

# roads bridges transit technology news

Local Transportation Information Center  
Iowa State University Engineering Extension Service

September 1984

## New program can fund your training

State and local employees can obtain funds to participate in safety and traffic engineering training activities through a new Iowa Department of Transportation program. The program uses federal funds received through the governor's Highway Safety Office.

Available October 1, the funds can be used to cover various costs associated with attending a seminar or short course.

Applications for the funds should be made with a letter that outlines the short course or seminar, the tuition cost, an estimate of the costs of meals and lodging, and a brief

description of how the training would benefit your work. Because each application must be approved by the Federal Highway Administration before costs can be incurred, it is important to allow enough time for such approval.

For additional information, or to submit a letter of application, contact the Federal Program Coordinator, Office of Driver Services, Lucas Building, Des Moines, Iowa 50319; phone 515/281-5014.

**Bob Andresen, project coordinator,  
Iowa DOT**

## Iowa update on ETP

Epoxy Thermoplastic (ETP) pavement marking material is a joint development of the Southwest Research Institute and the Federal Highway Administration (FHWA) research staff. It is generic material consisting of two epoxy resins, pigment, filler, and glass beads.

ETP is a 100 percent solids formulation containing no solvents or other volatile components and is applied as a hot spray at 450° F. It requires no primer and can be applied on either asphalt or portland cement concrete surfaces. Existing paint

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## Continuing education grants offered for management workshops

Continuing education grants are available for two workshops on Management for First-line Supervisors to be held November 27 in Ankeny and January 22 in Sioux City. Two grants will be awarded for each workshop. The cash awards of \$50 will be given for travel expenses and registration fees.

The workshops are for street superintendents and transportation-related supervisors who are new in the management area or who have not had the opportunity to attend courses on management. Material

covered will include dealing with people, communicating effectively, and motivating workers.

To be eligible, an applicant must be an employee of a town with a population of fewer than 5,000, or a county roads employee other than the county engineer or assistant

county engineer. One city and one county employee will receive grants for each workshop.

Selection will be made by a drawing and winners will be notified directly. To apply, complete the form below and return it to our office by October 30.

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### Transportation continuing education grant application Management for First-line Supervisors

Name \_\_\_\_\_ Title \_\_\_\_\_

Department \_\_\_\_\_ Town \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_

Check one: Ankeny (Nov. 27) \_\_\_\_\_ Sioux City (Jan. 22) \_\_\_\_\_

Return to the Local Transportation Information Center, Engineering Extension Service, Iowa State University, Ames, Iowa 50011.

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stripes must be substantially removed by sand blasting or other means prior to the application of ETP. The recommended application thickness is 15 to 20 mils with drop on glass beads at a rate of 4 to 6 pounds per gallon. The no-track time is less than 5 seconds so that coning is not necessary during application. When formulated according to specification, ETP has a pot life of at least 4 hours. Durability based on limited field testing indicates a life of from 2 to 10 times longer than normal traffic paint.

An FHWA demonstration project using ETP that was scheduled for September 1983 was described in the August 1983 issue of *Technology News*. Because of equipment problems this demonstration project was deferred until May 1984. Subsequently, the project was postponed indefinitely because inability to consistently retain the drop on glass beads resulted in very poor night visibility.

Recently, ETP was applied successfully by the Century Fence Company on two Iowa DOT portland cement paving projects. The first project is in

Marshall County on Iowa 330 from U.S. 30 south approximately 5 miles. The second project is in Johnson County on U.S. 218 from the Hills Interchange north approximately 4 miles. Several equipment modifications, including preheating the glass beads, were made to improve bead retention. The high initial reflectivity resulted in excellent night visibility on both projects. The Iowa DOT will monitor both projects to evaluate the long-term durability of the ETP material and reflectivity.

**Jim Hogan, area engineer, FHWA Iowa Division.**

## Loss of sign's reflectivity causes fatalities, lawsuit

A collision occurred at night at an intersection of a paved county road and a primary highway when a passenger car failed to stop at a stop sign and struck a semi. The driver of the passenger car was not familiar with the road. Both occupants of the passenger car were fatally injured.

A lawsuit was filed naming both the county and the state as defendants. The plaintiffs alleged that the county was negligent because the intersection was not lighted, there were no rumble strips and flashing beacons, and the stop ahead sign was not

sufficiently reflective. The negligence of the state was alleged because of insufficient warning of the presence of the intersection. Both defendants were also alleged to be negligent because the terrain restricted sight distance in the quadrant of concern such that approaching vehicles were not visible until they were relatively close to the intersection.

There was considerable testimony during the discovery process indicating that the stop ahead sign was severely weathered and essentially retained no reflectivity. This became the principal issue in the case.

In the out-of-court settlement, the county made a substantial payment, with the state adding a token payment to settle the suit.

This case exemplifies a problem that is occurring with increasing frequency—the continuing use of highway signs that have lost their reflective qualities. Signs in place need to be inspected by highway agencies on a regular schedule, at night and during the day.

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

## Better communication enhances public works programs

If the public is to be well served, better communication is essential for public works officials. Intergovernmental relationships and the complex issues of planning, financing, constructing, maintaining, and replacing public works facilities require extensive discussion.

The American Public Works Association has published a manual to familiarize public works professionals with communication techniques that can help them collect and disseminate pertinent information about their programs and projects. The manual contains specific, how-to information on establishing and implementing public works communication activities and programs. The 196 page

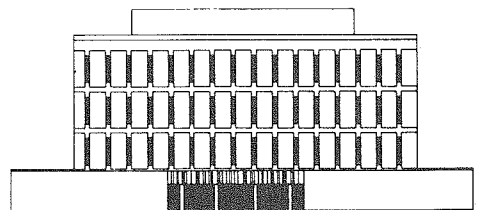
soft-cover manual, *Public Works Communication Manual*, is available for \$25.

A 30-page brochure that highlights the information in the manual also is available from APWA for \$1.50. *Better Communication: The Key to Public Works Progress*, presents 1-page summaries of topics such as: public speaking, appearing on television, the press release, how to work with reporters, radio, releasing critical and complex documents, and public hearings.

Both of these valuable publications can be purchased from APWA, 1313 E. 60th, Chicago, Illinois 60637.

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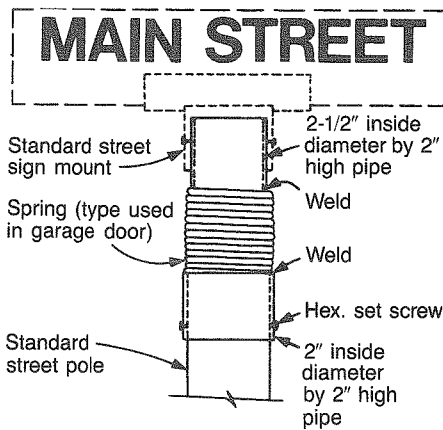
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## Reduce traffic sign vandalism

Each year, 1 out of every 10 traffic signs is defaced, destroyed, or stolen. An article in the November 1983 issue of *Public Works* discusses what municipalities can do to deter such vandalism. Recommendations include enactment and better enforcement of laws, a public information program, and educational techniques that can help reduce vandalism. The article, "Curbing Traffic Sign Vandalism," also offers specific physical alterations such as raising the height of sign blades and using protected sign face materials, hardware, and fasteners.

One idea for a vandal-proof mounting modification was described in the March 1983 issue of *Public Works*. According to Arvin D. Erskine, director of public works in



A garage door spring can be used in sign mountings to help combat vandalism.

South Portland, Maine, his innovative design has cut down on sign vandalism.

"Since the street markers were usually pulled from their sockets by a

person standing on the end of the marker, it occurred to me that some sort of a spring between the marker and post could be the answer," Erskine wrote.

Locally available, standard materials were used throughout the modified mounting. Broken garage door springs were obtained from an overhead door contractor.

The post and street marker were installed in an area of heavy vandalism. "It was observed that wind had little effect on the marker, but if someone tried to remove it by hanging or pulling on it, the sign would flex and would return to its original position when released. Some of the modified street markers have been in place for over a year and have all but eliminated this problem," Erskine reported.

## Rural transit publications available

The following reports and documents are available from the Secretary of Transportation, Washington, D.C. 20590. Include a self-addressed mailing label when ordering.

### Planning Services for Transportation of Handicapped People: Data Collection Manual, August 1983

This 228-page report describes a data collection process for use by local transportation planning agencies and transit operators in designing and evaluating public transportation services for mobility-limited elderly or handicapped people. Specify title and #DOT-I-83-40. Sample copies free from Technology Sharing Program (I-30HD) at the address listed above.

### Implementing Driver Selection and Training for Human Service Agencies: Administrators Guideline, May 1980

Effective training programs for drivers of specialized transit services is the subject of this 66-page report. Includes information on potential tar-

get groups, appropriate skills, alternative training delivery organizations, and a compendium of driver training techniques used in several states. Specify title and #DOT-I-83-18. Single copies free from Technology Sharing Program (I-30AG) at the address listed above.

### Rural Public Transportation Performance Evaluation Guide, November 1982

This 108-page report describes how rural and small city transit operators can use numerical indicators to assess their system's performance. Financial (expense, revenue, and subsidy) and nonfinancial performance factors are covered. Specify title and order #DOT-I-83-31. Single copies free from Technology Sharing Program (I-30PM) at the address listed above.

### Transportation for Older Americans: Issues and Options for the 1980's, April 1983

This report explores demographic, economic, and social changes

among the elderly, and addresses their transportation implications. In-depth analysis of inflation, energy, and funding issues. Specify title and order #DOT-I-83-42. Single copies free from Technology Sharing Program (I-300A) at the address listed above.

### Joint Development: A Handbook for Local Government Officials, September 1983

Techniques used successfully to promote privately-sponsored real estate development projects that are closely linked to public transportation services and station facilities are described in this 117-page report. Included are 5 specific ways to promote joint development success and details about some of the risks involved. Specify title and order #DOT-I-83-48. Single copies free from the Technology Sharing Program (I-30JD), Office of the Assistant Secretary for Governmental Affairs at the address listed above.

## 40 to 50 percent of all bridges rated substandard

About one-half of the approximately 600,000 highway bridges in the United States were built before 1940, and many have not been maintained adequately, according to a report in the Transportation Research Board's (TRB) *Research Results Digest* of February. Most bridges in service today were designed for less traffic, smaller vehicles, slower speeds, and lighter loads. Furthermore, deterioration caused by environmental contamination is a growing problem. According to Federal Highway Administration criteria, almost 40 percent of the nation's bridges are classified as deficient and in need of rehabilitation or replacement. More than 100,000 of these are considered structurally deficient because of deterioration or distress, and another

100,000 are termed functionally obsolete or inadequate for current requirements.

Although the Federal Highway Bridge Replacement and Rehabilitation Program funds about \$1 billion annually (set at \$2 billion for FY '86) to cover the 80 percent federal share of repair costs, the FHWA estimates the program's needs at almost \$50 billion. This current estimate does

not include future inflation or the cost of additional needs that will develop while the presently identified, deficient bridges are being eliminated, says the TRB report.

According to Better Roads' "1984 Bridge Inventory" published in the May issue of *Better Roads* magazine, the following shows how Iowa fits into the deficient bridge picture:

	Iowa	U.S.
Total interstate and state bridges	3,730	263,923
Total substandard	1,095 (29.3%)	70,598 (26.7%)
Total city/county township bridges	23,335	313,413
Total substandard	12,358 (52.9%)	176,119 (56.2%)
Total all bridges	27,065	577,372
Combined total substandard	13,453 (49.7%)	246,537 (42.7%)

## for more information

### Seldom Used Specifications

Published by the Pennsylvania DOT. The complete publication is available for free loan from the Info-Line, or you may request that a specific section be duplicated for you.

This 1983 document incorporates those specifications determined to be seldom used, but are sometimes needed by designers on certain projects. The sections included are earthwork, base courses, flexible pavements, rigid pavements, incidental construction, roadside development, traffic accommodation and control, and structure.

The following publications are available from the American Public Works Association, 1313 E. 60th, Chicago, Illinois 60637.

**Urban Stormwater Management, Special Report 49**  
\$25 for APWA members; \$30, nonmembers.

This 312 page guide outlines planning, designing, operating, and maintaining urban stormwater facilities.

### Planning and Evaluating Water Conservation Methods, Special Report 48

**\$15 for members; \$18, nonmembers**  
The text presents alternate methods of conserving water emphasizing economic incentives and social acceptance of such practices. Techniques for coping with droughts are discussed.

### Equipment Management Manual \$30

A comprehensive compilation of information produced by the APWA Research Foundation. The manual covers replacement analysis, spec writing—hardware, preventive maintenance, parts inventory control, equipment management information systems, and administration and planning.

### Street Cleaning Practice \$24 to APWA members; \$28, nonmembers

Based on APWA surveys of local public works agencies, this guidebook includes planning, methods and operations, personnel, budgets, equipment management, administrative techniques, local ordinances, and European practices.

### Guidelines for Developing a Bridge Maintenance Program

**\$8 to members; \$10, nonmembers**

This comprehensive manual provides local officials with guidance toward establishing a viable bridge maintenance program. Where programs are in place, the manual gives ideas on upgrading maintenance and inspection techniques and recommends work definitions, materials, construction requirements, work measurement units, and suggested payment methods. Also, guide specifications include discussion on repairing concrete surfaces, grouting reinforcing steel, structural steel repair, and more. A valuable publication for smaller communities who cannot focus their resources on important bridge maintenance needs.

### Cracking and Seating Slide Show Available for loan from the Asphalt Paving Association of Iowa, 515/244-3127

This new slide presentation discusses cracking and seating of deteriorated PCC pavements prior to upgrading with asphalt. It details the procedure for this new technique, now receiving widespread acceptance because of its efficiency and economy.

# tips from the field

For the City of Des Moines Public Works Department, the month of November marks the completion of summer maintenance programs and the start-up of winter preparation. If the month is dry and warm, we can accomplish a great deal to prepare equipment and personnel before the first snow.

The City of Des Moines' snow removal equipment consists of 36 truck plows, 26 spreaders, and 14 motor graders. In addition, there are 3 belt loaders, 5 wheel loaders, 3 skid steer loaders, and a rotary snow plow. Like most cities, Des Moines cannot afford to have equipment idle 8 or 9 months each year, so it is used summer and winter. For example, loaders are purchased with buckets and snow blades so that the equipment can be used in normal street maintenance activities during the summer season and for snow plowing during the winter.

Prior to its use for snow removal, operators and equipment mechanics begin preparing equipment. Plows are inspected for wear on cutting edges, fittings lubricated, flags installed and tires repaired. Conventional dump trucks are modified into snow removal equipment by placing drop-in vee type spreaders in the dump body.

On about October 30 of each year, the city performs a trial snow removal operation with all of its winter snow removal equipment. Also, the operators inspect the equipment to ensure that it is ready for the first snow. This inspection includes tire wear, brakes, clutch, lights on trucks, hydraulic leaks, windshield wipers, conveyors and spinners, plow lights, wheels, cables, and fittings. Although this inspection takes approximately two hours of employee production time, the results at the time of the first snow removal more than offset the cost. Following the inspection, all defects are referred to the central maintenance center so that repairs can be



A conventional dump truck is modified for year-round use.



Preseason maintenance ensures equipment readiness.

performed in a timely manner rather than as a response to an emergency situation. Equipment still breaks down, but the bulk of the fleet is ready.

Between about mid-November and mid-March, Des Moines receives 33 inches of snow. The city maintains approximately 250 miles of snow routes and 550 miles of residential streets. Dry pavement conditions are maintained on the snow routes while the residential streets are maintained in a snow packed condition. Therefore, straight rock salt is applied to the snow routes via drop-in vee type spreaders at a rate of approximately 500 pounds per two-lane mile. When temperatures drop below 25 degrees, rock salt is augmented with liquid calcium chloride; when temperatures reach lower than 15 degrees, sand with rock salt and calcium chloride is used as an abrasive on the snow routes. This level of service generally provides for dry pavement within 2 days following

snow storms. When the depth exceeds 2 inches, plowing begins on snow routes and continues until all routes are clear. Residential streets are plowed if snowfall has accumulated to 4 or more inches. Due to the lack of sufficient storage for snow along the gutters of the street in the central business district, the city windrows the material away from the curb and loads the snow out of the area. This operation, which requires full capacity of the department's equipment and personnel, is generally performed 2 or 3 days following the snowfall.

In the last 5 years, our snowfall has varied from 20 inches to 65 inches and the city has successfully met the challenge of combating winter storms. With proper preparation, we have found that our equipment and personnel can meet the needs of the citizens of Des Moines.

Lawrence Creek, street maintenance administrator, Des Moines

# conference 1 2 3 calendar

## APWA Iowa Snow Conference

Oct. 2, ISU

Sessions will offer updated information on equipment, plowing, drift control, sanding and chemical applications, and other topics of interest to those involved with snow removal and control. Call the Info-Line for more information.

## ASCE Surveying Conference

Oct. 10, ISU

This conference will address technical problems faced by practicing surveying professionals. Contact the Info-Line for more information.

## Management for First-Line Supervisors

Oct. 12, Bettendorf

Nov. 27, Ankeny

This practical workshop is for supervisors who have not undergone formal managerial training. Skills covered will include effective communications, motivating workers, organizing your work load, and interpersonal relations. The Info-Line has more information.

## ASCE Transportation Conference

Oct. 24, ISU

Topics will cover a broad overview of transportation: planning, safety, design, construction, maintenance, and operation practices of transportation facilities. Contact the Info-Line for more information.

## P.C. and A.C. Pavement Maintenance Workshop

Cedar Rapids, Waterloo

Dates to be announced

Updated information related to pavement rehabilitation will be covered in this workshop for crew members and for supervisors and city clerks who make decisions regarding pavement maintenance. Des Moines' city engineer Harold Smith and public works director John Bellizzi will be the instructors. The Info-Line has additional information.

## New AASHTO Geometric Design

Criteria

Nov. 6, ISU

AASHTO's new policy on geometric design will be discussed during this workshop intended for those involved in street and highway design. Call the Info-Line for more details.

## County Engineers Conference

Dec. 4-6, ISU

Continuing education sessions specifically for county engineers and technicians will be conducted. Contact the Info-Line for more information.

## Maintaining Granular Surfaced Roads

Dec. 12, ISU

The content will include selection and placement of the surfacing, maintenance, and dust control. The Info-Line has more information.



## Transportation Info-Line

Call toll-free

1-800-262-8498

In Ames call

294-7834

## Correction

In the July issue of the newsletter, The Tips from the Field column contained an error. The story on diesel powered vehicles referred to an aftermarket additive, Diesel Fuel Antigel and Fungicide. The price quoted in the article should have been less than 1.5¢ per gallon rather than 15¢ per gallon. We are sorry if this mistake caused any inconvenience.

## 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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