

Crossroads

Summer 2004



TRANSPORTATION Information Center—LTAP

University of Wisconsin—Madison

Learn asphalt pavement maintenance at Demonstration Day, July 7

Contractors and local crews will demonstrate a variety of proven methods for maintaining asphalt.

The T.I.C.'s 2004 Asphalt Pavement Maintenance Demonstration Day will be held (rain or shine) July 7 at Chula Vista Resort, Wisconsin Dells, with demonstrations on nearby roads. The fee is \$45.

The event is being held in cooperation with the Wisconsin Asphalt Pavement Association, several contractors, and Adams County, who is hosting.

Here is your opportunity to see, first hand, techniques and equipment that can help you maintain and improve your asphalt pavements. Demonstrations will include crack routing and sealing, infrared patching, chip seal, and other surface treatments. There will also be brief classroom presentations and plenty of opportunities to ask questions at the sites.

Current staff can learn or be refreshed on how to make pavements last longer, while new elected officials and administrators get a close up introduction to the procedures. The experience, along with information sheets and sample specifications, will help you implement the techniques in your agency and community.

All *Crossroads* recipients will receive a separate flyer with registration information. Don't wait. Sign up as soon as it arrives. Need more flyers? Contact the T.I.C. (see page 7).

Inside

For easier access to Web sites listed in *Crossroads*, click on Web address in the online edition at <http://tic.engr.wisc.edu>.

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Sealing cracks protects pavements from water damage. Demonstrations will highlight good practice and current equipment in routing and sealing.



Surface treatments like chip seal and slurry seal are an economical way to extend pavement life and spruce up a road's appearance.



Crack filling and patching ahead of the seal will enhance its effectiveness.



Idea Exchange

Former sign trailer now holds barricades

Sign trailers no longer considered safe on roadsides have been recycled by Iowa County. With a little welding, they now store and transport those giant Type III barricades used for closing roads.



"It's so handy," says Patrol Superintendent Mark James.

"Before, we had the barricades leaning against the side of the building. Now they're all on the trailer. When we need them we can just hook up the hitch to a truck and go."

Two stories in *Crossroads* gave him the idea, he says. The first, in Spring 2000, reported that sign trailers then used by counties on state roads, would no longer meet crash test safety requirements in work zones. The second, in Summer

2000, described an emergency trailer to hold Type III barricades and base supports developed by a county in South Dakota.

"We had the old sign trailers parked out in a quarry," James says. "We used the axles and frame, and welded 2x2 inch tube to hold the signs. They slide right in." Not only is it convenient and quick to get barricades to a site, they don't get banged up from loading and unloading, or from leaning against a wall when not in use. The cost was minimal since the county welder did the work using stock materials.

Most of the Iowa County Highway shops now have a trailer. Nearby townships have also borrowed a trailer when they have a road closing emergency.

For more information contact Iowa County Patrol Superintendent Mark James at 608/935-3381.

Notched wedge joints better, safer

Longitudinal joints on asphalt pavement tend to crack and ravel, making them the pavement's weakest element.

The reason is variable density at the centerline joint during paving. In conventionally paved vertical edge joints the "hot" lane, paved second, is more densely compacted than the edge of the previously paved "cold" lane.

Creating a notched, compacted wedge joint along the centerline reduces longitudinal joint cracking so significantly that most Wisconsin paving contractors now use it routinely. Based on a 10-year study completed in 2003, WisDOT has adopted this joint as a supplemental specification and will make it standard this year.

This joint also is safer for traffic. Instead of a vertical step-off between the paved and unpaved lanes, there is a tapered transition between them.

continued on page 6

Iowa makes a better salt shed door

The heavy wooden door would barely open on the Iowa DOT's salt shed in Cedar Rapids, even with two men pulling on it. Meanwhile, the garage's salt dome had no door at all.

First the Iowa DOT folks in Cedar Rapids bought a canvas door for the dome that could be raised and lowered, folding up like a roman blind. Steel rollers on the side of the canvas moved on metal tracks along the door frame.

But the door wasn't quite right. It wouldn't fold all the way to the top, so trucks couldn't fit through the opening.

By then Greg Callanan and Dale Sexton, equipment operators at the facility, had had enough. They replaced the dome door's metal tracks with wooden ones and the steel rollers with pipes running horizontally through the canvas, sliding up and down inside the wooden tracks. Now the door rises easily all the way above the door frame, well out of trucks' way.

The men then decided to replace the shed door, too. They designed a similar door—roman blind style with wooden



tracks. They used materials from the shop: truck tarps, fence top rail, cable, hardware, and a winch. The second door cost about a quarter what the commercial one for the dome had cost.

Now, opening and closing both doors is a snap. They glide smoothly all the way to the top and are much lighter.

For more information about replacing your salt shed door, contact Dale Sexton, 319/364-8189.



Lightweight canvas door folds up to let trucks in.

Using parts from the shop cut door cost 75%.

Do you have an idea that could help other streets or highway agencies? Tell us about it. See page 7 for contact information.

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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Signing and pavement marking

by Tom Heydel, Traffic Operations Engineer, WisDOT District 2



The 2000 MUTCD and 2002 Wisconsin Supplement are still in effect. When does WisDOT anticipate the new 2003 MUTCD being adopted and a new Wisconsin supplement being issued?

WisDOT anticipates it being adopted by the end of this year. In the interim you are encouraged to wait until the new Wisconsin MUTCD supplement is published; otherwise you may be taking a risk by choosing an option in the 2003 MUTCD that is not allowed by the new Wisconsin supplement.

When I have a speed zone change, is it best to have step down speed zones?

Yes. Drivers comply with the speed limit better when it is changed in increments. For example: going from 55 MPH to 40 MPH to 25 MPH is better than reducing the speed limit directly from 55 MPH to 25 MPH. Remember to also install the REDUCE SPEED AHEAD signs.



What is the proper REDUCE SPEED AHEAD sign?

The new 2003 MUTCD has changed the REDUCE SPEED AHEAD sign from a regulatory sign to a warning sign. The new sign code is W3-5 and W3-5A. There is a 15 year compliance period. After Wisconsin adopts the new MUTCD manual later this year you should begin using the new signs as old ones are replaced.

How far apart should speed limit signs be placed?

The MUTCD says to locate signs at the points of change from one speed limit to another. Install additional speed limit signs beyond major intersections and at other locations where it is necessary to remind road users of the speed limit. WISDOT uses the following guidelines:

- 55 MPH – Leaving a zoned area less than 55 MPH such as a town, village, city or municipality. After major intersections.
- 45 MPH – At points of change from one speed limit to another, after major intersections, and every half mile between reminder signs.
- 40 MPH – 2000'
- 35 MPH – 1500'
- 30 MPH – 1000'
- 25 MPH – 1000'

▲ Can I put a stop sign on the left side of the road?

Only as a supplement, and not in all locations. At an approach controlled by a stop sign, the MUTCD requires that, at a minimum, a stop sign shall be placed on the right side of the approach to which it applies. According to the MUTCD Wisconsin Supplement, placing a stop sign on the left as a supplement should not be done on roadways that do not have maintained centerline marking since it could be confusing to the driver. Exceptions allow their use on a one-way road or low volume rural gravel road.

If I install chevrons on a curve or turn, how many are needed?

Usually at least three, spaced 75-100 feet apart. Road users should always have two in view as they go around the curve, the MUTCD says. Remember to install one just before the curve starts, as a lead-in, and have one at the end of the curve. Chevrons really act as delineators and are an excellent device to guide the driver around a curve or turn.

Does a mailbox post have to meet breakaway standards?

Yes. Wood 4"x4" posts meet this standard.



Can I install a large two-direction arrow sign (W1-7, "double-headed night arrow") at a side road T-intersection?

Yes. This sign can be very beneficial to provide additional warning to the driver approaching a

T-intersection. The sign should be mounted at a right angle and in line to approaching traffic.

Where can I find guidelines on which crossings to mark and sign as school crossings?

Review Part 7A.02 of the MUTCD for guidance. Consider:

- the availability of adequate sidewalks
- number of students using the crosswalk
- the age levels of the students using the crossing
- the total extra walking distance

Can I use a school advanced warning sign even when the roadway doesn't border the school property?

Yes. The advanced warning sign can be used in advance of a school crossing. Remember to include the AHEAD plaque

(W16-9P) with the school warning sign (S1-1) and diagonal arrow sign (W16-7) at the marked crossing. The fluorescent yellow-green sign sheeting version of these signs is also permitted. When a school's grounds border a roadway, the S1-1 school advanced warning sign is required on that roadway prior to the school.

What low-cost safety improvements can I make to my roadways?

Many signing and marking improvements are relatively inexpensive and can help your roadways where you have safety problems, curves and turns, or other roadway characteristics. For example:

- add curve and turn warning signs
- install advisory speed plaques as a supplement to a warning sign for curves and turns
- install night arrows (one directional large arrow sign) on turns and curves
- install chevrons around sharper or troublesome curves or turns
- mark pavement centerlines or edgelines
- remove hazardous objects from the roadside clear zone or shield objects with guardrail

Can I make intersections safer at low cost?

Many changes can improve approaches to stop signs or uncontrolled intersections where crashes or potential crashes are a problem:

- install a STOP AHEAD sign where visibility is restricted or crashes related to running the stop sign have been a problem.
- double mark STOP AHEAD signs (right and left) or stagger them.
- double mark the STOP signs (right and left) where appropriate.
- install larger STOP signs.
- install a TRAFFIC ON [name the road or highway number] CROSSROAD DOES NOT STOP sign under the STOP sign where there are failure-to-yield problems.
- add rumble strips on the approach to a stop sign, but consider noise in residential areas before installing.
- overhead signing provides additional guidance, especially for older drivers.
- for uncontrolled intersections: install crossroad or sideroad warning signs where the approaches have sight restrictions as defined in the MUTCD Wisconsin Supplement, Section 2C.34.

For more help see the T.I.C. bulletins **Signing for Local Roads, No. 7**, and **Pavement Markings, No. 9**. (See Resources, page 6.)

Invasive weeds a spreading roadside problem

Populations of several bad weeds have begun to explode in Wisconsin, and they are using our roadsides for their dirty work. Like the zebra mussel and the gypsy moth, these are destructive foreign invaders. They are invading farm and grazing lands, attacking hunting and fishing habitats, and costing us plenty.

Four of the worst are wild parsnip, spotted knapweed, leafy spurge, and Canada thistle. They hitchhike across the landscape on mowers, off-road vehicles, construction equipment and wind.

Most people don't know that mowing these plants after they set seed can turn a small patch into a big problem—both along the road and on adjacent lands. Spot spraying with the correct herbicides is the most effective treatment. Mowing at the right time, or not at all if they are in seed, can help limit their spread.

WILD PARSNIP causes skin blisters like poison ivy, but more serious. Roadside crews should beware of this nasty plant whose flower stalk looks like an overgrown version of the herb, dill. When juice from the plant contacts bare skin and the skin is exposed to daylight, the resulting blisters cause pain and scarring.

"Wild parsnip is probably the most critical invasive plant for road agencies to be aware of because of the human health issues," says Kelly Kearns, DNR Plant Conservation Program Manager. "It's spreading rapidly right now and roadsides are by far the most common way it spreads." WisDOT recently printed a poster showing the plant, skin damage, and methods of control.



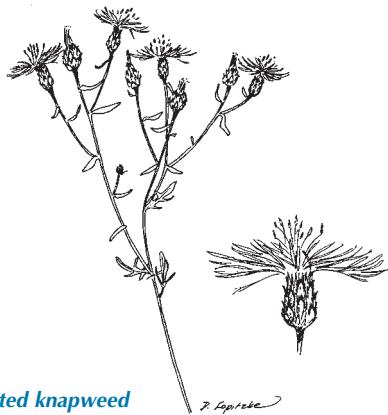
Wild parsnip

Flower stalks grow to 4' with umbrella-like clusters of yellow flowers (early July) that form large flat seeds. Don't mow when in seed.

Mowing in the early flowering stage, usually two weeks in early July, can help control wild parsnip. But if the plants have set seed, mowing crews should let them stand. Left alone, the heavy seeds will fall to the ground nearby. However, if they are mowed, the equipment picks up the seeds and distributes them along the roadside, making the problem worse. Spot spraying with Escort® or Roundup® in fall or early spring is effective.

SPOTTED KNAPWEED is a pretty but nasty purplish-pink flowered plant that kills all the other plants around it. The roots put out a toxin that clears everything in its path. "In the southwestern states it has destroyed millions of acres of grazing land," says Kearns.

"Where it has taken hold there are huge soil erosion problems. It has a



Spotted knapweed

Small thistle-like pinkish-purple flower heads on 2' to 4' stems. Flowers late June through August. Do not mow; mowing spreads seeds.

limited root structure and no other plants can grow to hold the soil."

Mowing does nothing to control knapweed, and mowing when it's in flower—late June through August—spreads the plant's thousands of seeds. Spot spraying with herbicides works, as do prescribed burns. Burning on roadsides has been very effective in Iowa, but is not often done in Wisconsin, Kearns says. "The best approach is prevention. Watch for small infestations and get rid of them before they spread," she says.

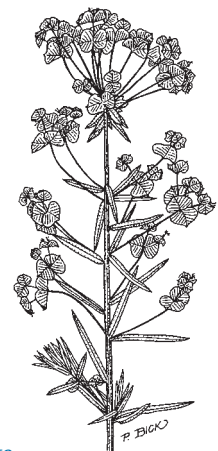
Two other problem invaders, leafy spurge and Canada thistle, are more familiar. They are "noxious weeds" under Wisconsin law, which requires landowners to attempt their eradication.

LEAFY SPURGE, 6"-36" tall with yellow-green flowers in late May and June, quickly invades and dominates roadsides, pastures, and old fields, and is hard to control. It is toxic to cattle and deer and the milky sap can cause blisters and skin irritation in humans. Roadside crews should learn to recognize and avoid it.

"It and Canada thistle are a big problem on roadsides, especially in the southern part of the state," says WisDOT Landscape Architect Dick Stark. "We are making an effort to combat leafy spurge now in the counties where it's not yet a big problem." Finding small patches and attacking them aggressively with Plateau® before they spread is the best strategy. Fall is the best time to spray.

In Adams County where leafy spurge is a problem in only a few areas, the WisDOT District Maintenance office and local DNR wildlife manager have cooperated on a control project. County crews located and mapped the leafy spurge populations along state highways; then the local DNR wildlife manager sprayed them with herbicide.

Mowing when the plant is in flower worsens the problem by spreading the seed. Mowing in late spring before seeds mature, and again in midsummer to prevent reflowering, helps control the plant. Other control methods include releasing a specialized beetle that feeds on the foliage and roots, grazing by goats and sheep, and prescribed burns.



Leafy spurge

Grows 6" to 36" tall with bluish-green leaves and yellow-green flowers that bloom in May and June. Mow in late spring before seeds mature and again in mid-summer to prevent regrowth.

CANADA THISTLE, also a noxious weed, is a problem where soil is disturbed, as it often is on roadsides and agricultural fields. It is a major agricultural pest, costing tens of millions of dollars in crop losses annually. It should not be allowed to go to seed and can be contained by mowing close to the ground while the plant is in full bloom or just before flowering, which begins in early July. Applying Transline® annually for at least three years is effective. It should be applied in spring when plants are 6"-10" tall. Reduced mowing in the right of way that lets native species thrive can also help keep it under control.



Canada thistle

Grows 1 1/2' to 4' tall with prickly leaves. Rose-purple, lavender, or sometimes white flower heads appear from June through October. Mow before flowers open.

Knowing that road agency budgets are stretched to the breaking point, Kearns offers some low-cost strategies for slowing the spread of these leafy villains:

Know the enemy. Teach mowing crews to recognize these and other invasive species. Local DNR and UW-Extension people can help. Use free posters and pocket size cards as handy reminders.

Mow smart. Don't mow patches where seeds have formed. Mow just before flowering or very early in the flowering phase.

Keep at it. These are tough plants to get rid of. Seeds and roots can survive in the ground and sprout for multiple years. Plan to keep going back each year.

Join forces. Your crews know their roads best. Forge working relationships between your agency and local land managers, citizen environmental groups, and natural resources specialists. They

On-line WISLR offers much

The Wisconsin Information System for Local Roads (WISLR) database offers local officials a useful tool for decision-making. The Internet-based system is accessible from anywhere in the state and lets users obtain data and maps of their local road systems.

Inventory information is available now. Pavement ratings data is being processed. About 88% of submitted 2003 pavement ratings have gone through initial loading with, on average, about 80% of the submitted rating data loading successfully.

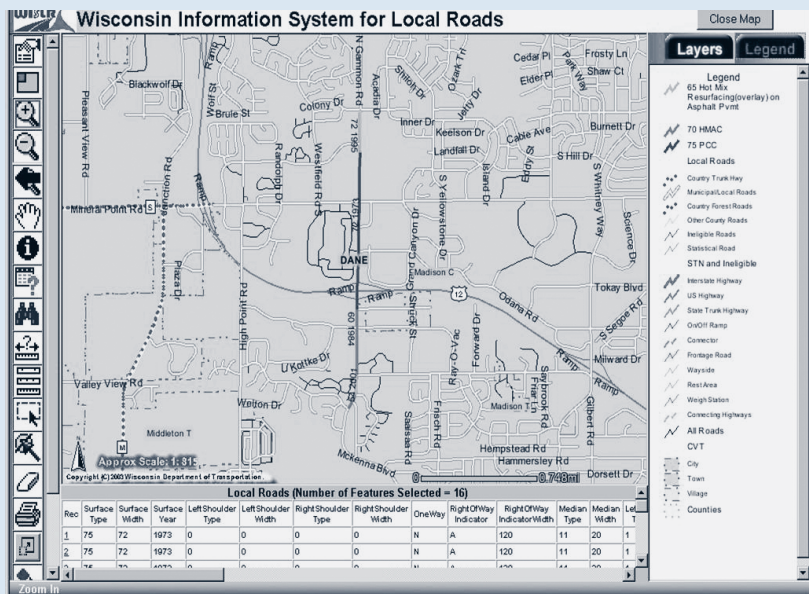
"WISLR now offers an abundance of valuable data which local governments and transportation agencies can use," says Joe Nestler, Chief of State Highway Program Development. Locals can check certified mileage information and look at roadway inventory data on line. Especially useful is the GIS-based mapping function.

The system can display a variety of different information as tables or graphically: pavement type, number of lanes, pavement condition, pavement width, shoulder, curb, and administrative attributes such as owner and functional

classification. "The ability to map information may prove useful for their business purposes," Nestler says. "It may help identify trends that are hard to intuit from a spreadsheet. You might see, for example, that a large number of needy pavements are in one subdivision, or of a specific pavement type, or from a specific construction year."

WISLR can also do rudimentary pavement needs analysis. Although it is not a pavement management system, WISLR's pavement analytical tools can provide very useful information to decision-makers—information that can be displayed graphically. WISLR's pavement tools will be available in June or July.

Over 400 local governments are currently using WISLR. Soon, users will have the ability to access and edit their pavement information online. By the time pavement condition reports are due again in 2005, local agencies will be able to load their pavement ratings directly into the WISLR system, if they choose. Training programs for editing data are expected to start later this year, continuing in 2005.



Find out how to access WISLR online at <http://www.dot.wisconsin.gov/localgov/wislr/>

may have resources to help train your crews and help locate priority weed infestations to control.

For more information contact DNR Plant Conservation Program Manager Kelly Kearns at 608/267-5066 or Kearns@dnr.state.wi.us.

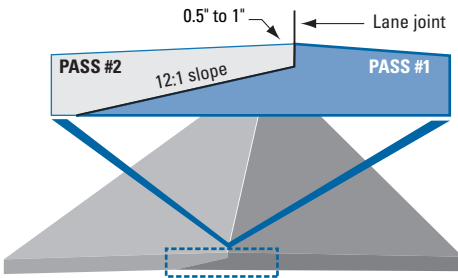
See Resources for a packet of information on these and other invasive species.

Other resources include the 15 UW-Extension Basin Educators (find at: <http://clean-water.uwex.edu/basins/meeteds.html>) or ask your county UW-Extension office).

Notched wedge joints *from page 2*

"It's pretty easy to do and pretty straight forward," says Scot Schwandt, Director of Engineering for the Wis. Asphalt Pavement Association. It does require adding a wedge-compacting roller to the paver. Worker experience also improves the success of the joint.

According to the WisDOT report, wedge joints using the Michigan method and two different steel compaction rollers, achieved over 92% of maximum density in the upper layer and had only 21% and 33% longitudinal joint cracking after 10 years. Conventional joints, using the standard butt-type joint, achieved 91% density at construction, but 10 years later they had 86% longitudinal cracking.



The key elements to a successful wedge joint are creating a 1/2" to 1" notch at the inner edge of the wedge, with a 12:1 taper ratio, and compacting the wedge with a steel roller. A tack coat on the wedge before the second lane is placed produces good adhesion.

Pavers used two methods to compact the successful wedges in the test: a tag-along steel roller and a steel wheel side roller. The tag-along roller produced a somewhat better performing joint at the end of 10 years, but workers reported the steel wheel side roller was much easier to use and its joints consistently ranked in the top three when evaluated at 2, 3, 4, 5, and 10 years.

Other joint methods tested—rolling with hauling truck tires and with rubber side roller wheel, no rolling, cut joints, and using a Bomag edge constraint device—all produced significantly poorer performance after 10 years.

See Resources to get wedge joint specs or copies of the report, **Evaluation of Techniques for Asphaltic Pavement Longitudinal Joint Construction** (Report No. WI-08-03) published by WisDOT's Technology Advancement Unit—available in print and online.

Resources

Printed publications

The following publications are available free from the T.I.C. while supplies last.

Invasive Species Packet Help crews learn to recognize four invasive plants commonly spread on roadsides: wild parsnip, spotted knapweed, leafy spurge and Canada thistle. Includes poster, color identification cards, and plant pamphlets with control strategies.

Evaluation of Techniques for Asphaltic Pavement Longitudinal Joint Construction WisDOT, No. WI-08-03 (*final report*), Nov. 2003. Evaluation of 8 longitudinal joint construction techniques. Density results and 10-year performance evaluation show that the wedge joints perform best. Also, download at <http://www.dot.wisconsin.gov/library/research/reports/pavements.htm>

Signing for Local Roads TIC/WTB No. 7, 2003, 12 pp. Helps local officials understand national and state signing standards. Addresses responsibility, principles, placement, and types of signs.

Pavement Markings TIC/WTB No. 9, 2004, 12 pp. Expanded and updated bulletin introduces basics of pavement markings including materials, general principles, and considerations for various marking types.

Roadway Safety and Guardrail TIC/WTB No. 12, 6 pp. Describes general roadside safety and discusses proper guardrail use.

Digital resources

For easier use, click on Web addresses in Crossroads online: <http://tic.engr.wisc.edu>.

Department of Administration Easy access to state purchasing resources, technical advice, data, and financial assistance. www.WisconsinPartnership.wi.gov

Full Road Closure for Work Zone Operations—A Cross-Cutting Study (August 2003, FHWA-OP-04-009). Summarizes how departments of transportation have used a full closure approach for road rehabilitation/reconstruction projects. Available at <http://ops.fhwa.dot.gov/wz/resources/publications/FullClosure/CrossCutting/its.htm>

Invasive Plant Species, WisDOT, Hwy. Ops., Transportation Synthesis Report, 9 pp., June 2003. Strategies and best practices to control invasive plant species along highway rights of way, with focus on six species of concern in Wisconsin: www.dot.wisconsin.gov/library/research/reports/tsr.htm

Reducing Injuries and Fatalities in Targeted Emphasis Areas. From NCHRP Project 17-18(3), Report 500. A series of guides addressing the 22 key areas that affect highway safety identified in the 1998 AASHTO

Strategic Highway Safety Plan. Each has a general description of the problem, the strategies/countermeasures to address the problem, and a model implementation process. These guides are available at: <http://safety.transportation.org/guides.aspx>. Guides that may be particularly useful are: *Collisions with Trees in Hazardous Locations*, VOL. 3; *Head-On Collisions*, VOL. 4; *Unsignalized Intersection Collisions*, VOL. 5; *Run-Off-Road Collisions*, VOL. 6.

WisDOT Specifications for the Wedge Joint are at <http://www.dot.wisconsin.gov/business/engrsrv/construction-library.htm>. CADDs details for the specs are available at www.dot.state.wi.us/business/engrsrv/roadway-design-files.htm MicroStation files -->Detail cells (ms det.exe).

Videotapes

Videotapes are an efficient and effective way to train staff. Recent additions are listed here. Videos are loaned free through county UW-Extension offices. The *2004 T.I.C. Video Lending Library Catalog* will be sent to agencies in July. Additional copies are available on request from the T.I.C. or online at <http://tic.engr.wisc.edu>

Plant Site Safety, Iowa State University, 1997, 11 min. #18630. Shows typical hazards at concrete, asphalt and crushing plants. Advice intended for plant workers, crane or truck operators. Good for new employees or as a refresher.

Drainage Pipe Installation, PA DOT, 18 min. #18667. The basics of proper culvert installation; planning steps; details and examples of excavating, removing, placing, and backfilling culverts; and the benefits of good compaction. Intended for field crews.

Safe Tree and Brush Removal, IL DOT, 2003, 19 min. #18668. Good training video. Begins with information on why to remove trees and brush. Shows details on daily maintenance, sharpening and tips for safe operation of chain saws and brush chippers. Also illustrates safe skills for tree cutting, stump removal and tree trimming.

Safe Mowing Procedures, IL DOT, 2003, 17 min. #18669. When and where to mow according to Illinois DOT policy. Has good details on daily equipment inspections and safe mowing operations.

On Again, Off Again: A Guide to Mounting and Dismounting Heavy Equipment Association of County Commissioners of Oklahoma, 2003, 18 min. #18670. A good review of basic safety rules. Includes steps for safe mounting of equipment. A few ideas presented with humor. Useful for all equipment operators.

Full road closure may be safer, faster

Full road closure is worth considering when planning a maintenance or construction project, says a recent FHWA report. Full closure has the potential to cut total construction time, improve safety for workers and travelers, and produce a smoother roadway. With adequate alternate routes, solid traffic management planning, and effective public outreach, a full closure can even improve public sentiment about the project. On the other hand, affected residents and businesses are often vigorously opposed, sometimes making it a difficult choice.

The publication, **Full Road Closure for Work Zone Operations**, reviews the benefits and considerations involved. Case studies of six projects around the country showed that full closure cut project duration by 63% to 95%. Closures were as short as two weekends and as long as 18 months.

Experience in three Wisconsin communities offers a local perspective based on recent major projects. All agree that careful project planning and thorough discussions with stakeholders are critical.

Whitewater Sometimes full closure is the only option. "The street was only 28 feet wide. There was no room to work on one half of the road at a time," says Dean Fischer, City of Whitewater Director of Public Works, about a downtown street totally reconstructed in 2001. During the project they also replaced water mains,

sanitary and storm sewers, widened the road, and moved the sidewalks.

"We had to make sure the public was aware of the situation," says Fischer. The city held public meetings early to explain the project and the need, maintained communications, and worked hard to give residents access and alternate parking. "We always tried to get them into their houses at night," says Fischer.

Manitowoc County In Manitowoc County Highway Commissioner Gary Kennedy's mind, keeping half the road open is a better option. "If it's at all possible to leave the road open, it's very beneficial in the public's eye and especially to businesses," he says. "If you detour the road, the businesses really suffer. Sometimes the extra couple days you save are not worth it."

You can only speed a project up so much, Kennedy points out. You can't hurry things like the curing time for concrete. Also, you still have to restore adequate access for emergency vehicles at the end of the work day.

He agrees that communication is critical. On a recent project to rebuild an urban section of CTH P, they kept half the road open with all traffic going one way. "We had two public hearings before the project, then met with all the businesses every Friday during the course of the project," Kennedy says.

Madison Closure decisions depend on many factors. The City of Madison has done both recently: closing Johnson St. all season in 2003, but leaving half of E. Washington Ave. open in 2004.

"Total closing is one tool. I think you have to look at each situation individually," says Deputy City Engineer Rob Phillips. "We look at public inconvenience, whether the street is a major collector or local, the type of construction, traffic volumes, project duration, and the availability of alternate routes." Keeping the public informed helps, Phillips says. In addition to press releases and media reports, Phillips uses signs extensively.

Drivers find their own solutions if alternate routes are available and publicized, the report notes. Projected congestion typically did not develop, demand was less than expected, and traffic redistributed itself in a couple of weeks.

The report concludes that full road closure requires significant lead time for planning and outreach, and that a solid traffic management plan is vital.

As you plan for reconstruction and maintenance projects, give full closure some thought. Whether for a single night or a full construction season, there are considerable benefits. The FHWA booklet is a helpful summary.

Copies of Full Road Closure for Work Zone Operations: A Cross-Cutting Study. Reducing Congestion and Crashes through Full Road Closure for Maintenance and Construction, are available from FHWA. See Resources on page 6 for how to get a copy.

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

Call, fax, email or visit our website:

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fax 608/263-3160
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Web http://tic.engr.wisc.edu/

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 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 _____



Calendar

T.I.C. Workshops

Specific details, locations and registration forms are sent to all Crossroads recipients prior to each workshop. Registration begins after announcements are sent.

Asphalt Pavement Maintenance Demonstration Day

Contractors and local crews demonstrate proven methods for maintaining asphalt pavements, held (rain or shine) July 7, Chula Vista Resort, Wisconsin Dells, with demonstrations on nearby roads. Fee \$45

Basic Surveying for Local Highway Departments – On-site

Learn to use a tape and hand level for fast and reliable measurements to set culvert and ditch grades, determine crown and slopes, and set construction stakes. One day workshop at your site with classroom instruction and outdoor exercises. For highway workers and foremen with little or no surveying experience. Maximum class of 20. For fee information and scheduling call, e-mail, or write (see page 7).

Winter Road Maintenance Mark your calendar now for the T.I.C.'s annual workshop on preparing for winter operations. This workshop covers equipment preparation, the latest on ice control materials, and operations planning. New equipment displayed. A great opportunity to share experiences and tips for better winter operations.

DATE	LOCATION
Sep 13	Eau Claire
Sep 14	Green Bay
Sep 15	Waukesha
Sep 16	Barneveld
Sep 20	Rhineland
Sep 21	Cable
Sep 22	Tomah

Other opportunities

Snow Plow Rodeo The APWA Snow Plow Rodeo is a friendly competition that tests crews on a plowing challenge course at Lambeau Field in Green Bay on September 22. To register contact T. J. Sorensen, Motor Services, City of Green Bay, 920/492-3751.

UW Seminars

Local government officials are eligible for a limited number of scholarships for the following Engineering Professional Development courses held in Madison.

Soil Engineering for Non-Soils Engineers and Technicians, Sep 13-14

Geosynthetics for Beginners, Sep 15-16

Managing Snow and Ice Control Operations, Oct 4-5

Pavement Design, Nov 15-16

Evaluation and Rehabilitation of Pavements, Nov 17-18

Effective Bridge Rehabilitation, Dec 1-3

Railway Bridge Engineering, Dec 6-7


Highway Bridge Design, Dec 8-10

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