T³S Quarterly

ARTS: Paving the Way for Rubber Recycling in South Carolina

by Wendy Franzese, Asphalt Rubber Technology Service

ARTS stands for *Asphalt Rubber Technology Service*. South Carolina's Department of Health and Environmental Control (DHEC)'s, Office of Solid Waste Reduction and Recycling awarded a $6 million, five year grant to the City of Clemson and Clemson University for a research-outreach program (ARTS) that could literally, pave the way toward eliminating the millions of worn-out tires that clog the state's landfills.

Through the project, recycled tires could find their way into everything from the state's highways and secondary roads to exit-ramp embankments, retaining walls, running tracks, and golf-course cart paths.

ARTS is led by Dr. Serji Amirkhanian, professor of civil engineering at Clemson University. What the ARTS team learns will not only benefit South Carolina but may have national implications. South Carolina is only the second state to implement a project of this magnitude. Tire recycling will resolve one of the dominant environmental problems facing South Carolinians today. Nearly *four million* tires are discarded in South Carolina every year. Nationwide, the number averages about *270 million* tires per year.

Recycling discarded tires could have significant impact on the reduction of solid waste in South Carolina and the rest of the nation. The five-year project will enable the ARTS team to work with agencies and communities statewide to identify recycling markets for waste tires and to provide education, training and consultation services. Grants will be available to help fund projects throughout the state. The service, which began advertising for projects in September 2000, could be involved with as many as four projects a year.

ARTS anticipates that $950,000 will be available per year over the next five years. Grant money comes from the state's Waste Tire Trust Fund. A $2 fee is paid on each new tire sold in South Carolina. Of that fee, 44 cents is placed in the Waste Tire Trust Fund. The program's funding is for the differential cost of con-

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ducting a project using crumb rubber versus using just the raw materials (i.e., no crumb rubber). For instance, if the cost of a proposed rubberized asphalt project is $200,000, but the cost of doing the job using conventional materials is $150,000, then ARTS will fund only $50,000 (the difference between conventional mix and rubberized asphalt mix).

The primary function of ARTS is to promote the use of waste tire rubber in civil engineering applications such as rubberized asphalt. This will be accomplished in several ways:

- ARTS will perform research to discover new uses for waste tires as well as improve upon existing uses.
- ARTS will conduct training classes and seminars on the use, design, testing, and construction of rubberized asphalt and other civil engineering applications.
- ARTS will provide funding for several test projects each year to be constructed in South Carolina. These projects will be used as demonstrations for research, testing, and training.

Our mission is to promote the practical utilization of waste tire rubber in hot mix asphalt as well as other civil engineering applications through research, training, education, and information services.

Please contact us for further information:
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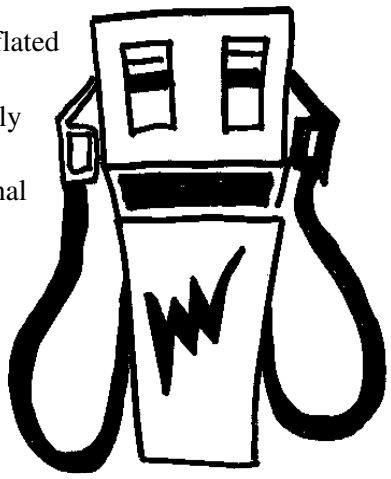
How to Save Money on Gas

Save money on gasoline with these tips from personal finance writer Cynthia Brodrick:



- Keep your tires inflated properly. Under-inflated tires waste fuel and wear out the tire tread.
- Use less gas by keeping your engine properly tuned.
- Don't overload the trunk. For every additional 250 pounds hauled, the car loses about one mile per gallon in fuel economy.
- Buy the lowest grade (octane) of gasoline that is appropriate for your car. Check your owner's manual for this information. As long as your engine doesn't knock or ping, low grade fuel is fine.
- Pay cash at stations that charge extra for credit cards.
- Don't top off the gas tank because that can lead to spillage and a waste of fuel.
- Avoid fast starts or sudden stops because those also waste fuel.
- Slow down. Driving at 55 miles an hour rather than 65 can improve your fuel economy by two miles a gallon.
- Avoid long warm-ups. Even on cold winter mornings, your car doesn't need more than a minute to get ready to go.
- Combine errands into one trip and plan your stops for the most efficient route. You'll save yourself time as well as money.

Leave a Proper Voice Mail Message

Karen Leland and Keith Bailey, authors of *Customer Service for Dummies*, offer these tips for using voice mail properly:

- Speak clearly and begin and end your message with your name and phone number.
- Be as specific as you can but try to keep your message to 60 seconds or less.
- Don't leave repeat messages with the same information. If you don't get a return call within a reasonable period of time, send an e-mail.
- Don't leave messages while you're at noisy places, such as crowded restaurants or airports, where the background noise can drown out your message

Unpaved Road Stabilizers: Can They Work for Your County?

by: Peter Zeck, Edisto–Savannah RC&D Office

South Carolina counties are spending an average of $1,750 to $2,000 per mile to maintain their 16,000 miles of unpaved (dirt) roads. These roads are graded on a six–week average cycle and the annual cost to maintain South Carolina's unpaved roads exceeds $30 million per year. This is a never–ending cycle of grading, pulling ditches, bringing in stabilizing agents, etc. A number of county Public Works Specialists, including Jim (Butch) Looper of Orangeburg and Bo Beauchemin of Berkeley County, are conducting tests on various dirt road stabilizers. It is early in the process, but they like what they see so far.

Bo Beauchemin pioneered much of the recent stabilizer testing and has recently installed a lignin–based stabilizer on limited sections of his county dirt roads. Butch Looper has also applied a lignin–based stabilizer to five miles of Orangeburg unpaved roads and is planning to put an enzyme stabilizer on other sections. He has also experimented with fly ash additives. All of us are familiar with the immediate benefit of dust suppression, but we need to know what other benefits reside in this technique. Butch and Bo are part of a growing network of Public Works Specialists who are sharing information and results of tests.

The Edisto–Savannah Resource Conservation and Development (RC&D) District and Clemson's Transportation Technology Transfer Service (T^3S) are combining efforts to help to ensure that South Carolina Public Works Departments will be fully informed on the many questions concerning the application of road stabilizers.

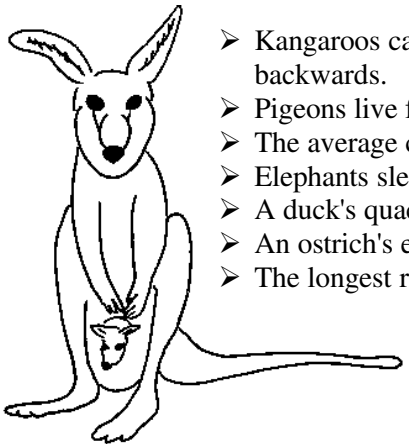
Save $15,000+ per Mile?

Butch Looper is currently investigating whether Orangeburg County can actually save $15,000 or more per mile by using a chemical stabilizing agent. These savings appear to be realized where the roads are scheduled for triple treatment or asphalt paving. The traditional preparation calls for 4–inch crusher run base as the undersurface at a cost of more than $26,000 per mile. Some stabilizers could possibly be substituted for the crusher run at a lower cost of $11,000. We need to determine if a stabilization process can be feasibly substituted long–term for some or all of the crusher run base.

Serji Amirkhanian of the Clemson University Civil Engineering Department is working with the Edisto–Savannah RC&D in an effort to develop a South Carolina four–county comparative analysis demonstration project of various stabilizers. The intent is to field–test various stabilizers with differing soil types. If funding can be arranged, it is hoped that the project can begin in spring 2001.

Stabilizer manufacturers interested in this planned project should contact Peter Zeck at the Edisto–Savannah RC&D Office, Box 2477, Aiken, SC 29802, telephone 803-641-1554.

Animal Facts



- Kangaroos can only move forward; they can't move backwards.
- Pigeons live for 35 years on average.
- The average cow produces 40 glasses of milk each day.
- Elephants sleep only two hours a day.
- A duck's quack doesn't echo.
- An ostrich's eye is bigger than its brain.
- The longest recorded flight of a chicken is 13 seconds.

Fluorescent Yellow Green Warning Signs for Schools, Pedestrian & Bicycle Crossings

by Cherie Kittle FHWA

The Federal Highway Administration's (FHWA) Office of Transportation Operations continues to optimize the performance of the transportation system by ensuring consistency on our roadways.

In 1992, the FHWA initiated a pilot study in conjunction with the National Park Service which examined the effects of the new color signs on motorist behavior at five pedestrian and bicycle crossings in the Washington, DC, area. Results indicated an increase in motorists slowing and stopping for pedestrians and bicyclists and conflicts decreased.

In 1993, FHWA conducted a 2-year study nationwide to evaluate this color on pedestrian, school, and bicycle crossing signs. A total of 57 jurisdictions were given permission to experiment in this study; 24 jurisdictions completed the experimentation and provided final reports. Our review of the studies and data indicate that fluorescent yellow green (FYG) warning signs improved the conspicuity of the sign message and motorists were able to recognize the sign from greater distances than the standard yellow warning sign. Many studies did not find significant changes in speed data, but motorists frequently commented that the signs caught the attention of the driver from a greater distance and were more aware of what was going on around them.

On June 7, 1996, a Notice of Proposed Rulemaking was published proposing the adoption of FYG as an optional color for pedestrian, school, and bicycle crossing signs. A total of 141 comments were received with 100 favorable comments received from local governments, including police departments and public school systems, in addition to special interest groups and the general public.

On June 19, 1998, a Notice of Amendment to the Manual on Uniform Traffic Control Devices (MUTCD) was published in the Federal Register which adopted FYG for optional use for warning signs related to pedestrian, bicycle, and school applications.

… fluorescent retroreflective materials are detected with higher frequency, and recognized with greater accuracy at further distances, than the corresponding standard highway colors.

Fluorescent yellow green was one of four unassigned colors that the FHWA had reserved for future applications. Studies indicate that fluorescent retroreflective materials are detected with higher frequency, and recognized with greater accuracy at further distances, than the corresponding standard highway colors. This is due to its greater luminance contrast with its surroundings. Pedestrian/bicycle-motor vehicle crashes continue to be a safety problem on our roads. FHWA believed a unique, unassigned color would be most effective in altering motorist behavior and reducing conflicts with pedestrians and bicyclists.

The use of FYG for pedestrian, bicycle, and school applications supports the Department of Transportation's Strategic Safety Goal to promote public health and safety by working toward elimination of transportation-related deaths, injuries, and property damage.

FYG also supports the FHWA strategic goal that targets pedestrian/bicycle as a national priority because this type of crash accounts for 15 percent of all fatalities. The plan calls for an improvement (reduction in number, rate, and severity) in this area.

Recent physical fitness trends promote walking and bicycling. Emphasis must be placed on utilizing state–of–the–art retroreflective fluorescent signage materials to better communicate with motorists that pedestrians and bicyclists are using the roadway with them.

Pedestrian and bicyclists represent significant areas of concern in transportation that would be well served by a unique color for traffic control devices.

This is not a stand alone effort, but part of our overall goal of optimizing performance through innovation, technology, communications, and partnering with the local community.

Cherie can be reached at 202-366-2188 or at cherie.kittle@fhwa.dot.gov.

2001 T^{3}S Workshop Schedule

The *tentative* schedule of T^{3}S workshops that will be offered in 2001 has been established.

With Fred Steele's retirement, we will be introducing a new speaker for our management–related topics. Barry Saunders will be offering a new workshop on *Managing Change in the Public Sector.*

Barry has a doctorate in education from NC State University, and has over 20 years experience as a trainer/facilitator. He served as Manager of Training and Development for the NCDOT, and has offered numerous management workshops for the NC LTAP center. We look forward to having Barry's experience in our future management workshops.

David Andrews of SI Geosolutions will be coordinating a new workshop on *Storm Water Quality Enhancement* for us sometime in March. David has done similar workshops for several other LTAP centers. The dates are not finalized, but a separate brochure announcing the seminar will be mailed at a later date.

On March 20, we will be co–hosting with the SCDOT a satellite downlink site for the ATSSA Video Conference on the new MUTCD.

More information on this video conference is presented in the article on page 6 of this newsletter.

Ed Clark will again be presenting for us in 2001 with a newly developed workshop on *Safety Management*.

Deric Governale of TranSafe will be coordinating a workshop in September on *Crack Sealing*. Deric has done a similar workshop in Georgia, and plans an on–site demonstration as part of the workshop agenda.

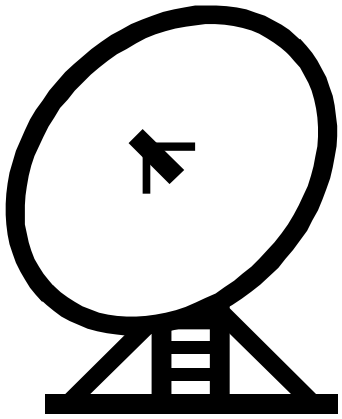
David Luhr of the Portland Cement Association (PCA) will be coordinating the development of a new workshop on uses of portland cement in the *Design, Construction, and Recycling of Pavement Bases*. This workshop is planned for October, and more information will be distributed at a later date.

Finally, Serji Amirkhanian will be offering a new workshop on the *Fundamentals of Asphalt Construction*. Serji has taught a number of workshops for us in the past, and he has a wealth of experience in all aspects of asphalt pavement design and construction. As many of you may be aware, Serji is the coordinator of all asphalt technician training and certification activities for the SCDOT.

While the schedule shown in the table at left is tentative, 2001 promises to be an excellent year for T^{3}S workshops, with a number of first–time offerings. We look forward to seeing you at some workshops this year!

Topic	Speaker	Date	Location
Managing Change in the Public Sector	**Barry Saunders**	**Feb 20 Feb 21**	**Charleston Columbia**
Storm Water Quality Enhancement	**David Andrews**	**Mar Mar**	**Charleston Columbia**
MUTCD Millennium Edition	**ATSSA Video Conference**	**Mar 20**	**Columbia**
SC Highway Conference	**SCDOT**	**Mar 28-30**	**Clemson**
Safety Management	**Ed Clark**	**Apr 18 Apr 19**	**Charleston Columbia**
Crack Sealing	**Deric Governale**	**Sep**	**Charleston Columbia**
Design, Construction & Recycling of Pavement Base	**David Luhr**	**Oct Oct**	**Columbia Charleston**
Fundamentals of Asphalt Construction	**Serji Amirkhanian**	**Nov Nov**	**Charleston Columbia**

T^{3}S to Host ATSSA Satellite Broadcast on New MUTCD on March 20th



Roger Wentz, executive director of the American Traffic Safety Services Association (ATSSA) has announced plans to hold a nationwide broadcast on March 20, 2001 that discusses changes and updates to the Manual on Uniform Traffic Control Devices (MUTCD). The manual, scheduled for completion in December, contains standards for traffic control devices that regulate, warn, and guide motorists in all 50 states. Uniformity of traffic control devices is critical to optimize traffic performance and to help improve safety by reducing the number and severity of traffic crashes.

"Everyone in the roadway safety industry has worked hard over the last couple of years to provide input and ideas into this new manual," Wentz said. "Many of the new changes and updates are significant, and by releasing this information to communities around the country simultaneously, countless lives will be saved on nation's roadways beginning immediately."

The current MUTCD, published in 1988, had several changes added in 1995 but, essentially, the 1988 version has remained the industry standard for over 12 years.

"Times have changed," said Shelley Row, director of the Federal Highway Administration's (FHWA) Office of Transportation Operations. "Congestion is a national issue, technology is pushing us in new directions. There are more work zones than ever before, and transportation professionals must respond to increasing demands. It's time for a new Manual," she said. Row handpicked a FHWA panel who will present the manual during the nationwide broadcast.

Along with the SCDOT, T^{3}S will co-host a downlink site for this broadcast at the Nations Bank Room, SCETV Telecommunications Center, 1047 George Rogers Boulevard, Columbia, SC, on March 20, 2001 from 11:00—1:30. A box lunch will be provided. .

The panel, the actual drafters of the new manual, will present the manual's changes and updates from a television set at Northern Virginia Community College, in Annandale, Va. on March 20. The two-and-one-half-hour broadcast begins at 11:00 a.m. EST. ATSSA, the host of the broadcast, is pre-registering downlink sites now across the country, via their website at www.atssa.com. Program viewers will also have the ability to immediately interact with the panel via toll free telephone numbers on March 20, in-place specifically for the broadcast.

Currently, ATSSA chapters across the country, as well as other agencies and organizations associated with roadway safety, are becoming actively involved and registering as downlink site sponsors for the broadcast. ATSSA has established a link at its website that explains the broadcast in greater detail. The link also features a nationwide map detailing the locations of pre-registered downlink sites, including driving directions to those locations.

"Anyone with an interest in roadway safety must get involved in this broadcast," said ATSSA President Dennis Sterndahl. "Communication tools exist right now to make this new information available to virtually anyone, anywhere, with immediacy and accuracy. Lives on our nation's roadways will be saved right away as a result of this broadcast."

Shortly after the broadcast, videotape copies of the program will be available through ATSSA, as well as both print and CD-ROM versions of the complete MUTCD.

To register as a downlink site in your community, visit www.atssa.com, *or contact Chris Kovacs-Sbitan at (800) 272-8772, ext. 150, or by e-mail at* chriss@atssa.com.

Information Request and Address Change Form

To order any of the publications, videos, or other materials listed in any issue of *T^{3}S Quarterly*, complete this form and mail it or fax it to **Sandra Priddy** at the address or phone number shown below.

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

Phone: **888.414.3069 (toll free)**
864.656.1456
Fax: **864.656.2670**

Publication or Video

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- ❑ ***This is a new address***
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Suggested Topoic for a Future Workshop

_____

New Video Catalog Available

T^{3}S maintains a video library of approximately 300 videotape titles covering transportation and other related topics. There are 19 major categories, including equipment maintenance, equipment operation, highway safety, construction, maintenance, paving, traffic, and work safety, etc. The new video catalog has a description of each video, and you can order videos by either title or catalog number. The videotapes are available for loan for two weeks at no cost.

You can view the catalog on–line at our web site, www.ce.clemson.edu/t3s. You can download a copy for your convenience, or just print the order form on page iii and fax it to us at 864-656-2670 to request videos. If you do not have Internet access, please call the T^{3}S office to obtain a copy of the catalog. These videos can assist in the training goals set by your department or agency, or support training already completed.

For questions concerning videotapes, or other T3S activities, contact our office toll free at 888-414-3069.

SPEED BUMP **Dave Coverly**

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.

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