

TECHNOLOGY NEWS

roads / bridges / transit

Transportation technology transfer for Iowa's local governments

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How low can you go?



THE CITY OF DAVENPORT has been experimenting with a simple, low-cost warning device to prevent high-profile vehicles and trucks from hitting the railroad bridge over Kirkwood Boulevard.

Plastic warning tubes were attached to a cable strung across Kirkwood Boulevard, a four lane divided residential street with a posted 25 mph speed limit. City Traffic Engineer Jon Krieg says the tubes "create a visual thing for drivers." They see how low the bridge actually is in a way that height warning signs don't convey. The sign near the warning tubes tells drivers that if they hit the pipes, they will hit the bridge.

Between 1994 and October 1997 before the warning tubes were installed, 34 vehicles hit the railroad bridge, causing virtually no damage to the bridge but over \$230,000 damage to the vehicles. Since the warning tubes were installed October 13, 1997, no accidents have been reported.

During the city's first attempt at constructing the warning tube device, the tubes were lengths of PVC pipe. Krieg says the city experienced some problems with kids vandalizing the tubes by beating on them like piñatas. After the city switched to plastic delineator posts, there has been no breakage.

The tubes are placed 300-500 feet before the bridge so drivers have room to turn around. To install the warning tubes, city workers strung 1/4-inch

aircraft cable between existing utility poles where possible. The tubes are hung from aircraft cable at the top only.

The cost breaks down like this:

- two utility poles (installed), \$800 x 2=\$1,600
- aircraft cable, \$.50/ft x 50 ft=\$25
- 4-inch polyethylene tubes, \$20 x 5=\$100
- total materials cost=\$1,725

The new warning system took two men four hours each to install with the use of a boom truck.

Krieg says that the city wanted to try out this system on one of its own streets first to see how it worked. Another low railroad bridge across Highway 61 in Davenport is a "truck eater," Krieg says. The success of the Kirkwood Boulevard warning system may persuade the Iowa Department of Transportation to install a similar system on Highway 61.

For more information about the warning tubes system, contact Krieg, 319-326-7754. ■

Thanks to Jack Latterell, retired from the Iowa Division Federal Highway Administration, for suggesting this story. If you have an idea for a story, see the back page.



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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Center for Transportation
Research and Education
2625 N. Loop Drive, Suite 2100
Ames, Iowa 50010-8615
Telephone: 515-294-8103
Fax: 515-294-0467
<http://www.ctre.iastate.edu/>

Tom Maze
Director
tom@ctre.iastate.edu

Duane Smith
Associate Director for Outreach
desmith@iastate.edu

Marcia Brink
Editor
marcia@ctre.iastate.edu

Tom McDonald
Safety Circuit Rider
tmcdonald@ctre.iastate.edu

Sharon Prochnow
Program Coordinator
sharon@ctre.iastate.edu

Stan Ring
Library Coordinator
stan@ctre.iastate.edu

Michele Regenold
Assistant Editor
michele@ctre.iastate.edu

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Reducing traffic delays due to construction



IN THE LAST FEW YEARS researchers from Iowa State University have experimented with nondestructive methods for determining the strength of new PCC pavement. One method—maturity testing—has given highway officials a way to reduce traffic delay due to PCC paving from 7 to 14 days to only 1 or 2 days for car traffic.

According to James Cable, associate professor of civil and construction engineering at ISU who conducted the studies, maturity testing is based on the concept that PCC strength can be expressed as a function of cure time and pavement temperature. Here's how it works:

First a maturity-strength relationship is established for a particular mix. At the beginning of a construction project, several flexural test beams are cast. Thermocouple wire for measuring temperature is embedded in one control beam. The strength of the other beams is measured one by one at regular intervals by traditional destructive methods. The strength is correlated to the "maturity value" of the control beam (under a time-temperature curve), and a maturity-strength baseline curve for the PCC mix is established.

The curve can be established while concrete is being placed. Temperature probes are installed at specified depths every 500–1,000 feet in the new pavement. Using the baseline curve, temperature readings from the probes predict pavement strength. Additional destructive tests of flexural beams from the site are unnecessary.

Pavement temperatures are read near the surface to determine when to saw transverse joints, and at midpavement depth to determine when to open the roadway to cars (350 psi flexural) and construction traffic (500 psi flexural).

Maturity testing can be useful to local governments whenever roadway construction is extremely inconvenient to motorists—at private driveway entrances, for example. Council Bluffs City Engineer Greg Reeder has been using maturity testing for three years. "The biggest advantage," he says, "is the acceleration of construction time, especially where people are cut off from their homes and businesses."

The city sets the probes and does the temperature testing. "It's not very time consuming," Reeder says. "Sometimes the probes get yanked out by the fin-

isher or even by kids, so be careful where you locate the probes."

Reeder has one other caution: "Your concrete supplier has to be on board," because the supplier has to establish the curves at the start of the project and whenever the mix changes.

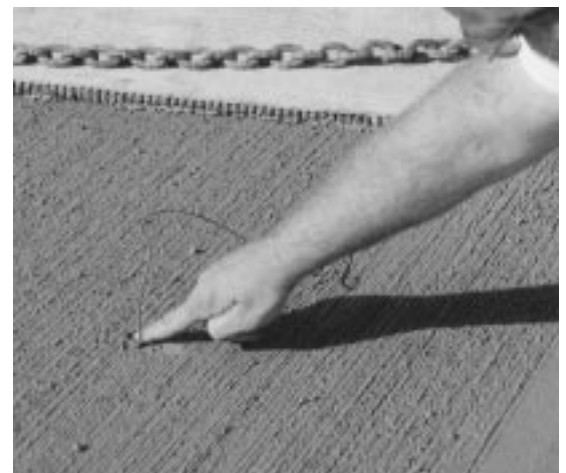
Jason Spooner, construction supervisor for Manatt's Inc. of Ames, says Manatt's has used maturity testing on several projects. "We were pretty skeptical at first. But this is our second season using it, and it's been very reliable."

In 1997 the Iowa DOT revised its specifications to allow wider use of maturity testing. See Iowa DOT specification "Mtls. I.M. 383" dated May 2, 1997.

For more information about the study, contact Cable, 515-294-2862, jkcable@iastate.edu. He presented his research at the Crossroads 2000 transportation conference in August 1998; the paper is printed in the conference proceedings and can be accessed online at www.ctre.iastate.edu/pubs/crossroads/149using.pdf. (This file is in pdf format and requires Acrobat Reader to be opened. Acrobat can be downloaded free at www.adobe.com/prodindex/acrobat/readstep.html.)

This study was supported by the Iowa Highway Research Board (HR-380). For a copy of the final report, contact CTRE's librarian, Stan Ring, 515-294-9481, stan@ctre.iastate.edu. Ask for publication P1314. ■

Under contract with the City of Ames, Manatt's is currently reconstructing East Thirteenth Street and using maturity testing on the PCC project. Here a thermocouple probe is placed in wet PCC mix.



New CTRE staff: resources for local agencies



DAN GIESEMAN has joined CTRE as transportation systems analyst. He has a master's degree in transportation from Iowa State University and works out of the center's GIS-T (geographic information systems for transportation) laboratory.

Dan is developing many GIS-based tools that will be important for local transportation agencies. One tool will help law enforcement officers locate crashes and look up location attribute data. Another tool allows users to import GPS data collected in the field into Geomedia, the Iowa Department of Transportation's desktop GIS software package. Other tools help Iowa DOT users access and work with the department's GIS data. Dan is also working on a project to provide water and sewer information to Iowa's decision makers to support decisions concerning infrastructure investments.

CTRE staff became well acquainted with Dan during his graduate assistantship at the center and are delighted to have him around full time. Welcome, Dan. ■■



CTRE ALSO WELCOMES Keith Knapp. Keith has a split appointment with CTRE, where he manages traffic engineering and traffic safety programs, and ISU's Department of Civil and Construction Engineering, where he is an assistant professor.

Keith has a Ph.D. in civil engineering from Texas A&M and has spent several years as a transportation engineer for CH2M Hill, Inc. The majority of his background includes systematic functional analysis of design-related impacts at a roadway corridor level, including the operational and safety impacts of new developments, traffic control, signing, and marking. In addition, he has a special interest in the systematic analysis (supply, demand, and design) of parking—the sometimes forgotten, but always important, land-use/transportation connection.

Keith's overriding principle in transportation work is that of "perpetual impact": Any project, no matter how small, will have positive and negative impacts, and it is our job to identify the impacts before they occur. ■■

LTAP Advisory Board

The people listed below help guide and direct the policies and activities of the Center for Transportation Research and Education's Local Technical Assistance Program (LTAP). The board meets at least annually.

Contact any of the advisory committee members to comment, make suggestions, or ask questions about any aspect of LTAP.

Saleem Baig
Local Systems
Iowa Department of
Transportation
Telephone: 515-239-1051

Gary Fox
Traffic and
Transportation Director
City of Des Moines
Telephone: 515-283-4973

Kevin Gilchrist
Senior Transportation Planner
Des Moines Metropolitan
Planning Organization
Telephone: 515-237-1316

Neil Guess
City Engineer
City of Newton
Telephone: 515-792-6622

Becky Hiatt
Iowa Division, Federal
Highway Administration
Telephone: 515-233-7321

Raymond Holland
City Engineer
City of Bettendorf
Telephone: 319-344-4055

Harold Jensen
Story County Engineer
Telephone: 515-382-6581

Larry Jesse
Local Systems
Iowa Department of
Transportation
Telephone: 515-239-1528

Bob Sperry
Webster County Engineer
Telephone: 515-576-3281



Center for Transportation
Research and Education

IOWA STATE UNIVERSITY

Iowa's pavement management program: an update

by Omar Smadi, Pavement Management Specialist

This is the sixth in a series of periodic articles updating Iowa's local government agencies on the progress of the state's pavement management program. Iowa's pavement management program covers all of Iowa's non-National Highway System (non-NHS) federal aid eligible roads under state, county, and city jurisdictions.

of completion. Most of the project's major tasks (GIS database, data collection, pavement management software, and data delivery) have been implemented, and the remaining tasks (pilot training programs and system evaluation) will be completed by the end of 1998.

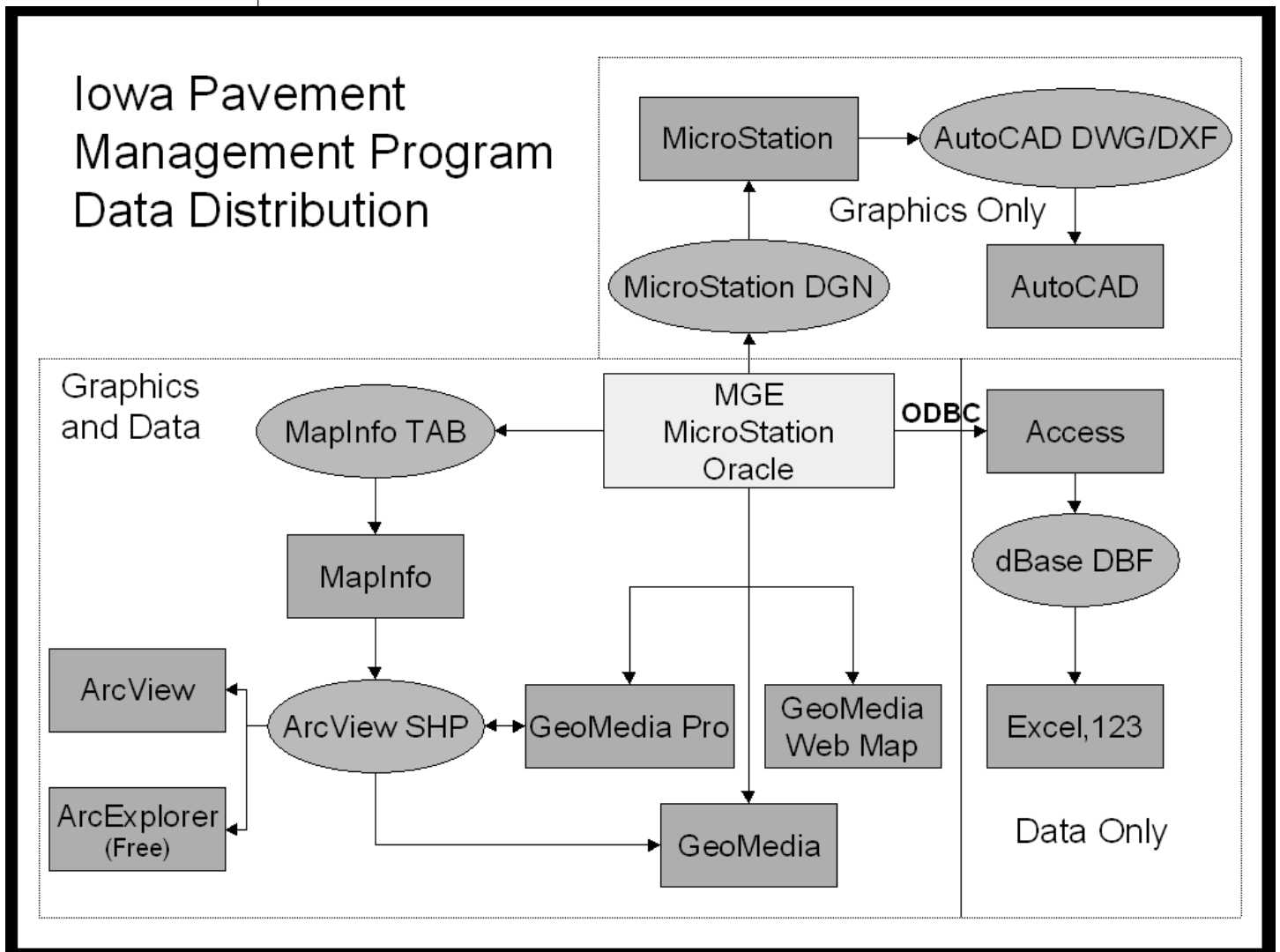
Some IPMP tasks will continue on an annual basis. These tasks include collecting automated condition information, maintaining and updating the GIS database, and delivering information. The following sections will cover each of these tasks.

Collecting data

The first cycle of condition data collection was com-

Three formats for data delivery include GIS (data and graphics), CAD (graphics only), and database (data only).

Iowa's pavement management program (IPMP), under development since 1994, is in the final stages



pleted in 1997. Roadware, Inc. collected condition data for 12 RPAs and all of the MPOs in the state between 1996 and 1997. In the beginning of 1998, a survey was sent to the remaining RPAs, and three of them decided to join the IPMP (10, 11, and 17). The second cycle of data collection started in the summer of 1998 and should be completed by the end of November.

RPAs 2, 3, 4, 6, 7, 12, and 18 will have condition data again this year, while RPAs 8, 9, 10, 11, 14, 15, 16, and 17 will have condition data collected in 1999. Also during 1999, we will conduct another evaluation of the automated distress data collection technology to determine if Roadware will remain the vendor to provide distress data to the IPMP.

Updating the database

The IPMP GIS database had been fully designed and implemented. Annual maintenance and update of the database is an integral part of the IPMP.

The GIS database must be updated with new Iowa DOT base records and new graphics at least once a year. As more distress data become available, the IPMP database is updated with the new information, and dynamic segmentation is run to summarize the information for individual pavement management sections. Finally, as rehabilitation and reconstruction projects are completed, the IPMP database will reflect those changes to the system. This is going to be an ongoing process to ensure the validity and accuracy of the IPMP database.

Delivering the data

The IPMP task force has established a mechanism for delivering and distributing the data. Data can be delivered in three formats: GIS (includes data and graphics—Geomedia, Mapinfo, Arcinfo), a CAD environment (graphics only), or a database (data only) where it can be converted to a spreadsheet or any other required format.

The schemata on page 4 shows the different options for IPMP data delivery.

A data delivery workshop will be held each year to discuss project progress, get input from local and regional governmental agencies, and deliver the collected distress data. Currently, the plan is to distribute data via CD-ROM. Agencies without

access to a CD-ROM drive will be accommodated by other means.

IPMP operations: your input is needed

As the IPMP went into the operation phase, local and regional governmental agencies were asked to provide information on two operational features of the IPMP. The first one is the purchase of the pavement management software, and the second is the collection of condition data on paved roads off the federal aid system.

The Iowa DOT, local, and regional governmental agencies were asked to make a decision regarding the purchase of the pavement management software early in the summer of 1998. So far, the majority of agencies have not responded.

To finalize the contract negotiations with the software vendors, we need to get a firm idea about how many agencies are interested in purchasing the software. The initial cost of the software depends on the number of users.

The two software selected are dTIMS from the Deighton company and FNOS from VEMAX. dTIMS is a project selection tool, while FNOS is more of a network level tool.

Local governmental agencies were also given the option of collecting, on the rest of their paved network, the same automated distress data collected on the federal aid routes. There was a very good response from cities and counties wanting to participate. This option is still available for cities and counties.

Data collection will cost about \$35 for rural areas and \$50 for urban areas if it can be done while the vendor is in the area collecting data on the federal aid system. So, if your city or county is in an RPA that is not part of the IPMP, we will not be able to offer these costs.

For more information on the IPMP, contact Omar Smadi, 515 294-7110, omar@ctre.iastate.edu. ■

Useful WWW links

www.cals.cornell.edu/dept/aben/localroads/intro.htm

This work zone safety and flagging tutorial was developed by Cornell in New York. (Differences between the New York MUTCD and the federal MUTCD are clearly noted.)

www.tfhr.gov/its/newarts.htm

This collection of research projects in the Advanced Rural Transportation Systems Compendium includes projects across the country.

www.ota.fhwa.dot.gov/walk/index.html

The Pedestrian Safety Roadshow site provides facts, links, a bulletin board, and a way to request that the Roadshow come to your area to give a presentation.

www.asphaltpages.com

This index of 1,500 links to public and private organizations is a good place to start if you're looking for information about asphalt.

www.iceasb.org

The Iowa County Engineers Association Service Bureau is online.

Do the math!

- 450** traffic cones (courtesy of Iowa DOT, City of Clive, City of West Des Moines)
- 80** contestants
- 40** teams
- 32** judges
- 6** snow plow trucks (courtesy of City of Ames and City of Clive)
- 2** motor graders (courtesy of City of West Des Moines; Ziglar Cat, Des Moines)
- 2** back hoes (courtesy of Midland Equipment (John Deere), Ankeny; CMI, (Case) Ankeny)
- 2** end loaders (courtesy of Midland Equipment (John Deere), Ankeny; CMI, (Case) Ankeny)
- 2** driving courses
- 1** great Roadeo to hone operators' skills before the snow sets in!

All-new snow "roadeo" lassos record attendance



First-place winners Nicky Witt (left) and Chris Legvold from Oskaloosa enjoyed this year's new, tougher course.



"IT WAS A CHALLENGE TO DRIVE," says Chris Legvold about the expanded driving course at Iowa's 9th annual Snow Plow Roadeo. "It was harder this year, but it was a lot more fun."

Legvold and his partner Nicky Witt from Oskaloosa drove away from the September 1 roadeo with first-place trophies. In the final minutes, their total scores on the driving course, written exam, and vehicle defects location exercise beat out last year's winning team from Cedar Rapids, along with 38 other teams.

This year's roadeo attracted a record number of contestants. They navigated several new legs in the driving course, including a hammerhead turnaround, a row of mailboxes, and a cul-de-sac.

The more challenging snow plow course was not the only new attraction. For the first time, the roadeo included a course for motor graders. This non-ground engaging competition simulated daily job

requirements like preparing road surfaces and shoulders, improving drainage, and removing snow.

Roadeo planners hope to make the motor grader competition a regular part of the roadeo.

Also on hand for the first time this year were back hoes and end loaders. Contestants tried their skills maneuvering this equipment to accomplish various tasks.

At the end of the day, participants recognized the contributions of Willard Wray, Clive Public Works Director. Wray, who will retire in January 1999, has been instrumental in promoting and improving Iowa's Snow Plow Roadeo.

Happy retirement, Willard. Thanks for your dedication to the roadeo! ■

New this year: a course for motor graders.





The ninth roadeo may be his last. Willard Wray, organizer extraordinaire, will retire in January 1999.



A contestant from Davenport inspects a truck for defects.



A row of mailboxes presented a new challenge on the snow plow course.

More than just a good time

THE SNOW PLOW ROADEO is a valuable training event for equipment operators. Some jurisdictions set up practice driving courses before the roadeo. The roadeo itself reinforces the skills and knowledge needed by drivers:

- A written test uses questions from the commercial driver's license exam.
- A defects drill tests drivers' ability to conduct a routine inspection of a snow plow.
- The driving course simulates actual driving conditions.

The roadeo is also a valuable public relations event. Participating agencies demonstrate their commitment to safe, efficient snow removal.

If someone from your shop participated in the roadeo, be sure to send a news release to your local newspaper and radio station. ■

Last year we told you about the Iowa Department of Transportation's advanced technology snow plow truck. It's been through one winter now; here's how it performed on the job.

High tech snow plow: An update



IN 1996 the state departments of transportation in Iowa, Michigan, and Minnesota talked with the people who operate and maintain snow plow trucks to learn what would make their work easier and more effective. The DOTs took those suggestions and designed, assembled, and tested an advanced-technology winter maintenance vehicle for each of the three participating states.

The winter of 1997-98 was the first test phase for the vehicles. The Iowa Department of Transportation's (Iowa DOT) prototype snow plow truck maintained I-35 from the I-35/I-80/I-235 interchange north to the Highway 210 interchange.

In addition to plowing and applying chemicals and abrasives, the vehicle automatically collected data for researchers through the air/pavement temperature sensor on the driver's side mirror and a friction meter behind the underbody blade. The global positioning systems (GPS) equipment recorded the truck's location every five seconds. All of this data was stored in the on-board PlowMaster computer, which, in later phases, will automatically adjust the application of materials for current road and weather conditions.

How did the advanced technology perform?

The concept vehicle combined several technologies that weren't necessarily designed for the harsh

environment of winter maintenance activities, and some of the technologies did not always work perfectly. The friction meter, because of its location near the road surface, accumulated salt and grit, and the temperature sensors were sometimes wrong. Malfunctioning equipment didn't prevent the operators from getting their work done, however. Drivers reported that they were still able to operate the truck at or above the same level of service with which they operated conventional snow plows.

The variable speed material applicators, which are used on some of the Iowa DOT's other maintenance trucks, worked well, drivers said. They were able to set the prescribed amount at a given speed, and the applicator compensates for speed changes. One suggestion was to move the material applicator controls so they can be used while the truck is in motion.

The PlowMaster computer was user friendly and easy to read, drivers said. The screen could be dimmed or brightened and information could be called up quickly.

Drivers reported that after they became familiar with the technology, they were able to use it with relative ease. The additional technology allowed them to focus more of their attention on the road, and it made drivers more efficient than with standard plows.

What will be done differently in the future?

Some changes and modifications are planned for the vehicle's technology for the winter of 1998-99. The vehicle will be fitted with differential GPS because of its greater location accuracy, usually within five feet, compared to conventional GPS, which can be off by as much as 100 feet. A collision avoidance system

may be added as well as additional sensors to collect even more weather data. Drivers may temporarily use cellular phones to transmit PlowMaster data to the base station. Eventually the cell phones will be replaced with radio communications.

Researchers at CTRE are identifying methods to quantify the benefits of the new technology, particularly materials costs, labor costs/savings, and safety.

For more information about the project, contact Bill McCall, CTRE's associate director for advanced transportation technologies, 515-294-8103, bill@ctre.iastate.edu. ■



Training • Training • Training • Training • Training

Invest in training

YOU'RE SHORT STAFFED and over budget. How can you spend the money and take employees away from their jobs for training?

Consider the benefits

- **Save money.** Learn the latest money-saving improvements in methods and technologies. Comply with the latest regulations. Make fewer costly mistakes. Work more efficiently.
- **Save time.** Well trained staff work smarter. Their supervisors can spend less time micromanaging and more time on their other duties.
- **Improve employee morale and performance and reduce turnover.** Employees given opportunities to improve their knowledge and skills have high job satisfaction. They feel like part of the team, become more innovative and involved in the overall goals of their business.

LTAP makes it easy

CTRE's Local Technical Assistance Program (LTAP) and Iowa State University Extension offer dozens of one-day, free or low-cost transportation-related courses. See the Safety Short (page 10) and the Conference Calendar (page 11). Also check CTRE's online workshop calendar at www.ctre.iastate.edu/Outreach/Conferences.CFM.

In addition, the LTAP library has a variety of resources for conducting training right in your own shop or office. See the training packages listed in your catalog, or search for topics in the online catalog (www.ctre.iastate.edu/Outreach/ltap/library/search.cfm).

Training is not an expense; it's an investment. ■

Winter operations training—in your own shop

THE IOWA DEPARTMENT OF TRANSPORTATION has produced a series of four excellent videotapes covering winter operations. Each of the 10- to 30-minute videos covers one topic:

- review of snow and ice removal equipment
- a step-by-step approach for conducting pre-season check of snowplow trucks and all mounted equipment
- thorough overview of daily equipment checks, proper radio procedures and protocol, and clothing for winter operations
- basic snow plowing techniques and procedures for clearing two-lane and multiple-lane roadways, including special techniques for intersections, bridges, railroad crossings, ramps, gores, curbs, and islands

To borrow the series, contact CTRE's librarian, Stan Ring, 515-294-9481, stan@ctre.iastate.edu. Ask for V563 through V566. ■

Sign me up

NEED TO TRAIN your employees about proper signing practices? Just give Safety Circuit Rider Tom McDonald a call.

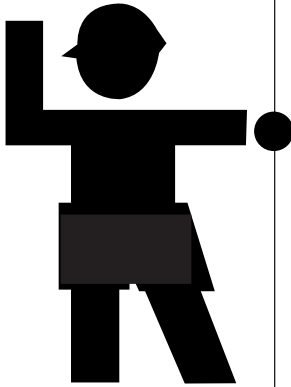
He'll present a four-hour program about signing including MUTCD requirements, sign inventory and management systems, vandalism and markings, and examples of current practice. You may schedule the workshop when and where it's convenient for you and your staff. And like the popular flagger workshops, this workshop is presented at no charge to your agency.

All Tom needs from you is

- a meeting room
- a VCR
- a television
- a projection screen
- up to 20 employees

All workshop participants will receive a certificate of completion.

To schedule a signing practices workshop or for more information about it, contact Tom McDonald, Safety Circuit Rider, 515-294-6384, tmcdonald@ctre.iastate.edu. ■



Safety training for 1998-99

by Tom McDonald, Safety Circuit Rider

RECENTLY the Center for Transportation Research and Education (CTRE) furnished an interest questionnaire to Iowa cities and counties to gather information on safety training needs. These data will be helpful in establishing a training schedule for the coming year and for developing new workshops and seminars.

Response to the questionnaire has been very good, with most interest shown in the following areas:

Back hoe safety

This would be a new workshop developed similarly to the successful and popular motor grader safety workshop. One of the key factors in the motor grader program's effectiveness has been the involvement and presentation assistance of experienced operators. To achieve comparable success with back hoes and/or end loaders, participation of an experienced operator is vital. Information provided in manuals and videos can be instructional, but nothing substitutes for the advice of someone who has actually experienced the problems and concerns of the workshop participants.

Chain saw safety

Numerous cities and counties expressed an interest in this presentation. We are currently working with a popular vendor to begin scheduling these workshops yet this fall.

Excavation safety

This workshop will be presented by Dr. Jack Mickle, ISU professor emeritus of civil engineering. We expect to schedule at least one presentation this fall, probably in eastern Iowa.

Signing practices for local governments

This subject has received the most replies from both the CTRE questionnaire and a survey by Steve DeVries at the County Engineers Service Bureau. In response, we have begun scheduling four-hour workshops in various locations around the state.

Flagger safety

Numerous respondents indicated a desire for this

popular workshop and scheduling has begun for this season's presentations.

Other opportunities for safety training for your employees will also be available at CTRE, and we are always interested in discussing your individual needs. If you haven't filled out and returned your interest questionnaire or need another copy, please contact Tom McDonald, Safety Circuit Rider, 515-294-6384, tmcdonald@ctre.iastate.edu. It is online at www.ctre.iastate.edu/outreach/survey/surveyform.cfm ■

Walkable communities workshop

November 2, 3, and 4, 1999

Council Bluffs, Ames, and Bettendorf, Iowa, respectively

CREATING A WALKABLE COMMUNITY is the focus of a new one-day workshop scheduled for November 2, 3, and 4 in Council Bluffs, Ames, and Bettendorf.

A walkable community is a city or town in which shops, parks, schools, and business and residential areas can all be accessed safely by pedestrians while also accommodating motorists. Participants in this workshop will include transportation professionals, educators, police, safety specialists, merchants, and all interested citizens and professionals who care about pedestrian safety.

Through local case studies and regional and national examples, participants will learn how to revitalize downtowns, suburban highways, neighborhoods, and school zones to be pedestrian friendly.

The workshop presenter, Dan Burden, was the pedestrian and bicycle coordinator with the Florida Department of Transportation for 16 years. He is currently conducting pedestrian research projects for the Federal Highway Administration.

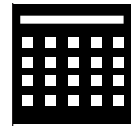
To receive a registration brochure, contact Sharon Prochnow at the Center for Transportation Research and Education, 515-294-3781, sharon@ctre.iastate.edu. ■

Back hoe trainer needed

IF ANYONE has an operator who would be interested and available to assist in the presentations at a back hoe and/or end loader safety workshop, please contact Tom McDonald at CTRE as soon as possible.

We can work together to assure that the time commitment would not interfere with normal duties. Thanks for any help you can offer in this area. ■

Training • Training • Training • Training • Training



conference
calendar

November 1998

2	Walkable Communities Workshop	Council Bluffs	Tom McDonald, 515-294-6384
3	Walkable Communities Workshop	Ames	Tom McDonald, 515-294-6384
4	Walkable Communities Workshop	Bettendorf	Tom McDonald, 515-294-6384
4	ASCE Transportation Conference	Ames	ISU Extended and Continuing Ed., 515-294-6222
5	Better Concrete Conference	Ames	Duane Smith, 515-294-8103
9	ASCE Structural Design Conference	Ames	ISU Extended and Continuing Ed., 515-294-6222
10	ICPA Concrete Pavement Restoration Workshop	Council Bluffs	Duane Smith, 515-294-8103
12	ICPA Concrete Pavement Restoration Workshop	Des Moines	Duane Smith, 515-294-8103
13	ICPA Concrete Pavement Restoration Workshop	Davenport	Duane Smith, 515-294-8103

December 1998

1	ICEA Winter Conference	Ames	Duane Smith, 515-294-8103
15	Excavation Safety Workshop	Coralville	Tom McDonald, 515-294-6384
17	Iowa Quality Initiative Conference	Ames	ISU Extended and Continuing Ed., 515-294-6222

January 1999

6	Basic Construction Inspection Workshop	Ames	Sharon Prochnow, 515-294-3781
7	Advanced Construction Inspection Workshop	Ames	Sharon Prochnow, 515-294-3781
10-14	Transportation Research Board Annual Meeting	Washington, DC	Tom Maze, 515-294-8103
14	Construction Inspection Workshop	Iowa City	Sharon Prochnow, 515-294-3781
15	SLSI Surveyor Workshop	Ames	Sharon Prochnow, 515-294-3781
21	Construction Inspection Workshop	Carroll	Sharon Prochnow, 515-294-3781
26	Asphalt Paving Conference	Ames	ISU Extended and Continuing Ed., 515-294-6222

Managing a small fleet

A NEW TRAINING PACKAGE, including videos and a student notebook, provides an in-house clinic on the fundamentals of small fleet management. Developed by the American Public Works Association, the package is equally helpful for city and county agencies. Six live-session videos cover the responsibilities of the small fleet manager, procuring equipment, evaluating your shop, scheduling work, contracting commercial repairs, and special topics. Examinations are available.

The entire package is available for an extended loan period to give users plenty of time to cover the material thoroughly. If you're interested, contract CTRE's librarian, Stan Ring, 515-294-9481, stan@ctre.iastate.edu. ■

Rural ITS applications

THE THIRD ARTICLE in a series about intelligent transportation systems (ITS) will appear in a future issue of *Technology News* and will cover Iowa's statewide ITS plan, which is being developed.

In the meantime, a recent Federal Highway Administration publication, "Technology in Rural Transportation: Simple Solutions" is a helpful resource for local transportation agencies. The book identifies proven, cost-effective, low-tech solutions for rural transportation needs.

To borrow the publication, contract CTRE's librarian, Stan Ring, 515-294-9481, stan@ctre.iastate.edu. An online version is available on the Internet at <http://inform.enterprise.prog.org> ■

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