

March 1991

## Johnson resigns NACE post

By Larry Mendenhall  
Editor, Technology News

Inadequate funding and a lack of transportation engineers are affecting the county engineering profession, according to Milton L. Johnson, P.E., Executive Director of the National Association of County Engineers.

Johnson resigns as executive director in April when NACE moves its headquarters from Ottumwa, Iowa, to Washington, D.C.

Johnson has been a member of NACE since the early 1960s. He was president in 1977 and served as executive director on a part-time basis until May 1, 1988. Johnson held the position full time after that. He also was county engineer in Clayton and Wapello counties.

"The lack of people is quite a problem for all highway-oriented government agencies," Johnson said. "Part of it relates to lack of funds,

especially when it shows up in pay scales. Pay in other engineering areas is higher and the attraction is to work in those areas."

Johnson attended a meeting in Washington, D.C., along with representatives of other groups concerned with the same problem. Francis Francois, Executive Director of AASHTO, organized the meeting. The purpose was to discover what efforts are currently being made to

recruit more people into engineering and to try to coordinate those efforts.

"The shortage of people in this area is very widespread," Johnson said. "If you invest a little more in the quality of people you can get more money out of what you spend for everything else. If you try to save money by lowering the pay scale, you lose expertise and a lot more money."

A computer system can help stretch a county's funds. Johnson recommends a computer system to help manage budgeting, planning, and maintenance, even for those engineers who know their counties well enough to do these tasks in their head.

"Many engineers can tell you anything



### APWA chapter holds 39th meeting

An exhibitor comments on a videotape during the Iowa Chapter of the APWA's 39th annual meeting. See story on page 2.

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# APWA holds 39th annual meeting

How Total Quality Management can be used in public works departments kicked off the 39th Annual APWA Public Works Conference March 14-15 at the Scheman Continuing Education Center in Ames.

Besides the Total Quality Management (TQM) presentation, the two-day conference featured legislative and Iowa Department of Transportation updates as well as speakers on various topics ranging from Iowa

and business and decreased costs," according to Acting Street Superintendent Roger Goodwin.

Governmental agencies are facing increasing competition from private agencies to provide some basic support services, like vehicle fleet management. Even if that competition doesn't exist, there is competition for skilled workers, according to Goodwin.

"Everyone works on improvements in teams and individually," Goodwin said. "We identify processes that need to be improved. When we improve the process it reduces costs and improves quality."

Goodwin described TQM as "totally different" from the usual top down way of managing.

"That way creates a lack of support," Goodwin said. "TQM increases the trust of workers and reduces barriers."

Goodwin lists improved communication, better "buy-in" at all levels of the work force, and better planning as benefits he has seen from the TQM program. The risks of the program include more work, individual fear about losing authority, and expense.

"You're going to work a lot harder," Goodwin said, "but it's a different kind of work. You're not dealing with as many crises."

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*Roger Goodwin,  
Acting Street Superintendent*



State University's Pavement Management System to stormwater management to sidewalk inspections.

Madison, Wis., began its TQM program in 1984. "It improves quality which means improved productivity

"If Total Quality Management works for the private sector, why can't it work for government?" Goodwin asked.

The four components of TQM as described by Goodwin are teamwork, customer focus, data-based decision making, and employee worth.

The expense of training and devoting time to meetings on company time is more than made up for by improved quality and better operations.

"Some things didn't get done," Goodwin said, "But overall productivity increased."

*Technology News* is published by the Iowa Transportation Center, Iowa State University, Business and Engineering Extension, 194 Town Engineering, Ames, Iowa 50011 Phone: 515/294-5642 Fax: 515/294-8216

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The preparation of this newsletter was financed through the Technology Transfer (T<sup>2</sup>) Program. The T<sup>2</sup> 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.

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# Johnson resigns continued from page 1

you want to know about their roads off the top of their heads," Johnson said. "In these cases, there's a reluctance to spend the money and take the time to install a computer system."

A computer analysis, however, is likely to give an engineer's opinion more weight with the public and the board of supervisors. Putting the details about the county in a computer database ensures that everyone has

Diverting funds originally meant for roads is part of the financial problem. "For example, road use taxes now fund most — if not all — of the state highway patrol," Johnson said. "Granted they patrol our roads, but they also have other responsibilities and most of the amount is funded from road use taxes. Another example is that we formerly received a percentage of the sales tax generated by motor vehicle sales. We no longer receive that money. Another

Keeping lawmakers aware of the importance of county roads is one of the purposes of NACE, as well as the National Association of Counties (NACO), according to Johnson. He points out a phrase in the highway bill, "highways of national importance," as an example of the emphasis put on the interstate system by Congress. This will likely mean that the interstate system will continue to receive a heavier share of available funds than local roads.

**"Limited funds for maintenance and new projects has always been a problem for county engineers and always will be."**

*Milton E. Johnson, P.E.  
Executive Director, NACE*



Financial considerations enter the picture again as rural America sees its population gradually moving toward urban areas. "Declining rural population is a problem in the sense that a smaller population doesn't necessarily mean a lighter load for the roads," Johnson said. "As a matter of fact, roads in those ar-

access to the data when needed. This can be especially important when a new engineer is hired.

The root of many problems for county engineers, however, remains the lack of funding. "Limited funds for maintenance and new projects has always been a problem for county engineers and always will be," Johnson said. "Every county engineer — and most of them are very good people — do their best to be efficient. The county engineer's job is to get the most out of every dollar available."

example is that we're losing millions of dollars in Iowa from exempting fuel tax on ethanol. All these things hurt. The condition of our road system will end up going downhill. If we don't turn things around pretty soon we're going to have to go back to pulling people out of the mud."

The financial situation is not likely to improve soon.

"The administration's transportation bill does not look good for local roads," Johnson said. "Of course, whether Congress takes that bill and uses it or comes up with one of their own remains to be seen."

roads tend to carry a slightly larger volume of traffic and a great deal more weight per axle. The increases come from more truck traffic as farmers haul their grain to elevators. During harvest, a road designed for an average of 50 vehicles per day is going to carry a lot more traffic than that with axle loads that are very, very heavy."

Since fuel tax money is allocated somewhat on the basis of population, that money will follow the moving population to urban areas, meaning less money to maintain rural roads that are carrying heavier traffic.

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# SMS helps keep signs in order

Computerized sign inventory systems can help local agencies better manage and track signs, control the condition of signs, and organize the planned replacement of signs. A sign management system (SMS) allows an agency to improve control over its sign inventory. Better control reduces costs and reduces the agency's liability risk by helping to maintain roadway signs.

Local Iowa agencies that do not use computerized sign management systems either keep paper records or keep no inventory at all. SMS performs many of the same functions as paper systems, but performs them automatically and faster. For example, if an agency developed a program to replace stop signs, the user could ask the SMS to identify all southward facing stop signs over five years old. The system could determine the location, report the signs' condition at the last visual inspection, and

calculate the replacement costs of those signs. Performing such an analysis is possible without a SMS, but would be a time-consuming task for an agency with hundreds of signs to do on paper.

Eighty-six Iowa counties have some type of sign management system, according to a survey of Iowa coun-

## Microtechnology

By Omar Smadi and Mike Specht,  
ISU Research Assistants

ties conducted last fall by Ed Bigelow, the Iowa Transportation Center's Safety Circuit Rider. The survey found that 31 counties have a computerized inventory system. Seventeen others keep both a computer

systems. All have basic database capabilities and all keep track of the data identified in Table 1. Beyond basic elements, however, the programs' capabilities varied. For example, one program contains a sophisticated mathematical model that predicts the life of a sign face. The program's prediction is based on the direction the sign faces, the type of sign face, the condition of the sign at its last inspection, the age of the sign, and the grade of the sign face. Other programs may only make re-

placement recommendations based on age. The difference in capabilities is reflected in the cost of the programs. The sign management programs reviewed varied from \$45 to \$2,000.

Some of the data elements listed in Table 1 are very specific. For example, the height of the sign above the center line and the Manual on Uniform Traffic Control Devices (MUTCD) code have clear definitions. Other data elements are descriptive and require subjective evaluation by the

user. For example, data collected on condition are based on visual inspections. The dictionary of conditions vary from program to program. For example, one program may identify a sign in poor condition as "Bad" while another would describe the same

**Table 1 Common data used by sign management systems**

<b>Sign Condition</b>	<b>Facing type</b>
<b>Reflectivity</b>	<b>Backing type</b>
<b>Number of signs in an assembly</b>	<b>Height above road centerline</b>
<b>Distance to pavement</b>	<b>Distance to cross roads</b>
<b>MUTCD code</b>	<b>Message on sign</b>
<b>Post condition*</b>	<b>Post type*</b>
<b>Visibility</b>	<b>Direction of sign</b>
<b>Dimensions of sign face</b>	<b>Date installed</b>

*\*Two programs ignored post data*

and paper inventory and 35 have a paper inventory only. Three counties responded with "other" when asked about how their inventories were kept.

To help *Technology News* readers understand the capabilities of SMS, we reviewed five sign management

**Continued on next page**

sign as "Vandalized," "Faded," or "Dirty." Another allows users to identify their own dictionary of conditions. A user-defined dictionary of conditions is often preferable if the user carefully identifies a broad set of conditions without defining more than are necessary.

Most of the programs reviewed contain a sort function so users could identify all the signs of a specific category. For example, the user could separate the sign records on a particular street to identify a pattern of vandalism. Not all of the programs, however, allow the user to give each sign its own number to create an index. Unique identification numbers should correspond to labels placed on the sign or

to other reference points. One program assigned sign numbers automatically, denying users the flexibility to develop their own unique identification numbers.

Because each system varies, users should first identify what their data

needs are and what they are likely to be in the future. Failure to fully understand the need for information may be a costly mistake. For example, one Iowa city developed an inventory system for its signs independently of any of its other inven-

make any comparisons between the separate databases.

The next step is to physically plan the functions of the system. For example, the user must decide how many terminals or computers should share the database at the same time, how many printers should be available, whether or not to print work orders directly to the sign shop, or if the inventory system should use bar coding to reduce manual coding errors.

The last step is to actually select the specific software. By the time, however, the

user goes through the process of specifying what functions are needed most of the software options will have already been eliminated. This makes the actual choice somewhat easier, but forces the user to thoroughly think about what is needed before making a purchase.

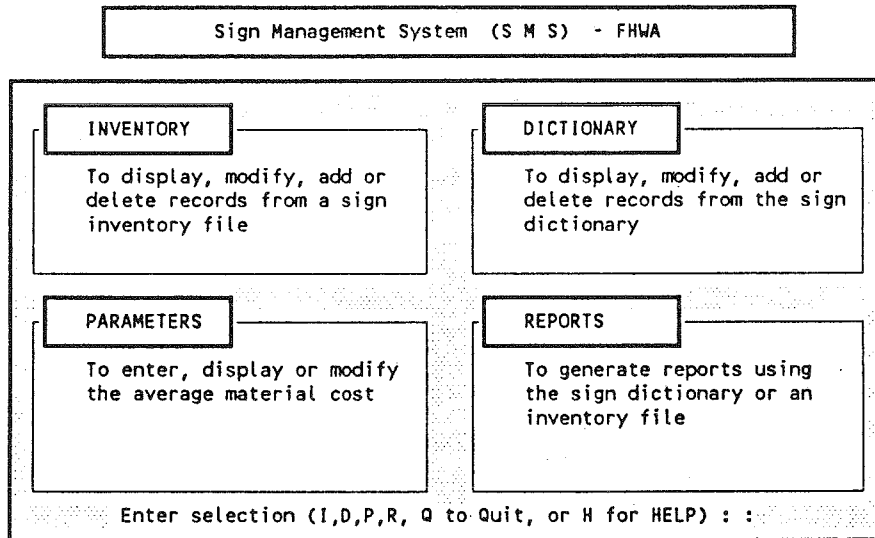


Figure 1 Screen display from FHWA SMS program

tory and management systems. Now it has a geographical information system, an accident record keeping system, and a sign inventory system that all have different methods of referencing the same physical locations. As a result, the data from each system must be manually prepared to

## Johnson continued from page 3

Because of limited resources, Johnson said "Good engineering is as much economic planning as it is designing the project. When money is short, you have to curtail projects or maintenance."

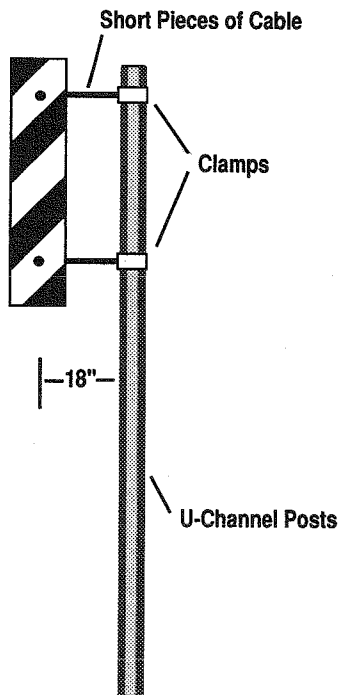
NACE's services to county engineers include a monthly newsletter, "action

guides," training guides, programs, and working with the National Association of Counties on transportation issues. During his term as executive director Johnson saw NACE's membership increase, state chapters start, and institution and corporate

memberships added. In the past three years, NACE's membership has jumped to 1,350; including many institutional and corporation members. The number of counties it covers is now about 1,150 — up from 1,000.

## Tips From The Field

# Designs extend object marker life

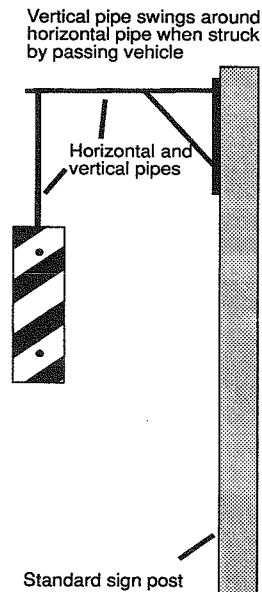


**Figure 1**

Object markers, especially those on rural roads, are often knocked down by passing farm equipment as soon as they can be replaced. Replacing fallen markers can represent a significant investment by local agencies in both material and time.

Three counties have designed object markers that resist breaking and consequently save time and replacement costs. Two of these designs can be made with spare materials, the other requires special materials that must be purchased.

Floyd County's object marker design consists of a Type 3 object marker, a common U-channel post, clamps,

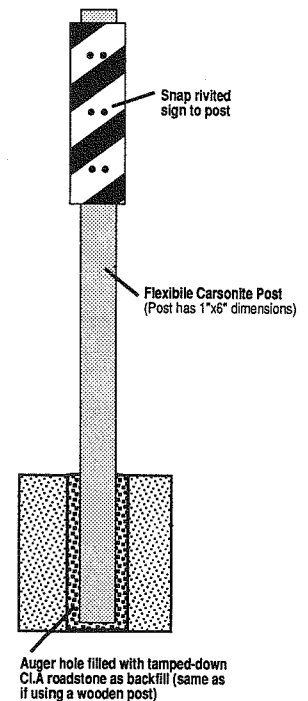


**Figure 2**

and short pieces of cable. When struck, the U-post twists slightly and the cables holding the marker flex (see Figure 1).

From Buena Vista County comes a design that uses lengths of pipe (see Figure 2). The object marker is bolted to a section of vertical pipe that swings around a horizontal pipe as the marker is struck.

Black Hawk County object markers are snap riveted to a post made of Carsonite. The post is shaped like a 1"x6" and is installed just like a wooden post. This post is flexible enough to spring back into place after being struck.



**Figure 3**

The materials for this kind of object marker cost approximately \$85, which means \$340 to put four markers on a bridge. This may seem expensive, but the life-span of these markers will far exceed that of a number of regular posts.

Any of these designs would be well-suited to "hot spots," or sites where object markers are consistently knocked down.

For more information call Floyd County Engineer Lyle Laartz, 515/228-7111; Black Hawk County Engineer Larry Clark, 319/291-2419; and Buena Vista County Engineer Don Linnan, 712/749-2540.



## For More Information

**The videotapes and publications listed in this column are available on a loan basis by contacting John H. Moody, Iowa State University, Iowa Transportation Center, 194 Town Engineering, Ames, Iowa 50011 or by calling 515/294-9481 Monday, Wednesday, and Friday mornings.**

**Automatic Tracer-Dilution Method Used for Stage-Discharge Ratings** — This is a 45-page report prepared by Phillip J. Soenksen for the Highway Research Board in cooperation with the Highway Division of the Iowa Department of Transportation concerning project HR-285. The report is concerned with determining discharge rates during periods of high flow using the Tracer-Dilution Method. **Request index #694**

**Placing and Compacting Thick Lifts of Hot Mix Asphalt Pavement** — This 13-page publication by the National Asphalt Pavement Association (NAPA) is designed to provide information of interest to NAPA members and is not considered to be a set of standards or regulations. The views expressed by the author do not

necessarily reflect the decision-making process of NAPA with regard to advice or opinion on the merits of certain processes, procedures, or equipment. For loan only. **Request index #695**

**Good Housekeeping — Your Responsibility** — This 24-page publication by the National Asphalt Pavement Association (NAPA) is concerned with the environmental affect of asphalt plants. Items considered are roadways and mobile equipment, aggregate stockpiles, and cold-feed driers, scrubber effluent, fumes, vapor, odors, and noise. Plant location and buildings are also discussed. For loan only. **Request index #696**

**Iowa Signals Go! Parts 1 and 2** The first part of this videotape discusses "Solid State Traffic Signal Operations" and the second part describes signal control. New types of signal controllers and related hardware are discussed with animation used to describe signal control. This tape is intended for elected and appointed officials and for the general public. **Running time: 36 minutes. Request index #115V**

**Mailboxes May Be Hazardous to Your Health** This 14-minute videotape, produced by the Texas Department of Highways, discusses the problems associated with mailboxes as they relate to traffic safety. A number of crash tests in involving mailboxes are shown — some in slow motion. Multiple mailbox mountings are shown and explained. **Running time: 14 minutes. Request index #117V**

**Paving the Way for Tomorrow's Highways** This 16-minute tape, produced by the Strategic Highway Research Program (SHRP), deals with the research being performed on asphalt and concrete pavement, taking into account pavement characteristics, highway operations, maintenance costs, and the protection of highway maintenance workers. There are references to the types of snow removal equipment, the significance of freeze-thaw cycles as related to pavement deteriorations and bridge repair methods with special mention of cathodic protection. **Running time 16 minutes. Request index #120V**

### Publication order form

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## Conference Calendar

**Strategic Highway Research Program Products, April 8-10, Denver Marriott City Center, Denver, Colorado** This conference will introduce the products resulting from early work in the Strategic Highway Research Program (SHRP). The conference is meant for those who will put the results of the research into practice. For reservation information call 303/297-1300.

**Fifth International Conference on Low-Volume Roads May 19-23, North Carolina State, Raleigh, North Carolina** This conference will examine new technologies and techniques in the planning, design, construction, operation, maintenance, and administration of low-volume roads and systems. Call 919/878-8080 for more information.

**Local Road and Street Pavement Management, March 27-28; Scheman Building, ISU, Ames** This workshop teaches participants how to use the Iowa State Pavement Management System. Course includes hands-on experience using the program on MS-DOS computers. Contact Connie Middleton 515/294-6229.

**Construction Inspectors Workshop, April 2, Council Bluffs; April 4, Cedar Rapids** This workshop provides construction inspectors an understanding of the importance of their job and the fundamentals of construction inspection. Contact Janet Gardner 515/294-5366

**Transportation Impacts of the Clean Air Act: Mobile Source emissions and Alternate Fuels, July 25-26, Des Moines Marriott Hotel** This national conference will provide fleet operators, public works departments, transit operators, motor

carriers, and state and local policy makers with insight into the emissions standards of the 1990 Clean Air Act, and alternative vehicle fuels and engines which meet these standards. There will be both policy and technology sessions. Fuels under discussion will include LNG, CNG, methanol, LPG, electricity, and petroleum fuels. Call 515/294-5366 to register or 515/294-7164 for more information on the conference's content.

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