Technology NEWS
January–February 2010
Iowa LTAP
Local Technical Assistance Program
Providing transportation technology transfer for Iowa's cities and counties

Inside this issue

IOWA STATE UNIVERSITY
Institute for Transportation

Resources for local roads safety improvements

Generally, one-half or more of all serious crashes in Iowa—those resulting in fatalities and major injuries—occur on city- or county-owned roadways.

Iowa's local (city- and county-owned) streets and roads experience lower traffic volumes compared to Iowa DOT-owned roadways, but local streets and roads comprise a much larger share (approximately 90 percent) of Iowa's overall road network (approximately 110,000 miles total). This accounts, at least in part, for the nearly equal crash potential on Iowa's locally owned and state-owned roadways.

In spite of the near parity in serious crashes, however, Iowa's local agencies receive less direct funding for safety investments compared to the Iowa DOT. This situation is true in many states.

The current federal highway funding legislation, SAFETEA-LU, does include a program designated specifically for rural roads, the High Risk Rural Roads Program (HRRR), but in many states this funding is applied only to state-owned roads.

Recognizing the funding disparity, the Iowa DOT is one of several state DOTs that have initiated programs to help local agencies identify and address safety needs on rural roads and urban streets. The State of Iowa has invested funding and developed programs to assist and train agencies, both engineering and law enforcement, in improving safety on local roads and streets.

Crash database

The backbone of this effort is a detailed, statewide crash database. Developing and finetuning Iowa's crash database has been an ongoing priority effort for the Iowa DOT for several years. The database contains records of crashes on all roads and streets in the state. Every year, crash data from the five most recent years, along with analysis software programs and training, are provided to local agencies at no cost. A website developed by the Iowa DOT provides current crash summaries in both tabular and spatial (map) displays; see the figure.

Traffic Safety Fund initiatives

Perhaps unique to Iowa, the state Code provides that one-half of one percent of the annual road use tax fund must be dedicated to roadway safety programs and improvements. This half-percent funding, known as the Traffic Safety Fund, totals approximately $4–5 million per year, much of which is directed to local agency programs, improvements, and research by the Iowa DOT through the Office of Traffic and Safety.

Traffic Safety Improvement Program (TSIP). The TSIP is the major Traffic Safety Fund initiative. This program awards annual funding in three categories: site-specific improvements, traffic control devices, and research and public information, with a significant percentage awarded annually to local agencies.

ITSDS. Jurisdiction-specific crash analysis and advice are furnished to local agencies on request through the Iowa Traffic Safety Data Service (ITSDS), a research and data analysis center provided by InTrans at ISU, the Iowa DOT through the Traffic Safety Fund, and the Iowa Governor's Traffic Safety Bureau (GTSB).

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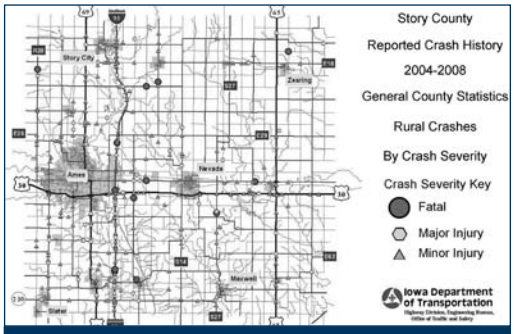

Sample spatial data display

Acronyms in *Technology News*

AASHTO	American Association of State Highway and Transportation Officials
APWA	American Public Works Association
CTRE	Center for Transportation Research and Education
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

LTAP is a national program of the FHWA. Iowa LTAP, which produces this newsletter, is financed by the FHWA and the Iowa DOT and administered by the Institute for Transportation.

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Resources continued from page 1

Small Town Sign Replacement Program. This initiative furnishes sign upgrades to small communities with population of 5,000 or less, on an as-needed basis.

Iowa LTAP safety circuit rider and local safety liaison. The Traffic Safety Fund, along with the Iowa GTSB, partially supports the safety circuit rider and local safety liaison positions through the Iowa Local Technical Assistance Program (LTAP). These two registered engineers —Tom McDonald and Bob Sperry, respectively—work primarily with local agencies to provide information, training, and assistance in addressing safety concerns.

For example, McDonald or Sperry performs road safety audits for local agencies on request. They develop and present safety-related workshops on selected topics such as work zone safety, flagger training, intersection safety, older driver design issues, and integrating safety into rehabilitation, restoration, and resurfacing (3R) projects. Local agencies can participate in these workshops at no or very low cost.

Other Iowa DOT programs

Other Iowa DOT cost-sharing programs and engineering services include the following:

- Traffic Engineering Assistance Program (TEAP), for cities and counties without a traffic engineer (although all cities and counties are eligible for roundabouts engineering assistance)
- County-State Traffic Engineering Program (C-STEP); Urban-State Traffic Engineering Program (U-STEP)
- Pedestrian Curb Ramp Construction Program

Details can be found on the related websites listed below.

Federal funding

The Iowa DOT also administers federal HRRR and Safe Routes to School (SRTS) programs for Iowa's local agencies. Details can be found on the related websites listed below.

For more information

To learn how Iowa and nine other states allocate safety resources to local agencies, see the 2009 report *Support by State Departments of Transportation for Local Agency Safety Initiatives,* compiled by Tom McDonald, Iowa LTAP's safety circuit rider, www.intrans.iastate.edu/research/detail.cfm?projectID=1249316917.

For details and contact information for the programs listed in this article, see the following websites:

- **Statewide crash data**, www.iowadot.gov/crashanalysis/data.htm
- **Crash data requests**, www.iowadot.gov/crashanalysis/crashdatarequests.htm
- **Iowa Traffic Safety Data Service**, online requests accepted **any time**, www.ctre.iastate.edu/itsds/index.htm
- **TSIP**, applications accepted by the Office of Traffic and Safety **through early June**, www.iowadot.gov/tsip.htm
- **Small Town Sign Replacement Program**, applications being accepted **now**, www.iowadot.gov/traffic/smalltownsign.htm
- **Iowa LTAP** safety circuit rider and safety liaison, www.intrans.iastate.edu/ltap/safety.htm
- **TEAP**, applications accepted by district engineers **any time**, www.iowadot.gov/traffic/teap.html.
- **C-STEP**, applications accepted by district engineers **any time**, www.iowadot.gov/fundguid.htm (click on Iowa DOT Funding Guide; go to page 35)
- **U-STEP**, applications accepted by district engineers **any time**, www.iowadot.gov/fundguid.htm (click on Iowa DOT Funding Guide; go to page 38)
- **Pedestrian Curb Ramp Construction Program**, letters of request accepted by district engineers **any time**, www.iowadot.gov/fundguid.htm (click on Iowa DOT Funding Guide; go to page 41)
- **High Risk Rural Roads Program**, applications accepted every **January** in the Iowa DOT's Office of Local Systems, www.iowadot.gov/local_systems/programs/hrrr.htm
- **Safe Routes to School**, applications accepted in **early fall** in the Iowa DOT's Office of Local Systems, www.iowadot.gov/saferoutes/index.htm ■

Winning solutions to common problems

You can do it, too!

- Build a convenient, environmentally friendly, temporary storage system for waste diesel fuel and/or tack oil.
- Add a simple magnet system to maintenance equipment to remove metal debris from granular road surfaces during routine operations.
- Build and install a durable culvert inlet that is easy to maintain and resists clogging.

These innovations—developed by local agencies in Colorado—won third, second, and first prizes, respectively, in FHWA's 2009 Build a Better Mousetrap competition for LTAPs and T(Tribal)TAPs.

Temporary waste oil and diesel storage system

Problem

Need a clean, environmentally safe location, other than the ground, parking lot, or roadway, to empty diesel fuel/tack oil residue from spray bars on oil distributor trucks and tack oil tanks after paving or chip seal operations.

Solution

A 20-ft section of culvert, cut in half lengthwise, is placed in a metal frame, with hinged steel plates for covers that can be closed when the system is not in use.

The lid of a 55-gal drum is cut in half, and each half is used to seal one end of the cut culvert.

The frame and culvert are elevated at one end. At the lower end of the frame and culvert, a nipple is threaded to the bung of the 55-gal drum lid and attached to a 300-gal tank with a 2.5-in. suction hose.

To use the system, a distributor truck backs up to the culvert and empties the spray bars into it, as shown in Figure 1. The used diesel/tack flows from the culvert into the tank. When the tank is full, a waste-oil company picks it up.

In addition, an approach ramp and added containment for the holding tank can be constructed for approximately $1,500.

Labor and equipment (about $920)

Two employees (including one with welding experience): one day
Hand tools
Welder
Front loader

Materials (about $845)

20 ft of 24-in. diameter culvert
Steel for frame and covers
2.5-in. suction hose
300-gal plastic tank
Miscellaneous parts (screws, caulk, etc.)

Figure 1. Distributor truck spray bars being emptied

Magnet system for picking up granular road debris

Problem

Flat tires on motorists' vehicles caused by nails, wires, screws, staples, and other small metal debris on gravel road surfaces.

Solution

District 3, Colorado, crew members devised an automatic, trouble-free magnet system.

When attached to maintenance equipment, the magnet system removes metal road debris during routine maintenance operations.

The system, shown in Figure 2, is raised by the maintainer's built-in air system. Figure 3 shows a typical day's collection of metal debris.

Equipment

Welder
Metal saw
Drill

Materials and cost (about $750)

Square tubing and hardware: $40
Air cylinder: $80
Electric micro-switch: $38
Electric operated solenoid valve: $55
2, 48-in. in yard magnets: $535

Labor

Two days of in-house labor

Figure 2. Magnet in down position

Figure 3. One day's collection of miscellaneous metal (approximately 10 lb) retrieved during routine gravel road maintenance

Culvert inlet improvement

Problem

Old culvert inlets get covered up, plugged, or lost over time.

Solution

Road crew members in Snowmass, Colorado, designed a low-cost, durable drop culvert that keeps inlets clear of rocks and other runoff debris and requires only minimal maintenance.

Each culvert is built in house as shown in Figure 4 with a Sonotube®, Sakrete®, a steel manhole ring, and a 24-in. slotted lid and installed on site as shown in Figure 5.

Figure 4. In-house construction of culvert

Figure 5. On-site installation

Materials and cost

30-in. round Sonotube® ($1.60/ft)
24-in. round Sonotube® ($1.40/ft)
Sakrete® ($7.00/bag)
24-in. slotted lid ($90.00)
24-in. old steel sewer riser ring (no cost)

For more information

For information about the inlet improvement, contact Will or Scott Binegar, Public Works Department / Road Division, Snowmass Village, Colorado, 970-923-5110.

For information about the magnet system to collect road debris, contact Mike Salyards, District 3 / Phillips County, Haxtun, Colorado, mikespc3@schollnet.com.

For information about the tack oil and diesel storage system, contact Ted Plank, road supervisor for Boulder County, Colorado, 303-441-3962, tplank@co.boulder.co.us.

These and several other useful tips, retrofits, and best practices—like Pinchie the Basin Cleaner (a skid attachment for removing debris from clogged catch basins) and Suck'em Dry Molokai (a portable hydraulic pump)—are described in the National Entry Booklet for 2009, www.ltapt2.org/resources/downloads/NationalEntryBooklet.pdf. ■

Conference calendar

March 2010

23	Work Zone Safety	Iowa Western Community College, Council Bluffs	Tom McDonald 515-294-6384 tmcdonal@iastate.edu
24	Work Zone Safety	Western Iowa Tech Community College, Sioux City	Tom McDonald 515-294-6384 tmcdonal@iastate.edu
25	Work Zone Safety	Buena Vista University, Storm Lake	Tom McDonald 515-294-6384 tmcdonal@iastate.edu
29	Work Zone Safety	Gateway Hotel and Conference Center, Ames	Tom McDonald 515-294-6384 tmcdonal@iastate.edu
30	Work Zone Safety	Gateway Hotel and Conference Center, Ames	Tom McDonald 515-294-6384 tmcdonal@iastate.edu

Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads | Excerpt 4 – Roadside and Clear Zones

This is the fourth in a series of summarized excerpts from the manual Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads. ***This excerpt is based on Chapter 4: Roadside and Clear Zone. Remove this page and post it, or photocopy it and distribute it to your staff.***

Mowing Entire ROW (Paved Roads)

Mowing full roadside right-of-way helps manage the brush and helps improve visibility for motorists. Since 2004, Lee County has been mowing the full right-of-way along approximately 156 miles of asphalt and concrete pavement roads. Members of the community appreciate the effort. The number of vehicle-animal crashes has been reduced. Because the county already mows or sprays roadsides, there is no additional cost for this strategy. Boone County also uses this program.

Project contact
Dennis Osipowicz, P.E.
Lee County Engineer
933 Avenue H
Fort Madison, IA 52627
Phone: 319-372-2541
denniso@LeeCounty.org

Mowed rights-of-way: flat and level terrain (left) and a typical county road ditch (right)
(Unless noted, all photos courtesy of Bob Sperry, Iowa LTAP)

Safety Dikes (Ramps) at T Intersections

Safety dikes (ramps) at T intersections provide a safe slope of descent for drivers who miss warning signs or run the Stop sign at the intersection. As a result of an Iowa DOT volunteer program started in the late 1980s, most T intersections in Story County have safety dikes. Each dike was installed for only the cost of a culvert (if necessary), shaping, and re-seeding; any soil required was provided through ditch maintenance projects.

Project contact
Darren Moon, P.E.
Story County Engineer
837 N Avenue
Nevada, IA 50201
Phone: 515-382-7355
engineer@storycounty.com

Entrance to the safety dike (ramp) at a T intersection

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Flattening Slopes of Entrances and Drives

Flattened slopes are effective for reducing crash severity at locations where lane departures are common. Flattening slopes of entrances and drives helps provide a safe descent for drivers who leave the roadway. Since the late 1980s, Boone County has been flattening slopes using dirt collected from standard ditching and ditch maintenance practices. This is a low-cost technique that requires only hauling, shaping, and re-seeding, plus the cost of culverts if needed.

Project contact
Robert J. Kieffer, P.E.
Boone County Engineer
201 State Street
Boone, IA 50036
Phone: 515-433-0530
engineer@co.boone.ia.us

A flattened entrance slope with a culvert

Removal of Hazard(s) in Clear Zone

Studies have shown that removing hazards from the clear zone can reduce up to 38 percent of all crashes and, when crashes occur, reduce injury severity. The clear zone includes the total roadside border area available for errant vehicles. Hazards include objects such as trees, telephone poles, and mailboxes that could pose a threat to an errant vehicle. Hazards in the clear zone should be removed; however, if that is not possible, consider other mitigation strategies, such as shielding or delineation.

Project contact
Jim George, P.E.
Dallas County Engineer
415 River Street
Adel, IA 50003
Phone: 515-993-4289
jgeorge@co.dallas.ia.us

Examples of hazards in clear zone that can affect crash severity (Photos courtesy of Jack Latterell)

Teen driving survey results may affect Iowa law

The results of a recent telephone survey conducted by researchers at the University of Iowa (UI) and the University of North Carolina (UNC) may help save the lives of some Iowa teenage drivers. The findings support revisions to the state's graduated drivers license program being considered by the Iowa legislature.

The September 2009 telephone survey was developed with the UI's Injury Prevention Research Center.

Parents support proposed changes to teen driving law

On January 19, 2010, Daniel McGehee of UI and his UNC colleague Rob Foss presented their survey results to the Iowa house and senate committees considering a bill (Senate Study Bill SSB3071) to enhance restrictions to the Iowa graduated drivers license. The telephone survey of 1,065 Iowa parents of teenage (16- and 17-year-old) drivers in all Iowa counties found overwhelming support for lawmakers' suggested enhancements.

Proposed changes to graduated drivers license

The proposed changes and the percentage of parental support for each are as follow:

- Banning texting while driving (97 percent) (see the figure)
- Banning cell phone usage while driving (90 percent)
- Moving the nighttime driving curfew from 12:30 a.m. to 10 p.m., with an exemption for work and school activities (82 percent)
- Limiting new drivers to no more than one teen passenger, with an exemption for relatives (79 percent)
- Extending the supervised practice period from six to 12 months for the intermediate license (57 percent)

Leading teen driver safety

McGehee notes that Iowa is frequently ahead of the curve in many safety initiatives, and this included graduated driver licensing during the late 1990s. "Since then, however, our system has not kept up with the most recent research that shows these proposed changes can be effective," he says.

"Iowa crash statistics show that of all deaths caused by inexperienced drivers, the teen driver is the one killed in 40 percent of crashes, and a passenger is the one killed in 30 percent of cases. The remaining deaths are other road users who are killed by the teen driver."

He adds that making selected changes to the Iowa graduated drivers' license system will provide more time for young drivers to practice for a full calendar year in all weather conditions. "Limiting cell phone usage and auto passengers will help minimize distraction during the most dangerous time—the first year—of driving."

"When North Carolina passed similar laws about 10 years ago, the North Carolina teen crash rate decreased 38 percent between 1991 and 2004," McGehee says.

For more information

Contact Gary Galluzzo, media writer, University of Iowa News Services, 319-384-0009, gary-galluzzo@uiowa.edu.

Daniel McGehee is director of the UI Public Policy Center's Human Factors and Vehicle Safety Research Program and adjunct associate professor in the College of Engineering and College of Public Health.

Note: Since this article was written, a version of the bill (Senate File 2150) has been passed by the Iowa senate and is now being considered in the Iowa House. You can follow the bill online. See the homepage for the Iowa General Assembly, http://www.legis.state.ia.us/index.html; then search for "SF2150." ■

Banning texting while driving is a key feature of the proposed revisions to Iowa's graduated drivers licensing law

Stanley L. Ring Memorial Library: Current materials

Note about delivery of materials: *The library now sends orders through the U.S. Postal Service. This change is resulting in important savings for LTAP, but ordered materials do not arrive as quickly. If you have an urgent need for library materials, let us know when you place your order and we will arrange faster delivery.*

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 *Technology News*.

Publications

P 1747 Sign Retroreflectivity Guidebook

This guidebook was developed to assist agencies in meeting the new federal requirements for maintaining traffic sign retroreflectivity on roads open to public travel. It includes a CD-ROM with an interactive version of the guidebook with features including a budget estimation tool and letter and memo templates that can be adapted to local needs.

P 1748 Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections

This document presents information on suggested effective low-cost intersection countermeasures developed using intersection safety research results and input from an intersection safety expert panel.

DVDs

DVD 265 Flagger Training

This video provides basic instruction on a variety of flagging operations. It covers proper equipment, pilot cars, and emergency situations. ■

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