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IOWA STATE UNIVERSITY
Institute for Transportation

Iowa LTAP study yields publication on traffic sign effectiveness

The safety and operational impacts of traffic signs can now be found in one publication recently produced by the Iowa LTAP.

The *Sign Effectiveness Guide* is a compilation and critical review of 48 research documents focusing on potential impacts of 11 static or enhanced signs commonly used by local jurisdictions.

David Veneziano, LTAP safety circuit rider, and Keith Knapp, Iowa LTAP director, led the research. They said transportation professionals can use the guide, along with the MUTCD, to better understand whether a particular sign can be expected to impact safety or operations.

It also can help agencies to better manage their signing budgets.

“Signing represents a significant investment for all government agencies,” said Veneziano, “and it has become even more significant with the requirement to implement an assessment and management plan for the maintenance of minimum sign retroreflectivity.”

The researchers collected and reviewed information on sign effectiveness, including the purpose of each sign; relevant information

from the MUTCD; potential safety, operational, and behavioral impacts identified by past research; and alternatives to signage, such as increased enforcement or pavement markings.

Some of the signs studied in the research were Stop, Yield, Speed Limit, Children at Play, Playground, Ice Warning, Deer Crossing, and enhanced signs, such as a stop sign equipped with a flashing beacon. The researchers also looked at some warning systems, including Prepare To Stop When Flashing signs and horizontal alignment signs, such as curve warning, chevrons, and advisory speed plaques.

They assigned reliability ratings of Low, Medium, or High to the research results, focusing on the potential safety or operational impacts of the signs and warning systems. Thirty-three of the results were rated Medium or High.

Veneziano and Knapp learned that few studies of the safety and operational impacts of basic traffic signs exist even though traffic signs are everywhere along America's roadways. “That's why it was important for us to rate the research

Sign effectiveness page 3



Stop and Deer Crossing signs were two of a number of signs investigated by Iowa LTAP researchers.

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



About LTAP

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From the director: Building a Better Iowa Mousetrap

“Build a Better Mousetrap” is a statement often used when discussing actions connected to innovation, specifically innovative solutions to everyday problems. The idea being, of course, that a person that builds a better mousetrap will have people beating down their door to purchase or use it. Many LTAPs across the country host their own annual Build a Better Mousetrap Competition, and, at some point, we had one here in Iowa too. But more recently, we've been doing this type of competition as part of the Streets and Roads Conference every September, and last year, we entered the winner into the National Competition. This competition receives a large number of entries with a wide range of innovations. They are judged by LTAP staff from across the United States, and winners are announced at the National LTAP/TTAP Conference. Some of the entries are “gadgets” (e.g., hardware or software) and others focus on changes to processes that make our jobs easier. They all are intended to “...increase safety, reduce cost, improve efficiency, and improve the quality of transportation.”

Local agencies in Iowa are continually innovating how they get the job done. These innovations can be small or large. The Iowa LTAP will be re-introducing a Statewide Build a Better Mousetrap Competition sometime this year (probably in the fall). This competition will give local agencies a chance to get some recognition for their ideas. I have found that innovation is actually happening all the time, but, more often than not, we don't know that what we're doing is “innovative.” Often times, I've heard people say that their idea “is just something we did to get

the job done easier, safer, or more efficiently” or that “everyone can or is doing this,” which isn't always true. Plus, the great Iowa characteristic of not “tooting our own horn” kind of gets in the way. But, these are the type of efforts we want to hear about for this competition, and recognition is a good thing. Plus, it may be of great value to others too! When in doubt, please put an application together and see what happens. The applications will include an indication of the problem, a discussion of the solution, costs and materials used, and some of the savings/benefits that occurred. Photographs, if that makes sense, are also really informative.

This year we are also working to develop workshops about self-cleaning culverts along with a Local Bridge Innovation Day. These are either being planned or close to being planned. In addition, we had our Bridge Inspection Refresher Training in late February. Some other traditional trainings occurring in the coming months include the Iowa DOT Culvert and Bridge Backwater Program Workshop in late March and several courses in four-lane undivided and three-lane roadway conversion. Also, motor grader operator (MoGO) and curb ramp design training will again be offered in May.

Lastly, congratulations to Paul Albritton, our technical training coordinator. Paul just got authorized to teach Occupational Safety and Health Administration (OSHA) classes.

Have a good and safe construction season. ■

Keith

Sign effectiveness from page 1

projects,” said Veneziano. He explained that their research gives a sense of the how reliable each study was, based on factors such as sample size, site diversity, and statistical analysis approach.

Results of many existing studies are good, said Veneziano, yet traffic professionals must be cautious how they apply them. “Research results from a study in a rural area may not be applicable in an urban area.”

Knapp added that the lack of documented research on a sign’s safety or operational effectiveness does not mean it is ineffective. “Many static and enhanced signs are currently being studied, and it is expected that many more will be, particularly with the relatively new driver behavior databases being created.”

In addition to their safety and operational effects, said Veneziano, signs

produce other driver behavioral changes and impacts that are not as easy to measure.

“These could be changes in decision-making, acknowledgment of the additional and expected notification of a hazard, and general increase or heightened awareness of a specific regulation or hazard. They are all essential to the safety and operations of the transportation system.”

The IHRB and Iowa DOT funded this study.

More information

The full *Sign Effectiveness Guide* is available at www.intrans.iastate.edu/research/documents/research-reports/sign_effectiveness_guide_w_cvr.pdf. ■

Safety items available for checkout through Equipment Loan Program

The goal of the Iowa LTAP is to continually provide technical and management assistance to Iowa’s many local agencies. One opportunity that you may not be aware of is the Equipment Loan Program, which offers these agencies free services/equipment.

Safety Circuit Rider David Veneziano currently has two types of safety-related equipment available for checkout through the program: a retroreflectometer and digital ball bank indicators.

Retroreflectometer

The retroreflectometer gun can measure sign retroreflectivity to meet MUTCD requirements. It can be checked out for brief periods of two to four weeks. Alternatively, interested agencies can contact Veneziano directly and schedule a time for him to visit their location and measure the retroreflectivity of signs in the shop or in the field.

Digital ball bank indicators

A ball bank indicator measures the overturning force (side friction), in degrees, of a vehicle traveling through a horizontal curve. The digital ball bank works by collecting and recording this data electronically as a vehicle passes through a curve. Data is collected for multiple passes through a

curve in each direction at a consistent speed (set via cruise control). A maximum and minimum degree of ball bank is reported by the device and the larger of these values is recorded for each run in both directions. After multiple runs through a curve, an average ball bank value for each direction of travel can be calculated and used to determine the appropriate advisory speed for the curve. MUTCD Section 2C.08, for example, provides support for advisory speeds based on the degree of ball bank that has been measured.

Local agencies are encouraged to use the digital ball banks if they have curves where advisory speeds are not posted or to check the appropriateness of existing, posted advisory speeds.

The Iowa LTAP currently has two Reiker RSD-BB-09 digital ball banks available for agencies to use.

Contact

As a note, upon checkout, all equipment will come with instructions and/or a device manual. Contact David Veneziano at dvenez@iastate.edu or 515-294-5480. ■



The Iowa LTAP has two digital ball bank indicators (left) and one retroreflectometer (right) available for checkout through the Equipment Loan Program.

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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Meet John Shaw, Iowa LTAP Local Roads Safety Liaison

John Shaw assumes a position once held by Tom Stoner and his predecessor Bob Sperry.

Since a substantial portion of Iowa's fatal and serious injury crashes occur on the secondary road system, Shaw, as the new Local Roads Safety Liaison with the Iowa LTAP, will be assisting county and municipal engineers from throughout the state to identify problem locations and implement appropriate solutions.

"Some of this involves looking at places with a history of serious crashes, but I'm hopeful that we can find cost-effective ways to address high-risk situations before casualties occur," said Shaw.

Background

Shaw joined InTrans in early January 2017, but has been working on various aspects of transportation safety since the 1990s. His first role after college was developing a series of incident management procedures for the automated trains that connect the terminals at the O'Hare International Airport in Chicago, Illinois.

Once the O'Hare project was completed, he joined the Wisconsin DOT, where he worked for 18 years in the areas of Planning and Operations. One of his early roles was to assist county and municipal officials in the Milwaukee area to obtain funding for highway improvements, including highway safety improvements. Later, he oversaw a team responsible for the collection and analysis of traffic and safety data and managed the development of a set of traffic simulation models used to guide design decisions for freeways in the Milwaukee, Madison, Fox Cities, and Green Bay areas.

His career then brought him to the University of Wisconsin–Madison, where he has been working on a series of work zone safety design guides and training materials for the past five years.

A look into the future

Shaw may be new to InTrans but not to the work produced by its centers and programs.



John Shaw, Local Roads Safety Liaison

"In my previous work I've made use of a number of Iowa LTAP research products and publications, so I was aware that it's one of the leading centers of its kind. In fact, that's true for the entire group of InTrans centers, and I'm excited to be able to work with such a strong team."

Besides his work for the Iowa LTAP, Shaw will hold a joint appointment with the Center for Transportation Research and Education at InTrans, performing work zone safety research.

Shaw looks forward to making safety a priority.

"What attracted me most about this position was the opportunity to work with engineers and other public officials at the local level to make a real difference in the health and safety of the public."

Shaw commented that if Iowa wants to get closer to zero deaths and zero serious injuries, we'll have to address both the mundane incidents as well as the salacious ones.

"To prevent casualties, we consistently need safe cars operated at safe speeds by safe drivers on safe roads. That can only happen through people working together. The way I see it, county and municipal engineers are the recognized experts on the secondary roadway system, and I hope I'll be able to support their pivotal role in guiding solutions to the safety problems in their jurisdictions."

Contact

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Engaging the employee base

By Bret Hodne, Public Works Director, City of West Des Moines, Iowa

“Let people fail.”

To begin this story, I want you to know that I have been a member of the West Des Moines Public Works Department for over 27 years. I began my career in 1989 as an equipment operator and today have the responsibility of being the Public Works Director. During this period of time, I have had the opportunity to witness and be a part of many changes within our organization. Some were good, others were just plain “challenging” to say the least. But the one thing I can tell you for certain is that change can be extremely difficult for a whole lot of people.

One of the major changes I have experienced over the course of my career is the cultural shift of delegating higher levels of responsibility to all levels of our city organization. To say it was somewhat of a daunting task would be a huge understatement.

In the earlier part of my career, like many other public organizations, the core managerial style of many of our city leaders could have been considered “para-military.” In other words, it was the “do as you’re told and follow orders” philosophy. Not to get too far off track, but that memory brings me back to a time when I was a new employee who thought I had a good idea to improve a work process in my department. When I approached my supervisor with the idea, I was told, “You get paid to do what you’re told, not to think.” Imagine how “engaged” that made me feel—my new reality was “so much for promoting any ideas for process improvement in this city.”

The world of management and leadership is changing rapidly in our profession. Go

sit through some education sessions at the APWA PWX, North American Snow Conference, or some of your chapter events, and you will quickly find out that many of the typical challenges most managers deal with are personnel-related in nature. Whether the issue is succession planning, generational gaps, or maybe labor relations, the work environment is changing quickly. And by the way, the old stand-by option of “burying your head in the sand” is probably not going to get you anywhere with this one, as the problem is not going away anytime soon.

So, as a manager of staff who wants to implement some changes in an organization, what are some things you might want to consider?

I will give you a few suggestions and some of my personal experiences.

1. **Attempt to involve your employees in decisions where you feel it would be appropriate.** That does not mean that they need to be involved with “every” decision, just those that may impact them directly and they may be able to assume some ownership. Here is a real-life example: We were changing our field staff work hours and moving toward a 10-hour summer schedule. Wearing my “engaging employee’s hat,” I told them we could have some flexibility in their work hours and that I would leave it up to the work group to decide. Giving the employees the flexibility of making that decision led to increased productivity and enhanced job satisfaction.

2. **Learn from other agencies’ successes and challenges.** Every organization is unique in one way or another; however, there are tremendous opportunities to network with others in our profession. Reach out to others in our industry and see what stories and ideas they may have to share.

3. **Let people fail.** That’s right, I will repeat that statement again: Let employees have the opportunity to fail. If you don’t instill in your employees the ability to try new ideas and “push it to the next level,” your organization will become stale and a breeding ground for the “we have always done it that way” mentality.

4. **Look for the “diamond in the rough.”** In other words, look for the hidden abilities that many of your staff may possess that may take some encouragement, mentoring, and refining to develop. Also, look for those hidden “leaders.” This is the staff member who may possess many qualities and attributes to take the organization to “new heights.” Leadership does not always simply mean becoming a manager, it can also mean leading a group of your peers in the right direction.

5. **Last but not least, figure out whose back you want the monkey on.** To me, this simply means “who” do you want to take responsibility for the various decisions that need to be made in your organization? For many decisions, the monkey may need to stay on your back, but for many others you may be able to delegate them to the staff members that will be impacted and be able to take ownership in them. ■

5 Questions with Travis Hosteng concerning the National Center for Wood Transportation Structures

1. *First off, how did you get involved with the NCWTS? What's your role?*

My current role is as the Center's director, which entails managing and supervising timber research projects, maintaining a website with a mission of supporting all timber-related research and technology transfer, and fielding questions from university, industry, and private sectors related to timber bridge research and/or construction. My involvement in the Center truly began when I was in graduate school here at ISU, working on my research under the then-director Dr. Terry Wipf. That work, and the subsequent timber bridge research that followed, put me on this path to becoming the director nearly a decade later, a role I've served now for over two years.

2. *Can you tell me a little about its history and purpose? How did the NCWTS become what it is today?*

The history of the Center goes back to 1988 when Congress passed the Timber Bridge Initiative, establishing a national program to provide effective and efficient utilization of wood as a structural material for highway bridges with three primary designated program areas: demonstration bridges, technology transfer, and research. In 1992, FHWA became a partner in the program following the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. In 2004, when funding ended for the program, the Forest Products Laboratory (FPL) moved to partner with ISU (together they had over 25 years of cooperative research in the area of timber bridges) and the National Parks Service (NPS) to fill the voids in research, education, and technical assistance to government agencies, industry, and research institutions.

Today, the Center directly conducts approximately \$200,000 to \$300,000 worth of research annually, often in cooperation with government agencies, universities, and private industry. This research is directed towards meeting the needs of an aging and deteriorating bridge inventory as well as developing ways to efficiently utilize a naturally sustainable forest resource.

3. *Any particularly interesting research projects currently being done?*

One in particular comes to mind: This past summer, we finished a cooperative project involving ISU, NCWTS, FPL, FHWA, and Buchanan County, Iowa. This project involved the design, construction, and monitoring of a glulam girder bridge on geosynthetic reinforced soil (GRS) abutments. A live webcam view of the bridge can be found on the NCWTS website at www.woodcenter.org/bec_cam/. The bridge is 52 ft long, 30 ft wide, and designed to HL93 standards. A large sensor array, somewhere around 80 to 100 sensors ranging from strain, tilt, moisture content, temperature, bearing load, etc., feeds continuous information related to the performance and condition of the bridge to a fully autonomous monitoring system that collects the data and sends it wirelessly to our office server where it is processed, analyzed, and then the results are outputted 24/7/365.

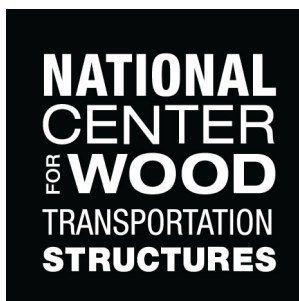
4. *How does work being done at the NCWTS impact local agencies in Iowa?*

There are a few ways our work impacts local agencies, one of the more important currently is developing and distributing information related to cost-effective timber bridge alternatives to assist counties in meeting the

demands of their aging infrastructure with limited budgets. In addition, I see a future for timber bridges in the realm of rapid, safe, high quality control (QC) bridge replacement or accelerated bridge construction (ABC). That means not just replacing obsolete bridges with timber bridges, but replacing them with engineered structures with construction being done in a controlled setting and a down time from road closure to road open of less than a week. This is already being done on larger high-profile state projects around the nation, and I think local agencies have much to gain by adapting this "technology" to their sector.

5. *What are the biggest challenges you are seeing in the area of wood transportation structures?*

Perception and lack of education. Number one, ask anyone about timber bridges and they'll either describe the bridges of Madison County, Iowa, or a solid-sawn structure they once drove across. But ask a county engineer the same question, and deteriorating timber piles will likely be one of their biggest issues. These perceptions—that timber is outdated, rots over time, and is stick built—don't accurately describe current timber products and timber bridges being built today in 2017. Demonstration projects, such as those completed by the NCWTS in recent years, have brought to light engineered glued-laminated timber bridge technologies. Furthermore, other projects are supporting their use via inspections documenting their performance over time and speaking to their sustainability. ■



Conference calendar

Date	Event Name	Location	Contact
April 2017			
19-20	Governor's Traffic Safety Bureau (GTSB) Conference	Altoona	Theresa Litteral
23-36	North American Snow Conference	Des Moines	Beth Richards
May 2017			
2	Motor Grader Operator Training	Tripoli	Paul Albritton
9	Motor Grader Operator Training	Storm Lake	Paul Albritton
16	Motor Grader Operator Training	Ames	Paul Albritton
23	Motor Grader Operator Training	Atlantic	Paul Albritton
31	Motor Grader Operator Training	Sigourney	Paul Albritton

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Event details and online registration

Watch for details and online registration information, by specific dates and events, on the Iowa LTAP Workshops page, www.iowaltap.iastate.edu/workshops/ltap-workshops/. ■

Iowa LTAP Tech Corner—FEMA mobile app

What is it?

The Federal Emergency Management Agency (FEMA) mobile app is a “one-stop-shop” with tools and tips to keep you safe before, during, and after disasters. By providing up-to-date weather-related alerts from the U.S. National Weather Service, this app helps keep you prepared for what's literally over the horizon, with information on over 20 types of hazards, including floods, hurricanes, tornadoes, and earthquakes for up to five locations at once.

How does it work?

The FEMA mobile app includes a variety of important and useful features:

1. Receive severe weather alerts for up to five locations across the U.S. and see information about how to stay safe
2. Upload and share photos of damage and recovery efforts to help first responders
3. Locate and receive driving directions to open shelters and disaster recovery centers
4. Save a custom list of the items in your emergency kit, as well as the places you will meet others in case of an emergency

Currently, the app is available for Apple, Android, and Blackberry mobile devices.

Where can I get it?

Use the QR code here or visit Google Play (search for “FEMA”) to download the free app today. Visit the FEMA website at www.fema.gov/mobile-app to learn more about the app. ■



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