South Carolina Transportation Technology Transfer Service Spring 2003

T3S Quarterly

Distraction–Related Traffic Crashes

Editor's Note: The information in this article is taken, with permission, from a Virginia Commonwealth University news release.

Rubbernecking, driver fatigue and looking at scenery are some of the leading causes of distraction-related traffic crashes, according to a study conducted by Virginia Commonwealth University. The study, conducted for the Virginia Department of Motor Vehicles, may be one of the most comprehensive of its kind in the nation. More than 2,700 crash scenes involving distracted drivers and nearly 4,500 drivers were studied.

"We've known for years that drivers contribute more to causing crashes than the vehicle or the roadway,"

"We've known for years that drivers contribute more to causing crashes than the vehicle or the roadway," said Robert J. Breitenbach, director of VCU's Transportation Safety Training Center. "In many instances the driver error involves not paying attention to the driving task. We can now identify those distractions with some confidence."

While cell phones have been widely criticized as the cause of distracted driving, they ranked sixth in the study's list of distracted driving behaviors. Looking at traffic, crashes and roadside incidents was the primary distraction in 16 percent of the crashes studied, followed by driver fatigue, 12 percent; looking at scenery, 10 percent; passenger and child distractions, 9 percent; and adjusting the radio, CD or tape player, 7 percent. Cell phones were cited as the primary distraction in slightly more than five percent of the crashes studied. Distractions inside the vehicle accounted for 62 percent of all the crashes studied.

"I think Virginia is a nice microcosm of the United States," said James M. Ellis with VCU's Survey and Evaluation Research Laboratory, which conducted the study in conjunction with the VCU Transportation Safety Training Center. "It has rural and urban areas; and a diverse population, climate and road network."

Most crashes in the study, 62 percent, occurred in rural areas, often resulting from driver fatigue, insects, animals and unrestrained pet distractions. Distracted–driving crashes in urban areas often resulted from drivers looking at other crashes, traffic or vehicles, or cell phone use.

Using federal grant funds, DMV requested the study to test a standard list of distracted driving behaviors. This list will be used by law enforcement when they report a traffic crash involving distracted driving.

"Law enforcement officers complete an accident report for every traffic crash," said Department of

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Motor Vehicles assistant commissioner Vince Burgess. "The information not only helps us keep tabs on Virginia's traffic crashes, it also provides us with valuable research information for driving issues, such as distracted driving."

Burgess noted there are many causes of distracted driving and law enforcement officers tend to use different terminology to describe the same behaviors. "Standardizing the list of distracted driving behaviors will strengthen our research data."

State troopers in all divisions and law enforcement in selected counties and cities participated in the study, which was conducted from June 15, 2002 through November 30, 2002.

Annually, driver distraction accounts for roughly 13 percent of all traffic crashes in Virginia, according to DMV.

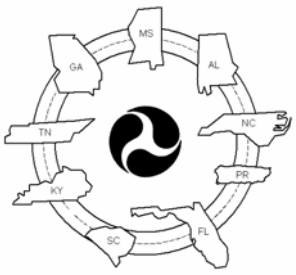
For additional information, contact Mike Frontiero at VCU:

mdfronti@vcu.edu.

Type of Distraction	Percentage of Crashes Caused
1. Looking at crash, vehicle, roadside incident or traffic	16%
2. Driver fatigue	12%
3. Looking at scenery or landmarks	10%
4. Passenger or child distraction	9%
5. Adjusting radio or changing CD or tape	7%
6. Cell phone	5%
7. Eyes not on road	4.5%
8. Not paying attention, day dreaming	4%
9. Eating or drinking	4%
10. Adjusting vehicle controls	4%
11. Weather conditions	2%
12. Unknown	2%
13. Insect, animal or object entering or striking vehicle	2%
14. Document, book, map, directions or newspaper	2%
15. Medical or emotional impairment	2%

* These percentages have been weighted to reflect variations in reporting statewide. The survey has a margin of error of plus or minus 1.9 percentage points.

Southeast Local Roads Conference October 12–14, 2003, Asheville, NC



The Southeast Local Roads Conference (SELRC) will be held October 12–14, 2003 in Asheville, NC. The meeting is a collaboration of the Federal Highway Administration (FHWA) and the southeast LTAP Centers, which include AL, FL, GA, KY, MS, NC, PR, SC, and TN.

The local roads conference is targeted to those whose work impacts the movement of persons and goods on local roads. It also provides the opportunity to share success stories and innovative advances in transportation planning, traffic safety operations, roadway design, maintenance, and construction.

This year's SELRC will be held at the Great Smokies Holiday Inn–Sun Spree Resort in Asheville, NC. Room rates are $99 per night, plus tax. This is an excellent rate during a time that might be "leaves" season in the NC mountains.

Registration materials and more information will be available soon. For more information, contact Pam Cloer at 919.515.7990 or pcloer@unity.ncsu.edu or on the web at www.itre.ncsu.edu/LTAP/SELRC.html.

Gravel Road Rehabilitation

By: Ken Skorseth, Field Services Manager and Arlie Long, Field Contact, SD LTAP Center

Introduction

Gravel roads are generally maintained by performing routine blading to maintain a crowned, smooth driving surface. Surface gravel is added as needed either by "spot graveling" or placing fresh gravel on an entire section. Some gravel roads can be maintained for indefinite periods with good blade maintenance and replacing surface gravel as needed.

However, almost any gravel road will gradually begin to show distress that requires more than routine maintenance to correct. If some rehabilitation isn't done, the time and money spent for simple routine blading and adding gravel is all but wasted. The road will never be in good driving condition until the right rehabilitation is done.

Identify the Problems

Problems can range from simple loss of crown on the driving surface to loss of shape on the entire cross section. The first problem to look for is poor drainage. Drainage is a critical matter on all roads and streets, but it is a particularly serious problem on those with gravel surfaces. When water begins to collect on the road surface, the gravel road will begin to lose shape very quickly. Two major drainage problems are poor crown and the high shoulder or secondary ditch.

Either of these problems should be corrected quickly since water that collects on the road surface or along the shoulder line will gradually percolate into the surface material and subgrade. When this happens, the road can quickly go out of shape, especially if it is subjected to heavy loads.

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The need for gravel road rehabilitation ranges from simple loss of crown and severe washboarding in the photo above to a complete loss of correct shape and cross section in the photo below.

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Another drainage problem is an inadequate roadside ditch. Along with poor ditches, plugged culverts or culverts placed at the wrong location or elevation will cause major problems. These problems are harder to correct, but in the long run, long-term road maintenance costs will be reduced when these problems are eliminated.

Even with the best of maintenance, gravel roads will gradually lose their shape. Surface material will shift to the shoulder and will even move to the inslope and ditch. This comes from "whip-off" from traffic, winter plowing operations, erosion from heavy rains and from poor blading techniques. Virtually any gravel road will require rehabilitation at some point in its life.

Perform the Correct Rehabilitation

If the problem is only with the road surface and/or shoulder, the problem can be corrected with a motorgrader alone. Shouldering disks can be a helpful tool to loosen material and break up vegetation to make the material more workable. Water trucks and rollers are certainly useful in reshaping operations to quickly restore a tight, dense surface. However, many rural departments have to work without them. In this case, density will only come with time, rainfall and traffic to recompact the surface.

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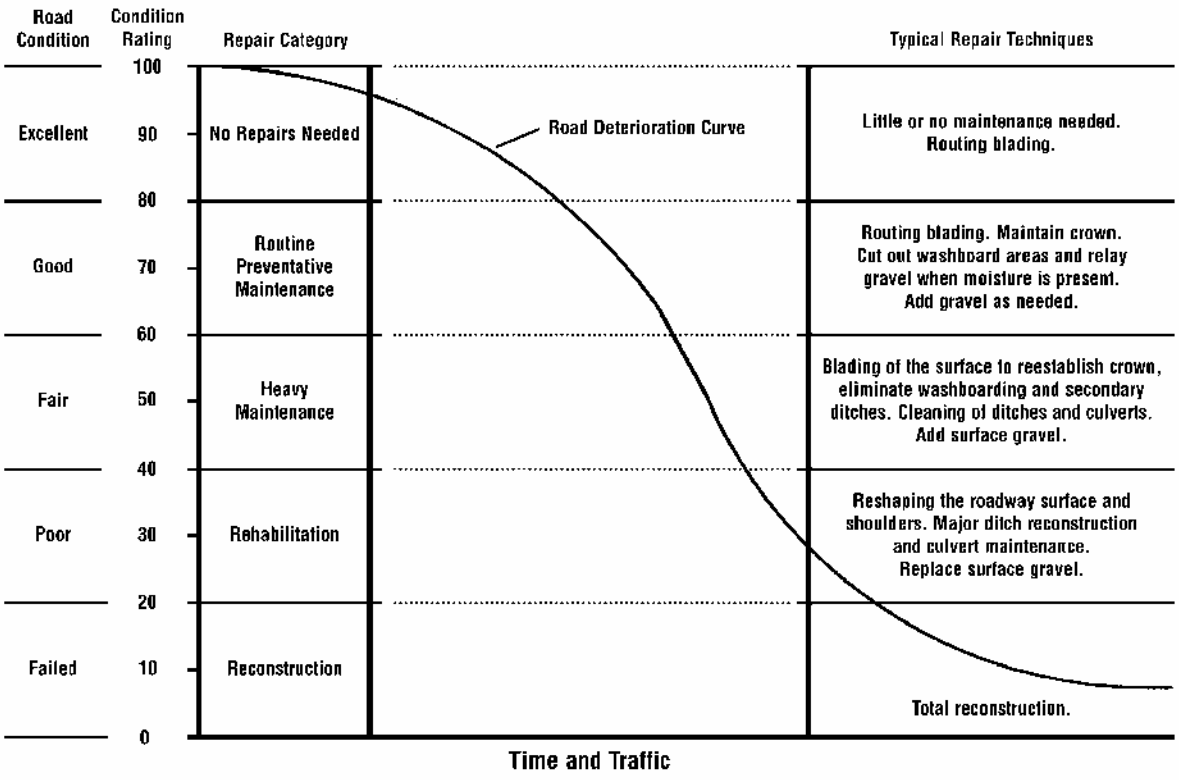
Good example of reshaping techniques. Motorgrader should be used either on inslope or on surface to maintain a shoulder line.

Relationship between Gravel Road Condition and Repair Requirements



Reshaping can be done without these, but a water truck and rollers are very helpful tools to recompact material.

It is very important to establish correct shape on surface prior to placing new gravel. The reshaped surface should have same crown as finished gravel surface so that a uniform gravel thickness will exist on the road.

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It becomes very important to do major reshaping only when moisture is present if watering and compaction cannot be done. It is generally best to do this work in the spring after the surface and shoulder become stable, but before much vegetative growth occurs. However, there is seldom enough time to get this work done within this short period. With good mowing and/or disking to destroy the vegetation, this work can be done throughout the maintenance season.

Since this work is nearly always done without much surveying or staking, it is very important that the motorgrader operator be skilled and knowledgeable. Re-establishing correct shape is in his/her hands. Lack of

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When reshape is finished, good quality surface gravel should be placed quickly before rain causes subgrade to lose its shape.

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crown can easily turn into excessive crown. A high shoulder and secondary ditch must be corrected, but too much material can be cut and moved so that no shoulder remains. This leads to new problems. Operators must understand correct shape of cross section!

The photos just shown are courtesy of Hughes County Highway Department, Pierre, SD. They, along with a few other counties, have a rehab program in which they do a major reshape on ten or more miles of gravel road each year. They recover lost gravel and use it along with dirt to reshape the inslope, shoulder and surface. The material makes a good base for new surface gravel and good drainage is restored. A program like this has great benefit in reducing long-term maintenance costs.

When the entire cross section of a road needs reshaping, the job becomes a greater challenge. From the photos just shown, it becomes obvious that a lot of work is involved. Yet, if this isn't done, simply trying to routinely blade a road and add gravel will never restore the road to a good condition. For example, the gravel can sink into a soft subgrade and be lost very quickly. Surface, shoulder and ditch drainage must all be functioning for a gravel road to perform well.

Finally, there can be more serious problems to address. These go beyond the scope of this bulletin, but here is one example. A road that passes through a swamp area or over wet, waterbearing soils will be impossible to correct in the manner just shown. In these conditions, select soils may have to be brought in and the grade built up. It may be worth considering the use of a "fabric" or geosynthetic to stabilize the road if all weather travel is required.

Sometimes, work like this cannot be justified on a very low volume gravel road. The road may simply have to be maintained in a manner that allows seasonal traffic only. These are administrative decisions. However, many gravel roads would benefit greatly from major rehabilitation and will become much easier to maintain in the long term.

Motorgrader doing final shaping on fresh surface gravel. The road now becomes much easier to maintain in the future.

Salute To Debbie

T^{3}S would like to take this opportunity to offer our appreciation and support to the individuals who have left their jobs, families, and friends in the defense of freedom.

Our workshop coordinator, Debbie Lipscomb, has been called to active duty with the US Coast Guard. We miss you!

All military personnel and their families are in our thoughts and prayers and we look forward to having them home in the near future.

We salute you all!

Traveling on the King's Highway

Once a king had a great highway built for the members of his kingdom. After it was completed, but before it was opened to the public, the king decided to have a contest. He invited as many as desired to participate. Their challenge was to see who could travel the highway the best.

On the day of the contest the people came. Some of them had fine chariots, some had fine clothing, fine hairdos, or great food. Some young men came in their track clothes and ran along the highway. People traveled the highway all day, but each one, when he arrived at the end, complained to the king that there was a large pile of rocks and debris left on the road at one spot and this got in their way and hindered their travel.

At the end of the day, a lone traveler crossed the finish line warily and walked over to the king. He was tired and dirty, but he addressed the king with great respect and handed him a bag of gold. he explained, "I stopped along the way to clear a pile of rocks and debris that was blocking the road. This bag of gold was under it all. I want you to return it to its rightful owner."

The king replied, "You are the rightful owner."

The traveler replied, "Oh no, this is not mine. I've never known such money."

"Oh yes," said the king, "you've earned this gold, for you won my contest. He who travels the road best is he who makes the road smoother for those who will follow."

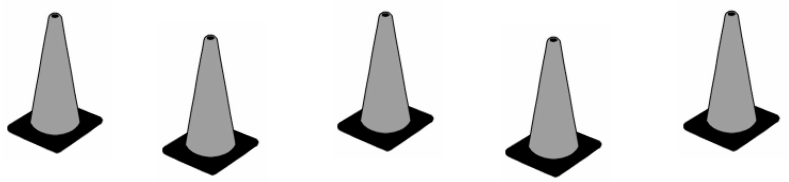
Boating Safety

The U.S. Coast Guard reports about 700 deaths a year from boating accidents. Eight out of 10 fatalities in boating accidents result from drowning. Nine out of 10 reported drowning victims were not wearing a life jacket.

Here are some tips for a safe outing:

- Operate at a safe speed and be ready to react quickly in emergencies.
- Be on guard for boater's fatigue. It's caused by the sun, wind, vibration, and motion.
- Reduce speed when approaching areas that may be shallow.
- Watch for submerged rocks, logs, and other obstacles.
- Know the boating "rules of the road." Take a boating safety course.
- Follow navigational markers.
- Watch for and avoid overhead power lines when operating a sailboat.
- Bring a first aid kit, sunscreen, sunglasses, and a tool kit.
- Have fire extinguishers on board.
- Don't drink.
- Make sure that everyone on board is wearing a Coast Guard approved life jacket that fits.

Safety Zone



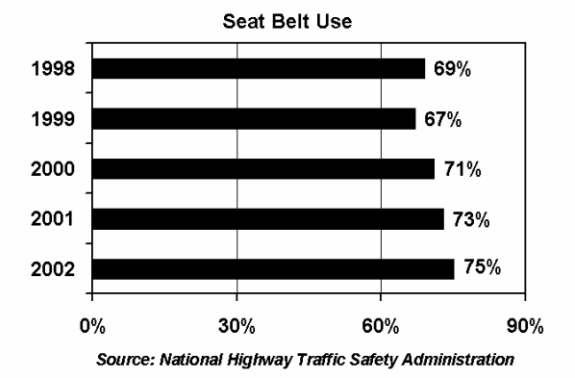
***Safety Effectiveness of Intersection Left-and-Right Turn Lanes* (FHWA–RD–02–089).** This report presents the results of research on the safety effectiveness of providing left–turn and right–turn lanes for at–grade intersections. The report considers three–leg and four–leg intersections, whether there is a STOP sign or a traffic signal, whether turn lanes are provided for one or both major–road approaches, and whether the intersection is urban or rural. In addition, economic evaluations of the installation of left–turn lanes at various types of intersections were conducted, thereby allowing the calculation of benefit–cost ratios and cost effectiveness thresholds. A six–page **Tech Brief (FHWA-RD-02-103)** that provides a synopsis of the report is available**.** The full report is available at http://www.tfhrc.gov/safety/safety.htm.
Contact: Michael Griffith at mike.Griffith@fhwa.dot.gov or 202.493.3316 to obtain a copy of the Tech Brief.

Guidance on Traffic Control Devices at Highway–Rail Grade Crossings. This report of the U.S. DOT Technical Working Group is now posted on the safety website at http://safety.fhwa.dot.gov/media/twgreport.htm. This report is the result of a collaborative effort of the surface transportation agencies within U.S. DOT, representatives from transportation/safety associations and professional organizations, State and local transportation agencies, railroads, public safety officials, universities, consultants and vendors. The purpose of the report is to assist in decisions to install traffic control or otherwise improve highway-rail grade crossings.
Contact: Debra (Dee) Chappell, 202.366.0087.

Prediction of the Expected Safety Performance of Rural Two–Lane Highways: a report that documents the algorithm for predicting the safety performance of rural two–lane highways. The algorithm estimates the effect on safety performance of roadway segment parameters including lane width, shoulder width, shoulder type, horizontal curves, grades, driveway density, two–way left–turn lanes, passing lanes and roadside design, and of intersection parameters including skew angle, traffic control, exclusive left– and right–turn lanes, sight distance, and driveways. The algorithm enables highway agencies to estimate the safety performance of existing or proposed highways and to compare the safety performance of geometric design alternatives. The algorithm forms the basis for the Crash Prediction Module of the Interactive Highway Safety Design Model (IHSDM). A PDF version of the report can be obtained at http://www.tfhrc.gov/safety/99207.htm.
Contact: Michael Griffith at mike.Griffith@fhwa.dot.gov or 202.493.3316 to obtain a copy of the report.
Contact: for general information about IHSDM, Ray Krammes at ray.krammes@fhwa.dot.gov or 202.493.3312.

Restoring Credibility to Speed Setting: Engineering, Enforcement & Educational Issues is now available on the FHWA Speed Management Safety website. http://safety.fhwa.dot.gov/programs/speedmgnt.htm. The report summarizes the findings of workshops that brought together critical engineering, enforcement, and judiciary personnel to discuss the multi–disciplinary aspects of managing speed.
Contact: Beth Alicandri, 202.366.6409 or Davey Warren, 202.493.3318.

NCHRP Report 470 TCD's for Passive Crossings. This report presents an evaluation of traffic–control devices to improve the behavior of drivers when approaching and crossing passive railroad–highway grade crossings. In addition to a review of the literature, the report includes a comprehensive analysis of the tasks drivers face at a passive grade crossing. Those responsible for signing and evaluating safety at grade crossings, as well as those interested in human factors in safety, will find this report informative. A key audience for the report will be those responsible for the Manual on Uniform Traffic Control Devices because it is intended that the recommendations be considered for the next edition. The report is available at http://www4.trb.org/trb/onlinepubs.nsf/web/nchrp_reports.



Seat Belt Safety. The Buckle Up America campaign has a goal to increase seat belt use nationwide. This campaign focuses on building public–private partnerships, enacting strong legislation, maintaining active, high–visibility law enforcement, and conducting effective public education. Visit http://www.buckleupamerica.org.

***Safer Journey—Interactive Pedestrian Safety Awareness* CD–ROM (FHWA–SA–00–009).** This is an interactive CD that takes the user through various pedestrian safety scenarios. It has been developed to improve the level of pedestrian knowledge for all road users and safety practitioners. It is also available on the web at http://safety.fhwa.dot.gov/programs/ped_bike.htm.
Contact: Leverson Boodlal, 202.366.8044 or Ann Do, 202.493.3319.

Reports on Pedestrian Safety:

- *Pedestrian Facilities Users Guide: Providing Safety and Mobility* (FHWA–RD–01–102).
- *An Analysis of Factors Contributing to Walking Along Roadway Crashes* (FHWA–RD–01–101).
- *Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines* (PDF only).

You can view these reports online at http://safety.fhwa.dot.gov/fourthlevel/design_p.htm#crosswalk. Limited hard copies have been printed.
Contact: Ann Do, ann.do@fhwa.dot.gov, 202.493.3319 or
Tamara Redmon, tamara.redmon@fhwa.dot.gov, 202.366.4077.

Work Zone Safety. Transportation agencies have identified their best practices/policies for minimizing delay and enhancing safety during construction and maintenance operations. The report can be seen at http://ops.fhwa.dot.gov/wz/bestprac.htm.

***Pedestrian/Bicyclist Safety Resource Set* CD–ROM (FHWA–SA–00–005).** The CD contains information on how to improve pedestrian and bicyclist safety in communities across the nation. It includes information on facility design, planning, guidelines, good practices, and tools to aid in countermeasures development. This CD is intended for safety practitioners and other advocates who want to create "walkable/bikeable" communities.
Contact: Leverson Boodlal, 202.366.8044 or Ann Do, 202.493.3319.

Peer–to–Peer Traffic Control Devices (P2P TCD)

FHWA has initiated a new service designed to assist public agencies in effectively applying traffic control devices and the MUTCD. The "Peer–to–Peer for Traffic Control Devices" (P2P TCD) is designed as a no–cost program to:

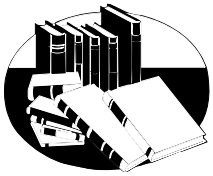
- Provide short–term assistance in matters related to traffic control devices;
- Address specific technical issues in the MUTCD;
- Spark dialogue and foster an "esprit de corps" among professionals in the transportation community; and
- Contribute to a better transportation system–optimized traffic performance and improved safety.

The P2P TCD program is designed to provide an easy-to-use way for practitioners to receive assistance from other practitioners.

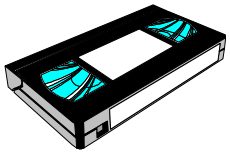
How does it work?

Local, county, regional, or state transportation agencies request assistance by email (P2P@fhwa.dot.gov) or by calling a toll-free number (1.888.700.PEER). The program coordinator then matches transportation professionals who are experienced and knowledgeable in the relevant technical area. The peer, in turn, will contact the agency to work out the details of the assistance to be provided within the program framework. The peer's assistance is short–term and will address specific, technical issues.

For the opportunity to participate in the program on a less formal basis, you can visit the Discussion Area on the MUTCD Web site at http://mutcd.fhwa.dot.gov.



Publications and Video Tapes Available



The publications described below are free to individuals employed by any city or county government agency in South Carolina. You can obtain a free single copy of some publications, or borrow a copy of one of the "for loan" publications or videos.

Publications

Safety Effects of Marked vs Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines. FHWA–RD–01–075, Mar., 2002.

Massachusetts Bridge Technology . FHWA, Mar., 2002.

Moving Ahead: The American Public Speaks on Roadways and Transportation in Communities. FHWA–OP–01–017, access on line at fhwa.dot.gov.

Wildlife Habitat Connectivity Across European Highways. FHWA–PL–02–011, Aug., 2002.

European Right-of-way and Utilities Best Practices. FHWA-PL-02-013, Aug., 2002.

Videos

Fire Safety—Real, Real Life. This one of kind, interactive fire safety video program will take employees through some real–life situations and force them to think about how they would respond. *Coastal Videos.*

Fire in the Workplace. This program will help train employees about the causes and dangers of workplace fires. *Coastal Videos.*

Fire Extinguishers. This video will help your employees receive accurate and concise training on how to use fire extinguishers. *Coastal Videos*.

Fire Safety—There's No Second Chance. This video re-creates an actual workplace fire with tragic circumstances. *Coastal Videos.*

Mutual Aid Program. Describes mutual aid program in which local governments agree to provide equipment and personnel to other members when needed during and after an emergency. *New Hampshire Public Works.*

Information Request and Address Change Form

To order any of the publications, videos, or other materials listed in this or other issues of *T*^{3}*S Quarterly*, complete this form and mail it or fax it to **Sandi Priddy** at the address or phone number shown below. You can also order videos and publications on-line at www.ces.clemson.edu/t3s.

Transportation Technology Transfer Service
Civil Engineering Department
Clemson University, Box 340911
Clemson, SC 29634-0911

Phone: **864.656.1456**
Toll free: **888.414.3069**
Fax: **864.656.2670**

Publications

- ❑ Safety Effects of Marked vs Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines
- ❑ Massachusetts Bridge Technology
- ❑ Wildlife Habitat Connectivity Across European Highways
- ❑ European Right-of-way and Utilities Best Practices
- ❑ 32nd Annual SCDOT Highway Conference Proceedings

Videos and CD's

- ❑ Fire Safety—Real, Real Life
- ❑ Fire in the Workplace
- ❑ Fire Extinguishers
- ❑ Fire Safety–There's No Second Chance
- ❑ Mutual Aid Program

Other

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❑ ***This is a new address***

❑ ***Please add my name to your mailing list***

Suggestions for Possible Future Workshop Topics

T ^{3}S Quarterly is published by the South Carolina Transportation Technology Transfer Service (T ^{3}S) for the benefit of county and municipal government agency personnel in SC. T^{3}S, administered by the Clemson University Civil Engineering Department, is the Local Technical Assistance Program (LTAP) center for SC. T ^{3}S is part of a nation–wide network of LTAP centers established by the Federal Highway Administration (FHWA) in cooperation with state transportation agencies. T^{3}S is jointly funded by FHWA and the SCDOT. The views, opinions, and recommendations contained in the newsletter do not necessarily reflect the views of the FHWA or the SCDOT.

How to Contact Us

SC Transportation Technology Transfer Service
Civil Engineering Department
Clemson University — Box 340911
Clemson, SC 29634–0911
Phone: 888-414-3069 Fax: 864-656-2670
e-mail: t3s@ces.clemson.edu

Director:	**Jim Burati**	**864-656-3315**
Program Manager:	**Sandi Priddy**	**864-656-6141**
Program Coordinator:	**Debbie Lipscomb**	**864-656-1456**

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Transportation Technology Transfer Service
Civil Engineering Department
Clemson University
Box 340911
Clemson, SC 29634-0911