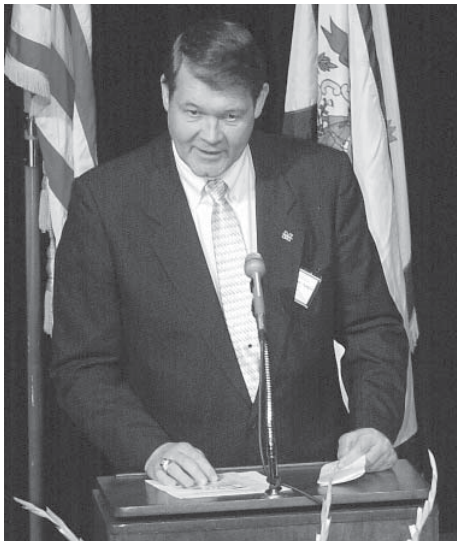


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*ITS TECHNOLOGY FAIR. Clockwise from top left: Jason Conley of ITS America speaks during the panel discussion; RTI Director Bob Plymale addresses conference attendees; RTI Technology Transfer Specialist Pam Hamilton describes RTI programs to Marshall Alumnae Janice Conley; IT professionals visit the RTI display; Marshall University President Dr. Dan Angel speaks during the*



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## RTI Student of the Year: Nathan

by Errin Jewell

Nathan Bowe of Glasgow, W.Va., was selected RTI's 2001-02 Student of the Year for his outstanding contributions to RTI research and education projects.

"Nate's skills and expertise with Geographical Information Systems (GIS) were critical to the success of several research projects and helped RTI gain recognition as a state of the art GIS resource provider for the transportation industry," RTI director Bob Plymale said. "This recognition helped create additional project support from agencies in West Virginia and other states' Departments of Transportation."

Bowe also developed West Virginia's first statewide highway GIS system, which has been expanded to include the Appalachian Development Highway System outside the state. Bowe's participation in formal presentations and demonstrations for transportation professionals contributed to the success of that project and led to software customizations for end users.

Bowe began working for RTI May 2001 after he graduated from



Marshall University with a BS in Environmental Science. His first project as a Graduate Research Assistant was to assist a team of Principal Investigators on a project titled *Endangered Species Identification along Roads Planned in West Virginia Using Geographic Information Systems and Remote Sensing Technologies*. After collecting field data on locations of suspected endangered species using Global Positioning System technologies, Bowe set up a GIS system for storing, viewing and analyzing the data. He has also assisted faculty members in developing and teaching remote sensing and GIS courses.

Nate will soon complete a Master of Science in Physical Science with an Emphasis in Transportation Systems and the Environment.

## Courses Prepare Students to Manage Off-Highway Vehicle Trails,

by Lori Smith

Marshall University's Park and Leisure Services department, in cooperation with RTI, now offers a series of undergraduate and graduate courses to instruct students and professionals to plan, construct, operate and manage off-highway vehicle trails and facilities.

"Our goal is to complete a series of courses in which graduates or undergraduates can minor or take as electives," Dr. Raymond Busbee, Assistant Director, Program Development and Management, said.

Two graduate and 13 undergraduate students have registered for the first course, PLS 540/440 Off-Highway Vehicle Recreation in America, Busbee said.

The course integrates off-highway vehicle recreation concepts, supply and demand concerns, research trends and legal and management issues. Two other courses, "Planning, Development and Construction of Off-Highway Vehicle Trails and Facilities," and "Operation Management of Off-Highway Vehicle Trails and Facilities," are under development.

## ECN 650 Introduces Processes for Managing Transportation of

by Lori Smith

Marshall University Graduate College is offering a new course Spring 2003 titled ECN 650 Introduction to Transportation and Logistics.

RTI Principal Investigator Mark Burton will teach the course, which is designed to provide a graduate-level introduction to processes for

managing and transporting inventories of raw materials, intermediate goods and finished products.

"Freight transportation and the effective management supply chains are essential, but often overlooked components of efficient commerce," Burton said. "I hope to provide my students with a wide array of knowledge

on this subject. Thus, I am going to present the content of this course from three distinct perspectives: that of shippers, transportation carriers and policy-makers."

For more information contact Burton at [burtonm@marshall.edu](mailto:burtonm@marshall.edu).



## Transportation Professionals Gain Knowledge, Earn CEUs at 'Railroad and Highway Traffic Safety and Operations' TPD

by Wendy Anderson

Professionals from the transportation and railroad industries explored the basic aspects of design, construction, maintenance and temporary traffic control issues during a "Railroad and Highway Traffic Safety and Operations" Transportation Professional Development seminar Nov. 19-20, 2002, at Cacapon State Park, Berkley Springs, W.Va.



Participants were provided information that allowed them to become aware and understand the mission and organization of railroad companies and state highway agencies; understand the physical and operational characteristics of railroad locomotives or cars and highway vehicles; understand normal maintenance practices employed by

the railroad and state highway; be aware of the basic principles of highway traffic control devices and railroad signaling devices; and be able to identify and establish key communications between the two entities.

Participants also received Continuing Education Units (CEUs) for completing the course.

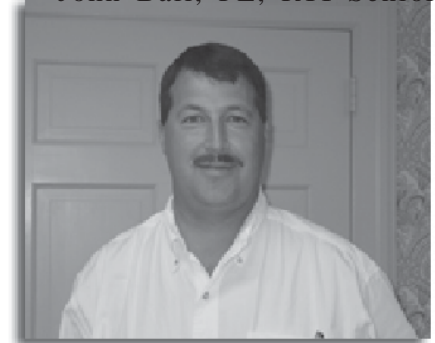
RTI, CSX, Norfolk Southern Corporation,

West Virginia Department of Transportation, West Virginia Department of Highways, Federal Highway Administration and Marshall University Division of Environmental Science and Safety Technology sponsored the TPD, which will be repeated March 18-19, 2003, at the Holiday Inn on the Hill, Bluefield, W.Va. Register online at [www.marshall.edu/rti](http://www.marshall.edu/rti) or call (304) 696-7098.

## "Future of Transportation in W.Va." Explored at WVUIT ASCE 38th Annual Fall Technical Conference by RTI PE

by Wendy Anderson

John Ball, PE, RTI Senior



Program Engineer, presented the "Future of Transportation in West Virginia" during the 38th Annual Fall Technical Conference at West Virginia University Institute of Technology in Montgomery, W.Va.

The conference took place Nov. 21, 2002, in conjunction with the American Society of Civil Engineers and RTI.

"The conference was a success, and it is always good to return to my alma mater and see the next generation of engineers. They are literally the future of transportation, not only for West Virginia, but for the United States," Ball said.

Engineers and industry professionals also discussed topics such as the, "Liability of Design Professionals," "Application of Corrugated Metal and Plastic Products to Highway Drainage," and "Hydraulic and Scour Studies for the Proposed U. S. Route 50 Bridge over Blennerhasset Island."

WVUIT engineering students

## Transportation Seminar Presents Solutions to Waste Tire Problem

by Wendy Anderson

The focus on waste tire accumulation sites has taken on some urgency with the recent spread of West Nile virus, which is transmitted by mosquitoes that may use abandoned tires as breeding sites. As a result, the public health community is aware of the need for an inventory of tire accumulation sites and strategies for monitoring sites for potential mosquito vectors.

Researchers and professionals from government agencies, private industries and higher education institutions examined the issue during "Waste Tire Remediation in W.Va.: Associated Economic and Public Health Impacts," Oct. 24, 2002, in South Charleston, W.Va.

During this transportation seminar, some personnel responsible for overseeing abandoned tire cleanup programs and protecting public health; private businesses that deal with waste tires; and industries that are contemplating strategies for alternative uses of waste tires discussed methods of locating potential mosquito breeding grounds and cleaning up, disposing of or recycling waste tires.

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## TO<sup>2</sup>W Introduces Transportation Careers, Technologies to Students

by Wendy Anderson

Pre-K through high school students are introduced to transportation-related careers and learn the basics of transportation technologies through RTI's Transportation Outreach on Wheels (TO<sup>2</sup>W) program.

Since 1999, Dr. Bill Carter, professor of education at Marshall University, has guided pre-service teachers in instructing more than 2,000 students in West Virginia, Kentucky and Ohio at TO<sup>2</sup>W workshops and activities.

Students ages 3-5 learn basic transportation concepts by assembling vehicles, tracks and cargo carriers from pictorial charts and LEGO DUPLO blocks. These pre-K students move "cargo" from various locations while factoring time, distance and weight into the transportation process.

Elementary school students (ages 5-8) receive transportation-related "story challenges," which must be solved using LEGO DUPLO blocks. The students use LEGO CAD software to design vehicles or simple machines, which contain gears, levers or pulleys to solve the "story challenges."

Older students assemble vehicles and traffic control components from LEGO DACTA kits and install RCX microcomputers, light sensors, digital timing devices and motors. Using ROBOLAB software, middle school students write computer programs and download them to the RCX-equipped vehicles and traffic control devices.

High school students explore careers in automobile assembly, engineering, manufacturing, computer pro-



gramming, education, transportation and robotics while learning the basics of LEGO CAD, ROBOLAB, RCX programming and teleoperation.

Pre-service teachers who participate in the TO<sup>2</sup>W program also benefit by gaining valuable teaching experience.

Nathan Estel, who is pursuing a Master of Arts in Teaching, said, "The TO<sup>2</sup>W program has allowed me to gain experience I will use in the classroom. TO<sup>2</sup>W places me in front of a diverse audience to which I must adapt my speaking styles and instructional methods. This experience has chal-

## Pre-K Students Learn to Construct Roads, Intersections through RTI Outreach Program

by Wendy Anderson

Thirteen four-year-old students from the Child Development Academy at Marshall University participated in RTI's "On the Road With the Little Lambs" program Aug. 13-14, 2002.

RTI graduate assistants and MU pre-service teachers led students from the "Little Lambs" class in discussions including the history of roads and vehicles construction. After students were informed of various transportation professions, the students constructed vehicles that reflected

transportation careers to which they said they would like to aspire.

The "Little Lambs" were supplied materials such as gravel, sand, soil and water, with which they created model roads for various types of vehicles.

RTI instructors also carried the transportation theme into snacktime by helping students make transportation-related snacks, including tires and wheels made from crackers, cheese and other foods.

*Right: Pre-service teacher Jessica Tingler helps pre-K students create vehicles used by transportation professionals.*





We welcome your questions and input!

RTI wants your input on future research topics and activities including:

- Intermodal Transportation
- Transportation Professional Development Courses
- Transportation and Economic Development
- College Degree Programs or Courses

To submit your feedback, call us at (304) 696-7098 or click

### Upcoming Events at RTI

#### Conferences

##### March 27-30, 2003

RTI co-sponsors 2nd Annual National OHV Program Managers & NOH-VCC; Charlotte, N.C.

#### Transportation Professional Development Courses

##### March 13, 2003

Evaluating Security Technology; MUGC, South Charleston, W.Va.

##### March 13, 2003

Improve the Quality Of Your Guard Force Contract; MUGC, South Charleston, W.Va.

##### March 18-19, 2003

Railroad and Highway Traffic Safety and Operations; Holiday Inn on the Hill, Bluefield, W.Va.

##### March 21, 2003

Managing Critical Incidents Threat Assessment and Explosives; MUGC South Charleston, W.Va.

##### April 7 & May 2, 2003

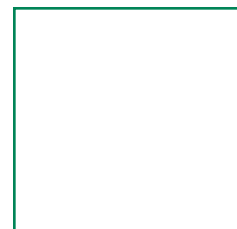
Railroad Conductor Training Program (First Day of Class); Cabell County Career Technology Center; Huntington, W.Va.

Register online at [www.marshall.edu/rti](http://www.marshall.edu/rti) or call Sandra Jones at (304) 696-7098.

UPCOMING EVENTS



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