

roads bridges transit technology news

Local Transportation Information Center
ISU Extension--Business and Engineering

April 1988

DOT trains 15 local PAT instructors

Transportation systems and vehicle operators serving elderly and handicapped passengers have suffered from a lack of adequate driver training on correct passenger assistance techniques (PAT). As a result, passengers are exposed to the possibility of injury and transportation systems may be subject to public criticism.

Thanks to the efforts of Iowa DOT's Air and Transit Division, local transportation systems now have access to certified PAT instructors in the state. Employees from 15 Iowa public transit systems recently completed an instructor training conducted by Transportation Management Associates of Fort Worth, Texas. The firm has trained PAT instructors in more than 25 states.

During 16 hours of instruction, participants received skills and materials necessary to provide

in-service workshops to local transit drivers and employees of human service agencies. In addition to lectures and discussions, the training included 4 hours of technique practice. And with the help of video cameras, participants gained practical teaching experience.

Local trainings will cover personal assistive devices, passenger assistance, vehicle boarding, seating assistance and transfer techniques, and wheelchair placement and securement. Each new PAT instructor received slides, cassette tapes, a handbook, and other instructional tools for use in their local courses.



An invitation to attend

The Iowa Department of Transportation is celebrating its 75th anniversary in 1988. DOT employees and their families, former employees, and the public are invited to participate in transportation-related activities that will be held in conjunction with the observance, and to attend the National Transportation Week kickoff in Ames, Saturday, May 14, 1988.

The kickoff will be held at the DOT's Ames headquarters. Displays will be open to the public, and several prominent guests will speak under a tent erected for the celebration.

National Transportation Week, May 15-21, will be observed with weekday afternoon tours at the Ames complex and various activities all week involving DOT employees and others.

For information contact George Calvert, 75th Committee, Iowa DOT, 800 Lincoln Way, Ames, Iowa 50010; (515) 239-1374.

Weekly check keeps Clive safe and sound

Clive public works director, Willard Wray, has developed a weekly safety check program to help ensure safe and efficient working conditions. Each Tuesday morning all equipment operators are required to conduct a thorough safety check of their equipment. They inspect vehicle lights, oil, tires, mirrors, transmission, mileage for service, horns, wipers, washers, and many other items. Any deficiencies found are corrected immediately. The program has been an effective safety measure for Clive.

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Under new management

In corporate and county offices alike, the management is changing. And it's a change for the better, according to Tim Shields who directs the University of Iowa's Institute for Public Affairs. Speaking to more than 50 county engineers during their annual conference at ISU, Shields outlined a new philosophy of management that is revolutionizing the American workplace.

Economic ground lost to other industrial nations forced the change in the American approach to management, Shields said. An obvious alternative was the Japanese Management Model. Taught in university business courses throughout the U.S., the imported method and its champions have graduated from the classroom to the workplace.

The Japanese system takes the form of participatory or democratic management. Problems are solved and decisions made by workers rather than their managers. According to Shields, the manager's role is that of a change agent. "They are leaders involved in the transformation of low producers into high producers," he said.

The Japanese process takes longer but offers a critical advantage. Because workers are involved in the decisions defining the transformation, they are less likely to resist their changing conditions, Shields said. As a result, changes occur rapidly in the workplace.

ICEA presents awards

R.L. Carstens and two county engineers received awards during the 41st annual County Engineers' Conference held recently at ISU. The awards were presented by the Iowa County Engineers' Association (ICEA).

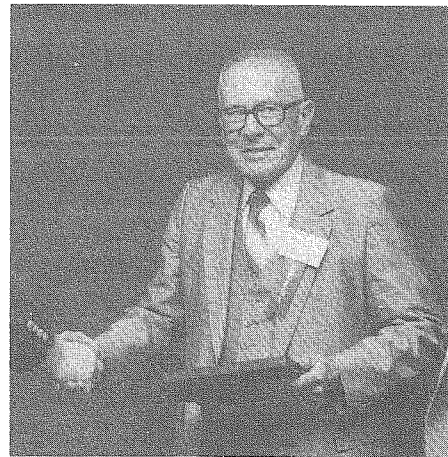
R.L. (Sam) Carstens, whose tort liability articles appear regularly in *Technology News*, received the Special Service Award. Carstens is Professor Emeritus of civil engineering at ISU where he taught for 22 years. He is well-known as a researcher and consultant on safety-related issues.

The Outstanding Achievement Award was presented to Don Linnan, Buena Vista County Engineer. Linnan has served Buena Vista County since 1959 and is a past president of ICEA.

Bob Gumbert, Tama County Engineer, received the Iowa County Research

According to Shields, a recent study of American workers concurs with the positive impact, and potential success, of participatory management. The study showed that increased pay was not the most effective motivator. Involvement in decision making was preferred as an incentive for improving job performance. "Americans are starting to discover that groups tend to make better decisions than individuals," Shields said.

To be effective in a participatory system of team building and group decision making, managers require



R.L. Carstens received the Special Service Award at the 41st Annual County Engineers' Conference.

Boards's Past President Award. Prior to joining the Tama County staff in 1978, Gumbert worked in Black Hawk County and taught at Hawkeye Tech and ISU.

different skills than in the past. "Engineers and accountants have had their times as the heads of large companies. The trend is turning away from the specialist towards someone who is a generalist--a person who is able to work with people," he said. "The biggest problem facing the manager of today is just managing people."

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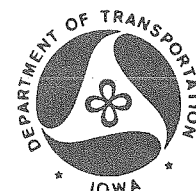
The preparation of this newsletter was financed through the Technology Transfer (T2) Program. The T2 Program is a nationwide effort financed jointly by the Federal Highway Administration and individual state departments of transportation. Its purpose is to translate into understandable terms the latest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

The 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 the Iowa Department of Transportation.



U.S. Department
of Transportation

Federal Highway
Administration



Highway research reports available

The following research reports on IHRB projects have been approved for distribution. Copies are available from Vernon J. Marks, Office of Materials, Iowa DOT, Ames, IA 50010; phone (515) 239-1447. When ordering, request by both title and number.

Cracking and Seating PCC Pavement Prior to Resurfacing to Retard Reflective Cracking--Fremont County (HR-279)

The report discusses the cracking pattern and construction techniques used on 2 miles of 18-year old pavement in Fremont County. Two sections were resurfaced without cracking and seating. Two different thicknesses of asphalt concrete resurfacing were used on the cracked and seated portion of the pavement to determine the benefits of additional ACC thickness. Annual evaluations are continuing.

Control Structures for Stabilizing Degrading Stream Channels--Pottawattamie County (HR-236)

Streams in western Iowa may have serious degradation due to loose soil. One solution is a grade stabilization structure at critical points. Effectiveness of such structures during a 4-year period is reported.

Thin Bonded Portland Cement Concrete Overlay (HR-520)

A 3-in. thick, thin bonded overlay of PCC with integral widening was used to rehabilitate a 4.5 mile section in Dallas County in 1983. The performance is evaluated in this 1987 report.

High Molecular Weight Methacrylate Sealing of an Iowa Bridge Deck (HR-2031)

When cracks in a bridge deck allow water to penetrate, deicing salt brine can interact with the reinforcing steel.

This report details the use of high molecular weight methacrylate to seal deck cracks and eliminate the intrusion of water.

Multiplan Spreadsheets for Highway and Hydraulic Engineering Computations in County Engineering Offices (HR-284)

A report on a project in which multiplan spreadsheet solutions were developed for selected engineering computations. Training seminars for county engineers were held and floppy disks with instructions and solutions are available.

Beneficial Effects of Selected Additives on Asphalt Cement Mixes (HR-278)

The objective of this report was to determine the effect of additives on asphalt cements and asphalt aggregate mixtures and develop a method of evaluating additives. Three additives (Asphadur, hydrated lime, and Styrelf) and 2 polymerized asphalt cements were evaluated.

Evaluation of Calcium Magnesium Acetate Deicer in Scott County, Progress Report (HR-253)

The Iowa Department of Transportation has been experimenting with CMA since 1980 at various field locations. In the winter of 1986-7, a 9-mile section in Scott County was studied evaluating the application of CMA versus sodium chloride. This report documents the study and results.

Improved Asphalt Surfaces and Asphalt Resurfacing Performance through Crack Maintenance, Final Report (HR-312)

The objective of this research was to evaluate 6 crack preparation methods and 7 sealant materials. The cleaning and sealing, which was performed in 1983, was evaluated in 1985.

Center offers reprint about possible reporting of infrastructure assets

Should communities be required to report their infrastructure assets? Should a dollar value be assigned to such assets? Should capital improvement plans be included in financial statements?

These and other issues are examined in an excellent article in the Second Quarter 1987 issue of *Public Works Pro Views*, the official publication of APWA's Institute for Professional Development.

According to the article, the Government Accounting Standards Board is proposing that cities must have detailed data on their infrastructure fixed assets such as bridges, sewers, and roads. Such a requirement would have far-reaching ramifications in all cities. The proposal is awaiting feedback from state and local financial officials.

In addition to a discussion of the possible new requirements, the article features an excerpt from Dayton, Ohio's capital management program which includes an example inventory summary.

Reprints of the complete article, "City Financial Reports May Require Detailed Data on Infrastructure," are available from John Moody, Iowa State University, Local Transportation Information Center, EES Building, Haber Road, Ames, IA 50011-3074; (515) 294- 8817.

WWI surplus trucks paved the way

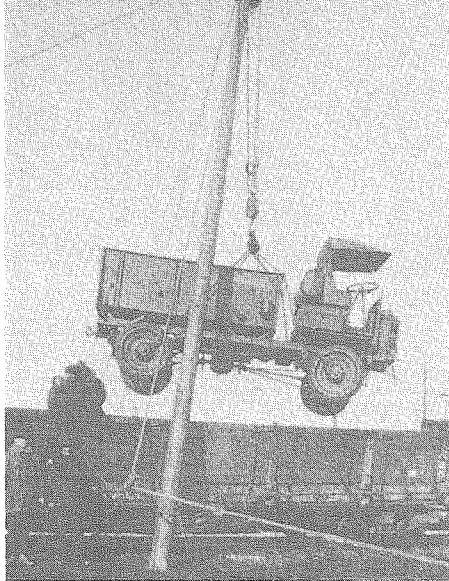
By Stan Ring

At the end of World War I the U.S. War Department offered surplus equipment to state agencies. The Iowa State Highway Commission, which was located in the Engineering Annex on ISU's campus, accepted the offer. By

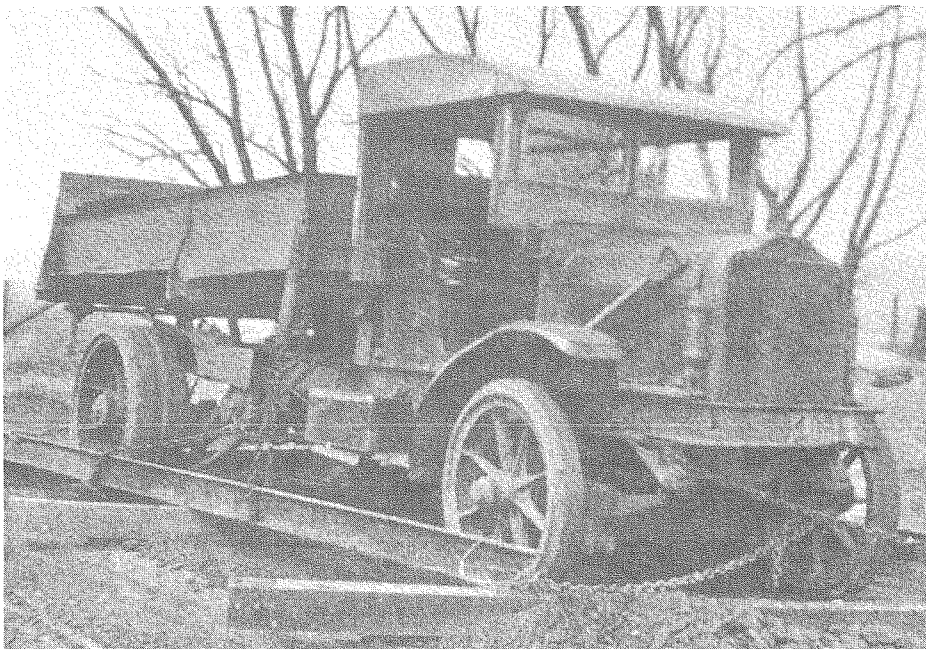
February, 1920, the agency had received 512 army trucks suitable for road maintenance operations. It also obtained several other vehicles including autos, ambulances, and tractors.

More than 300 vehicles were distributed to counties. Others were modified into graders, drags, snowplows, and dump trucks. They were put to work on highway construction projects and maintenance operations throughout the state.

As chief engineer Fred White noted years later, the surplus trucks played a role in determining the present-day site of DOT's headquarters in Ames. The trucks provided the impetus--and some of the finances--to construct storage buildings. A tract of land west of the Northwestern Railroad and south of Lincoln Way was leased for a period of 7 years with an option to purchase. The storage facilities for the trucks were built on the tract at a total cost of \$45,000. Used today as offices, these buildings mark the beginning of the DOT's complex in Ames.



A 2-ton, 4-wheel drive WWI surplus truck (c.1920). Because bad weather prevented transport by road during much of the year, equipment was shipped by rail.



Two-ton, solid-tire, WWI surplus trucks were converted to handle highway construction and maintenance in Iowa during the 1920s.

PMS is key to street maintenance

Several years ago Mesa, Arizona streets were in rough condition. John Ashley, Street Maintenance Administrator for the city, realized the situation needed correction. He began to experiment with the U.S. Army Corps of Engineers' PAVÉR program as a basis for a Pavement Management System. He strongly believed that a sound PMS was the key to effective preventive maintenance, but knew he had to determine needs and establish quality control before he could initiate an effective program.

His first move was to complete an inventory and detailed pavement condition survey. He then divided Mesa's streets into five categories based on traffic loads. "The pavement will tell you what it needs," Ashley says.

It took about five years of systematic upgrading to bring Mesa's street system to the point where he could effectively practice preventive maintenance.

On major arterials Ashley applies a fog-seal when the surface shows low severity weathering and raveling, usually 3 to 4 years after rehabilitation or new construction. When the surface shows low to medium severity raveling and cracking, an emulsified asphalt fog-seal is applied.

If an arterial street shows medium severity cracking and low-to-medium weathering and raveling after 2 or 3 fog seals, Ashley applies an aggregate seal coat. If cracking is medium-to-high severity with medium severity weathering and raveling, he will place a seal coat using rubberized asphalt.

Ashley put intersections in a separate category for special maintenance treatment because they act differently than other types of pavement. He uses a high stability asphalt mixture to

Continued on next page

PMS is key, con't.

rehabilitate intersections at major arterials to prevent rutting and shoving.

On collector and residential streets, Ashley applies an asphalt surface treatment about every 3 years to prevent oxidation in the hot Arizona sun. After approximately 12 years, when the surface shows medium severity weathering and raveling, Ashley applies an emulsified asphalt slurry seal. Cracks are always sealed before placing any surface treatments.

If routing maintenance will not make the necessary improvements, Ashley moves to Major Maintenance and Repair to Overhaul. Major M and R includes pothole repair, skin patch, partial-depth patch, full-depth patch, and overlays of one inch or less. Overhaul involves complete rehabilitation with asphalt concrete overlays of one inch or more. Before Ashley decides to overhaul a street, he conducts nondestructive or destructive tests to determine structural and performance analysis.

This article is reprinted from the Winter, 1988 issue of *The Center Line*, published by North Dakota State University's Transportation Technology Transportation Center. It was condensed from the original article by R.E. Campbell in *Asphalt Magazine*, Fall, 1987.

And justice for all

Appointment, promotion, admission and programs of 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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Metal drums on their way out

According to a report in the American Traffic Safety Services Association's (ATSSA) Signal, the organization will petition FHWA to mandate the elimination of metal drums on all federally funded projects. ATSSA also will recommend that MUTCD be altered as soon as practical to prohibit the use of metal drums.

Recent studies have shown that metal drums used as channelizing devices in work zones create significant hazards

to motorists and construction workers. Plastic drums have proven to be much safer and more durable.

Furthermore, an ATSSA survey of metal drum usage in all 50 states revealed that 30 states already prohibit metal drums. In the 19 states that allow either plastic or metal, plastic drums predominate. Two states (California and Hawaii) prohibit the use of both types of channelizing devices.

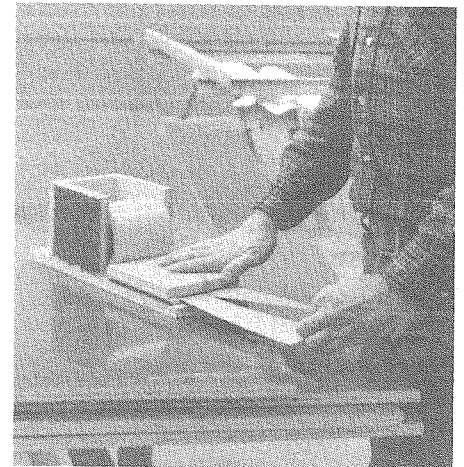
tips from — the field —

Strip-cutting box

In late 1986, the sign shop in the Beaumont district of the Texas Department of Highways and Public Transportation needed high intensity, engineering-grade reflective sheeting in 1-in. widths for small sign borders. However, the only tape rolls in stock were 4 in. wide. Attempts were made to cut the rolls down with a hacksaw and a band saw. The results in both cases were ragged, unsightly edges that made unprofessional looking borders.

Kent Corbello found a solution. He built a box with 2 sides and a back just deep enough to hold a full roll of tape. The bottom of the box is about 16 in. long. In front of the open side of the box is a piece of plywood set on shims. This shroud acts as both a stop for the roll of tape and a stabilizer for a razor blade. The front edge of the box bottom and shroud are slotted. Single-edged, industrial razor blades are fitted into the slots at a cutting angle of approximately 60 degrees.

Because of the construction of the box, blades are easy to change or rearrange if different width borders are needed. The box also can be used on 2-in. tape rolls.



Strip-cutting box is easy to build and eliminates the need to stock different widths of reflective border tape.

For more information contact Huey Eaves or Mr. Ted East, Texas Dept. of Highways and Public Transportation, 8350 US Highway 69, Beaumont, TX 77708; (409) 892-7311.

Reprinted from *Technology Transfer*, Texas Department of Highways and Public Transportation--Research Section.

The ultimate liability challenge: work zone traffic control

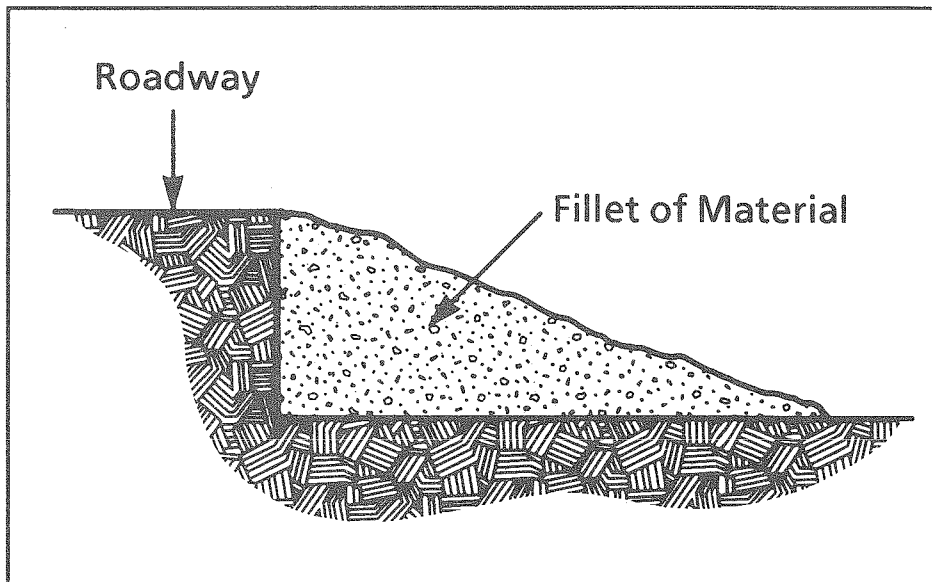
by R. L. Carstens, Professor Emeritus of Civil Engineering

About 700 fatalities and countless injuries result each year in the United States from traffic accidents in work zones. Work zone accidents also represent a substantial and growing proportion of the liability actions arising from highway mishaps. In the past two years, one of every eight accident cases brought to the writer for study has been a work zone accident. Ten years ago this proportion was about one in 100.

Attorneys for plaintiffs welcome work zone accidents because they often present the potential to reach several "deep pockets." Usually one or more public entities end up as defendants in such actions as well as all of the contractors and subcontractors involved in a construction project.

Work zones present an unusual challenge to those responsible for traffic control. A nearly infinite variety of work situations arise and each one may require unique measures for traffic control that are not covered specifically by available references. The duration of the work may be quite brief so that there is a strong tendency to ignore traffic control and avoid the bother of putting out a few signs and having to remove them subsequently. On projects of long duration, signing changes may not keep up with changes in the work situation. Vandalism of traffic control devices is a constant problem on projects of any duration.

All persons involved with work zone traffic control must be familiar with Part VI of the Manual on Uniform Traffic Control Devices, the basic reference source for guidance in this area. Section 10.310, Traffic Control, in the AASHTO Maintenance Manual (1976) also should be mandatory reading for all personnel responsible for work area safety. However, knowing what to do solves only part of the work zone safety problem. Constant monitoring of the devices in



Cross section of material fillet used to decrease the hazard of an excavation adjacent to roadway. (From "Work Zone Traffic Control," FHWA, 1985.)

place is essential to assure that they are properly maintained and remain in place and that the traffic control plan is still appropriate to the work situation.

To assist in making work areas safer for the public, the following three questions are presented to indicate the appropriate actions in certain specific situations:

1. In a maintenance activity of short duration, such as adding granular surfacing material to a gravel or rock road, would the road even briefly be unsafe for an unskilled motorcyclist? If the answer is yes, temporary ROAD WORK AHEAD signs should be used in both directions and flagging may be needed at times.

2. In asphalt resurfacing of a highway, is there an edge dropoff that must be left overnight that could present problems to an incompetent driver of any vehicle with four wheels? If the answer is yes, follow the construction specifications that are applicable in your jurisdiction by using the appropriate traffic control devices

and/or adding a fillet of material as shown in the accompanying figure.

3. Is your road *actually* closed (not even local traffic except contractor vehicles) even though it is officially closed by resolution or ordinance? If the answer is no, then you should consider many of the same traffic control measures that you would use on a road open for traffic.

Since traffic control in work areas presents so many unique problems, you may not be right all of the time. A conscientious effort by persons who are knowledgeable about work zone traffic control is needed. The resulting traffic control plans may prevent accidents and surely will help in the liability actions that inevitably would follow any accidents that occur.



for more information

Research and Publications Review

This helpful newsletter published jointly by Minnesota's Local Road Research Board and Department of Transportation contains abstracts on research reports dealing with subjects on transportation. Subjects range from pothole repair to evaluations of concretes and equipment.

To receive the newsletter, contact Pamela Newsome, Information Services-Minnesota Department of Transportation, Room B26, Transportation Building, John Ireland Blvd., St. Paul, MN 55155; (612) 296-2385

Directions: News and Information for Traffic Engineering Professionals

This quarterly newsletter from the Traffic Control Materials Division of 3M is available at no cost. It highlights state-of-the-art traffic management tools and techniques and offers a forum for the exchange of ideas and information. Recent articles featuring new technologies and their applications included: a computerized sign inventory management program, innovations in pavement marking, and principles of reflectivity. Regular columns are Tech Talk and Washington Scene. Well-illustrated with photos and diagrams.

To subscribe, contact Directions Editor, Marketing Communications Department, 3M Traffic Control Materials Division, Building 223-3N-01, 3M Center, St. Paul, MN 55101-9924

The following publications are available from John H. Moody, Iowa State University, Local Transportation Information Center, EES Building, Haber Road, Ames, Iowa 50011; (515) 294-8817:

Automated Pavement Data Collection Equipment. (Iowa DOT Demonstration Project No. 72 or FHWA-DP-72-2 PASCO Road Survey System)

This report compares and contrasts the PASCO road survey system of pavement evaluation with manual distress survey procedures. The report shows the PASCO system can provide comparable results with improved accuracy, improved data collection speed and an invisible record, while offering a comparable cost to the manual method.

This report and a 13-minute videotape are available for loan.

National Association of County Engineers-NACE Action Guide Series

These guides provide organizational and technical information based on the best nationwide practices. With more than 150 county engineers contributing to the guides, the series is a valuable training resource that provides information on 21 management and technical subjects in 3 volumes. Each volume covers a separate area: Administering your Department's Program's, Planning your County's Infrastructure, and Keeping the System Going.

Also available is the NACE Training Guide Series consisting of 7 volumes aimed at specific areas ranging from communication to improving traffic maintenance. A limited number of free copies are available.

Manual Geometric Design Standards for Canadian Roads

This is the 1986 metric edition containing 9 chapters ranging in subject matter from classification to intersections and travel barriers. Available on a loan basis.

Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications.

A set of review checklists and technical guidelines developed to aid engineers in their review of projects containing major and unusual geotechnical features. These features may involve any earthwork or foundation-related activities such as the construction of cuts, fills, or retaining structures which, due to their size, scope, complexity, or cost, deserve special attention. A limited number available on a loan basis.

Guidance for Controlling Friable Asbestos-Containing Materials in Buildings

This 66-page document provides information that supplements previous EPA guidance on controlling asbestos-containing materials in buildings. The document summarizes data on exposure to airborne asbestos; identifies issues in establishing an asbestos program; reviews technical issues of assessing potential for exposure; summarizes and updates information on applicability, effectiveness, and relative costs of alternative remedial actions; suggests a process for selecting course of action; and discusses criteria for determining successful asbestos control.

Inspectors Guardrail Checklists

A handy pocket-sized, laminated checklist containing 20 questions for on-site guidance. A limited quantity are available from the Local Transportation Information Center.

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28th Annual APWA North American Snow Conference

April 10-13

Des Moines

Extensive program includes workshops and presentations by American and Canadian experts.

Topics: equipment tips, weather predicting, bridge deck cathodic protection and monitoring, computers, safety tips for snowfighters, frost formation on bridge decks, environmental policy, new techniques for snow and ice control, legal aspects.

Contact Harold Smith (515) 283-4920.

Forum on the Future of The Rural Intercity Bus Service

April 13

Scheman Building, ISU

Discussion on the role of intercity bus services in rural communities, the issues involved as such services struggle to survive, and how community leaders can help maintain service in their hometowns. Speakers include Jo Ann Zimmerman, Lt. Governor of Iowa; Daniel Prins, President, Jefferson Lines, Inc.; and Nancy Richardson, Director, Iowa DOT Air and Transit Division. \$10 fee, contact Connie Middleton, (515) 294-6229 to register.

Rural and Specialized Transit Management Workshop

April 18-22

University of Wisconsin--Milwaukee

Contact Christine Alaspa, (414) 229-4422

APWA Motor Vehicle Equipment Management

April 25

Lincoln

Contact workshop registrar, (312) 667-2200.

1988 Iowa Airport Conference

April 19

Scheman Building, ISU

Field experts discuss current concerns and issues in planning, design, construction, and operation. **Topics:** state aviation system planning, obstructions and zoning, airport mapping, and hospital heliports. \$40 fee, contact Connie Middleton, (515) 294-6229 to register.

Local Public Agency Real Estate Acquisition Seminar

April 21

Scheman Building, ISU

Those responsible for implementing public agency right-of-way programs can receive instruction on the manual *Real Estate Acquisition Guide*.

Topics: laws and regulations, right-of-way plans--ownership and title, appraisal, negotiations, settlements, functional replacement, property management. Offered by FHWA and NHI. \$20 fee. Contact Tom Maze (515) 294-6777 for more information.

IES Annual Meeting

May 5-7

Cedar Rapids

13th Annual Iowa Traffic Control and Safety Conference

May 6

Scheman Building, ISU

Current details on street and highway traffic control and safety subjects for those in engineering, education, and enforcement positions. For more information, call Jim Cable, (515) 294-2862.

ASCE Spring Convention

May 9-13

Nashville

Passenger Assistance, Safety, and Wheelchair Securements

May 23-26

University of Wisconsin--Milwaukee

Contact Christine Alaspa (414) 229-4422

Technology News

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