TECHNOLOGY NEWS
roads / bridges / transit
Transportation technology transfer for Iowa's local governments

December–January 1998/1999

Driver expectancy, traffic control, and roadway design

by Keith Knapp, Manager, Traffic Engineering and Traffic Safety Programs at CTRE

This article is the first in a series about traffic engineering and traffic safety.

DRIVER EXPECTANCY is "an inclination, based on previous experience, to respond in a set manner to a roadway or traffic situation." It affects how drivers control, guide, and navigate their vehicles. In fact, the characteristics and consequences (good or bad) of a driver's reaction to a particular situation can, in many cases, be related to how well the situation met his or her expectancy. The concept of driver expectancy forms the basis of many traffic control and urban street design requirements in the *Manual of Uniform Traffic Control Devices* and the *Policy on Geometric Design of Highways and Streets.*

Drivers bring two types of expectancy to their driving experience:

1. Long-term (or *a priori*) expectancy is based on past experience, upbringing, culture, and education. For example, based on past driving experience in the United States, drivers do not generally expect stop-controlled intersections on freeway-standard rural roadways. The addition of such stop controls would therefore typically violate long-term driver expectancy.
2. Short-term (or *ad hoc*) driver expectancy is based on local practices or situations encountered on a particular roadway during a particular trip. For example, if a roadway is paved and straight, a driver will typically expect that the roadway will continue in this manner. Suddenly encountering curves or an unpaved surface would violate short-term driver expectancy.

Driving errors typically occur when driver expectancy is violated—in other words, when a driver is surprised by a situation. A driver's reaction time increases in these situations, perhaps resulting in a crash. In general, therefore, a primary goal of transportation professionals is to design roadways and traffic control to reinforce drivers' short-term expectancy and conform to their long-term expectancy. If this is not possible, a secondary goal should be to change driver expectancy through the proper use of advance signing and/or marking.

Drivers assume or expect a standard driving situation unless signing, markings, and/or the general roadway environment indicates otherwise. When a roadway design or traffic control device is different from what drivers would normally expect, drivers must be told what to expect in a uniform and understandable manner.

A large number of warning and regulatory signs are used to alter driver expectancy—in other words, to prevent surprises. For example, the sign shown in Figure 1 informs drivers that the roadway is about

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Figure 1. Advance warning turn sign

The preparation of this newsletter was financed through the Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa by the Federal Highway Administration and the Iowa Department of Transportation. The mission of Iowa's LTAP:

To foster a safe, efficient, environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, to improve the quality of life for Iowans.

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to turn left (i.e., the sign overrides and changes driver expectancy). Drivers' initial expectation, even in this urban area, is that the roadway alignment will continue straight ahead. Drivers who are unfamiliar with this roadway and miss this sign will probably continue straight through the intersection.

The "minor" street approach at the intersection in Figure 2 is controlled by a stop sign. An auxiliary sign informs stopping drivers that through movement at the intersection is different from what they would normally expect (i.e., the auxiliary sign overrides and changes driver expectancy). An alternative to the auxiliary sign would be to redesign and reconstruct the corner and driveway radii to match the intersection layout with its intended function and operation. Such reconstruction would meet driver expectancy better, allow the removal of some signs, and produce an intersection that operates more efficiently and safely.

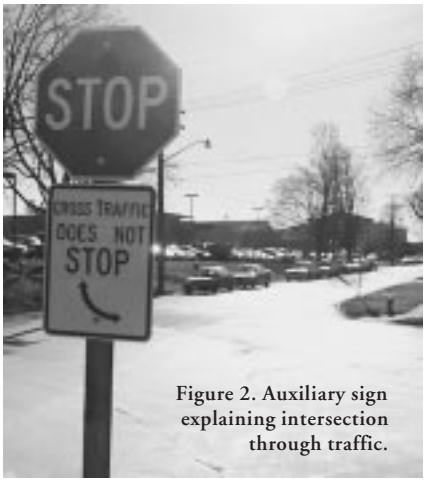


Figure 2. Auxiliary sign explaining intersection through traffic.

Any changes in roadway design or traffic control (e.g., signals or signs) must accommodate the long- and short-term expectations of drivers. Figure 3 shows an auxiliary regulatory sign used with traffic signals that include a green left-turn arrow. Such signal equipment now allows the treatment of left-turn movements to change from cycle to cycle. In some cycles, left turns are protected (as indicated by the green left-turn arrow); in other cycles, left turns are permitted only after drivers yield to oncoming traffic (as indicated by the green ball); in still other cycles, left turns are protected and then permitted (as indicated by the green left-turn arrow changing to a green ball). Having experienced a protected left turn at one or more intersections, however, drivers (especially older drivers) may begin to expect that all left turns are protected at all intersections within the jurisdiction. The auxiliary left-turn-yield-on-green sign (a symbolic green ball) overcomes that expectancy, reminding drivers to yield to oncoming traffic before turning left on a green ball.

Figure 3. Left-turn-yield-on-green (symbolic green ball) sign.

Meeting driver expectancy through consistent, uniform, and understandable roadway designs, traffic controls, and general roadway environments will improve overall driving operation and safety. When drivers can predict a roadway design, traffic control, or vehicle movement, they are less likely to make driving errors.

Changing the overall roadway environment to match the goals of a community and produce appropriate driving behavior (e.g., traffic calming) will be the subject of another article. For more information, contact Keith Knapp, 515-294-7082, kknapp@ctre.iastate.edu.

WWW links

http://www.fastwww.com:8080/~10
The Maintenance Superintendents Association bulletin board allows registered members to pose questions to each other about work related matters. Guests can read all the messages but not post any.

http://hpc.fhwa.dot.gov/
The High Performance Concrete web site provides "showcases" of HPC projects in several states.

http://www.stpaul.gov/
St. Paul, Minneosota's web site is a great example of an interactive site. Users can report pot holes, get regular updates about road construction, and sign up for e-mail notification of snow emergencies before the snow plows hit the streets.

http://www.pure-energy.com
The Department of Energy recently designated Pure Energy Corporations's P-Series fuel as an alternative fuel. The fuel is produced from approximately 70 percent renewable biomass and reduces greenhouse gas emissions and tail pipe emissions and can be used in flexible fuel vehicles in place of gasoline.

TEA-21 and Iowa's LTAP

by Duane Smith, Associate Director of Outreach

THE NEW FEDERAL legislation, the Transportation Equity Act for the 21st century (TEA-21), is in place. TEA-21 continues to support the Federal Highway Administration's (FHWA) Local Technical Assistance Program (LTAP), although supplemental funding for urban applications has been eliminated. This change in funding provides a unique opportunity for Iowa's LTAP.

Some history
Iowa's LTAP is part of a national network of transportation technology transfer centers for local governments. Originally called T² centers, a total of 57 LTAP centers support local agencies in every state and Puerto Rico, as well as Native American tribal governments. The Iowa Department of Transportation (Iowa DOT) administers the LTAP contract in Iowa for the FHWA, and the Center for Transportation Research and Education (CTRE) at Iowa State University implements the program.

Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which expired in 1997, the national LTAP was funded at $10.5 million annually. This amount included a specific allocation for urban programs, allotted to states based on their urban populations. Under TEA-21, the urban programs allotment was eliminated, reducing 1999 LTAP funding to $7 million.

What does this mean for Iowa's LTAP?
The future of Iowa's LTAP looks good. As a significantly rural state, Iowa did not rely on ISTEA's urban LTAP funding as much as very urban states did, so the federal cuts in TEA-21 are not as significant for Iowa. In 1999, the federal portion of Iowa's LTAP budget will be about 25 percent less than in 1998. Although this reduction is disappointing, the Iowa DOT and Iowa State University continue to provide matching support, and CTRE is enthusiastically looking at alternative funding options.

CTRE will continue to provide basic LTAP services that local governments rely on—the transportation library, *Technology News*, the Safety Circuit Rider, and training workshops. At the suggestion of the Iowa Highway Research Board, registration fees for our summer and winter training "expo"s will be increased by $10 per person in 1999. However, fees for most LTAP workshops and training events will remain at the same low cost-recovery level that has been charged for the last several years. Many events, especially those sponsored through the Safety Circuit Rider program, will remain free of charge.

Your input is important
TEA-21 provides CTRE with an opportunity to look at Iowa's LTAP services and operations during the next few months and ensure we are hitting the target with our customers. The LTAP advisory committee will be a primary resource when reviewing LTAP operations. If you have comments or suggestions about the library, newsletter, Safety Circuit Rider, or training workshops, please contact a board member (see list at right) or me, 515-294-8103, desmith@iastate.edu.

Lead states program

THE STRATEGIC Highway Research Program (SHRP) has launched a new web site for its Lead States Program. The Lead States Program, begun in 1996, is a way for state transportation agencies to share their practical, real-world experiences with others.

The web site, located at **http://leadstates.tamu.edu**, offers information about several technologies including Superpave, high performance concrete, anti-icing and road weather information systems, pavement preservation, concrete assessment and rehabilitation, alkali-silica reactivity, and innovative pavement maintenance materials.

Each technology has its own list of contact people, brief descriptions of field tests and trials currently underway, a library of resources, a calendar of events, and an online discussion called a listserv. The web site can be searched globally or within specific technologies.

The goal of this web site and of the Lead States Program is to encourage the implementation of these innovative technologies, shorten the learning period for others, and avoid unnecessary and costly duplication of effort.

Reusing scrap tires

WHOLE SCRAP TIRES have been banned from Iowa landfills since 1991, but they're still finding their way underground—this time as culverts.

Dodger Enterprises of Fort Dodge created a prototype culvert on company property. Assistant Professor Bruce Kjartanson and Professor Bob Lohnes of Iowa State University's Civil and Construction Engineering Department have conducted tests of the culvert to quantify its performance and develop design guidelines.

Groups of three whole truck tires held together with steel strapping were placed side by side in a trench. The tire bottoms were filled with sand to act as ballast to hold the tires in place and to prevent water from puddling and stagnating. The 0.5m diameter opening doesn't allow for huge amounts of flow, Kjartanson says.

Not only do truck tire culverts save money, but these drainage structures represent a significant reuse of scrap tires.

Fifty meters of truck tire culvert would reuse 190 truck tires. Using whole tires minimizes material production costs. The material cost for the truck tire culverts is $30 per meter length. This can be compared with plastic and concrete culverts of approximately the same diameter. Concrete pipe is about $72 per meter and plastic is about $53 per meter.

Not only do truck tire culverts save money, but these drainage structures represent a significant reuse of scrap tires. According to Kjartanson and Lohnes, the amount of scrap tires is growing at the rate of about one scrap tire per American per year or about 260 million tires. In Iowa alone, scrap tires are accumulating at the rate of about three million per year. In the United States about two billion scrap tires already clutter the countryside.

Kjartanson and Lohnes conducted several tests to see how truck tires stand up to heavy loads. Parallel plate tests on 37 single truck tires demonstrated that a tire's load response depends on the condition and thickness of the tire's tread, whether there are holes in the sidewall, the tire's wear, and its size. Smaller tires with deeper treads are generally stiffer.

Buried conduit tests were conducted on a truck tire culvert consisting of 18 tires (six groups of three tires banded together) placed in a shallow trench (about 0.6m of fill above the top of the tires). In one test that represented a potential worst case scenario for lateral backfill support, backfill was placed loosely over the culvert with no compaction. In a test representing a potential best case scenario for lateral backfill support, backfill was placed to a dry unit weight exceeding a relative compaction of 95 percent of the glacial till soil.

Researchers concluded that the load-carrying capacity of the truck tire culvert depends on the strength and stiffness of the backfill and, for shallow trenches, on the location of the loading along the culvert's length. As expected, the culvert with uncompacted backfill experienced more tire deflections than the culvert with compacted backfill support. Where loads were heaviest, the truck tire culverts experienced more deflection, and a couple of bald tires buckled.

Project sponsors included the Iowa Department of Natural Resources' Landfill Alternatives Financial Assistance Program and the University of Northern Iowa's Recycling and Reuse Technology Transfer Center. Final results have been submitted to both agencies.

For more information, contact Bruce Kjartanson, 515-294-3925, bkjartan@iastate.edu.

Outlet of a whole-truck-tire culvert. Photo courtesy of Bruce Kjartanson.

Teaming up for safety

TO THOROUGHLY discuss the "what ifs" of traffic and pedestrian safety issues, you need to get diverse points of view. That's the purpose of multidisciplinary safety teams like the ones in Dubuqe County and Scotty County.

These teams bring together professionals in traffic and transportation engineering, law enforcement, emergency services, fire prevention, civil defense, and traffic safety. In other words, "all the groups that need to work together," says Bill Schlickman, Dubuque city traffic engineer.

The Dubuque County Multidisciplinary Safety Team (MDST) was formed in April 1997 with assistance and guidance from Mark Campbell, Governor's Traffic Safety Bureau, and Jack Latterell, now retired from the Federal Highway Administration. The group's focus is to identify traffic and pedestrian safety concerns and work together to solve or reduce safety problems in Dubuque and Dubuque County.

The Dubuque County MDST is interested in

- work zone safety and enforcement
- high accident locations in cities and the county
- traffic light preemption
- speed situations
- high-tech mobile auto reporting system (MARS)/officer information manager (OIM)/ geographic information system (GIS)
- incident management/diversion routes

The team meets every sixth Friday and includes representatives from the City of Dubuque engineering department, the Dubuque County engineer's office, the East Central Intergovernmental Association (MPO), the Dubuque County sheriff's office, the Dubuque police department, the Dubuque fire department, Iowa State Patrol, the Iowa Department of Transportation, Dubuque County 911 Center, Governor's Traffic Safety Bureau, and Dubuque County Emergency Management.

Getting safety issues on the table and resolved is the main benefit of this safety team, says Mark Campbell. Team members hear feedback they may not normally hear.

Campbell cites an example from the Scott County MDST, which was formed in 1991. An emergency medical services (EMS) representative on the Scott County MDST suggested installing 1/10 mileposts on heavily travelled stretches of I74 in the Quad Cities area to help motorists identify exactly where they were along the highway during emergency situations. During blizzards, other severe weather, or accidents, stranded motorists often don't know precisely where they are along the highway. Campbell says the mileposts will be installed.

A small item the Dubuque County team dealt with early on was speeding complaints in several residential areas of Dubuque. The city engineer's office and the police department established a working relationship to handle complaints about speeding. An electronic traffic counting device that measures speed and several other variables was borrowed from the FHWA and installed to first determine if a speeding problem did exist and then to record the time of day of the speeding problem. If, for example, the device recorded five vehicles over the speed limit from 4:30 to 5:00 pm, the police department would send an officer during that time period to enforce the speed limit.

Schlickman says the team's current priority is determining incident managment detours around the city of Dubuque and Dubuque County. Incident management detours are pre-planned routes to detour traffic around incidents such as hazardous waste spills, accidents, or other incidents that would require long-term road closures. The team has nearly completed all diversion routes in the county and plans to meet with representatives from Illinois and Wisconsin to discuss the effects the proposed strategy would hold for them.

Schlickman says other details still need to be worked out, like who the main contact person will be, what types of detour signs will be used, and where the signs will be placed. An incident management detour would be put into effect for an incident that would take an estimated 8–10 hours or more to clean up.

Campbell says this kind of "meeting of the minds" is the biggest benefit of an MDST. He stresses the importance of the team being multidisciplinary.

For more information about MDSTs, contact Mark Campbell, Governor's Traffic Safety Bureau, 515-281-5430. For information about the Dubuque County MDST, contact Bill Schlickman, City of Dubuque Engineering Department, 319-589-4270.

Getting safety issues on the table and resolved is the main benefit of this safety team . . .

Using automated distress data in quadrennial need study

EVER SINCE the quadrennial need study was first conducted in 1960 to help identify county highway financial needs and distrubute road use tax funds (RUTF) among Iowa counties, funding levels have sometimes fluctuated sharply for individual counties. Omar Smadi, pavement management specialist with the Center for Transportation Research and Education, investigated the use of automated distress data collected for the Iowa Pavement Management Program (IPMP) for paved county roads to support need assessments.

In 1998, the IPMP made it possible for counties to extend the distress data collection to the rest of their paved miles off the federal aid system . . . .

Study methodology

The underlying hypothesis for this study is that IPMP data can be used to support the need study, improve its results, and possibly reduce the volatile fluctuations of funding allocated to counties in consecutive need studies. (Another recent study, which performed a sensitivity analysis of the software system used to support the need study, found that the quality of the pavement condition data collected and the currency of these data affected the volatility in the funding level fluctuations.) The automatically collected data should alleviate the problems created by the inherent subjectivity and the lack of currency in manually collected data.

This study identified a procedure for integrating roadway distress data (or condition data), collected automatically for the IPMP, into the quadrennial need study computer program, HWYNEEDS. Presently, pavement surface ratings collected manually by the Iowa Department of Transportation (Iowa DOT) are used as input data for HWYNEEDS. These surface rating data are collected on a 10-year rotation; each year, surface rating data are collected manually for one-tenth of the entire county road network, resulting in complete coverage every 10 years. For this study, IPMP condition data, collected automatically for all participating roadways on a two-year cycle and providing a more accurate and current measurement of pavement condition, were used as input data for HWYNEEDS.

The IPMP distress data are collected on a two-year cycle, which provides a more accurate and current measurement of pavement condition, which in turn will lead to a better representation of need and funding allocations.

A pilot study area was selected to demonstrate the use of the new distress data; the area consisted of several corridors across several counties covering a variety of environmental conditions. The results showed a substantial difference between total need based on automated distress data ratings, and total need based on the Iowa DOT's manually collected base record condition ratings. Using distress data collected automatically for the IPMP as input for the quadrennial need study was proven to be feasible and beneficial.

Recommendations

Before automated distress data may be fully implemented as input for the need study, however, several issues should be addressed:

- Automated distress data are not collected on all paved roads in the secondary system; data are collected only on the federal-aid-eligible system. Also, three regional planning affiliations (RPAs), which include 15 counties, are not part of the IPMP, and no distress data are available for those counties.
- In 1998, the IPMP made it possible for counties to extend the automated collection of distress data to the rest of their paved miles off the federal-aid system (with additional cost). This will increase the coverage of the IPMP distress data and encourage the rest of the counties to participate in the IPMP.
- Although these changes will encourage full coverage of the paved secondary road system in the IPMP, they do not necessarily mean that all paved secondary roads will be part of the IPMP.

Aside from incorporating IPMP distress data in the HWYNEEDS program, other improvements can be made to the current quadrennial need study process. The study showed that when base record ratings used in the HWYNEEDS program are deteriorated to reflect the first year of the quadrennial need study (using HWYNEEDS deterioration rates), the difference between need based on the automated ratings, and need based on base record ratings, decreases by almost half. Using deteriorated base record ratings should provide better condition assessments, which will lead to a more equitable distribution of funds and fewer shifts in fund allocations.

The previous recommendations deal only with condition data. Improvements should also be made to the HWYNEEDS program itself: the deterioration models, decision trees, and values assigned to a section's condition after a treatment is applied.

Also, the methodology of the HWYNEEDS program needs to be investigated. In two cases during this project, total needs decreased substantially for

DISTRESS DATA . . . continued on page 7

DISTRESS DATA . . . continued from page 6

individual corridors even though surface ratings decreased for the same corridors. A decrease in the surface ratings should result in increased need. The researchers investigated these anomalies and determined that since the HWYNEEDS program only performs a one-year prioritization analysis, it does not consider future condition ratings and future feasible rehabilitation alternatives. This narrows the scope of the analysis and results in less than effective decisions. This is an inherent problem in the software and requires major changes to the HWYNEEDS program or even the selection of a new software system that allows for multi-year prioritization.

For more information, contact Omar Smadi, 515-294-7110, omar@ctre.iastate.edu. The report is available online at http://www.ctre.iastate.edu/bulletin/.

Iowa EMS announces CODES grant

by Richard Harmon, EMS Coordinator, Iowa Department of Public Health

A GRANT TO LINK three sources of traffic-related information has been awarded to the Bureau of Emergency Medical Services (EMS), Iowa Department of Public Health. The 18-month, $238,519 grant from the National Highway Traffic Safety Administration will be used to design, develop, and implement a Crash Outcome Data Evaluation System (CODES) for the identification, collection, and evaluation of data regarding traumatic injuries in Iowa resulting from motor vehicle crashes.

By linking motor vehicle crash, ambulance, and health care records into one record, isolated pieces of information are joined together into a more complete picture. Crash and occupant variables will be related to injury outcomes, allowing access to information about the impact of such risk factors as alcohol impairment or lack of safety belt use on injury type and inpatient charges.

Though crash records provide an estimate of injury severity, only health records capture the location of the injury, the hospital charges, the expected payment source, and the discharge disposition. Conversely, the motor vehicle crash records provide a wealth of information about the nature of the crash and the risk factors for being injured.

The Center for Transportation Research and Education and the University of Iowa Injury Prevention and Research Center will assist in the analysis and application of the linked data to:

- determine acute care charges and severity of injury for use versus non-use of safety equipment in motor vehicle crashes
- determine acute care charges and severity of injury for helmeted versus non-helmeted motorcycle crashes, and crashes involving slow moving vehicles, such as farm machinery
- determine acute care charges and severity of injury among different motor vehicle crash speeds
- determine the validity and reliability of recorded personal identifiers in the traffic records
- provide a research database to communities, EMS regions, EMS agencies, state agencies and research institutes to monitor and evaluate highway safety programs

The goal of CODES is to provide detailed, reliable, and readily accessible information on motor vehicle crash victims. These data will allow assessment of prevention activities, quality of care, and highway safety systems and continued research in the area of motor vehicle crashes.

Information obtained from the CODES data will enable the state to approach the legislature and other governmental bodies in more meaningful ways as Iowa develops laws and public policies dealing with motor vehicle crash injuries.

The Bureau of EMS will coordinate the CODES grant in collaboration with the Governor's Traffic Safety Bureau, the Iowa Department of Transportation's Division of Driver Services, the Association of Iowa Hospitals and Health Systems, the Center for Transportation Research and Education, and the University of Iowa Injury Prevention and Research Center.

For more information contact Dick Harmon, 515-281-5737.

Midwest equipment innovations

Excerpted from an article by Melissa R. Black, Missouri Department of Transportation public affairs specialist

IF YOU MISSED the Midwest Equipment Innovations '98, a multi-state maintenance equipment show September 17 in St. Joseph, Missouri, you missed a lot.

Sponsored by the Federal Highway Administration and the Missouri Department of Transportation (MoDOT), the show featured 60 innovations from the Iowa, Kansas, Missouri, and Nebraska transportation departments.

MoDOT General Services Division Director Clif Jett said, "Transportation field employees develop a lot of new inventions to improve their operations every year. In the past, we didn't have a good way to share these ideas with other states, but this year we decided to create a multi-state show to feature the best of each state's ideas in order to benefit as many agencies as possible." More than 700 transportation agency employees attended.

Ron Stutzel, an Iowa Department of Transportation regional mechanic, said, "We've definitely seen some other ideas we're taking back to Iowa. We really like the employee-made items. Most of the ideas are usable in all states, and I think a show like this is really beneficial because everyone can go home and use these ideas to improve their own operations."

"I think this type of show is great because it makes transportation employees realize that their ideas are special and useful in many different areas," said Thomas Sands, Nebraska Department of Roads fleet manager. "I've already had lots of our guys talking to me about implementing things in Nebraska that they've seen here."

The Missouri Department of Transportation (MoDOT) Culvert Band-It is a super-sized pair of pliers that hooks bands together to join culvert pipes. The pliers fit inside the pipe to open the band and outside the pipe to clamp it down. The Culvert Band-It was designed by MoDOT District 3 Regional Maintenance Supervisor Kevin Barker. It was one of 24 MoDOT innovations featured at Midwest Equipment Innovations '98 held September 17 in St. Joseph, Mo.

Photos courtesy of Mike Wright.

Innovations displayed

Iowa Department of Transportation

- recirculating crack fill wand
- standard crack fill wand
- recirculating hose within a hose
- anti-ice sprayer
- taillight air puffers
- tailgate air foil
- crash barrels filled with water or sand
- new dump truck

For more information about Iowa's innovations, contact Iowa DOT Maintenance Equipment Technician Brad Osborne, 515-239-1556.

Kansas Department of Transportation

- cone setting platform
- glass bead transport truck
- sign trailer
- tail light air blaster
- front mount post hole digger
- light for nighttime flagging
- spreader lifting bar
- sign rack system
- crash attenuator with "V" box spreader
- edge rut disk
- gate within a tailgate
- trailer plug tester
- step inside dump bed
- Z-piece sign system
- signing/attenuator truck
- cone hauling device (front plow mount)
- new dump truck

For more information about Kansas' innovations, contact KDOT Equipment Engineer Tim Cunningham, 785-296-3661.

Missouri Department of Transportation

- underbody plow remover
- modified aggregate spreader
- salt brine mixing system
- culvert band-it
- salt brine mixing trough
- salt brine spreader
- portable bridge
- brush and limb cutter
- rear sign rack
- stump puller
- bridge washer
- chip spreader
- clockwise mower
- hood protector
- sign carrier
- sign trailer
- center of gravity markers
- drive-on jack for tractors
- experimental hydraulically powered sick mower
- delineator repair tool
- snow plow jack
- sign repair unit
- dump truck mounted striper
- edge rutting repair machine
- new dump truck

For more information about Missouri's innovations, contact MoDOT General Services Director Clif Jett, 573-751-2838.

Nebraska Department of Roads

- DoAll truck with zero velocity spreader
- dump truck with 1,000 gallon tank and dual spray bars (sodium chloride)
- distance measuring instrument (pickup and trailer)
- DoAll truck with tanks (anti-icing system)
- shouldering machine
- steel sign post step
- trailer with propane heater (cold mix heater)
- magnesium chloride tank and spray bar mounted on pickup
- field mechanics work truck with hoist and vice
- crack pouring machine
- pavement tape dispenser
- pavement tab dispenser
- pavement tab pulled
- new standard dump truck with snow plow and sander

For more information about Nebraska's innovations, contact NDOR Fleet Manager Tom Sands, 402-479-4355.

The Nebraska Department of Roads' (NDOR) Pavement Tape Dispenser, one of 13 NDOR innovations, places pavement markings during patching or armor-coating. The dispenser saves a lot of time and energy because no manual cutting or placement is involved.

The Edge-Rutting Machine was designed and manufactured by the MoDOT Mendon maintenance crew to enable one person to fill edge ruts, low spots over culverts, and potholes. The machine has netted an increase in production of up to 600 percent in patching-related tasks since its invention in February 1998.

safety short

Share the road

by Tom McDonald, Safety Circuit Rider

A NEW WARNING sign is beginning to appear on our streets and highways here in Iowa as well as across the nation.

"Share the Road" warning signs were described by the Federal Highway Administration (FHWA) in the Federal Register almost two years ago, but only recently have these signs started coming into use.

The small 18-inch by 24-inch rectangular signs are designed to be used as a supplement to other warning signs such as farm machinery, bicycle, pedestrian (MUTCD designations W11-5, W11-1, and W11-2, respectively), or other larger warning signs which might be erected to advise motorists of potential conflicts with other slower moving roadway users. FHWA surveys and studies have indicated a very high recognition of meaning for this sign's message and appropriate driver response.

We all know that vehicles traveling at different speeds result in more potential conflicts. Installation of this newly approved warning sign where appropriate should heighten awareness of motor vehicle drivers to possible encounters with slower moving roadway users and of the need to share the road with other transportation modes.

If you have streets or roads in your jurisdiction where travel by agricultural machinery, bicycles, or even pedestrians is a common occurrence, you might want to consider installing some "Share the Road" supplements; see Section 2C-39 of the MUTCD.

Drivers and bicyclists are warned to share the road in Iowa City. Photos courtesy of John Yapp, assistant transportation planner in Iowa City.

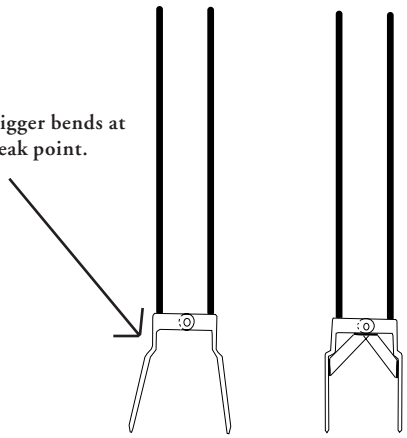
tip from the field

Beef up your post hole digger

KENT W. KREGEL, a maintainer operator with the Allamakee County Highway Department, recommends a simple fix for post hole diggers that tend to bend at their weak points, causing the blades to bend outward.

Disassemble the digger and straighten it in a press. Then weld steel strap braces (1 inch by 1/8 inch by whatever length you need) to the digger from the pivot bolt area down to the blade rivet area.

For more information, contact Kent W. Kregel, 319-568-2736.



conference calendar

January 1999

21	Advanced Construction Inspection Workshop	Carroll	Sharon Prochnow, 515-294-3781
26	**Asphalt Paving Conference**	**Ames**	**ISU Extended and Continuing Ed., 515-294-6222**

February 1999

17–18	Traffic Signal Workshop	Ames	Duane Smith, 515-294-8103
24–25	**Traffic Signal Workshop**	**Cedar Rapids**	**Duane Smith, 515-294-8103**

March 1999

16–17	National Workshop on Sign Vandalism	Kansas City, Mo.	Duane Smith, 515-294-8103
31	**Signing Conference**	**Ames**	**Tom McDonald, 515-294-6384**

April 1999

1	Soil Construction Workshop (in conjunction with APWA Spring Conference)	Ames	Duane Smith, 515-294-8103
1–2	**APWA Spring Conference**	**Ames**	**Duane Smith, 515-294-8103**
19–20	Summer Maintenance Expo	Ames	Duane Smith, 515-294-8103

Signing conference

March 31, 1999
Scheman Building
Ames, Iowa

A NEW ONE-DAY conference on signing has been developed to inform transportation professionals about the importance of and need for proper signing. Conference topics will include

- MUTCD standards and revisions
- history and development of signing
- sign fabrication
- sign sheeting
- installation practices
- material inventory and management
- sign management software program essentials
- signs and supports
- reflectivity standards and inspection procedures

Registration materials will be in the mail soon. For more information about the conference, contact Tom McDonald, Safety Circuit Rider, 515-294-6384.

Signing don'ts

IF YOU'RE A DRIVER trying to figure out which way to turn, the numerous highway signs and arrows in Figure 1 may do more harm than good. The same is true for the street sign hiding behing the utility pole in Figure 2. Also in Figure 2, the stop sign is significantly faded, especially when compared with the 4-way sign beneath it. Drivers would recognize and understand the yield sign in Figure 3, but the proper yield sign is no longer yellow and black—it's red and white. But if drivers can't even see the sign, like the stop sign playing peekaboo with the tree and mailboxes in Figure 4, their safety may be compromised.

Figure 1

Figure 2

Figure 3

Figure 4

Update your mailing address

_____ Add me to your mailing list.

_____ Delete me from your mailing list.

_____ Address correction.

Name _____

Address _____

City/State/Zip _____

Organization _____

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