

Crossroads

Summer 1998



TRANSPORTATION Information Center — LTAP

University of Wisconsin—Madison

Asphalt treatments: seeing is believing

On Wednesday June 17 you can see live demonstrations of eight asphalt pavement maintenance treatments. The treatments feature both the latest equipment and interesting older approaches applied on streets in and around the Green County Fairgrounds in the city of Monroe.

Milling and overlaying in small areas—pavement sections of 50 to a few hundred square feet—will be demonstrated by crews from Monroe which is hosting the demonstration program. A chip seal operation in cooperation with Green County will showcase the county's state-of-the-art, computer-controlled distributor truck. The truck effectively spreads the right amount of oil, regardless of speed, which is important to get a good chip seal job.

Other demonstrations include crack routing and sealing using the latest equipment, and three types of pothole repair using a high pressure spray patch machine, an infrared thermal bonding method, and a truck mounted hot patch unit. Slurry sealing, often used in urban areas because there are no loose stones and dust problems, will be demonstrated using two types of aggregate.

"A few years ago we heard from Middleton about how they used their small paver and tried to borrow it, but couldn't because they used it every day," says Nate Klassy, Monroe Director of Public Works. "Now we use ours every day too and wouldn't be without it."

Each year Klassy inspects streets and schedules spot repairs. The paving crew is busy all summer fixing sags, soft spots, ruts, utility cuts, old patches, and other small structural problems. They use a 24-inch milling machine, an eight foot



Spray patcher fixes potholes faster and better.

Demo by City of Beloit



Routing and sealing cracks extends asphalt pavement life.

Demo by City of Janesville

wide self-propelled paving machine on crawler tractors, and a small vibratory steel-wheeled roller to make repairs.

Seal coats every 5-6 years, done only after small structural problems are milled and resurfaced, have helped keep Monroe's residential streets in good repair despite a limited budget. They contract with Green County to spread the oil with their highly efficient new distributor truck, then apply, roll and sweep the chips themselves.

Continued on page 3



Sealcoats help preserve low volume roads. Spot repairs keep underlying pavements healthy.

Demos by City of Monroe and Green County

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Idea Exchange

Air powered endgate release

Spreading gravel means managing several operations at once. An air system for tripping the endgate would make the process easier and safer. The Valley City, North Dakota, highway department has built a release mechanism for less than half the cost of a commercial device.

A single-acting air cylinder is mounted under the box. The end of the endgate trip handle shaft is modified to hold the end of the cylinder. A 1/4-inch hose connects to the air switch which is mounted in the cab adjacent to the box lift lever. The air source can be tapped at the air seat supply or wherever it is convenient. The endgate is closed manually after the box is lowered and the truck has stopped.

According to John Windish, Valley City Highway Supervisor, materials cost about \$70 and labor is estimated at \$100. He indicates that the system works very well and is easy to install.

For more information contact Windish at 701/845-8508.

Retreading tires can save money



You may save 30%-50% over the cost of new truck tires by buying retreads. The key is quality, which has improved dramatically in the last decade. With poorer operations quitting business the number of shops has now dropped from nearly 10,000 to about 1350.

"It costs around \$150 to have each tire capped compared to \$300 for a new tire" says Gordy Paprocki, who manages over 100 trucks as equipment superintendent for the City of West Allis Department of Public Works. They put recaps on all their Class 7 and 8 garbage and dump trucks.

"We had some problems a few years ago, using non-OEM capping companies, before Goodyear got up to speed," he says. West Allis buys only Goodyear tires and returns the casings to the distributor which runs a capping plant nearby.

Retreading your own worn casings ensures that you know the tire's wear and care history. If you plan to retread, keep the cases properly inflated throughout the tire's life and retire the tire with 4/32-inch of tread remaining. Ninety percent of all problems with tires occur within this last 4/32 of tread. It also provides more surface for retreading.

Other operations prefer not to use retreads. "We get a really good deal on our new tires through net state pricing," says Bill Fischer, Outagamie County Highway Superintendent. "We found that selling the casings back to the recappers was more cost effective." In addition, the last time they tried retreads two or three years ago, they had problems

with sizing. The circumferences were not standard and the tires didn't mate well with other tires.

Clearly retreads can be a good deal if quality can be assured.

A portion of this article was adapted from "Maintaining a Healthy Tire Inventory" in the Winter 1997 issue of **Road Business**, the newsletter of the New Hampshire T2 Center. You can reach Gordy Poprocki at 414/302-8809 and Bill Fischer at 920/832-5380.

Do you have an idea to share with **Crossroads** readers? Let us know what it is and we'll contact you for details. Use the form on page 7.

T.I.C. joins the
World
Wide
Web



Check out the brand new Wisconsin Transportation Information Center web site at the following world wide web address:

<http://www.engr.wisc.edu/centers/tic>

You'll find a variety of information there, including copies of the **Crossroads** newsletter from 1996-98. New material is being added regularly, so come back often.

Crossroads

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Non-profit organizations are welcome to reproduce articles appearing here. Please contact us first for any updates or corrections.

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Asphalt treatments

*continued from page 1***Patching and crack sealing techniques**

A City of Beloit crew will demonstrate their new spray patch machine. The machine uses pressure to blow a stream of coated aggregate into a hole at high velocity, building the patch from the bottom up. This resulting patch is very dense and long lived. Beloit Street Supervisor, Dick Kinzer is very happy with the results they get.

"We can do better patches, quicker, even in wet weather," he says. "In the first quarter of 1998 we patched over 1000 holes and had only two fail. The guys love it because they patch it once and that's it."

Demonstrating Infrared Thermal Bonding will be Fahrner Asphalt Sealers. The technique produces a joint-free repair by bonding fresh hot asphalt to heated existing asphalt pavement. In addition, the City of Janesville will demonstrate their truck-mounted hot patch unit.

A Janesville crew will work with a Sherwin Industries crew to demonstrate the latest crack routing and sealing equipment. Two other asphalt maintenance contractors, B. R. Amon & Sons and Scott Construction, will demonstrate slurry sealing operations using two kinds of aggregate.

To be effective, every maintenance treatment must be used at the right time, in the right place, and in the right way. Thanks to these cities, contractors, and suppliers, you'll see how to best use these treatments and learn when and where to apply them.

The T.I.C. plans more demonstrations around Wisconsin. If you would consider hosting one in your area call Don Walker or Steve Pudloski at 800/442-4615.

Thanks to the following 1998 sponsors:

City of Monroe
Nate Klassy
Director of Public Works, host
Federal Highway Administration
Transportation Information Center
Wisconsin Asphalt Pavers Association

And demonstrators:

City of Beloit	B. R. Amon & Sons
Green County	Fahrner Asphalt
City of Janesville	Scott Construction

For details on how you can attend the June 17 Asphalt Pavement Maintenance Demonstration in Monroe, contact Mercy Ranum at 608/263-3160 or 800/442-4615. Advance registration is required.

Resources

Materials are available from the Wisconsin T.I.C. unless otherwise noted. Call 800/442-4615 or use the form on page 7. Videotapes are loaned free through Wisconsin County Extension Offices.

Videotape Lending Library Catalogue, T.I.C., January 1998. A new videotape catalogue is available to help you conduct your own in-house training. It lists nearly 300 tapes you can borrow by calling your county Extension agent. Tapes are listed by topic area with a short description so you can choose the right tape for your needs.

Transportation Information Center bulletins The T.I.C. has produced a series of fact sheets that introduce and discuss a variety of highway topics. These four- to 12-page booklets are designed to inform local officials, residents, and new staff of common highway concerns and practice. Multiple copies are available for your use.

1. Understanding and Using Asphalt
2. How Vehicle Loads Affect Pavement Performance
3. LCC-Life Cycle Cost Analysis
4. Road Drainage
5. Gravel Roads
6. Using Salt and Sand for Winter Road Maintenance

7. Signing for Local Roads
8. Using Weight Limits to Protect Local Roads
9. Pavement Markings
10. Seal Coating and Other Asphalt Surfaces
11. Compaction Improves Pavement Performance
12. Roadway Safety and Guardrail
13. Dust Control On Unpaved Roadways
14. Mailbox Safety
15. Culverts-Proper Use & Installation
16. Geotextiles in Road Construction/Maintenance and Erosion Control
17. Managing Utility Cuts
18. Roadway Management and Tort Liability in Wisconsin
19. The Basics of a Good Road

NACE Action Guides Series, National Association of County Engineers, 1992. Practical straight-forward explanations, methods, examples, and references to help you effectively organize and manage street and highway maintenance activities and organizations. A limited number of the following action guides are available:

Public Awareness and Support Personnel
Purchasing Authority
Impact of Land Development on Road Planning
Rural Transportation Planning

Road Programming
Road Surface Management
Bridge Maintenance on Local Roads
Safety Improvements
Traffic Operations
Soil Erosion Prevention
Subsurface Soils Exploration
Solid Waster Management

Inspector's Job Guide and Highway Maintenance Tables

Do you ever need to figure how many tons of stone you'll need to place on a road 18 feet wide using an application rate of 15 pounds per square yard? OR How many tons of hot mix you'll need if you plan to lay down a 1-inch mat over a road that is 1/4 mile long and 21 feet wide? OR How much crushed stone or sand your new stockpile can store if its base is 45 feet long and 25 feet wide? If so, then this new pocket-sized guide is just what you need. There are also hundreds of other tips and suggestions on how to do your job better. In two versions: 1) English units, or 2) metric. Multiple copies are available. Get one for each of your inspectors, supervisors, and road crew leaders.

Flagger training makes safer work zones

"One of the toughest things I have to do is to stress the importance of the flagger's job," says instructor Jeff Moore. "Flaggers have to know proper techniques, procedures and signals. The goal is to improve the safety of the work zone." Moore is a trainer with the Institute for Transportation Research and Education at North Carolina State University. He and Tim Baughman, director of the Institute's highway program, recently taught several flagger-trainer workshops around Wisconsin.



Training session offers practice in flagging.

Participants learn the six most common types of flagging operations: single flagger, two flagger, pilot car operation, one direction control, emergency flagging, and night time flagging. After classroom presentations, workshop participants practice on an outdoor model roadway.

"We provide people with the training, the tools, and the self-confidence they need to train their employees," says Moore. "They stand up and practice to make sure they actually understand the signals."

In a variety of active exercises, participants take the roles of flaggers and vehicles. This gives the flagger somebody to control and lets the "driver" see good flagging signals. The course prepares trainers and managers to teach a half-day session on proper flagging to their employees.

The program, which originated six years ago as a project for the South Carolina Department of Transportation, has now been taught in a number of states.

People commonly want to know about liability in an accident where they are flagging. Typically they could be named in a suit, says Moore, though the employer's umbrella liability insurance should cover them. This is one reason crew leaders and trainers may want to encourage management to provide proper flagger equipment, signing and training.

"Actions speak louder than words," says Moore. "A public works director came to my course and then did some flagging afterwards. He got a lot of mileage out of it with his crew. He demonstrated his commitment to the importance of flagging."

This flagging training program is the first in a series of work zone safety courses offered jointly by the T.I.C. and WisDOT. A new flagger handbook was prepared for workshop participants and their flagging trainees.

Calendar

Specific details and locations for workshops are sent to all **Crossroads** recipients. For additional copies, or more information, call the T.I.C. at 800/442-4615.

T.I.C. workshops

Asphalt Pavement Maintenance Demonstration Today's materials, machines and methods can help you extend the useful life of your asphalt pavements through maintenance. Learn when and how to use eight pavement maintenance techniques and see them applied on the street. Advance registration required. June 17 — Monroe

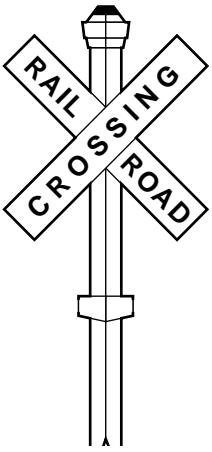
Winter Road Maintenance Time to prepare for winter operations. This workshop covers equipment preparation, operations planning, and the latest on ice control materials. Includes time to share better winter operations experiences and tips with your peers.

Sept. 21	Tomah	Sept. 28	Green Bay
Sept. 22	Eau Claire	Sept. 29	Brookfield
Sept. 23	Cable	Sept. 30	Barneveld
Sept. 24	Rhineland		

Local Transportation Issues (ETN) The UW Local Government Center and the T.I.C. will offer a series of workshops on transportation issues at over 103 ETN locations across Wisconsin. You can register for one workshop or the whole series.

- Local Authority to Manage Road**, Oct 15
- Local Transportation Aids and Grants**, Nov 5
- Bidding for Local Road Construction Projects**, Jan 14
- Changes in the Local Road Data Base**, Feb 11
- Liability for Local Road Agencies**, Mar 4

Chainsaw Safety, Maintenance and Operation Learn about personal protective equipment, proper maintenance procedures, and the most effective techniques for chainsaw use. Taught by expert trainers from the Forest Industry Safety & Training Alliance, Inc., this workshop includes a classroom session in the morning and outdoor demonstrations in the afternoon.



Locals, R.R.s cooperate for safer crossings

More than 2700 passive railroad crossings will soon have a new look. By the end of summer 1999, each one will get brand new reflectorized cross-bucks signs. The new signs, which have "Railroad Crossing" on both sides, will significantly improve crossing visibility to drivers.

New reflective tape will also be applied on both sides of posts from the ground to the sign bottom. Studies

show it produces a flashing, strobe effect reflecting headlights between railroad cars when a train is moving across the crossing. Materials for the project, including replace-

ment posts where necessary, are paid for by a \$850,000 Federal Highway Safety grant through the Wisconsin Department of Transportation. Railroads will pay for installation.

The new signs are part of a comprehensive effort to improve railroad crossing safety. This spring local officials, WisDOT staff, and railroad personnel gathered to discuss these safety issues at five seminars organized by the WisDOT Bureau of Railroads and Harbors.

"We need local highway officials to be an early warning system for crossing problems," says Tom Wildenborg, chief of the Railroad Engineering Section at WisDOT.

Railroad crossings have been the focus of renewed attention nationally since there were school bus incidents at crossings in suburban Chicago and northeastern Wisconsin. The seminars addressed issues highlighted in a national FHWA report. In addition to installing reflectorized material at passive grade crossings, other issues are:

- Identifying and signing sagged and humped crossings that can hang up truck trailers
- Solving problems where stop signs or traffic signals back traffic up across tracks
- Promoting grade crossing closure with federal and railroad incentives
- Inspecting and maintaining interconnects between crossing signals and traffic signals
- Promoting *Operation Lifesaver*, a national railroad crossing safety education program for children, motorists and professional drivers.

Local communities are being strongly encouraged to close grade crossings. Railroads may offer incentive payments, which a Federal program will match dollar for dollar up to \$7500 per crossing. The Federal money must be used for transportation safety. Railroads may also offer additional unrestricted incentive payments over \$7500, along with paying to install barricades, remove pavement surface, and build cul de sacs on streets at crossings.

"Every crossing can be a headache," says Wildenborg. Most are crossings with no signals and many have obstacles that make safety improvements impossible. "We'd like people to drive an extra block or two to get to a safer crossing with automatic warning devices." Crossings are also a problem for the railroads in maintaining the track.

The safety seminars stressed the importance of communication between railroads and local officials, public works directors, engineers, streets commissioners, and emergency people to ease the process of closing a crossing.

For more information on railroad crossing safety contact Tom Wildenborg at 608/267-7349, e-mail: twildenb@mail.state.wi.us.

Nov 2	Rhineland	Nov 9	Green Bay
Nov 3	Cable	Nov 10	Brookfield
Nov 4	Eau Claire	Nov 11	Barneveld
Nov 5	Tomah		

UW-Madison Seminars

Local government officials are eligible for a limited number of scholarships for the following engineering courses in Madison. For details, use the form on page 7, call 800/442-4615, or e-mail: ranum@engr.wisc.edu.

- Traffic Engineering Fundamentals, Jul 22-24
- Neighborhood Design and Traffic Calming, Sep 10-11
- Managing Snow and Ice Control Operations, Oct 5-6
- Implementing a Sidewalk Management System, Oct 7-8
- Stormwater Detention Basin Design, Oct 26-29
- Municipal Engineering for Non-Engineers, Nov 2-3
- Evaluation and Rehabilitation of Pavements, Nov 4-6
- Managing Urban Forestry Programs, Nov 5-6
- Managing the Environmental Impacts of Public Works Operations, Nov 16-17
- Highway Bridge Design and Rating, Dec 7-9

Other training opportunities

Snow Plow Roadeo The Roadeo sponsored by the Wisconsin Chapter of the American Public Works Association is your opportunity to test the best crew you've got against crews from other communities in friendly competition. It's also a great way to get everyone tuned up and ready for winter. Held Wednesday, October 7, at the Waukesha County fairgrounds. Call Bill Kappel at 414-286-2369 for more details.

Signs — Some common questions

With so many signs and conditions to consider, knowing what to use can be a challenge. Participants at the T.I.C.'s most recent Safety Workshop got a lot of good information from instructor Tom Heydel, traffic operations engineer with WisDOT District 2.

Q: Where should STOP signs and stop bars be placed?

Normally, signs shall be no closer than 12 feet from the edge of the travel lane. When there is curb and gutter, use a two foot clearance. It may be necessary to use a lesser clearance in urban areas or at rural intersections with large radii. Place stop signs 12 to 50 feet from cross traffic (*MUTCD*, fig. 2-2). The stop sign does not have to be in the same horizontal line as the stop bar. Generally, place a stop bar 12 feet from cross traffic or less if needed for the driver to see cross traffic. When there is also crosswalk marking, place the stop bar four feet before it.

Q: When should STOP signs be used at RR crossings?

A detailed traffic study is required before you may install a stop sign at a railroad crossing. Crossings with the following characteristics may need stop signs, normally as an interim measure until active signal controls can be installed:

- the highway is secondary and has low traffic counts
- train traffic is substantial
- line of sight to approaching trains is restricted by physical features
- the railroad agency has been consulted

Q: Do I need a curve sign before a winding road sign?

In a winding road situation, you should show the direction of the first curve or turn by erecting the appropriate sign approximately 500 feet in advance of the winding road sign (*Wisconsin Supplement*, 1992).

Q: Can I mount a STOP sign on RR X-ing crossbucks?



STOP signs should not be mounted on the railroad crossing crossbucks.

The stop sign should be mounted separately for three reasons: 1) To optimize visibility. 2) Because generally the railroad agency maintains the crossbucks and the road authority maintains the stop sign. 3) Normally, signs should be erected individually on separate posts except where one sign supplements another. The stop sign is not a supplement to the crossbucks.

Q: Can a "Next x miles" sign go on a winding road sign?

Yes, when there are three or more curves extending over one mile of roadway or more, the supplemental plaque *Next x miles* (W7-3a) may be installed. Repeat the winding road sign when there are straight road sections 600 or more feet long. Also consider side road traffic and repeat the winding road sign as applicable for these drivers.

Q: What are the changes in the MUTCD on street name signs?

FHWA has approved changes to the 1988 *MUTCD* saying that street name signs must be retroreflective. Letters should be 6 inches high. If upper and lower case letters are used, upper case letters should be 6 inches and lower case letters should be 4.5 inches. The street name sign may be mounted above a stop sign with no required vertical separation. However, a 6 inch space is recommended. It is desirable to mount street name signs separately for better visibility of the stop sign. Do not use red as the face color for street name signs.

Q: Can I mount signs to utility poles?



Mounting signs on utility poles requires the owner's permission.

Normally, signs should have their own posts. If site conditions make this impossible, get permission from the pole owner. Utility companies generally do not want signs on their poles for safety reasons and because the signs hinder access to the poles.

Q: Do I need a School sign on all three roads that border a school?

Yes. Under the *Wisconsin Statutes* and the *Wisconsin Supplement* a school sign (S1-1) is required on roads passing school buildings or grounds. This refers to both private and public schools and their surrounding grounds. A School Crossing sign is used at established crossings and has crossing lines on the sign.

Q: Is a 15 mph sign required at a school?

The school speed limit sign is not required unless the limit has been changed from 15 mph. However, it is always a good idea to have a speed limit sign in school zones. The 15 mph limit is fixed in *Wisconsin Statutes 346.57* and applies, when children are present, to traffic passing an intersection that is properly marked with a School Crossing sign.

To change the limit, the authority in charge of the highway's maintenance may establish and post a lower limit, up to 10 mph lower, under *Section 349.11 (Wisc. Stats.)*. To increase the speed or make a change beyond 10 mph lower, the authority must consult WisDOT.

Where it is used, proper signing according to the *Wisconsin Supplement* is an assembly of three signs or a single sign panel with these components: "School" (S4-3), "Speed limit" (R2-1) with appropriate numerals, and "When children are present" (S4-2). This assembly or panel must be erected separately from the S1-1 School sign.

Inspecting signs – day and night – a must

Warning signs, regulatory signs, informational signs—all are vital to driver safety and functioning. But signs don't live forever. It's your duty to check and replace them regularly, especially now with new FHWA minimum reflectivity standards due out this year.

Keeping signs in good shape helps ensure driver safety and also protects your municipality from liability in case of a lawsuit. Safety consultant William Wiedenbeck offered a number of suggestions about sign inspections at a recent T.I.C. Safety Workshop.

Signs generally have a useful life of 10 to 12 years, depending on exposure, snow plowing mishaps, theft, vandalism, and sometimes unknown factors. "Signs can be funny," says Wiedenbeck. "You can have two identical signs at an intersection and one will go bad and the other doesn't."

Inspect top coat Look for cracks and feel the surface. Newer reflective sheeting seems to develop cracks sooner but maintains reflectivity longer than older engineering grades, Wiedenbeck says. Visible cracks that haven't broken the top coat may not degrade reflectivity. A heavily cracked sign looks shabby, however, and may distract drivers, even if it is still functional.

Observe color Make sure red signs stay true red. When yellow signs get so pale they look white at night, it is an indication that reflectivity will decline dramatically within a year. Even if motorists accept them, faded color can become a factor in a legal case.

"There's no doubt that FHWA's new standards will have an impact in the future," says Wiedenbeck. "There's always a sign out of sight around the corner that can go bad when

nobody is looking. But if you have an inventory and planned maintenance it will considerably reduce those situations."

Assign responsibility Give one person the job of routinely inspecting signs in daylight and at night and recording the results. Plan the activity; don't expect it to "just happen." Too often sign maintenance and inventory take a back seat to other obligations.

Keep an inventory A well-maintained inventory can track sign age and flag the ones to check. Inventory systems help with budget projections, staffing assignments, and work zone signing plans. Record all relevant information each time a sign is replaced to help the next person who must service it. Adding an installation date to the required ID code on the sign back will aid the inventory and help in accident investigations.

To learn more about sign inspection, maintenance and inventory management, plan to attend the T.I.C.'s next Safety Workshop. Watch Crossroads and your mail for course announcements.



Night inspections are crucial. This sign which seems fine in daylight, is barely visible at night. White measured 4.5 candlepower, yellow 2; the minimum is 35.

Reader Response

If you have a comment on a *Crossroads* story, a question about roadways or equipment, an item for the *Idea Exchange*, a request for workshop information or resources, or a name for our mailing list, fill in this form and mail *in an envelope* to:

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Or call, fax, or e-mail us:

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e-mail Ranum@engr.wisc.edu

- Please put me on your *Crossroads* mailing list.
- Please send me information on _____

- My idea, comment or question is _____

(We'll contact you to get more details or answer your question.)

Name _____ Title/Agency _____
 Address _____ City _____ State _____ Zip _____
 Phone () _____ fax () _____ e-mail _____



