TECHNOLOGY NEWS
Iowa's Local Technical Assistance Program (LTAP): providing transportation technology transfer for Iowa's cities and counties
September–November 2001

Acronyms in this issue

AASHTO	American Association of State Highway and Transportation Officials
CTRE	Center for Transportation Research and Education
FHWA	Federal Highway Administration
Iowa DOT	Iowa Department of Transportation
ISU	Iowa State University
LTAP	Local Technical Assistance Program
MUTCD	Manual on Uniform Traffic Control Devices

Managing drifting snow

PREVENTING SNOW from drifting on roadways is less expensive and time consuming—and safer for motorists and maintenance crews—than removing it from the road.

For example, plowing snow can cost up to 100 times more than installing snow fences.

Three general guidelines for reducing snow drift on roads include shaping the roadside topography, minimizing the use of roadside guardrail, and placing snow fences.

Shaping topography
Perhaps the best way to control drifting snow is to shape the roadside landscape appropriately. Ideally, this is accomplished when the roadway is designed, but sometimes the topography of existing roadways can be improved or reshaped in the following ways. (Implementing either technique likely requires a right-of-way agreement.)

Enhance ditches. Snow tends to accumulate in sheltered depressions rather than on the higher ground around the depressions. Widen and deepen ditches to increase their capacity to contain blowing snow and snow plowed off the roadway surface.

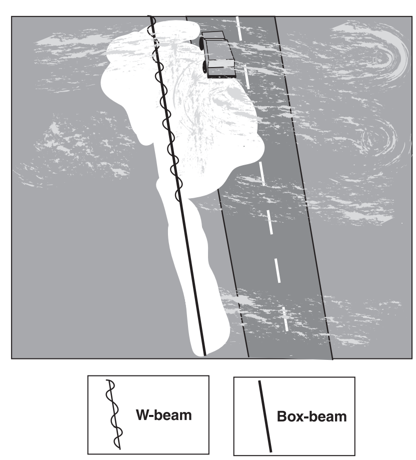
Eliminate snow traps. Snow traps occur when roadsides are higher than the road's surface. Blowing snow collects and swirls in these depressions, creating hazardous road conditions. Eliminating snow traps involves removing embankments to flatten the adjacent roadside and constructing adequate ditches.

(For how-to suggestions regarding removing snow traps, see a related article in the November/December 2000 issue of *Technology News*, www.ctre. iastate.edu/pubs/Tech_News/2000/.)

Minimizing the use of roadside guardrail
Roadside guardrail can trap snow on the roadway. Ideally, good road design eliminates or minimizes the need for many guardrail installations. For example, building gentler slopes on embankments and ditches and extending culverts can reduce the need for guardrail.

However, when guardrail is necessary, choose designs that interfere as little as possible with snow removal activities. Of the four common designs—box-beam, cable, concrete, and W-beam—box-beam and cable may be preferable because they allow better airflow and interfere less with snow removal activities. As illustrated below, blowing snow can move more freely through box-beam guardrail but tends to collect in drifts near W-beam rail.

SNOW continued on page 2



Technology News is the newsletter of Iowa's Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa by the FHWA, Iowa DOT, Iowa Governor's Traffic Safety Bureau, Iowa Highway Research Board, and Iowa State University Extension.

Subscriptions to *Technology News* are free. To subscribe or obtain permission to reprint articles, contact the editor (below).

The mission of Iowa's LTAP is to foster a safe, efficient, environmentally sound transportation system by improving the skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

Iowa's LTAP is housed and administered at Iowa State University's Center for Transportation Research and Education (CTRE):

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SNOW continued from page 1

Modify existing guardrail so it doesn't collect drifting snow by anchoring the ends in the back slope or flaring ends away from the roadway.

Placing snow fences

When reshaping topography is not an alternative, the next best choice is to manage blowing snow in such a way that drifts form adjacent to the roadway instead of on it. Snow fences, living and artificial, decelerate snow-laden winds, causing snow to collect at the point of deceleration rather than on the road.

The theory is simple enough, but properly installing snow fence is a science that considers overall topography, average wind speeds, fence design, and other factors. Inappropriately placed or designed snow fences can actually exacerbate the formation of snow drifts on roadways.

Artificial snow fences. Artificial, or structural, snow fences can be temporary or permanent.

Temporary structures, generally four-foot high, portable plastic or wooden fences, are usually installed after the fall harvest and removed before spring planting.

Permanent structures of various designs and materials generally occupy a narrow strip of land and require little maintenance.

Living snow fences. Trap snow "naturally" by (1) planting living snow barriers, (2) leaving cropland untilled, or (3) leaving a few rows of unharvested corn in the field.

Understanding how snow moves

Understanding the characteristics of blowing snow can help you select optimum strategies for reducing snow accumulation on your roadways. Snow generally moves in three ways: by creep, saltation, or suspension (also called turbulent diffusion).

Particles too large to be lifted off the ground in a light wind *creep* or roll along the ground surface. Creeping snow is easily trapped by snow fences.

Lighter snow particles may *saltate*, or jump along the ground. These particles rise vertically and then return to the surface at a shallow angle trajectory. Saltating particles can be particularly problematic because they can dislodge particles that have become frozen to surface material, increasing the amount of blowing snow. The good news: saltating snow is also easily trapped in snow fences.

Suspended snow has become airborne and remains so for extended periods of time. Particles become suspended when the wind is strong and/or snow particles are relatively small. Once suspended, they become smaller through evaporation and then tend to be carried even higher.

Most blowing snow is in suspension, with the greatest amount of suspended snow within three feet of the surface. Suspended snow only stops moving in sheltered areas. To be caught in a snow fence, suspended snow must settle in a sheltered area.

Snow particles do not move for long distances. As they move, they break into smaller pieces, perhaps become airborne, and eventually evaporate.

For more information

Both *Design Guidelines for the Control of Blowing and Drifting Snow* (P2381), a publication of the Strategic Highway Research Program, and *Controlling Drifting Snow* (P718) by Stanley Ring, Iowa State University professor emeritus of civil engineering, contain helpful discussions of snow movement. Contact Jim Hogan, CTRE's library coordinator, 515-294-9481, hoganj@iastate.edu. •

(1) Buffer strips of native grasses adjacent to roadways can resist the weight and slow the speed of moving snow, trapping snow from two to three average snowstorms. They can also help prevent silt accumulation in ditches, reserving the space for snow.

One aspect of the reauthorized federal Conservation Reserve Program (CRP), which provides conservation incentives to landowners, involves planting such buffer strips.

Rows of trees or shrubs can also make effective snow fences. The distance that snow will drift on the lee side of the windbreak depends on the windbreak's permeability.

Less permeable windbreaks cause snow to accumulate in deep, narrow drifts; more permeable windbreaks cause snow to accumulate in shallow, wide drifts.

The Iowa DOT's general living snow fence design consists of two rows (five feet apart) of trees and shrubs, with plants spaced three feet apart within each row. Rows are placed at a distance from the roadway at least 10 to 12 times (preferred, 15 times) the height of the plants.

The Natural Resources Conservation Service (NRSC), one of CRP's partners, offers a cost-share program with farmers for planting trees and shrubs to serve as windbreaks.

(2) Natural vegetation on untilled acres can help prevent snow from blowing onto roadways.

The NRCS also pays landowners to leave highly erodable lands untilled. (Landowners may remember a similar state program called the Wind Erosion Control Incentive Program (WECIP).)

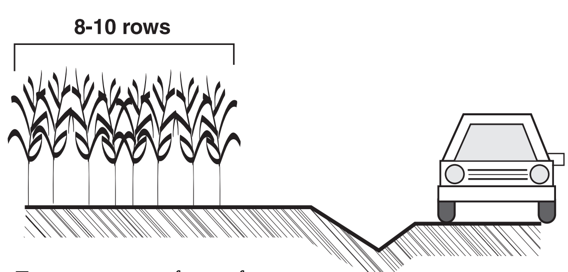
(3) For several years, some Iowa counties and the Iowa DOT have contracted with farmers across the state to leave a few rows of corn unharvested in their fields, parallel to the roadway, as a snow barrier. The program can benefit both agencies and farmers.

For more information

For more information about

- designing and placing snow fences, see SHRP's *Snow Fence Guide*, P801.
- working with landowners to install temporary or permanent structural fences, contact Dennis Burkheimer, Iowa DOT winter operations administrator, 515-239-1355, dennis.burkheimer@dot.state.ia.us.
- working with farmers to leave rows of corn in their fields through the Iowa Cooperative Snow Fence Program, contact Dennis Burkheimer, Iowa DOT winter operations administrator, 515-239-1355, dennis.burkheimer@dot.state.ia.us.
- working with the Natural Resources Conservation Service and Conservation Reserve Program to create living snow fences, contact your local National Resource Conservation Service (NRCS) office. For Iowa office information, see the NRCS web site, www.nrcs.usda.gov/.
- understanding the snow drift implications of guardrail, contact Safety Circuit Rider Tom McDonald, 515-294-6384, tmcdonal@iastate.edu.
- controlling drifting snow, see the Strategic Highway Research Program's (SHRP) *Design Guidelines for the Control of Blowing and Drifting Snow*, P2381.

To borrow the referenced publications, contact Jim Hogan, CTRE's library coordinator, 515-294-9481, hoganj@iastate.edu. •



Temporary snow fence of corn rows (not to scale)

Iowa Department of Transportation

CTRE
Center for Transportation Research and Education

IOWA STATE UNIVERSITY

Editor's note: See page 11 for information on a related event: FHWA Concrete Admixture Workshop.

Understanding the complexities of concrete mixes

Concrete Chemistry, Microstructure, and Performance Workshop
November 14, 2001
Ames, Iowa

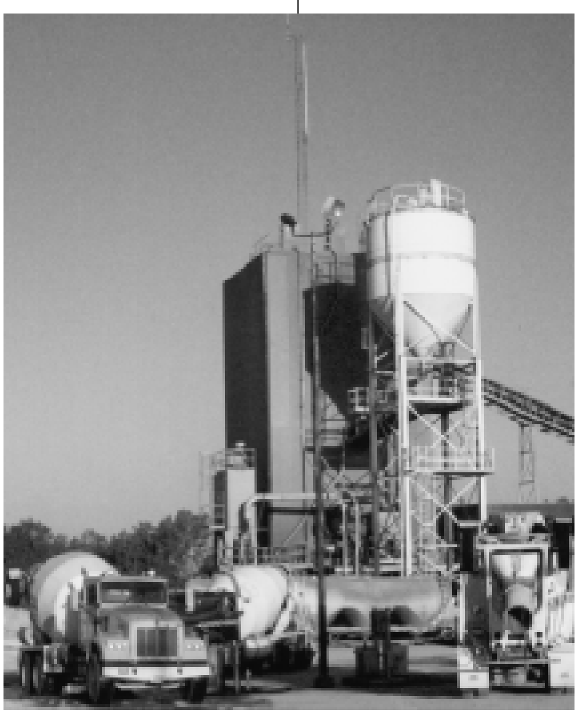
If it's been a while since you reviewed the complexities of modern concrete mixes, this practical workshop will teach you about

- the basics of current cements
- the importance of various materials and admixtures
- supplementary cementitious materials
- changes during hydration and microstructure development
- effects of concrete chemistry on durability

Concrete materials have changed dramatically over the years.

Concrete materials have changed dramatically over the years. They now include finer ground cements; blended and special cements; supplementary materials such as slag, fly ash, and silica fume; and a wide range of admixtures. Climatic conditions such as freeze/thaw cycles take their toll and so do frequent applications of deicer salts.

Therefore, it is critical that selecting proper materials be given paramount consideration in constructing a durable concrete pavement that can resist weathering action, chemical attack, abrasion, or any other process of deterioration.



Workshop registration information is in the mail and online at www.ctre.iastate.edu/calendar/.

For more information, contact Harold Smith, training and public works engineer, Center for Portland Cement Concrete Pavement Technology, Iowa State University, 515-294-4218, hsmith7@iastate.edu, or see www.ctre.iastate.edu/calendar/. •

Correction—and more—about flowable mortar

FLOWABLE MORTAR mix specifications were incorrect in the July/August issue of *Technology News* (page 6). Correct specifications for one cubic yard of standard flowable mortar are

- cement: 100 pounds
- fly ash: 300 pounds
- fine aggregate: 2,600 pounds
- water: approximately 70 gallons

A variation on standard flowable mortar

In very tight areas that are difficult to excavate and/or compact, controlled low-strength flowable mortar (also known as controlled low strength material, or CLSM) may be the preferred backfill for storm or sanitary sewer, water line, and utility conduit trenches.

Controlled low-strength flowable mortar has the fluidity and other advantages of standard flowable mortar, but it is much easier to excavate. In fact, it's commonly removed with a back hoe.

In addition, because controlled low-strength flowable mortar more closely simulates the compacted natural earth surrounding the trench, fewer cracks tend to develop in the pavement slab along trench boundaries. That is, controlled low-strength flowable mortar can minimize or eliminate the "beam effect." This is particularly true in shallow trenches where the mortar encasement (or arch or bedding) is close to the pavement and/or when the earth adjacent to the trench has a tendency to compact.

But, of course, controlled low-strength flowable mortar isn't as strong. Standard flowable mortar has approximately half the weight-bearing strength of portland cement concrete; controlled low-strength flowable mortar has less strength than standard flowable mortar but more than the surrounding earth.

Proportions for one cubic yard of controlled low-strength flowable mortar (from the *Central Iowa Standard Design and Specification Manuals)* are

- cement: 50 pounds
- fly ash: 250 pounds
- fine aggregate: 2,910 pounds
- water: approximately 60 gallons •

ERIS: Improving agency communications with emergency response providers

Jacqueline Comito, affiliate instructor of anthropology, Iowa State University, and director of ERIS project development team

In Iowa, local communities assume most responsibilities for maintaining efficient emergency response services. Without joint planning and open communication between communities and transportation agencies, state highway projects, road closings, and other incidents outside community control can interfere with emergency response decision making.

The objective in developing Iowa's Emergency Response Information System (ERIS) is to improve communications between Iowa DOT planners and operations personnel and local emergency response services, thereby helping to improve emergency response time and the survival rate of crash victims on highways.

The concept for an emergency response information system began with a case study evaluation of the effect of the relocation of Highway 218 on local communities' response capabilities in Washington, Henry, and Lee counties. In cooperation with the Iowa DOT's Office of Traffic and Safety, and using GIS-ALAS, a geographic information systems version of the Accident Location and Analysis System, response boundaries and fire district names in the three counties were added to detailed maps of the townships, cities, and transportation systems in the three counties.

The Iowa Safety Management System Coordinating Committee (SMS) provided seed money to expand this preliminary mapping work. Maps of emergency response districts were layered with the location of emergency response stations, vehicles, and equipment, and ERIS was created.

By including attributes such as level of emergency response capability, number and availability of personnel, hospital locations, vehicles, equipment, population, etc., a powerful tool is being developed for both state and local organizations.

Now with information for 10 Iowa counties, ERIS provides a system of easily retrievable information to help Iowa DOT planners and operations personnel communicate with emergency response services before and during construction, emergency conditions, weather events, temporary road closings, and similar events in those counties.

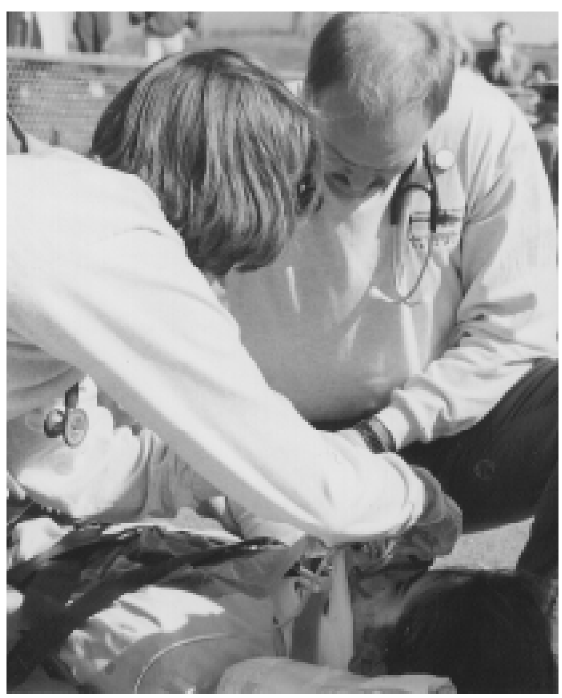
On the local level, ERIS is an effective assessment and planning tool for local emergency response providers. In addition, ERIS will create an important component in the education of emergency response personnel and their communities in the importance of traffic safety and the benefits of strong ties to Iowa's transportation agencies.

By January 2002, ERIS will be up and running with data from 17 counties chosen as pilot regions.

For most counties, however, fire and emergency response boundaries are still being hand-mapped by local officials and are not accessible on a state level. The Iowa DOT is one of the few state agencies with the technological resources to conduct a statewide mapping of Iowa's fire/EMS districts. It is important for future road safety that this mapping project be completed on a statewide basis. •

Editor's note: This article was originally published in the fall 2001 issue of Safety Lines, *the newsletter of the Iowa Traffic Control and Safety Association. A more detailed version is online at www.ctre.iastate.edu/pubs/Tech_News/2001.*

Photo of emergency responders courtesy of Mercy Medical Center, Des Moines, Iowa.



[A] powerful tool is being developed for both state and local organizations.

When are three lanes better than four?

Because the turning lane is reserved for left-turning traffic, a three-lane roadway can improve sight distance for turning vehicles and eliminate lane changes to avoid left-turning vehicles.

GUIDELINES are now available to help Iowa traffic engineers determine when a relatively quick, easy, and inexpensive improvement—re-marking a four-lane, undivided roadway into three lanes, with one lane in each direction and a center two-way left-turn lane (TWLTL)—might be an option for a roadway.

Funded by the Iowa DOT's Office of Traffic and Safety, Keith Knapp, former assistant professor of civil and construction engineering at ISU and manager of safety and traffic programs at CTRE, and Karen Giese, former graduate research assistant at CTRE, recently studied such conversions.

Sometimes simpler is better

To improve operations and safety along a four-lane, urban, undivided roadway, traditional improvements include constructing a raised median or a center TWLTL. Both alternatives, however, involve widening the roadway, which is costly and sometimes impractical.

Converting a four-lane, undivided roadway to three lanes with a center TWLTL can have several advantages. Compared to other improvements that involve widening the roadway, they

- are relatively inexpensive,
- generally have less impact on adjoining property, and
- interrupt traffic for a shorter time during conversion.

Because the turning lane is reserved for left-turning traffic, a three-lane roadway can improve sight distance for turning vehicles and eliminate lane changes to avoid left-turning vehicles.

Not for every roadway

The study cautions, however, that converting a four-lane, undivided roadway to a three-lane roadway with TWLTL is not the solution for every urban corridor. For example, it may be a reasonable alternative only if operational impacts (e.g., decrease in average travel speed) are locally acceptable.

Little research had previously been done on operational impacts of four-lane to three-lane conversions. In this study, in addition to case study analyses of conversions in Iowa and elsewhere, researchers used simulation software to conduct a "sensitivity analysis" of various factors affecting average arterial travel speeds on three-lane and four-lane, undivided roadways.

The study concludes with a thorough discussion of a number of factors that must be considered to determine when a four-lane-to-three-lane conversion is an alternative improvement:

- roadway function/environment,
- traffic volume and level of service,
- turn volumes/patterns,
- frequently stopping/slow-moving vehicles,
- crash types and patterns,
- pedestrian/bicycle activity,
- right-of-way acquisition costs, and
- general roadway characteristics.

The guidelines presented in the study help owners determine when this option might be included for further study in the alternative improvement comparison stage. The project report is online at www.ctre.iastate.edu/reports/4to3lane.pdf. •

An award-winning conversion in Sioux Center left room for parallel parking. *Photos courtesy of the Iowa DOT.*

Editor's note: This article was originally published in the August 2001 issue of CTRE en route, *the newsletter of the Center for Transportation Research and Education, Iowa State University.*

Preventing dangerous edge drop-offs

ABOUT 25 PERCENT of fatal crashes in Iowa involve a single vehicle that runs off the road; nationally, this is the primary type of crash in rural areas.

When a vehicle leaves the road, drop-off or rutting at the pavement edge can contribute to the driver losing control. A significant difference in elevation between the shoulder and pavement may cause the driver to overcorrect as he or she steers back onto the roadway, sending the vehicle into the opposing lane where it may spin out or hit an oncoming vehicle. Properly maintaining pavement edges and shoulders can help prevent such crashes, improving motorist safety and reducing tort liability claims.

Causes
Several factors can cause or exacerbate edge drop-off or rutting:

- erosion caused by surface drainage runoff, by wind, or by wind currents created by large, fast-moving commercial vehicles
- settlement of the shoulder or degradation of shoulder granular material
- high traffic volumes, particularly heavy commercial traffic
- off tracking by wide vehicles

The most serious shoulder deterioration occurs in the first two feet from the pavement edge.

Certain locations along roads with earth or granular shoulders may be especially prone to edge rutting. Steep hills, the low side of super elevated curves, and intersections commonly exhibit more severe edge rutting than relatively flat, straight locations.

Edge drop-offs also occur during asphalt overlay operations. The Iowa DOT has responded to this problem with design procedures that avoid significant edge drop-offs adjacent to open traffic lanes during overlay operations. Local agencies may want to include the use of sloped fillets along the overlay edge, along with shoulder rehabilitation, in every overlay contract.

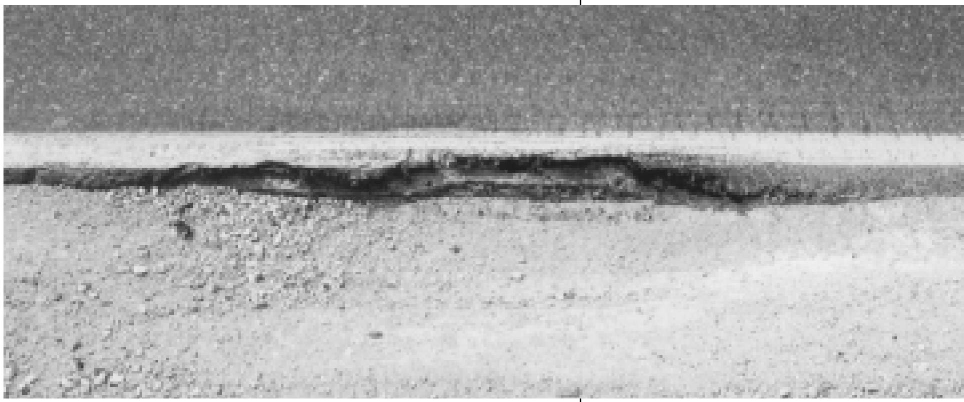
Although pavement edge drop-off is most common with unpaved shoulders, settlement of paved shoulders can also result in a difference in elevation between the shoulder and adjacent pavement.

To pave or not to pave the shoulder?
Almost exclusively, Iowa's lower volume, local and state rural roads have earth or sod and granular surfaced shoulders. Unless the topography promotes edge rutting, a good quality earth or sod shoulder can provide excellent service on these roads.

The Iowa DOT specifies paved shoulders only on very high-volume and Interstate roadways. Specs include a 14-foot wide paved traffic lane that, when striped for a conventional 12-foot wide travel lane, provides a two-foot wide paved shoulder.

Maintenance suggestions
Pavement edge drop-offs of three to four inches or more are generally considered unsafe. Iowa DOT maintenance standards are more stringent, requiring corrective action when drop-offs approach two inches.

A dangerous combination of pavement edge rutting and shoulder degradation



Include shoulder maintenance in your regular maintenance schedule. These activities should include

- regularly repairing bituminous shoulders,
- sealing edge ruts, and
- replacing aggregate and blading unpaved shoulders.

At locations prone to rutting or erosion, consider installing low-cost asphalt widening units, approximately two feet wide. This improvement can be made by agency maintenance staff on a flexible schedule and can significantly reduce future maintenance needs in these often troublesome locations.

For more information
Contact Safety Circuit Rider Tom McDonald, 515-294-6384, tmcdonal@iastate.edu.

Also, see *The Elimination or Mitigation of Hazards Associated with Pavement Edge Dropoffs During Roadway Resurfacing* (P1001), an AAA Foundation for Traffic Safety publication, and the Iowa DOT shoulder maintenance standard. To borrow these publications, contact Jim Hogan, CTRE's library coordinator, 515-294-9481, hoganj@iastate.edu. •

W5-1

W5-2


W5-2a

W5-3

Highlights from Iowa's supplement to the MUTCD

Tom McDonald, Safety Circuit Rider

Editor's note: This article is part of a series introducing a new resource: Iowa Traffic Control Devices and Pavement Markings: A Manual for Cities and Counties. *The manual was funded by the Iowa Highway Research Board (TR-441) and supplements the* Manual on Uniform Traffic Control Devices *(MUTCD). For information, contact Jim Hogan, library coordinator, 515-294-9481, hoganj@iastate.edu, or Tom McDonald, Safety Circuit Rider, 515-294-6384, tmcdonal@iastate.edu.The manual is online, www.ctre.iastate.edu/pubs/itcd/.*

In rural Iowa, it's relatively common to find bridges and other structures that are narrower than the roadway. One-lane bridges and culverts can present particular safety concerns and traffic control challenges.

Signing and marking reduced-width structures
Iowa's new manual for cities and counties presents several straightforward options for signing and marking narrow and one-way structures, particularly on paved roads, in Section C11, "Narrow Bridges and Culverts." For example, the manual describes the appropriate use of signs illustrated at left.

Accommodating farm equipment on narrow structures
Wide agricultural equipment crossing narrow structures can damage signs, markers, and guardrail, reducing safety and increasing maintenance costs.

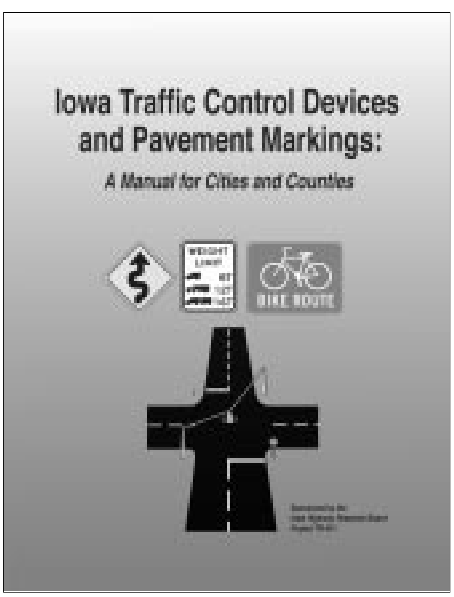
Several signing options that accommodate wide equipment are also described in Section C11 of Iowa's manual. These options include

- installing flexible supports,
- installing markers on one side of the structure only, and
- reducing sign mounting height.

Tapering the roadway
A tapered pavement or roadway edge can be used to guide drivers away from hazardous obstacles in the area of a narrow structure. Section C11 of Iowa's manual recommends minimum taper lengths according to operating speeds.

For more information
An innovative feature for bridges and other structures, developed in Des Moines County and described on the following page, could be particularly useful on narrow structures.

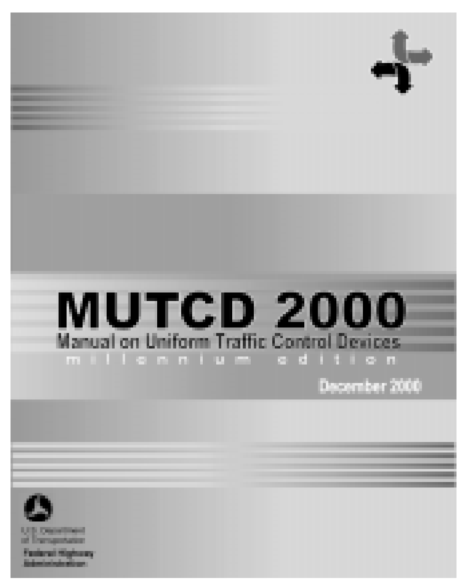
Sections 2C.13 through 2C.15 of the *Manual on Uniform Traffic Control Devices* (MUTCD) present several signs that can be installed to warn approaching drivers of narrow structures. Part 3 of the MUTCD contains specific recommendations pertinent to marking narrow pavements. •



See the conference calendar on page 11 for dates and locations of MUTCD training workshops scheduled in Iowa during fall 2001.

Iowa's supplement to the millennium MUTCD (left) addresses issues of particular importance to Iowa's city and county road departments.

The Iowa DOT will mail copies of the official millennium edition of the MUTCD (right) to Iowa cities and counties this fall.



Better mousetraps abound!

THE FIRST ANNUAL "Build a Better Mousetrap" competition, held September 5 during the Iowa Maintenance Training Expo, attracted several contestants. Six winners were chosen:

- Quick Snow Fence Roller, Joe Hodapp, City of Ankeny
- Limb Lopper, Mark Fee and Timothy Van Roekel, Marion County
- Concrete Trailer, Public Works Department, City of Clive
- Telescoping Bridge Rail, Tom Watts and Evan Walker, Des Moines County
- E.Z. Rack, Pat Zimmerman, Johnson County
- Liner Installation Tools, Culvert and Drainage Crew, Johnson County

The "mousetraps" were judged by five people, two from cities, two from counties, and one from the Iowa DOT, according to the following criteria:

- The innovation serves a purpose and is practical.
- It applies to all levels of government (city, county, and state).
- It saves time or cost in operations.
- Others could likely build a similar device.
- It performs well.
- It shows originality and ingenuity.
- The judge would consider doing it himself.

One of the competition organizers, Duane Smith, associate director for outreach at CTRE, was pleased by the variety of competition submissions. It was clear to him that the contestants "were proud and enthused" about their entries. Smith says the contest will be continued next year. He thinks it could have tremendous participation in the years to come.

Al Olson, public works administrator for the City of Ankeny and organizer of the contest judging (though he was not a judge), sees the competition as a way to encourage innovation among employees and build camaraderie within an organization. He noticed many people watching the "mousetrap" demonstrations and thinks they prompted people to think about other ways of doing things.

Olson anticipates that Ankeny employees, who he says "can put square pegs into round holes," will have something to enter every year. He hopes other organizations will encourage their employees to participate, too. •

A winning mousetrap: telescoping bridge rail

WHEN FARMERS need to move their wide farm equipment across a bridge, they may unintentionally bend or break bridge rails and signs. Des Moines County maintenance workers Tom Watts and Evan Walker developed a telescoping bridge rail system that permits lowering bridge rails and allows sign or object markerposts to be temporarily removed so farmers can pass without causing any damage.

Square tubing is attached to the bridge with smaller tubing inserted inside. Pins and bolts are used for stops, and light chain is attached to prevent loss. The bridge rails cannot be lifted out of the brackets, only lowered. For the railing, chain is inserted in PVC pipe between the upright posts.

For bridges where this kind of railing system cannot be used or is unnecessary, the post system is used for the signs or object markers at both ends of the bridge.

Watts says the system performs very well and lowers the county's maintenance costs. Farmers are happy that they don't cause any damage to get across a bridge. Vandalism has not been a problem.

For more information about telescoping bridge rails, contact Tom Watts or Evan Walker, Des Moines County Secondary Roads Department, 319-753-8154. •

Posts for signs and object markers can be temporarily removed (right) so farmers can cross the bridge without causing damage. *Photos courtesy of Des Moines County Secondary Roads Department.*

Tom Watts (left) installs a telescoping bridge rail on a Des Moines County bridge on a granular-surfaced road.

conference calendar

October 2001

Date	Event	Location	Contact
23	Multidisciplinary Safety Teams Peer Exchange (in conjunction with ITCSA Conference)	Des Moines	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
23–24	ITCSA Conference	Des Moines	Sharon Prochnow 515-294-3781, prochnow@iastate.edu
30	MUTCD Training	Ames	Duane Smith 515-294-8817, desmith@iastate.edu
31	ASCE Transportation Conference	Ames	Jim Cable 515-294-2862, jkcable@iastate.edu
31–Nov 1	Traffic Signal Maintenance and Management	Ames	Duane Smith 515-294-8817, desmith@iastate.edu

November 2001

Date	Event	Location	Contact
1	Better Concrete Conference	Ames	Jim Cable 515-294-2862, jkcable@iastate.edu
5	MUTCD Training	Amana	Duane Smith 515-294-8817, desmith@iastate.edu
5	ASCE Structural Engineering Conference	Ames	Jim Cable 515-294-2862, jkcable@iastate.edu
6	MUTCD Training	Bettendorf	Duane Smith 515-294-8817, desmith@iastate.edu
7–8	Traffic Signal Maintenance and Management	Bettendorf	Duane Smith 515-294-8817, desmith@iastate.edu
14	Concrete Chemistry, Microstructure, and Performance Workshop	Ames	Harold Smith 515-294-4218, hsmith7@iastate.edu
14–16	Fall ISAC	Des Moines	Duane Smith 515-294-8817, desmith@iastate.edu

Decmber 2001

Date	Event	Location	Contact
3–7	Math Fundamentals	Ames	Duane Smith 515-294-8817, desmith@iastate.edu
11–13	Iowa County Engineers Association Conference	Ames	Jim Cable 515-294-2862, jkcable@iastate.edu
18	FHWA Concrete Admixture Workshop	Ames	Harold Smith 515-294-4218, hsmith7@iastate.edu

More conference info online

Want more information about any of the events listed here? Check out our reformatted online conference calendar, a new, cooperative service provided by Iowa State University's Department of Civil and Construction Engineering and CTRE: www.ctre.iastate.edu/calendar/. •

FHWA Concrete Admixture Workshop

December 18, 2001
Ames, Iowa

City, county, and state engineers, consultants, contractors, and concrete producers involved in pavement quality control and mix design will benefit from this event. The workshop will provide up-to-date information and lessons about chemical admixtures, which are integral components of modern concrete mixes.

Topics will include

- fundamentals of concrete admixtures
- field experiences and future needs
- water reducers, including self-compacting concrete
- shrinkage-reducing admixtures
- accelerating and retarding admixtures
- admixtures that mitigate corrosion
- special admixtures, including colors

Registration information is in the mail and online at www.ctre.iastate.edu/calendar/.

For more information, contact Harold Smith, training and public works engineer, Center for Portland Cement Concrete Pavement Technology, Iowa State University, 515-294-4218, hsmith7@iastate.edu, or see www.ctre.iastate.edu/calendar/. •

2001 "roadeo" winners

Iowa's annual Snow Plow and Motor Grader "Roadeos" were held at the Iowa State Center in Ames on September 4, 2001.

Chris Archer of Pocahontas County took top honors in the motor grader competition, followed by Sac County's Rick Sackett in second place and Pocahontas County's Ken Hoopingarner in third.

First place in the snow plow competition went to the Ankeny team, Charles Cole and Dennis Gaulke. Second place went to Dan Arndt and Hobart Schoonover of Polk County, and third to Mark Goins and Greg Householder of Ankeny.

Competitors in both events took a written exam and navigated a snow plow or motor grader through an obstacle course.

Top, left to right: K. Hoopingarner; Ron Dirks, Pocahontas County, motor grader competition organizer; R. Sackett; C. Archer

Bottom, left to right: D. Arndt; H. Schoonover; C. Cole; D. Gaulke; Bret Hodne, City of West Des Moines, member of Expo steering committee; Al Olson, City of Ankeny, chair of Expo steering committee; G. Householder; M. Goins.

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