



# ROADTALK

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THE UNIVERSITY OF TENNESSEE 

## Tennessee's Strategic Highway Safety Plan

by Dr. David Clarke, P.E.

During the period 1998-2002, motorists in Tennessee were involved in an average of 170,000 reported annual crashes. In 2002, these crashes resulted in 74,814 injuries and 1,177 fatalities.



Tennessee's fatality rate was 1.72 fatalities per 100 million vehicle miles traveled (VMT), exceeding the national average rate of 1.50. According to a study conducted by the U.S. Department of Transportation, Tennessee's 2002 economic loss due to traffic crashes exceeded \$4.6 billion.

Clearly, highway crashes are a major health and economic issue in our state. Addressing this issue is the priority of a team of agen-

cies from various levels of government. The Tennessee Strategic Highway Safety Committee consists of the Departments of Transportation and Safety, the Governor's Highway Safety Office, the Nashville Metro Police Department, the Federal Highway Administration, and the Federal Motor Carrier Safety Administration. The formal mission of the Committee is to reduce—through coordination of education, enforcement, engineering, and emergency response initiatives—the number of

crashes that result in fatalities, injuries, and related economic losses on Tennessee's roadways. In November 2004, the Committee issued a Strategic Highway Safety Plan that presents the planned approach for improving highway safety in Tennessee. The goal of the plan is to effect a 10 percent reduction in the traffic fatality rate by fiscal year 2008-2009. To accomplish this goal,

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## Roadway Safety Tools for Local Agencies

The Transportation Research Board's (TRB) National Cooperative Highway Research Program (NCHRP) has issued a synthesis of highway practice that will be of great interest to local agencies. TRB's Synthesis 321: Roadway Safety Tools for Local Agencies examines the safety tools and procedures that are practical and relatively easy to apply, and that can be implemented by agencies with limited financial support and personnel. Recognizing the wide variation in the operations and responsibilities of local agencies, the report acknowledges that the level of expertise in transportation safety analysis also varies greatly. The report can be viewed and downloaded at [http://gulliver.trb.org/news/blurb\\_detail.asp?id=2393](http://gulliver.trb.org/news/blurb_detail.asp?id=2393)

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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

By the time you all read this, Spring will be well along, with the trees leafing out and flowers blooming, and the trials of Old Man Winter will be a fading memory. However, with the onset of warmer weather, the job jar comes off the shelf. Now that the work season has begun, it's time to get those maintenance chores underway on our streets and highways. Spring rains do more than make the flowers grow. They also provide a severe test of our drainage facilities. We won't cover part 2 of the drainage series in this issue of *RoadTalk*, but inspecting and cleaning culverts, ditches, detention basins, and other elements of the stormwater system should be a regular part of spring roadway housekeeping. We also can start to examine the condition of road surfaces and make plans to correct any deficiencies. Crack sealing, pot patching, and other maintenance chores extend the life of the pavement and result in a better ride quality. Examine signs and pavement markings to ensure that they are clearly visible, properly reflective, and in good condition. Finally, take note of vegetation that is encroaching on the roadway and plan for removal or herbicide treatment. Yes, Spring brings a lot of chores, but the result will be a safer and longer lasting roadway, and that's what we're all about!

Speaking of safety, this issue of *RoadTalk* describes Tennessee's new Strategic Highway Safety Plan which outlines goals for reducing fatal crashes. Local roadways account for a significant portion of highway fatalities statewide. Attention to roadway safety at the local level can go a long way towards meeting goals set forth in the plan.

Have a safe and prosperous Spring! Call us if we can help you in any way.



## Free Technical Assistance

by Matt Cate

It seems like we're always running into people who aren't aware of TTAP's free technical assistance services. Part of TTAP's mission is to provide transportation-related technical assistance at no cost to cities and counties across the state of Tennessee. Some of the issues that we are asked to address can be handled with a quick phone call or an email. A question regarding the proper use of a warning sign or other traffic control devices can often be addressed by faxing a copy of the applicable pages from the *Manual on Uniform Traffic*

*Control Devices* with an explanation of the text. Issues related to roadway drainage or safety are evaluated after visiting the location. Regardless of the amount of time devoted to a technical assistance request, the cost to the agency is the same: **it is free.**

The only restrictions that we place on this service are that: 1. the request must address a roadway or other transportation-related issue, 2. the request must be made by a city or county agency within the state of Tennessee, and 3. TTAP cannot serve as consulting engineers. Rule number three is especially important,

as TTAP seeks to provide "assistance" to the local agency, often asking for some type of local participation.

While we will never turn away a technical assistance request that is within the scope of our program, our services are allocated on a first-come, first-served. If you have a problem that has been bugging you, or if something has just come up, now would be an excellent time to give us a call. TTAP can be reached by telephone at 1-800-252-ROAD (1-800-252-7623) or via email at TTAP@utk.edu.

the plan addresses the following emphasis areas:

- I. Improve Decision Making Process and Information Systems;
- II. Keep Vehicles in the Proper Lane and Minimize the Effects of Leaving the Travel Lane;
- III. Improve Intersection Safety;
- IV. Improve Work Zone Safety;
- V. Improve Motor Carrier Safety;
- VI. Improve Driver Behavior;
- VII. Safe Communities;
- VIII. Legislation; and
- IX. Training Programs.

Space limitations prevent a comprehensive review of the plan in *RoadTalk*. For those wishing to view the complete document, it is available on the internet at <http://www.tdot.state.tn.us/news/2004/pdfs/11-17-04mou.pdf>.

However, I'd like to summarize some of the key points of importance to local roadway agencies.

Emphasis area I recognizes that the identification of safety problems and the evaluation of progress towards improving safety depend upon having good information and using this information to plan and implement projects. Accordingly, the plan proposes to:

- Expand local agencies' role and resources to improve safety;
- Provide training on data analysis, updating, definitions, importance, and uses to State and local personnel;
- Increase cooperation among various public and private organizations that share responsibilities

for highway and transportation safety in Tennessee;

- Expand coordination, communication, and cooperation with the Metropolitan Planning Organizations (MPOs); and
- Institutionalize safety conscious planning to include safety criteria in the state's and MPOs' Transportation Improvement Program (TIP) processes and encourage safety conscious planning at all stages of transportation planning.

The second emphasis area focuses on keeping vehicles in travel lanes and providing a more forgiving roadside. Emphasis area III focuses on improving intersection safety. Lane departure crashes and intersection crashes account for a major portion of fatal crashes statewide. The Strategic Plan promotes strategies to identify high crash locations and to develop engineering strategies to improve safety at these locations.

The Plan recognizes work zones as high risk locations for both roadway workers and motorists. Accordingly, the Plan promotes training of roadway workers and the use of appropriate work zone traffic control measures.

The Safe Communities initiative is another important aspect of the plan for local roadway agencies. Strategies to be promoted under this emphasis area include:

- Addressing identified highway safety problems based on crash and injury data specific to each community;
- Review and prioritization of local highway safety needs;
- Streamlining the project development and approval process for state and
- local agency projects;

- Assisting local agencies to implement highway safety improvement projects;

- Inform local agencies on the importance and proper use of the Manual on Uniform Traffic Control Devices (MUTCD); and

- Inform local officials on the importance of standards and policies and liability issues when standards and policies are not followed.

At this point, you may be wondering why so much emphasis should be placed on local needs. Perhaps the following statistics will put things in perspective. Tennessee's fatal crash data for 2002 shows that 392 fatal crashes (37.1%) of 1058 statewide occurred on non-state (i.e. county and city) roads. These crashes resulted in 427 fatalities (36.3%) of the 1177 statewide. Furthermore, non-state roads account for a relatively small portion of the total travel statewide, so the rate of fatal crashes is likely higher than for the state highway system. The bottom line is that a focus on local roads will have a significant safety payoff for Tennessee's motorists. In fact, we may question whether the goal of reducing fatal crashes can be accomplished without addressing local roads. TTAP stands ready to help local roadway agencies implement the strategies outlined in the Safety Plan. We will be focusing both our future training and technical assistance activities more intensely on safety issues. Let's support the Plan's vision of having all our roadway users arrive safely at their destination!

# Preventing Run-Off-the-Road Crashes

by Matt Cate

Hopefully you have already read the article on “Tennessee Strategic Highway Safety Plan” (page 1) by Dr. Clarke explaining the new initiative taken by the Tennessee Department of Transportation (TDOT), the Tennessee Department of Safety, the Tennessee Governor’s Highway Safety Office, the Federal Highway Administration, and others to reduce the overall traffic fatality rate on Tennessee’s roadways by at least ten percent by fiscal year 2008-2009. The reason that the safety plan is so important to most of us is found in the final paragraph. More than a third of Tennessee’s traffic fatalities occur on local roadways where TDOT has no jurisdiction and

Safety: the “Forgiving Roadside”). This information is very important, but wouldn’t we really rather keep the vehicles on the road and in the proper lane to begin with? In this article I’ll give a brief recap of some options available to reduce the occurrence of lane departures.

**Rumble Strips:** We’ve all seen the rumble strips cut into the shoulder of interstate highways and chances are good that you’ve also heard them. These rumble strips work very well on high-speed highways with wide shoulders where they are meant to provide drivers with a warning that they are leaving the outside edge of the roadway. However, these strips may not be as ideal for lower-volume rural roads where the shoulders are typically



funding opportunities are scarce.

The second emphasis of the highway safety plan is to “Keep vehicles in the proper lane and minimize the effects of leaving the travel lane.” In our last issue of *RoadTalk*, I discussed some ways to reduce the consequences of run-off-the-road (ROR) crashes (Rural Road

narrow if they are present at all.

Some states are *experimenting* with the use of rumble strips for roadways with narrow or unpaved shoulders. One design places a narrower version of the standard inverted rumble strip along the white edgeline. Another *experimental* application places the rumble strip within the travel lane. This strip

would alert the driver to a lane departure situation as it was contacted by the inside wheels of the car. A final *experimental* application of this technology is the centerline rumble strip. This strip, milled or rolled into the center of the roadway, is intended to reduce the occurrence of head-on collisions by providing the driver with warning that the vehicle is crossing into oncoming lanes of traffic.

## Increased Delineation:

This option may seem natural to most readers, but it still merits attention. The *Manual on Uniform Traffic Control Devices (MUTCD)* is full of signs that can be used to warn drivers of upcoming curves and turns in the roadway. In many cases, these curves can be obscured by a rise in the roadway or by roadside development. Other curves present drivers with a decreasing radius. Regardless of the situation, it is vital to warn drivers of unexpected changes in the roadway ahead. We can use curve or turn warning signs. These warning signs can be accompanied by advisory speed plaques and/or emphasized with flashing beacons. These signs may be supplemented by chevrons or delineators placed along the edge of the roadside. A less-widely used option is the installation of transverse rumble strips in advance of the curve.

## Improved Pavement

**Markings:** Some jurisdictions utilize pavement markings to warn drivers of curves ahead. Full markings (centerline and edgeline) may be used in locations where there is a high occurrence of ROR crashes. If these markings are already

*continued on page 5*

present, they can be widened for emphasis or supplemented through the use of raised pavement markers. In-lane markings may also be added using text, symbols, or a combination of both to warn of the change ahead.

#### **Shoulder Treatments:**

Drivers have a far better opportunity to return to the roadway if the shoulder is level. In some cases a level grassy shoulder may be all that the driver needs to regain control of the vehicle and safely return to the roadway. In other locations the roadway agency may decide that a paved shoulder is necessary to reduce the occurrence or risk of run off the road collisions. Edge drop-offs also reduce the driver's ability to return the vehicle to the roadway safely. A drop-off of just three inches can cause a driver to lose control and overcorrect the vehicle as he or she attempts to return to the roadway. Many states are exploring the use of the Safety edge, where the pavement edge is formed at no more than a 45 degree angle from horizontal.

#### **Skid Resistant Pavements:**

Older asphalt pavements can become especially slick in wet weather due to bleeding (excess asphalt binder rises to the surface) or polishing (mineral aggregate is exposed and polished by traffic forces). Rutting in the wheel path may result in standing water on the roadway. Lack of crown or poor shoulder maintenance may prevent water from exiting the roadway. Many of these problems must be fixed with overlays or microsurfacing. Others can be addressed with maintenance of drainage structures such as ditches and storm drains. All strategies involve increasing the amount of friction between the roadway surface and

the vehicle's tires.

**Improved Roadway Geometry:** While improvements to roadway are the most costly of the options available to prevent ROR crashes, they can often be the most effective since many of these crashes occur at curves. By reducing the severity of the curve or providing increased superelevation in the curve, the frequency of curve-related crashes may be reduced by as much as 80 percent. While many of the previously-discussed countermeasures for ROR crashes can be implemented in the short term, improvements to roadway geometry must often be delayed for years to complete design, permitting and property acquisition processes and secure project funding.

While this article provides some basic information and ideas for preventing ROR and other lane departure crashes, plenty of additional information is available on the internet. One of the most helpful starting points in addressing many types of traffic crashes is the American Association of State Highway and Transportation Officials (AASHTO) Strategic Highway Safety Plan website (<http://safety.transportation.org>). Here you can download Volumes one through thirteen of the National Cooperative Highway Research Program (NCHRP) Report 500. These guides deal with issues ranging from collisions with trees in hazardous locations to increasing seat belt usage. Other resources are available from FHWA (the *MUTCD*), AASHTO (the Green Book and the *Roadside Design Guide*), and others. As always, TTAP is available to assist local agencies across the state in all transportation-related issues, including ROR crashes.

## Road Safety Audits

TRB's National Cooperative Highway Research Program (NCHRP) Synthesis 336: Road Safety Audits examines the state of the practice of road safety audit (RSA) and road safety audit review applications for U.S. states and Canadian provinces. This synthesis also reviews international RSA practices. RSAs were first introduced in the United Kingdom more than 20 years ago and have been applied in New Zealand and Australia since the 1990s.

([http://trb.org/news/blurb\\_detail.asp?id=4477](http://trb.org/news/blurb_detail.asp?id=4477))

*(Editor's Note: An article on Road Safety Audits written by Dr. Martin E. Lipinski, PE, first appeared in our Summer 2004 RoadTalk.) Dr. Lipinski is the Ensafé Professor & Chair, Department of Civil Engineering at the University of Memphis.*

### National Public Works Week (May 15 - 21, 2005)

National Public Works Week (NPWW) is a celebration of the tens of thousands of men and women in North America who provide and maintain the infrastructure and services collectively known as public works. To find out how you can help raise the public's awareness of public works issues and to increase confidence in public works employees who are dedicated to improving the quality of life for present and future generations, go to <http://www.apwa.net/About/npww/>



**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.**

<b>Title</b>	<b>Date</b>	<b>Location</b>	<b>Instructor/s</b>
Defensive Driving NSC DDC6	April 5	Knoxville	Williams
Defensive Driving NSC DDC6	April 6	Chattanooga	Williams
Defensive Driving NSC DDC6	April 8	Jackson	Williams
Design of Pedestrians/Bike Facilities for MPO's & Cities	April 14	Nashville	Utley
Erosion Control	April 21	Chattanooga	Buchanan
Traffic Engineering 2	April 27-29	Nashville	Wegmann/ Chatterjee/Han
Asphalt Pavement Maintenance	May 2	Chattanooga	TBA
Portland Cement Mix Design for Small Projects	May 3	Chattanooga	Huang
Asphalt Pavement Maintenance	May 4	Jackson	TBA
*Fundamentals of Context Sensitive Solutions	May 5-6	Nashville	Johnson
TDOT Funding for Cities & Counties	May 10	Knoxville	Hayzlett
Erosion Control	May 11	Franklin	Buchanan
TDOT Funding for Cities & Counties	May 11	Chattanooga	Hayzlett
Considerations for the Older Driver	May 24	Chattanooga	Amparano
Considerations for the Older Driver	May 26	Nashville	Amparano
Portland Cement Mix Design for Small Projects	September 13	Jackson	Huang
Work Zone/Flagging	September 22	Nashville	Brewer
Erosion Control	September 27	Knoxville	Buchanan
*Geotech Design/Earthwork; What Makes a Good Sub-grade and How to Improve it	October 13-14	Nashville	Drumm
Chain Saw Safety	October 18	Jackson	Vandergriff
Work Zone/Flagging	October 25	Nashville	Brewer
Work Zone/Flagging	October 26	Jackson	Brewer

Title	Date	Location	Instructor/s
TDEC/NPDES Issues	November 8	Chattanooga	Chlarson
TDEC/NPDES Issues	November 15	Nashville	Chlarson
TDEC/NPDES Issues	November 16	Jackson	Chlarson
Traffic Engineering 1	December 5-7	Nashville	Wegmann/ Chatterjee/Han
Work Zone/Flagging	December 9	Johnson City	Brewer
TDOT Funding for Cities & Counties	December 13	Nashville	Hayzlett
TDOT Funding for Cities & Counties	December 15	Jackson	Hayzlett

## 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  
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The University of Tennessee  
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## LTAP/TTAP Products Technical Panel

The first Local Technical Assistance Program (LTAP) and Tribal Technical Assistance Program (TTAP) products technical panel will meet in Knoxville, TN on May 12 and 13. They will develop a training and technology transfer tool for signs and pavement markings. The technical panel is comprised of Howard McCann, Texas LTAP; Frank Brewer, Tennessee LTAP; and Stuart Thompson, Utah LTAP.

Some components of the new LTAP/TTAP product would be a core curriculum course covering signing and pavement markings, a marketing tool, train the trainer component, instructor guide, road signs and pavement markings pocket guide publication, a short presentation on signs for officials, municipal league, etc., guidelines on immediate or as necessary sign replacement. One important component would be a toolkit/module on retroreflectivity including handouts and tools.

Since we are determined not to “reinvent the wheel” we have been collecting examples of presentations and course outlines from the LTAP/TTAP community.

- ▶▶ **Does your center have a sign and pavement markings course? What does it cover?**
- ▶▶ **What would you change/add to make it better (a new video, job aid, train-the-trainer, training exercises, guidelines, newsletter articles, etc.)?**
- ▶▶ **If your center doesn't have a signs and pavement marketing course, what would you like to see in a nationally developed product?**

Please send any course outlines, presentations, handouts or other information you would like to share with the LTAP/TTAP product panel and the LTAP/TTAP community by April 15 to [ltap@apwa.net](mailto:ltap@apwa.net).

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