Cost-effective safety feature: Iowa gets the safety edge

Iowa LTAP has developed informational materials to help agencies learn about and implement a low-cost safety enhancement—the Safety Edge—on their paving or resurfacing projects.

The Safety Edge is a pavement design feature that helps reduce or mitigate crashes related to edge drop-off. The Safety Edge is an approximately 30-degree fillet constructed along the outside pavement edge. See figure 1.

The fillet creates a sloped transition area that can be more easily and safely traversed, compared to a near 90-degree drop-off, when an errant vehicle attempts to remount the pavement. Although more commonly associated with asphalt, the Safety Edge can be constructed on both asphalt and concrete pavement construction and resurfacing projects. Minimal hardware, labor, and material costs are required to implement the Safety Edge on hot-mix asphalt projects.

The Safety Edge can provide a more permanent and less costly long-term solution for pavement edge drop-off, although routine maintenance of unpaved shoulders should not be neglected even if the pavement features a Safety Edge.

Preliminary results from a Midwest Research Institute pooled-fund study of 242 sites in Georgia and 148 sites in Indiana resurfaced with the Safety Edge suggest that the feature is effective in reducing crashes overall. In addition, the proportions of fatal and injury crashes decreased, but the impact of the Safety Edge on this finding has not yet been determined.

Because of the potential benefits, the FHWA is actively encouraging local and state agencies to incorporate the Safety Edge into their construction and resurfacing projects. This emphasis is part of FHWA’s Every Day Counts initiative.

What's happening in Iowa?

Beginning with October 2010 lettings, the Iowa DOT has issued a Safety Edge design guidance standard for non-interchange, non-curbed primary highway construction and rehabilitation projects, both asphalt and concrete, with paved shoulders less than 4 feet wide. The beveled edge should have a 30-degree slope, not accounting for surface slope. Additional information and plan details are included in the Iowa DOT Design Manual 2010 (www.iowadot.gov/design/dmanual/03C-06.pdf).

The FHWA, Iowa Division, and the Iowa DOT have contracted with the Center for Transportation Research and Education (CTRE) at InTrans/ISU to provide support for state districts and county road agencies incorporating the Safety Edge in their projects. This effort has been led by Shauna Hallmark, associate professor of civil and construction engineering, and involved several projects con-
Two concrete paving projects were included under this effort: County Road E-34 in Linn and Jones Counties, which was the first known concrete pavement constructed with a Safety Edge in the country, and County Road V-63 in Keokuk County. Before and during construction, CTRE provided technical assistance to agencies and contractors. Assistance included recommendations such as plan notes and specifications, equipment such as a slope measuring tool, and the loan of “shoes”—asphalt paver attachments that automatically form the Safety Edge. CTRE also organized and hosted several demonstration open houses.

The team developed educational materials for local agencies. These include a PowerPoint presentation and several technical briefs describing the pavement edge drop-off problem, the Safety Edge solution, quality assurance, contractor benefits, lessons learned, estimating additional cost of material, and general recommendations.

An advisory committee of representatives from industry and agencies was actively involved in this study. The extensive communication among public and private stakeholders has accelerated knowledge transfer.

Early assessments
It is too early to assess the extent, if any, of reduction in crash frequency and severity related to the Safety Edge in the Iowa projects. However, some initial evaluation information is available.

For most projects, the 30-degree angle was relatively easily achieved, with some variations, more or less, recorded.

There is some concern that the presence of a Safety Edge could increase the dislodging of granular material alongside the pavement by errant tires and vehicle turbulence, and thus accelerate the formation of edge rutting or drop-off. A recent evaluation by the CTRE team, collaborating with Sue Miller, Freeborn County (Minnesota) engineer, did not find such an increase on a Safety Edge project constructed in Minnesota in 2005.

Concrete projects
The team worked with Keokuk County staff to develop design standards and specifications; see figure 2. Jones County developed its own; see figure 3. The counties’ designs included a narrower pavement width, compared to the Iowa DOTs design standards, and thus contained fewer square yards of placed concrete, which is the basis for project costs in Iowa.

Shoe assemblies for concrete pavers are not commercially available. Therefore, special forming assemblies were fabricated by Horsfield Construction, Epworth, Iowa, for Jones County and by Wicks Construction, Decorah, Iowa, with advice from Gomaco, for Keokuk County.

Even though saw cuts were not extended through the Safety Edge, cracks induced at sawed transverse joints continued through the Safety Edge as expected.

At intersections, the Safety Edge must be eliminated during construction or removed by sawing after paving operations to obtain vertical pavement faces on intersecting slabs for effective tying of the slabs.

Results of air-void and modulus tests indicated that the concrete quality was uniform between the normal pavement section and the Safety Edge.

The amount of additional material required to construct a Safety Edge on concrete proj-
The amount of additional material required to construct a Safety Edge on asphalt projects is estimated to be about 4.86 percent (based on CTRE/Keokuk County design).

**Asphalt projects**

The use of modified safety shoes that tended to "extrude" asphalt material appeared to produce the most uniform results.

Rollover during compaction caused some distortions of Safety Edge on all projects studied. Potential mitigation strategies include using only the final roller on the outside foot of pavement, paving during cooler ambient temperatures or with warm-mix asphalt, or modifying the paver shoe attachment.

Maintaining a consistent slope is more difficult than on portland cement concrete projects. The CTRE team recommends that design details and specifications tolerate some variation, perhaps plus-or-minus 10 degrees.

An asphalt Safety Edge is compacted only by the paver. Density tests on core samples, however, revealed that approximately 80 percent of density was obtained.

The amount of additional material required to construct a Safety Edge on asphalt projects is low, from 0.5 percent for 1-in. total lift depth to 2.7 percent for 5-in. total lift depth.

**For more information**

Contact Shauna Hallmark, 515-294-5249, shallmar@iastate.edu. For training information, contact Tom McDonald, 515-294-6384, tmcDonald@iastate.edu. For information about FHWA’s Every Day Counts initiative, see www.fhwa.dot.gov/ everydaycounts/.

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**Providing registration alternatives and options**

by Keith Knapp

You may have noticed some additional registration options with some of our 2011 workshops. Online registration is something that has been added.

Registration online does not require payment to be done online (although we hope to at least offer the option soon), but it does ensure you a space at the workshop. Of course, this is most important when the demand for a subject is greater than expected and exceeds the capacity of our meeting space.

This happened with the “Changes in the MUTCD” workshop we recently advertised—these locations/workshops unexpectedly reached a SOLD OUT capacity status within weeks. Not to worry—we added a “waiting list” to the registration online, have moved the workshop to a larger venue in Ames, and are also adding new dates in both Ames and Solon. We’ll be contacting everyone with these changes.

With the online registration option, a single individual can register multiple people without re-entering all the contact information. A confirmation email is then sent, indicating that the registration has been completed and a check can be mailed later with a print-out of that confirmation. If you need to cancel later, we are just a phone call or email away.

Of course, we still offer the ability to email or fax us the information (and we’ll enter it into the website) and you can mail the registration form. We have, however, already experienced a “lost in the mail” situation. We will do our best to provide options if a workshop date has reached room capacity before we get the mailing. It’s best to pre-register for any workshop that you really want to attend or think will be very popular. It ensures a space is held. All of this also allows us to invoice electronically.

We have provided some brief hints about online registration, using “fillable” forms, and attaching documents to emails on page 4 of this newsletter.

So, why are we doing all this? Well, I hope it offers you more and easier options to register for our workshops and provides you with better access to information about them. I also hope it saves us all more time and effort, and maybe saves a few bucks. Essentially we are trying to do more with less and still serve you better. The last thing I want to do is have the opposite impact. I also hope it reduces the “interpretation” mistakes that often occur with handwritten registrations.

Of course it might have helped if we would have started all this with a workshop that wasn’t needed as much as the MUTCD summary, but, as they say, hindsight is 20/20. As things settle out during the coming months and we work to iron out any bugs with the new system, I’m very interested in your input on all this. Please call me at 515-294-8817 or email kknapp@iastate.edu with any comments or questions.

Now, on to something more interesting: Iowa LTAP continues to look closely at the implementation and impacts of Safety Edges, see the related article beginning on page 1. Our collaboration with Iowa DOT, the Midwest Transportation Consortium, and the Iowa Division of FHWA has people looking to Iowa as a national leader in this subject.

We have also been receiving questions about “depaving” (pavement to gravel transfer) and have proposed a potential project to provide some guidance on this subject.

Also, we are working on some additional collaboration. I sat down with DMACC to talk about a survey course, and we are hoping to help out with the Iowa County Engineers Association Annual Conference next December.

Lastly, we are working with the Iowa Chapter of the American Public Works Association to offer some morning meetings that provide a little technical content (this year—roadway crew work zone safety), discussion of LTAP and APWA resources, and time for a roundtable of transportation issues of interest. We hope that this results in a regular collaboration each year for some technical training.
Iowa LTAP Mission
To foster a safe, efficient, and environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

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Proposed FY 2012 federal budget
Following are highlights from President Obama’s FY 2012 budget request, based on information assembled by Joe Jurasic, construction/transportation engineer, FHWA, Iowa Division.

Regarding transportation, the budget centerpiece is a $556 billion, six-year (2012–2017) surface transportation reauthorization. This is almost a 50 percent increase over the most recent multi-year authorization, SAFETEA-LU, and includes a $50 billion “up-front” economic boost to improve the nation’s highway, rail, transit, and aviation systems and enhance the safety of their operations.

The President’s requested budget for FY 2012 is $70.5 billion plus $27.7 billion of the “up-front” funding. It consolidates and streamlines several existing programs into five core federal-aid highway programs:
• Safety
• National Highway Program
• Livable Program
• Federal Allocation Program
• Research and Technology Program

Regarding highway safety, the proposed budget almost doubles investments in programs to reduce fatalities and serious injuries and increases states’ flexibility in addressing safety issues. It continues the Highway Safety Improvement Plan (10 percent of which must be spent on rural safety projects) and establishes a Highway Safety Data Improvement Program.

The proposed budget also
• Redefines the National Highway System as an expanded network carrying 55 percent of all traffic and 97 percent of all truck-borne freight,
• Proposes establishment of a National Infrastructure Bank to finance transportation projects of national or regional significance,
• Attempts to address existing and projected shortfalls in the Highway Trust Fund by expanding it into a new Transportation Trust Fund with accounts for highway, mass transit, rail, and the National Infrastructure Bank.

These proposals face months of legislative negotiation. And keep in mind that, currently, Congressional stopgap funding resolutions are keeping the federal government running (until April 8, as this issue goes to print) without an approved budget for FY 2011.

For more information, see www.dot.gov/budget/2012/fy2012budgethighlights.pdf, or contact Joe Jurasic, 515-233-7304, joe.jurasic@dot.gov.

How to sign yourself up online for an LTAP event
Until our new registration system is up and running, you can register for Iowa LTAP events online using the website address listed on our event brochures. Most of our forms simply ask you for your name and agency information, an email address to receive a confirmation email, and a payment method, and then you’re registered for an event.

You do not need to pay online, but we recommend that you register online to save your spot. Then you can simply print the registration form and mail it in with your check.
Iowa Public Employees Leadership Academy

by Bob Sperry

What’s that you say? You can provide employee development training for your staff and employees whenever you want? And when THEIR workloads allow, in periods as short as 30–45 minutes? WOW! What? There’s more? Each course consists of several lectures and quizzes that can be reviewed and repeated for 90 days? Tell me more…

In 2007, members of the Iowa Chapter of the American Public Works Association approached the Local Technical Assistance Program (LTAP) director about the need for in-house, conveniently accessible, employee development training. The result of those initial discussions: Iowa Public Employees Leadership Academy, a series of online training modules developed in Iowa for and with Iowa’s city/town, county, and state employees.

The modules can replace in-person workshops that normally require travel and sometimes overnight expenses for attendees. National APWA accreditation for Iowa’s Leadership Academy is expected soon.

A unique approach
An advisory committee has guided the development of the Leadership Academy and of individual modules. The committee includes representatives from cities, counties, and the Iowa DOT.

For each module, a regular workshop on the topic is first conducted for a “live” group of participants. Lectures, with presentation slides, are provided by working professionals with superior knowledge and interest in their fields.

After the workshop, timing or content problems are identified and modified. Then the lectures are professionally videotaped and loaded into web-based software owned by Iowa State Extension, through an agreement with Iowa LTAP. The videotapes are reviewed, edited, and coordinated with the slides, supplemented with short auto-scored quizzes, and uploaded to the web.

Who should participate?
The Leadership Academy is geared toward current first-line supervisors and higher, plus employees aspiring to become leaders. Some public employees may choose to complete just one or two modules that have a direct impact on their particular job roles.

The modules cover a broad scope of topics (see below), many of which can help all employees, whether public or private, improve their skills to better qualify for more responsible positions.

How to participate
Web registration is available, www.intrans.iastate.edu/ltap/leadership_academy.htm, for one registrant or multiple registrants from one agency, for one module or multiple modules.

The registration is valid for 90 days, during which modules can be accessed as often as desired. The fee for each module is $75.

Training topics
Eleven modules are now available:
• Supervisory Techniques
• Team Development
• Communications Skills
• Leadership Skills
• Community Service
• Legal Understanding
• Fundamentals of Government
• Finance
• Resource Management
• Operations and Management
• Basic Management.

Three modules are scheduled to be available by late July 2011:
• Emergency Management
• Project Management
• Winter Maintenance Management

For more information
Questions should be addressed to Leadership Academy Coordinator Robert Sperry, 515-294-7311, rsperry@iastate.edu.

Registration forms and module details are online, www.intrans.iastate.edu/ltap/leadership_academy.htm. For more information about online registration and courses, contact ISU Extension Continuing Education and Professional Development (CEPD), 515-294-6222, cepd-courses@iastate.edu.

Editor’s note: A version of this article will be published in Cityscape, the magazine of the Iowa League of Cities, and in The Iowa County, the magazine of the Iowa State Association of Counties.
Three ways to order LTAP library materials

- Use the online catalog, www.intrans.iastate.edu/ltap/library/search.cfm.
- Contact Jim Hogan, library coordinator, 515-294-9481, hoganj@iastate.edu, fax 515-294-0467.
- Mail or fax the order form on the back cover of this Technology News.

Publications

P1001 Elimination or Mitigation of Hazards Associated with Pavement Edge Dropoffs.

This AAA study sought to determine the extent of the pavement edge drop-off problem and recommended changes to eliminate or mitigate the problem and related liability.

P1746 The Safety Edge: A Pavement Edge Drop-Off Treatment.

This updated FHWA brochure describes safety issues related to pavement edge drop-offs, how the Safety Edge can help alleviate those issues, an Iowa case study based on Shauna Hallmark’s recent project with counties (see page 1), and answers to frequently asked questions about the treatment.

CDs/DVDs

DVD 1 Work Zone Safety (Disc 1).

This DVD covers several topics related to work zone safety: grading, plant sites, structures, traffic control/professional flagging.

DVD 2 Work Zone Safety (Disk 2).

This covers the following work zone safety topics: utilities, surveying, heavy equipment, demolition, maintenance operations, and paving operations.

DVD 150 Traffic Control for Urban and Utility Work Zones.

This two-part production provides guidelines, including basic principles and devices with sample applications, and methods applying part one guidelines in typical work situations.

DVD 209 What’s Wrong with This Work Zone?

Viewers are “driven through” work zones on a four-lane highway and on a rural, two-lane road. Each work zone has several errors in design or application for viewers to identify.


This comprehensive resource covers temporary or short work operations in five sections: introduction, devices, control zones, flagging, and legal issues.

In conjunction with Work Zone Awareness Week April 4–8, the following resource may be useful as a community-education or public-service resource.

DVD 51 The Work Zone: Expect the Unexpected.

This DVD emphasizes safe driving through work zones in a format patterned after the TV series “The Twilight Zone.”

Conference calendar

April 2011

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<th>Event</th>
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<tr>
<td>27</td>
<td>Iowa Public Employees Leadership Academy* Module 13: Project Management</td>
<td>InTrans, Ames, IA</td>
<td>Bob Sperry 515-294-7311 <a href="mailto:rsprey@iastate.edu">rsprey@iastate.edu</a></td>
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<td>26–28</td>
<td>National Concrete Consortium/ Tech Transfer Concrete Consortium</td>
<td>Indianapolis, IN</td>
<td>Denise Wagner 515-294-5798 <a href="mailto:dfwagner@iastate.edu">dfwagner@iastate.edu</a></td>
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May 2011

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<td>10</td>
<td>Changes You Need to Know: MUTCD 2009 (SOLD OUT)**</td>
<td>Cronks Café, Dennison, IA</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
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<tr>
<td>11</td>
<td>Iowa Public Employees Leadership Academy* Module 14: Winter Maintenance Management</td>
<td>InTrans, Ames, IA</td>
<td>Bob Sperry 515-294-7311 <a href="mailto:rsprey@iastate.edu">rsprey@iastate.edu</a></td>
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<tr>
<td>12</td>
<td>Changes You Need to Know: MUTCD 2009** (SOLD OUT)**</td>
<td>Brosh Community Center, Solon, IA</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
</tr>
<tr>
<td>24</td>
<td>Changes You Need to Know: MUTCD 2009** (SOLD OUT)**</td>
<td>Quality Inn, Ames, IA (NEW LOCATION)</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
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August 2011

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<tr>
<td>18–19</td>
<td>2011 Mid-Continent Transportation Research Symposium</td>
<td>Gateway Hotel, Ames, IA</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
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September 2011

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<tr>
<td>13–14</td>
<td>SPOT (Snow Plow Operators Training)</td>
<td>Camp Dodge, Johnston, IA</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
</tr>
<tr>
<td>15</td>
<td>Snow Roadeo (Truck, Motor Grader, Loader)</td>
<td>Iowa State Fairgrounds, Des Moines, IA</td>
<td>Kris Angaran 515-294-8103 <a href="mailto:krisa@iastate.edu">krisa@iastate.edu</a></td>
</tr>
<tr>
<td>27–29</td>
<td>Iowa Streets and Roads Conference and Workshop</td>
<td>Quality Inn, Ames, IA</td>
<td>Beth Richards 515-294-2869 <a href="mailto:brich@iastate.edu">brich@iastate.edu</a></td>
</tr>
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</table>

*Enrollment for Iowa Public Employees Leadership Academy modules is limited to about 40 participants. Registrations will be accepted on a first-come, first-served basis.

**Additional workshops covering changes in the MUTCD may be offered later in the year. If you are interested in participating, contact Keith Knapp, 515-294-9481, kkknapp@iastate.edu.

Online Registration

Information and registration details about events sponsored by LTAP, InTrans, or other ISU organizations are available via the online calendar, www.intrans.iastate.edu/calendar/index.cfm.

Motor Grader Operator Training

Events are being scheduled around the state during May and June. If you are interested, contact Kris Angaran, 515-294-8103, krisa@iastate.edu.
April 4–8: Enlist motorists to help create safer work zones

“Safer driving. Safer work zones. For everyone.” This is the theme for the 2011 Work Zone Awareness Week, April 4–8. The national annual campaign informs motorists about specific safety hazards in work zones and how they can keep themselves—and road workers—safe.

Work Zone Awareness Week efforts are led by the National Work Zone Safety Information Clearinghouse, which is managed by the American Road and Transportation Builders Association (ARTBA) with support from the American Association of State Highway and Transportation Officials, the Texas Transportation Institute (TTI), labor organizations, and other safety groups.

Free educational materials available

With little effort and no cost, you can participate in this initiative by providing free informational materials for motorists in public spaces in your jurisdiction. The following resources can be acquired through the Clearinghouse at no cost, while supplies last:

- The official National Work Zone Awareness Week *poster* (available after mid-March). The Iowa LTAP will also have a small supply of these posters. Contact Jim Hogan, LTAP librarian, 515-294-9481, hoganj@iastate.edu.
- Know the Signs *poster*. This poster illustrates the various work zone safety signs that drivers will encounter and is designed to look like a work zone sign.
- Know the Blind Spots *poster*. This poster illustrates the various hazards created by construction vehicles and is also designed to look like a work zone sign.

The Clearinghouse also provides free resources for worker training:

- Roadway Safety + CD (a Road Construction Industry Consortium Training Program). This program orients workers to common work zone hazards and simple prevention measures before they enter a job site. Materials include an instructor manual, trainee booklets in English and Spanish, and pamphlets in English and Spanish. This is an excellent course to provide now, before spring and summer road work begins.
- Know Flagging *poster*. This new poster illustrates best practices in flagging and is designed to look like a stop/slow panel. It can also be posted for public awareness.
- Basic Spanish for Safety and Emergencies *brochure*. This new brochure features translations for basic safety expressions.

Other resources for enhancing awareness of work zone safety issues—ribbons, wristbands, even a theme song on CD—are available at reasonable cost through the Clearinghouse. The website also provides information about activities being planned across the country for Work Zone Awareness Week.

Every week of the year

You don’t need to limit a work zone safety–awareness campaign to one week. In addition to the resources listed above, the Clearinghouse provides a wealth of work zone safety–related information: crash data, expert contacts, laws and regulations, standards and practices, research, safety products, training materials, and more.

For resources and information


In addition, the LTAP library has several work zone safety resources. Search the catalog, www.intrans.iastate.edu/ltap/library/search.cfm, or contact Jim Hogan, LTAP librarian, 515-294-9481, hoganj@iastate.edu.

Goodbye and hello!

Georgia Parham, long-time LTAP secretary, retired at the end of 2010. Georgia had a 22-year employment history at ISU. She came to InTrans (then the Center for Transportation Research and Education) in 1996. In recent years she assumed responsibilities for LTAP workshop registrations and logistics, and many readers will have met her at one or more events. She is missed here at InTrans.

Georgia’s LTAP activities are now being handled by Kris Angaran, a secretary at ISU since 2000 who joined InTrans in 2009. Kris now spends half her time assisting LTAP Director Keith Knapp with a variety of workshops and other LTAP-related activities. The other half of her time is dedicated to providing general InTrans support.

Kris made her LTAP debut at the September 2010 Snow Roadeo and SPOT workshops and is enjoying meeting local street and road employees.

“There’s no time to be bored with LTAP!” Kris says.
LTAP Materials

To make a change to the Technology News mail list or to order library materials, please complete the information below and mail or fax this page (including mail label) to the InTrans address below:

Institute for Transportation
2711 S. Loop Drive, Suite 4700
Ames, IA 50010-8664
Fax: 515.294.0467

☐ Add the name/address below to the Technology News mail list.
☐ Delete the name/address below from the Technology News mail list.
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