

Technology

Roads Bridges Transit

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Iowa State University

News

March 1994

Study explores strategies

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Construction Engineering**

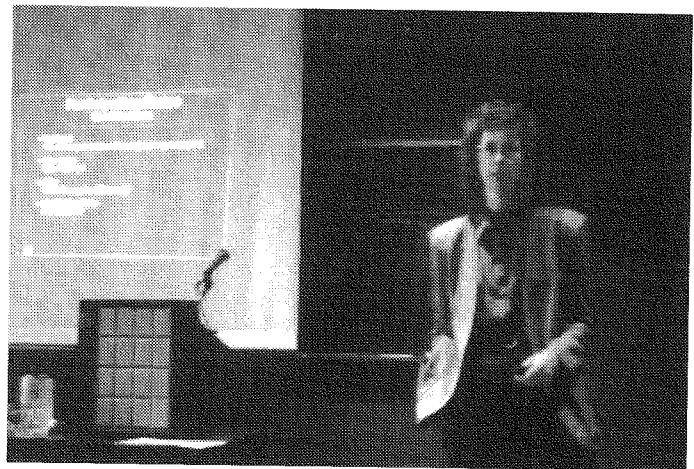
An Iowa State University study is exploring strategies to help attract a new generation of engineers into the county engineering profession. The two-year study focused on the issues confronting the profession as it works to avoid personnel shortages that could have an adverse effect on the quality of the three million miles of county roads that county engineers maintain nationwide.

Transportation professionals are concerned about projected personnel shortages because many county engineers are nearing retirement. In this study of nine states (participating states included Iowa, Kansas, Michigan, Missouri, Minnesota, Nebraska, Ohio, South Dakota, and Washington State), nearly 70 percent of those surveyed indicated they were between five and 15 years from retirement. It is especially troubling to note that some county engineers are opting for early retirement (by age 60).

These figures indicate that county engineering is facing a substantial loss of knowledge and experience. County engineers are responsible for the construction, maintenance, and rehabilitation of local roads. Without

a new generation of professionals ready to take over for retiring engineers, the impact on county infrastructure – particularly rural counties – could be significant.

The survey uncovered several insights into why engineers may choose careers other than county engineering. Many county engineers who participated in this project – who have been on the job between 15 and 30 years – indicated that low salary structures, “political hassles,” environmental regulations, tort liability issues, and public complaints would discourage them from becoming county engineers if they had their career choices to make again. They also indicated these are the factors that may serve to worsen projected shortages of county engineers, particularly in rural counties. Only 17 percent of those engineers currently in office and who participated in the project said they would make the same career choice given the opportunity to do so.



Dr. Kathleen Waggoner presents her research results at a county engineers' meeting.

As these engineers retire, there are fewer qualified professional engineers to take their places. There are several reasons for this. One is that the county engineer of the near future will be expected to blend increasingly-sophisticated skills such as management, public relations, political, and even legal skills with their technical expertise. While this may sound like an intriguing challenge, however, when coupled with salaries lower than other engineering careers, county engineering may not appear as an attractive career option.

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Curb ramp deadline one year away

By Kim Shelquist
Editorial Assistant

As the time for achieving compliance with the Americans with Disabilities Act of 1990 (ADA) grows near, it is becoming even more important that state and local government agencies evaluate the progress they're making toward meeting the requirements of the Act. Failure to comply with the guidelines of the act could expose agencies to the possibility of ADA-related lawsuits.

Under Title II of the Act, January 26, 1995 is the deadline for making all structural changes needed to achieve program accessibility. For some agencies this is simply a matter of tying up a few loose ends, but for many it's likely to cause more than a few budget woes.

The goal of program accessibility is to ensure that all citizens have access to government buildings and services. Often achieving program accessibility includes installing curb ramps. While agencies should put priority on those crosswalks which access government buildings, services, and transportation, the Act requires that ramps be installed at all crosswalks by January 26, 1995.

Many agencies have already begun to install curb ramps on their pedestrian walkways. In cooperation with ADA guidelines, agencies must include curb ramps as part of any new construction or reconstruction of their facilities which was let out for bids after January 26, 1992.

With the deadline for compliance so near, it may seem to state and local governments that the requirements of the ADA place an extreme financial burden on their agency's budget. While this argument has been used to justify non-compliance or partial compliance in the past, it appears it may no longer serve as a defense for non-compliance.

In 1993 a federal judge in Philadelphia ruled against that city in its attempt to argue that installing curb ramps on walkways along streets which had been let out for bids for resurfacing after January 26, 1992 constituted an undue burden. The ruling will cost the city nearly \$1.5 million, and sets a precedent that other agencies should be aware of. It is the belief of the court that the long-term benefits to society of installing the ramps outweighed the cost.

What this ruling means for other agencies is that, at the very least, serious consideration should be given to all aspects of the ADA when any new construction or reconstruction is being done.

Jerry Moore, research analyst for the League of Municipalities, says the most important thing agencies can do is to make a "good faith" effort to comply with ADA guidelines. He acknowledges that there are many obstacles that state and local governments must get past to comply, but says they must be dealt with.

"To do nothing isn't the answer. All agencies must show that they're trying to comply," he said.

Steve Salvo, operations administrator for the City of Ames, agrees.

"We can't just ignore the requirements. In Ames we're trying to comply with the law in an orderly fashion and I think we're making a good faith effort to do that," he said.

Salvo points out that the City of Ames has put together a long-range plan which sets a timetable for new curb ramp installation. He adds that

Technology News is published by the Iowa Transportation Center, 2521 Elwood Drive, Suite 125, Ames, Iowa 50010-8263 Phone: 515/294-8103 Fax: 515/294-0467

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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 the Iowa Department 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.

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.

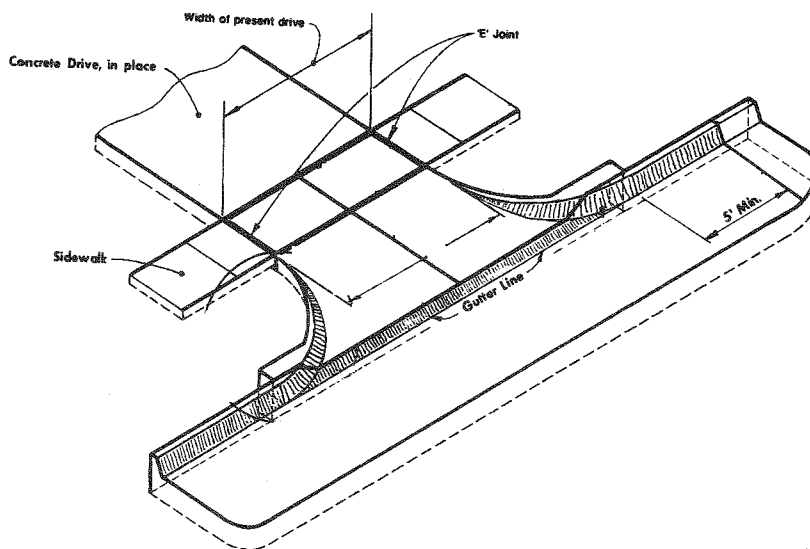


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part of the funds which are set aside each year for curb reconstruction are made available to install curb ramps in neighborhoods where disabled people live or access public transportation. He says that although the city's plan only specifies that one section of the city be done at a time, this is an example of how the city tries to accommodate its residents and comply with the ADA at the same time.

Similar efforts, regardless of the scale, can help all agencies meet the ADA's guidelines and help reduce any conflict which might occur due to non-compliance. To borrow a copy of the Title II and Title III requirements contact Iowa Transportation Center Library Coordinator Stan Ring at 515/294-9481.



For more detailed plans contact the Iowa Department of Transportation.

Recruiting strategies continued from page 1

Another possible reason for lack of interest in county engineering is the fact that it has traditionally been a low-profile profession. As regional, state, and national associations for county engineers become more involved in recruiting strategies, visibility will become an important issue. As I have said at so many county engineering conferences, "It is not that the profession has a bad image. It is that it has no image at all."

For those who are appointed primarily by elected officials, there is prudence in maintaining a low profile, in large part because visibility carries with it the risk of politicizing the profession. Perhaps, however, the issue has become one of tradeoffs. In the study, county engineers noted

that "We need more positive publicity" and "We need to get motivated to work together." One county engineer went further, stating that "We must become more visible through the media by bragging about our accomplishments."

Some of those engineers who are trying to increase the employment pool for county engineering, suggest that if recruiting strategies do not factor in issues such as retirement, consistently low salary structures, and lack of visibility then states are likely to see the quality of their rural roads placed in jeopardy. The solution is, as one county highway superintendent from Nebraska said, "We need to take a more active role in promoting our profession."

While many county engineers and their organizations have made efforts to get young people involved in the profession; they also point out that more needs to be done. Many county engineers could be instrumental in advertising the profession's strongest selling points, including job satisfaction, job diversity, and rural living. Being one's own boss, seeing a job through from beginning to end, and the public service aspect, are also included in the many factors that county engineers agree compensate for lower salaries.

Most engineers have already taken the first step. Of those responding to this study, a majority indicated their state associations offer scholarships

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Sharing software can be illegal

Installing a single software package on multiple computers within the same office may seem like a harmless thing to do. Along those same lines, copying software from the computer at work and installing it on a home computer may seem like a good way to save money. Unfortunately, both of these actions are a violation of U.S. copyright laws which could earn the offender a large fine and, in some cases, jail time.

Christian Gurney, executive director of product lines for CE Software in Des Moines, says these are the biggest problems he sees.

"Absolutely. These are the most common violations of copyright law in regard to computer software. People need to realize its against federal law," he said.

Gurney added that he's seeing an increase in the number of lawsuits being brought against violators. While software is a relatively new form of intellectual property, it is covered under established laws that regulate more traditional property such as books, films, and recordings.

Title 17 of the U.S. Code prohibits the reproduction and distribution of copyrighted material without authorization. Individuals or agencies found to be in violation of the code are subject to fines ranging from \$100,000 to \$250,000. Because the unauthorized duplication of software is a federal crime, violators may also face jail terms of up to five years.

Fortunately for software users, avoiding these risks is relatively easy and painless. The first thing to remember when purchasing software for office or home use is that each application

Microtechnology

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Technology News

may be installed on only one computer. If the software is going to be used on more than one machine other arrangements can be made, but they must be done correctly to stay in compliance with federal law.

Gurney says that for organizations needing more than 25 copies of software, a site license is usually available through the manufacturer. To get a site license the software user must tell the manufacturer how many machines the software will be installed on and also agree to keep the manufacturer notified of any change in that number at regular intervals.

Employees who perform part of their work at home often need to have the same software package they use at work installed on their home computer. To avoid breaking the law two copies of the same software must be purchased. Gurney says software manufacturers are becoming more sensitive to the burden this places on company and personal finances. He points out that Microsoft has recently begun to allow their software to be installed on both home and office computers, with the condition that neither program is used for more than 50 percent of the work. He feels more producers will be following Microsoft's lead.

For those agencies that are already operating pirated software, Gurney says it's only a matter of time before they run into trouble. He says that

the Software Publishers Association (SPA) actively pursues reports of software piracy. He adds, that while SPA investigations have led to criminal charges being brought against violators, their primary purpose is to educate software users and bring them into compliance with federal law.

In most cases, Gurney says, the SPA will give agencies the chance to admit to the violation and pay the appropriate compensation to the software manufacturer. He says it is mostly in cases where the violator refuses to cooperate that criminal charges are filed.

Often office managers and employees are unaware they're operating pirated software. Because of this the SPA says it's important to conduct a software audit. This allows the agency to prepare an inventory of the software they're using and is a first step towards identifying any programs which are not licensed to the agency. The SPA has designed a program called SPAudit. When used with purchase records and other information, SPAudit can help prevent the unlicensed use of software.

The most important thing for software users to remember is that unauthorized use of software violates federal law and can lead to fines and possibly even jail time. Keeping good records and following the manufacturer's instructions are an essential part of staying in compliance with U.S. copyright laws and avoiding the legal hassles of software piracy.

To obtain a copy of SPAudit or for more information on software licensing call 800/388-7478.

Iowa engineers see few problems with upcoming metric conversion

In an attempt to comply with the Omnibus Trade Act of 1988 the Federal Highway Administration will require that all federally funded construction contracts let out for bids after September 30, 1996 use metric measurements. While this decision has raised some questions about how the change will be implemented, most transportation officials don't see any problems in making the change.

The act makes metric the preferred system of measurement for U.S. trade and commerce. Although the act will require converting highway signs and road markings to metric at some time in the future, the general public isn't directly affected by the 1996 deadline. For now it's those people in the transportation field who will be most affected by the switch to metric.

Dan Franklin, assistant director of Policy and Information at the Iowa Department of Transportation (Iowa DOT), doesn't anticipate changing to metric will cause many problems. He says the Iowa DOT is offering training classes to its employees which will help them learn to work with metric conversion.

"Different employees will need different types of training, and we'll set up our programs with that in mind," he said.

One of the choices which must be made by agencies is which conversion method to use. Currently, there are two accepted methods. The soft

conversion changes the English unit to the nearest exact metric unit. The hard conversion method converts the English unit to the nearest convenient metric measure. Usually that measure is divisible by 10, 5, 2, or 1.

Franklin says that wherever possible the Iowa DOT has opted to use the hard conversion to convert to standards set by the American Association of State Highway and Transportation Officials (AASHTO). He says AASHTO will soon approve new metric standards which will make conversion unnecessary, at least when determining accepted standards.

"Last year AASHTO voted in the most important standards," he said. "Soon all the specifications should be in metric."

The move to metric affects more people than just those with state and local highway departments. It also affects the contractors who bid on their jobs. Franklin says, in his opinion, this doesn't create a problem.

"Most of the big contractors we use have dealt with metric already, and they don't see any problems occurring," he said.

Bill Moellering is the Fayette County engineer and also serves as the chairman of the National Association of County Engineers metric committee. He says there are several issues which need to be addressed when making the switch to metric.

According to Moellering the first step in a complete metric conversion is making sure all agencies which receive federal highway funding have taken steps to train their employees in the metric system and the accepted conversion methods. In some cases, the agency may also need to make some changes to their survey equipment to comply. He says this is pretty basic and in most cases will not cause the agency any major problems.

"The biggest problem is just doing it," he said. "Whenever you're trying to do something new there's always a certain amount of resistance, but by working together we'll get through it. It's just a simple matter of learning to think metric."

Moellering points out there are also several secondary issues which arise from the scheduled switch to metric. These issues range from designing highway signs to translating property easements on land-ownership documents.

Both Moellering and Franklin agree that while the switch to metric may not happen without a few minor glitches, they don't see it causing a lot of problems for those agencies which receive federal highway funds.

For help in adapting your agency to the metric system, the Iowa Transportation Center's library has several AASHTO conversion guides available. Contact Stan Ring, Center librarian, at 515/294-9481 for more information.

Tips From The Field

Sanders serve as sandbag fillers

The Flood of 93 had yet to recede before meteorologists were warning everyone of the possibility of more flooding this spring. Conditions are so ripe for flooding that the National Weather Service has lately issued its own warnings. So the timing seems perfect for this tip from Willard Wray, public works director for the City of Clive.

During last year's floods, Wray and his crews adapted dump trucks to act as mobile sandbag fillers.

"We have five dump trucks outfitted for this purpose. Our crews can drive along the flooded area and leave sandbags where they are needed," Wray said. "You can imagine five of these trucks in a row going down the edge of the road sandbagging. It works wonderfully well."

Photo 1 shows how crew members have taken the salt/sand chute and turned it 90 degrees toward the street for filling sandbags. For sanding purposes in winter, the chute would normally direct the flow of sand or salt under the truck where the spinner is mounted.

The photo also shows a slip-on rack that was designed to hold hundreds of sandbags.

Photo 2 shows how a three-person crew would fill and tie sandbags. The truck driver is close enough to the person filling the bag to know when to start and stop the conveyor chain. The chute's position allows crew members to fill and tie the bags a safe distance from the wheels.



Photo 1 – The City of Clive has adapted its dump trucks to fill sand bags.



Photo 2 – The truck's design allows the driver to be close enough to the workers filling sandbags to know when to start and stop the device.

For more information, contact Willard Wray by calling 515/223-6230 or by writing to the following.

City of Clive Public Works Department
9289 Swanson Boulevard
Clive, IA 50325

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.

Videotapes

“Traffic Detector Video Training Course,” Federal Highway Department These videotapes provide information on traffic detectors, their theory, design, installation and maintenance. It has a companion manual, publications # 938 and # 950, to be reviewed with this videotape. Request # 329V and # 330V.

“Soil Stabilization: Selecting the Modifier,” Federal Highway Department This videotape discusses the use of a soil stabilizing additive to make construction easier, to modify the subgrade, or to add strength and durability to the pavement. It explains what additives are available and their applications. Request # 331V.

“Plows of the Future,” SHRP This videotape shows the results of research into designing a more safe and efficient snow plow blade. Using a new mold board shape and material, and a snow scoop, the plowing operation is safer and uses less energy. Request # 334V.

“Installation of a Snow Scoop,” University of Wyoming This videotape shows how to install the snow scoop to a plow’s mold board. The scoops may be purchased. Request # 335V

“Staying Ahead of the Storm,” SHRP This videotape explains the Road Weather Information System which provides up to the minute weather information and predictions. Request # 336V.

Publications

“Asphalt Pavement Repair Manuals of Practice,” SHRP This publication contains two manuals; Crack Sealing, and Repair of Potholes. It is intended for maintenance personnel – both those working in the field and those supervising activities. For loan only. Request # 941.

“Concrete Pavement Repair Manuals of Practice,” SHRP Crack Sealing, and Repair of Potholes. These manuals are intended for maintenance personnel – both those working in the field and those supervising activities. For loan only. Request # 942.

“Guide to Metric Conversion,” AASHTO This guide was prepared to provide an explanation of the change and an outline for a transportation agency to design their own conversion program. For loan only. Request # 943.

“Interim Selected Metric Values for Geometric Design,” AASHTO This publication provides metric tables for "A Policy on Geometric Design of Streets and Highways," 1990 (The Green Book). For loan only. Request # 944.

“Part VI of the Manual on Uniform Traffic Control Devices,” Federal Highway Administration, 1993 This publication covers standard and guides for traffic control on street and highway construction, maintenance, utility, and incident management operations. For loan only. Request # 952.

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. Please limit requests for videotapes to four.

	Video/Book Title	Index No.	No. of Copies
Name _____	_____	_____	_____
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Phone _____	_____	_____	_____

Please send a complete listing of all publications from your office.

Please send a complete listing of all audio visual materials available.

Strategies continued from page 3

to students. While they believe scholarships are beneficial, however, most said this strategy has yielded few, if any, candidates for the profession. The problem is, particularly at the university level, there is no requirement that students have an interest in county engineering. The only requirement is that they be enrolled in a civil engineering program.

County engineers and their organizations could begin to solve this problem by showcasing the positive aspects of a career as a county engineer through educational programs. These programs would be aimed at students enrolled at both technical schools and universities. Other programs could be designed to allow students "on-job-experience" in the county engineering field. Efforts such as these would emphasize the desirability of county engineering as a career and expose young people to

the variety of work a county engineer encounters.

While these students would not be prepared to work as county engineers right out of school, they would be well qualified for positions such as assistant county engineers, private sector consultants, and other public service related positions. Experience in these jobs would make a good background for a young person who eventually wants to hold a county engineering position.

For more information on this project, call the Iowa Transportation Center at 515/294-8103.

And justice for all

Appointment, promotion, admission, and programs of extension at Iowa State University are administered 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 Calendar

3rd Annual Traffic Signing Workshop April 27 – Scheman Center, Iowa State University This conference addresses such issues as metric conversion of signs, reflectivity of signs, sign materials, and revisions to MUTCD. Jeff Paniati, developer of the FHWA's Sign Management System, will discuss version 4.0 of the SMS program. To register contact Janet Gardner at 515/294-5366.

Iowa Traffic Control and Safety Conference May 19 – Scheman Center, Iowa State University Safe and efficient transportation is the focus of the annual spring conference co-sponsored by the Iowa Traffic Control and Safety Association. This year, the conference is being held in conjunction with the ITE Missouri Valley Section meeting. Participants represent the engineering, education, and enforcement professions related to safety on streets and highways. For registration materials call Connie Middleton, 515/294-6229

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