

# roads bridges transit technology news

Local Transportation Information Center  
Iowa State University Engineering Extension Service

July 1985

## Iowa DOT sees savings in contractor inspection

Since 1983, the Iowa DOT's highway division has conducted a training program to certify portland cement concrete and asphalt cement concrete plant technicians. The program's third phase for contractor and ready-mix personnel will be carried out next winter.

The purpose of the program is twofold, according to C. L. Huisman, director of the materials division. One goal is to facilitate the construction of quality projects with maximum specification compliance and minimum investment of manpower for monitoring, inspecting, and testing. Second, the program is designed to eventually shift the responsibility of plant control and product quality to the contractor. The highway division quality control would then be limited to monitoring and assurance sampling, and testing of the completed product built.

The first two phases of the technician training program have been completed. During the winter of 1983-84, training was conducted for contracting agency personnel. County, municipal, and consultant personnel received instruction during 1984-85.

Next winter, contractor and ready-mix technicians will be trained and certified. According to Huisman, the 1986 construction year will be the first season when plant inspection certification will be implemented on a mandatory basis. However, it will be an optional requirement on county secondary projects in 1986.

Huisman noted that asphalt cement concrete contractors, portland cement paving contractors, and ready-mix operators are encouraged to select their candidates and assign plant inspectors as soon as possible so that they can become acquainted with some of the regular procedures necessary in the program.

Two important prerequisites were pointed out. First, the candidates must have experience on at least one significant project as an assistant plant inspector or as a plant inspector. Second, the candidate must hold a valid aggregate technician certificate. In addition, the candidate should be able to perform the various physical tests demonstrated in the physical test schools conducted annually by the district materials engineers.

In discussions with various industry personnel, Huisman has found that responses to the program are favorable.

In addition to the technician certification program, a three-phase materials certification program is underway in the state. This includes:

1. A comprehensive materials certification program that has been in place during the past two decades and one in which there is good reason to have utmost confidence.
2. A certification program whereby the product manufactured or its production process can be managed. Here particular reference is

made to asphalt cement concrete and portland cement concrete as the manufactured products. Phase two, which is currently under way, involves the training for certification of plant technicians.

3. It is planned that, in phase three of this program, nondestructive testing will be done by the agency (contracting authority), by a consultant, or by others. This applies to cases in which the quality specified in the contract documents is assured by the record testing that is completed on the final product, whether that product be a culvert, bridge, highway, or parking lot.

Huisman says that Iowa is not ready to implement phase three at this time. However, it is his opinion that the quality assurance procedures presently employed in the district materials operations are effective and will be used for the foreseeable future.

For more detailed information about this program, contact the Office of Materials, Iowa DOT, 515-239-1101.

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## Play it safe when using herbicides

Exposure to dangerous herbicides is most common during the handling and mixing stages. The risk of this exposure can easily be reduced by simply assuming a posture of safety and by using common sense.

Time-saving shortcuts are a particular concern during the handling and mixing stages and should be avoided. As these are toxic principles, the risk of exposure and the potential injury that could result is a major concern. In addition, if label procedures are not followed closely, poor results can occur.

The risks when using a herbicide involve both the toxicity of the product and the length of exposure of the person to that product. Although a particular herbicide might be extremely toxic, if there is no exposure, there is no risk. Although most of the herbicides commonly used in Iowa

are relatively low in toxicity, it is still important to minimize the exposure element and to ensure safe and effective handling and mixing procedures.

Whenever herbicides are handled or mixed, it is important to be familiar with the product label. The label will contain instructions about specific mixing procedures, handling precautions, and emergency information. It will also often describe the appropriate clothing to wear while in contact with the product. Be sure to read the label before working with a herbicide product and make note of any precautions that are indicated.

It is always important to wear protective clothing while handling and mixing herbicides. Certain areas of the body, particularly mucal openings such as the nose, eyes, and

mouth, are more likely than others to allow the movement of a herbicide into the body. Other areas of concern include the stomach, arm pit, and genital region. The feet may also be susceptible to transferral of herbicides into the body.

Proper attire includes long-sleeved shirt, full length trouser (bottoms outside the boots), rubber boots, gloves, head covering, eye protection, and an appropriate respirator. It is important to wash the clothing frequently. If any herbicides spill on the clothing, it is important to immediately change and wash the exposed items in a strong detergent solution. It is also wise to wash the herbicide-exposed clothing separate from the household laundry.

**Micheal D.K. Owen, ISU extension specialist in weed science.**

## Words communicate better than symbols in road signs

Sometimes words communicate better than pictures. In a transportation research project undertaken in the early 1980s, Iowa State University civil engineering professor K. A. Brewer found differences in the way people perceive messages conveyed by road signs. Some people understand word messages better; others understand graphic messages better.

At the same time, ISU psychology professor L. L. Avant was doing theoretical research on the efficiency with which people process words, particularly exploring the misinterpretations of word and nonword messages.

In laboratory experiments, 92 percent of drivers placed stop signs at a T intersection, and almost 37 percent wanted an advance warning sign to use the words "stop ahead." Smaller percentages chose signs with symbols. Their collaboration provided guidance about what types of road signs drivers in real life find most understandable.

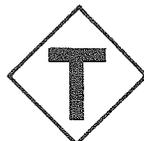
This article was adapted from a story that appeared in the March 1985 issue of *Connections*, a newsletter published by the College of Engineering at Iowa State University.



92.0%



36.9%



28.8%



24.7%

Brewer and his colleagues found that the word signs produced more correct driver action than the symbol versions of the same sign.

### And justice for all

Appointment, promotion, admission, and programs of University Extension at Iowa State University are administered equally 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.

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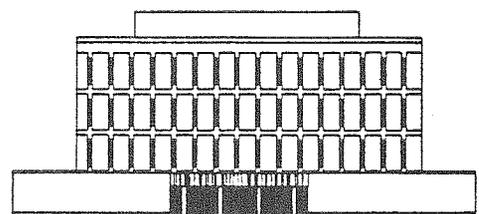
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civil engineering extension



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## tips from — the field —

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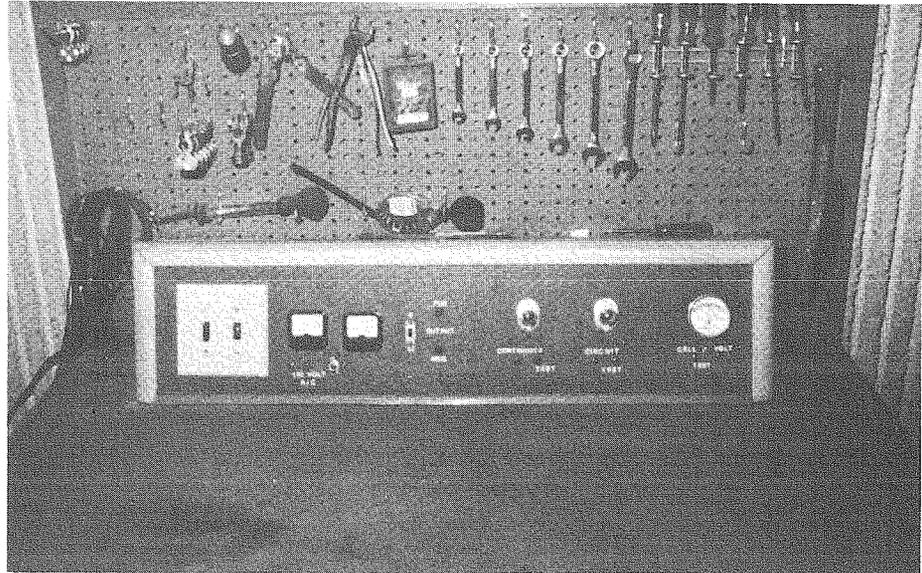
The electronic test bench is a unique piece of equipment designed and built by the Spencer street department. Made from a battery charger, it is used for: trickle charging 6- or 12-volt batteries; wire continuity and circuit tests; individual cell voltage tests; and general battery, starter, or alternator repairs. The instrument also has a 110-volt tap that allows larger pieces of equipment to be tested on it.

The bench is made of 3/4-inch plywood on castors, with room for battery storage on a lower shelf. A pegboard is attached to the back of the bench to allow quick and easy access to testing and repair tools and electrical supplies.

The dimensions of the test bench are approximately 2 feet by 4 feet, with the working surface about 3 feet above the ground. It cost approximately \$50 to build and equip.

For more information, contact John Moody, Local Transportation Information Center, Haber Road, Iowa State University, Ames, Iowa 50011, phone 1-800-262-8498; or Chuck Fisher,

assistant superintendent, Spencer Department of Public Works, Spencer, Iowa 51301, Phone 1-712-262-6456.



The electronic test bench has proven to be a handy piece of shop equipment.

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## Iowa DOT devises new solutions to grade crossing problems

The Iowa DOT has an innovative solution to grade crossing problems. The line segment analysis approach helps identify grade crossing problems and initiate improvements.

All rail lines in Iowa are being divided into approximately 50 mile segments based on ownership, and each segment is being given a

unique identification number. The information will be computerized and printouts will calculate and list for each crossing the hazard index, average predicted accidents, or other information from existing accident or inventory files.

A diagnostic team, including personnel from the Iowa DOT, FHWA, railroads, cities, counties, and law

enforcement agencies will then analyze the data. The benefit of the diagnostic team approach, by line segment, is that it should generate many low cost improvements, particularly in rural low-traffic locations, that might otherwise be overlooked.

The plans being executed are unique to Iowa, and were devised and perfected by the Iowa DOT.

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## Civil engineering extension calendar available soon

Each year the civil engineering section of ISU's Engineering Extension Service publishes a nine-month wall calendar that provides dates and information about conference offerings scheduled from September through May. The calendar also

includes meetings of associations related to public works and transportation.

Those who received a civil engineering extension calendar last year will automatically receive one again this

year. If you did not receive one last year and would like to have a 1985-86 calendar, call the Info-Line and ask to be put on the mailing list. The calendars will be mailed in August.

# conference 1 2 3 calendar

**National Society of Professional Engineers Meeting**  
July 15-20, Buffalo

**Transportation Research Board Workshop on Geometric Design for Large Trucks**  
August 5-7, Denver

**American Public Works Association—Iowa Section Annual Meeting**  
August 15-16, Sioux City

**American Public Works Association Annual Conference and Equipment Congress**  
September 9-12, Los Angeles

For additional information on the following conferences, call the Info-Line.

**Traffic Engineering Workshop**  
September 18, Davenport

For engineers and technicians working in the areas of design standards and traffic operations, this course will provide vital new information on two important publications.

AASHTO's new *A Policy on Geometric Design of Highways and Streets* will be discussed along with the "Unsignalized Intersections" chapter of the new *Highway Capac-*

*ity Analysis* manual. Offered in conjunction with the MOVITE/ITSCA meeting on September 19-20.

**Iowa Public Airports Association Conference**  
October 1, ISU

This conference offers a forum for airport owners, sponsors, and administrators to discuss current issues in airport management. The new Public Airports Association will sponsor the event and those attending can participate in planning future association activities.

**APWA Iowa Snow Conference**  
October 9, ISU

Rural and urban operators, supervisors, and administrators can learn what's new in the areas of snow control and removal during this popular conference. An extensive display of equipment and exhibits is planned.

**ASCE Transportation Conference**  
October 14, ISU

This 15th annual conference will feature topics of interest to those concerned with Iowa's highways and rail, air, and water facilities. Sessions will cover various aspects of planning, safety, design, construction, maintenance, and operation practices.

**Management for First-line Supervisors**  
November 6, Mason City

For supervisors who have not undergone formal managerial training, this practical workshop offers skills for effective communications, motivating workers, and organizing work loads.

**Fundamentals of Pavement Management**  
November 12, ISU

Topics will include making a street and road condition inventory, evaluating needs and priorities, and preparing a periodic rehabilitation plan.

**Maintaining Granular Surfaced Roads**  
November 18, Atlantic  
November 19, Storm Lake

Sessions include materials selection, blading operations, equipment application determination, and operator practices. Also, how to reduce potential for tort liability will be discussed in-depth.

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## FHWA adopts new policy for highway and street design

A new handbook issued by the American Association of State Highway and Transportation Officials (AASHTO) entitled *A Policy on Geometric Design of Highways and Streets* was adopted by the Federal Highway Administration as the official policy for the geometric design of all federally assisted construction and reconstruction projects, effective

May 15, 1985. This document, also called the "Green Book," replaces the old "Blue Book" and "Red Book" as the state-of-the-art in street and highway design. There are significant changes in the new policy, and anyone concerned with geometric design should be familiar with these new criteria.

A workshop explaining the new policy was held in Ames during November 1984, with more than 230 people attending. Another workshop is scheduled for the spring of 1986. The date will be announced later. If you have any questions about the workshop or the new design publication, call the toll-free Info-Line 1-800-262-8498.

## Three lawsuits cite vegetation as contributing cause

A single-vehicle accident on a county gravel road in July 1979 resulted in fatal injuries to a passenger in the small pickup truck involved. The vehicle overturned in the roadway when the driver swerved to avoid an automobile entering the roadway from a farm driveway. The entering vehicle reportedly had stopped with its front near the edge of the traveled portion of the roadway. This position was necessary because of sight restrictions resulting from the presence in the right-of-way of large trees in the farmstead's windbreak. In the resulting lawsuit, which was settled without trial, the county contributed a five-figure amount to the settlement.

A two-vehicle collision in July 1981 occurred when a westbound small pickup truck failed to yield from a stop sign and was struck broadside by a southbound vehicle. The passenger in the pickup was injured and initiated a lawsuit against the county involved. Witnesses for both sides agreed that weeds and grasses growing in the right-of-way in the northeast quadrant obscured the view of a westbound driver unless a vehicle was stopped so that it encroached slightly on the traveled portion of the north-south gravel road. This case settled without trial, and the county contributed a five-figure amount to the final settlement.

A collision occurred on an oiled county road in August 1983, when a southbound automobile collided with a northbound moped. The 14-year-old moped operator was fatally injured. His parents sued the county involved, alleging that sight distance was insufficient on the curve where the accident occurred due to weeds and brush in the right-of-way. After the plaintiffs declined to accept a pretrial offer of settlement in five figures, a jury trial found that the county had not been negligent.

In each of these cases the common factor was the presence in the highway right-of-way of vegetative growth that was alleged to have contributed to the accident. Most

counties have adopted policies that substantially limit spraying, mowing, or cutting to control weeds and brush. Although these policies generally have been adopted in the interest of economy, they have received widespread support for their scenic enhancement and wildlife preservation. Although these environ-

mental objectives are laudable, counties should be alert to the possible need for spot control of vegetation at locations where the motoring public's safety would otherwise be seriously compromised.

R. L. Carstens, professor of civil engineering, ISU.

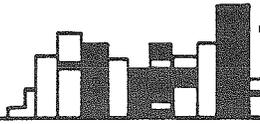


Tall weeds and grasses growing at this intersection obscure both the signs and the driver's view of approaching traffic.



Trees at the end of the farm driveway block the driver's view of oncoming vehicles.

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# for more information

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## **Evacuation and Rescue of Elderly and Disabled Passengers from Paratransit Vans and Buses**

**Order # UMTA-MA-06-0152-84-3**

This 190-page report describes techniques for the evacuation and rescue of elderly and disabled passengers from vans, body-on-chassis small buses, and heavy-duty transit buses. Methods and equipment are identified, and accident rates and crash-worthiness of various vehicles are studied. The document also includes detailed reviews of transit accidents and their outcomes. It should be particularly useful to managers of small or social service transit systems, police and fire departments, and groups responsible for meeting the mobility needs of the elderly. Send a self-addressed mailing label to Mr. William Gathaway (DTS-65), Transportation Systems Center, Kendall Square, Cambridge, Massachusetts 02142. Note the report's title and document number when ordering.

## **Master Traffic Engineering**

**Available from Military Traffic Management Command, Attn: MT-SA, Washington, D.C. 20315.**

This publication presents general ways to clear up common traffic bottlenecks that result in wasted

energy, and provides assistance in the planning and design of facilities that will encourage motorists to switch to a more energy-efficient travel mode—the bicycle.

## **A Basic Asphalt Emulsion Manual—Volume 1: Understanding and Using Emulsions**

**Order # FHWA-IP-79-1**

**Available from U.S. D.O.T.—FHWA, National Highway Institute, Washington, D.C. 20590.**

The purpose of this manual is to impart a basic understanding of asphalt emulsions to those who work with the product. A review of the manual should enable one to recommend where, when, and how emulsions should be used.

## **Pavement Undersealing: Principles and Techniques**

**Available from ChemGrout, P.O. Box 1140, LaGrange Park, Illinois 60525; phone 312-354-7112.**

Every pavement system relies on full contact and support to function properly. Deterioration occurs through heavy loading and water and creates voids. Voids in turn lead to cracking. This publication covers the stabilization of voids by the process of undersealing.

## **Small Transit Vehicles: How to Buy, Operate, and Maintain Them**

**NCTRP Report 11**

**Available from Transportation Research Board, National Research Council, 2101 Constitution Ave., N.W., Washington D.C. 20418.**

**Price: \$7.60**

Designed for analysts and transit managers concerned with the procurement, operations, and maintenance of small buses less than 35 ft. in length, this manual provides guidance in the decisions they must make. Specific topics include selection of vehicle type/size, selection of features and auxiliary equipment, estimation of operation and life-cycle costs, and maintenance.

## **Accident Research Manual**

**Order # FHWA-RD-80-016**

**Available from the National Technical Information Service, Springfield, Virginia 22161.**

This 136-page manual is a text for professional highway accident researchers, and provides standard statistical tables and an introduction to statistical testing.



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