THE DEADLINE for local governments to adopt a plan and method for maintaining minimum levels of sign retroreflectivity as spelled out in the latest MUTCD (Manual on Uniform Traffic Control Devices) is coming up in January 2012. It is a prime opportunity to create a well-organized inventory of traffic signs, something the Federal Highway Administration has recommended for more than 40 years as an efficient way for local road officials to manage signs and meet all MUTCD requirements. An up-to-date inventory also is useful for planning, budgeting and reducing liability exposure.

Various presenters discussed the subject of sign inventories, manual or computerized, at a Transportation Information Center workshop on Highway Safety last fall and a Sign Retroreflectivity program the year before. While attending those sessions, Steve Bezemek from the Town of Necedah and Jeff Peterson from the Town of Westboro each began to formulate plans to find an inventory tool to fit their sign management needs.

From zero to something

Besides the 2012 date for having a sign management or assessment method, the MUTCD requires that governments meet minimum retroreflectivity requirements for regulatory, warning and other signs by January 2015 and all street name and overhead guide signs by January 2018. A sign inventory that is current and updatable makes it easier to meet these deadlines and manage limited resources wisely.

Software tools on the market include SignView by Iowa-based Cartegraph, SignMaster by Mastermind Systems of Elmore, Ohio, and Simple Signs by Minnesota-based Rowekamp Associates. These and other sign inventory systems offer a range of features that state and local governments can evaluate to find one that fits their sign management needs and budgets.

Necedah’s Bezemek says when he started as Road Supervisor with the Juneau County community four years ago, there was nothing on paper or anywhere else about the status of sign replacements or maintenance. However, of the more than 700 signs his agency maintains on 116 miles of local roads, he found a lot that needed attention. This fact combined with the impending MUTCD deadlines convinced him the time was right to develop an inventory.

Bezemek already ran his operation—a mix of three full- and part-time people—from a laptop in his truck. He keeps track of road maintenance, connects to the Diggers Hotline and records pavement ratings data in WISLR (Wisconsin Information System for Local Roads) from his mobile office. The prospect of having access to a current database of traffic signs from there fit his idea of being efficient. “Do it once, do it right.”

Continues on page 8
Streetlighting with LEDs

STREETLIGHTS make roadways safer and more navigable after dark for drivers, bicyclists and pedestrians. They light the way, discourage crime, and improve quality of life for residents and businesses.

Operating and maintaining streetlights, however, takes a bite out of municipal budgets. Technologies like LED (light-emitting diode) streetlights are an example of an alternative designed to lower costs and save energy. But if LEDs reduce lighting levels, the change can have a negative impact on safety. As the technology comes into the mainstream for outdoor lighting, local governments need to consider whether or not to incorporate LEDs into their own streetlighting plans.

They can learn from the experience of public agencies in Wisconsin and across the country doing replacements with LED fixtures right now. Pilot studies by federal agencies and private groups give state and local governments the chance to evaluate the technology’s potential and its limitations.

Understanding LEDs

LED technology uses direct current to activate a solid-state lighting device. In streetlighting and other applications, the technology’s advantages can include energy savings, longer life, instant start and restart, and greater control of fixture operation.

What kind of energy savings do LEDs produce? And what kind of light do they give? The industry claims a 40 to 80 percent decrease in energy use with LEDs. But some of those savings come from reducing the light (lumens) that shines onto the pavement. Local agencies should evaluate where it makes sense to install LEDs, how to space the lights for optimal illumination, and determine the wattage or drive current needed to achieve it. Some roads or intersections might require higher light levels than LEDs supply. There are energy conservation groups and manufacturers that recommend lower lighting levels based on research that shows the white light produced by LED fixtures improves the ability to accomplish certain tasks. But it is unclear if this research applies to streetlighting applications. Current streetlighting design standards require the same level of light on the pavement regardless of the light source.

LEDs are new enough that there is limited field data on how long they last, but the current generation of LED luminaires—a complete lighting unit—is rated at 10 to 16 years. If field experience matches the ratings, this might translate into reduced maintenance costs compared with the typical three-to-four year relamping cycle for conventional streetlights. Agencies also need to calculate the costs of maintaining light output, from periodic cleaning of the luminaire to component replacement.

The initial investment in LED fixtures is higher than what highway and street departments generally spend on replacements. Recent public bid tabulations in Wisconsin show LED costs of $325 to $425 per luminaire versus $80 to $100 per luminaire for typical high-pressure sodium (HPS) cobra head-type streetlights. That gap has narrowed with growth in the market for LEDs. Experts predict LED streetlight costs will decrease 5 to 15 percent per year going forward.

Payback on the investment varies according to local energy costs and whether the new luminaries are required to provide the same.

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Two images from a streetlighting installation on 75th Street in Kenosha—one of three projects in recent years where the city applied new lighting technology by retrofitting or replacing streetlights with LED luminaires.
amount of light as the existing system. In recent reports on demonstration projects funded by the U.S. Department of Energy (DOE), communities saw a 10-to-12 year payback. Other agencies reported a return in as few as seven years.

Research the options

In Wisconsin, Waukesha and Kenosha are among several cities that took advantage of ARRA (American Recovery and Reinvestment Act) grants distributed through DOE for some or all of their recent lighting projects that included installing LED fixtures.

Outside funding makes it easier to consider replacing or retrofitting streetlights with LEDs despite the long payback period. Reports of rapid advances in the technology and its long-term energy- and cost-saving potential made it of interest to municipalities budgeting future streetlighting replacements.

The City of Waukesha adopted an energy efficiency plan four years ago, says Katie Jelacic, a project engineer with the city’s department of public works. The plan included retrofitting all existing HPS streetlights with either LED or induction fixtures. Thanks to a $657,400 ARRA grant, the city embarked in January 2010 on a project to replace the city’s streetlights with newer technology.

Jelacic led the project which included testing the performance of products from 14 vendors. “We needed to see the technology in action to decide what would work for us,” she explains about the process that helped the city narrow the field of viable options.

Each company loaned two to four fixtures and all necessary equipment to mount them on existing poles at no cost. Over six months, Waukesha evaluated the fixtures for energy efficiency, light distribution, ease of retrofit, price and the response from the public.

In a June 2010 report to the DOE, Jelacic described the project team taking readings with a light

**LED Checklist**

Many companies are vying for a share of the growing LED market. Local governments exploring the technology for current or future projects should look for vendors with expertise in the technology. This checklist highlights key issues involved in selecting a product that will perform well.

- Look for manufacturers with LED and streetlighting luminaire experience.
- Ask the manufacturer for a certified luminaire photometric report (per IESNA LM-79) from an approved lab for each luminaire under consideration.
- Obtain lumen depreciation data for a LED luminaire supported by the LED chip manufacturer’s IESNA LM-80 test data.
- Learn about LED luminaires and drive current: Increased drive current produces greater light output but can reduce LED life and increase energy use.
- Test LED luminaires with different corrected color temperatures (CCT) and get public feedback on preferred light color.
- Look for luminaires with a vibration rating tested according to ANSI C136.31 requirements.
- Look for Ingress Protection (IP) Code designations that rate how a fixture holds up against exposure to water, dust and other materials that can enter the luminaire assembly.
- Test sample luminaires for ease of installation, maintenance and repair.
- Look for LED luminaires with an extended warranty and check manufacturer’s ability to stand behind it. A five-year warranty is common for LED streetlights but longer warranties might be available. Understand what the warranty covers, what constitutes failure and if there are any exclusions.

Streetlighting systems that work well improve visibility without producing excess glare, skyglow or light trespass onto adjacent properties.

### Resources

- [www1.eere.energy.gov/buildings/ssl/consortium.html](http://www1.eere.energy.gov/buildings/ssl/consortium.html)
- Two Lighting Research Center reports compare conventional and LED continuous streetlighting systems.
- [www1.eere.energy.gov/buildings/resources](http://www1.eere.energy.gov/buildings/resources)
- Ingress Protection Code designations on the website of UL, global safety science company.
- Ingress Protection Code designations on the website of UL, global safety science company.

Harbor Park in Kenosha as seen from the air, showing newly installed LED streetlights that line a boulevard street. The whiter light produced by the LEDs contrasts with the yellow glow of conventional streetlights on adjacent streets.
meter to determine light distribution at street level and measuring the amount of energy used at each luminaire to compare the energy consumption of HPS and LED or induction fixtures. The new fixtures meet the city's minimum criteria for light output. Estimating the average life of the newer fixtures at more than 60,000 hours for both lamp and driver versus 18,000 hours for the HPS lamp and 60,000 hours for the ballast, she figured the city would see measurable savings with the new streetlights.

They also anticipate saving on maintenance costs. “I hope to go as long as 10 years before needing to replace most of these lights.” She estimates payback on the upgrade in approximately seven to eight years.

Changing streetlights already was part of an approved multi-year plan in Waukesha. But when the city secured the grant, public works was able to accelerate its replacement program rather than do it piecemeal. Earlier this year, they completed retrofitting all 1,200 of the city’s streetlights with one of the LED cobra head luminaires tested during the pilot at a cost of $365 per fixture plus labor.

Reflecting on the project, Jelacic says researching their options was a real help in identifying which product best met Waukesha’s goal of going green in a way that benefits the community.

Project-to-project comparison

Several road projects over the last three years gave Kenosha’s Director of Public Works Ron Bursek the chance to install LED streetlights in several retrofitting projects and one that involved a redesign. “We started looking at this technology several or eight years ago and I’ve seen major improvements every year in cost and performance,” he notes, adding that while the city’s primary reason for the change was to reduce maintenance costs, reducing the impact on the environment also played a role.

The department undertook its first upgrade on a road reconstruction project in 2008. They installed LED cobra head luminaires on existing poles and modified the arm to extend an additional eight feet over the roadway.

“That project turned out fairly well, but we thought we could improve on having to work with the existing pattern of poles,” Bursek says.

They got the chance a year later on a mile of street where city engineers redesigned the streetlighting based on the capabilities of the new lighting technology. Being able to position light poles in the best location for LED illumination produced great results.

Cost per luminaire was $800 installed for the cobra head fixtures on these two projects, four times the city’s previous cost of $200 plus labor for the old sodium lights. What Bursek expects to see are lower labor costs for LED light sources in fixtures lasting up to 16 years versus lamps in conventional streetlights that last three or four years.

A third project involved retrofitting decorative Acorn fixtures in the downtown area with LEDs that match the historic look of existing lights. Partially funded through an ARRA grant, it is a demonstration project evaluating the energy efficiency of LEDs. Kenosha contributed $400,000 to the project’s $1.3 million total cost. According to Bursek, the lights they chose are similar in cost to conventional replacements of this particular fixture but with an estimated 16-year life cycle. While they expect 35 to 40 percent in energy savings, he notes the greatest projected savings will be in replacement costs.

Bursek says the city studied the issue of upgrading the Acorn lights for a year, doing the analysis necessary to find the best replacements. Part of his process was to negotiate a long-term warranty since there is no track record for the technology or the products. Based on average city use of 4,200 hours per year for the luminaires, the warranty covers 70,000 total hours in operation at no less than 70 percent of lumens emitted when new. It also covers any components that fail during that same period.

“Making sure we did the research was important,” he notes. “So even ahead of the curve on adopting LEDs, I feel confident we’re going in the right direction.”

Use standard as guide

It is a good idea to design streetlighting to a recognized standard when considering LEDs for a retrofit or as part of a reconstruction project. Systems that work well improve visibility without producing excess glare, skyglow or light trespass onto adjacent properties.

The American National Standard Practice for Roadway Lighting, known as IES/ANSI RP-8, covers the standard practice for design of streetlights on roads with continuous lighting systems. RP-8 is produced by the IES (Illuminating Engineering Society) and approved by the ANSI (American National Standards Institute).

For state highways, the AASHTO (American Association of State Highway and Transportation Officials) Roadway Lighting Design Guide specifies minimum levels of lighting quality and identifies roadways where lighting is warranted. State or local policies that establish pole placement and the spacing of streetlights for non-continuous lighting also may apply.

Does it pencil out?

There is a lot of information to digest when weighing the pros and cons of installing LED streetlights. Recent reports from the Lighting Research Center at Rensselaer Polytechnic Institute indicate minimal energy savings for LED continuous lighting systems designed to current recommended practices on collector and arterial streets.
LED futures

Advances in product design and growing competition in the streetlighting market means LED technology is worth keeping in mind for replacement or redesign projects. The numbers may not “pencil out” this year, but they might make sense in subsequent years. Local governments will benefit by reviewing information about LED streetlights from credible sources and studying the results reported by communities in Wisconsin who are early adopters of the new lighting technology.

Community Maps highlight crash data

**LOCAL GOVERNMENT**

Officials can view and map crash data on the roads they manage thanks to collaboration between the Wisconsin Transportation Information Center (TIC) and the Traffic Operations and Safety (TOPS) Laboratory at the UW-Madison.

The web-based Community Maps program provides local agencies with the facts they need to keep roads safe and traffic moving.

Joni Graves, who directs the project for TIC and works with developer Steven Parker of the TOPS Lab, says it is the aim of Community Maps to give local road officials, law enforcement and county Traffic Safety Commissions (TSCs) a powerful resource to help them identify and prioritize safety improvements. Users can access data on fatal traffic accidents from 2001 to the present.

The site uses the familiar Google Maps to create an online tool available for viewing by the public. General users can search for results in one or more counties and limit their search by date range, crash severity or manner of collision. They also can identify two points on a segment of road or draw a “boundary box” around an area of interest.

**How it works**

Many local governments will benefit from the advanced search functions of Community Maps, which requires login account access to the WisTransPortal. Advanced users can create spot maps and download data from their search results. The “admin” feature allows registered users to map and manage their crash data.

To maintain the map of fatal crash locations, Graves updates the site with preliminary data from the Daily Fatality Report (DFR). Then she seeks information directly from local law enforcement to augment the report and make the map time-liner. “We use a simple, web-based interface to request additional information, an approach I hope builds awareness of Community Maps and piques some interest in using it locally,” Graves explains.

**Adding users**

A number of local officials began mapping crash data during the pilot phase for Community Maps and the project is looking for more local governments to incorporate its benefits into their planning.

One new user is Theresa Burgess, Chief Deputy with the Lafayette County Sheriff’s Department, who switched from managing crash data manually to working with Community Maps about six months ago. After creating an up-to-date crash file from a backlog of data with help from TIC, she now produces spot maps on fatal crashes for the county’s TSC.

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Community Maps main page opens on a map of Wisconsin with tools in the left-hand column to search for data on one or more counties.
Community Maps highlight crash data

from page 5

Burgess describes the program as easy to use and a “huge step in a positive direction” for her operation. The online tool allows her to verify details and locations for all local crashes, including car vs. deer incidents, injury accidents and property damage. She expects her department to expand its use of Community Maps, taking advantage of other features for plotting and managing crash data.

Make data available

Graves started working on the project six years ago when she was Transportation Planner at the Southwestern Wisconsin Regional Planning Commission. About a year into the pilot, she began collaborating with Parker, who developed the Community Maps software and maintains the WisTransPortal at the TOPS Lab. The TransPortal was introduced in 2006 and is the repository for transportation data from various sources, providing a centralized source for historical crash data.

The Wisconsin Bureau of Transportation Safety (BOTS) supports the Community Maps project and hopes users across the state will participate in mapping local crash data.

According to the recently retired director of BOTS, Major Dan Lonsdorf, the Bureau’s goal is to reinforce the TSC network’s role as a primary source for unfiltered crash data. Providing local users with a resource for mapping and managing their crash data helps ensure that valuable data is more accessible and timely. Lonsdorf adds, “The information also will be more complete, since local use of local data will lead to improvements in data quality.”

Resource for TSCs

The state established TSCs in 1971 to work at the county level on reducing the incidence and severity of traffic crashes. Membership includes the county highway commissioner, chief law enforcement officer and other local stakeholders. Each commission is responsible for preparing and maintaining spot maps of crash locations in their jurisdiction, monitoring traffic safety problems and recommending corrective action.

Community Maps is a resource for TSCs in support of this effort.

“The maps project provides TSCs with crash facts they can use to guide their search for strategies to improve safety generally or implement counter measures in a specific location,” says TIC Director Steve Pudloski. “The historical data is especially important for seeing trends that indicate a roadway or intersection is prone to crashes.”

Expand content and quality

As part of her campaign to expand content and improve data quality, Graves is connecting with potential users. She has attended TSC meetings to provide an overview of the project and seek input. Recently, she surveyed members attending the annual Wisconsin Traffic Safety Officers Association (WTSOA) conference to learn more about local crash mapping and gauge their interest in using Community Maps.

She also considers it important to make Community Maps easy for law enforcement officials to use, noting, “No one goes into that field because they want to do paperwork.” TIC is collaborating with a sheriff’s department in southern Wisconsin to develop and document a more efficient and timely process for incorporating local crash data. Graves hopes this will be a model other departments in Wisconsin can replicate.

Data-based decisions

Graves says she appreciates the commitment of all Community Maps partners to making the concept work—from having an accessible online tool with 10 years of statewide crash data to the growing number of local users who contribute to its value.

“After years of development, it is energizing now to see local decision makers using the program to spot trends and take action.”

Community Maps is part of TIC’s ROaDS (resources, outreach, and data support) initiative to support TSCs and local law enforcement. Pudloski observes that as the scope and quality of available crash data improves, it will help focus local efforts to manage and maintain safer roads.
WISLR adds features in time for ratings deadline

**LOCAL GOVERNMENTS** must report their pavement ratings to the Wisconsin Department of Transportation by December 15, 2011, documenting the physical condition of the local roads they manage and maintain. For most local officials, the process involves using PASER ratings in tandem with spreadsheets and, for a growing number, submission of their pavement data using WEB WISLR.

The web-accessible local roads inventory system is an updatable resource where local government officials can input and store details on road width, surface type, surface year, shoulder, curb, road category, pavement condition and other information. WISLR also assists local governments who are required to comply with GASB (Governmental Accounting Standards Board) standards by mandating regular reports on infrastructure assets.

Recent enhancements to WISLR give users more reason to incorporate the program into road maintenance operations. Kelly Schieldt, Statewide Local Roads Coordinator for WisDOT, describes the updates as a way for local governments to track their preventive maintenance projects. The WISLR improvements also reflect the fact that as users become proficient with the online tool, they are prepared to do more with it. The additions keep WISLR robust and relevant.

**More options**

With the new Route Comments feature, WISLR users can add, edit and store additional route information such as data on culverts, drainage and associated costs that support items in the Pavement Analysis section. “People wanted a way to store and access a range of details easily and this answers that need,” Schieldt says.

Another enhancement is a repository for information on maintenance treatments. Given recent increases in maintenance projects, local governments are doing more to extend the life of their pavements and delaying the need for more expensive rehabilitation and reconstruction. The addition of Maintenance Treatments lets them record treatment types in WISLR for local roads under their jurisdiction. The mapping function found elsewhere in WISLR is not available yet for this attribute.

**More users**

Every year, WisDOT receives more requests for access to WISLR. Schieldt estimates that about 2,200 users statewide are going into the system to make rating entries, update physical attributes, conduct a pavement analysis and perform other activities. Online pavement rating submittals increased from 42 percent of all local governments in 2005 to 59 percent in 2009.

Local road officials not registered for access to WISLR can set up an account by following instructions at the WISLR page on the WisDOT website. However, any account that is inactive for 26 months becomes unavailable — another incentive for local governments to keep using WISLR tools in their local roads programs year round.

Wider, more frequent use certainly benefits the system. WisDOT expects a WISLR User Group of both basic and advanced users will offer valuable feedback. Information about participation in User Group meetings is included in the annual mailing to local governments that contains certification materials. It is also available on the TIC website.

**Spread the word**

Outreach has helped spread the word about WISLR. Workshops Schieldt and others in the department conduct with TIC give

Recent enhancements to WISLR give users more reason to incorporate the program into road maintenance operations.

Public officials will be busy over the next few months inspecting local roads as they prepare to record and report pavement ratings to WisDOT by December 15. Whether using the basic or advanced features of WISLR, their work is helping to make the local roads inventory system reflect what local governments need to do their job. Learn more about PASER and WISLR online at WisDOT and sign up for the upcoming web course sessions to become more familiar with these programs.
Sign inventory makes it easier to meet the MUTCD

Bezemek says building the inventory answered the biggest concern with sign replacement projects, knowing how to budget.

Resources

www.lrrb.org/ Minnesota Local Roads Research Board has information about sign retroreflectivity and management, including downloadable guides and toolkits.

http://safety.fhwa.dot.gov/roadway_dept/night_visib/retrotoolkit/ FHWA developed this Sign Retroreflectivity Guidebook to help local agencies select an effective sign assessment or management method.

http://www.rowekamp.com/ Link to producer of Simple Signs inventory software.

http://cartegraph.com/ Link to producer of SignView inventory software.

www.mastermindsystems.com/ Link to producer of SignMaster inventory software.

After researching inventory software products, Bezemek chose Simple Signs. He says the one-time cost of $1,500 plus $500 to add GIS mapping was a factor in his decision to recommend it for town board approval. The price covers updates, customization and technical support. Final cost, including a new computer, was under $4,000.

He expects the easy-to-use software will help him meet MUTCD requirements ahead of time. Over about a month and a half in early 2010, Bezemek entered sign data into his laptop as he drove the town roads, creating the initial inventory database. He started using it to replace signs by June of 2010 and completed more than 200 replacements by last fall. His goal is to more than double that number in 2011 and complete all sign replacements over the next two years.

Bezemek says building the inventory answered the biggest concern with sign replacement projects: Knowing how to budget. “Without a good sign inventory, I didn’t know how much to set aside for maintenance,” he recalls. “Now that I know where we stand, I can project what it’s going to take and how long. And I can defend my budget requests with hard facts.”

Bezemek uses the inventory to generate colored maps designating sign locations that he gives crew members along with their assignments. Marked-up maps provide new data that goes into the inventory.

Bezemek considers it one of the best operational improvements the town has ever made.

Go to next level

Peterson, who is Road and Maintenance Director for the Town of Westboro, recalls starting 10 years ago to stamp the backs of signs with replacement dates to track vandalism, a serious issue in the area around the Taylor County community. Hearing about sign inventory software at the TIC workshop and anticipating the MUTCD deadlines, he was ready to go to the next level.

Like Bezemek, he saw Simple Signs as a cost-wise choice for his small agency and one that did not require great computer skills. “I’m no computer expert so I was glad to find a program that is self-explanatory and guides you through the screens without difficulty,” Peterson says. “I also wanted a computerized database where I can store and update information, and also share it with other agencies when necessary.”

The town manages some forest roads, he notes, and the new inventory makes it easy to send data to forest service officials when there is an issue.

Westboro paid $2,000 for the basic program with mapping. Peterson worked with the vendor to develop a map that matches the town’s needs. The 89 miles of road his agency manages cover three-and-a-half townships so Peterson needed a long skinny map that shows everything. Rowekamp set up the screens Peterson needed with categories like sign type, exact location, post material and other identifying factors.

After working with the interactive sign inventory for a year, Peterson says he finds the process of inputting new data on each sign straightforward. The program also alerts him about scheduled maintenance activities. And since the sign inventory map is similar to the
pavement ratings map he uses in WISLR, Peterson sees a real advantage in being able to cross-track details in both systems. “It really is easier now to set aside a realistic amount for sign maintenance in the annual budget,” Peterson says. “I can judge what needs to be replaced and plan ahead on spending to meet the mandates.”

**Seeing the benefits**

Maintaining hundreds of traffic signs is a major part of managing safety on local roads. A comprehensive inventory—whether electronic or pencil and paper—should contain a range of facts about each sign, from installation dates to its retroreflectivity score.

After a year in action, the inventory Bezemke implemented has streamlined Necedah’s sign maintenance operation, he says. “With the database loaded, I can check on a sign in the system from the office, order replacements and update individual sign information.” The program lets him record sign location, orientation and offset, and sign properties that include size, MUTCD code, sheeting type, what kind of post and how many, the sign vendor and warranty details. An activities section contains data on installation dates, retroreflectivity conditions and comments. He also lists who performed the tasks related to installing or servicing the sign.

Bezemek and Peterson both use the inventory to track damaged, stolen or vandalized signs. Peterson says having a verifiable record of problem areas helps him flag law enforcement about where to increase patrols.

The program generates reports on the entire inventory or specific segments for scheduling and budget meetings. It produces printouts the town officials use for work assignments that they mark up in the field with notes on sign condition and maintenance actions, later transferring those notes to the database. Like many small road and street departments who rely on part-time workers to assist with maintenance projects, Bezemek and Peterson say having inventory maps is a good way to give assignments to a workforce that might not be familiar with area roads and sign locations. “It communicates very precise information about where to go and which signs to work on,” Peterson observes.

A complete sign inventory also makes it easier to assess the placement and purpose of existing signs. Bezemek says he identified unnecessary or redundant signs using the inventory tool and locations without signs that needed them.

**Choose a Method**

The 2009 MUTCD requires public agencies to establish and implement one of five sign management or assessment methods by January 2012 to maintain sign retroreflectivity at or above minimum levels. The standards also allow the use of other methods based on engineering studies.

**Visual Nighttime Assessment**

Conduct nighttime inspections with accepted procedures for calibration and comparison to establish minimum levels.

**Measured Sign Retroreflectivity**

Take exact measurements of all signs using retroreflectometer.

**Expected Sign Life**

Record age of sign and replace before retroreflective material is expected to degrade to minimum level.

**Blanket Replacement**

Replace all signs at specific intervals based on expected life of sheeting material.

**Control Signs**

Base replacement of signs on the performance of a sample of each type of sign in a field or maintenance yard.

**FACT CHECK**

**Sign Retroreflectivity Deadlines**

There is some confusion among local agencies about what each 2009 MUTCD compliance date requires of them when it comes to meeting the new national standards for sign retroreflectivity. The facts are these:

- **By January 2012**
  - All local agencies must establish and implement a sign management or assessment method that supports their plan for meeting minimum sign retroreflectivity levels required in MUTCD.

- **By January 2015**
  - All agencies must ensure that traffic signs comply with new retroreflectivity standards. These include all regulatory, warning and ground-mounted guide signs—except for street name signs—that do not meet minimum requirements according to the management or assessment method chosen.

- **By January 2018**
  - Agencies must meet all sign standards, including the new retroreflectivity minimums.

**Valuable working tool**

Any sign inventory that is easy to maintain helps local agencies meet the MUTCD deadlines for updating non-compliant regulatory, warning and guide signs without major strain on budget resources. Once in place, the inventory becomes a valuable tool that supports ongoing maintenance and long-range planning.

The Minnesota Local Roads Research Board offers two downloadable publications to assist local agencies in responding to the federal guidelines, a retroreflectivity toolkit and a sign maintenance handbook of best practices. Both discuss the benefits of sign inventories. TIC’s bulletin on signing is another good resource for local governments in Wisconsin responsible for the traffic signs that keep the state’s local roads safe for the driving public.

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**Once in place, the inventory becomes a valuable working tool that supports ongoing maintenance and long-range planning.**
CROSSROADS INDEX

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Articles from the last eight issues of Crossroads newsletter listed by topic, title and issue date. Available for download at http://tic.engr.wisc.edu or call the Transportation Information Center at 800-442-4615 to request copies.

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Winter Roads

- Plow blade advances improve snow control SUMMER 09
- Positive results from dairy brine test on winter roads FALL 10

Contact us via email, phone, fax or mail:

Email: tic@epd.engr.wisc.edu
Tel: 800.442.4615
Fax: 608.263.3160
Wisconsin Transportation Information Center 422 N. Lake Street Rm 811 Madison, WI 53706
http://tic.engr.wisc.edu

The Wisconsin Transportation Information Center provides a full range of transportation information services 24 hours a day. From traffic conditions and road closures to snowfall forecasts and weather warnings, TIC is your source for transportation information.

Feedback

Please contact us via email, phone, fax or mail.

Name ___________________________________________ Title/Agency ____________________________________________
Address ___________________________________________ City _________________________ State ___________ Zip ___________
Phone _____________________________________________ Fax _______________________ Email ___________________________________________

☐ Address change/addition ☐ Information request ☐ Idea/comment ☐ Email delivery only

Additional comments: ____________________________________________________________

http://tic.engr.wisc.edu
RESOURCES

Publications

PASER Manual Series, 2000-02. Pavement Surface Evaluation and Rating manuals provide help with road ratings process, and review of surface condition and repairs for most road surface types. Describes and illustrates common defects. Includes surface rating system that links type, number and severity of defects with maintenance methods. Six manuals available from TIC in print or electronic versions.

Asphalt PASER Manual 39 pp., 2002
Brick and Block PASER Manual 8 pp., 2001
Concrete PASER Manual 48 pp., 2002
Gravel PASER Manual 32 pp., 2002
Sealcoat PASER Manual 16 pp., 2000
Unimproved Roads PASER Manual 12 pp., 2001

Signing for Local Roads, TIC Bulletin #7, 12 pp., updated 2011. Reviews role of local governments in maintaining safe, effective traffic signs on local roads. Includes latest MUTCD and WisDOT guidelines for placement and installation, details on sign types and sizes. Available in print or electronic versions.

Web Sources

FHWA Sign Retroreflectivity Guidebook provides an interactive online resource for local agencies who are selecting a sign assessment or management method. Includes Q&A that helps users identify the best method to implement by January 2012. Some copies available in print from TIC.
http://safety.fhwa.dot.gov/roadway_dept/night_visible/retrotoolkit/

www.lrb.org/

Follow WISLR link on TIC home page for information about the local roads inventory system, including a Pavement Rating Help Guide and access to registering for or logging into WISLR.
http://tic.engr.wisc.edu/Links/WISLR.lasso

NEW Urban Bikeway Design Guide from the National Association of City Transportation Officials (NACTO) provides best practices for improving bicycle transportation in places where competing demands for the use of the right-of-way present unique challenges. Contains information on successful implementation of bicycle facilities and detailed studies. Follow these links to online or print guides.
http://nacto.org/cities-for-cycling/design-guide/
http://nacto.org/print-guide/

FHWA Bicycle Facilities and the Manual on Uniform Traffic Control Devices includes a table that lists bicycle-related signs, markings, signals and other treatments. Also indicates which bicycle facilities do and do not fall under the scope of the 2009 MUTCD and which are experimental.
www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm

Two recent Specifier Reports from the National Lighting Product Information Program of the Lighting Research Center at Rensselaer Polytechnic Institute explore use of LED streetlights designed to meet IES RP-8 standards.

Street Lights for Collector Roads available at:
www.lcrl.umn.edu/lpp/publicationDetails.asp?id=927&type=1

Streetlights for Local Roads is available at:
www.lcrl.umn.edu/lpp/publicationDetails.asp?id=931&type=1

Demonstration Assessment of Light-Emitting Diode (LED) Roadway Lighting on Residential and Commercial Streets, Host Site: Palo Alto, California, a Solid-State Lighting Technology Demonstration GATEWAY Program Report published in June 2010 by the DOE.
www1.eere.energy.gov/buildings/ssl/gatewaydemos.html


This University of Pittsburgh study compares environmental impact of LED technology for streetlighting to conventional lighting systems. www.news.pitt.edu/news/led-streetlights-best-buy-cities-pitt-researchers-report-first-cradle-grave-comparison-common-a

DVD/VHS/ Multimedia

PASER Ratings Series, University of Wisconsin–Madison, 2000. 74 minutes, #18390 VHS. Single cassette with three PASER training videos includes Asphalt PASER, Gravel PASER and Sealcoat PASER. Learn how to evaluate and rate pavement conditions using PASER manuals. Also available as individual programs:
#17761 Asphalt PASER (46 min.)
#18385 Gravel PASER (15 min.)
#18386 Sealcoat PASER (13 min.)

Print copies of listed publications available free from TIC. Download or request items at Publications on TIC website. Video, CDs, and DVDs loaned free at county UW-Extension offices. Also see Video Catalog on TIC website.

TIC website
http://tic.engr.wisc.edu/
1 Sign inventory helps with MUTCD deadlines
2 Streetlighting with LEDs
5 Community Maps highlight crash data
7 WISLR adds features
10 Crossroads Article Index
11 Resources
12 Calendar

On-Site Workshops
Save time and travel costs by scheduling training at your shop or office. It’s convenient and courses can be tailored to your specific needs. On-site workshops let you train more people for the same cost or less, including staff from other municipal departments, nearby communities, or businesses you contract with. Contact TIC to book the program and date you want. On-site workshops include:
- Basic Surveying for Local Highway Departments
- Basic Work Zone Traffic Control
- Flagger Training

UW-Madison Seminars
Local government officials are eligible for a limited number of scholarships for these EPD courses held in Madison. Go to http://epd.engr.wisc.edu or call 800-462-0876.

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8 Principles and Practices of Construction Project Scheduling #L571
9-10 Principles and Practices of Estimating for Construction and Design Professionals #L572
20-22 Solving Neighborhood Traffic Problems #L945

AUGUST 2011
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16-18 Traffic Engineering Fundamentals #M716

SEPTEMBER 2011
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14-15 Management Skills-Engineering Capital Projects #M596

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24-28 Structural Design for Non-Structural Engineers #L566

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Project Management 100: The Basics, Plus Important Insights #L742
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The historical data is especially important for seeing trends that indicate a roadway or intersection is prone to crashes. – page 6