



# Quarterly



## Surface Treatment: An Effective Means of Pavement Maintenance

*By Ali A. Selim, P.E., PhD, South Dakota LTAP Director*

When you lay down a new pavement, providing it was properly designed and constructed, you, as a motorist, get this feeling of comfort while driving over it. If you represent the agency that is responsible for that road, the feeling is one of accomplishment and pride that there is one less section of road to

*Maintenance ... is an inevitable task for highway agencies.*

worry about.

But Mother Nature and traffic will not leave that road in peace. Traffic pounding, rain, freezing temperatures, earthquakes, etc., will cause numerous distresses to that pavement. As a local official, it is your responsibility to establish a workable maintenance management system that can take care of this pavement for its intended life. Maintenance,

which is defined as **“routine work performed to keep a pavement as nearly as possible in its constructed condition under normal conditions of traffic and normal forces of nature,”** is an inevitable task for highway agencies.

As most of you know, maintenance can be classified as preventive or reactive (corrective). The former is the type that is intentionally applied ahead of time (usually routinely) to prevent a distress from occurring, and the latter is normally applied after a distress has occurred and is visually observed. Examples of preventive maintenance techniques include **surface treatments** such as seal coats, chip seal, fog seal, slurry seal, and micro surfacing. Examples of reactive maintenance techniques include pothole patching/repair, milling and overlay, and hot mix thin overlay to name only a few. This article concentrates on common surface treatment techniques.

### Seal Coat (Chip Seal)

Seal Coat or Chip Seal is the appli-

cation of a thin layer of liquid asphalt cutback or emulsion to a road surface, followed by spreading a cover aggregate for the purpose of waterproofing the pavement surface, sealing moderate cracks, and restoring roughness to the surface to

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improve skid resistance. The application rates for both liquid asphalt (in gallons per square yard) and cover aggregate (in pounds per square yard) are normally designed through established procedures.

*Maintenance can be classified as preventive or reactive (corrective).*

### Fog Seal

Fog Seal is the application of diluted slow-setting emulsion to renew old asphalt surfaces and seal small cracks and surface voids. The dilution is made by adding an equal amount of water to the emulsion. The application rate is between 0.10 and 0.15 gallons per square yard depending on the surface texture and level of dryness of the existing surface.

### Asphalt Emulsion Slurry Seal

Asphalt Emulsion Slurry Seal is a mix consisting of slow-setting emulsion, fine aggregate and mineral fillers, and additional water to produce slurry with adequate consistency. Slurry seals are normally used for rut filling and sealing cracks. There are three different types of asphalt emulsion slurry seals and they differ in material composition and equipment used. Type I is used to fill fine surface cracks and provide thin cover on the road surface and uses the finest gradation. Type II is slightly coarser and is recommended for ar-

eas with severe raveling and loss of skid resistance. Type III is used when the existing surface contains severe irregularities, to fill depressions, and also as a first layer in multi-course application. If you need more information about aggregate gradation for these three types, you can contact your asphalt supplier.

### Crack Sealing

Crack Sealing is used to prevent moisture from reaching the underlying layer of pavement. All cracks must be sealed. This form of maintenance involves cleaning out the cracks (routing is commonly used) and then filling the clean cracks (routed reservoir) with sealant to prevent water and compressibles from entering the pavement. Cracks of 1/4 inch and larger are good candidates for this type of maintenance. Smaller cracks can be handled by other means such as seal coats, fog seals, or slurry seals. Several sealants are available on the market. Rubberized asphalt crack sealers have been found to be quite effective. ASTM D-5078 is a good specification for sealants.

### Micro Surfacing

Micro Surfacing is one of the newest mixtures in surface treatment. It is composed of polymer-modified asphalt emulsion, 100 percent crushed aggregate, mineral filler, water, and field control additives as needed. When properly designed and applied, it has shown good results in improving surface friction and filling wheel ruts and minor surface irregularities on both low and high volume roads.

### Importance of Trained Personnel

One important item that must be addressed here is the skilled maintenance personnel who can make pavement maintenance an exciting and rewarding means of preserving pavements. Proper supervision, skilled workers and good workmanship are three things that must be present. Lack of any one of these will spell failure. Successful maintenance requires knowledge of which asphalt products to use for certain applications. Incompatibility of maintenance operations with weather can be detrimental to surface treatment. For example, mixtures containing emulsion or cut-back will take longer to cure during high humidity. This might delay placing the traffic back on the road. Most surface treatments can be affected by moisture during the first few hours after placement. Rain and/or fast traffic during this critical period will often result in the loss of most cover aggregate.

Your asphalt supplier can help you in determining the most suitable treatment and the proper material for that treatment.

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## ***Last Chance!*** **SE Local Roads Conference** **May 23-25, 1999 in Gatlinburg, TN**

The Southeast Local Roads Conference will be held May 23-25, 1999 in Gatlinburg, TN. The theme for the conference is *Preparing for the Next Century*. The conference is hosted by the Tennessee LTAP center and is a collaboration of the FHWA and the LTAP Region IV states that include KY, TN, NC, SC, GA, AL, MS, and FL. City and County personnel, local elected officials, and private sector corporations are invited to attend.

Plenary sessions will include topics regarding the impact on local roads of TEA-21, state aid, geometric design, and the MUTCD. Breakout session themes include: Safety, GIS, Tort Liability, Pavements, Traffic Engineering, Privatization, Innovative Practices, and Vegetation Management.

This is an excellent opportunity for South Carolina municipal and county road personnel to obtain up-to-date information on a number of important topics relating to local roads.

**Editor's Note:** *SC has traditionally not been very well represented at past SE Local Roads Conferences. We encourage you to benefit from this source of very useful and timely information on local roads. In particular, those in the Upstate should take advantage of the relatively close location of the conference. Contact Jenny Jones at TTAP, 423-974-5255, for registration information.*

### **Be Seen to Be Safe**

Make sure that rescue vehicles can find your home in an emergency.

- House numbers should be between 4 and 6 inches high and made of reflective material.
- They should be visible from the road. If not, set up a sign near the entrance of your driveway.
- In rural areas, mailboxes should be numbered on both sides and unobstructed by newspaper boxes, shrubbery, or weeds.



### ***Life Jackets.*** ***They Float,*** ***You Don't***

Observe National Safe Boating Week May 22-28 by putting on your life jacket when you're out on the briny. *Why?*

- ◆ More than 60 percent of boating fatalities result from capsizing, falling overboard, or swamping.
- ◆ Nearly 9 out of 10 boat-related drownings involve victims who were not wearing life jackets.
- ◆ Hypothermia, the loss of body heat, contributes to as many as half of all water fatalities. If



you spend 50 minutes in 50-degree water, you have a 50 percent better chance of survival if you are wearing a life jacket.

- ◆ Life jackets are almost impossible to locate and put on once you are in the water. Put them on before an emergency occurs.

Check for the UL Mark and the U.S. Coast Guard approval number on the life jacket you may be considering.

## ***Make Your Voice Heard!***

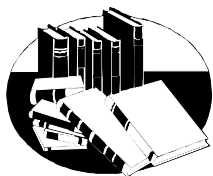
### **Brief Survey on Technology Transfer Coming to Local and Tribal Governments**

In the coming months, you may receive a copy of a short survey from the Federal Highway Administration (FHWA). The questionnaire asks about your organization's use of the training and technology transfer services of the South Carolina Transportation Technology Transfer Service and how those services might be improved to better meet your needs. FHWA is mailing the questionnaire to 2,400 local and tribal governments in the U.S. and Puerto Rico.

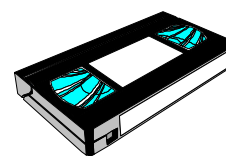
We are expecting a great response to this survey! It is important that everyone who receives a questionnaire completes it. If you are a recipient, please answer and return it promptly in the postage-paid, pre-addressed mailer provided. Everyone who completes the questionnaire will receive a summary of the results of the survey. The summary should be distributed in the fall of this year.

This is your chance to provide valuable feedback and affect a federal program designed for you. Responses from customers of all the Technology Transfer, LTAP and Tribal Technical Assistance Program Centers in the U.S. and Puerto Rico will be combined to assess the program's impact nationally.

We appreciate your helping ensure that LTAP provides the highest quality service possible.



## **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**

***Life-Cycle Cost Analysis in Pavement Design—In Search of Better Investment Decisions.*** Publication No. FHWA-SA-98-079, September 1998.

***Utility Cuts in Paved Roads—Field Guide.*** Publication No. FHWA-SA-97-049.

***Positive Guidance and Older Motorists—Guidelines for Maintenance***

***Supervisors.*** Texas Transportation Institute, December 1996.

***Proceedings of the 28th Annual South Carolina Highway Conference.*** March 24-26, 1999, Clemson, SC.

***Flexibility in Highway Design.*** Publication No. FHWA-PD-97-062.

***Reference Guide to Work Zone Traffic Control.*** Texas Engineering Experiment Station.

### **Videos**

***The New Generation of Snow and Ice Control.*** FHWA, 7 minutes.

***Prefabricated Timber Bridge Deck Panels.*** US Department of Agriculture, Wood In Transportation Program, 11 minutes.

***RU Y2K OK?.*** US Department of Transportation, 17 minutes.

***Asphalt Paving Inspection.*** Federal Highway Administration, 60 minutes

***Understanding Superpave Mix Design.*** Federal Highway Administration and National Asphalt Pavement Association, 13 minutes.

***Job Site Safety Series: Work Zone Safety Concepts.*** International Road Federation, 25 minutes.

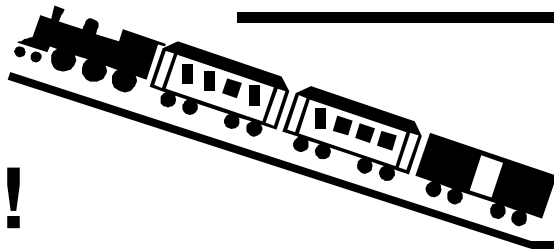
***Flagging Operations and Procedures.*** SCDOT, 23 minutes.

*Editor's Note: the publications and videos shown here can be ordered by completing the form on page 7 and returning it to us by FAX.*

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# Join a Can Do Team!

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## CAN'T

We've never done it before  
It's too complicated  
We don't have the resources  
It will never work  
There's not enough time  
We already tried it  
There's no way it'll work  
It's a waste of time  
It's a waste of money  
We don't have the expertise  
Our vendors won't go for it  
It's good enough  
We don't have enough money  
We're understaffed  
It will never fly  
We don't have the equipment  
It's not going to be any better  
It can't be done  
No one communicates  
Isn't it time to go home?  
I don't have any idea  
Let somebody else deal with it  
We're always changing direction  
It's too radical a change  
It takes too long for approval  
Our customers won't buy it  
It doesn't fit us  
It's contrary to policy  
It's not my job  
I CAN'T

## CAN

We have the opportunity to be first  
Let's look at it from a different angle  
Necessity is the Mother of Invention  
We'll give it a try  
We'll re-evaluate some priorities  
We learned from the experience  
We can make it work  
Think of the possibilities  
The investment will be worth it  
Let's network with those who do  
Let's show them the opportunities  
There is always room for improvement  
Maybe there's something we can cut  
We're a lean, mean machine!  
We'll never know until we try  
Maybe we can sub it out  
We'll try it one more time  
It'll be a challenge  
Let's open the channels  
Days go so quickly around here!  
I'll come up with some alternatives  
I'm ready to learn something new  
We're in touch with our customers  
Let's take a chance  
We'll walk it through the system  
We'll do better at educating them  
We should look at it  
Anything's possible  
I'll be glad to take the responsibility  
I CAN!

*[Thanks to Xerox Document Services Group for supplying this article.]*

## SCDOT Conducts Its First Research Peer Exchange

The Federal Highway Administration (FHWA) mandates that states conduct Peer Exchanges to receive Federal research funds. The purpose of the exchange is to improve the quality of states' research programs through reviews and discussions of research practices and management processes. The requirement contained in 23 CFR Part 420.207 stipulates that each state must host a Peer Exchange every three years with the first to be held by the end of 1998.

The hosting highway agency then selects a team, usually three to five

members knowledgeable about state research programs, to conduct an in-depth review of its research program and management process. The team may consist of representatives from other state research units, other agencies, universities, or the private sector. The process of the exchange is at the discretion of the host state.

SCDOT's Research Unit hosted its Peer Exchange on September 21-24, 1998. Invited team members were:

- Al Crawley, MS DOT, Moderator
- Lamar Caylor, GA DOT
- Roger Port, FHWA – MO
- James Sime, CT DOT
- Mike Stanley, NC DOT

The Research Unit identified focus areas to help ensure the process was

meaningful to the Department. This information, along with documentation describing the SCDOT's research procedures and program, was forwarded to team members for review prior to their arrival.

During the exchange, SCDOT research personnel and each team member gave a short presentation on their respective research programs. The team also interviewed more than nineteen DOT, FHWA,

and University staff. The interviews followed an

open discussion format and provided the exchange team on opportunity to listen to concerns, successes, technical accomplishments, and suggestions as well as answer questions from those interviewed.

A final report was prepared jointly by the team members and Department Research personnel describing the activities of the exchange, listing observations and suggestions made by each team member, and actions each planned to take to improve their research program. A few of the items noted by the Research Unit to improve the Department's program were:

- improve customer awareness of on-line research and product

information services available for their use;

- utilize a "champion" for each research project;
- increase efforts to make Principal Investigations aware of project deadlines and completion dates to facilitate timely reporting of results;
- develop and distribute "bullet" type summaries of studies conducted by the Department or other states or agencies;
- highlight long term goals or needs when soliciting research topics.

## UPDATE

The SCDOT Peer Exchange was a success due to the time and effort of the team members and the professionalism they exhibited throughout the process. Also, those interviewed contributed greatly to the success. In fact, of all the activities, presentations, and discussions conducted during the Peer Exchange, the interviews with Department personnel from other units was probably the most beneficial part of the process. Several concerns were noted and suggestions made that when addressed, will improve the program for them, the customers.

*Editor's Note: This article was submitted by Karen Nicholson of the SCDOT.*



## Information Request and Address Change Form

To order any of the publications, videos, or other materials listed in this or other issues of *T<sup>3</sup>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  
Civil Engineering Department  
Clemson University, Box 340911  
Clemson, SC 29634-0911**

**Phone: 864.656.3000**

**Fax: 864.656.2670**

### Publications

- ☐ Life-Cycle Cost Analysis in Pavement Design—In Search of Better Investment Decisions
- ☐ Utility Cuts in Paved Roads—Field Guide
- ☐ Positive Guidance and Older Motorists—Guidelines for Maintenance Supervisors
- ☐ Proceedings of the 28th Annual South Carolina Highway Conference
- ☐ Flexibility in Highway Design
- ☐ Reference Guide to Work Zone Traffic Control

### Videos

- ☐ The New Generation of Snow and Ice Control
- ☐ Prefabricated Timber Bridge Deck Panels
- ☐ RU Y2K OK?
- ☐ Asphalt Paving Inspection
- ☐ Understanding Superpave Mix Design
- ☐ Job Site Safety Series: Work Zone Safety Concepts
- ☐ Flagging Operations and Procedures

### Other

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

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☐ ***This is a new address***

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

### Suggestions for Possible Future Workshop Topics

## Success

“Success is not something you come upon all of a sudden. It is something which grows outward from inside of you. It is a blessing you already have, which you nurture until it blossoms.”

— *Ralph Marston*

## How to Contact Us

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## ***T<sup>3</sup>S: Technology Transfer for Local Transportation Agencies***

*T<sup>3</sup>S Quarterly* is published by the South Carolina Transportation Technology Transfer Service (T<sup>3</sup>S) for the benefit of county and municipal government agency personnel in South Carolina. T<sup>3</sup>S, which is administered by the Clemson University Civil Engineering Department, is the Local Technical Assistance Program (LTAP) center for South Carolina. T<sup>3</sup>S is part of a nation-wide network of LTAP centers established by the Federal Highway Administration (FHWA) in cooperation with state transportation agencies. The FHWA LTAP is under the State and Local Programs Branch of the Office of Technology Applications. T<sup>3</sup>S is funded jointly by funds from FHWA LTAP and from the South Carolina Department of Transportation (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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