

December 1993

## Results in from road survey

By Larry Mendenhall  
Editor, *Technology News*

A survey by the Iowa Transportation Center indicates that many local agencies could take better advantage of pavement management principles when planning maintenance of their streets and roads.

The ITC's survey showed that 28 out of 63 counties responding to the survey replied "no" when asked if they made periodic evaluations of highway conditions. Out of 42 cities, nine replied "no" to that question. The survey was sent out to all counties and cities earlier this year by the Iowa Transportation Center.

"What the survey tells me is that some cities and counties have made a good start on implementing management systems but that more needs to be done," Tom Maze, director of the Iowa Transportation Center, said. "They need to further develop what they are doing so that it can be used in some sort of system — whether that system is based on paper or a computer."

Management systems will help local agencies when the regional funding process in the Intermodal Surface Transportation Efficiency Act (ISTEA) is finalized. Management systems for pavement, bridges, highway safety, traffic congestion, intermodal sys-

tems, traffic monitoring, and public transportation facilities and equipment are mandated for federal aid highways by the ISTEA. Neither regional planning entities nor local agencies are strictly required to use these systems. By using these systems, however, regional and local groups will have objective data to use when seeking funding for their projects.

Roger Anderberg and Jerry Solbeck from the Iowa Department of Transportation are not concerned about what the survey may indicate. Anderberg, who is the director of Local Systems, and Solbeck, the direc-

tor of Program Management, believe that local agencies are using a variety of methods for keeping track of their streets and highways.

"I think that most counties and city engineers are using pavement systems that may not be documented on computer, but are documented on a map, in their heads, or on paper," Solbeck said.

"In my mind, it's questionable whether all cities and counties need an automated pavement management system," Anderberg said.

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### County engineers meet at ISU

County engineers gathered at the Scheman Center at Iowa State University for the 47th Annual County Engineer's Conference held in December. Keynote speaker was Debra Delmore, the communications manager for the Minnesota Road Research project.

Vendors wait for engineers to look at their wares during the Annual County Engineer's Conference.

# Pavement survey

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"Some road systems aren't extensive enough to require a PMS more sophisticated than what engineers can keep track of in their heads or on a few sheets of paper."

Anderberg also believes that many local agencies are waiting for either guidelines or something to be done by the Iowa DOT to satisfy the pavement management requirement.

"We're not promising anything, but we're looking to help as much as possible," Anderberg said. "We need to fit into ISTEA's regional planning requirement. We want to have one system so we're comparing apples to apples as far as planning goes."

No matter what the Iowa DOT develops, local agencies will still need to optimize their pavement maintenance decisions by using some sort of management system.

"A lot of organizations are not applying pavement management principles in maintaining their streets and roads," Maze said. "No matter what comes from the state, a lot of jurisdictions are still going to have to have some system to make that information work."

Survey Questions	Counties		Cities	
	Yes	No	Yes	No
Do you conduct a periodic evaluation of roadway and/or street condition in your jurisdiction?	35	28	33	9
How long (in years) has your jurisdiction been evaluating pavements using its present method?	Min. 0, Max. 35, Avg. 14		Min. 1, Max. 33, Avg. 10	
Do you have a computerized pavement management system?	7	56	11	22
Do you categorize pavement failures by specific types of distress?	9	26	8	14
Is your evaluation of pavements recorded in a file or log to allow you to review the performance of pavements over time?	7	28	12	10
Are you planning to computerize your pavement management activities?	22	12	15	8
Have you attended any training programs on pavement management systems?	23	40	19	15
What is the name and vendor of your pavement management software?	ISUPMS 5, In house 2		ISUPMS 4, ITX 2, In house 2, GBA 1, Paver 1, PMP 1	
<b>Total response – 105; 63 counties, 42 cities</b>				

**Table 1: Results from the ITC survey**

Management systems of any type provide quantified data on which to base maintenance decisions. Decisions made on that basis are less vulnerable to non-engineering considerations.

"We hope to provide a tool that gives credence to engineering judgments instead of non-engineering judgments," Solbeck said.

Anderberg agreed. He said that the justification for pavement manage-

ment systems is that it "optimizes the process of maintaining streets and roads."

"Pavement management is a decision-making tool that helps local agencies spend money on their systems in an appropriate manner," Anderberg said.

Survey results are shown in Table 1. For more information on the ISU Pavement Management System, call 515/294-8103.

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The opinions, findings, or recommendations expressed here are those of the Iowa Transportation Center and do not necessarily reflect the views of the Federal Highway Administration or the Iowa Department of Transportation.



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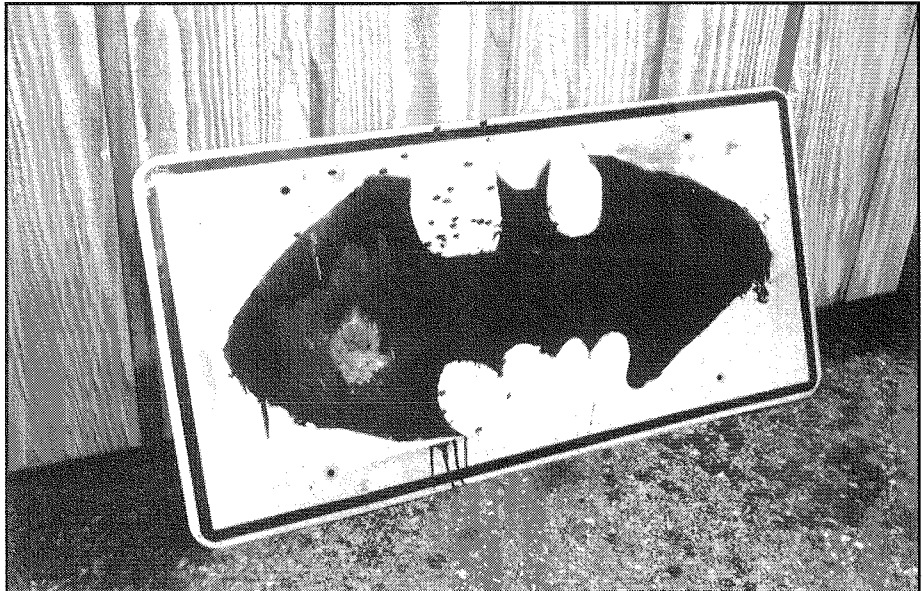
# DOT seeks to reduce sign vandalism

Traffic signs in Iowa are being shot, painted, bent, broken, and stolen to the tune of \$1.5 million each year and just on the secondary road system. Despite the large price tag, sign vandalism is not viewed as a serious problem by the public or by the judicial system according to a study of sign vandalism.

The survey was part of a 10-year study of the problem. The project, HR-246 "Engineering Study for Reducing Sign Vandalism," was sponsored by the Iowa Highway Research Board and the Iowa Department of Transportation. The objective was to reduce the rate and cost of sign vandalism in Iowa. The four major phases of the project included seeking changes in Iowa's sign vandalism law; developing a public awareness campaign for grades K-12; developing an information campaign to make the public aware of the dangers and costs of sign vandalism; and collecting data from five Iowa counties on sign vandalism incidents.

The final report found attitudes toward sign vandalism changed little even after a series of public information campaigns were held and new penalties for sign vandalism were enacted. The public information campaign included brochures, several posters, and bumper stickers sent to over 200 school districts as well as to wildlife and sportsmen's clubs from 1987 through 1990. A similar campaign in Wisconsin resulted in a 57 percent reduction in sign vandalism.

Stricter sign vandalism laws were passed in 1991. A person convicted of sign vandalism may be found guilty of a serious misdemeanor and faces a maximum \$1,000 penalty or a year in jail. That is double the pre-



**Perhaps the prankster who painted this sign would not have thought it so clever had he or she been aware that sign vandalism on secondary roads in Iowa costs \$1.5 million per year.**

vious penalties. An offender may also be required to do community service in addition to making restitution to the jurisdiction where the vandalism occurred.

These stiffer penalties, however, are regarded as excessive by the judicial system, according to the survey. Due to that belief, full sentences are rarely given. In one case tried with the stiffer penalties in force, a group had over 40 signs in its possession. The maximum fine could have been \$40,000. A plea bargain agreement resulted in a \$2,000 fine (later suspended by the presiding judge) and 200 hours of community service. The county attorney, however, used publicity from the case to sponsor a sign amnesty week. During the amnesty period, people could return stolen signs without being prosecuted. Over 100 signs, barricades, and other traffic control devices were recovered.

The study also looked at ways to make sign vandalism more difficult. It recommended the following methods:

- Mount signs higher and further from the road to make painting and stealing more difficult.
- Use plywood substrate to replace signs prone to being shot. The plywood sustains less damage when shot.
- Use vandal-resistant fasteners when mounting signs.
- Use anchor rods or cleats at the bottom of sign posts to prevent rotation or removal.
- Place identification decals on the back of signs. The decals include the installation date and owner

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# Buses could be coordinated by GPS

By Kim Shelquist  
Editorial Assistant

A research project at Iowa State University is exploring how automatic vehicle location (AVL) applications could be used by local agencies to keep track of their vehicles.

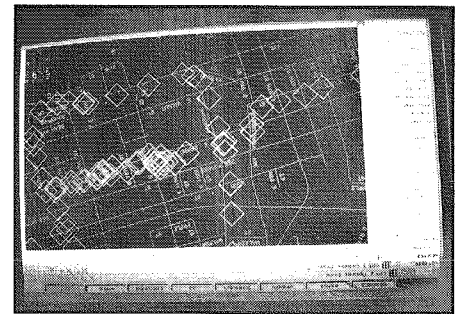
*Smart Bus: A Vehicle for Intra-Urban and Urban-Rural Coordination* with Dr. Mary Kihl as principal investigator, explores using AVL and global positioning technologies to coordinate rural and urban bus routes. The applications being explored for the project could also be used on snow plows, law enforcement vehicles, ambulances, maintenance trucks, fire trucks, or any other type of vehicle fleets. The cost for these systems becomes affordable when it can be split between several departments.

Over-the-road trucking firms have used AVL technologies for many years. More recently, private businesses such as taxi and package delivery companies, are beginning to successfully use AVL.

The focus of Kihl's project is to evaluate the effectiveness of using an automatic vehicle locator to coordinate transfers between paratransit, rural buses, and fixed route buses. By combining well-coordinated transfers with the newly accessible buses it becomes possible for paratransit and rural bus users to plan their own trips on their own schedules. A rider may still need to use paratransit and rural buses to get to a fixed route bus, but once there, they'll have the freedom to choose any destination on the fixed route.



**In the photograph above Madhulika Singh, a graduate student in the Department of Community and Regional Planning, demonstrates how a vehicle's location is tracked by global positioning software. The photograph at the right is a close up of the screen's display.**



According to Kihl, the global positioning system (GPS) is only one of the many methods currently being evaluated for use in tracking transit vehicles. In order to use GPS each vehicle must be fitted with a GPS receiver, a logic board (computer), and a radio which transmits the information to a base unit. The base computer should be installed with Geographic Information System (GIS) software. The software enables base personnel to track the vehicle's progress on a computerized display map.

Aside from making public transportation more available to disabled passengers, Kihl says GPS has many uses which can benefit transit com-

panies. Local agencies could gain the same benefits.

"Testing for location is only the beginning. These systems have many benefits. In the future we'll see more and more cities using them," she says.

GPS can also be used as a safety device. Because the system tracks the vehicle, it can monitor any deviations made from the scheduled route. This fact, along with the capability to install a silent alarm system for the driver to use in an emergency, helps increase the safety of both the driver and the passengers.

**continued on page 5**

# Updates could slow you down

Advances in computer hardware and software don't merely happen quickly — they happen like a stampede. Very few computers retain top-of-the-line status for more than one or two years. Each advance in hardware is accompanied by software written to take advantage of the new hardware.

If the latest computer model isn't sitting on your desk, the software written for advanced hardware can degrade the performance of your machine to the point where you may be tempted to go sharpen your pencils and dust off your calculator. If you find yourself in that position, here are a few suggestions to boost your computer's performance.

**More RAM** One of the quickest ways to increase performance is to buy more RAM (random access memory). A computer writes and accesses RAM memory faster than it does the storage memory found on your hard drive. A program writes frequently needed instructions and data to RAM. The more RAM that your machine has, the more information it can store there for quick access. RAM modules, called SIMMS (single inline memory modules), are installed two at a time. Installing RAM can usually be done by the average user in about 15 to 20 minutes.

**Install a math co-processor** If you work with applications that do a lot of

## Microtechnology

By Larry Mendenhall  
Editor, *Technology News*

math calculations (spreadsheets, databases, some high end graphic and CAD programs) then a math co-processor will improve your machine's performance. Many computers come with a co-processor already installed. If your applications aren't written to take advantage of a co-processor, then adding this feature will not improve performance. Most computers using 80486 chips come with co-processors installed. However, you may have to add one to 80386-equipped machines.

**Upgrade your motherboard** This is a major hardware upgrade for your machine. It involves replacing your old motherboard with a new one. In effect you have a new computer in your old casing. However, unless you have experience installing computer equipment, you may want a service person install it for you. Just buying a motherboard may be the least expensive way to get the most improvement into your old computer.

**Buy a new computer** Competition among computer manufacturers has driven prices to very low levels. A top of the line model by a major manu-

facturer can be purchased for around \$3,000. Your old computer may work perfectly well for someone on your staff who just does word processing or simple spreadsheet calculations. So-called out-of-date computers can work well as file servers. In some cases, they also may be relocated to an office that doesn't have one or a shop that could make use of one. Buying a new computer has other advantages. Current models are usually equipped with higher-capacity hard drives and monitors with higher resolutions.

**Just say no** This may be the most sensible policy. Not every upgrade that comes along is going to significantly boost your productivity. You could end up spending a fortune by buying every upgrade that comes along. Consider buying only major upgrades. Major upgrades to software are usually given a whole version number like 5.0 or 6.0. You may want to wait, however, for a version number like 5.1 or 6.1 since it's not unusual for minor bugs to creep into major upgrades.

Upgrading either your computer or your software should not be done lightly. As tempting as it is to have the fastest and newest equipment or software, it does not automatically increase productivity. Selectively choosing what you upgrade and when will save you and your organization a lot of money over time.

## Bus coordination continued from page 4

The advantages of tracking systems to mass transit are leading many cities to evaluate their use. Kihl says that some major cities such as Dallas and Denver are testing GPS tracking

systems right now. She adds that while these two large cities are still working out the bugs, the Smart Bus project is focusing on the Des Moines MTA system and is providing researchers with valuable data which

can be applied to GPS projects in mid-sized cities.

For more information on the Smart Bus project call Dr. Mary Kihl at 515/294-7427.



## Tips From The Field

# Turn loaders into brush pluckers

From the City of Carroll comes a couple of quick tips to expand the functions of bucket loaders and tractors equipped with a bucket. Used in combination, these tips help make brush pickup easier.

Don Buswell, street superintendent for the City of Carroll, said his department needed something that would pull stacked brush piles onto the street. His answer was to get a small tractor with a bucket attachment and a pair of old plow shanks obtained from a salvage yard. Buswell attached the shanks to the tractor's loader bucket by simply drilling a pair of holes on each side of the bucket (Figure 1).

Buswell used his loader modification for other tasks as well. It can be used to lift up cement, like old side-

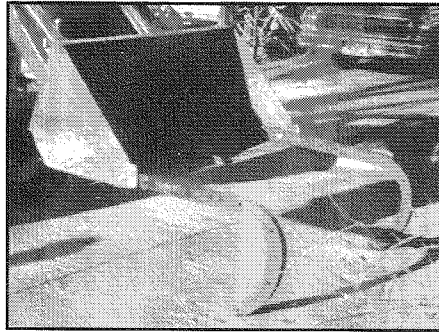


Figure 1

walk panels. He's also used a clevis at one end and used the hook to remove heavy brush from creeks.

"These old plow shanks are very strong and it would take a pretty hefty machine to bend them," Buswell said.

Once the brush is pulled onto the street, Buswell wanted a way to pick

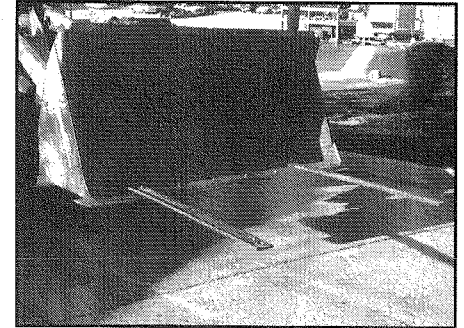


Figure 2

up large piles with a regular loader bucket. He did that by taking a pair of worn motor grader blades (6' x 3/4") and bolting them onto the bucket (Figure 2).

For additional information contact Don Buswell, Street Superintendent, City of Carroll 403 E. 3rd St. Carroll, IA, 51401 or phone 712/792-9869.

## Sign vandalism

as well as a warning about the consequences of sign vandalism.

The study concluded with several recommendations to reduce sign vandalism and theft. They are:

- Have enforcement and legal personnel treat sign vandalism as a crime and not as an infraction like a speeding ticket.
- Establish a sign inventory in addition to regular sign inspections to keep track of patterns and trends of vandalism so that selective measures can be taken.

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- Get the community involved in the issue.
- Make it personal. Only when sign vandalism is taken seriously will positive steps be taken to reduce it.

### Tips from Other Sources

An FHWA pamphlet, "Maintenance of Small Traffic Signs," suggests two ways to remove paint from a sign without destroying the sign.

The first way assumes that an enamel-based paint was used in the

vandalism. Wiping the painted area lightly with a soft cloth moistened with mineral spirits should remove the paint.

If that doesn't work, it may be because the vandal used a lacquer-based paint. In that case, wipe the painted area with a lacquer thinner until the paint is removed.

Both methods should leave the sign face undamaged. However, it is a good idea to make a reflectivity check at night to make sure the sign is still readable.

## For More Information

The videotapes and publications listed in this column are available on a loan basis by contacting Stan Ring, Iowa State University, Iowa Transportation Center, 2521 Elwood Dr., #125, Ames, Iowa 50010-8263 or by calling 515/294-9481 Monday, Wednesday, and Friday mornings.

### Publications

**Highway/Utility Guide** This 297 page publication provides guidance on the better practices employed. It addresses planning, design permits, information management, legal, safety, construction, and maintenance aspects. Multiple copies available. Request #936

**Rock and Mineral Identification Guide** This publication can help the engineer or technician who desire a better understanding of rocks and minerals. It allows them to make distinctions as to type of materials and their characteristics. Multiple copies available. Request #934

**The Value of the County Engineer: Strategies to Expand the Shrink-**

**ing Employment Pool Iowa Highway Research Board Publication HR - 338** This project studied the problem of attracting replacements for the county engineering position and looked at ways to improve the position and selling points for new candidates. Loan copy only. Request #933

**Construction Costs and Operating Characteristics of Vintage Trolleys** Because of interest in trolley start-ups the Federal Transit Administration instituted this study on costs and service characteristics of vintage type trolleys in operation. Loan copy only. Request #932.

### Videotapes

**History of Concrete Pavement in Iowa** This videotape was sponsored by the Iowa Concrete Paving Association and covers the development

of concrete paving in Iowa prior to WWII. Request #325V

**History of Concrete Paving in Iowa - The Slip Form Paver** This Iowa Concrete Paving Association videotape covers the period from WWII to the present, with emphasis on the slip form paver invented in Iowa. Request #313V

**Breakaway Timber Utility Poles** This videotape covers the modification of an existing in-place pole to a breakaway pole and demonstrates crash testing. Installations in Massachusetts and Kentucky have been hit with no injuries. Request #327V

**Permanent Pothole Patching** This video depicts a low-tech pothole patching operation in Utah. It illustrates the operation from loading the truck to final compaction, and explains how potholes develop. Request #328V

### Who to call at the Iowa Transportation Center

For library information.....	Stan Ring 515/294-9481
For safety programs.....	Ed Bigelow 515/294-8103
For T-square programs.....	Joe Henderson 515/294-8817
For general information.....	Margaret Hammer 515/294-8103

### Publication order form

To obtain the materials listed from the ITC, return this form to the Iowa Transportation Center, Iowa State University, 194 Town Engineering, Ames, IA, 50011-3233.

	Title	Index No.	No. of Copies
Name _____	_____	_____	_____
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Please send a complete listing of all publications from your office.

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# Conference Calendar

**National Committee on Uniform Traffic Control Devices January 5-6 – Arlington, Virginia** The topic for this meeting will be revisions to the present Manual on Uniform Traffic Control Devices. To register contact Woodrow Rankin at 202/857-1224.

**1994 Transportation Research Board Annual Meeting January 9-13 – Washington, D.C.** This meeting will offer groups a chance to discuss topics which include transportation systems planning and administration, and the operation, safety, and maintenance of transportation facilities. To register call Angelia V. Arrington at 202/334-2934.

**Asphalt Paving Conference January 25 – Scheman, Iowa State University** This conference is designed to provide information on innovations in the design, construction, and operation of asphalt highway and runway surfaces. To register call Janet Gardner at 515/294-5366.

**Iowa DOT Annual Meeting February 24-25 – Scheman, Iowa State University** This conference is designed as a forum for Iowa DOT engineers and administrators to learn and share up-to-date information relating to highway, rail, air, and water transportation. To register call Connie Middleton at 515/294-6229.

**National Association of County Engineers Annual Meeting and Management and Technical Conference February 28 - March 2, 1994 – Washoe County, Nevada** This conference is an opportunity for county highway and public works professionals to work with experts from across the nation to solve county road and bridge problems, learn the latest technology, and find money-saving ideas. To register call NACE at 202/393-5041.

**APWA Public Works Spring Conference March 17-18 – Scheman,**

**Iowa State University** This conference will bring consultants, suppliers, manufacturers, and public works officials together to discuss topics of current interest related to the technical and managerial aspects of public works. To register call Connie Middleton at 515/294-6229.

**3rd Annual Traffic Signing Workshop April 27 – Scheman, Iowa State University** This conference addresses such issues as metric conversion of signs, reflectivity of signs, sign materials, and revisions to MUTCD. To register contact Janet Gardner at 515/294-5366.

## And justice for all

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