

Crossroads

Summer 2001



TRANSPORTATION Information Center — LTAP

University of Wisconsin—Madison

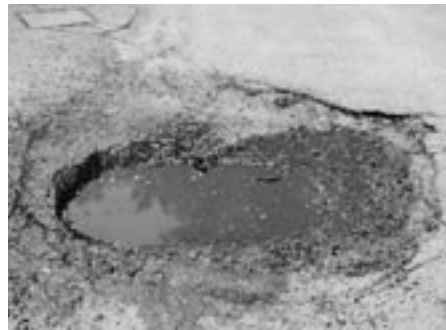
Maintenance basics – potholes and cracks

Potholes and cracks are a constant headache for local road agencies. Not only do they bring citizen complaints and cause untold wear on vehicles, they're a serious threat to pavement life. Water gets through the pavement surface and weakens the road structure underneath. Here are some basics guidelines:

Patch promptly An open pothole collects water and directs it down into the pavement structure. The sooner you close it the better.

Use high quality patching material The quality of asphalt used for patching is more important than the patching method, according to research by the Federal Highway Administration (FHWA). For temporary patching, use a high quality, asphalt mix customized for patching. These mixes have chemicals added to make the material stickier for longer. For permanent patching use hot mix asphaltic concrete. Hot mix will usually provide the most durable patch.

Patch a dry, clean hole Patching material will stick better when you have cleared loose material out of the hole and the base underneath is dry. This may not always be possible. Some agencies use spray injection equipment that blasts the hole with high pressure, blowing loose material and water out of the way.



“Throw and roll” works Simply filling a pothole and compacting the patching material with the maintenance vehicle's tires produces a patch that is usually good enough. Such patches, when using high quality material, lasted as long as those using the “semi-permanent” method of squaring the hole's edges and compacting with a vibratory compactor, FHWA research demonstrated.

Make permanent patches If you have not used the higher priced patch material, plan to return to the area and replace the temporary patch with a permanent one. Use a concrete saw to cut a rectangular opening 6-12 inches wider than the pothole. Loosen and remove material from center out to cut lines and down to dry, solid base. Blow or sweep out extra fines. Tack edges and place hot mix in layers no more than 3 inches thick. Tamp into corners and compact with a plate compactor or wheeled roller.

Effective patching can save 25% How many times have you filled a pothole, only to see the asphalt popping out again in a few days to a few weeks? Putting in a patch that stays will reduce regular maintenance costs and extend pavement life.

Fix underlying problems When an area of pavement breaks up more often or sooner than neighboring stretches, there likely is a soil or water problem underneath. Review the surrounding area, then plan a permanent solution. Excavate small areas of unstable soil and replace with sand/gravel mix. Improve drainage if necessary.

Clean and seal cracks Cracks let water into the pavement and often spawn potholes. It is best to seal cracks in spring or fall when they are at their midpoint. Seal in dry weather if possible. Rout out relatively straight, individual cracks to 1/2-3/4 inch wide and 1/2-3/4 inch deep. (Clustered cracks, alligator or edge cracks require patching.) Clear debris with a hot air lance or compressed air. Apply sealant with applicator wand from hot kettle or use a pour pot. Squeegee to make a clean edge and push sealant into crack. Apply blotter: sand or single ply toilet paper.

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Asphalt Maintenance

DEMONSTRATION DAY

Patching and Surface Treatment Techniques

July 11, 2001 at UW-Green Bay

Learn about a variety of asphalt pavement maintenance techniques and see them demonstrated live. Watch for a T.I.C. mailing with more details.

PASERWARE 2.5 out now; more training in July

The first Windows version of PASERWARE (v. 2.5) is now available. Many new features make it easy to use:

- A run time version of Access 2000 is included with PASERWARE 2.5 so you do not need a separate copy of Access 2000 to use the program.
- The Windows operating system manages printers, ending the printer problems of earlier DOS versions.
- It translates all data from previous versions of PASERWARE and ROADWARE.
- All menus and features are mouse driven. Most reports have screen previews so you can look at the report without having to print it.
- The data entry screen, the general report, and the inventory forms all have a place to enter new "on/at" location descriptions.
- A new datasheet screen lists locations, condition ratings, and rating year in a spreadsheet-type table.

- The History File can now be sorted and printed by the year the work was done.
- Instead of a single five-year budget for the simulation, the new version allows three five-year budgets: one for preventive maintenance, one for rehabilitation, and one for reconstruction projects. It also suggests trial budgets to begin the simulation process.
- A new WISLR report can be used to submit road condition data to WisDOT when it's required in December 2001.

PASERWARE 2.5 is written in Access 2000, and works in Windows 95, 98, NT, ME, and 2000 Professional. PASERWARE 2.5 requires at least a Pentium class PC with a minimum of 64 Megs of RAM.

Training sessions are being offered in July for those who were not able to attend in March and April. For information about PASERWARE 2.5 or PASERWARE training, contact the T.I.C. at 800/442-4615.

Pavement condition ratings due in December

Local governments must submit condition ratings for all local roads to Wisconsin DOT by December 15, 2001. While hundreds of local governments have been rating their pavements for years, over a 1000 more began the condition rating process this year by attending PASER training sessions in February and March. More than 900 local officials also attended PASERWARE computer software training sessions around the state to learn about using the newest version. Additional PASERWARE training sessions will be conducted in July and October.

There are four ways to submit ratings using PASER:

Electronic spreadsheet WisDOT will supply an electronic copy of an Excel spreadsheet on request. It lists the municipality's local road segments as they appear on the local road mileage certification map. Local officials only have to enter the PASER rating for each segment and the year it was rated. If conditions require that a segment be changed, then the new segments must be described in the spreadsheet.

Hard copy spreadsheet Small governments without a computer can submit information on a hard copy of that same Excel spreadsheet, also mailed by WisDOT on request.

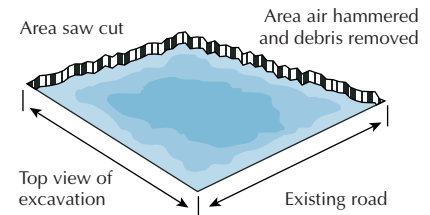
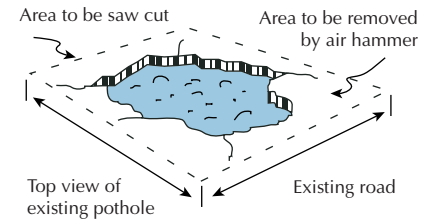
PASERWARE 2.5 WISLR report This electronic report is generated by PASERWARE 2.5 and can be e-mailed to WisDOT. (See related story above.)

Direct Internet entry When the Wisconsin Information System for Local Roads (WISLR) is on line in September, local governments can enter their PASER condition ratings and rating years directly into the WISLR data base. Training on the new WISLR data base will be offered around the state in late summer and early fall. WisDOT will send dates and locations to local governments in the near future.

To request a spread sheet contact Diane Phaneuf, WisDOT, PO Box 7913, Madison, WI 53707-7913, or 608/266-7136, or e-mail diane.phaneuf@dot.state.wi.us

Potholes and cracks

from page 1



Make patches permanent by sawing an opening, removing material, then filling and compacting hot mix.

Choose the sealant Many types of sealants are on the market, from asphalt emulsion, which is usually lowest cost, to silicone on the highest end. In deciding, consider such factors as preparation time, ease of placement, elasticity, resistance to aging and tracking, along with price. The summary chart offered by T.I.C. can help you decide (see below).

Consider a seal coat Once you have patched it, you can add years to the life of a low-volume or medium-volume road by covering it with a sealcoat treatment.

For copies of the crack sealant chart see Resources, page 7. This article summarizes some of the information presented by Tom Nelson, Professor of Civil Engineering, UW-Platteville, at the T.I.C.'s Spring 2001 Asphalt Road Maintenance Workshop. T.I.C. offers the workshop every spring at several locations around the state.

Crossroads

This newsletter provides information on roads and bridges to local officials and is published quarterly by the Wisconsin Transportation Information Center, part of the nationwide Local Technical Assistance Program (LTAP). **Crossroads** is produced with assistance from the Federal Highway Administration, the Wisconsin Department of Transportation, and the University of Wisconsin-Extension.

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

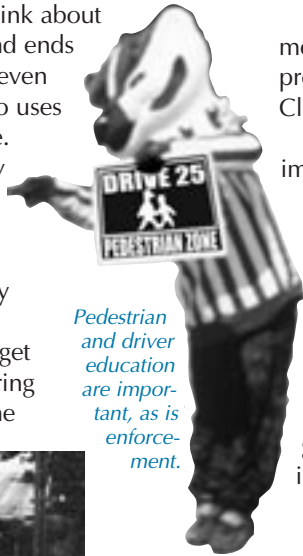
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How are your pedestrian facilities?

When you stop to think about it, every trip starts and ends as a pedestrian trip, even when the person also uses a car, bus, or bicycle. Walking is especially important among children ages 5-14, and adults over 45.

Is your community serving pedestrians effectively? You can get some help in answering that question from the



Pedestrian and driver education are important, as is enforcement.

Don't forget to insist that contractors meet pedestrian needs during construction projects. Simply putting up a "Sidewalk Closed" sign is not enough.

Education and enforcement are also important.

Sometimes it can be a challenge to consider pedestrian issues, including the requirements under the Americans with Disabilities Act. One good place to start is with the Pedestrian Road Show program. (See article in *Crossroads*, Summer 2000.) WisDOT is also developing a "Best Practices" guidebook for communities to be ready in early spring 2002.

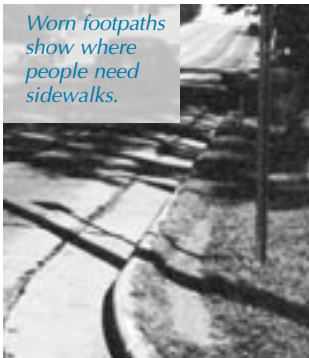
The current sidewalk policy has been in place since 1984, but has been a controversial issue since the 1960s.

Amundson plans to work with local neighborhood associations who have expressed an interest in sponsoring a Pedestrian Road Show. The intent will be to rebuild grassroots understanding and support for pedestrian facilities.

"When I see the number of people walking and using the facilities we've built in similar neighborhoods over the past 15 years, it's a shame we're not continuing to build on our previous efforts," he says.

The City of Brookfield, by contrast, has built about 65% of the pedestrian and bike facilities identified in its 1986 plan.

Worn footpaths show where people need sidewalks.



Wisconsin State Pedestrian Policy Plan, which will be ready for distribution in late summer. This plan summarizes current pedestrian conditions, concerns and programs in the state based on research and extensive public comment. The plan offers goals, objectives and actions to realize its vision: "to establish pedestrian travel as a viable, convenient and safe transportation choice throughout Wisconsin."

"Some people say that their town or suburb has no need for sidewalks because they don't see many people walking now when there aren't many sidewalks," says Tom Huber, statewide pedestrian and bicycle coordinator at WisDOT. "If you apply that thinking to building streets and highways, you won't see many cars where there is no road." Good pedestrian facilities are also good economics for tourism and commercial businesses.

It is important to consider pedestrian needs at every level of community and road development, Huber says, including land use plans, commercial and residential developments, new road construction, and reviews of existing roads and neighborhoods.



Sidewalk gaps are a problem for pedestrians.



Pedestrians use streets when there are no sidewalks.

Politics and retrofits

Few topics can bring as much citizen protest as proposing to install curb, gutter, and sidewalks in residential areas long since accustomed to not having them.

"Cost is not the only issue, just one of the many reasons why property owners don't want sidewalk built," says Brian Amundson, Director of Public Works for the City of Eau Claire. "They say: we've never had it and we don't need it. There are no pedestrians here. We don't want to shovel it. I'm going to lose part of my front yard. You'll take out mature trees. We'll lose the character of the neighborhood. There's no demonstrated safety problem."

In April, Eau Claire's newly elected City Council reversed a decision approved just two months earlier by the previous Council, deciding not to build sidewalks in several existing residential areas as part of planned street reconstruction projects.

Mayor Kathryn Bloomberg said in a letter to WisDOT that surveys of her citizens show 80% approval for pedestrian facilities. She also noted that opposition has waned as the inclusion of walkways has become more routine.

"The people who objected when the sidewalks were first proposed, admit now that they're surprised by how many people really use them after they are built," says Tom Grisa, Brookfield's Director of Public Works. "In many cases, the people objecting are the sidewalks' highest users." In addition to having the political will, two elements are critical to improving pedestrian facilities Grisa notes: having a plan, and having a person on staff who is committed to making it happen.

For information on the Pedestrian Road Show contact Tom Huber, WisDOT, 608/267-7757. The draft Pedestrian Plan is on the web: <http://www.dot.state.wi.us> under Pedestrian and Bicycle Transportation, as are other useful pedestrian links.

Winter equipment ideas ready to go

A baker's dozen of winter equipment ideas have earned strong positive votes from the counties involved in the WisDOT Winter Concept Vehicle program. Some were reported in Crossroads before. Now, after two winters' testing, there is more field time to back up their use. Most have several vendors and prices can vary, so talk to your equipment supplier about sources and costs. (Amounts listed below are the approximate cost or the cost range paid by WisDOT in 2000.)

Front Plow Shield (\$700-\$1400) Plastic hoods are mounted at the top of the plow. The shields capture snow that tends to blow over the plow onto the windshield and direct it under the vehicle. This drastically reduces the white-out effect for snow plow drivers. It is most useful for higher speed plowing (25 to 40 mph). "They've increased our plowing speed by about 10 mph," says Portage County Highway Commissioner Bill Weronke. "We are probably going to make shields common on all our trucks."



Rear air foil (\$900-1000) Mounted on top of the salt box, the airfoil prevents snow from being blown down over the rear of the truck. This keeps rear lights, signs, and reflectors visible during plowing. It should be useful for any speed plowing operation.



"Since we put it on the truck the employee did not have to clean the lights one time," says Weronke. "Without it, it would take them 10 minutes to clean lights every time they made a round."

LED lights (\$1000-\$2500) New LED lighting systems use large clusters of tiny, very bright bulbs in one bulb assembly. They give much better visibility. They will fit into existing tail and turn light fixtures. "They're a good safety feature," says Dave Lyga, Shop Superintendent, Trempealeau County. "If one element burns out, or even 15, it doesn't affect the light. They're still very bright."

Wing lights A snow cloud often covers the wing when it is in operation. A light, either LED or strobe, located on the outside edge of the wing plow alerts motorists that the wing is down and where its end is when they are passing. Wing lights can be tied to turn signals as well. "It's a great feature that we never had before," says Weronke. "In the past we have had several wings run over on four-lanes and Interstates."

HID (High Intensity Discharge) lights (\$900-1000) These extremely bright blue-ish lights are set above the normal lights on the truck cab roof. They are not yet approved as headlights for trucks, so they supplement conventional headlights on plow trucks. "They're probably one of the best inventions that ever came out according to our operator," says Lyga. "We have them wired to the high beams and that's the only time they're on. They illuminate the whole countryside."



Rear Cameras (\$1700-\$2500) Some concept vehicle truck counties are now mounting two cameras: one in the rear to show vehicles hidden behind the truck. This is very helpful when backing, at intersections, and in urban areas. This same

camera can also show whether the spreader is actually putting out material. A second camera sits on the passenger side mirror to show what is in the blind spot which is very helpful on multilane roads and in urban areas. "We've had several backing accidents in Portage County," says Weronke. "The benefits of the rear camera are very clear. Whether they outweigh the cost, and we can get them through the budget process, I don't know."

Single "joy stick" control This unit allows the driver to operate plow, spreader, dump box, etc. all with one control. Once drivers learn how to use them, they love them and feel it is safer and less tiring than all the individual controls. "We've been using them for four years on all our plow trucks," says Lyga. "When you had six or eight levers it could be difficult to find the right one in the dark cab. This way it's all done with one hand and the thumb. It's so easy on the hand, and your arm just sits on the armrest."

"Hands free" two-way radio controls These let the operator radio the base or his foreman without taking his hands off the steering wheel or other plow controls.

Pavement temperature sensors (\$450-\$900) remain very helpful for plow truck operators and supervisors since application of deicing or anti-icing materials, and even abrasives depends upon pavement temperatures. These devices are now in wide use helping operators use materials more effectively. "We've used them for six years," says Lyga. "They're now on all foreman's vehicles, and half the patrol trucks. They let the operator know of changing conditions so they don't have to wait for the foreman to call and say switch to sand or salt."

Under-body plows These plows apply downward pressure and can remove more snow pack or ice than front-mounted plows. When truck-mounted they can help reduce the need for graders and they are finding some year round use for shoulder grading and other projects. Uneven manholes or other utilities in the pavement cause operating problems. "I have them on all my state trucks and I haven't run a grader during a snowstorm in the last five years," says Weronke. "They've allowed



us to go from 12 graders down to four which is a big benefit when graders cost \$250,000 each." Weronke observes that underbody plows vary widely in reliability and maintenance.

New spreaders with a chain or belt in the bottom of the salt box. These spreaders can be reversed to permit discharge either to the rear or the front of the truck. They can discharge material in front of the drive wheels and to the side, for shouldering or spreading black dirt in the summer. "We like them," says Lyga. "It makes a very versatile truck." "I don't like them," says Weronke. "If you get a rock in the gear drive or under the belt it can be very uncomfortable chiseling it out of there at 20 degrees below zero."

Automatic tire chains (\$1800) These chains hang next to the wheel until activated, then they spin under the wheel giving traction. They eliminate tire chain inventory, installation time, and maintenance and seem to be effective in hilly areas. "Our county is quite hilly and we've been using them for a number of years," says Lyga. "Even when we get expensive chains they tend to break, and wear a lot. With this unit you just flip a switch. Maintenance-wise they're so much better; you just replace a short link."

Anti-icing System An on-board 900 gallon liquid storage tank, spray bar and pump system allows the operator to switch back and forth for an anti-icing application to a dry or prewetted salt application mode by the flip of a switch or the turn of a knob. This setup makes the truck more flexible for various types of winter operations.

For more details on these items, contact Bill Weronke, Portage County, 715/345-5230, or Dave Lyga, Trempealeau County, 715/538-2221. Other counties involved in the study are Barron, Columbia, Florence, Kenosha, Manitowoc, and Taylor. A report will be available after July 1. Contact Tom Martinelli, 608/266-3745, or e-mail: thomas.martinelli@dot.state.wi.us

Winter Concept Vehicles test gadgets

Planning for the Winter Concept Vehicle (WCV) program began in August 1998 and it now has two snow seasons of experience. Starting with three counties in winter 1999-2000, the program had a total of eight counties in the winter of 2000-2001. These volunteer counties field-test new equipment and technology under real winter weather conditions. The program is organized by Tom Martinelli, winter operations engineer, in WisDOT's Bureau of Highway Operations.

"The intent is that the experiences will be shared with other counties, giving them the information they need to decide if they want to incorporate any of these options on their trucks," says Martinelli. The state pays for the concept equipment beyond what the county would normally put on a

winter patrol truck. In return, the county people evaluate and report on the individual equipment.

The counties are testing many 21st century "gizmos and gadgets" now available from vendors. Other technologies under study include GIS systems, data reporting systems, and zero-velocity spreaders.

"We have some features that have not yet proved themselves," says Martinelli, "but we will continue to work with them." The counties reported this past winter's experiences and data at a May WCV Committee meeting. Martinelli will have a progress report available in early summer.

For more details on WCV items and results, ask Tom Martinelli for his report after July 1 at 608/266-3745, thomas.martinelli@dot.state.wi.us

Signing, marking, and the new MUTCD

The Millennium Edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) was the focus of a T.I.C. workshop series in April. Attendance was very good and there was a lively discussion of new and old issues relating to signing and marking on local roads. This article offers some of the highlights.

WisDOT is now preparing the *Wisconsin Supplement* to the new federal MUTCD—a process which should be completed by the end of this year. Both documents will become effective for Wisconsin after the *Supplement* is adopted.

Local highway and traffic engineering agencies will have to obtain their own copies of the MUTCD. Sources for the federal manual are listed in the *Resources* section. Print copies will not be available until errors in the draft are corrected. They should be ready this fall. To review current versions of the 2000 manual go to:

<http://mutcd.fhwa.dot.gov/index.htm>

Local officials should use this transition period to learn more about the new MUTCD. **Crossroads** will publish more articles in the future to help with this process. Some changes that affect local agencies include:

- The existing MUTCD uses the terms *shall*, *should* and *may* to indicate when

a practice is mandated, recommended or optional. In the new MUTCD sections called "STANDARD" contain mandated provisions. "GUIDANCE" sections have recommended practices. You may deviate from GUIDANCE provisions if engineering judgement or an engineering study shows the deviation is appropriate. Finally there are "OPTIONS" that you may choose to use. "SUPPORT" sections give additional information.

- The terms *Engineering Judgment* and *Engineering Study* are significant in the new MUTCD. The engineering judgment process must be done by an engineer or under the direction or supervision of an engineer. An engineering study has the additional requirement that it must be documented with written reports, data, or other supporting material.



continued on page 8

Calendar

T.I.C. workshops

Specific details, locations and registration forms are in the announcements mailed to all Crossroads recipients nearer the date of each workshop. **Registration begins after announcements are distributed.**

Asphalt Pavement Maintenance Demonstration Day

Learn about a variety of asphalt pavement maintenance techniques; and then see them demonstrated live. The presentations will review each technique and when it is best to use it. Field demonstrations will give you a chance to see each technique applied on streets and parking lots and to ask questions of the people who are doing the work.

July 11 UW–Green Bay

PASERWARE 2.5 training

Repeat of spring offering. Because many people could not attend the spring offering of this workshop, it is being repeated in July. Learn how to use the new Windows-based PASERWARE 2.5 to help you develop your capital improvement program, project the results of your street maintenance and improvement decisions, keep a history of your projects, and report your condition ratings to WisDOT. You will receive PASERWARE 2.5 at the workshop.

July 16	Barneveld
July 17	Brookfield
July 18	Green Bay
July 25	Eau Claire
July 23	Rhineland
July 24	Cable
July 26	Tomah

PASERWARE 2.9 training

PASERWARE 2.9 is a REVISED version of PASERWARE 2.5 that is designed to download the new format of the state local roads data base that will come on line in September 2001. This workshop is for local governments that have never used any previous version of PASERWARE or ROADWARE and will not have downloaded their local roads data base before September 2001. At this course you will receive PASERWARE 2.9 and learn how to use it to help you develop your capital improvement program, project the results of your street maintenance and improvement decisions, keep a history of your projects, and report your condition ratings to WisDOT.

October 17	Green Bay
October 18	Brookfield
October 19	Barneveld
October 22	Rhineland
October 23	Cable
October 24	Eau Claire
October 25	Tomah

Winter road maintenance

Prepare for winter operations. This workshop covers developments in winter maintenance equipment, the latest on ice control materials, operations planning, and an opportunity to share experiences and tips for better winter operations. Winter survival techniques is a new topic, presented by a national expert.

September 17	Rhineland
September 18	Cable
September 19	Eau Claire
September 20	Tomah
September 24	Green Bay
September 25	Barneveld
September 26	Brookfield

UW–Madison Seminars

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

Traffic Signal Design and Operation

July 18-20
Milwaukee

Traffic Engineering Fundamentals

October 10-12
Milwaukee

Managing Snow and Ice Control Operations

October 10-11

Effective Environmental Management: New Tools for Facilitating Compliance with State and Federal Regulations

October 16-17

Earthwork Construction Using Geosynthetics

November 8-9

Effective Bridge Rehabilitation

December 3-5

Other programs

Snow Plow Rodeo

The 12th annual Snow Plow Rodeo, sponsored by the Wisconsin Chapter of the American Public Works Association, will be held on September 26, 2001, at the Waukesha County Fair Grounds. It will be a great time to practice your snow plowing skills and meet your fellow snow fighters from around the state. Come and join in the fun. If you are not the person in charge of organizing the team(s) for your organization, please forward this information to the appropriate person(s).

For additional information contact: Mark Hochschild, 414/761-5376 or Ben Weinke, 262/886-8440, benw@racineco.com

Resources

Materials are available free from the T.I.C. unless an alternate source is listed.

Wisconsin State Pedestrian Policy Plan 2020, DRAFT This plan summarizes current pedestrian conditions and concerns and offers goals, objectives and actions to help establish pedestrian travel as a viable, convenient and safe transportation choice throughout Wisconsin. Copies are available at all WisDOT District offices and as a PDF file on the web at: <http://www.dot.state.wi.us>. Look under *Pedestrian and Bicycle Transportation*. You will find other useful pedestrian links there.

Crack sealant chart This useful chart shows various sealant types, gives costs, and rates their usefulness for different purposes. Will help you select the right product for your conditions and budget.

PASERWARE 2.5 The first Windows version of PASERWARE (v. 2.5). Many new features make it easy to use. Call the T.I.C. at 800/442-4615 for more information.

Pavement condition reports on Excel Municipalities may request an electronic copy of an Excel spreadsheet with local road segments for reporting pavement condition. Contact Diane Phaneuf, WisDOT, PO Box 7913, Madison, WI 53707-7913, or 608/266-7136, or diane.phaneuf@dot.state.wi.us

Millennium 2000 MUTCD The current version is available only on the web at <http://mutcd.fhwa.dot.gov/index.htm> After final corrections are in, print copies can be ordered from:

AASHTO Publications Order Department at 800/231-3475, e-mail: aashto@abcgroup.com, or on the Web: <http://www.transportation.org/publications/bookstore.nsf/Home?OpenForm>
American Traffic Safety Services Association, 540/367-1701, 15 Riverside Pkwy. Ste. 100, Fredericksburg, VA 22406-1022 http://www.atssa.com/products/mutcd_manual.htm.

Claritors Law Books & Publications, 800/274-1403, P.O. Box 261333, Baton Rouge, LA 70826-1333, Fax 225/344-0480

Institute of Transportation Engineers, 1099 14th Street, NW, Ste. 300 West, Washington, DC 20005-3438, Fax: 202/289-7722, [http://www.ITE.org/bookstore](http://www ITE.org/bookstore)

Managing Nuisance Beavers Along Road-sides: A Guide for Highway Departments, 1999, Cornell University Cooperative Extension, 16 pp. Analyzes economic considerations of culvert replacements, water level control devices, pitchfork guards, and trapping. Makes management recommendations and has a sample form for documenting and cataloging culverts potentially susceptible to being plugged by beaver. For a print copy, contact the T.I.C. Agencies with good Internet access can get a PDF file at: <http://www.dec.state.ny.us/website/dfwmr/wildlife/beaver3.pdf>

Other web sites on beaver control include:
<http://beaversww.org/index.html>
<http://www.usroads.com/journals/rmej/9804/rm980401.htm>
<http://www.fsiculvert.com/BeaverStop.htm>
<http://wildlifedamage.unl.edu/>

Videos

Videos are loaned free from UW-Extension county offices.

What's Wrong With This Work Zone? #18410 VA DOT, 1998, 22 min

Video shows an urban 4-lane road with a lane closure and a 2-lane rural road with a flagger operation. Each work site has many errors. The video explains what is wrong and how to correct the problems. It refers to VA DOT policy and is a very good review of practical work zone safety issues. Useful for construction and maintenance personnel.

Paving Practices For Quality #18411 National Asphalt Pavement Association, 2000, 30 min

A three part series describing basic paving and rolling operations for hot mix asphalt. Part one covers site work by laborers, including dump truck guide, raking and safety. The second part covers the paver operations such as material flow control, speed and screed controls. Finally, the rolling operation is discussed with information on roller types, proper use, rolling, and patterns. The video has many practical tips for quality control and safety.

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:
phone 800/442-4615
fax 608/263-3160
email tic@epd.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.)

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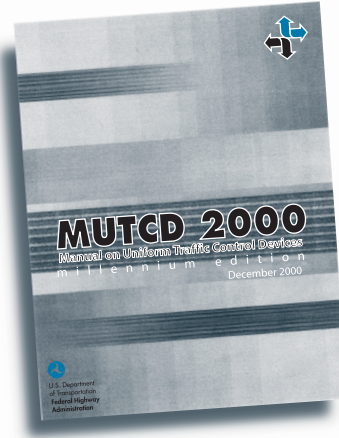
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The new MUTCD from page 5

- Changes in the *MUTCD* that involve new signs often have a phase-in period allowing additional time before installation is required. A list of conformance dates is in the *MUTCD*.
- One example of signing and marking changes: At intersections where all approaches have stop signs, a supplemental plaque must (STANDARD) be mounted below the stop signs. *All Way* signs are preferred. The compliance date is January 17, 2004.
- Street name signs should be (GUIDANCE) installed at all urban street intersections and at important rural road intersections. The signs shall be (STANDARD) retro-reflective with uppercase letters that are 6" high and lowercase letters that are 4" high. When traffic speed is less than 25 mph, 4 inch letters may be used. The compliance date for minimum letter height is 2012.



- Parking restriction signs shall be (STANDARD) retroreflective.
- Centerline marking is required (STANDARD) on urban arterials and collectors with more than 6,000 ADT (average daily traffic). It should be used (GUIDANCE) on

urban arterials and collectors over 4,000 ADT. Centerline should be used (GUIDANCE) on rural arterials and collectors over 3,000 ADT.

- Edgelines shall be placed (STANDARD) on rural arterials with more than 6,000 ADT and should be placed (GUIDANCE) on rural arterials and collectors with more than 3,000 ADT.
- Edgelines may be used on roads where no centerline is used.
- A new part of the *MUTCD* is dedicated to low volume roads. A reduced level of signing is possible on rural roads with less than 400 ADT.

Watch *Crossroads* for developments in the new *MUTCD* and *Wisconsin State Supplement*.

See Resources on page 7 for how to buy print copies of the *Millennium MUTCD*.

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