

September 1989

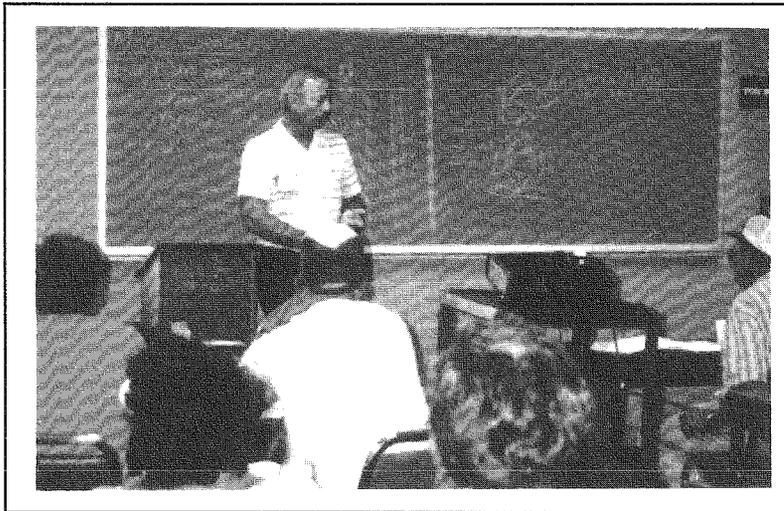
News

T² begins Iowa motor grader course

The Motor Grader Operator Short Course sponsored by The Local Transportation Information Center helps motor grader operators put classroom lessons to work in the field.

The course is for Iowa motor grader operators who work for local governments. It makes them more aware of their equipment's total capability and demonstrates improved grading techniques. The Iowa program is taught by Doug Taggart, Audubon County maintenance foreman, and is similar to the long-successful Nebraska motor grader operator course.

"Thinking back to when I was first learning to operate a motor grader, a program like this would definitely have helped me," Taggart said. "It's a tremendous step for novice motor grader operators because in very rare instances



Doug Taggart lectures on motor grader operation

does the beginning operator get proper training."

Taggart has worked for the county for 23 years. He started on the engineering staff before spending 11 years operating motor graders and heavy equipment. His practical experience and participation in a training course by Nebraska's motor

tor) and John Hansen (Mills County maintenance foreman) have really helped us get started on the right foot."

The course is for the more experienced motor grader operator as well as the beginning operator. In general, the course is designed to improve the skills of all motor grader

grader program instructors made him a good choice for instructor, according to Local Transportation Information Center Manager Tom Maze.

"We're really fortunate that Doug has been able to help us get our motor grader program going," Maze said. "He and assistant instructors Alvin Jansen (long-time Crawford County motor grader opera-

operators. Experienced operators use the course to exchange operating tips, refresh their skills, and learn

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Inside pages

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- 6** "Tips From The Field" shows how to work safely under a raised hydraulic truck bed.

State provides financial help for UST owners

Underground storage tank (UST) owners — including local government agencies — can now apply for financial help from the state to meet new UST regulations from the Environmental Protection Agency.

The regulations require UST owners to cleanup any existing leaks, modify tanks, install tank monitors, and establish financial responsibility (i.e. an insurance policy).

The Iowa Comprehensive Underground Storage Tank Fund Board was established in the last legislative session to help small businesses comply with the regulations. Funds are divided into a remedial account, a loan guarantee account, and an insurance account. Local governments may apply for either remedial or insurance funds, but not for loan guarantees. Since complying with the regulations could easily run over a million dollars, these funds are critically important for the small UST owner.

Daniel Winegarden, legal counsel for the Iowa Legislative Service Bureau, wrote in an article for the *Iowa Insurance Quarterly & Securities Report* that "Without state assistance, the federal regulations were expected to directly cause the closing of more than a third of Iowa's

gas stations, with the losses concentrated in rural communities."

Initial funding will come from the sale of bonds. Additional funding will come from an environmental protection charge on petroleum products and part of a yearly registration fee owners must pay for their tanks.

Remedial funds totaling \$6 million are earmarked for cleaning up leaks. For leaks reported between July 1, 1987, and May 5, 1989, the qualifying UST owner may be reimbursed up to 33 percent of the costs. UST owners may be able to recover 75 percent of the cleanup cost for leaks reported after May 5, 1989.

If a small business owner can show that a commercial loan cannot be arranged to finance tank modification, the board will guarantee loans up to 90 percent of the face value. The UST owner must show that an attempt has been made to get a private loan.

All UST owners must be able to show that they will be able to pay for cleaning up any leaking tanks or pipes in the future. One method of establishing financial responsibility is through insurance coverage. The amount of coverage needed ranges from a minimum of \$500,000 per

tank to \$2 million for a site containing more than 100 tanks.

A subsidized insurance program established by the tank fund board will help UST owners establish financial responsibility. The rates begin with a minimum of \$100 per tank or a maximum of \$200. However, the subsidies will be phased out during a five-year period. The insurance rates will go up \$50 to \$100 per year for the first five years before the program is required to become actuarially sound.

Financial assistance from the board will help the UST owner meet deadlines established in the new EPA regulations. Those were effective Dec. 12, 1988, and will satisfy the 1986 amendments to the Resource Conservation Recovery Act. UST owners, including cities and counties, must show financial responsibility by Oct. 26, 1990.

The tougher rules are needed because it is estimated that between 35 and 60 percent of the approximately 3.5 million underground tanks in the country are already leaking and that half of the existing, bare steel tanks will start to leak within 15 years. In brief, all existing tanks must be upgraded with 10 years to meet the new requirements.

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Technology News is published by the Local Transformation Information Center, Iowa State University, ISU Extension — Business and Engineering, 382 Town Engineering, Ames, Iowa 50011 Phone: 515/294-6777

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The preparation of this newsletter was financed through the Technology Transfer (T²) Program. The T² Program is a nationwide effort financed jointly by the Federal Highway Administration and the Iowa Department of Transportation. Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation personnel.

The opinions, findings, or recommendations expressed here are those of the Local Transportation Information and do not necessarily reflect the views of the Federal Highway Administration or the Iowa Department of Transportation.

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Bad shoulders may lead to lawsuits

Two recent national studies (by AASHTO and Transafety, Inc.) found that shoulder defects were among the most common bases for negligence claims against highway agencies. Claims for inadequacies in shoulders ranked second among all claim categories based upon dollar totals for settling claims in a study of highway tort claims against counties in Iowa.

We wrote of problems from edge ruts in *Technology News* in November, 1987. Other claims relating to shoulders include a variety of allegations of negligence in the way that shoulders are maintained.

In several cases in which the writer has been involved, the plaintiffs have alleged that the highway agency was negligent because a shoulder was unstable. This becomes a problem when a vehicle encroaches upon the shoulder, the driver loses control, and then collides with another vehicle upon regaining the pavement. The AASHTO Maintenance Manual (1976), section 3.110 states that "Earth or sodded shoulders should contain a sufficient amount of granular material for stability." Granular material should be added as necessary to fill ruts or soft spots after they appear, but this cannot assure stability. Instability will become a problem after a rain or, in northern climates, in late winter or early spring when the earth thaws. This is especially true on new shoulders or others where vegetative growth has not become well established. The extensive use of chlorides for ice and snow control will further inhibit vegetative growth. In general, efforts should be directed to establishing and maintaining grass cover. Blading, when

Tort Liability

By R. L. Carstens
Professor Emeritus of
Civil Engineering

necessary, should be done lightly enough to leave grass roots in place.

A problem with turf shoulders is the gradual build-up of material that will tend to leave the shoulder too high. At least two suits against the State of Iowa have alleged negligence because a shoulder was so high that water could accumulate on the pavement. Obviously, this should not be permitted to happen. Maintenance standards suggest that

since aggregate-surfaced roads depend to a considerable extent upon the compaction afforded by traffic for stability, the edges are likely to be less firm than the center portion. Consequently, the edges can be likened to a soft shoulder during certain climatic conditions and can contribute to an accident. A solution to this problem is to assure that the graded portion of the road is limited in width and that the shoulders are maintained correctly in the same manner as turf shoulders on a paved road.

In the writer's experience, juries seem to be quite reasonable in deciding cases where a soft shoulder has been blamed for an accident. (They are not very tolerant of

"... the edges can be likened to a soft shoulder during certain climatic conditions and can contribute to an accident. A solution to this problem is to assure that the graded portion of the road is limited in width and that the shoulders are maintained correctly in the same manner as turf shoulders on a paved road."

shoulders should slope away from the pavement at a rate of least 0.04. For turf shoulders, a rate of 0.08 (one inch per foot) is recommended by the AASHTO Maintenance Manual. Water will not accumulate on the pavement with shoulders that are properly shaped and have these cross slopes.

A number of cases against counties have alleged that shoulders on aggregate-surfaced roads were defective. These roads typically are bladed so that there is no clear line of demarcation between the shoulder and the traveled way. However,

edge cuts, however.) Typically, a plaintiff's expert will recite from written policies and guidelines that may establish performance levels that are not attainable in practice. However, juries tend to look for an application of common sense and a reasonable effort to follow guidelines concerning shape and slope.

So, use your common sense when you maintain shoulders. Your trip to court on a shoulder case will not be all that bad, not really fun, but much less unpleasant than would be the case if you fail to use common sense.

VDT's can indirectly affect workers' health

While listening to the news on the way home from work a couple of months ago, the announcer discussed the findings of a study done to determine if radiation emitted from common computer video display terminals (VDT's) has any effect on reproductive problems (i.e., spontaneous abortions, stillbirths, or birth defects). The study found no evidence to show that reproductive problems were caused by VDT's.

Most workstations do emit minor amounts of radiation. A typical desktop VDT has a phosphor layer on the inside of the screen. An electron gun hits the screen and visible light is emitted. The light makes the characters and lines on the screen. This action creates a modest amount of radiation, but it has not been found to be a health hazard.

However, VDT's can indirectly affect a worker's health. Office workers commonly suffer from backaches, eyestrain, burning and itching eyes, neckaches, fatigue, and even nausea from working at VDT's. These ailments have become known as VODS, video operator's distress syndrome, but have nothing to do with radiation from the VDT.

VDT's have become a necessary part of the working environment. It is estimated that half of all U.S. workers will regularly use a VDT by 1997 and as many as 60 percent a few years later. Given that more and more computers are going to appear in the work environment, the important question for VDT users and managers of VDT workers is how to minimize VODS.

Microtechnology

By Tom Maze
Program Manager

The best way of reducing VODS is to improve the working environment.

Most of us have been raised with the notion that more light is always better and that natural lighting from windows is the best type of lighting. That is not necessarily true when working with VDT's. While exposure to bright, outside lighting may have positive psychological effects, outside lighting is likely to create glare and varying light intensity throughout the day.

The relative intensity of lighting at and around the VDT and the workstation is a critical factor. Operators working at VDT's typically look back-and-forth between source documents, drawings, other objects and the screen. In many applications, the screen background is dark to provide good contrast with characters on the screen. If bright lights, windows, bright reflecting tabletops, etc. are within the user's field of vision, the user's eyes must constantly adjust as they move back-and-forth. Constant adjusting in this manner causes eye strain and VODS. The worst case is where bright light sources cause the users to strain just to see the characters on the screen.

So what kind of lighting is best in a VDT environment? The environment should not have so much light that the eyes have difficulty readjusting to the VDT screen. Generally, this level of lighting will seem dim in comparison to most office environments. On the other hand, the

environment should not be so dim that users have difficulty reading source documents. In general, direct lighting, focused on the work area, causes shadows and sharp contrasts. Indirect lighting reflects back to the user from the walls and ceiling and reduces the opportunity for shadows and sharp contrast. If a direct light source is used to improve the readability of source documents, the light should be focused on the document with the light source shaded to keep the direct light out of the user's field of vision.

The workstation should be arranged so that the user does not look directly into a light source with normal eye and head motions. Nor should the VDT or the desk be placed in locations where light sources are likely to reflect on the screen or tabletop into the user's field of vision.

In summary, VDT's are becoming increasingly a part of the modern workplace. They impose no known serious health threat to workers. However, to minimize VODS, the work environment should be designed to reduce the contrast, brightness, and glare related to office lighting. In applications that involve a great deal of watching the screen, a dimly-lit environment may offer workers the best lighting.

I am constantly working at a VDT. All my correspondence, articles, notes, and memos are composed on a computer. Since starting the research for this article, I have disconnected two of the fluorescent light bulbs in my office. I have noticed no difficulty in completing my work and I plan to leave the bulbs disconnected, despite the janitor's attempts to replace them.

First fatal traffic mishap happened in 1905

Iowa's first traffic fatality shocked the community of Hampton back in 1905. And — despite the number of fatal accidents in the intervening years — Iowans are still shocked when a member of their community dies in an accident.

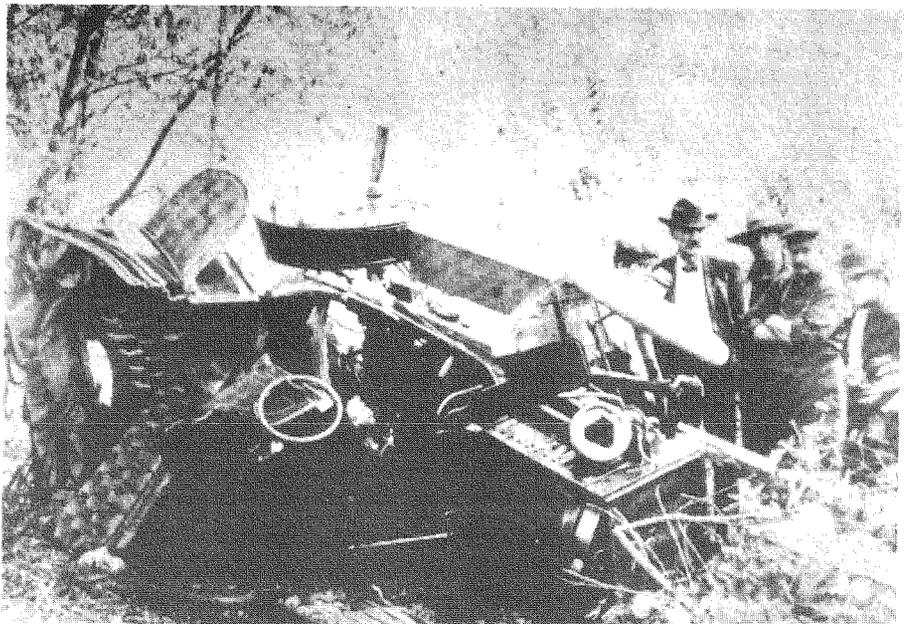
Past Roads

By Dr. Stanley Ring

The following report of Iowa's first traffic fatality is reprinted from *The Hampton Chronicle* of September 30, 1905.

"All Hampton was shocked this morning to learn that attorney Fred A. Harriman had been killed in an automobile accident last evening on his way home from Geneva." "... the machine was running at a very high rate of speed, and when coming down the hill just south of A. D. St. Clair's it must have been going at the rate of 30 miles an hour at least.

"Mr. Harriman was guiding the machine, and owing to the tremendous rate it was going down the hill, he must for a moment lost control of it, as it got off the road grade to the



The aftermath of Iowa's first traffic fatality looks much the same as accidents in 1989.

right about two feet, just before passing over the bridge.

"The fall there was nearly a foot and when the machine struck the bridge it was thrown clear across the bridge and 15 or 20 feet the other side, and the machine turned clear over in the air, and when it landed on the ground it was facing the south, and lying on its right side, and at the bottom of a six-foot embankment.

... "when the machine struck the bridge, the momentum was so great

that Mr. Harriman must have been instantly killed by being struck in the solar plexus by the end of the guide rod (steering wheel by today's terminology)."

This first Iowa auto traffic fatality on what is now US #65 south of Hampton, took the life of a 32-year-old father of two children and was a forerunner of the tragic death toll that has increased through the years.

Motor grader course continued from page 1

better methods from each other, as well as from the course.

"To a degree, most of what we teach is new," Taggart said. "But even if it's something that the operators have heard before, having it refreshed doesn't hurt. Teaching the course is enjoyable, challenging,

and gratifying because we instructors learn a lot, too."

The course has proven popular because it combines classroom lectures with one-on-one training in the field and its instructors have extensive practical experience running motor graders.

The course runs two days. Motor grader techniques are discussed in the classroom during the first day. On the second day, operators put the classroom discussions into practice on their own routes. Course instructors visit each operator to see

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Tips From The Field

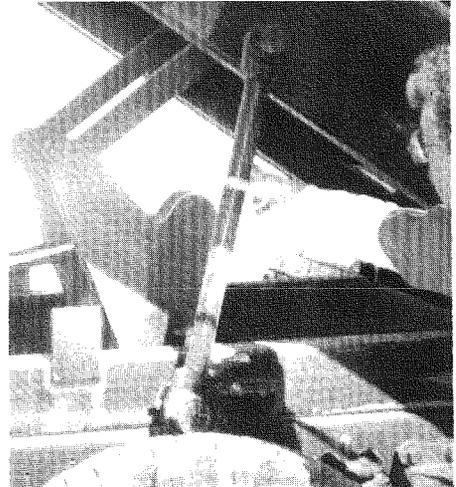
Hoist lever keeps mechanics safe

Working under a raised hydraulic bed can be dangerous. A safety lever that keeps a raised bed in its place will help prevent injuries to operators and mechanics underneath.

"If your trucks do not have this now, you shouldn't go another day without installing them," Clive Public Works Director Willard Wray said. "Too many people have been killed or injured over the years while servicing hydraulic reservoirs or rams."

The rod is solid steel. The same pin used to make the hinge on the bottom of the rod is welded to the truck. When not in use, the rod lays down to the left into a receiving "U" device welded onto the side of the truck. Wray says this device is commercially available through truck distributors.

For more information, contact Willard Wray, City of Clive Public Works Director, 8505 Harbach Blvd., Clive, Iowa 50053 or call 515-223-6230.



Lever keeps workers safe

Underground tank regulations continued from page 2

In general, the regulations require: 1. mandatory cleanup of leaks; 2. the UST owner to be financially responsible for any damage caused by spills and to show proof of that responsibility; 3. that UST owners follow Environmental Protection Agency procedures to report and cleanup leaks, close tanks, retrofit existing tanks, and install new ones.

The EPA guidelines state that all tanks, new and existing, meet specific requirements covering installation, spill and overflow prevention, corrosion protection, and leak detection. The guidelines also require that the proper state and federal agencies be notified before a tank is removed or installed.

For local governments, the regulations require at least \$500,000 financial assurance per occurrence

as well as an aggregate of \$1 million for one to 100 tanks and \$2 million for more than 100 tanks. Local governments can show financial responsibility with either pollution liability insurance, state funds, trust funds, risk retention groups, or self-insurance.

Crawford County cut their costs by doing some of the work itself, instead of hiring an outside contractor.

"We have 25 underground tanks that we modified and there's not much problem, — unless you have a leaking tank," Crawford County Engineer Dale Wight said. "And that isn't bad if it hasn't contaminated the ground water. We have one that did contaminate the ground water and we've contracted with Terracon (a Kansas City firm) to help us clean it up.

"I'd say the private Ma and Pa gas stations haven't been hit in the head with these regulations yet. I think they're just starting to realize what's going to be required," Wight said.

Local government agencies are allowed to help the small business owner by offering property tax credits, according to Robert Hubbard of the firm Williams and Co., which is administering the fund.

"We're certainly hopeful that local government entities will do that on behalf of their people," Hubbard said.

For financial assistance questions call Williams and Company in Sioux City at 1-800-842-1000. For questions about the regulations call the Department of Natural Resources - Underground Tank Section at 515-281-8779.

For More Information

The following video tapes and publications are available on a loan basis by contacting John H. Moody, Local Transportation Information Center, 194 Town Engineering, Iowa State University, Ames, Iowa 50011 515-294-9481.

“Effects of Tire Pressure on Pavements” The subject of this tape was discussed by Dr. Curt Nyshek at the 32nd Annual Bituminous Conference. Dr. Nyshek reviews tread patterns left on the road surface by bias-type tires as opposed to radial-type tires. He compares load versus gross contact area and bald tires with those having an unwoven tread. Pressure prints are illustrated and variations shown in these prints as load is increased. Running time — 22 minutes. Request index #101.

“Rural Roads -- A New Approach” In this tape, specific reference is made to the maintenance of roads in Galitan County, Montana, with assistance provided by Montana State University. Use is made of a filter fabric on the surface of the road to reduce the depth of gravel required to provide strength to the surface. Running time — 27 minutes. Request index #104.

“Bituminous Seal Coat” This tape, made in the State of Washington, points out the necessity of good material along with equipment that is in good repair, effective traffic control and proper work methods as the important ingredients for the application of an acceptable bituminous seal coat. Details the various steps of performing the seal coat operation. Running time — 16 minutes. Request index #100.

“Snow and Ice Control” A four-page bulletin published by the Colorado Transportation Information Center which details in understandable terms the action of de-icing chemicals, salt (sodium chloride) and calcium chloride. It goes into the various factors which affect the de-icing action, such as concentration, temperature, time, weather, road surface type and topography. There are references to the various types of spreading equipment, sand, chemical mixtures and environmental impacts. Request index #569.

“Protect Your Agency From Tort Liability Suits” A four-page bulletin published by the Colorado Transportation Information Center con-

taining 15 general policy practical tips for reducing tort liability. In addition, it lists a number of specific highway-related items which can go a long way toward reducing exposure to tort liability suits. Among these are emergencies, hazards, low shoulders, icy spots and snow removal, sign deficiencies, work and construction zones, guardrail repair, potholes, and general maintenance items. Request index #570

“Improving Operational Safety On Local Roads and Streets” There are three general types of highway safety improvements: roadway improvements, roadside improvements and operational improvements. This 46-page pamphlet, prepared by the Federal Highway Administration, deals only with the last of these -- operational improvements. Request index #571. Companion pamphlets have been prepared for the second type of improvement (roadside) they are “Roadside Improvements for Local Roads and Streets” (index #216) and “Improving Guardrail Installations on Local Roads and Streets” (index #113). A limited number of these pamphlets are available.

Publication order form

To obtain the materials listed above, return this form to the Local Transportation Information Center, ISU Extension, 194 Town Engineering, Ames, IA, 50011.

	Title	Index No.	No. of Copies
Name _____	_____	_____	_____
Address _____	_____	_____	_____
City/state/zip _____	_____	_____	_____
Phone () _____	_____	_____	_____

Please send a complete list of all publications.

Please send a complete list of all audio-visual materials.

Conference Calendar

Motor grader continued from page 5

how well the techniques are working and to answer any questions the operator may have after experimenting with the techniques.

The enrollment for each program is limited to about 30 operators so that the instructors have time to visit each in the field. Usually, three counties will jointly request the program and share the cost. For more information, contact Lowell Richardson at the IDOT's Office of Local Systems, 515-239-1291, or the Local Transportation Information Center at 515-294-8082.

And justice for all

Appointment, promotion, admission, and programs of extension at Iowa State University are administered to all without regard to race, color, creed, sex, national origin, disability, or age. Call the Affirmative Action Office at 515-294-7612 to report discrimination.

ASCE National Conference
Oct. 8-12, New Orleans Contact
ASCE 800-548-ASCE.

Iowa Chapter of APWA Snow Conference
Oct. 11-12, Ames, ISU, Scheman Building This conference is designed for all local governmental administrators, engineers, snow fighting managers and supervisors. There will be over 20 equipment and related product exhibitors. Contact Connie Middleton, 515-294-6229.

TRB National Conference on Rural Public Transportation
Oct. 29-Nov. 1, San Antonio Contact TRB 202-334-2934.

International 4-R Pavement Management/Maintenance Exposition and Conference, Oct. 31-Nov. 3
Kansas City Contact 4R Symposiums 312-298-6622.

Combine MOVITE, ITCSA & Iowa Section of ASCE Transportation Conference, Nov. 1-3, Des Moines, Downtown Marriott Prior to the

meeting, a one-day program will be presented on the new Roadside Design guide. For more information, call Jim Thompson, 515-283-4973.

APWA Micro/Mainframe PAVER Training, Nov. 14-16 Contact APWA 312-667-2200.

Portland Cement Concrete and Asphalt Concrete Pavement Maintenance Workshop **Call for dates**
This workshop is designed for street and road maintenance crew supervisors and crew members. It defines cost effective methods for maintaining, restoring, and rehabilitating PCC and AC pavements. Contact Connie Middleton 515-294-6229.

Iowa County Engineers Conference, Dec. 5-7, ISU, Ames, Scheman Building This conference offers continuing education courses for county engineers and technicians. Presentations and special technical sessions included. Contact Connie Middleton 515-294-6229.

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Technology News

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