

roads bridges transit technology news

Local Transportation Information Center
Iowa State University Engineering Extension Service

November 1985

Combat lawsuits by establishing snow removal policies

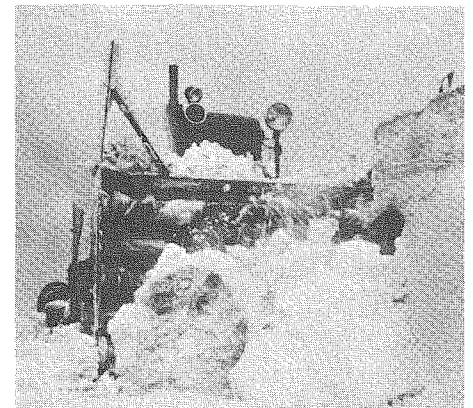
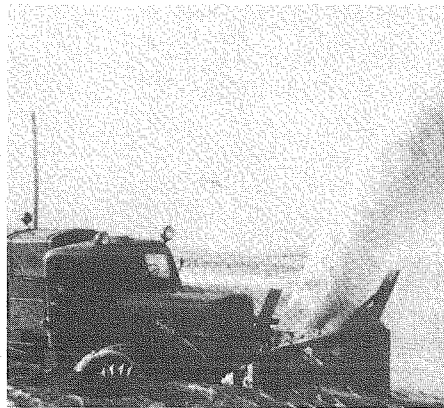
A written, clearly outlined snow removal policy can protect cities and counties from lawsuits, according to Sioux City's director of public works.

William W. Amundson, P.E., told the 183 representatives from 110 cities, 36 counties, and three states gathered at the October 9 APWA Iowa Snow Conference in Ames that they should take advantage of a new provision in Iowa law freeing political subdivisions from fault liability in accident suits if those subdivisions can prove they were complying with their stated snow removal policies at the time of the accident.

Amundson outlined a number of factors to be considered in writing these policies, including establishing a record system documenting snow removal activities (proof of compliance); providing local media with information about what the policy is; specifying which types of streets will be given priority treatment; establishing a formal complaint procedure; and adapting the policy so that, given Iowa's unpredictable weather, the city or county will be able to comply with it.

"The overall goal is the production of a realistic, meaningful, and practical policy that has the flexibility required to make adjustments" for uncontrollable factors, according to a report Amundson presented to the conference.

A number of snow removal policies developed by Iowa communities and counties were presented to the group, and they embodied some of



A history of snow removal equipment was presented at the APWA Iowa Snow Conference.

Amundson's tips. A copy of the survey highlighting samples of practices and procedures used in Iowa towns, cities, and counties can be obtained from the Local Transportation Center, Engineering Extension Service, Haber Road, Iowa State University, Ames, Iowa 50011, or call toll free in Iowa, 800-262-8498.

For example, the Des Moines policy states that property owners are responsible for removing snow on their sidewalks, and advises them that if the city is forced to do the shoveling, the property owner will pay for it. It also sets snow removal priorities into a hierarchy of four classes, and explains exactly what will be done to which type of street under which conditions.

The Palo Alto County Snow Clearance Ordinance warns that, "Snow can be expected to accumulate adjacent to the traveled portion [of a road] to the extent that a motorist's sight distance . . . may be greatly reduced or impaired."

Flexibility in the use of personnel was a consideration in the writing of Urbandale's Snow and Ice Control Policy, "As the need to change crews or add to the crew to begin the removal of actual snow arises, public works supervisors may initiate additional crew calls."

In addition to Amundson's presentation, the conference included exhibits by six snow removal equipment companies, a history of snow removal equipment as seen through the eyes of Iowa State University Civil Engineering Professor Stan Ring, and explanations of the basics of **(continued on page 2)**

The preparation of this newsletter was financed in part through federal funds provided by the Federal Highway Administration. The opinions, findings, or recommendations expressed here are those of the Local Transportation Information Center and do not necessarily reflect the views of the Federal Highway Administration or those of the Iowa Department of Transportation.

snow removal by representatives of four cities and counties.

To wrap up the conference, Bill Bittner, Council Bluffs director of public works, told participants about "What Happens at a Rodeo?" The "rodeo" is an event where snow removal personnel mount their machinery and compete in contests to prove their driving, plowing, and spreading expertise.

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 individual State Departments 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, to local and county highway and transportation personnel.

The T2 Center at Iowa State University is sponsored by the Iowa Department of Transportation and provides information and counsel to the municipalities and counties in Iowa. This newsletter is designed to keep you informed about new publications, techniques, and training opportunities that may be helpful to you and your community. Individuals wishing to receive future copies of this newsletter at no cost may send their requests to: John Moody, Local Transportation Information Center, Engineering Extension, Iowa State University, Ames, Iowa 50011.

Technology News is published by the Local Transportation Information Center
Engineering Extension Service
Haber Road
Iowa State University
Ames, Iowa 50011
1-800-262-8498 (in Iowa)
Program manager—Stan Ring
Coordinator—John Moody
Editor—Mary Holz Clause
Editorial assistant—Steve Shamash

lowans involved in national research

Faced with staggering highway rebuilding requirements in the next few years, the U.S. will spend \$200 billion on bridge rehabilitation and pavement restoration alone. Although much highway research has been accomplished in the past, enormous opportunities exist for technical improvements. Even small improvements in rehabilitation and restoration operations can have dramatic financial impact on budgets.

The desire to seek out and apply the best technology available is the driving force behind the creation of the Strategic Highway Research Program (SHRP). Beginning in 1986, SHRP will provide \$150 million for research.

Nine of Iowa's outstanding technical people were chosen for the SHRP advisory team, which will assist with the preimplementation phase of the

program. Their selection was based on technical qualifications, appropriate experience, commitment, availability, and organizational support. Their names and the areas in which they will direct research activities are listed below.

Dr. Kenneth Brewer, ISU, developing research design for maintenance
Robert H. Given, Iowa DOT, overview and integration
Gene Hardy, Dallas County engineer, cement and concrete
Charles Huisman, Iowa DOT, asphalt
W. H. Jorgenrud, Bremer County engineer, pavement performance
O. J. Lane, Iowa DOT, bridge protection
Bernard Ortgies, Iowa DOT, maintenance
Paul Schwarting, Sac County engineer, maintenance
Dr. Wallace Ripple, Iowa DOT, snow and ice

Videotapes available for free loan

The May 1985 issue of *Technology Transfer* listed eight videotapes produced by the Portland Cement Association. The following additional tapes are now available from the Local Transportation Information Center and can be obtained by calling or writing our office: 1-800-262-8498 (in Iowa)
Engineering Extension Service
Haber Road
Iowa State University
Ames, Iowa 50011.
Be sure to specify tape titles.

PCA 4R Video Transfer #9 (15 min.)
Construction of a full-depth unbonded overlay on a 1 inch minimum stress relief course placed over the old 9 inch reinforced concrete pavement on I-70 from U.S. 40—easterly

4.2 miles in Ohio. Traffic was maintained during construction and an asphalt median barrier supporting reflectorized candles was used.

PCA 4R Video Transfer #10 (18 min.)
"Traffic Control on Concrete 4R Projects"—A discussion of traffic control measures used on Portland Cement concrete 4R projects across the country. The importance of public relations, contractor input, and degree of concern of all persons involved are addressed in the tape. The tape demonstrates control measures successfully used on projects where the average daily traffic varied from a few thousand cars in rural areas to as many as 135,000 cars in urban settings. Construction projects in eight states are reviewed.

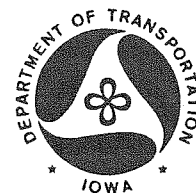


Transportation Info-Line

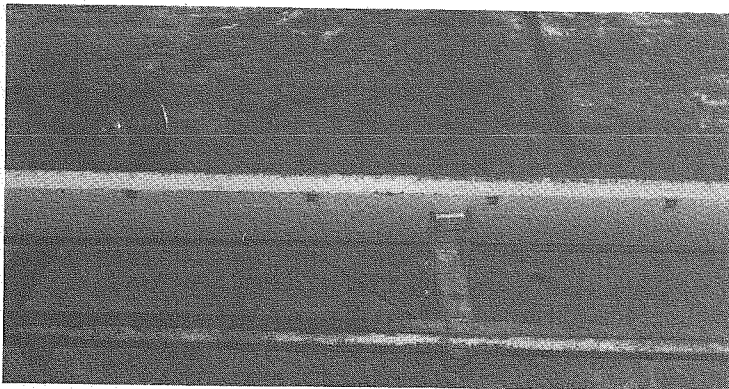
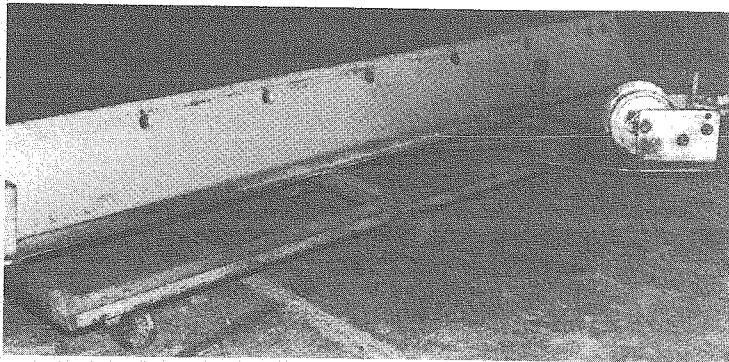
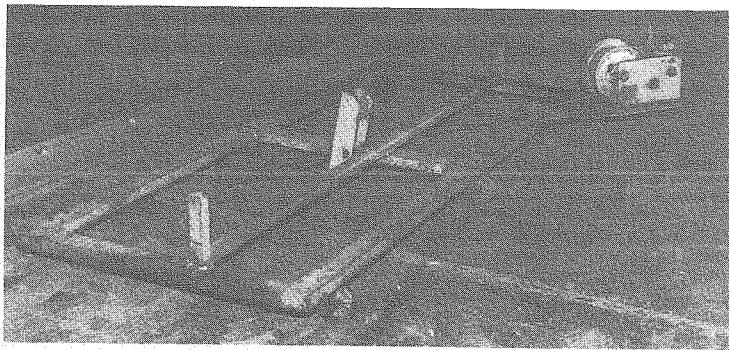
Call toll-free
1-800-262-8498
(in Iowa)
In Ames call
294-8815



U.S. Department
of Transportation
**Federal Highway
Administration**



tips from — the field —



Ice blade carrier

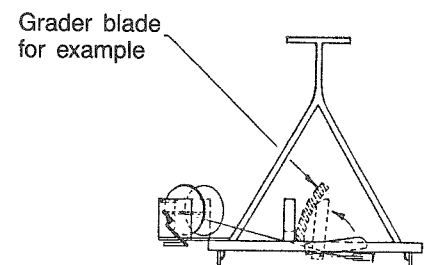
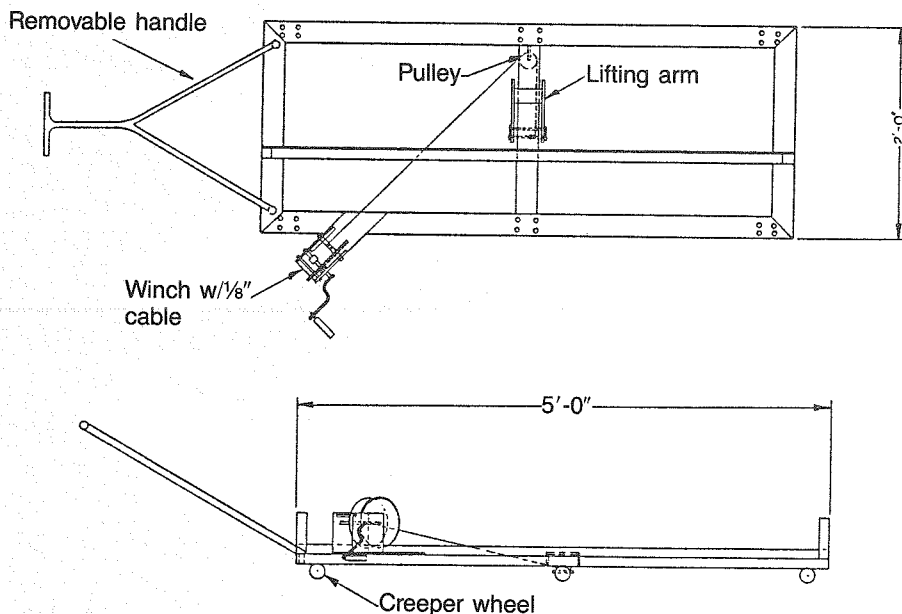
The Ice Blade Carrier is a rectangular frame 5 feet long and 2 feet wide mounted on four casters, equipped with a winch and a lifting arm. Intended for use in mounting blades on motor graders or trucks, this device is easier and safer than previous methods. It eliminates the need for a worker to assume awkward positions to do excessive heavy lifting.

Here's how the carrier works: the chosen blade is placed on the carrier, which is then rolled into position under the machine. Using the winch and lifting arm, the blade is raised to the proper angle, and the mold board is lowered to the blade. A blade bolt is then installed at each end, and the carrier can be rolled out of the way. The remainder of the blade bolts are then inserted and tightened.

An important benefit of this apparatus is that one worker alone can perform the operation that normally requires two or three people.

Estimated cost of the blade carrier, including labor and materials, is \$100 to \$125.

It was developed by Robert E. Davis of the Iowa D.O.T.



Ice Blade Carrier

Be alert for changes in sign standards

In October 1981, a driver failed to obey a stop sign at a T intersection of a paved county highway and a primary road in western Iowa. The accident report stated, "The car went off the grade, through the air and stopped in a field, with the driver partially pinned beneath the vehicle." The driver was seriously injured. He sued the county, alleging that it was negligent in failing to properly warn of hazardous conditions at the intersection.

The plaintiff hired a traffic engineer who found the symbol-type stop sign used in advance of the intersection to be in violation of current guidelines: the red octagon within the stop ahead sign spanned only 15 inches, compared to the current standard of 19 inches (see figure 1). The arrow was also smaller than the standard size used today. He considered this to be a "severe violation of the manual."

Use of the symbol-type stop sign was first permitted by the Federal Highway Administration (FHWA) in March 1977. The standard was incorporated in the next edition of the *Manual on Uniform Traffic Control*

Devices (MUTCD), published in 1978. The standard dimensions established for this sign included the 15 inch octagon and the arrow size used on the sign in western Iowa. The sign used in western Iowa had been fabricated in 1978, in strict compliance with the standards then in effect.

However, in November 1980, the stop ahead standard was revised to incorporate the larger octagon and arrow. Users were allowed a five-year compliance period; since five years had not elapsed, the stop ahead sign used in western Iowa was in compliance.

This case highlights the need for local government signing officials to keep abreast of the frequent changes in sign standards. Detailed sign dimensions are published by the FHWA in *Standard Highway Signs*, and changes are published in the *Federal Register*. Few local officials have regular access to these publications, but they do receive these updates from the MUTCD and from Iowa DOT mailings. They should be studied carefully.

Every change in the MUTCD is accompanied by a *Listing of Official MUTCD Rulings on Interpretations, Changes and Experimentations*, which includes compliance dates for some changes. (An example is a compliance date of 2/9/88 to ensure that all type 3 hazard markers are black and yellow.) People responsible for signing need to exert a genuine effort to ensure their signs are in compliance with current standards.

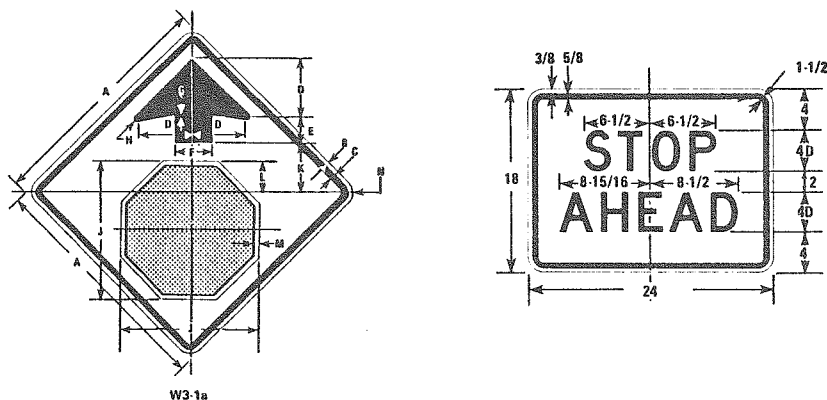
Training slides/tapes available

Two slide/tape training references, "Maintaining Granular Surfaced Roads" and "Snow Removal," are now available for previewing and purchase. These nationally recognized training packages are being used by local transportation units to train their operators and foremen.

If you would like to preview the slide/tape package, the Technology Transfer Center has a loaner set for public agencies. To reserve this educational tool, contact John Moody at 1-800-262-8498 (in Iowa) or 1-294-8815. This service is intended to provide you with the opportunity to screen the material to determine if you would like to purchase it.

If you wish to purchase the sets call Vernon Marks, Iowa DOT, at 515-294-1447. The cost is \$40 for each slide/tape package.

Figure 1. Example of standard from *Standard Highway Signs*, FHWA.



SIGN	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	N
MIN.	30	1/2	3/4	7-1/2	3-3/4	5	5/8	5/16	15-3/4	6-1/4	2-7/8	1/2	1-7/8
STD.	36	5/8	7/8	9	4-1/2	6	3/4	3/8	19	7-1/2	3-1/2	5/8	2-1/4
SPECIAL	48	3/4	1-1/4	12	6	8	1	1/2	25-1/8	10	4-1/2	3/4	3

COLORS

BORDER AND ARROW—BLACK (NON-REFL)
SYMBOL—WHITE BORDER ON RED BACKGROUND (REFL)
BACKGROUND—YELLOW (REFL)

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.

conference 1 2 3 calendar

15th Annual ASCE
Transportation Conference
Scheman Building, ISU
November 22, 1985

This annual conference will address current transportation topics including the formation of an Iowa DOT Safety Bureau, cultural resources in highway projects, pavement rehabilitation, weight in motion, and methods for protecting concrete bridges.

39th Annual Iowa County
Engineers Conference
Scheman Building, ISU
December 3-5, 1985

Courses conducted during this conference are planned for county engineers and technicians. Association and agency updates will be presented and more than 30 exhibits from manufacturers and suppliers will be featured.

Asphalt Paving Association
of Iowa Annual Convention
Des Moines, Iowa
December 5-6, 1985

Iowa Ready Mixed Concrete Association's
Promotion Workshop
Scheman Building, ISU
December 11, 1985

This annual meeting provides the concrete ready-mix industry an opportunity to meet and update themselves on changes in the industry. Discussion topics include innovative marketing, new ready-mix techniques, and products available.

ASCE Structural Design Conference
Scheman Building, ISU
December 19, 1985

Updates on university research developments and successful design techniques will be presented. This year's conference includes topics on admixtures in Portland Cement concrete, masonry design, restoration of a multiphased project, discussion of light gage steel stud-bearing walls, and new ASCE design standards.



For more information on these conferences, call the Info-Line at 1-800-262-8498.

The following publications can be obtained by contacting the Local Transportation Information Center.

Safer Bridge Rails, Volume 1
"Executive Summary"—Available from the Technology Transfer program or the director of FHWA's Safety and Traffic Operations Research and Development Division, 6300 Georgetown Pike, McClean, Va. 22101; #HSR-30. The book documents research undertaken to develop guidelines to improve the safety of bridge rails in order to comply with AASHTO specifications. The research included a series of 60 mi/hr impacts from various angles by vehicles ranging in size from a subcompact automobile to a bus into five selected rail systems and a rigid wall. The resulting guidelines are an improvement from those outlined by the National Cooperative Highway Research Program Report 230. Three other volumes of the report are available also.

Audio-Visual Lending Library of the Federal Highway Administration, #1
Provided here is a list of films, slide and cassette packages, and videotapes available through FHWA regional offices.

Construction Handbook on PCC Pavement Rehabilitation, #7
Published by the Construction and Maintenance Division of the FHWA, this handbook can assist FHWA Area Engineers in making construction inspections and in reviewing specifications and special provisions during the PS&E stage of a construction project.

Our Nation's Highways—Selected Facts and Figures, #13
Intended for general audiences, the book provides an overview of the U.S. highway system based on data gathered in 1981.

Hydrology, #31
This compilation of techniques for the design and analysis of highway drainage structures was prepared by Stottler, Stagg and Associates, Inc. with technical guidance from FHWA office of engineering hydraulics.

Mailbox guide revised

The AASHTO Task Force for Roadside Safety of the Standing Committee on Highways has prepared an informational guide entitled *A Guide for Erecting Mailboxes on Highways*. The guide includes information on:

- Mailbox support and attachment design
- Mail stop design and location
- Model regulation for mailbox and newspaper delivery boxes on public rights-of-way

Copies are available for \$5.25 from: American Association of State Highways and Transportation Officials;

444 North Capitol Street, N.W., Suite 225; Washington, D.C. 20001

The revised guide states "... some mailbox supports are so massive they are damaging the vehicles and causing serious injuries to people who accidentally strike them. The use of heavy metal posts, concrete posts, and miscellaneous items of farm equipment, such as milk cans filled with concrete, should be avoided." The new guide goes on to say, "... the ideal support for a mailbox assembly if struck will bend or fall away from the striking vehicle instead of damaging the vehicle and injuring its occupants."



index of articles

Bridges

- Bridge funding increased (June '83)
- Exhibit tells Brooklyn Bridge story (Dec. '84)
- Federal bridge funds for cities (Jan. '84)
- 40 to 50 percent of all bridges rated substandard (Sept. '84)
- Portable bridge maintenance scaffold (Tips from the field) (Jan. '84)
- Water blasting holds promise for bridge repairs (Jan. '84)
- Water blasting use spreads (Dec. '84)

Cities and Towns

- Combined engineering office saves money in Burlington (May '84)
- Des Moines public works department preparing equipment for winter (Tips from the field) (Sept. '84)
- Spencer public works department diesel powered equipment (Tips from the field) (July '84)
- Spencer public works department electronic test bench (Tips from the field) (July '85)
- Spencer public works department free-standing rack for sign storage (Tips from the field) (May '85)
- Spencer public works department hoist trouble light (Tips from the field) (July '85)

D.O.T.

- Agencies providing transit services must be certified (Sept. '85)
- Iowa D.O.T. devises new solutions to grade crossing problems (July '85)
- Iowa D.O.T. sees savings in contractor inspection (July '85)
- Who to call at D.O.T. (April '83)
- Who to call at D.O.T. (June '83)

Economics

- Buying a van? Figure life cycle cost (Nov. '83)
- The economics of seal coating (July '84)
- How to figure LCC for mid-sized vehicle purchases (Mar. '84)

Equipment

- Bosch prisms (Tips from the field) (May '84)
- Diesel powered equipment (Tips from the field) (Sept. '84)
- Edge rut dresser (Tips from the field) (June '83)
- Electronic test bench (Tips from the field) (July '85)
- Free standing rack for sign storage (Tips from the field) (May '85)
- Heim (Tips from the field) (Dec. '84)
- Hoist trouble light (Tips from the field) (Mar. '85)
- Ice blade carrier (Tips from the field) (Dec. '85)
- Iowa sports high tech traffic recorder system (Mar. '84)
- Portable bridge maintenance scaffold (Tips from the field) (Jan. '84)
- Pushcart for transporting a plate tamper between pavement patches (Tips from the field) (Aug. '83)
- Quick hitch snowplow attachment (Tips from the field) (Nov. '83)
- Recirculating crack-filling wand (Tips from the field) (Mar. '84)
- Spring maintenance ideas (Equipment) (Mar. '84)
- Water blasting holds promise for bridge repair (Jan. '84)
- Water blasting use spreads (Dec. '84)

Funding/grants

- Bridge funding increased (June '83)
- Continuing education grants offered for management workshops (Sept. '84)
- Continuing education grants offered to city, county employees (Nov. '83)
- Federal bridge funds for cities (Jan. '84)
- FHWA offers fellowships for graduate study (Dec. '84)
- Funding available for new railroad signs (June '83)
- Funding available for road safety and improvement (Mar. '84)
- New program can fund your training (Sept. '84)

- Public transit assistance available (April '83)

Landscape Management

- Three lawsuits cite vegetation as contributing cause (July '85)
- Management considerations for roadside vegetation (May '85)
- Play it safe when using herbicides (July '85)

Law/legislature

- Agencies providing transit services must be certified (Sept. '85)
- Be alert for changes in sign standards (Dec. '85)
- Court ruling implications (April '83)
- High accident intersection leads to large judgment (Mar. '84)
- Inventories are better than memories (Dec. '84)
- Lawsuit's message: maintain low-level roads (July '84)
- Legislature faces transportation decisions (Nov. '83)
- Loss of sign's reflectivity causes fatalities, lawsuit (Sept. '84)
- Rules explained for archeological findings (Nov. '83)
- Combat lawsuits by putting snow removal policy on paper (Dec. '85)
- Snow removal policy can reduce liability (Dec. '84)
- Three lawsuits cite vegetation as contributing cause (July '85)
- Too many signs lead to a liability problem (May '85)
- Tort claims against cities continue to rise (June '83)
- \$250,000 judgment against county: diagnosing what went wrong (May '84)

Pavement

- Asphalt pavement failure can be avoided (Aug. '83)
- Brick-patterned concrete paves Ohio development (Dec. '84)
- Discouraging performance by geofabrics in recent tests (Sept. '85)
- The economics of seal coating (July '84)

Filling versus sealing cracks in asphaltic concrete surfaces (May '85)
 Iowa update on ETP (Sept. '84)
 New pavement marking material to be demonstrated in Des Moines (Aug. '83)
 Pavement deicer explained at conference (Verglimit) (Dec. '84)
 Paving fabrics useful over longitudinal joints or cracks (May '84)
 Tested pavement prevents ice formation (Verglimit) (May '84)

Programs/services

A chance to share and work together (April '83)
 Contract renewal sparks program planning (Mar. '85)
 Info-line update (Aug. '83)
 Introducing the Local Transportation Information Center (April '83)
 John Moody joins staff (Mar. '85)
 Program promotes rail crossing safety (Aug. '83)
 Public Works magazine features Stan Ring (Mar. '85)
 Services available for microcomputer users (Mar. '84)
 Services available for microcomputer users (May '84)
 Toll-free Info-line is in operation (June '83)
 Traffic engineering consulting service is free (June '83)
 Traffic signal software available (May '85)
 We've moved (Dec. '84)

Publications

Better communication enhances public works programs (Sept. '84)
 Civil Engineering Extension calendar available soon (July '85)
 1984-85 extension service conference calendar available (May '84)
 1984-85 extension service conference calendar available (July '84)
 FHWA adopts new policy for highway and street design (July '85)
 Maintaining granular surfaced roads training audiovisuals available (Dec. '85)
 Snow removal audiovisuals available (Dec. '84)
 Snow removal audiovisuals available (Dec. '85)
 Traffic control device handbook available (Jan. '84)

Repair

Ames tests two patching products (Mar. '84)
 D.O.T.'s patch mixture alternatives (May '84)
 Electronic test bench (Tips from the field) (July '85)
 Filling versus sealing cracks in asphaltic concrete surfaces (May '85)
 Hoist trouble light (Tips from the field) (Mar. '85)
 Pothole patching procedures (April '83)
 Pushcart for transporting a plate tamper between pavement patches (Tips from the field) (Aug. '83)

Recirculating crack-filling wand (Tips from the field) (Mar. '84)
 Roofing compound works as crack patch (Nov. '83)
 Water blasting holds promise for bridge repair (Jan. '84)
 Water blasting use spreads (Dec. '84)
 Winter pothole patching (Jan. '84)

Research and Technology

Accident data improves safety (June '83)
 Appropriate technology: ISU studies low water stream crossings (Aug. '83)
 Board oversees highway research (Jan. '84)
 Discouraging performance by geofabrics in recent tests (Sept. '85)
 Highway research reports released (July '84)
 Iowans involved in national research (Dec. '85)
 Iowa sports high tech traffic recorder system (Mar. '84)
 Iowa's innovative pavement projects viewed by 400 (Nov. '83)
 Lime yellow "safer" for fire engines (Mar. '85)
 Words communicate better than symbols in road signs (July '85)

Signing

Be alert for changes in sign standards (Dec. '85)
 Inventories are better than memories (Dec. '84)
 Loss of sign's reflectivity causes fatalities, lawsuit (Sept. '84)
 Posted load limits pay off (May '84)



Interested in receiving some of the materials discussed in *Technology News*?

Place a check mark next to the items that interest you and send this panel to:

Local Transportation Information Center
 Engineering Extension Service
 Haber Road
 Iowa State University
 Ames, Iowa 50011
 1-800-262-8498 (in Iowa)
 515-294-8815

Name _____
 Firm _____
 Address _____
 City _____
 State _____ Zip _____
 Phone _____

Free Information

____ City and Snow Ordinances
 ____ For More Information (specify title(s))

 ____ Other, Please Specify

Preview Information

____ Granular Surfaced Road Training Slide/Tape
 ____ Snow Removal Training Slide/Tape
 ____ Video Tapes, Title and Number _____

Index (continued)

Reduce traffic sign vandalism (Sept. '84)
Signs offer a high return on investment (Sept. '85)
Too many signs lead to a liability problem (May '85)
Words communicate better than symbols in road signs (July '85)

Snow

D.O.T recommends less salt (Mar. '84)
Pavement deicer explained at conference (Verglimit) (Dec. '84)
Quick hitch snowplow attachment (Tips from the field) (Nov. '83)

Snow know-how (Jan. '84)
Combat lawsuits by putting snow removal policy on paper (Dec. '85)
Snow removal audiovisuals available (Dec. '84)
Snow removal policy can reduce liability (Dec. '84)
Tested pavement prevents ice formation (Verglimit) (May '84)

Transit

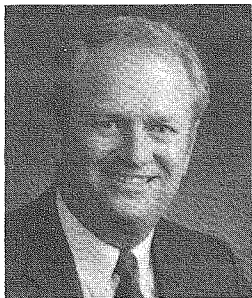
Agencies providing transit services must be certified (Sept. '85)
Buying a van? Figure life cycle cost (Nov. '83)

How to figure LCC for mid-sized vehicle purchases (Mar. '84)
Iowa transit regions (April '83)
Public transit assistance available (April '83)
Rural transit publications available (Sept. '84)

Videotapes Available for Free Loan

Eight Portland Cement Association videotapes (May '85)
Two additional Portland Cement Association videotapes (Dec. '85)

Knutson named president of the American Concrete Pavement Association



M. J. "Knut" Knutson was recently named president of the American Concrete Pavement Association in Chicago. He will continue to serve as the executive vice president of the Iowa Concrete Paving Association until March 1986.

Knutson, a civil engineering graduate and registered professional engineer in Iowa, has been involved with many civic and professional organizations. He was the recipient of the H. W. Hartmann Outstanding Achievement Award from the American Concrete Pavement Association.

He is the author of several technical papers on slipform paving, continuous reinforced concrete paving, recycling of concrete pavements, fibrous concrete resurfacing, concrete resurfacing designs, Iowa's bonded concrete resurfacing, pavement design, and pavement restoration.

Knutson served as the national chairman of the American Concrete Pavement Association Resurfacing, Recycling, and Reconstruction Committee. He has worked with various engineers in the design of all types of concrete resurfacing and recycling, and has worked with contractors in the construction of these research and demonstration projects. He is a member of the Rigid Pavement Construction Committee (A2F01) for the Transportation Research Board.



engineering extension service
iowa state university, ames, iowa 50011

Route to:

Address correction requested.
Include entire mailing label.