



# ROADTALK

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## TDOT Continues Traffic Sign Grant Program for Small Communities

by Matt Cate

Traffic signs give drivers valuable information that they need to travel safely everyday. While each of us appreciates the importance of these signs, they are often neglected due to a lack of funding or time. Even if the right sign is installed in the proper location, the sign has a limited service life. Many signs that appear adequate in daylight may have little or no reflective quality at night. Some signs are in place so long that the color has faded away, leaving us with pink or white stop signs, among others. The burden of continuing traffic sign maintenance can be especially heavy for small communities. Realizing that this problem exists in areas across the state, TDOT has developed a grant program designed to improve highway safety in

small communities across the state by offering assistance in the form of regulatory and warning signs for their roadways.

For towns with a population under 5,000 and counties under 30,000, TDOT has a grant program that offers up to \$10,000 to be used for the purchase of traffic signs and mounting hardware. As a match to the state's grant funds, the local agency provides its own installation labor. There is also an option for grant recipients to purchase a package of recommended work zone traffic control devices, including drums, signs, and stop/slow paddles. Due to the safety emphasis of this program, street name signs are not eligible for the grant.

### What it is:

TDOT Regulatory and Warning Traffic Sign Grant Program. The grant provides up to \$10,000 per recipient.

### Who is eligible:

Cities with a population of less than 5000, counties with a population of less than 30,000. Applicants must be in compliance with the National Bridge Inspection Program. Some previous recipients of the grant may be eligible; contact Diana Collins for details.

### What is funded:

Regulatory and Warning signs and mounting hardware (posts, nuts and bolts, etc.). Street name signs are not covered under this grant program. The city or county must provide the labor to install the signs.

### How to apply:

Call Diana Collins with TDOT at (615) 253-2419.

## TTAP Welcomes New Director



Dr. Stephen H. Richards, Executive Director of the Center for Transportation Research (CTR), recently announced the appointment of Dr. David B. Clarke, P.E. to the position of Director of the Tennessee Transportation Assistance Program (TTAP). Dr. Clarke brings to TTAP almost 22 years of experience in the transportation field, including work as an educator, researcher, and practitioner. He is delighted to return to the "true" orange of UT after some 5-1/2 years on the faculty at

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# ROADTALK

is a publication of the Tennessee Transportation Assistance Program (TTAP). TTAP is part of a nationwide Local Technical Assistance Program (LTAP) financed jointly by the Federal Highway Administration (FHWA) and Tennessee Department of Transportation (TDOT). Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation to local highway and transportation personnel.

The views, opinions, and recommendations contained within this newsletter are those of the authors and do not necessarily reflect the views of FHWA and TDOT.

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## From the Director

As mentioned in page 1, I am TTAP's new director and I am glad to be back in Tennessee. I would like to thank Robert Russell for his excellent contributions to TTAP as interim director for the past year and I know that we will continue to do our best to serve the Tennessee transportation personnel.

We are pleased that TDOT is continuing its Traffic Sign Grant Program for Small Communities. The article on page 1 will give you all the information as to how you can apply for the grant.

Please reserve 8 and 9 September, 2004 for the Eastern Winter Road Maintenance Symposium.

Once again, I am glad to be on board. Please let me know if my staff and I can provide you any training or technical assistance.

David Clarke

## Eastern Winter Road Maintenance Symposium & Equipment Expo September 8 & 9, 2004 in Knoxville, TN

Following the "Blizzard of 1996," which nearly paralyzed transportation in America's Eastern States, the Federal Highway Administration (FHWA) set out to provide a forum for the expedient exchange of information and technologies available to combat the effects of winter's wrath. The resulting **Eastern Winter Road Maintenance Symposium & Equipment Expo**—held annually in September—is targeted at Winter Maintenance managers and other public works practitioners from cities, townships, counties, and states (as well as other public agencies and private sector partners) east of the Mississippi River.

Through this effort, we hope to bring the most up-to-date information on equipment, materials, and technology closer to you and your colleagues. It is also intended to serve as a companion to the American Public Works Association's (APWA) **Western Snow & Ice Conference** held annually in Colorado in late September. Through these efforts, snow/ice management forces all over the nation will be provided with ideal opportunities to gain insight as to the best practices, materials, and equipment available and to compare notes with their peers from other states with similar (as well as widely different) experiences to improve operations and the transfer of information

nationwide, as well as reduce costs.

Since 1996, this event has been held in Washington, DC., Hagerstown, MD, State College, PA, Albany, NY, Roanoke, VA, Worcester, MA, Charleston, WV and Manchester, NH and provided more than 10,550 practitioners with exposure to the latest in winter maintenance technology and applications. Last year's event, held in Manchester, NH, had more than 1,000 participants.

This September, the event is moving to the Knoxville Convention Center, since the Tennessee

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# Elvis' Hometown Braces for "A Whole Lot of Shaking"

by Becky Jaramilla, PE; FHWA - TN Division

In Memphis, Tennessee, the Hernando DeSoto Bridge, which carries Interstate 40 over the Mississippi River, sits over the southeast edge of the New Madrid Seismic zone. The New Madrid Fault System running 120 miles from Illinois to Arkansas is considered to be the highest earthquake risk in the United States outside of the West Coast. In 1811-1812, the Great New Madrid Earthquake sent a series of shocks for five months, which rang church bells on the eastern seaboard.

The Hernando DeSoto Bridge is a vital link for transportation, commerce and defense needs. The bridge was designed and built in late 1960's with very little seismic protection and therefore would not be serviceable if a damaging earthquake occurred. After consideration of potential national and regional impacts resulting from closure of the I-40 Mississippi River Bridge, it became a high priority of the Federal Highway Administration (FHWA), Tennessee Department of Transportation (TDOT) and Arkansas State Highway and Transportation Department (AHTD) to provide a seismic retrofit on this structure.

## Seismic Performance Goals

Three major seismic performance goals were established:

- I. The bridge must remain operational and serviceable after the maximum probable "Contingency Level Earthquake" which was established to be a 2500 year return period (or a 2% chance of occurrence in 50 years).
- II. Closure of the bridge for inspection after a major seismic event should be limited to 2-3 days.
- III. Any damage found on the bridge after a major seismic event during inspection should be minimal and repairable under traffic.

## Description of Existing Bridge

The Hernando DeSoto Bridge was originally designed for only wind forces; earthquake loads were not considered. The existing bridge is a total of 3.3 miles long and contains 164 spans, 160 piers, and 10 abutments. The main spans over the channel consist of two tied arch truss spans and five steel box girder spans. The approaches and connecting ramps to the West consist of prestressed concrete I beams and steel plate girders. To the East, the approaches and connecting ramps consist entirely of steel plate girders.

The original expansion joints allowed only limited longitudinal movement, and no transverse movement.

The existing bearings were tall and poorly braced.

## Retrofit Design Strategies

Two retrofit strategies were considered. The first was the traditional "strength and ductility" retrofit strategy which takes the basic approach of adding strength to bridge components in order to transfer all loads through the entire system. This approach required extensive strengthening or complete replacement of numerous bridge components.

The second seismic retrofit strategy considered combines strength, ductility and isolation. In general, isolation strategies limit the structural stresses on the bridge components while potentially increasing displacements. When compared to estimates using the strength and ductility approach, isolation strategies yielded a 40% reduction of construction costs.

Because there was significant cost savings without compromising structural safety or serviceability, FHWA, TDOT and the AHTD selected the Isolation Strategy for the Hernando DeSoto Bridge seismic retrofit design.

*continued on page 4*



Overview of Bridge Looking North

### Design Features Overview

Using the isolation as the retrofit approach, the major design features included: replacement of existing bearings with isolation bearings, footing strengthening, column strengthening, column cap enlargement, webwall modifications, replacement or strengthening of lateral bracing, strengthening of steel cross frames, truss strengthening and replacement of existing joints with modular swivel expansion joints.



Column Cap Retrofit

### Isolation Bearings

Two types of isolation bearings were used in the seismic retrofit of the Hernando DeSoto bridge: friction pendulum bearings and lead rubber bearings. Friction pendulum bearings are on the leading edge of innovative seismic design. Currently, the Hernando DeSoto Bridge incorporates the largest vertically loaded friction pendulum bearings in the world. The largest of these bearings can withstand more than 1.3 million lbs of lat-

eral seismic force. Twelve lead rubber bearings have also been utilized in the Hernando DeSoto Bridge retrofit. Lead rubber bearings have been installed on over 100 Bridges and 70 Buildings and have proven their effectiveness over the years. These bearings can withstand a 550,000-lb lateral load and a lateral displacement of 22.5" during an event.

### Current Construction Status

Retrofit construction on the Hernando DeSoto Bridge began in December of 1999. To date close to \$72 million of combined state and federal funds have been let to contract for this project and it is

expected to take an additional \$102 million to complete. Work on the bridge has already made this project a pioneer in seismic design and construction. Once the retrofit is complete, the Hernando DeSoto Bridge will safely endure an earthquake with a magnitude of 7 on the Richter scale with little to no damage.

If you have any questions you can contact Becky Jaramilla, PE. Becky is with the FHWA-TN Division, Tel: 615-781-5758 or email [rebecca.jaramilla@fhwa.dot.gov](mailto:rebecca.jaramilla@fhwa.dot.gov).

Department of Transportation (TDOT) and TTAP have volunteered to co-host the 9th Annual Eastern Winter Road Maintenance Symposium and Equipment Expo with the FHWA. This year's event is scheduled to be held September 8 and 9. The annual event offers:

- 1) Breakout sessions on the state-of-the-practice in anti-icing
  - \* The latest in winter maintenance techniques
  - \* New products, equipment, and other tools
  - \* Emergency communications with the public, the media, between jurisdictions, within organizations
  - \* How to plan for and direct all aspects of storm management
- 2) A grand display of both heavy and light-weight equipment as well as the latest winter maintenance technology and available products in the exhibit hall.

**Attendee registration for this event is free**, so make plans now to attend.

Visit the Eastern Snow Expo website for additional program: [www.easternsnowexpo.org](http://www.easternsnowexpo.org), or contact TTAP at 1-800-252-ROAD or at our website [TTAP@utk.edu](mailto:TTAP@utk.edu).



Clemson University, where his responsibilities included teaching transportation engineering courses at the graduate and undergraduate levels and performing transportation research. During the 1990s, Dr. Clarke spent 8-1/2 years at the CTR in a number of roles, including administration of the Tennessee Department of Transportation's research program, manager of the CTR's Pellissippi Research Office, and as investigator in a number of research projects. He was previously employed as an engineer at Science Applications International Corporation and Bechtel Corporation.

Dr. Clarke received B.S., M.S., and Ph.D. degrees in Civil Engineering (transportation emphasis) from the University of Tennessee. He is active in numerous technical organizations, including the Transportation Research Board, the American Society of Civil Engineers, the Institute of Transportation Engineers, and the American Railway Engineering and Maintenance of Way Association. He is a registered professional engineer in Tennessee and South Carolina.

Highways have been a focus of much of Dr. Clarke's research and teaching experience. He regularly taught traffic engineering, roadway

design, and transportation planning while at Clemson. His research has included such diverse areas as pavement performance, work zone traffic flow, pavement marking retroreflectivity, and highway safety analysis. Dr. Clarke is no stranger to the technical assistance mission. He has taught short courses for both TTAP and the South Carolina LTAP center. He has also been involved in technology transfer activities resulting from his research and is eager to resume working with the roadway community in Tennessee.

## Materials from TTAP



TTAP has received CDs and publications from a variety of sources. As part of TTAP's mission to provide information on the latest materials and techniques being used in transportation field, we make these materials available to you, the city and county transportation officials of Tennessee. We have multiple copies of some materials, while others can only be loaned for short-term use. A complete listing can be found on our website [ctr.utk.edu/ttap/](http://ctr.utk.edu/ttap/). If you have an interest in any of the materials listed below, please contact Denczil Rolle at 1-800-252-ROAD or (865) 974-5255.

Publications	Author	Date
Avoiding Utility Relocations	USDOT	2002
Effects of Geosynthetic Reinforcement Spacing on the Performance of Mechanically Stabilized Earth Walls	FHWA	2003
Long-Term Performance of Corrosion Inhibitors Used in Repair of Reinforced Concrete Bridge Components	FHWA	2003
NACE Action Guide Volume III-4: Roadway Safety	NACE	2000
NACE Action Guide Volume III-5: Stormwater Management and Drainage	NACE	2000
NCHRP Report 492: Roadside Safety Analysis Program (RSAP) - Engineer's Manual	NCHRP	2003
NCHRP Report 499: Effects of Subsurface Drainage on Performance of Asphalt and Concrete Pavements	NCHRP	2003
NCHRP Report 501: Integrated Safety Management Process	NCHRP	2003
NCHRP Report 504: Design, Speed, Operating Speed, and Posted Speed Practices	NCHRP	2003
NCHRP Synthesis 311: Performance Measures of Operational Effectiveness for Highway Segments and Systems	NCHRP	2003
NCHRP Synthesis 318: Safe and Quick Clearance of Traffic Incidents	NCHRP	2003
Remote Sensing for Transportation; Products and Results: Foundations for the Future	TRB	2003
Videos		
On Again, Off Again: A Guide to Mounting and Dismounting Heavy Equipment	PERI	2003
Getting Across: Passage of Aquatic and Semi-Aquatic Organisms at Road-Stream Crossings	USDA Forest Service	2003
The Forgiving Highway	Energy Absorption Systems	
Crash Comparison	Energy Absorption Systems	



**Education and training opportunities** are available through The University of Tennessee Center for Transportation Research (CTR), Southeast Transportation Center (STC), and Tennessee Transportation Assistance Program (TTAP). This listing of courses currently available includes both TTAP and TATE courses that are offered in conjunction with The University of Tennessee Department of Civil and Environmental Engineering and the Tennessee Section of the Institute of Transportation Engineers. Local roadway departments can benefit from all of the workshops. Because of this, we ask that you please share this listing with others who might be interested in our workshops. The Center for Transportation Research is always eager to meet your research and training needs. If you have a special course in mind or would like a course held on site especially for your employees, please contact Annette Jones at 1-800-252-ROAD.

**\*CEU and PDH credit hours available.**

TITLE	DATE	LOCATION	INSTRUCTOR(S)
Design of At-Grade Intersections	Feb 02, 2004	Knoxville	Childers
Work Zone / Flagging	Feb 11, 2004	Chattanooga	Kervin
Work Zone / Flagging	Feb 12, 2004	Knoxville	Kervin
Traffic Signs & Pavement Markings	Feb 24, 2004	Jackson	Kervin/ Brunelle
<del>Road Surface Management System (RSMS) for Beginners</del> <b>CANCELLED</b>	<del>Mar 01, 2004</del>	<del>Jackson</del>	<del>Cate/Brewer</del>
Storm Water Drainage	Mar 04, 2004	Chattanooga	Kervin
Innovations Applications of Cement & Concrete	Mar 10, 2004*	Knoxville	Various
Advanced Roadway Surveying	Mar 25-26, 2004	Jackson	Kervin
Innovations Applications of Cement & Concrete	Mar 30, 2004*	Jackson	Various
	Mar 31, 2004*	Memphis	Various
Basic Roadway Surveying	Apr 08, 2004	Knoxville	Kervin
Context Sensitive Highway Design	Apr 22, 2004	Nashville	Norm Johnson
Millennium Edition of the MUTCD: Revision 2 Significant Changes	Apr 27, 2004	Jackson	Brunelle
Millennium Edition of the MUTCD: Revision 2 Significant Changes	Apr 29, 2004	Chattanooga	Brunelle
Traffic Engineering 2	May 12-14, 2004	Nashville	Wegmann/Chatterjee/Han
Pavement Design	May 17, 2004	Chattanooga	Huang
Road Surface Management System (RSMS) for Beginners	Sept 08, 2004	Nashville	Cate/Brewer
Design of At-Grade Intersections	Sept 13, 2004	Nashville	Childers
Advanced Roadway Surveying	Sept 20-21, 2004	Nashville	Kervin
Roadside Design Guide	Sept 29, 2004	Chattanooga	Brunelle
Work Zone/Flagging	Oct 04, 2004	Jackson	Kervin
Work Zone/Flagging	Oct 05, 2004	Nashville	Kervin
Pavement Design	Oct 14, 2004	Jackson	Huang
Storm Water Drainage	Oct 25, 2004	Nashville	Kervin
Asphalt Pavement Patching	Nov 08, 2004	Knoxville	Hearn
Asphalt Pavement Patching	Nov, 09, 2004	Nashville	Hearn
Traffic Signs & Pavement Markings	Nov 16, 2004	Nashville	Kervin/Brunelle
Traffic Engineering 1	Dec 13-15, 2004	Nashville	Wegmann/Chatterjee/Han

**\*Add on - not listed in catalog**

# TTAP Training Review

by Frank Brewer

Thank you for attending TTAP Courses. Who, you ask? Well, 529 of you from across the state that's who. These folks attended 26 courses during 2003. We had a varied mix of topics. Of the 26, seven of the



Tracy Meggs from Jackson receives her TATE certificate.

courses were TATE courses which allowed nine persons to complete their TATE program. We at

TTAP are very pleased with the turnout for our program. Thank you for your participation.

TTAP is offering some new courses this year. Context Sensitive Design, Traffic Signs and Pavement Markings, Asphalt Pavement Design, and Intersection



Attendees create a table-top work zone example

Design are now available. Please consult the course listings at our

website: [ctr.utk.edu/ttap](http://ctr.utk.edu/ttap) or call us at 865-974-5255. If you are outside of the 865 calling area you may dial 800-252-7623. We will be offering some familiar courses as well, such as Work Zone/Flagging, Traffic Engineering, Roadway Surveying, and others. If you have any questions please contact us. Check our website for future courses. See you there.

## TALK TO TTAP

We are always looking for your comments, ideas and suggestions to help make the TTAP program more useful to you.

1. Please send me more information on the following articles mentioned in this newsletter.

\_\_\_\_\_

\_\_\_\_\_

2. Please list any additional training workshops you would be interested in attending.

\_\_\_\_\_

\_\_\_\_\_

3. Please list topics for videos you would like TTAP to obtain.

\_\_\_\_\_

\_\_\_\_\_

4. Please list any other ideas or suggestions on how TTAP could assist you.

\_\_\_\_\_

\_\_\_\_\_

5. Please list your name and organization to verify for TTAP's mailing list.

Name \_\_\_\_\_

Address \_\_\_\_\_

Title \_\_\_\_\_

Organization \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_

Are you currently on TTAP's mailing list?  yes  no

Do you wish to be on the mailing list?  yes  no

Please fax your form to TTAP at (865) 974-3889 or mail to TTAP; Suite 309 Conference Center Building; Knoxville, TN 37996-4133.

FROM: \_\_\_\_\_

Tennessee Transportation Assistance Program  
Center for Transportation Research  
The University of Tennessee  
Suite 309 Conference Center Building  
Knoxville, TN 37996-4133  
Tel: 865-974-5255/1-800-252-ROAD  
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Non-Profit Org.  
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E-mail: [TTAP@utk.edu](mailto:TTAP@utk.edu)  
Web: [ctr.utk.edu/ttap](http://ctr.utk.edu/ttap)



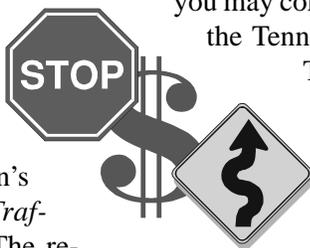
Federal Highway  
Administration



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### Sign Grants Available from TDOT, continued from page 1

Once a city or county has been approved for the grant and placed on the waiting list, TTAP will perform a sign inventory in the community. The survey identifies the existing signs and includes recommendations for changes and additional signs in compliance with the Federal Highway Administration's *Manual on Uniform Traffic Control Devices*. The recipient is sent a list of signs that may be added or replaced and a set of maps identifying the location of each sign. The recipient is re-



imbursed up to \$10,000 for the actual cost of all signs and hardware purchased from the list of eligible signs.

If you interested in obtaining a traffic sign grant for your community, you may contact Diana Collins with the Tennessee Department of Transportation at (615) 253-2419. Applicants are awarded funding on a first-come, first-served basis. If applications for the current year exceed available funding, the remaining communities will be funded in the following year.

## Visit these websites to find out more about:

**NATIONAL WORK ZONE  
AWARENESS WEEK  
(APRIL 4-10, 2004)**  
[http://www.atssa.com/  
pubinfo/nwzaw.htm](http://www.atssa.com/pubinfo/nwzaw.htm)

**NATIONAL  
TRANSPORTATION  
WEEK (MAY 16-22, 2004)**  
<http://www.ntweek.org/>

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