



## Regulation is Rx for driveway headaches



Driveways can affect the safety, capacity, structure, and drainage of a roadway—as much on a rural town road as on a busy four-lane. Emergency vehicle access is also a concern. As a result, more and more municipalities are restricting where a driveway goes and how it's built.

"Hilly places like New Glarus have more problems," says J.R. Habeck of the Wisconsin Towns Association. "If someone puts in a driveway that is right over a hilltop, there's not much line of sight there and you're just asking for an accident," he says. He consults with towns interested in passing permit ordinances and offers them sample regulations.

In addition to controlling entrance locations, towns may also address land slope, driveway width, surface material, side slope, and culvert size. Some ordinances require erosion control plans and address potential driveway washouts or other hazards to the town road.

"Mostly towns seem to be administering the permits themselves," says Habeck. "That includes enforcement. You have to name somebody to oversee it. If all you do is pass an ordinance people will ignore it." Permit and inspection fees can help defray some of the costs. Having effective support from the county is also important.

Driveways are a major expense, so some home builders may ask for waivers or changes. "We had some conflicts at first but the last four years now we haven't had any serious problems," says New Glarus Town Chairman John Freitag. "So far our county has supported the township and they will not issue a land use permit for a house until the town has approved and given the driveway permit."

The town enacted its driveway ordinance about eight years ago after a house burned to the ground because fire trucks could not get up its driveway. Just recently the town amended the ordinance to cut construction costs, reducing width requirements from 20 feet to 14 or 16 feet. Required sight lines remain 250 feet in either direction. The town requires both a permit fee and a refundable \$500 deposit to ensure the driveway meets ordinance guidelines.

### Counties face driveway pressures too

In the last three years, three different subdivision developers have paid to rebuild a Waukesha County road section to get a driveway entrance permit, reports Highway Commissioner Rich Bolte. The reason is the county's thorough and detailed access/driveway policy and the Highway Committee's strong commitment to it.

"We don't change the policy, period," says Bolte. Nearly all of the 50 to 100 driveway applicants each year simply follow the requirements, he says, though one or two will choose to change the development or move the access point to a local street or road.

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*Driveway entrances affect highway safety. To meet county highway permit requirements, a developer paid to lower the hilltop on this Waukesha County highway.*

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# Idea Exchange

## Step up to sign challenge; win \$100



Out in Nebraska, they've come up with this nifty sign step. It quickly hooks into steel channel posts to let workers do minor sign repairs without lugging along a ladder. When **Crossroads** called Nebraska, we discovered they don't have anything comparable to use with wood 4x4 or round steel posts.

Don't forget to include your name, address, and phone number.

What about you? Can you come up with a simple step design for wood or round posts? If you do, and it works, you could win \$100 from the T.I.C. We'll also report on the winners in the spring newsletter. Contest deadline is November 15, 1999.

Send photos and specs to Don Walker at T.I.C., 725 Extension Bldg., 432 N. Lake St., Madison, WI 53706. If you would like specs for the Nebraska step, use the form on page 7.

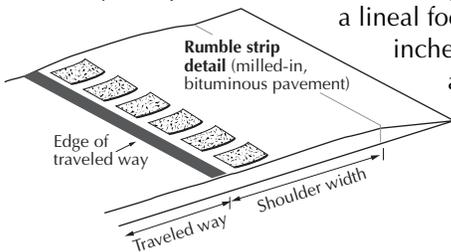
## Rumble strips make roads safer

Studies show that shoulder rumble strips can significantly reduce crashes on rural highways – by up to 70% on long monotonous stretches. The noise and vibrations wake inattentive drivers who are drifting off the road. Rumbles along the centerline also increase safety where there is a history of head-on crashes on a double yellow. Another use is inside sharp turns where cars tend to run on the shoulder. This may also help reduce shoulder maintenance costs.

Now, rumble strips can be added any time in the life of the road. Following new specs developed by WisDOT, contractors are grinding in the strips. Formerly strips were rolled into fresh hot asphalt. However, some shoulders were breaking up prematurely because the rolling process reduced compaction. Also, later installation means that drivers diverted onto the shoulder during construction do not have to ride the rumbles

The new process has a reasonable price tag. "The cost has come down tremendously in the last four or five years," says Pat Fleming, a WisDOT engineer. "Right now they are very competitive with rolled-in strips at about 12-18 cents

a lineal foot." The grooves are 16 inches wide, 1/2 inch deep, and 12 inches apart from center to center. They are cut one at a time as the grinding machine



moves down the paved shoulder at approximately 3 mph. In Wisconsin, the rumble strips are located on the outside and median shoulders of expressways and freeways.

For rumble strips across a travel lane, such as those approaching a four way stop controlled intersection, be sure to consider the needs of bicyclists and do not install rumble strips on the outside one foot of the traveled lane or on the shoulder, Fleming notes. The bicyclist may lose control of the bike and crash. Also, areas with Amish populations should consider the consequences for horses and buggies.

For copies of state rumble strip specs contact Pat Fleming at 608/266-8486 or patrick.fleming@dot.state.wi.us. Crash reduction data from the Fall 1998 issue of the **Wyoming T2** newsletter.

## T.I.C. Advisory Committee changes

The T.I.C. welcomes three new members and thanks three outgoing members of our Advisory Committee. Members provide advice on Center services like the video lending library and technical assistance and recommend topics for training and publications. The committee also is a sounding board for T.I.C. staff and helps in coordinating with other state associations.

Joining the committee in 1999 are: John Edlebeck, Director of Public Works, City of Waupaca; Gary Kennedy, Highway Commissioner, Manitowoc County; and Christine Walsh, Operations Director, City of Beloit.

Departing are: Roger Kolb, Highway Commissioner, Brown County Highway Department; William Bittner, Director of Public Works, City of Eau Claire; and John VanAlstine, Director of Public Works, City of Stevens Point.

Also thanks to continuing members: James Blazek, City Engineer, City of Racine; Daniel Fedderly, Highway Commissioner, Saint Croix County; Nate Klassy, Director of Public Works, City of Monroe; George Koval, Town Chairman, Keystone; Al Sattler, Town Chairman, Calumet; and Emmer Shields, Highway Commissioner, Ashland County.

## Crossroads

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## Concrete over asphalt has promise

A new technique, called Ultra Thin Whitetopping (UTW), is helping solve some old pavement problems. UTW involves bonding a thin layer of concrete to an asphalt surface. The resulting rigid pavement can be especially useful at intersections with high levels of traffic-related surface damage.

The intersection of Janesville Avenue and Rockwell Avenue in an industrial area of Ft. Atkinson is a good example. The large number of semis stopping and turning caused considerable shoving and rutting.

"It was to the point where milling was only a short term fix," says Jeff Woods of the Ft. Atkinson DPW. "We were looking for something more permanent and it sounded like whitetopping could solve the problem." When cores showed that the asphalt pavement was suitable, the city went ahead with the new approach. It cost about \$25,000 to resurface a section 300 feet long and four lanes wide with a four inch layer of concrete. Two years later the intersection remains solid.

"It is still in good shape," says Woods. "We're starting to get some real fine cracks in some slabs but everything is good and tight and nothing's popped out. It is still well bonded to the asphalt base there."

Whitetopping can also eliminate reflective cracking and can increase load capacity on rural roads, especially those affected by spring thaw, according to Kevin McMullen, president of Wisconsin Concrete Pavement Association

(WCPA). In addition, some users appreciate night time visibility and the esthetics of the white surface.

### New methods make UTW work

Whitetopping is more than 30 years old, but experimental projects in the last five years have shown that thin concrete layers, just two to six inches deep, are effective and relatively cost competitive. In addition, newer "high early strength" concrete mixes mean traffic can start using whitetopped roads within 24 hours.

Roads with 6-12 inches of existing asphalt are candidates for UTW. The surface can be milled or power washed to ensure a good bond when the paver lays the concrete. Unlike conventional concrete paving where expansion joints are at 15 foot intervals, however, UTW surfaces are divided into four-foot-square blocks.

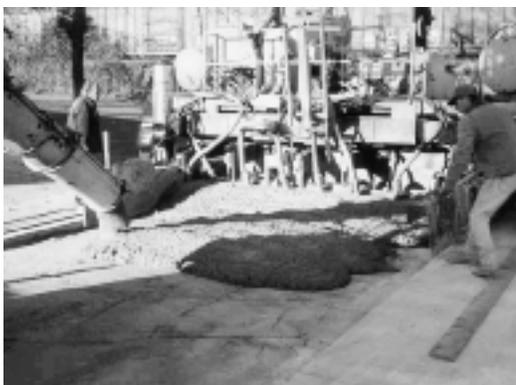
The checkerboard pattern looks different but does not produce ride noise, according to McMullen. In addition, water infiltration through the joints is not a concern because the joints are thin (1/8th inch) and the underlying asphalt layer provides a water stop.

### Lower lifecycle cost

Using concrete to resurface roads is a new concept with its own design requirements and expectations. While people normally think of concrete as needing an eight inch depth and having a life span of 20 to 40 years, the thinner UTW layers can be spec'ed for the same 10 to 15 year life as an asphalt overlay. The total cost over that time, including required maintenance, should be equivalent or better McMullen says.

That was an important consideration for a project in the Village of Slinger, a residential community of 3,600 near West Bend. "I have high hopes for it adding quite a bit to the life cycle of our roads," says James Mann, village administrator. "UTW costs more in the short run, but if we don't have to go back in 10 or 15 years to do another resurfacing or additional crack sealing, the village will start to be money ahead."

*For more information on whitetopping, contact Kevin McMullen, Wisconsin Concrete Pavement Association, 608/831-2977, McMullen@chorus.net*



*A thin layer of concrete can rehabilitate asphalt pavement. The resulting rigid pavement can be especially useful at intersections with high levels of traffic-related surface damage.*

With no ditch to drain it away, water stands at road edge. Resulting pavement breakup requires costly maintenance. ▼



◀ Lack of drainage produced these longitudinal cracks along the road edge.

◀ Urban areas often lack ditches because residents want to use the area for parking and to maintain it as their lawn. This practice causes pavement damage.

# Water, water everywhere . . . will wreck your roads

What would happen to your house if water stood in the basement most of the time? Pretty soon there would be serious damage. The same is true of your roads. A healthy road quickly sheds water from surface, base and shoulder areas. A road with "wet feet" requires excess maintenance and deteriorates sooner. Pictured below are examples of poor drainage and accompanying damage. Do they remind you of locations on your roads?

**Learn how to spot drainage problems and what to do to fix them in the TIC's all new Roadway Drainage workshop series. Sign up now for the workshop in your area. Dates and locations are in the Calendar on page 6.**

## Resources

Materials listed here are available from the Wisconsin 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.

**The SAFER Manual** (Safety Evaluation for Roadways), the Transportation Information Center, 1997. The manual uses a hazard rating scale along with many pictures and brief text to show potential hazards along roadsides, at intersections and railroad crossings, and associated with roadway geometrics. The SAFER Manual will help you identify these hazards, rate safety needs, address immediate problems, and budget for longer term safety improvements. Use it to plan next year's projects.

**Thickness Design for Concrete Highway and Street Pavements**, Portland Cement Association 1984, reprinted 1995, 48 pp. Technical bulletin on methods of determining adequate slab thicknesses for traffic loads on concrete streets and highways. Includes design factors, procedures, tables, worksheets, and references. Copies limited.

**Design and Construction of Joints for Concrete Highways**, American Concrete Pavement Association, 1999, 24 pp. Technical bulletin for concrete pavements 8-14 inches in thickness. Copies limited.

**Intersection Joint Layout**, American Concrete Pavement Association, 1996, 6 pp. Jointing plans and methods for a wide variety of intersection configurations. Copies limited.

**Thickness Design: Asphalt Pavements for Highways and Streets**, Manual Series #1, Asphalt Institute, Feb. 1991, 98 pp. Technical manual for asphalt pavement thickness design including considerations, principles, traffic analysis, materials evaluation, design charts, and design procedure. Copies limited.

**Asphalt Overlays for Highway and Street Rehabilitation**, Manual Series #17, Asphalt Institute, June 1983. Technical manual covering techniques to evaluate the structural capacity of existing pavements, plus methods and procedures for designing structural overlays. Copies limited.



▲ *Culverts must be cleaned and repaired routinely to maintain drainage. Also, lack of at least 12 inches of cover will lead to culvert damage.*



◀ *This new pavement overlay is already breaking up along the edge because drainage was not improved along with the investment in a new surface.*

▼ *Cleaning ditches should be a routine maintenance activity and is especially important before surface improvements are made. Ditches should be re-seeded with grass promptly to reduce soil erosion.*



## Long idling hard on newer diesel engines

Electronic diesel engines built since 1992 are a different breed of cat (or Cat) technicians say. Unlike older diesels that people tended to leave idling because they could be hard to restart, these new types should be shut down after 15 minutes.

Long idling shortens engine life by lowering running temperature. This leads to soot and carbon deposits forming on piston rings, valve stems, and injectors. The result is more oil consumption and low power along with accelerated engine wear, according to Cal Gilbertson at FABCO Caterpillar dealer.

In addition, it wastes fuel: "About half a gallon to a gallon per hour," says Dan Poeschel, Team Leader of the Diesel Mechanics Program at Fox Valley Technical College. "It also shortens the life of oil in the engine, meaning you have to change the oil quicker."

"We don't like excessive idling, but we don't want immediate shut down either," says Lawrence Adlebush, Brown County Shop Superintendent. "We like to see a good five minutes of idle to cool down turbo-chargers and equalize the coolant temperature to get back to normal operating temperature." Brown County's fleet is equipped with Cummins engines.

One situation where drivers could shut down is while waiting in line to load or unload the dump body. "If they're working in a big crew and are the second or third truck in line, it's going to be 30 or 40 minutes till their turn so they don't need to let it idle," says Pat Brushafer, automotive mechanic supervisor, City of Milwaukee.

However, for some work assignments, trucks must be kept idling, despite engine wear. "If we have a truck standing on a construction project, we almost always have to leave it running to keep the flashing lights going," says Adlebush. "If we shut it off the battery will go dead." Hydraulics operations and cab temperature control may be other reasons for longer idling.

Lack of mechanical background and concern for getting the job done may also lead drivers or their immediate supervisors to leave a truck idling. "Some crew managers don't have the mechanical background to understand that it's okay to shut these new trucks off," says Brushafer. "Also you don't see the engine wear right away. It's very minimal compared to what you could lose from a crew falling day or two behind because a truck wouldn't restart."

Considering the savings in engine life, oil life, and fuel consumption, it may be worthwhile to remind operators and supervisors to keep idling to a minimum.

## Calendar

### T.I.C. workshops

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

**Winter Road Maintenance** Time to prepare for winter operations. This workshop covers equipment preparation, the latest on ice control materials, operations planning, and an opportunity to share experiences and tips for better winter operations.

Sept. 13 Rhinelander	Sept. 21 Green Bay
Sept. 14 Cable	Sept. 22 Brookfield
Sept. 15 Eau Claire	Sept. 23 Barneveld
Sept. 16 Tomah	

**Local Transportation Issues ETN Series** The UW Local Government Center and the T.I.C. present an ETN series of five short workshops that focus on transportation issues. This series is available at over 103 locations throughout Wisconsin. The fee is \$10 per session or \$40 for all five. All workshops are on Thursdays from 10:30 a.m. to 12:20 pm. Call 608/262-9960 for a brochure. Titles and dates:

Oct 7, 1999	Utilities in the Public Right-of-Way <sup>1</sup>
Nov 4, 1999	Managing Sidewalks <sup>2</sup>
Jan 20, 2000	Local Transportation Aids and Other Local Roads Issues <sup>3</sup>
Feb 9, 2000	Liability for Local Road Agencies
Mar 9, 2000	Bidding and Inspecting Local Road Projects

#### <sup>1</sup> Utilities in the Public Right-of-Way (ETN, Oct 7)

Learn about the rights and responsibilities given to local governments in protecting their streets, intersections, and rights-of-way against damage and disruption by private and public utilities. Find out how to permit and inspect utility work in your right-of-way.

#### <sup>2</sup> Managing Sidewalks (ETN, Nov 4)

Review liability and risk management issues and strategies to fix damaged sidewalks before a lawsuit. Study proven techniques for timely inspection, repair and replacement programs for your community.

#### <sup>3</sup> Local Transportation Aids and Other Local Roads Issues (ETN, Jan 20)

Learn about funding availability and procedures to qualify for various local transportation improvement and assistance programs through WisDOT. Learn about the new WISLR software program for the new local road data base, and other recommendations of the local roads advisory committee.

**Roadway Drainage** This workshop is your opportunity to brush up on culvert and ditch maintenance and learn how to size and construct ditches and install culverts.

Nov. 15 Rhinelander	Dec. 14 Green Bay
Nov. 16 Cable	Dec. 15 Brookfield
Nov. 17 Eau Claire	Dec. 16 Barneveld
Nov. 18 Tomah	

**Roadway Safety** This workshop will cover sign maintenance, sensible signing and pavement marking for local roads, and other cost effective things you can do to improve the safety of your local roads.

Jan. 5 Green Bay	Jan. 19 Cable
Jan. 6 Brookfield	Jan. 20 Eau Claire
Jan. 7 Barneveld	Jan. 21 Tomah
Jan. 18 Rhinelander	

### UW-Madison Seminars

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

Managing Snow and Ice Control Operations, Oct 4-5
Implementing a Sidewalk Management System, Oct 6-7
Drainage System Design, Oct 18-21
Evaluation and Rehabilitation of Pavements, Nov 1-3
Neighborhood Design and Traffic Calming, Nov 15-17
Traffic Signal Design and Operation, Dec 7-9
Nondestructive Evaluation of Bridge Conditions, Dec 6-7
Bridge Rehabilitation, Dec 8-9
Managing Utility Cuts, Dec 13-14

### Other Training Opportunities

The Wisconsin Chapter American Public Works **Snow Plow Roadeo** is your opportunity to test the best crew you've got against the best crews from other communities in friendly competition. It's also a great way to get everyone tuned up and ready for winter. Held Wednesday, September 29, 1999 at the Waukesha County fairgrounds. Call Bill Kappel at 414/286-2369 for more details.

American Concrete Institute Seminar on **Fiber Reinforced Concrete** in Milwaukee, November 16. Covers different types of fibers used in concrete mix designs, and how to specify, test, and economically construct fiber reinforced concrete. For a brochure call 248/848-3815.

**Pesticide Applicator Training for right-of-ways** will be offered again in late January. The preregistration deadline is two weeks earlier. For the 2000 dates, call after November 1, at 608/262-7588 or e-mail PAT-Program@facstaff.wisc.edu. Revised fees are now \$45/person.

## PASERWARE update in the works

PASERWARE is getting a facelift. This computer software, which uses the PASER rating system, helps local street and highway managers identify and budget pavement repair and rehabilitation needs. A Y2K compliant MSDOS version is available now; a Windows version will be out in January.

Surveys indicate that many local governments use computers running on the MSDOS operating system. To accommodate these users the T.I.C. revised the MSDOS version of PASERWARE to make it Y2K compliant. This version allows current users not on Windows-based systems to continue using PASERWARE through 2010.

*continued on next page*

**PASERWARE update** *from page 6*

In addition, T.I.C.'s computer programming staff is hard at work on a PASERWARE version that runs under the Windows operating system. Testing will be completed in the fall and initial distribution is planned for January 2000. User training sessions are scheduled for February and March.

PASERWARE 2.0 will work with existing data files and offer a number of new features (determined by a user survey). Enhancements include:

- Three five-year budgets, one each for preventive maintenance, restoration, and reconstruction.
- Budget recommendations based on current pavement condition.
- Selection of specific projects and years for simulation.
- Three categories of pavements by traffic load and volumes—"heavy", "medium", and "light". Deterioration, treatments, and costs could be related to those groups.
- Ability to project condition for more than five years to see long term results of alternative budgets and treatment priorities.

Current and prospective PASERWARE users should expect to hear more details by the end of the year.

**R<sub>x</sub> for driveway headaches** *from page 1*

Keeping driveways 500 feet back from an intersection and spacing them at least 600 feet apart is important for safety and to keep traffic moving. The distances are measured before a land parcel is subdivided. "We get people who want to carve off a small piece of land and put in another driveway," says Bolte. "We tell them, no. Use what you've got or give up one of them."

In some situations, they will make an exception. "We try to work with the community," Bolte says. "If most of the land is already developed and a driveway pattern is

established, it would be arbitrary not to permit an access point. One more driveway will not change the character of the area."

Permit fees range from \$75 for a single family driveway without a culvert to \$330 for each subdivision or commercial drive. Fees are intended to recover the costs of plan review and on-site inspection.

**Safety, capacity, expansion are state concerns**

Higher speeds and larger traffic volumes make driveway control even more critical on state trunk highways. "Our goal is to minimize the number of access points by consolidating driveways or re-directing them to local streets or roads," says Norm DeVries, planning engineer at WisDOT District 1. He can point to examples where the policy has succeeded including Hwy 12 from Middleton to Sauk City, and north of Baraboo.

Under a section of the Highway Administrative Code revised in February 1999, WisDOT is required to review all land divisions that could affect a state highway. In addition to access they consider drainage and setbacks. Setbacks may require developers to keep any permanent structure or signs out of the area directly abutting the road.

"In some locations we're trying to preserve the land in the corridor in case we have to expand the highway to four lanes," says DeVries. "When we go in there buying land for the expansion we won't have to buy houses, businesses, et cetera." WisDOT also sometimes buys development rights for the same reason. More counties are requiring proof of access before a parcel is sold, even on property with an existing driveway, he notes.

Compliance with access controls is good, according to DeVries. "We work things out with the property owner. It's crucial to have a good process," he says.

*For copies of sample town driveway ordinances contact J.R. Habeck, Wisconsin Towns Association, 715/526-3157. Use the form below to get copies of county ordinances from the T.I.C.*

**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 e-mail us:**

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

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# Work zone training at your site

Why not schedule the one day T.I.C. *Basic Work Zone* workshop at your own site? This training is valuable for anyone who sets up work zones or inspects them. In addition to your own work force, consider inviting contractors, plumbers, and utilities that work in your rights-of-way.

The training is six hours long, usually from 8 a.m. to 3 p.m. It covers the basic work zone rules and lets the participants apply them through group problem solving exercises. All participants receive their own Wisconsin Work Zone Safety pocket-sized guides. The T.I.C. instructors have practical work zone experience and helped write the Wisconsin Work Zone Safety guide book.

T.I.C. offered this workshop in January and March of 1999 around the state. Last April the City of Oshkosh was the first city to schedule the workshop at their own site for their employees.

"It's been very beneficial," says Bill Rassmussen, Superintendent of Streets and Sanitation who sent eight staff to the session. "This is the first time we sent the workers. Before when there was training available we sent the supervisor and the person in charge of signs. Now they can work as a team and look out for each other." He noted that a few times since the training one of his staff suggested that a work zone signing setup might need some changes.



The cost to have the one day workshop at your site is \$400 for up to 30 participants and \$800 for 30 to 60 participants. T.I.C. will provide the instructors and instructional materials, you provide the room, break refreshments, and lunch. If you do not schedule a workshop at your own site, you can still have some of your employees attend this workshop because T.I.C. will offer Basic Work Zone again in February 2000.

*If you want to schedule a Basic Work Zone workshop at your own site, call Mercy Ranum at 800/442-4615.*

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