

roads bridges transit

technology

news

Local Transportation Information Center
Iowa State University Engineering Extension Service

March 1984

DOT recommends less salt

In reference to the Snow know-how article in the January newsletter, the DOT makes the following recommendations. It is important to note that the Salt Institute's recommended rates of application are approximately double those used effectively by the DOT for 31 years. Over the years, the DOT has developed an effective and economical snow and ice control operation using deicing chemicals. The department has found that the benefits of rock salt can be extended greatly by blending it 50/50 with ice control sand. This is effective in all but urban areas where there is risk of plugging storm sewer systems with the added sand.

A basic rule of thumb is that salt should not be used to melt snow bulk. The use of rock salt to melt snow bulk is wasteful and expensive at current prices. Salt should be used to remove the balance of an ice or snow accumulation after traffic has packed it and after the maximum use of snow plows to remove snow bulk.

Specifically for conditions 1 and 2 (temperatures near or below 30°F. and falling, with snow, sleet, or freezing rain and wet or sticky road surfaces), the DOT recommends a maximum of 300 pounds per two-lane mile rather than the 500 pounds recommended by the Salt Institute.

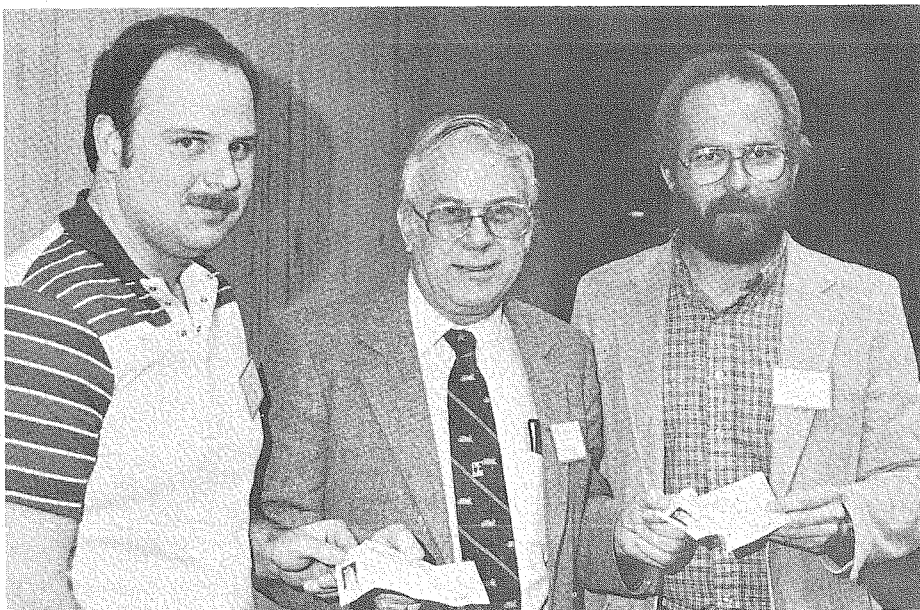
Applications should be repeated if necessary.

Whenever the temperature is below 20°F. as in conditions 3 and 4, the DOT does not recommend the heavy application of salt in any situation. When the temperature is below 20°F. with snow, sleet, or freezing rain and wet road surfaces (condition 4), it is excessive to apply rock salt at 600 to 800 pounds per two-lane under any situation. This practice will soon lead to problems of pollution of roadsides and streams if continued. Again, the recommendation is for 300 pounds of sand/salt mix with repeated applications if beneficial. However, rarely is this the case.

In condition 5 where the temperature is below 10°F. with snow or freezing rain and an accumulation of packed snow or ice, the application of rock salt is not justified in any volume except a minimum amount to freeze proof the abrasive pile in the cold winter conditions.

These comments are offered in the belief that the rates of application cited by the Salt Institute are more typical of eastern urban areas where rock salt is used as a basis for melting snow bulk.

Charles R. Huisman, Materials Engineer,
Iowa DOT.



Grant winners attend conference

During ISU's Asphalt Paving Conference, January 24, program manager Stan Ring (center) awarded \$100 checks to Lamoni street superintendent Steve Slycord (left), and Michael Hansen, Shelby County Engineer's technician. The two were winners of our continuing education grants covering registration fees and travel expenses. Topics discussed at the conference included crack and joint sealing, asphalt overlays, cold in-place recycling, and budgeting for rehabilitation. A third award winner, Melvin Frost of Rudd, was unable to attend.

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Iowa sports high tech traffic recorder system

The Iowa Department of Transportation's new traffic recorder system is one of the most advanced in the nation. An automatic traffic data collection system is replacing mechanical punch tape recorders used for traffic monitoring at 106 sites statewide.

The new system was assembled for the Iowa DOT by Streater Amet. It consists of an IBM PC XT microcomputer functioning as the central controller, Telac field units, Hayes and Universal Data Systems telephone modems, ARCO solar panels, and Yuasa storage batteries. Existing pavement loops were retained. The hardware is driven by a Streater Amet software package tailored to meet Iowa's needs.

The system controller is housed in the central DOT complex in Ames. It automatically polls each of the 106 remote stations using outwatts telephone lines at night when they are not in use. The field units continuously gather and hold traffic data until polled. They derive their energy from 12 volt solar panels coupled to 38 amp/hour storage.

In addition to volume counting, 33 of the field units are capable of gathering vehicle length and speed data.

The new system has several attractive features. Besides a three-year payback on costs, components are standard manufacture shelf items. All field units are completely solid state

electronics. Operating modes and speed and length categories are selected through central control unit keyboard. Furthermore, there are built-in system checks to detect field unit malfunctions and installation, maintenance, and minor repair can be done by Iowa DOT personnel.

If interested in more information about statistics in your area, contact Pat Cain, Office of Transportation Inventory, DOT, 515/239-1073.

John Whited, Transportation Research, Iowa DOT.

Funds available for road safety and improvement

Cities and counties can take advantage of two cost-sharing programs available through the Iowa Department of Transportation. The C-STEP (County-State Traffic Engineering Program) and U-STEP (Urban-State Traffic Engineering Program) funds can be used for mutually beneficial safety and operational improvements. To cover the state's share, each program has been allocated \$2 million from the state's share of the road use tax fund.

Under C-STEP two kinds of improvements will be considered. One is a 'spot' type of project, such as an intersection. The second is a 'linear' project, which could be a rehabilitation or reconstruction of several miles of road.

The state's share of spot improvements would be 55 percent, with a maximum of \$200,000 per project. On linear projects, the state's share would be on a graduating scale,

based on traffic volume, type of work, and ownership of the road when the project is completed. It will range from a low of 30 percent and \$23,000 per mile to a high of 60 percent and \$125,000 per mile. In all cases, the county will handle the design and construction engineering costs.

Under U-STEP, eligible projects include but are not necessarily limited to: widening for turn lanes; widening to eliminate bottlenecks; installing, upgrading, or modernizing signals; increasing turning radii; improving sight distance; pavement marking; signing; and resurfacing to improve traffic operations. Any improvement of limited scope that will improve traffic flow or eliminate accident potential will be considered.

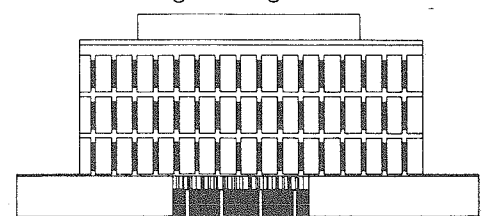
Eligible programs are processed on a first-come, first-served basis while the money lasts. City or county officials interested in learning about the program and how to develop an eligible project should call the Iowa DOT's local systems office in Ames, 515/239-1528.

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Program manager—Stan Ring
Coordinator—Dave Dickinson
Editor—Teddi Barron-Penfold
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civil engineering extension

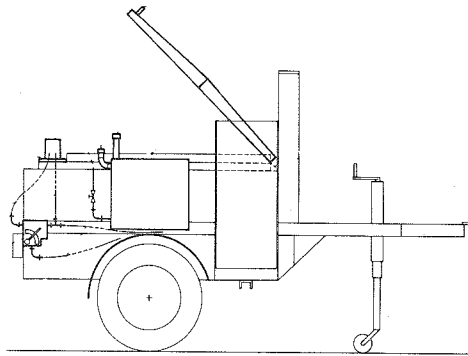


tips from the field

The Iowa DOT has developed a recirculating crack-filling wand that improves the efficiency of maintenance crews when sealing pavement cracks. The recirculating wand keeps a constant supply of heated sealing material at its tip. This prevents freezing-up caused by the material cooling and solidifying at the tip. For more information about the wand and names of possible manufacturers, contact Arlo Merritt at the DOT, 515/239-1227.

If you have a piece of equipment, modification, or an innovation technique that would be beneficial to others involved with local transportation systems, please share it with us.

Contact Dave Dickinson, Local Transportation Information Center, 110 Marston Hall, ISU, Ames, Iowa 50011.



Tar kettle with hydraulic driven pump and recirculating wand.

New service for microcomputer users

The Federal Highway Administration has established a microcomputer user support center for statewide applications by state and local highway agencies.

The support center will operate a transportation software exchange, perform software testing and packaging, provide advisory services, develop custom software, and publish a news brief.

Microcomputer users can subscribe to this comprehensive service for a fee. If you are interested and have not yet received detailed information from FHWA about the new microcomputer user support center, contact the Info-Line and the information will be sent to you.

conference 1 2 3 calendar

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

Design of Urban Streets

March 12, IWCC, Council Bluffs

March 14, DMACC, Ankeny

Planning, design, and operation of urban streets. Detailed course notes.

Land Surveyors Annual Conference and Workshop

March 29-31, ISU

Current surveying topics, specialized workshops, new product exhibits, spouses' activities.

Better Concrete Conference

April 5, ISU

Update on changes in concrete technology and rehabilitation with applications.

Traffic Control and Safety Conference

May 10, ISU

Current status of highway traffic control and the safety and efficiency of Iowa's transportation system.

Traffic Engineering Workshop

May 22-23, ISU

Current issues are reviewed for professional development.

Spring maintenance ideas

While the polar winds blow, bring the crews out of the cold and prepare tools and equipment for spring. Work experience has shown us that this timely work activity saves headaches in spring. It is important to have equipment and tools in working condition. In Clive, we believe that the equipment that meets the public eye should reflect the attitude of the public works professional. Take time now to examine equipment and tools closely.

The four major areas we inspect are safety, power train, operator area, and exterior of vehicle.

Safety—the safety of the vehicle is critical for the protection of the operator and others. Carefully check safety features. You may even save a few dents in your vehicles.

Power train—good maintenance is a must. Closely inspect the power train because it is the bread and butter of your equipment. Now is a good time to look for needed overhauls. Stop oil leaks and make adjustments in the power train area.

Operator area—check the operator area. Improve the quality by cutting scrap carpet for floor pads and cleaning and repairing the interior.

With a "we care" attitude, the life of the vehicles can be extended and the public works professionals can be proud of their equipment.

Willard Wray, Director of Public Works, Clive.

Iowa Department of Transportation Tabulation of bids for 1, 16-Passenger bus w/wheel chair lift, April 13, 1983

| Bidder | Make Model | Base bid | A/C option | Diesel option | Total each | Warranty credit | LCC |
|---|-----------------------------|-------------|------------|---------------|-------------|-----------------|------------------|
| Ward Bus Body Sales 1501 East Lincoln Way Ames, Iowa 50010 | Ward MS2000 IHC 1723 | \$31,957.66 | — | — | \$31,957.66 | - 250. | \$31,707.66 |
| | | 31,957.66 | \$4,000. | — | 35,957.66 | + 250. | 36,207.66 |
| | | 31,957.66 | — | \$1,950. | 33,907.66 | - 250. | <u>33,657.66</u> |
| | | 31,957.66 | 4,000. | 1,950. | 37,907.66 | + 250. | 38,157.66 |
| Saf-T-Liner Bus Sales Box 3232 Des Moines, Iowa 50316 | Thomas 83-197ON IHC 1723 | 32,210.00 | — | — | 32,210.00 | + 750. | 32,960.00 |
| | | 32,210.00 | 6,625. | — | 38,835.00 | + 1,250. | 40,085.00 |
| | | 32,210.00 | — | 1,811 | 34,021.00 | + 750. | 34,771.00 |
| | | 32,210.00 | 6,625. | 1,811. | 40,646.00 | + 1,250. | 41,896.00 |
| Badger Body & Truck Equip. 6336 Grover St. Omaha, Neb. 68106 | Wayne Lifeguard IHC 1723 | 34,501.00 | — | — | 34,501.00 | + 750. | 35,251.00 |
| | | 34,501.00 | 1,425. | — | 35,926.00 | + 750. | 36,676.00 |
| | | 34,501.00 | — | 1,638. | 36,139.00 | + 750. | 36,889.00 |
| | | 34,501.00 | 1,425. | 1,638. | 37,564.00 | + 750. | 38,314.00 |

Ames tests two patching products

City of Ames engineers are conducting a pavement experiment to test the effectiveness of two relatively new patching products.

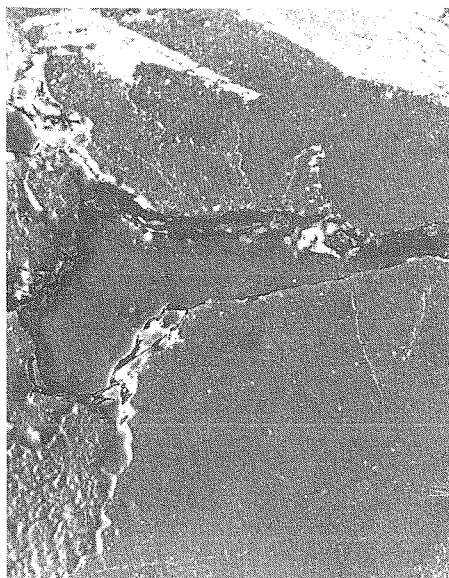
One of the worst rated sections of the city's pavement inventory was selected for the comparison between a fiberglass reinforcing material and an engineering fabric. Both of the relatively new products are designed to cut down the severity and frequency of pavement cracks that result from freeze-thaw cycles. Neither product has been used previously in Ames.

On the north lanes of West Lincoln Way (old Highway 30), the city engineers used a 12-inch fiberglass reinforcing, a strong matting that resembles a woven placemat. Juncture cracks in the breakup were cleaned, filled with a layer of asphalt, then covered with the fiberglass strips. A two-inch asphalt mat was then poured over the strips.

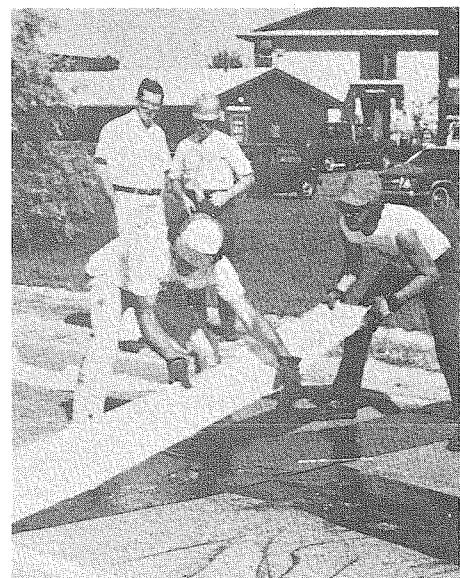
On the south side of the highway, a full width engineering fabric was used. The entire fabric was covered with a two-inch asphalt mat.

Each material works in the same manner. By allowing pavement move-

ment to spread over a wider area during freeze-thaw periods, water penetration is stopped and further deterioration prevented. Ames officials hope to determine which material works best.



Juncture cracks provide the testing ground for two new pavement patching products.



A fiberglass strip is positioned for the Ames experiment. Its strength during freeze-thaw cycles is being compared to an adjacent patch made with an engineering fabric.

How to figure LCC for mid-size vehicle purchases

Iowa has developed a method for considering vehicle Life Cycle Costs (LCC) in the determination of contracts awarded to **purchase mid-size (16-24 passenger body-on-chassis) vehicles**. After reviewing LCC methods used by other states on transit systems the Iowa DOT has devised a LCC method that will hopefully prove to be a workable approach to purchasing more cost-effective vehicles. The contract award formula we intend to use in a procurement that is out for bids now is as follows:

$$CA = BP + MCG - WC$$

CA = Contract Award
 BP = Bid Price
 MCG = Maintenance Cost Guarantee
 WC = Warranty Credit

The mileage estimate over the life of the vehicle shall be based on an average of 24,000 miles per year, 120,000 miles over the life of the vehicle.

Maintenance cost guarantee

This factor covers the cost of periodic (daily, weekly, monthly) scheduled maintenance requirements (lubrication, oil/filter, etc.). Using the manufacturer's lubrication and maintenance manuals as authoritative reference, the bidder guarantees that scheduled maintenance costs will not exceed a specified amount (MCG) for 12 months or 24,000 miles of operation. A performance surety will be held to pay any documented costs in excess of the MCG.

Each bidder is required to use a worksheet in preparing MCG estimates. The bidder is to supply MCG estimates for five years of vehicle operation. Material prices are to be from the bidder's latest available price lists. The receiving agency will document actual maintenance costs on the vehicle. If the vendor can show that maintenance costs are excessive, the actual cost will be adjusted downward in the evaluation of the MCG performance to the going rate by the Department.

Warranty credit

The minimum warranty requirement is 100 percent parts and labor for 12 months with unrestricted mileage. Extended warranties, beyond 12 months, are interpreted as an indication of the bidder's faith in the reliability of the specified product. Extended warranties shall require a surety to insure the warranties offered. As a factor of the contract award formula valuations (penalties) have been assigned to the absence of manufacturer's extended warranties.

Warranties of incremental periods shall be credited according to the extent of the warranty offered and the specified credits. That is, an 18 month—36,000 mile warranty would be credited at—\$375. See the table below.

Performance bonds

A performance bond shall be issued as surety for extended warranty credit and for the maximum maintenance cost guarantee. The bond amount for the warranty credit shall equal the amount of the credit as shown in the Contract Award section of this instruction. The bond amount of the maintenance cost guarantee shall be for \$500.

The performance bonds shall be in the name of the transit agency designated to receive the new vehicles. The bonds will not be required until the vendor enters into a contract to deliver vehicles.

Frank Sherkow, Public Transit Division, Iowa DOT.

Valuations of warranty credits and penalties

| Unit | 12 months | 12 | To 24 | To 36 | To 48 | To 60 |
|---|------------------------|---------------------|------------------------|------------------------|------------------------|-------------------------|
| | Less than 24,000 miles | months 24,000 miles | months to 48,000 miles | months to 72,000 miles | months to 96,000 miles | months to 120,000 miles |
| Chassis, to include engine and all components below the floor line, excluding tires and batteries | +\$ 750 | \$0 | -\$ 750 | -\$1,400 | -\$2,000 | -\$2,500 |
| Body, to include all components starting at floor line, excluding air conditioning | +\$1,000 | \$0 | -\$1,000 | -\$1,900 | -\$2,600 | -\$3,200 |
| Air conditioning, including all lines, compressor and wiring | +\$ 500 | \$0 | -\$ 200 | -\$ 400 | -\$ 600 | -\$ 800 |



for more information

Pothole Repair Management slide set and self study course

Prepared by The Pennsylvania Transportation Institute

Slide sets available on free loan basis from the Info-Line (accompanying study guide need not be returned).

One hundred thirty-eight slides on effective pothole repair including causes of potholes and pavement distress, materials and proper procedures for repair, improving crew performance and productivity, improving equipment utilization. The study guide provides a complete text and allows viewer to learn at his or her own pace. Although the slides must be returned to us, the guide may be kept for your future reference.

Iowa Transportation Laws Annotated Prepared by DOT Iowa Highway Research Board

Available for \$16.50 from Office Supplies, Ames Storeroom, DOT, 800 Lincoln Way, Ames, Iowa 50010. Order #000304200. (Include a check for the exact amount.)

This new 638 page report contains annotations of case decisions and Attorney General opinions for Iowa laws pertaining to transportation. Pertinent information for Iowa counties and cities.

The following periodicals are offered free to qualified highway public works officials. For a free subscription, write a letter of request including signature and title to the address listed below.

American City and County—

Published monthly, articles are concerned with urban development and street maintenance. American City and County, Berkshire Common, Pittsfield, Mass. 01201.

Better Roads—Published monthly, contains articles of national interest on rural road construction, maintenance, and innovation. Better Roads, PO Box 558, Park Ridge, Ill. 60068.

Public Works—Published monthly, carries topics of national interest, primarily involving urban public works. Public Works Journal Corp., Box 688, Ridgewood, N. J. 07451.

Rural and Urban Roads—Published bi-monthly, features articles of interest on road construction and maintenance. Scranton Gillette Communications, Inc., 380 Northwest Highway, Des Plaines, Ill. 60016.

Highways and Heavy Construction—A nationally distributed publication. 875 3rd Avenue, New York, N. Y. 10022.

Airport Services Management—A nationally distributed monthly publication. Fulfillment Department, Airport Services Management, 731 Hennepin Ave., Minneapolis, Minn. 55403.

Metropolitan—A nationally published monthly magazine on mass transit subjects. Editorial Offices, Metropolitan, Bobit Publishing Co., 2500 Artesia Blvd., Redondo Beach, Calif. 90278.



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