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**IOWA STATE UNIVERSITY**  
Institute for Transportation

## Bob Dingman leads the way in online leadership training program

by Bob Sperry, Leadership Institute coordinator



First Public Employees Leadership Institute graduates: l to r (top row) Bob Dingman, Douglas House, Scott Thomas; (bottom row) Ron Wiese, Mike Coughlon

The Public Employees Leadership Institute announces its first graduate, Robert J. (Bob) Dingman, operations supervisor with the City of West Des Moines. Congratulations, Bob!

On March 20, 2012, Dingman completed the last of 14 online courses offered by the Institute—a 100-hour leadership training program. He had this to say about his experience: "Participation in [Institute] courses keeps you current with new technology

and management practices and techniques . . . I had the opportunity to learn from the ideas and experiences of many different agencies."

Other Institute participants were right on Dingman's heels. By April 4, Douglas House of Moline, Illinois—the first out-of-state Institute graduate—had also completed the entire 14-course series, as had three additional West Des Moines employees—Scott Thomas, Ron Wiese, and Mike Coughlon.

*Institute continued on page 3*

## Acronyms and Abbreviations in *Technology News*

AASHTO	American Association of State Highway and Transportation Officials
APWA	American Public Works Association
FHWA	Federal Highway Administration
IHRB	Iowa Highway Research Board
InTrans	Institute for Transportation (at ISU)
Iowa DOT	Iowa Department of Transportation
ISU	Iowa State University
LTAP	Local Technical Assistance Program
MUTCD	Manual on Uniform Traffic Control Devices
NACE	National Association of County Engineers
TRB	Transportation Research Board



U.S. Department of Transportation  
Federal Highway Administration



Iowa Department  
of Transportation

### About LTAP

LTAP is a national program of the FHWA. Iowa LTAP, which produces *Technology News*, is financed by the FHWA and the Iowa DOT and administered by the Institute for Transportation at Iowa State University:

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## From the director: Planning, training, reporting



During the past quarter, the Iowa LTAP held its first strategic planning meeting. It was attended by representatives of the agencies and customers that support LTAP activities. The agenda included a summary of the LTAP mission, which helps guide all our activities. It also included an overview of the four general focus areas that the FHWA has asked LTAPs across the country to address through training, outreach, and/or technology transfer activities. Iowa LTAP already provides some type of outreach/extension activity in all four of these categories, which are

- Worker and workplace safety
- Highway safety (a heavy focus in recent years)
- Infrastructure management
- Workforce development

Participants in the meeting also addressed a series of "what if" questions dealing with subjects ranging from prioritization of training to LTAP advisory board activities. The group's responses to these questions will help provide long-term guidance for Iowa LTAP's year-to-year decision making.

Iowa LTAP completed several training activities leading up to the heavy road construction/maintenance season. We

- Conducted another successful year of Motor Grader Operator (MoGO) training. We are especially interested in how you think the new approach worked.

- Again assisted the Iowa DOT with training regarding the accessibility of sidewalks and curb ramps. More information on the design standards that now apply in Iowa can be found in both the Iowa DOT Design Manual and the Statewide Urban Design and Specifications (SUDAS) manual. For the first time, I'm told, the language in these two manuals is the same for a specific subject.
- Offered excavation safety training in two locations.
- Assisted with an asset management focus and feedback group.
- Helped advertise the availability of some crane operator training and a gravel roads academy.

Upcoming training will include Snow Plow Operator Training (SPOT) and the Snow Roadeo in September, along with our free fall safety series. We are working again with the Des Moines Area Community College (DMACC) to offer route surveying fundamentals at the Boone campus in September. We will also likely offer some additional accessibility training. Remember, we have quite a few on-demand offerings (just give us a call).

This issue of *Technology News* covers

- An important ruling that has revised language in the 2009 Manual on Uniform Traffic Control Devices (MUTCD), resulting in the elimination of many deadlines that were discussed in last year's training (page 4).
- Our first graduates from the Leadership Institute (cover story). This is big milestone, both for the program and for the people who have graduated. Congratulations.
- Geosynthetic reinforced soil (GRS) integrated bridge systems (IBS) (page 6). This was the subject of an FHWA Every Day Counts webinar in February in which Brian Keierleber from Buchanan County, Iowa, was a speaker.

Have a productive summer,

Keith

*Institute continued from page 1*

Upon completion, House wrote, “This is a fantastic online program that I would recommend to anyone at any level of public works supervision whether a public works director, manager, supervisor or crew leader. The Iowa State University Leadership Institute is well worth the time and is an excellent dollar value for communities with shrinking training budgets!”

### Picking up speed

Since the online-only Institute offered its first courses in late 2010, almost 500 public employees (about equally divided between cities and counties) have taken advantage of one or more of its courses. Although participants are primarily Iowans, several hail from other states, including Alabama, Colorado, and Illinois, and from Canada.

The Institute’s popularity seems to be spreading. In the first quarter of 2012 alone, more than 50 people registered for a course.

### Convenient, flexible, low-cost employee training

The Institute offers 14 online leadership training courses. Although the Institute was developed by Iowans for Iowa public employees, most course topics are appropriate for public and private employees in any state.

Participants can take one or a few courses, in any order, to gain or hone specific skills and knowledge. Or, like Dingman and other graduates, they can complete all 14 courses to enhance their overall leadership qualifications; there is no time limit to do so.

Either way, the Institute makes it possible for employees to access up-to-date, relevant, expert training for professional development and career advancement.

Each self-paced course is equivalent to a 6–8 hour face-to-face workshop. Participants have 90 days to complete a course.

Each course is presented in several short modules that can be accessed 24/7, in any order, and as often as desired during the 90 days. The course registration fee is \$75.

### Who can benefit

The Institute was specifically developed for motivated employees who



## Leadership Institute credentials

In July 2011 the Public Employees Leadership Institute was **accredited by the national American Public Works Association**. Development of the Institute (originally, the Academy) was funded by the Iowa Highway Research Board (TR-606). The Iowa LTAP developed the 14-course program with significant hands-on help from the Iowa chapter of the American Public Works Association as well as a core group of technical topic experts and an advisory committee representing Iowa city, county, and state transportation employees.

The online courses are offered through the Iowa State University Extension training website. The link is available from the Institute website, [www.intrans.iastate.edu/ltap/leadershipinstitute/](http://www.intrans.iastate.edu/ltap/leadershipinstitute/).

- Want to enhance their qualifications, either for their current position or for a more responsible one.
- Consider themselves as leaders and want to excel in that role.
- Have recently been promoted to a position with supervisory duties.
- Simply desire to improve their supervisory or management knowledge and skills.

If this sounds like you (or if you, as a supervisor, have a talented employee with leadership potential), check out the course offerings online and get started!

### Course format, presenters, and topics

The course format allows registrants to print and follow handouts while watching a series of short, online video presentations. Presenters are content experts and professionals with both field and classroom expertise. Their sharing of real-life experiences adds value to each course.

Course topics were carefully selected to help employees develop the core competencies needed by public works supervisors and leaders:

- 1 Supervisory Techniques and Skills
- 2 Team Development
- 3 Effective Communications
- 4 Leadership Skills
- 5 Customer/Community Relations
- 6 Legal Aspects
- 7 Fundamentals of Government
- 8 Finance
- 9 Resource Management
- 10 Operations and Maintenance
- 11 Basic Management
- 12 Emergency Management
- 13 Project Management
- 14 Winter Maintenance Management

### For more information

Could your organization benefit from some of the leadership training courses offered by the Public Employees Leadership Institute? Details, brochures, user comments, and registration instructions are on the Institute website, [www.intrans.iastate.edu/ltap/leadershipinstitute/](http://www.intrans.iastate.edu/ltap/leadershipinstitute/).

The Institute program coordinator is Bob Sperry, 515-294-7311, [rsperry@iastate.edu](mailto:rsperry@iastate.edu).

## 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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# Important revisions to 2009 Manual on Uniform Traffic Control Devices

by Tom McDonald, safety circuit rider, and Bob Sperry, local roads safety liaison

The approach of certain compliance dates in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD), particularly those related to minimum retroreflectivity of signs, has increased local agency interest, inquiries, and workshop attendance for the Iowa LTAP during the past year. Recently the FHWA published a brief statement describing two key revisions to the 2009 MUTCD. Following is a summary of these revisions and their implications for local agencies:

## Revision 1: Engineering studies and judgment

The first revision contains two parts. First, much of the language is restored from the 2003 MUTCD pertaining to the definition and application of engineering studies and judgment in selecting and applying traffic control devices on roads and streets.

The language in Section 1A.09 will now read as follows:

The decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment. Thus, while this Manual provides Standards, Guidance, and Options for design and applications of traffic control devices, this Manual should not be considered a substitute for engineering judgment. Engineering judgment should be exercised in the selection and application of traffic control devices, as well as in the location and design of roads and streets that the devices complement.

The second part of the first revision modifies Section 1A.13 by **eliminating** the following sentence from the definition of Standard:

Standard statements shall not be modified or compromised based on engineering judgment or engineering study.

## Revision 2: Compliance dates

The second and more significant revision eliminates 46 compliance dates from the 2009 MUTCD, including several dates related to minimum retroreflectivity standards for signs.

After eliminating the 46 dates, several compliance dates remain and are listed the revised Table I-2 of the 2009 MUTCD (<http://mutcd.fhwa.dot.gov/index.htm>). These compliance dates and related sections of the MUTCD are listed and summarized in the table on the following page.

## Agency responsibilities

Remember, only certain compliance dates have been eliminated. **The standards to which those dates applied remain in effect.** Therefore, all future sign replacements must be made according to the new standards.

Page I-3 of the Introduction to the 2009 MUTCD describes upgrade requirements when no compliance date exists. Briefly, whenever a device is replaced due to serviceability, or as part of a federal-aid road improvement project, or as part of a regular general upgrading effort, the replacement must comply with current standards. There are few exceptions.

## For more information

The Iowa LTAP staff can answer questions about these changes to the 2009 MUTCD.

Contact LTAP Director Keith Knapp, Tom McDonald, or Bob Sperry, 515-294-8103, kknapp@iastate.edu, tmcdonal@iastate.edu, or rsperry@iastate.edu.

*MUTCD continued on facing page*

MUTCD continued from previous page

## Remaining 2009 MUTCD Compliance Dates (from MUTCD Table I-2)

- December 31, 2011** . . . . . New **worker safety considerations** for highway ROW workers, flaggers, and adult crossing guards, which involve the wearing of high visibility (ANSI Class 2) apparel were to have been in compliance by December 31, 2011. Most agencies have already upgraded to this type of apparel.  
(See Sections 6D.03, 6E.02, and 7D.04)
- January 17, 2013** . . . . . **Crashworthy sign supports** must be used on roadways with speed limits equal to or greater than 50 mph by January 17, 2013.  
(See Section 2A.19)
- June 13, 2014** . . . . . All local agencies must now have an **assessment or management method for maintaining the retroreflectivity of all of their warning and regulatory signs** adopted and in use no later than June 13, 2014 (two years after the new rule's effective date).  
(See Section 2A.08)
- December 31, 2014** . . . . . Very few local agencies have **left-hand exits** within their road systems, so the changes to 2E.31–36 will have minimal effect. The compliance date for these changes is December 31, 2014.  
(See Sections 2E.31, 2E.33, and 2E.36)
- June 13, 2017** . . . . . New signal requirements for **yellow change and red clearance intervals** must be in compliance by either June 13, 2017, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first.  
(See Section 4D.26)
- June 13, 2017** . . . . . New requirements for **pedestrian intervals and signal phases** must be implemented by June 13, 2017, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first.  
(See Section 4E.06)
- December 31, 2019** . . . . . The changes to the **number and locations of one-way signs** will affect very few local agencies, but may be applicable in some cities. Compliance with this change must occur by December 31, 2019.  
(See Section 2B.40)
- December 31, 2019** . . . . . The revised use and spacing of **many horizontal alignment signs and plaques, including chevrons**, must be in compliance by December 31, 2019.  
(See Sections 2C.06–2C.14)
- December 31, 2019** . . . . . The new requirement for **retroreflective strips** (front and back) on the **crossbuck sign support** at all rail crossings has a compliance date of December 31, 2019.  
(See Sections 8B.03 and 8B.04)
- December 31, 2019** . . . . . The new requirement for a **stop (or yield) sign** to be present at each **passive rail crossing** (either on the crossbuck sign support or a separate one) has a compliance date of December 31, 2019. Note that placement of a stop sign requires an engineering study and must be deemed appropriate for a particular approach.  
(See Section 8B.04)

# FHWA's "bridge of the future": As easy as 1-2-3

Jurisdictions in several states are using a "radically simple" accelerated bridge construction system that is especially effective for small, single-span bridges (less than 140 ft (42.5 m)). The geosynthetic reinforced soil (GRS) integrated bridge system (IBS)

- Eliminates many of the elements of a traditional bridge, including the approach slab, sleeper slab, bridge bearings, and parapets.
- Typically reduces construction time and costs by 25 to 60 percent.
- Is easy to build and maintain because of fewer parts.
- Is a flexible design that can accommodate all soil types (even unsuitable soils), utilities, and proximity to structures.
- Is appropriate for both steel and concrete superstructures.

## Unique design and construction process

Instead of installing a deep foundation with reinforced concrete piers, a GRS-IBS involves quickly building a shallow, economical reinforced soil foundation by alternately layering compacted granular fill material and fabric sheets of geotextile reinforcement.

There are three general steps to the "stack and compact" process:

1. First, builders lay a level row of facing blocks.
2. Second, they add a layer of fill (soil, etc.) compacted to the height of the facing blocks (8 in.).
3. Next, they add a layer of geosynthetic fabric.

The process is repeated over and over until the desired height is achieved.

This low-tech approach continues as the bridge is placed directly on the GRS abutment mass. A GRS approach-way is then built behind the bridge beams to transition the bridge to the approaching roadway.

## Benefits

No joint or cast-in-place concrete is needed. The bridge extends naturally out of the roadway.

A GRS-IBS is built in days or weeks, not months. There is no need to wait for cast-in-place concrete to dry; the substructure is immediately ready for the bridge.

A large, experienced crew is not necessary. A typical crew consists of laborers and an equipment operator.

In addition to a track hoe excavator and a walk-behind vibratory plate tamper, workers need only readily available tools like hand tools and measuring devices.

Weather is rarely a problem, since this type of construction can occur in variable conditions. And fewer delays mean faster completion.

The technology is environmentally sensitive and results in minimal environmental impacts. The construction footprint is reduced since no deep foundation is needed. Construction can be adapted to fit the environmental needs of a variety of applications.

Workers also benefit. Because the abutments are built from the inside out, personnel are less exposed to potential roadside hazards. And simpler construction generally means fewer accidents.

Shorter construction time also means shorter travel disruptions and lane closures. Typically, fewer lanes need to be closed.

Jointless construction is a noticeable side benefit to travelers. A smooth transition from the bridge onto the roadway alleviates the "bump at the bridge" caused by uneven settlement of the bridge and approaching roadway.

GRS-IBS is strong and durable. A recent full scale shake table experiment showed that a GRS abutment structure can withstand a 1.0 g earthquake acceleration.

The clean, simple design of GRS IBS is modern and attractive.

## Iowa experience

Two years ago Brian Keierleber, Buchanan County Engineer, used a modified approach to constructing GRS bridge abutments for the 72-ft long Hoods Bridge on the 1900 block of Olympic Avenue (Independence, IA).

"My crew doesn't have a lot of experience laying block," Keierleber says, "but I have excellent equipment operators. So I adapted the system a little to work with what we have."

The Hoods Bridge abutments were constructed with a "curtain wall" of wrapped layers of compacted geotechnical material, reinforced by riprap and tied under the structure with concrete. The deck superstructure was constructed with tied rail cars. See the photos on the facing page.

Tests on the bridge have revealed good performance in general, with slightly low safety factors for the geosynthetic fabric. On future projects, Keierleber plans to upgrade the fabric and, to accommodate the FHWA's new design guide released since the Hoods Bridge was constructed, add drainage systems behind the abutments, and achieve a higher universal global slide factor for the riprap.

This summer Buchanan County is constructing a bridge using compacted concrete instead of the riprap on the abutments.

## For more information

Information in this article was primarily derived from the following resources:

- The FHWA's Every Day Counts website, [www.fhwa.dot.gov/everydaycounts/technology/grs\\_ibs/](http://www.fhwa.dot.gov/everydaycounts/technology/grs_ibs/).
- A detailed, viewer-friendly video and a new FHWA publication, *Geosynthetic Reinforced Soil Integrated Bridge System Interim Implementation Guide*, [www.fhwa.dot.gov/publications/research/infrastructure/structures/11026/index.cfm](http://www.fhwa.dot.gov/publications/research/infrastructure/structures/11026/index.cfm).

To learn more about Buchanan County's experience, contact Brian Keierleber, 319-440-0268, [engineer@co.buchanan.ia.us](mailto:engineer@co.buchanan.ia.us).

# Conference calendar

## August 2012

16	FHWA Every Day Counts-Exchange: "Adaptive Signal Control Technology"	Ames (webinar)	Keith Knapp 515-294-8817 kknapp@iastate.edu
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## September 2012

11–12	Snow Plow Operators Training (SPOT)	Des Moines	Judy Thomas 515-294-1866 jathomas@iastate.edu
12–14	Route Surveying Fundamentals	DMACC, Boone	Kelli Bennett 515-433-5230
13	Equipment Roadeo	Des Moines	Judy Thomas 515-294-41866 jathomas@iastate.edu
25–27	Iowa Streets and Roads Workshop and Annual Conference	Ames	Beth Richards 515-294-2869 brich@iastate.edu

# Online calendar

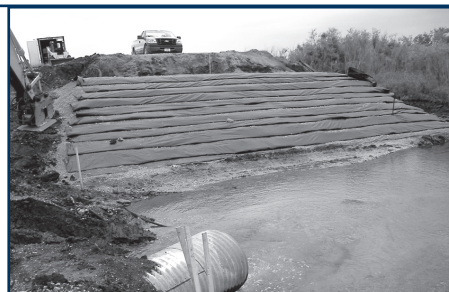
LTAP has updated and redesigned its online calendar of workshops. Information and registration details about transportation-related training events sponsored by LTAP, InTrans, or other organizations are available on this site.

Stay up to date on upcoming events, [www.intrans.iastate.edu/mors/calendar/](http://www.intrans.iastate.edu/mors/calendar/).

1-2-3 (photos) continued from previous page



Starting with two layers as a curtain wall



Completed lifts on one side



Compacting 8-in. lifts  
(Note: Pilings are vibrated in)



Adding riprap



Leveling and compacting



Completed Hoods Bridge, Buchanan County  
(Note the concrete-covered riprap under the bridge)

The photos at left, provided by Buchanan County Engineer Brian Kieirleber, show the progression of GRS bridge abutment construction on Hoods Bridge in Buchanan County. This is a modified approach to the FHWA's GRS-IBS design guidelines, which are based on projects like the Scott Road Bridge in Defiance County, Ohio, shown in the photo immediately below. Note the concrete block in the Ohio bridge abutments. (Photo courtesy of the FHWA's Every Day Counts program.).



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