



Pulverize for longer pavement life

With construction season just around the corner, it's time to review a valuable tool for resurfacing asphalt roads—pulverization. Whether the pulverized material goes into the base course or gets recycled and relaid, the process eliminates reflective cracking and extends road life. Pulverizing equipment works effectively within curb and gutter, over old concrete and even brick pavements, and on rural roads.



"It's like starting over with a new pavement," says John Edelbeck, Director of Public Works in Waupaca. "You've eliminated the existing cracks that will put pressure on the new overlay." Waupaca, a city of 5,000, uses pulverization on all types of streets and roads. Since many of its roads are thin asphalt layers over sandy

soil, pulverizing's main benefit is conserving the existing pavement to increase road strength, according to Edelbeck.

Waupaca's contractors pulverize the old asphalt surface to a depth of 6-8 inches and mix it in place with the stone base course. Often, about half the material is hauled away to keep the final surface even with existing curb and gutter and to help maintain proper crown. The city stockpiles the excess material and uses it for shoulders and as utility backfill.

After pulverizing, a grader comes in and grades and compacts the surface. A 1½ inch binder course and a 1½ inch surface course of asphalt follow. With the residual asphalt in the pulverized pavement, the graded and compacted surface is "passable," Edelbeck says. This allows the road to be opened to traffic quickly which is good when there's a delay before the paver comes in.

"We've been doing it for three years now and hope to continue pulverizing streets where we can," says Edelbeck. Even with removing half the surface material, the process tends to raise the road's crown height, so older, wider streets

with a flat crown are good candidates for pulverizing, he says. Streets with subbase failures are not good candidates he says. Pulverizing costs 45 cents per square yard.

Pulverizing over concrete and brick

On its many streets that are asphalt over concrete, the City of Racine first grinds off the asphalt then breaks up and re-seats the underlying concrete. The contractor breaks the concrete pavement into pieces 3-4 feet square then rolls it with a vibratory roller. "This helps considerably with reflective cracking," says City Engineer Jim Blazek. "The pieces all mesh together and you don't have the heavy cracking coming through."

Reflective cracking is a particular problem on streets with asphalt over concrete. They are more prone to developing potholes because water seeps in between the two layers causing deterioration from the inside. The freeze thaw cycle accelerates the process. So do very hot or cold temperatures because the materials expand and contract at different rates.

Old brick streets don't cause reflective cracking but often they will have deep depressions in the tire tracks. After pulverizing off the asphalt surface, the contractor fills in low areas before laying the binder course. Leveler courses are also used to meet higher gutter levels and to even out the surface around old concrete patches that are elevated above the surrounding brick layer.

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PASER and PASERWARE— *Clarifying the facts*

The T.I.C. gets many calls about PASER, PASERWARE, and the new state requirement that local governments rate their roads. We hope the following helps clarify the situation.

PASER is a state-approved pavement surface rating system that is used to rate the condition of streets and roads, on a scale of 1 to 10 for paved surfaces and 1 to 5 for unpaved ones. T.I.C. has PASER manuals for asphalt, concrete, and gravel roads that show how to do the ratings using pictures and simple text. T.I.C. also has a videotape that explains how to rate asphalt surfaced roads using PASER.

PASERWARE is pavement management software that local officials can use to inventory local roads, recording physical characteristics (such as length and width), PASER condition ratings, and maintenance and repair actions. PASERWARE provides an initial inventory of local roads because it translates the state database of local roads. It also projects into the future to help local officials evaluate the consequences of alternative maintenance strategies and budgets. It creates graphs and tables to help local officials communicate the consequences of alternatives.

Two new versions of PASERWARE will be available this spring. PASERWARE 1.1, an updated MS-DOS version, and PASERWARE 2.0, a Windows-based version written in Access 97 are updates to the current 1.0 version of PASERWARE. The MS-DOS version is being continued for local agency users whose computers don't have the speed and memory to process the Windows version.

Earlier versions of PASERWARE were named ROADWARE. The name of the software was changed to PASERWARE to avoid confusion with a Canadian company that makes pavement testing equipment. ROADWARE 6.0 and PASERWARE 1.0 are essentially the same. Both new versions of PASERWARE (1.1 and 2.0) will read road data files from RW 6.0 and PW 1.0. Agencies with road data in earlier versions of ROADWARE (5.12, 4.0, 3.0) may not be able to transfer their road data files to the new versions without special assistance. In some cases, it may be better to start over.

By December 2001, condition ratings of local roads are to be reported to Wisconsin DOT. This will give local governments time to rate their roads using any state-approved condition rating system. DOT will review condition rating systems and provide a way to submit condition ratings closer to the date when they are due.

If you want to learn how to rate your roads using PASER and how you can benefit by using PASERWARE, consider attending a workshop in April or May. See the *Calendar* on page 5 for dates and locations.



The new Portland Avenue Bridge in Beloit won an Award of Excellence for design. It was recognized for sensitivity to the existing river-front site and innovations required by endangered species and hazardous materials in the Rock River.

Idea Exchange

Windshield treatment improves vision in rain

A WisDOT reader sent a recommendation for rain repellent glass treatments. "I just love using the products because they improve vision greatly and almost totally eliminate the need for wipers at high speeds," says Mark Paulat. "They would definitely help highway crews as well."

The products penetrate the microscopic pores of glass creating a superslick, invisible barrier. They are wiped on and polished off like a wax. "Rain-X" and a similar product from STP cost under \$5 a bottle at auto parts and discount stores. They require two applications 5-7 days apart and last about a month. "Aqualpel" from PPG Industries, is a service treatment costing \$29.95 for a passenger vehicle. It is supposed to last six months to a year.

Although they are not a substitute for windshield wipers, they are effective against slush, rain, snow, frost, ice, mud and bugs, as well as salt. They seem to work better when the vehicle is traveling at 35 m.p.h. or faster. In fact, they are commonly used on airplane windshields.

Does your municipality have experience using these products on streets/highway maintenance vehicles? Please call, email, or write to tell us how well they work. (To reach us see page 7.)

Crossroads

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Spray patchers speed repairs

Spring is bustin' out all over, especially in the potholes on your roads. To combat them, some Wisconsin municipalities are using new spray injection patching equipment, and they find it makes better patches quickly and safely in all kinds of weather.

"It is so much better than a cold patch because it stays pliable. It adheres to the road and moves with the road," says Richard Kinzer, Beloit streets supervisor. "We have had just three pothole failures since we bought the patcher in 1997 and last year we repaired more than 10,000 potholes."

Beloit's trailer-mounted Patchmobile put 200 tons of chipped limestone and 7,000 gallons of emulsion into fixing potholes, blending in raised manholes, ramping up to bridge decks, and other maintenance chores.



Patches stick tight

Blowing a blend of emulsion and stone into the pothole under high pressure (about 50 mph) makes the patches stay in place. The fill material is fully compacted in thin layers from the bottom up. An initial jet of compressed air clears the hole of debris and standing water, helping ensure a good bond with the pavement.

Spray patches also seem to be as good or better than hot mix patches, and they can be done in any weather. "You can use it year round and the patch stays in the hole the first time. You're not going back to the same hole five or ten times," says Kinzer. "And a great advantage is you can use it in wet weather if you have a bad hole that needs to be fixed right away. You can build a little dam around the hole to keep the water out."

Beloit has even used their Patchmobile in temperatures as low as -10° F, but they keep trips short because valves tend to stick and freeze in very cold weather.

The machines are especially good for fixing shallow holes. "It's very good on viaducts," says Daryl Sobczak, City of Milwaukee Street Repair District Manager. "You tend to get a lot of spalling on bridges because of the amount of rebar so close to the surface. When holes do form they are shallow. Normal asphalt doesn't last in those types of holes." The City of Milwaukee just bought its second self-propelled Roadpatcher.

Milwaukee crews are out most days of the year. Each machine goes through approximately 100 gallons of CRS-2 emulsion and three tons of 1/4-inch washed stone every day.

Economical and safer

Although the initial equipment cost is more than for conventional patching methods, in the long run it is more cost efficient. "The big cost saving is you reduce your crew

from two to one. Also, you can stay out year round and the patches stay in longer," says Sobczak. Milwaukee paid \$122,000 for their newest truck-mounted Wildcat Road-patcher. Beloit's Patchmobile trailer cost \$34,000 for a two-yard trailer, plus \$3000 for the emulsion tanks.

Using the patcher is much safer for the crews, Sobczak points out. "In the past we had people walking behind a truck exposed to heavy traffic on major arterials," he says. Now the operator stays safely inside the cab. A large arrow board on the back and strobe lights make the patcher very visible and vehicles do move over, he notes. Also, since the patches set up immediately, the operator is exposed to traffic for less time.

Techniques

Patchers need good well-trained operators Kinzer and Sobczak agree. The operator needs to be attentive when operating the valves and filling the emulsion tanks. And it takes a while to learn how to manage the emulsion-stone mix for different conditions.

"You have to crown the patch about a quarter-inch to compensate for the settling," says Kinzer. A thin coat can help hold an alligatoring road together until it can be repaired permanently. Beloit has also used it to fix sunken curb and gutter. One problem Milwaukee found is that in very hot weather the patches had a tendency to track. They resolved it by increasing their cover aggregate.

They also found 1/4 inch washed stone is best, otherwise fines tend to clog the conveyor. The stone also needs to be fairly dry. Beloit uses limestone chip aggregate from a local quarry, graduated from 5/16 inch down into the fines.

Positive public response is also an advantage. "Citizens like the looks of the patches, because they come out white and look like concrete roadway," Sobczak says. They appreciate the smoothed out road with patches that stay in place.

For more information about patcher operations, contact Richard Kinzer, Beloit, 608/364-2929 or Daryl Sobczak, Milwaukee, 414/286-5533.

This pothole measuring 8' x 9' x 6" took 30 minutes to fill.



Good drainage lengthens road life

Improving roadway drainage can make your roads last longer. Last fall's **Roadway Drainage** workshops highlighted ways to identify the cause of drainage problems and how to follow up with effective improvements. The workshop instructor was David Orr, Technical Assistance Engineer with the Cornell Local Roads Program in New York. A former county highway engineer, Orr shared his experience with a very enthusiastic audience in this Wisconsin T.I.C. workshop series. For those who could not attend, here are several key points.

Good quality base course It is very important to insist on (and test) good quality aggregate for all roadway base and surfacing materials. One common sense step is limiting the fines in base course aggregate to less than 8%. It is not easy to tell the fine content of a graded aggregate just by looking, as a classroom demonstration showed. In the workshop most participants could not identify the best quality material from among three base course samples, even after touching them. This shows that running a simple gradation test on your aggregate is an essential, economical way to improve local road performance.



Roads with poor crown and no shoulder or ditch will suffer pavement failure.

should be maintained regularly to remove grass and debris that builds up along the edge and traps water.

Under drains Installing under drains can cut localized road failures from sub-surface water. These systems should be installed to drain the base course thoroughly to its bottom. It is important for the long term performance of the drains to keep fine materials out of them. Unfortunately, many fiber-wrapped pipes offered commercially for under drains are simply not effective in removing silt and clay material.

For the most effective long-term performance of under drains, enclose the pipe in granular material and wrap the entire trench in a geotextile designed for a separation layer. If you wrap the pipe with a geotextile, its apparent sieve opening should be 40 or smaller. Others have found that using washed concrete sand around the pipe will filter out the fines and not clog the under drain system. Do not confuse well-graded, washed concrete sand with uniformly sized mason sand. The mason sand will not be effective.

Pavement crown

Orr reviewed the value of good pavement and shoulder crowns for getting water off the road and into the ditch. The shoulder cross slope should be slightly steeper than the pavement crown to improve drainage away from the pavement. Shoulders

Under drains must be maintained. Design them to discharge into a ditch and cover the outlets with a rodent screen. Locate the outlet 6-12 inches above the ditch's flow line. This avoids back flow and clogging when silt and debris fill the ditch. Inspect the outlets periodically and clean as necessary.

Geotextiles have also proven effective in preventing road failures where there are poor subsoils and a high water table. The geotextile separates the base course from the fine-grained soils and water below. Non-woven geotextiles resist puncture well and give excellent long-term performance.



Culverts need proper cover and end treatments to prevent erosion and undercutting.

Installing culverts Most culvert installations are replacing existing culvert pipes. Orr cautioned participants to review the culvert's effectiveness before simply replacing it with the same size and type. Consult local residents and long time maintenance personnel about which pipes can adequately handle heavy storm flows.

A check on the sizes of upstream and downstream culverts can also be revealing. A simple way to spot undersized culverts is to compare the square footage of their openings. Changes in land development up stream from the culvert can also significantly impact pipe adequacy. Consider not only existing conditions but also improvements planned for the next few years.

Careful attention to backfilling around pipes is the most important step in avoiding damaged or collapsed culverts. It is good practice to place the backfill in 6 to 8 inch layers and compact each layer. Orr also cautioned about the false economics of using a culvert pipe that is too short. Pipes should be aligned with the stream's natural flow, not just placed perpendicular to the road. They need to be long enough to provide good protection at the end of the pipe and to avoid erosion and undercutting during heavy flow. It is always cheaper to buy an adequate length of pipe than to try to fix erosion and stream flow problems afterwards.

Diggers Hotline Orr reminded everyone to call Diggers Hotline at least three days before doing any excavation and to use its services. When you are planning an excavation, Diggers Hotline locates underground utilities and advises on safe working clearance for overhead lines. Orr also uses the Hotline to track other projects scheduled in his right-of-ways.

Protecting the environment Transportation liaison staff from Wisconsin DNR regional offices spoke at each workshop. They reviewed state regulations on erosion control and constructing and maintaining local roads near wetlands and navigable streams. DNR staff welcome questions about the regulations and will help local officials meet state requirements. They urged participants to contact them when planning work near

navigable streams and wetlands or projects that will uncover more than five acres of soil. A list of DNR transportation contacts for each county and a summary of the regulations were distributed and are available from the T.I.C.



Protect exposed ditch soil from erosion. Seed immediately and use erosion control blankets.

Maintenance Road-side ditches must be maintained. Ideally the ditch bottom should be at least one foot below the bottom of the base course. Its slope may need to be different from the roadway's slope to maintain flow and avoid erosion. Ditch slopes between 1% and 3% are most desirable.

Periodic cleaning is normally required to remove the build up of silt and debris. You can minimize ditch erosion if cleaning minimizes the area disturbed. Orr recommended to remove silt only from the ditch bottom and to avoid scraping soil from the slope on the sides. Exposed ditch soil should be seeded immediately by hand sowing the seed and walking it in. On steep ditch slopes that are subject to erosion, Orr recommended using erosion control blankets. These come in a variety of materials.

Culvert inspection and cleaning The workshops also highlighted the need for periodic culvert inspection and cleaning. A handy, short inspection form was included in the workshop handouts.

This inspection form, the *Roadway Drainage* manual, the *Diggers Hotline Guide*, and the handouts from DNR are available from the T.I.C. (See *Resources*, page 6.)

Good drainage makes your roads last longer. It requires regular maintenance and special attention when making pavement improvements.

Calendar

T.I.C. workshops

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

Maintaining Gravel Roads How to build and better maintain gravel roads taught by Ken Skorseth, Field Operations Manager of the South Dakota Transportation Technology Transfer Service. Workshop covers routine grader operations, fixing ruts and washboards, and proper surface materials/fabrics.

Mar 13 Rhinelander Mar 15 Eau Claire
Mar 14 Cable Mar 16 Tomah

Pavement Management for Local Roads: PASER & PASERWARE Learn to use the T.I.C. pavement surface rating system (PASER) to evaluate street and road conditions. See how the T.I.C. pavement management software (PASERWARE) helps keep good records of PASER ratings, set maintenance priorities, prepare budgets, and communicate proposals to decision-makers and the public.

April 6 Barneveld May 10 Cable
April 18 Stevens Point May 11 Eau Claire
April 19 Green Bay May 16 Tomah
April 20 Brookfield May 17 Fond du Lac
May 9 Rhinelander May 18 Brookfield

Basic Highway Surveying Methods A new one-day, hands-on workshop on basic plan reading, measuring, calculations, and setting grades will be held the weeks of June 12 and 19. Includes classroom and field exercises. Brochures will be mailed soon. Class limit is 20. Class locations:

Monroe	Wauwatosa	Manitowoc	Barron
Marinette	Rhinelander	Sparta	

UW-Madison Seminars

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

- Maintaining Asphalt Pavements**, Mar 27-28
- Improving Public Works Construction Inspection Skills**, Mar 29-30
- Preparing the Public Works Budget**, Mar 27-28
- Presenting the Public Works Budget**, Mar 29
- Municipal Engineering for Non-Engineers**, Mar 30-31
- Minimizing the Impact of Utility Cuts**, Apr 10-12
- Development Review and Access Management**, Apr 10-12
- Managing Street and Highway Design Projects**, Apr 13-14
- Traffic Signal Design, Maintenance, and Operations**, May 1-3
- GIS for Public Works**, May 2-4

Other Training Opportunities

Public Works Supervisory Academy is a certificate program in supervisory skills that consists of 10 one day courses offered by UW-Madison and taught at locations around the state on an ongoing basis. Contact Gregg Miller, Professional Development and Applied Studies, for more information at (608) 263-8256.

Better Communities through Traffic Calming A conference sponsored by WisDOT, Bureau of Traffic Safety (BOTS), on how traffic calming is making large and small communities safer and more appealing. The main conference is in Milwaukee on May 11. A mini-conference is in Eau Claire on May 8 and DePere on May 9. To register call 414/286-3263 or visit the safety partners web site at www.danenet.org

Spring APWA Conference May 10-12 at Milwaukee's Midwest Express Center. Wed. evening tours, reception and dinner are at Discovery World. Technical engineering and public works sessions are Thurs. morning with equipment-related presentations in the afternoon. Thurs. lunch is on the exhibit floor so participants can enjoy a major indoor vehicle display and exhibits. The business meeting and a talk on legal issues relating to public works projects/services by a City of Milwaukee Assistant Attorney are on Friday. Registration materials will be mailed to APWA members in early April. Non-members should contact Mariano Schifalacqua, Deputy Commissioner of Public Works Milwaukee, 414/286-3302 or Bill Kappel, Director of Buildings and Fleet, 414/286-2369.

New standards for crashworthy work zone devices

New tests show that several types of work zone devices can make fixed object crashes more severe. Many barricades and most portable sign supports with signs made from rigid materials are uncrashworthy under NCHRP 350 standards adopted by the Federal Highway Administration.



The A-frame barricade and rigid sign do not meet the new crashworthy requirements.



This X-footprint support and roll-up sign are crashworthy under FHWA's new standards.

"Minivans, pickup trucks, and 4WD vehicles are becoming more common, and crash tests show problems. Some work zone devices are penetrating the windshields or getting sent into a work area in a crash," says Tom Notbohm, Traffic Operations Engineer of the WisDOT Bureau of Highway Operations. Improving work zone devices is part of the FHWA's Congressional mandate under the 1991 ISTEA act to make all roadside hardware devices more crashworthy.

Local street and highway agencies, road contractors, and utilities should start phasing out uncrashworthy items now and begin specing and ordering devices that meet the standards. All new category 2 devices bought after October 1, 2000 for use on the National High-

way System must be crashworthy. This category includes barricades, portable sign supports, and drums with lights.

Since the guidelines allow agencies to use up current stocks, full compliance dates in Wisconsin are two to five years hence, depending on the type of device and whether it is used on national or state highway system roads. Tentative Wisconsin sunset dates are:

- Barricades—January 1, 2002 for state-let contracts on National Highway System (NHS) routes; January 1, 2004 on all state routes and contracts.
- Portable signs supports—January 1, 2003 for state-let contracts on NHS routes; January 1, 2005 on all state routes and contracts.
- Maintenance and utility work on state highways—dates are not firm yet, but will be similar.

The requirement does not apply at the local level unless the agency is doing work on a National Highway System or state route. However, FHWA strongly recommends following these standards on other routes for both safety and liability reasons. "Liability may be an issue if an agency has a different standard on some roads than others," Notbohm says.

Sign trailers currently used by counties and others don't meet the crash test requirements. "We recognize that the trailers have safety benefits for the work crews," says Notbohm. "We want to continue allowing the use of existing trailers for several more years, but we are recom-

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Resources

Materials listed are available from the Wis. T.I.C. unless otherwise noted. To get your copy call 800/442-4615 or use the form on page 7. Videotapes are loaned free through Wisconsin County Extension Offices.

PROPOSED AMENDMENTS to the Manual on Uniform Traffic Control Devices (MUTCD), Part 5, Traffic Control Devices for Low Volume Rural Roads, Federal Register and FHWA, December 1999, 22 pages. The Federal Highway Administration is proposing to add a new Part 5 for low volume rural roads. The intent of new Part 5 is to provide in one location in the MUTCD the standards and guidance that are unique to low volume rural roads.

Proposed Part 5 defines low volume roads as both paved and unpaved roads outside of corporate limits that carry traffic volumes with an annual average of less than 200 vehicles per day. The proposal includes Standards and Guidance for sign sizes and placement, regulatory signs, warning signs, pavement markings, traffic control for highway-railroad grade crossings, and

temporary traffic control. It also includes options for low volume roads in the sections concerning sign placement, stop and yield sign warrants, and centerline pavement markings. **FHWA is accepting comments until June 30, 2000.**

Roadway Drainage The materials below were distributed at T.I.C.'s fall Roadway Drainage Workshops. They offer valuable advice and information on how to identify the causes of common roadway and roadside drainage problems and some practical ways to solve them. Available in limited quantity for those not able to attend.

Roadway and Roadside Drainage by David P. Orr, P.E., Cornell Local Roads Program, Publication No. 98-5, 88 pp. Workshop manual that includes information on soils, road construction materials, subsurface water problems and their correction, use of subsurface drains, culverts materials, sizes, and installation, ditches, side slopes, and erosion control.

The Excavator's Guide to Diggers Hotline by Wisconsin Diggers Hotline. A complete guide for anyone planning to excavate in the public right-of-way. Covers notification procedures, phone numbers, excavator responsibilities, and state law on excavation notification.

Municipal Roadway Projects Near Wetlands and Navigable Streams, Wis. DNR, Nov. 1999, 3 pp. Helpful fact-sheet on regulations local agencies must follow when doing road and drainage construction and maintenance work near wetlands and navigable streams. Includes a handy list of DNR transportation liaison contacts by county.

Replacing culverts, cleaning ditches? Plan Ahead An article from *Crossroads*, Summer 1996, on problems that can be caused by improper ditching and poor culvert installation and how several Wisconsin local highway departments have worked with DNR to meet state requirements in a cost-effective way.

RR-xings get safety upgrade

Every day 150 trains travel through Wisconsin, often at speeds of 60-79 mph. In the process they cross streets and highways at nearly 5000 locations most of them unprotected, at-grade crossings. That's a lot of opportunities for vehicle-train collisions.

Every grade crossing in the state is getting better markings, under orders from the State Commissioner of Railroads. The railroads began last year installing new crossbucks signs and putting reflectorized tape on the sign posts. The project should be completed in 2002.

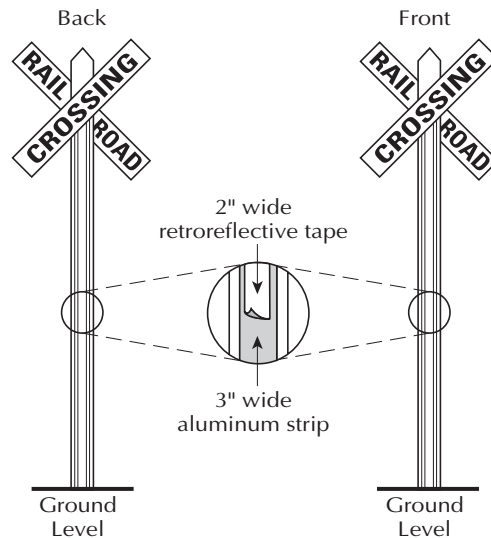
These new markings make the crossings more visible at night, especially on dark rural roads. Reflectorized tape on the front and back of every post not only delineates the crossing, but also helps motorists recognize when there is a train in it. Studies in several other states show that when headlights shining on the tape between the passing train cars there is a very noticeable flickering or strobe effect.

"It's a way to improve safety right away at a lot of crossings," says Doug Wood of the Commissioner's office. The number of crashes and frequency of fatalities at rural crossings is disproportionately high. "Once trains are going more than 40 mph there is a huge increase in the number of fatalities," he says.

Upgrades are being done in segments along the rail corridors. The first ones were installed last summer on the Wisconsin and Southern line.

This program is an opportunity for local streets and highway agencies to review their crossings for proper advance warning signs and visibility triangles. The agency that owns the road is responsible for putting up the familiar round signs (available free from the railroads through the County Highway agency).

Trains are also supposed to be visible from 330 feet down the track from the center of the intersection. Local



All Wisconsin railroad grade crossings are getting new signs and reflective tape.

agencies are responsible for clearing brush and trees that obscure this vision corner for 330 feet down their right of way. They should also work with landowners when brush on private land obstructs driver vision.

For intersections where brush on private land is a hazard, you may want to secure an easement and do the clearing with your own crews. It would be similar to a construction easement, and would formalize the arrangement.

Considering that a car or a train going 60 mph will take less than 4 seconds to travel 330 feet, it's a very small, but possibly crucial margin of safety.

For more information contact Doug Wood at 608/266-9536, email: Woodd@psc.state.wi.us

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:

Crossroads

Transportation Information Center
University of Wisconsin-Madison
432 North Lake Street
Madison, WI 53706

Or call, fax, or email us:

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- 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 () _____ email _____



New standards for work zone devices from page 6

mending against purchasing new ones." Two states successfully tested light weight trailers with small wheels.

Several manufacturers offer barricades and sign supports that meet the crash standards. These are listed on FHWA's web site (see below).



Sign trailers like these don't meet the new standards. New trailers should not be acquired, but existing ones may continue in use for a few years.

All manufacturers of work zone devices must certify their crash-worthiness in writing.

Agencies making their own devices can find generic designs and specifications on the FHWA website. Most of the generic designs are for Type III barricades (three rails to close a lane or road).

By May Notbohm expects to have purchasing recommendations on portable sign supports with roll-up signs based on county evaluations of features, ease of setup, durability, ability to hold the sign upright, and other factors.

For more information contact Tom Notbohm, 608/266-0982, email: thomas.notbohm@dot.state.wi.us. Designs are listed on the FHWA web site: <http://safety.fhwa.dot.gov/roadside/>

Pulverize for longer pavement life from page 1

Costs for pulverization, cracking and seating, and leveler courses vary with the contract bid, Blazek says. On three recent contracts, milling cost \$9.60, \$8.35, and \$8.32 per ton. Cracking and seating cost \$.41, \$1.15, and \$.35 per square yard. Binder courses with MV mix type asphalt cost \$26.75, \$29.85 and \$27.75 per ton.

All contracts pay separately on a unit price basis for hauling away pulverized material. "That way, if we estimate amounts wrong on one street we pay only for the amount the contractor hauls out," says Blazek. Streets department staff use historical records, observe curb height, and sometimes take cores to help them make tonnage estimates.

Rather than trying to reuse or salvage their own pulverized material, Racine's bid specs allow using recycled asphalt mix for either course. "The contractor's logistics aren't such that they can pick up and re-mix and lay the same material," says Blazek. "They stockpile it, then bring us virgin or recycled material that is not necessarily ours."

Pulverizing in urban areas has its challenges, Blazek, says, and may cost a little more, but is worth it. "We've been doing it at least 10 years and have found it to be very effective. We get 30% to 50% longer life out of the pavement," he says.

For more information on pulverization, contact John Edelbeck, Waupaca, at 715/258- 44220, email: jaewaup@yahoo.com; or James Blazek, Racine, at 262/636-9191, email: jblazek@cityofracine.org

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Local Technical Assistance Program (LTAP)

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