SUMMER 2007

CROSSROADS

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WISCONSIN TRANSPORTATION INFORMATION CENTER– LTAP

Plan to attend an August workshop on "Managing Your Roads Using PASER and WISLR" for more road rating resources and tips on using valuable web-based tools. See Calendar on page 12 for dates and locations.

INSIDE

Time to rate your roads

STATE STATUTE requires all local governments in Wisconsin to rate the condition of their pavements every two years and submit those ratings to the Wisconsin DOT. Last month, local governments received a packet of materials from WisDOT describing how to submit ratings prior to the December 15, 2007, deadline.

Benefits of road rating

Meeting state requirements is one reason local governments rate their roads regularly. A better reason is the chance to manage local road systems smarter by tapping the tools in WISLR—the Wisconsin Information System for Local Roads. The data management system is a powerful way for officials to evaluate alternative road maintenance budgets and develop five-year plans (see story on page 9). Systematically and accurately rating your roads also provides other benefits. Decision makers can:

- review condition of the whole road system at a single time
- monitor the performance of past maintenance projects
- discover emerging problems or worsening conditions
- focus discussion about what action to take based on actual road conditions.

Once the road rating is complete and entered in WISLR, local officials have access to current maps, charts, and budget routines to make informed road project decisions, and explain those decisions to other elected officials and the public. This article examines rating the conditions of local roads using PASER *(Pavement Surface Evaluation and Rating)*.

Rating / Visible distress	*Condition / Treatment measures*
4 – FAIR Severe surface raveling. Multiple longitudinal and transverse cracking showing slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (½" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 – POOR Closely spaced longitudinal and transverse cracks often with raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.

Compare distress descriptions, as in this excerpt from the Asphalt PASER Rating Table, to come up with the right rating.

Close inspection the key

Visual inspection of the extent and severity of specific distresses in a pavement surface is the basis for the PASER pavement condition rating system. Those distresses indicate a specific PASER rating that defines appropriate preventive maintenance, repair, rehabilitation, or replacement treatment.

PASER correlates the condition rating, visible distress, general condition, and appropriate maintenance treatments over the life of the pavement. For paved roads a PASER rating of 10 is ***excellent*** and a rating of 1 is ***failed***.

Predictable deterioration

Pavements usually pass through a series of predictable stages as they deteriorate with use and age. Research and practice show

Continues page 8

Keep roadsides in check and in flower

Choice of how to control plant growth should depend on the natural lay of the land.

SPRAY. MOW. CUT. CLEAR. Every tool county and local road crews use to manage vegetation growth along the roads and highways has its place, say Jim Merriman and Dick Stark of WisDOT. As a host of native and non-native species head into peak season along roadways—some perceived to be "out of place" or known to be hazardous to the people doing the work—the two landscape architects offer a handful of reminders and resources to help with safe and effective roadside management.

Plant communities determine treatment

Choice of how to control plant growth should depend on the natural lay of the land. Jim notes habitat characteristics can help determine the best management techniques—like using prescribed burns on stretches of mature prairie along a right of way. The key is to get things identified. Jim recommends contacting local county Extension agents, local Land and Water Conservation Department staff people, local environmental groups or various DNR subject matter experts familiar with area landscape features. Many of these agencies have contacts and natural resource mapping available online.

Management choices

Understanding habitat and monitoring changes should make the choice for how to manage roadside vegetation easier. Usually this means a combination of mowing, cutting and applying herbicides. The recommended approach is basic.

Mow one mower width—a minimum of five feet—from the edge of the roadway or shoulder to prevent fires and keep a clear zone for vehicles to pull off the road safely in an emergency.

Let vegetation grow to a height of one foot or greater then mow to six inches and no shorter. This helps maintain the health of desirable plants and discourages unwanted species from germinating. And remember to delay any extra-width mowing until after July 15 to protect nesting habitat for migratory birds.

Herbicides help in controlling roadside brush. Dick notes, however, that when foliar treatments are applied early in the scenic travel season, it turns green leaves an early brown and spurs complaints to WisDOT from travelers and others dismayed at seeing so much dead brush along county or town roads. He recommends local crews cut brush and treat the stumps to prevent growth or apply a basal bark herbicide treatment during the winter months. "The best method of treatment depends on what species are present, of course. But even an application of Krenite in mid-September, just before the

Idea EXCHANGE

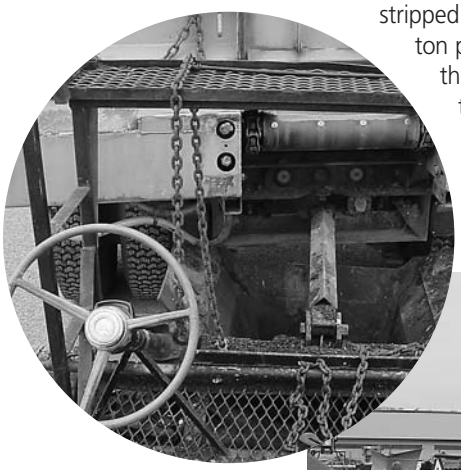
Rut-filling sled handles repairs

Innovation and an old truck sparked an idea 13 years ago that continues to serve the Trempealeau County Highway Department well—a rut-filling sled that makes efficient work of a routine operation. As County Highway Commissioner Jim Johnson explains, there was nothing on the market back in 1994 that offered an efficient way to handle hot asphalt mix applications on rut repair jobs. So department crew members devised a solution.

Department inventors stripped a three-quarter-ton pickup down to the frame, leaving the four wheels and steering wheel intact. Next they attached a sliding apparatus underneath that bears down during the rut-filling process to spread and feather the repair mix. In action, the sled rides tandem behind a live bottom dump truck carrying hot mix asphalt made of 3/8-inch aggregate or smaller. A hopper sitting between the two vehicles transfers the mix to the slider.

Trempealeau's hard-working contraption even served as a prototype for the Buffalo County Highway Department that built a similar sled a few years back.

"The sled is a real benefit in our repair work on both state and county roads," Jim says. "And these days, when we can't afford to do a full overlay on every stretch of road, we keep it busy removing ruts to meet our safety standards." ■



Rut-filling sled rides tandem behind truck carrying hot asphalt mix. INSET: *Hopper mounted between feeds mix to slider.*

Mowing to prevent fires and keep a clear zone for pull-offs is a big part of every local roads management program.

leaves start to turn, avoids immediate brownout while ensuring the plants will not leaf out in spring."

Invasives require early detection, rapid response

Jim says invasive species are a major issue right now, with a lengthy most-wanted list that road crews must deal with annually. Vigilance is important, he adds, since highway corridors offer an opportunistic pathway for invasives to spread. Cleaning mower decks and other equipment before leaving an infested area is critical to avoid spreading unwanted plants from one area to another. Early detection and rapid response in eradicating them before they gain a foothold is the single most effective way to keep new invasive species from spreading.

Wild parsnip is one culprit operators should recognize and manage carefully. It is an aggressive, hardy weed that can change a variety of open habitats once established. The plant also is a hazard to handle. Dick recommends operators mowing or clearing roadsides where wild parsnip is present avoid getting the plant juices on skin that is exposed to sunlight. "The reaction is like a third-degree burn with severe blistering that can take some time to heal. And since it is a chemical reaction rather than an allergic reaction like poison ivy, virtually no one is immune."

Controlling this botanic pest requires that you be able to recognize it and understand best management practices. Cut all herbaceous invasive species as flowering begins in June or early July before the seeds set. If necessary, mow again a few weeks later to prevent recurrent flowering. Jim adds that local crews can help spot and report any new infestation of wild parsnip as the state monitors its progress.

Jim says a Department of Natural Resources website is expanding to include information on hazardous plants that will help county and municipal crews keep these species in check. Meanwhile, check the links here to the Wisconsin Council on Invasive Species and the University of Wisconsin Botany site for visual IDs and other information. Contact Jim Merriman to request a WisDOT poster describing wild parsnip for your shop.

Safety a big issue

Traveler safety and keeping the highway facility in good condition drives most roadside maintenance programs. Dick suggests and identifies several other safety issues that deserve close attention. When mowing, mow with, not against, traffic. Equip all mowers with proper safety equipment like yellow caution lights and rollover protection systems.

Watch for and eliminate trees with serious structural defects. A dead or weakened tree can fall and cause damage to anything of value. If a tree is in danger of falling on the roadway, it poses a serious risk to passing traffic.

Vegetation that obstructs views present another concern—and liability for local governments. Dick recounts a recent case where an accident victim won legal judgment against a county, town, and landowner because a tree on private property reduced visibility and caused a crash. Local crews need to control vegetation that restricts vision at intersections and driveways, insides of curves or near highway signs.

Timely tips

Check the resources supplied here to learn more about the latest on invasive species control and other seasonal tips for managing local roadside landscapes. ■

Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants, Bureau of Endangered Resources, Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin 53707-7921

Check "What's blooming" along Wisconsin roads on this UW botany site:
http://www.botany.wisc.edu/wisflora/blooming/

DNR-based Wisconsin Council on Invasive Species:
http://invasivespecies.wi.gov/awareness/index.asp

Poison Ivy, Oak and Sumac Identification Photos:
http://poisonivy.aesir.com/view/pictures.html

James Merriman, WisDOT
james.merriman@dot.state.wi.us

Early detection and rapid response is the single most effective way to keep new invasive species from spreading.

Wild parsnip is an aggressive, hardy weed that can change a variety of open habitats once established.

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Culvert replacement Q&A: DNR Liaisons a good resource

A healthy culvert.

EARLY ATTENTION to detail is good advice on any road project. When it comes to organizing the particulars of a culvert replacement project, local decision makers have an important local resource in their Wisconsin Department of Resources (DNR) Transportation Liaison. Transportation Liaisons operate in every county to streamline the mandated DNR review of culvert project plans and the process of securing necessary approvals, says Cameron Bump, Central Office Coordinator of Transportation Liaison Staff for the DNR in Madison. He describes each liaison as a "single point of contact," available even before a conceptual project plan is submitted to help local governments evaluate replacement priorities. "Early coordination on a culvert project saves time and money, things we know are critical for all local agencies today." Putting his claim into action, Cameron offers *CROSSROADS* readers answers to questions about culvert replacement.

Q *What is the DNR's role in my project?*

The DNR gets involved on road projects that affect fish, wildlife, water quality, and other sensitive natural resources. Where the Wisconsin Department of Transportation (DOT) takes the lead on a project, the two agencies coordinate reviews and approvals directly. On a bridge or culvert replacement project proposed by a local agency, the DNR works one-on-one with local officials to identify the issues requiring permits and then assists in getting approvals in place. Cameron says, "Our main role is to review plans and make sure environmental standards are met. But because we are local, DNR liaisons know the lay of the land, literally, and provide a knowledgeable assessment and practical advice on projects." For example, he notes Transportation Liaisons can identify the true quality of environmental components—like an outstanding trout stream—and whether they are home to endangered or threatened species.

Culvert replacement work site.

Q *What type of DNR review do I need for culvert replacement?*

Wisconsin Administrative Code Trans 207 defines standards local governments must follow in design and construction of public highway bridges, arches, and culverts over and in navigable streams. This includes replacement projects. Cameron says DNR Transportation Liaisons typically review the conceptual plans required by Trans 207 to be sure they comply with specified environmental regulations. These include preserving navigability of a stream, fish passage, adhering to flood flow, utilizing erosion control, and protecting critical habitat features. This is where, he points out, early coordination benefits most projects. "As soon as local authorities start to anticipate a project, they can tap us for site and habitat information that's useful in planning future expenditures and scheduling the replacement project."

Q *What is a navigable stream?*

Cameron explains that Wisconsin law categorizes a navigable stream as a waterway with a defined bed and bank capable of floating—on a regularly recurring basis—the lightest boat or skiff used for recreation or any other purpose. He adds the definition also includes dry runs that qualify as navigable during a seasonal high flow, and streams that appear impassible because of thick vegetation. If uncertain about the waterway involved in a culvert replacement, Cameron suggests talking to a DNR expert trained to evaluate navigability and profile a stream area before a project moves ahead.

Q *What size culvert do I need to install?*

Local governments faced with budgeting time and money for culvert replacement sometimes look for ways to save by installing the smallest structure allowed. That could cost more in the long run, Cameron says. "Rule of thumb is to figure out just how wide the stream is and try to match the new culvert with that width. This has a better chance of reducing future maintenance costs and prolonging the useful life of the structure." He notes if a culvert is too small it can become perched, or elevated, causing fish migration barriers. A perched culvert also increases stream velocity, causing erosion problems that can compromise the integrity of the structure and prompt having to fix or replace the culvert more often. A DNR Transportation Liaison can give guidance on accurately matching culvert width to stream width to avoid this and other problems.

Q *Do I need a hydrology and hydraulics analysis?*

This applies to flood flow requirements as outlined in Chapter NR116 of the Wisconsin Administrative Code. A hydrology and hydraulics analysis looks at how any proposed culvert installation—new or replacement—will affect stream flow. No analysis necessary, Cameron notes, if you replace the culvert with one the same size or larger, and if the culvert opening area is less than 50 square feet. Larger culverts and bridges (with

openings over 50 square feet) may require analysis of water capacity and velocity to protect against a negative effect on resources and adjacent landowners. He advises that local agencies are responsible for having an analysis done where required and providing it to the DNR for review.

Q *What does it mean to provide pass-through clearance for vessels?*

Typically, this is not a big issue, says Cameron. But it is critical where there is an expectation of moving people, goods, and equipment along a waterway. The goal with culvert replacements is to maintain existing flow capacity. Where a culvert opening allows pass-through clearance for watercraft, like canoes, constructing authorities must replace with a structure the same size or larger. The rule of thumb here, he adds, is that clearance of at least five feet is required for vessel passage. Where it is reasonable or necessary to reduce pass-through clearance, local agencies must provide a portage route to ensure public passage.

Q *How deep should I plan to set the culvert?*

Below streambed level is the simple answer, according to Cameron, who acknowledges this is sometimes easier said than done. Bedrock beneath the streambed can present a blasting challenge, for instance, if you want to sink a replacement culvert to the desired depth. The DNR recommends setting the culvert anywhere from six inches to a foot below streambed level, sometimes more depending on the stream. Cameron cautions that when replacing the culvert at that level, planners should maintain the amount of flow capacity. This could mean installing a culvert slightly larger than what was there to make up for lost capacity from sinking the new structure lower. He also cautions the slope of the culvert needs to match the slope of the stream. "Slope it the wrong way and you'll end up with a perched culvert and all the resulting problems. If the stream skews one way, the culvert should skew likewise to make sure velocity is constant upstream and down." Setting the culvert correctly protects the fish habitat and reduces maintenance.

Q *Why is construction erosion control important?*

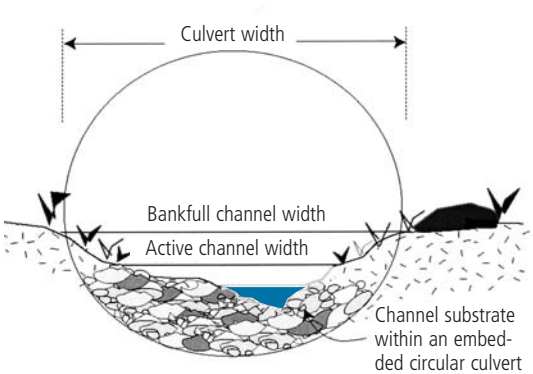
Trans 207 spells out requirements for protecting stream bank slopes from erosion as part of culvert replacement. A conceptual plan submitted under these standards must address how the project will minimize siltation of navigable waters. The DNR reviews the erosion controls outlined in the plan and gives recommendations for improvements, Cameron says. Liaisons can provide information on effective treatments—from silt fences during construction to riprap for the finished installation—and refer local agencies to resources about recommended materials to use and how to install them. "Our focus on natural resource and habitat protection means the DNR sees erosion control as an essential consideration in a replacement project," he says. "Bare soils on steep banks that slope into a stream wear away quickly and have a direct negative impact on fish and their habitat. That is why effective erosion controls are essential to protecting fish." He suggests checking out the Wisconsin Erosion Control Product Acceptability List compiled by WisDOT. For guidance on installing certain measures, see the DNR Construction Site Erosion and Sediment Control Technical Standards.

Culvert installed without erosion control measures quickly affects water quality.

Q *What other permits do I need for a local road project?*

When local agencies planning a highway bridge or culvert replacement project in navigable waterways comply with Trans 207, they are exempt from having to secure permits. Beyond that, Cameron says, there are issues not covered by those exemptions that do require additional permits. The Army Corp of Engineers may get involved along with the DNR where certain wetlands are in play, requiring a federal permit. If a project covers an area bigger than an acre, the constructing authority must file for a storm water permit from the DNR. Extensive dredging and channel relocation for a culvert replacement requires Chapter 30 permits. Other state approvals may involve identifying any historic or archeological feature affected by a replacement project. Again, Cameron reminds readers that DNR Transportation Liaisons are ready to help local governments evaluate both the construction site and a replacement plan, and aid them in identifying required permits. "Single point of contact and experienced in the field—we make a good resource for bringing projects along effectively and efficiently." ■

Channel cross section



Schematic shows the proper setting of culvert below the streambed.

Resources

Learn who your DNR Transportation Liaison is: *http://dnr.wi.gov/org/es/science/DOT_liaison_list.pdf*

Trans 207, Wisconsin Administrative Code: *http://www.legis.state.wi.us/rsb/code/trans/trans207.pdf*

Culverts: Proper Use and Installation, Wisconsin Transportation Bulletin No. 15, TIC, 2004, 12 pp. From TIC website: *http://tic.engr.wisc.edu/publications.lasso*

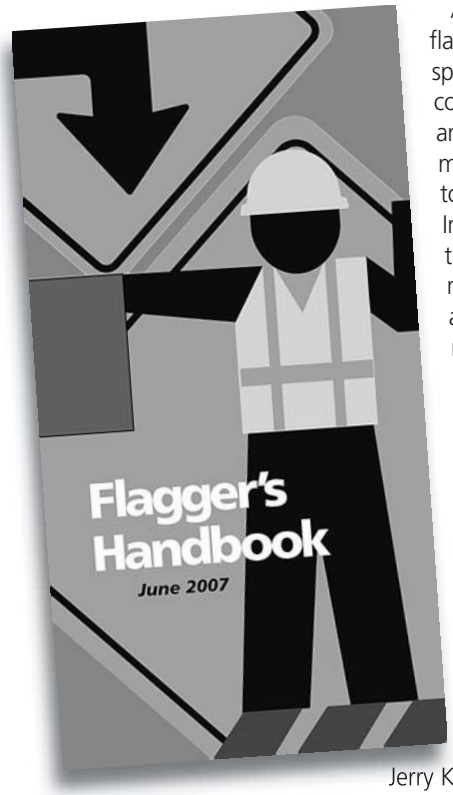
National Extension Water Outreach Education website: *http://wateroutreach.uwex.edu/CPBhomepage.cfm*

Fish Friendly Culverts from UW–Extension: *http://clean-water.uwex.edu/pubs/pdf/shore.fishfriendlyculverts.pdf*

New edition of Flagger's Handbook available

AN UPDATED *Flagger's Handbook* is available now incorporating changes in the federal *Manual on Uniform Traffic Control Devices* (MUTCD).

Yellow highlights quickly identify the standards workers and supervisors must follow to protect their organizations and themselves from incurring liability. The pocket-sized handbook also contains new, easy-to-follow descriptions that clarify flagger signals, set-ups, and operations.



Download or order at:
http://tic.engr.wisc.edu/

Among new standards, flaggers now must wear specific high-intensity colors with a minimum amount of retro-reflective material to be more visible to approaching motorists. In night flagging operations, the flagging station must have auxiliary lighting and stop/slow paddles must be retro-reflectorized.

TIC offers work zone and flagging courses in January 2008 and on site for agencies and companies interested in the training. Many cities, counties, and companies have TIC customize topics for their on-site courses and some include the training in annual Safety Day events.

Jerry Kuhl, Human Resources Director and Risk Manager with Hoffman Construction in Black River Falls says his company makes flagger and work zone safety training—like the TIC courses—a requirement for laborers and foremen on their road projects. "We want all laborers trained to high standards of safety, and supervisors and foremen ready to address safety issues on the spot. The TIC training is invaluable for this, very complete, very professional. The people who participate find it really meets their needs. And ours!"

The cost for one instructor to teach a one-day course at your site is $600. To learn more about setting up a course, contact Jane Sauer at 800-442-4615. ■

LRIP funding cycle coming up

FUNDING FOR major improvements on local roads is front and center again as the latest grant cycle approaches for the biennial Local Roads Improvement Program, or LRIP. Grant requests for the 2008-2009 fiscal years are due in to county highway commissioners by November 1, 2007. Before then, LRIP Program Manager Janice Watzke encourages local governments to review their high-priority roads projects and prepare to submit applications.

Janice, along with State and Local Unit Leader Lori Richter and Kathryn Dustin, the other LRIP Program Manager, plan to conduct trainings around the state in July and August. They will meet with county highway commissioners and other officials in each of the eight WCHA (Wisconsin County Highway Association) districts to answer program questions, hand out updated information packets, and review the application process. LRIP information packets for the new program cycle also will be available on the WisDOT website after July 1.

Continued impact and value

Lori notes the reimbursement program continues as a vital resource for counties, towns, cities, and villages, paying up to 50 percent of project costs on improvements that address serious deterioration of existing local roads. "The program has dispersed $281 million in grants since 1991—a sizable amount of those dollars on large projects. LRIP provides a funding option in cases where no other federal or state dollars are available."

LRIP eligibility components include County Highway Improvement (CHIP), Town Road Improvement (TRIP), and Municipal Street Improvement (MSIPLT and MSIPGT). Additional discretionary components exist for counties (CHIP-D), towns (TRIP-D), and cities and villages (MSIP-D) to provide funds for high-cost road projects.

The majority of projects funded are roadway reconstruction or resurfacing, which together accounted for 695 of 921 projects approved over the past biennium, Lori says. LRIP also reimburses up to half the cost of design, right-of-way acquisition, and any items related to the construction or engineering of an improvement project.

LRIP requires applicants to bid all project elements as one.

Completed County road (CHIP) project at CTH F and CTH W Intersection in Kenosha County.

Eligible work completed in recent LRIP cycles include a town road (TRIP) project on Koshkonong Road, Town of Christiana in Dane County ABOVE, *and a city street (MSIPGT) project on Farnam Street, City of LaCrosse in LaCrosse County* BELOW.

Rules recap on H endorsement

Continued confusion over who must have a hazardous materials, or H endorsement and when prompted *CROSSROADS* to ask for a rules recap. Thanks to Dodge County Highway Commissioner Brian Field who raised the question and Terry Ewing at the Wisconsin Department of Transportation who tapped his expert sources to provide clarification.

Changes last year in rules governing H endorsements exempt all government agencies from requiring their drivers to get the endorsement. Federal statute CFR49-§171.1 (Applicability of Hazardous Materials Regulations [HMR] to persons and functions) specifically states that federal, state or local vehicles transporting hazardous materials do not need to meet placarding requirements. Likewise, employees operating those vehicles do not need the H endorsement on their CDL. The endorsement—which involves background checks and proof of citizenship or permanent residence—is reserved for drivers and vehicles involved in transporting hazardous materials for commercial purposes.

Local agencies that choose to use the exemption should remove the H placard from their vehicles so the drivers of those vehicles are not required to have the CDL H endorsement.

http://www.myregs.com/dotRSPA/ for full text of CFR49-§171.1.

The only exception is hot mix asphalt purchases. Bid separately, they qualify for reimbursement.

All improvements made with LRIP funding must meet appropriate road standards, unless applicants request approval for an exception through WisDOT. Every LRIP project, including the purchase of hot mix asphalt, must meet the requirement of having a 10-year design life. And all projects exceeding $65,000 in cost require an engineering certification.

What is not eligible for LRIP funding? No new roads. No alleyways. No state highways. No utilities. No single chip seals. No routine patching or other road maintenance, for starters. Look for these and other examples on the LRIP page of the WisDOT website.

Sunset rules

While guidelines for this funding cycle mirror previous rounds, the LRIP team reminds successful past applicants that a sunset clause created with the 2004-2005 cycle to keep projects on time remains in force. Projects from that cycle and earlier must be completed and reimbursed by June 30, 2009, or funds will become unavailable. All projects programmed with 2006-2007 dollars must be reimbursed by June 30, 2011.

LRIP recipients unsure of the sunset for their funds can check with state highway commissioners, who receive a list of their open projects from program staff on a quarterly basis. A complete list also appears on the WisDOT website.

In setting this rule and improving the department's response to applicants, Janice and Lori say LRIP meets its mission to ensure that the government entities responsible for the quality of local roads have what they need to make long-lasting improvements. ■

The reimbursement program continues as a vital resource for counties, towns, cities, and villages, paying up to 50 percent of project costs on improvements that address serious deterioration of existing local roads.

Resources

LRIP background, information packets, guidance and useful links:

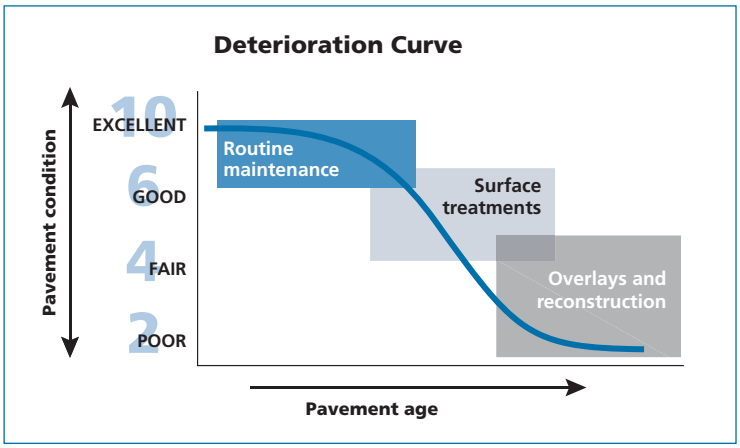
http://www.dot.wisconsin.gov/localgov/highways/lrip.htm

Time to rate your roads

continued from page 1

Local governments should think of the PASER rating process as a planning, not a design tool.

specific maintenance and rehabilitation treatments extend the useful life of a pavement. The deterioration curve below depicts how the "right treatment at the right time" keeps a pavement in good condition longer and at a manageable cost. PASER ratings must reflect pavement condition accurately for this approach to work.



This graphic depicts how the right maintenance at the right time extends a pavement's useful life.

Rate pavements accurately

Rating a pavement by looking at surface distresses is similar to what a doctor does when diagnosing an illness and prescribing a treatment. Like the doctor, a pavement rater observes the symptoms, or distresses, reviews pavement history, and determines underlying physical causes to come up with appropriate treatment.

Pavement raters often think of each rating as code for a specific treatment; for example, we talk about a 7 rating as a crack seal and a 4 as an overlay for asphalt pavements. While that may facilitate discussion, an accurate pavement rating requires observation, investigation, thought, and judgment.

Recognize distresses

Underlying physical mechanisms that lead to pavement distresses relate to traffic loads, temperature variations, moisture in and under the pavement, and aging. These physical stress mechanisms, often acting in combination, give rise to distresses observed when rating pavements.

Each of six TIC PASER manuals lists and pictures distresses typical of a given pavement type, and describes typical causes. Distresses outlined in the asphalt manual fall into four categories: surface defects, surface deformation, cracks, and patches and potholes.

More than one physical factor can cause a specific distress, as with alligator cracking. These include:

- fatigue due to traffic loading and aging of the pavement
- soft sub-grade soil support, often related to poor drainage
- combination of fatigue and poor sub-grade support

Exercise judgment

The primary guide to selecting the right rating based on these factors is the Rating System Table in each PASER manual. It correlates ratings with visible distresses, general comments about pavement condition, and treatment measures.

As an example, the distress description for the asphalt rating of 4 has no alligator cracking. Block cracking with the rating is less than 50 percent of the surface, patching is fair; rutting is less than one-half-inch deep.

A rating of 3 equals severe block cracking, closely spaced and raveled longitudinal and transverse cracks, alligator cracking on less than 25 percent of the surface, rutting from 1- to 2-inches deep, poor patches and some pot holes.

At all ratings, remember that pavements may have one or more of the distresses listed.

Distress descriptions in the table should lead the pavement rater to the appropriate rating and treatment. Nonetheless, the rater must use judgment and take into account pavement history and any specific causes of the distress. If there is a small area of alligator cracking observed in a pavement section with distresses that relate to a 4 rating, this does not mean the rater should rate the pavement a 3. They should plan instead to correct the cracking and its cause as part of the overlay project.

Planning not design

Local governments should think of the PASER rating process as a planning, not a design tool. It is a good idea to conduct an engineering evaluation that may include testing prior to design and construction to insure you address the causes of the distress—especially for pavements rated 4 through 1.

Pavement types

All pavements face the same basic physical stress mechanisms. The distresses that result, however, are unique to each pavement type. The six PASER manuals and rating scales cover Asphalt, Concrete, Sealcoat over Gravel, Gravel, Unimproved Roads, and Brick and Block pavement types. TIC also publishes a Drainage Manual that helps pavement raters evaluate another factor with a significant impact on pavement performance.

WISLR features 15 different pavement types because the database contains historical data that includes several physical charac-

Key to eight asphalt pavement types in WISLR

45 =	Cold mix asphalt pavement on concrete
50 =	Cold mix resurf on asphalt pavement surface plus base <7" thick
52 =	Cold mix resurf on asphalt pavement surface plus base >7" thick
55 =	Cold mix asphalt pavement surface plus base <7" thick
57 =	Cold mix asphalt pavement surface plus base >7" thick
60 =	Hot mix asphalt pavement on concrete
65 =	Hot mix resurf on asphalt pavement
70 =	Hot mix asphalt pavement

teristics that can affect pavement performance and longevity. The Asphalt PASER Manual is used to rate all eight asphalt pavement types in WISLR—45, 50, 52, 55, 57, 60, 65, and 70.

Pavement performance

Long-term performance of the eight WISLR asphalt pavement types is likely to vary. Those variations are reflected in the deterioration curves developed for each pavement type in the WISLR five-year budget simulation. Making sure WISLR has the correct pavement types improves the accuracy of the database and budget projections.

Choosing pavement sections

One of the first decisions when preparing to rate pavements is how to divide the road system into manageable pavement rating sections. The WISLR rating download automatically divides a road system into sections so that each section has the same road name, pavement type, date of last construction or age, and condition rating. From a pavement deterioration standpoint, this makes sense. Local governments should consider changing their pavement sections to match the length of a typical construction or maintenance project.

Ratings responsibility

Local government officials play the lead role when it comes to maintaining roads within their jurisdiction. Conducting a thorough, accurate ratings process is part of that responsibility. WISLR, with its dynamic pavement analysis tools, gives them an effective way to evaluate and communicate the condition of the whole road system and explain their budget decisions. In this way, local officials can better meet their stewardship responsibilities to provide a cost-effective transportation system to meet local needs. ■

Pavement analysis tools sharpen planning

PLANNING & BUDGETING for road maintenance and replacement gets harder all the time as local governments juggle complex needs and limited resources. Enter the pavement analysis tools in WISLR (Wisconsin Information System for Local Roads). Added in the last two years, the tools allow decision makers to sharpen their planning and take informed action.

Joe Nestler, an engineer with Applied Research Associates and one of three instructors for the upcoming TIC workshop on using WISLR, recently outlined some of the applications he says make the system a powerful benefit to counties and municipalities.

WISLR generates reports with estimates of pavement maintenance and capital improvement needs for sections of rated roads. It produces maps from this data that color-code repair types. There are charts showing distribution of pavement conditions and the percent of pavement that fall into different ratings spreads. Joe calls the graphical printouts a good overview of the data. He envisions their use as a dynamic presentation tool when reviewing

Continues page 10

WISLR relies on users

KEEPING TRACK of accurate data on local roads became an interactive process five years ago with the introduction of WISLR (Wisconsin Information System for Local Roads). The Pavement Rating Entry web-based tool makes it easy for local officials to enter their own ratings information.

Susie Forde, Chief of Data Management for WisDOT, helped put WISLR into action. She says the system has seen more use every year since its launch in 2002. In 2005, 44 percent of submitted pavement ratings were entered via WISLR.

"We have over 2,000 users now, 1,500 of them local governments," Susie notes. "As people see what's possible, how they can generate maps, graphs, spreadsheets, and other reports from the data, view local road data statewide, when they see how to use it to spot trends, compare their road condition to a neighboring municipalities, the value of WISLR comes through."

With ratings due later this year, Susie and Kelly Schieldt, Statewide Local Roads Coordinator with WisDOT, remind local agencies that while inspecting roads in their jurisdiction, they can correct inaccurate pavement data.

WISLR's advantage is that authorized users have any-time access to their local roads database. They can—and should—go in to verify all road features, from surface type and width to road names. It is easy to download and review a spreadsheet to see where data is wrong or out of date. Users can make changes by going into the worksheet on the WEB WISLR Pavement Rating Entry Screen.

First-time users go to https://on.wisconsin.gov to register and receive access confirmation from WisDOT.

Susie, who participates again this August in a TIC workshop on using road-rating tools, calls WISLR a unique partnership between state and local agencies. "The first of its kind in the country, it's a model of how to maintain data quality on a vital, shared asset and give local governments the tools to control and manage resources wisely." ■

Four steps in ratings process

These general guidelines will get a pavement rating project off the ground.

1– Prepare to do the ratings

Download WISLR data, check for accuracy, make corrections. Mark road sections and plan rating route. Review condition table in PASER manual. Gather information on known problems. Arrange for multiple raters to work in tandem for consistency.

2– Rate the pavements

Take camera, tape, straightedge, rating map, spreadsheet, and pens. Ride pavement section to judge average condition, ride again at slow speed or stop to inspect pavement at close range and note condition. Consider causes and assign PASER rating.

3– Review ratings with others

Examine and verify all ratings on a map. Ask others who know the roads to review. Check for consistency with multiple raters. Field check any questionable ratings. Finalize ratings.

4– Enter ratings in WISLR

Enter final ratings into WISLR by web connection or other method.

The system has seen more use every year since its launch in 2002. In 2005, 44 percent of submitted pavement ratings were entered via WISLR.

Pavement analysis tools sharpen planning

continued from page 9

"The data available depends on what local governments put in for their PASER ratings."

recommendations with other officials or the public.

Introduced last year, the new budget simulation tool in WISLR gives users before-and-after, five-year budget information as a way to assess the impact of projected spending. The tool helps in evaluating each pavement section for suggested action. It calculates individual section costs and puts projects in priority order against budget projections until funds run out. In the process, WISLR creates a list of backlog projects, or unmet needs.

"The data available depends on what local governments put in for their PASER ratings, of course," Joe says. "But once they do, they are just a few mouse-clicks away from translating those ratings into valuable multi-year budget planning information."

He says when assessing a budget's impact on system condition, the budget tool resets ratings to a higher value when the project is scheduled. A built-in deterioration curve based on statewide averages of pavement age and type determines the rating of delayed or unscheduled projects that continue to deteriorate.

WISLR prioritization fine-tunes the data. It calls for treating pavements rated fair-to-very-good when ***functional*** rather than ***structural*** deterioration is the dominant distress. Joe notes this approach emphasizes "pavement preservation"—meaning local governments can maintain pavements in good condition at a lower cost per year of service life than pavements with significant structural deterioration.

Recognizing that significant roads in poor-to-failed condition cannot be ignored, the WISLR model also considers roadway classification as an indication of local importance. This dual-priority approach helps in selecting projects based on cost-effectiveness and on the importance of a road to overall system function.

Approved users can change two factors in the budget simulation. They can alter the take-action status of a roadway by identifying it as major, minor, local, or low use. Users also can change the unit costs for repair associated with pavement ratings and pavement type.

Joe says educating local governments about WISLR is an important ongoing effort that is paying off as more agencies give the pavement analysis tools a try.

"When it comes to substantiating budget requests with clear data on need and impact, weighing trade-offs, and coming up with a plan that gives more bang for the buck, this resource is outstanding," he concludes. "The right projects at the right time and with the right fix—it can happen." ■

RESOURCES

Print copies of publications available free from TIC while supplies last. Electronic copies may be downloaded from the TIC website.

Video, CDs, and DVDs are loaned free through county UW–Extension offices. Print copies of the current TIC. Copies of the TIC Lending Library Catalog were distributed last July. Items also are listed on the TIC website.

TIC website
http://tic.engr.wisc.edu/

Publications

PASER Series

The six manuals in the Pavement Surface Evaluation and Rating (PASER) series help you evaluate roadway surfaces and plan repairs for most road surface types. Common defects are described and illustrated with photos. A surface rating system links type, number, and severity of defects with the type of maintenance needed.

Asphalt PASER Manual
28 pp., 2002

Brick and Block PASER Manual
8 pp., 2001

Concrete PASER Manual
28 pp., 2002

Gravel PASER Manual
20 pp., 2002

Sealcoat PASER Manual
16 pp., 2001

Unimproved Roads PASER Manual 12 pp., 2001

Drainage Manual, TIC, 2000, 16 pp. Guide to evaluating and rating drainage conditions along rural and urban roadways.

Gravel Road Maintenance: Meeting the Challenge
A limited number of this training DVD and CD available from TIC. DVD includes modules on Correct Roadway Shape, Shaping the Roadway, Good Surface Gravel, and Dust control. CD contains instructors guide and FHWA Gravel Roads Maintenance and Design Manual. Limited number of print copies also available.

REVISED *Flagger's Handbook,* updated publication available from TIC this summer. It incorporates changes to the Manual on Uniform Traffic Control Devices (MUTCD).

Culverts: Proper Use and Installation, No. 15, TIC, 2004, 12 pp. Practical information on culvert design, permitting, material selection, construction, and maintenance.

Fish Friendly Culverts, a UW–Extension publication. A limited number of printed copies available from TIC. Demonstrates proper design, installation, and maintenance techniques for culverts that protect fish while providing effective drainage for roadways. Available online at http://clean-water.uwex.edu/pubs/pdf/shorefishfriendlyculverts.pdf

New editor joins *CROSSROADS*

MARY MAHER debuts as editor of *CROSSROADS* with this issue of the TIC newsletter. She replaces long-time editor, Lynn Entine, who retired in March.

A Wisconsin native based in Madison, Mary is an independent writer and editor with decades of experience in publication management and marketing communications. Her association with the University of Wisconsin– Madison Department of Engineering Professional Development—home to TIC—dates back seven years when she began researching and writing articles for publication in support of architecture, engineering and construction management courses.

In her own words, a few first-person comments:

Thanks to Lynn for a thorough introduction, to the group at TIC—Don, Steve and Ben—and to designer Susan Kummer for their help pulling my first issue together. The past several months have been an intense short course for me in understanding the critical job local officials face in keeping "the roads they own" in shape for commerce and travel. My goal is to be a quick study and bring some fresh perspective to the pages of **CROSSROADS.** *I can see my own road trips around Wisconsin will never be the same. Finally, thank you to our readers for continued interest in and support of this high-quality publication. I hope you'll stay in touch with feedback on our coverage and topic ideas for future issues.* ■

New CROSSROADS editor Mary Maher

RESOURCES

Websites

WISLR—information and a link to the WISLR website: http://tic.engr.wisc.edu

Click on "Links to WISLR Information" under "What's New?"

Local Roads Improvement Program (LRIP) information available online at: http://www.dot.wisconsin.gov/localgov/highways/lrip.htm

Site includes general information, contacts, and reports, including lists of past and current projects funded through the program.

Wisconsin Erosion Control Product Acceptability List at: http://www.dot.state.wi.us/business/engrserv/pal.htm

Features products approved by WisDOT for use in culvert replacement projects.

Construction Site Erosion & Sediment Control Technical Standards are available at: http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/techstds.htm#Construction

Details DNR recommendations useful in culvert replacement projects.

Videotapes/ Multimedia

NEW ***Guidelines for the Selection of W-Beam Barrier Terminals,*** FHWA, 2006, 13 minutes, #18898. CD shows the challenge of constructing a safe W-Beam guard rail. Actual crash tests illustrate the need for proper design and site grading. Includes video segments of interest to maintenance crews and supervisors. Limited supply of CD also available from TIC.

Dangerous Travelers: Controlling Invasive Plants Along America's Roadways, USDA Forest Service Technology and Development Center, 2006, #18818. DVD covers best-management practices to help road maintenance crews control the rapid spread of invasive plants. Highlights plant identification, inventory systems, mapping, mechanical removal, herbicide treatments, weed-free products, maintenance techniques, and equipment cleaning.

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CALENDAR

TIC Workshops

Specific details, locations, and registration forms go out to all CROSSROADS recipients prior to each workshop. Additional workshop information and online registration available at : http://tic.engr.wisc.edu/workshops/listing.lasso.

Using PASER and WISLR to Manage Your Roads Help with rating your roads and submitting ratings to WisDOT (ratings due December 15, 2007). Also learn how to use the web-based WISLR pavement analysis tools to manage your roads more effectively. *Fee: $45*

July 31	DePere
August 1	Waukesha
August 2	Barneveld
August 6	Tomahawk
August 7	Hayward
August 8	Eau Claire
August 9	Tomah

Winter Road Maintenance
Practical information and procedures for snow and ice control on local roads. New winter maintenance equipment will be on display at each workshop. Come prepared to share your ideas and learn from others. *Fee: $45*

October 2	Green Bay
October 3	Waukesha
October 4	Barneveld
October 8	Tomahawk
October 9	Cable
October 10	Eau Claire
October 11	Tomah

Highway Safety Workshop
Basics of signing and marking, and highlights good sign installation and maintenance practices on local roads. Also helps you identify roadside safety hazards and understand and use crash information to improve the safety of local roads. *Fee: $45*

November 1	Barneveld
November 2	Waukesha
November 5	DePere
November 6	Tomahawk
November 7	Cable
November 8	Eau Claire
November 9	Tomah

On-Site Workshops Save time and travel costs by bringing instruction to your shop or office. Schedule training for the time and place most convenient for you and ask the instructors to tailor content to your specific needs. On-site workshops let you train more people for the same or less cost, including staff from other municipal departments, from nearby communities, and from businesses you contract with. Contact TIC early to get the program you need on the date you want. Workshops TIC can bring to your location include:

- Basic Surveying for Local Highway Departments
- Basic Work Zone Traffic Control
- Flagger Training

Snow Plow Roadeo and Equipment Show The 18th annual event sponsored by the Wisconsin Chapter American Public Works Association will be held at Lambeau Field in Green Bay, Wednesday, September 19. Additional information and registration forms available at *http://www.wisconsin.apwa.net/index.asp,* or contact Gordon Paprocki at (414) 302-8809 or *gpaprocki@ci.west-allis.wi.us*.

UW–Madison seminars

Local government officials are eligible for a limited number of scholarships for these Engineering Professional Development courses held in Madison. http:// epd.engr.wisc.edu or 800-462-0876 for details.

JUNE

25-26 Improving Intersection Safety and Efficiency
27-29 Traffic Signal Design and Operation

SEPTEMBER

11-12 Traffic Impacts of Land Development
13-14 Access and Site Design of Parking Lots
24-25 Introductory Principles of Engineering Project Management
26-27 Management Skills for Engineering Capital Projects
28 Computer Tools for Engineering Project Management

OCTOBER

8-10 Railroad Engineering
15-17 Docks and Marinas
15-16 Managing Snow and Ice Control Operations

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