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## Iowa's network of survey benchmarks to be updated

THE GREAT SCAVENGER HUNT across Iowa is underway.

Last summer state and local transportation staff began delving into remote corners of the state to track down dozens of concrete survey monuments, remnants of the National Geodetic Survey's original benchmark network from the 1930s. Sixty years after that first network was established, the NGS is working with states to establish an updated system of reference points with latitude/longitude identified by sophisticated Global Positioning System (GPS) technologies.

This new benchmark system will be the cornerstone of the NGS's new High Accuracy Reference Network (HARN), and some of Iowa's existing monuments will be part of it.

The impetus for establishing the HARN was the development of GPS-based surveying capabilities. Using antennae, receivers, and specialized software to measure and coordinate the distance between a monument and at least four orbiting satellites, NGS surveyors can now determine the latitude and longitude of that monument to within a centimeter of accuracy. In light of these capabilities, the NGS's original benchmark coordinate addresses are inaccurate enough to be obsolete.

The HARN will provide a new network of phenomenally accurate benchmark coordinates for land surveying and many other uses.

To develop the HARN in Iowa, the Iowa Department of Transportation has taken the lead in establishing the Iowa Geodetic Network Committee (IGNC). The IGNC is comprised of representatives from each division of the department and representatives of the NGS, the Iowa State Association of Counties, the Iowa County Engineers Association, the Iowa League of Cities, the Society of Land Surveyors of Iowa, the Iowa Public Airports Association, and others.

Alice Welch, survey/photogrammetry engineer at the Iowa DOT, is involved in coordinating the search for Iowa's existing monuments. According to

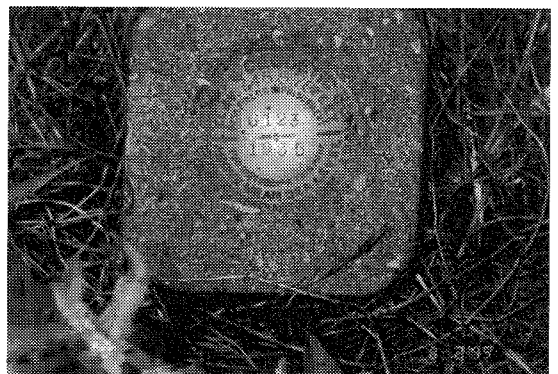
Welch, using the original monuments as HARN survey stations serves two purposes.

"Using some existing monuments ties HARN to the original network," says Welch, "and that's a requirement of the NGS. Also, every existing monument that qualifies for the HARN reduces the number of new monuments to be set and lowers the cost of this project."

As necessitated by pre-World War II surveying equipment and techniques, Iowa's original monuments were generally set on hills or rises. Many of them are in extremely remote areas and/or on private property.

To qualify as HARN stations, existing monuments must meet new NGS criteria: They must be stable structures situated on public lands or rights-of-way and must be easily accessible by two-wheel drive vehicles. Also, because antennae placed at the sites must receive signals from orbiting satellites, monuments must have a wide, unobstructed view of the sky. These criteria effectively eliminate any crumbling, wobbly, secluded, overgrown or otherwise hidden monuments and those on private property.

... continued on page 2



This marker in Washington County, dating from the NGS's original survey in the early part of the century, may qualify as a monument for the HARN.

The preparation of this newsletter was financed through the Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa 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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Center for Transportation  
Research and Education  
2625 N. Loop Drive, Suite 2100  
Ames, Iowa 50010-8615  
Telephone: 515-294-8103  
Fax: 515-294-0467  
BBS: 515-294-9784

Tom Maze  
Director  
(e-mail: tmaze@iastate.edu)

Jan Graham  
Assistant to the Director

Duane Smith  
Associate Director for Outreach  
(e-mail: desmith@iastate.edu)

Marcia Brink  
Editor  
(e-mail: x1brink@iastate.edu)

Ed Bigelow  
Safety Circuit Rider

Sharon Prochnow  
Program Coordinator

Stan Ring  
Library Coordinator

Diane Love  
Account Clerk

Margaret Hammer  
Secretary

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## HARN . . . continued from page 1

So, although more than 200 monuments have already been found in Iowa, the hunt continues. Welch's goal is to find at least two monuments per county that will be approved by the NGS to serve as HARN stations. "If we find enough existing monuments that qualify for HARN," she says, "we won't have to set any new ones."

The federal-base HARN will not use as many monuments as the 1930s network, but each state can determine how "dense" its state-base, or cooperative-base, network will be. Monument spacing for the federal-base network is 100 kilometers, so the federal-base network in Iowa will consist of 22 points. Five of these 22 points will have an A-order accuracy rating (one part error in 10,000,000 parts); the rest will have a B-order accuracy rating (one part error in 1,000,000 parts).

The Iowa DOT has requested 50-kilometer monument spacing for Iowa's state-base, or cooperative-base, network and will coordinate with the NGS to obtain the additional monument addresses, or positions. This network will consist of an additional 155 points, each with a B-order accuracy rating.

A survey of Iowa's cities with populations greater than 5,000 and of Iowa's counties found that some local agencies would prefer 25-kilometer or even denser monument spacing. To help make this possible, some counties are assisting with the monument reconnaissance and/or otherwise contributing toward the cost of data collection.

Montgomery County Engineer Alan Estvold, for example, is interested in 25-kilometer spacing to make land surveying easier and more accurate. His staff has located about half of the dozen or so original monuments in Montgomery County. "But only a couple of them are very accessible," he says.

According to Welch, Iowa's statewide scavenger hunt should be finished and appropriate monuments approved by November 1996. NGS staff will then work with Iowa DOT staff to conduct the field work in Iowa to determine the GPS-based coordinate addresses for the approved monuments. The data will become part of the HARN, and NGS will publish the data for the cooperative-base network and make them available in Iowa.

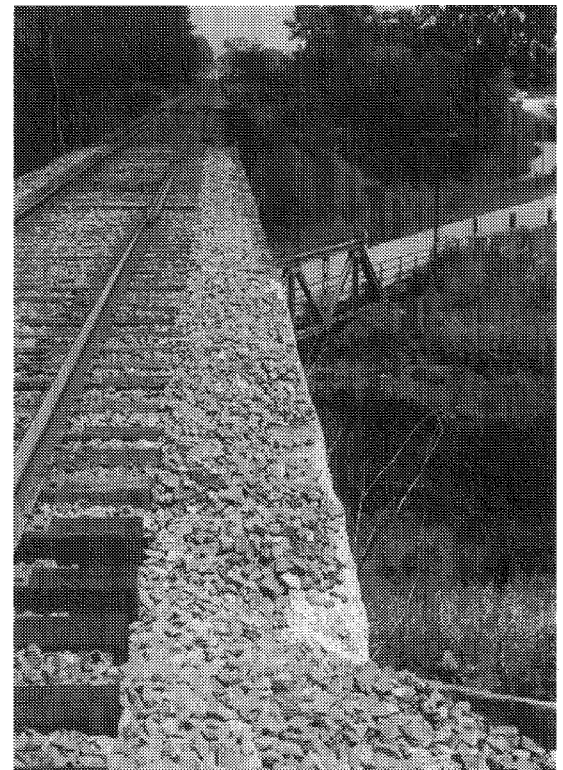
Iowa has been one of the last states to jump on the HARN bandwagon, primarily because state plane coordinates are not required by law for land surveys

in Iowa. The Iowa DOT decided to take the lead in working with the NGS in an effort to maintain effective ground control for all of Iowa's public infrastructure systems.

Most important to the department, superior road and bridge engineering requires the most accurate surveying information available, and that is what the HARN delivers. The HARN will also provide a foundation for those geographic information systems (GIS) applications that require highly accurate reference points, as well as for computer-aided maps and pavement and bridge management systems.

The HARN will be a refined version of the North American Datum of 1983.

If you have questions about the HARN or information about old NGS monuments in your city or county, contact Alice Welch, 515-239-1041. ■



The old marker on this railroad bridge in Washington County is still in good shape—but too inaccessible to qualify for the HARN.

## Iowa DOT reorganization: spotlight on the Transportation Centers



A TEAM MANAGEMENT APPROACH at the six Iowa DOT Transportation Centers is a prime example of changes within the department that have resulted from an increased focus on customer service.

Before reorganization, the Iowa DOT had six districts in the state, each managed by a district engineer who reported to the department's former Highway Division. Reorganization brought more than just a change in name from "district" to "region"; now each former district engineer is part of a regional management team located at the region's Transportation Center, and team members report to different divisions within the department.

Each Transportation Center team consists of a development engineer, a construction engineer, a maintenance engineer, a transportation planner, and a field services coordinator. Each member brings a different area of expertise to help administer the department's goals in the region and, ultimately, to better serve the region's customers—including county and city transportation agencies.

An example of the team management approach facilitating customer service is the "Dodge Street project" in Dubuque, a two-year project to realign approximately two miles of Dodge Street/U.S. 20. To increase safety, the roadway will be somewhat straightened, and local traffic will be separated from highway traffic.

Because this project is primarily a construction project within the East Central Iowa Transportation Center (ECITC), Bruce Kuehl, the ECITC construction engineer, is heavily involved. In addition, Maurice Burr, development engineer, works with Lee Benfield, transportation planner, in concept development, while Kevin Mahoney, maintenance engineer, deals with access permits and ensures that the project has no code violations.

Each of these team members works directly with Iowa DOT customers and others within the areas of their expertise and refers customers to other team members when appropriate.

Meanwhile, Lawrence Bryant, ECITC's field services coordinator, is working closely with the media, members of the chamber of commerce, and other community groups to ensure that the public is informed about the progress of the project.

Recognizing that the people of Dubuque will be inconvenienced by the Dodge Street project, Bryant has set up a special committee to keep the public informed of project developments.

Although the Dodge Street project is still in its infancy, Bryant and others at ECITC are pleased with what they perceive as increased opportunities for customer service allowed by the team management approach.

Kevin Schmitt, chair of the Dubuque Chamber of Commerce's ground transportation committee and a member of Bryant's special committee on the Dodge Street project, says his experience with the Iowa DOT is limited but so far the ECITC is doing a good job of letting the committee and the public know their schedule.

"I'm pretty pleased with them," says Schmitt.

Mike Koch, Public Works Director in Dubuque, also feels the ECITC team is doing a good job with the project. "The first phase of the project went well. There were few glitches—much less than I expected," he says.

Of course, a change from one administrator to a team of five is a big one, not to be made easily. According to Darrel Rensink, director of the Iowa DOT, each Transportation Center is handling the transition and developing its team approach as best suits the region. The centers often have different opportunities, priorities, and difficulties, so no two centers may operate alike.

"There is no set pattern, it's just a little different at each transportation center simply because each has different situations. The basic organizational structure is the same in each region, though," says Rensink.

According to team members, customer reaction to the new organization varies.

"I still have customers calling me with questions that should maybe go to the maintenance engineer or the field service coordinator," says Jim Bump, development engineer at the Northwest Iowa Transportation Center. "It's just a matter of customers getting used to the new organization."

Michael Audino, director of the Field Services Division, says the teams are performing well. "Given the

### LTAP Advisory Committee

The people listed below help guide and direct the policies and activities of the Center for Transportation Research and Education's Local Technical Assistance Program (LTAP).

The committee meets at least annually. Representatives of rural and urban agencies and individuals concerned with the transfer of transportation technology in Iowa are welcome to attend advisory committee meetings.

Contact any of the advisory committee members to comment, make suggestions, or ask questions about any aspect of LTAP.

Roger Anderberg  
Local Systems  
Iowa Department of  
Transportation  
Telephone: 515-239-1291

Saleem Baig  
Local Systems  
Iowa Department of  
Transportation  
Telephone: 515-239-1051

Charles L. Fisher  
Superintendent of  
Public Works  
City of Spencer  
Telephone: 712-264-7220

Kevin Gilchrist  
Senior Transportation Planner  
Des Moines Metropolitan  
Planning Organization  
Telephone: 515-237-1316

Becky Hiatt  
Iowa Division, Federal  
Highway Administration  
Telephone: 515-233-7321

Raymond Holland  
City Engineer  
City of Bettendorf  
Telephone: 319-344-4055

Harold Jensen  
Story County Engineer  
Telephone: 515-382-6581

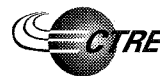
Brian Parker  
Iowa Division, Federal  
Highway Administration  
Telephone: 515-233-7315

Bob Sperry  
Webster County Engineer  
Telephone: 515-576-3281

Jim Thompson  
Transportation Director  
City of Des Moines  
Telephone: 515-283-4973



Iowa Department  
of Transportation



Center for Transportation  
Research and Education

IOWA STATE UNIVERSITY

continued on page 4

*Editor's note: This article is the last in a series discussing the recent reorganization of the Iowa Department of Transportation. We appreciate the generous help of Iowa DOT staff who talked to us about their divisions and offices and reviewed articles for us during the past year.*

**TRANSPORTATION CENTERS . . . continued from page 4**

limited guidance they were provided, the teams are doing an outstanding job. We've put some difficult tasks on them, and they're doing a tremendous job."

Audino sees customer service as central to the team management concept and hopes the Transportation Centers will ultimately serve as models for the rest of the department.

"I would like to see the DOT, through utilization of teams, reach out to the customer more frequently,

to invite suggestions, comments, and ideas," says Audino.

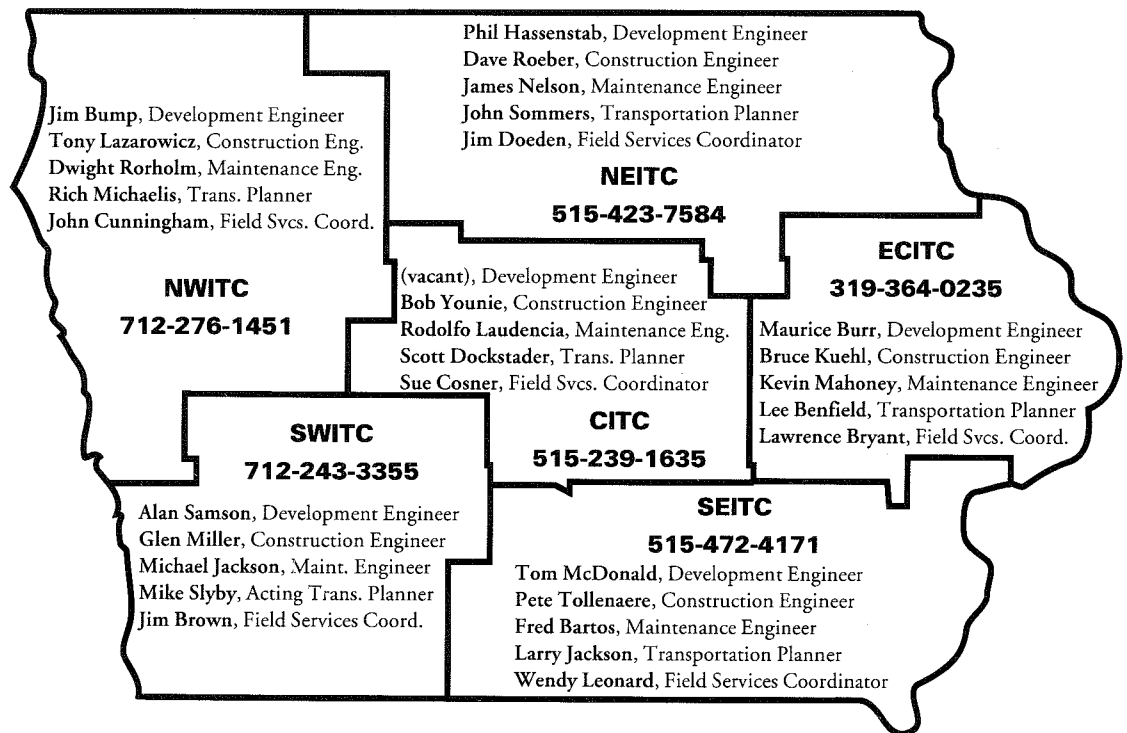
The Transportation Centers are the first line of access to the Iowa DOT, and customers should usually direct their questions to the nearest center. If you're not sure who to call at a center, the field services coordinator should be able to decide who can best help you. See telephone numbers on the map below. ■

**Correction!**

**Iowa DOT garages**

The December 1995 issue of *Technology News* contained a list of Iowa DOT garages and their telephone numbers (pages 4-5). A few numbers on page 4 were incorrect. Following is a corrected listing:

- Dyersville 319-875-7615
- Elkader ..... 319-245-2724
- Emmetsburg 712-852-4886
- Estherville ..... 712-362-2780
- Fairfield 515-472-5367
- Forest City ..... 515-582-2073
- Fort Dodge 515-955-8571
- Garner ..... 515-923-2305
- Gowrie 515-352-3550
- Greenfield ..... 515-743-8324
- Grinnell 515-236-3014
- Grundy Center .. 319-824-5259
- Guthrie Center 515-747-3561
- Hamlin ..... 712-563-2268
- Hampton 515-456-2721
- Hanlontown ..... 515-896-3100
- Harlan 712-755-2558
- Humboldt ..... 515-332-2768
- Ida Grove 712-364-2027



**Northwest Iowa Transportation Center (NWITC)**  
2800 E. Gordon Drive, P.O. Box 987  
Sioux City, IA 51102-0987  
712-276-1451

**Southwest Iowa Transportation Center (SWITC)**  
U.S. 71 & U.S. 6, P.O. Box 406  
Atlantic, IA 50022  
712-243-3355

**Northeast Iowa Transportation Center**  
1420 Fourth St. S.E., P.O. Box 741  
Mason City, IA 50402-0741  
515-423-7584

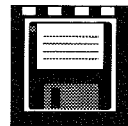
**Central Iowa Transportation Center (CITC)**  
1020 S. Fourth Street  
Ames, IA 50010  
515-239-1635

**East Central Iowa Transportation Center (ECITC)**  
430 16th Avenue S.W., P.O. Boc 3150  
Cedar Rapids, IA 52406-3150  
319-364-0235

**Southeast Iowa Transportation Center (SEITC)**  
307 W. Briggs, P.O. Box 587  
Fairfield, IA 52556-0587  
515-472-4171

Each Iowa DOT Transportation Center is managed by a team of professionals.

## Software simplifies bridge data collection



micro  
technology

FOUAD FANOUS, a professor of civil and construction engineering, and his colleagues at Iowa State University have developed user-friendly software for bridge inspectors to use to collect data for the Pontis bridge management system (BMS). Pontis is the software selected by the Iowa Department of Transportation for its BMS.

The Iowa DOT has about 4,000 bridges, and Iowa has approximately 20,500 county-owned bridges and 1,100 city-owned bridges. In October 1995, the Iowa DOT began collecting data for Pontis as part of its regular bridge inspections. Counties and cities that elect to participate in Iowa's BMS will begin collecting data for Pontis as part of their regular 1997 bridge inspections.

The bridge inspection software developed by Fanous and his colleagues acts as an interface between the bridge inspector and the Pontis database. When loaded on a laptop computer, the software can be used in the field during bridge inspections (or immediately after) for recording condition data and other required information. The software's menu-driven format guides users through the inspection and data entry process.

After bridge inspection data have been entered, the software can prepare detailed inspection reports. Perhaps even more important, it can convert the data to Pontis format for entry into the state database.

Roger Walton, an engineer in the Office of Local Systems at the Iowa DOT, is pleased with the bridge inspection software. Function buttons, pull-down menus, and online help menus make it easy to use, he says. A brief, easy-to-follow manual has many pictures and examples.

"The software is so straightforward," says Walton, after loading data from 100 sample state prestress concrete beam bridges. "Just about anybody can learn it without outside help. If you aren't used to computers, learning the program will take a little more time, but it won't be difficult."

Users of the bridge inspection software developed by Fanous do not need a strong computer background, but they should have a working knowledge of Microsoft Windows and the Notepad application of Windows. They also need:

- a 386 or higher, 100 percent IBM compatible computer with a minimum of 4 MB of RAM

- a hard disk drive with at least 12 MB of disk space
- VGA or higher resolution monitor
- DOS 3.3 or higher
- Windows 3.1
- a printer supported by Windows (optional)

The software can be used on the PC in your office or on a laptop computer for in-the-field data input. According to Walton, it should also work on pen-based computers loaded with pen-based Windows software, although it has yet to be tested on pen-based computers. Fanous envisions the day when it can be used with hand-held, voice-recognition computers. "Voice recognition still needs to be perfected," he says, "but this software is just the kind of application that would be very convenient to use in the field with voice commands."

The bridge inspection software was developed by Fanous and his colleagues under a contract sponsored by the Iowa DOT and the Iowa Highway Research Board (HR-364). For specific information about the software, contact Fanous, 515-294-9416.

The software will be available to all cities and counties that elect to participate in Iowa's BMS. For more information, call Bruce Brakke, maintenance bridge engineer at the Iowa DOT and chair of the Iowa Bridge Management Technical Subcommittee, 515-239-1165. ■

*Editor's note: Bridge management systems (BMS) mandated by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) have been rendered optional by the National Highway System authorization bill signed by President Clinton in November 1995. The Iowa Department of Transportation (Iowa DOT) is going ahead with a BMS for its 4,000 bridges in an effort to use limited bridge construction and maintenance funds most effectively. The decision to participate in this program at the local level will be made by Iowa's cities and counties and not by the Iowa DOT.*

*The Iowa DOT will present information about Pontis, the software for its BMS, at the spring meeting of the Iowa State Association of Counties. The BMS session will be held the afternoon of March 20, 1996, beginning at 1:00 p.m.*

The data collection software has online help menus and a brief, clearly written manual.

## Announcing the Semisesquicentennial Transportation Conference

Celebrating the 75th anniversary of the  
Transportation Research Board and the  
contributions of research to transportation

May 13–14, 1996

Iowa State University  
Ames, Iowa

AT IOWA STATE UNIVERSITY, where the idea of the Transportation Research Board was conceived, a special two-day national conference will commemorate the past through presentations on the history of transportation research, and will herald the future by providing a forum for exchanging information on today's critical transportation issues.

Thanks to the efforts of Anson Marston, first dean of engineering at Iowa State College, and other visionaries during the last 75 years, our interstate and national highway systems are prized for the integrity of their design, materials, engineering, and safety features. Maintaining that integrity and, even more important, incorporating our roadways into a multimodal system for tomorrow's transportation needs are the challenges for today's researchers. Conference presentations will thus showcase the variety of research that will help define transportation in the next 75 years and beyond.

**Presentations: Transportation Research Yesterday, Today, and Tomorrow**

Presentation sessions at the conference will cover several topics organized in concurrent sessions. Diverse topics will include the following:

- Pavement design, nondestructive evaluation of pavements, and pavement materials
- Bridge design and nondestructive evaluation of transportation structures
- Traffic safety, accident records, and traffic safety features
- Innovative techniques in transportation planning and planning applications of land use
- National and state transportation policy and finance
- Urban and freight applications of Intelligent Transportation Systems (ITS)
- Transportation impacts of NAFTA
- Freight transportation policy and its impacts on truck and intermodal transportation

- Highway maintenance management and innovation in highway maintenance
- Winter maintenance management and advanced technology in winter maintenance

### A Commissioned Historical Book

A highlight of the conference will be a presentation by Dr. R. Douglas Hurt, professor of agricultural history and rural studies at Iowa State University and director of the Center for Agricultural History. Dr. Hurt will discuss his research on the history of transportation research and development in Iowa, from the turn of the century to the present. Dr. Hurt has been commissioned to develop a historical commemorative book covering the role Iowa has played in developing local and national transportation research agendas.

Conference registrants will receive a copy of Dr. Hurt's commemorative book.

### A special award

Another highlight of the conference will be the presentation of a unique "Semisesquicentennial Award for Transportation Excellence." This award will honor an individual or individuals who, through a significant lifelong contribution to the improvement of transportation or through research that has substantially advanced transportation, have contributed to the ideals exhibited by Anson Marston and his colleagues.

A nominee's strong connection to the state of Iowa will be a key element in the committee's selection.

### Plan now to attend in May!

The registration fee is \$100. A brochure with registration information will be mailed in March 1996.

Requests for more information about this conference (including advance hotel registration) may be directed to the Center for Transportation Research and Education (CTRE) at Iowa State University:

Tom Maze or Sharon Prochnow  
CTRE

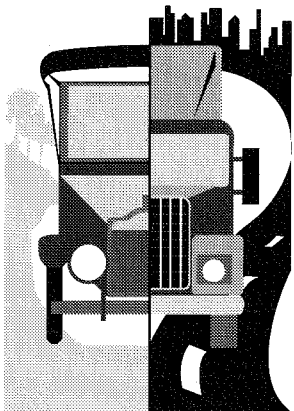
ISU Research Park  
2625 N. Loop Drive, Suite 2100  
Ames, IA 50010-8615

(voice) 515-294-8103; (fax) 515-294-0467  
(Tom's e-mail) tom@ctre.iastate.edu  
(Sharon's e-mail) sharon@ctre.iastate.edu ■

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attended a research  
conference, make the  
Semisesquicentennial  
Transportation  
Conference your first.  
Together, the Iowa  
Department of Trans-  
portation and Iowa  
State University are  
planning a world-class  
event, with distin-  
guished guest speakers  
including*

*Frank Francois,  
Executive Director of  
AASHTO*

*and Damian Kulash,  
President and CEO of  
the Eno Foundation.*



## Blue Ribbon Transportation Task Force urges interagency cooperation

In its final report to the governor, the task force made nearly 40 recommendations that, if implemented, could free millions of dollars from the Road Use Tax Fund (RUTF) for the central mission of Iowa's transportation agencies—building and maintaining Iowa's roads.

ON JANUARY 5, 1996, Governor Branstad heard recommendations from the Blue Ribbon Transportation Task Force, ending the group's five-month review of Iowa's state and local highway transportation budgets. The review focused on administrative and operations budgets.

According to Iowa DOT Director Darrel Rensink, the task force recommendations "will likely provide some new and innovative ways to conduct our business for the citizens of Iowa."

### Sharing resources

In its report to the governor, the task force strongly encourages intergovernmental cooperation as a strategy for using transportation funds more efficiently, emphasizing the members' philosophy that today's transportation challenges require the Iowa DOT and local governments to work together more like a single enterprise. "Sharing" and "partnering" are common themes in the report.

For example, the task force recommends that the Iowa DOT take the lead in connecting all its offices and garages, all Iowa counties, and all Iowa cities with a data communications network that will allow them to communicate via electronic mail and share information quickly.

The task force also recommends that local governments be given the opportunity to buy technology through Iowa DOT or Department of General Services (DGS) contracts, and that the Iowa DOT and local agencies share real-time weather information by contracting jointly with providers. The task force also recommends that the state's transportation community expand the number of partner projects among all levels of government and with the private sector.

As a successful example of such partnering, the report cites a joint construction project between Greene County and the city of Jefferson. Greene County, contracting for reconstruction and paving on a seven-mile stretch of roadway, allowed Jefferson to piggyback a three-quarter mile paving

project within the city limits. This arrangement significantly reduced the overall cost of the city's portion of the project.

The task force estimates the potential savings resulting from intergovernmental sharing of equipment alone could be three to five percent of the RUTF. The task force's recommendations on sharing are intended to create—from the "bottom up"—an environment in which sharing among agencies becomes commonplace. For example, the task force recommends that a special sharing committee be formed to solicit and fund pilot sharing projects across the state, encourage the formation of voluntary transportation districts, and provide technical assistance to local governments and the Iowa DOT regarding opportunities for sharing.

Tim Moerman, assistant city manager in Dubuque and chair of the task force subcommittee on sharing, acknowledges Iowa's strong culture of local control. "We hope a few successful pilot projects will demonstrate that sharing resources can save local and state governments money while helping them improve the services they offer."

### Implementing new technologies

Many task force recommendations emphasize implementing information technologies. The task force recommends, for example, that the Iowa DOT re-engineer information management, streamline and automate paperwork processes, put services on line for contractors, establish a statewide plan for geographic information services (GIS), and exploit the capabilities of the Iowa Communications Network for conducting long-distance workshops and meetings.

Estimated technology-driven savings will require a significant up-front investment, and a one-time state appropriation for such an investment may be necessary.

### Outsourcing

The task force believes that by far the best remaining outsourcing opportunities in Iowa's public transportation sector involve fleet management, including fleet leasing and maintenance. The task force recommends that the Iowa DOT, as well as cities and counties, investigate the possibility of leasing light duty vehicles and heavy equipment.

... continued on page 8

*Editor's note: The Governor's Blue Ribbon Transportation Task Force was appointed in the summer of 1995 to find ways to maximize the benefits of each dollar spent from Iowa's Road Use Tax Fund. This article is based on the task force's final report dated December 28, 1995. For general information about the task force and its charge, see the December 1995 issue of Technology News, page 13.*

*The task force's mandate was to take a fresh, objective look at Iowa's transportation expenditures and to recommend strategies for reconciling flat or decreasing transportation budgets with growing infrastructure costs.*

Other areas recommended for study as possible outsourcing opportunities include some clerical functions, computer-aided design and drafting, custodial services, facilities management, materials testing, printing and publishing, sign making, radio communications, real estate acquisition, rest area upgrading, and purchasing.

#### General recommendations

The task force also made some important general recommendations, including the following:

- Reevaluate off-the-top, non-road-surface-related diversions from the Road Use Tax Fund.
- Study alternatives to the current city-county-state system of road responsibility.
- Consolidate maintenance facilities under state, county, and city partnerships and/or reduce the number of Iowa DOT garages.
- Evaluate the possibility of building high standard, two-lane, rural expressways instead of four-lane highways whenever possible.
- Build thicker pavements where roads sustain heavy truck traffic.

The task force's mandate was to take a fresh, objective look at Iowa's transportation expenditures and to recommend strategies for reconciling flat or decreasing transportation budgets with growing infrastructure costs. Says task force chair Suzan Stewart, a former state transportation commissioner, "We have a heritage in Iowa of an excellent system of roadways. These recommendations are intended to help Iowans continue to enjoy this system for years to come."

Some of the task force recommendations may be quickly implemented. Many, like examining outsourcing opportunities, will require a more thorough investigation to determine their actual money saving potential. All recommendations, including some not mentioned here, are being carefully reviewed by the governor, the legislature, and the Iowa DOT.

Local agencies are encouraged to become familiar with the recommendations also. CTRE has a limited number of the task force's report available for free, as well as loan copies, from its library. Call Stan Ring, librarian, 515-294-9481. ■

## National Highway System established

By April Greenbeck, Editorial Assistant



WHEN PRESIDENT CLINTON signed the National Highway System Designation Act of 1995 (the NHS bill) in

November, \$5.5 billion of withheld highway and interstate maintenance and construction funds was released to state governments, including \$77.7 million in fiscal year 1996 apportionments to Iowa. As outlined by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), these funds had been withheld pending designation of the National Highway System (NHS).

The 161,000-mile NHS consists of the interstate system along with other highways deemed essential to the nation's defense, economy, and mobility. Representing only four percent of the nation's roadway mileage, it generally carries 40 percent of all traffic. Ninety percent of Americans live within five miles of an NHS road.

Iowa's 3,213 NHS miles include 785 miles of interstate highway and 2,428 miles of state highways. Eventually, approximately 30 miles of city streets will also be added to the NHS in Iowa. For the most part, these connecting streets link NHS highways and interstates to intermodal stations like airports, Amtrak depots, or waterway docks. ISTEA requires that these critical connections be identified and designated as part of the NHS. (See the partial map of Clayton County on the next page.)

In addition to establishing the NHS, the NHS bill contains several provisions, like the repeal of the national 55-65 speed limits, that effectively give state and local transportation authorities more freedom in managing their roadways. Many of these provisions involve the repeal of mandates.

Some NHS bill provisions that may affect Iowa's local agencies include the following:

**The CDL requirement for emergency snow plow operators is relaxed.** Effective 180 days after passage of the NHS bill, replacement and emergency snow plow drivers are exempt from commercial driver's license requirements when regular drivers are unable to operate the snow plow or when a snow emergency requires additional operators.

**Metrication requirements are relaxed.** The NHS bill postpones until September 30, 2000, the

*continued on page 9*



deadline for state and local transportation authorities to convert highway design standards to metric. The bill rescinds the requirement for metric legends on highway signs.

According to Roger Anderberg of Local Systems at the Iowa DOT, the department will continue to convert its design standards to metric as quickly as possible and encourages local jurisdictions to begin developing all designs in metric units.

**ISTEA-mandated management systems become optional.** ISTEA requires that states implement several management systems, including bridge, pavement, congestion, and safety management systems. The NHS bill suspends this requirement. However, because of their value as management tools, the Iowa DOT is continuing to implement the management systems and will inform local agencies about their options for participating.

**Requirements and penalties related to the states' use of crumb rubber asphalt are eliminated.** The NHS bill repeals the ISTEA requirement that states use a certain percentage of crumb rubber in federally funded asphalt pavement projects. Repeal of the mandate was a response to industry concerns about the high cost of crumb rubber asphalt, uncertainty about its performance capabilities (like the ability to withstand the freeze-thaw cycles in cold climates), and the difficulty and expense of recycling crumb rubber asphalt.

Dan Franklin, assistant director of the Director's Staff at the Iowa Department of Transportation, is pleased with the repeal of the crumb rubber requirements.

"Now we can judge crumb rubber asphalt based on its merits," Franklin says. "Instead of being forced to use it under fear of penalties, engineers can make an engineering decision about the material."

The U.S. Department of Transportation may provide grants to states to develop programs to use crumb rubber as a modifier in asphalt pavements, but no specific funding for such grants is provided by the NHS bill.

**Requirement for motorcycle helmet laws is removed.** Under the NHS bill, states like Iowa will no longer be penalized for not having a helmet law. Therefore, more money will be available for highway construction and maintenance.

**Strategies to enhance work zone safety are outlined.** The bill outlines specific strategies for implementing the work zone safety program established under ISTEA. These strategies include conferences exploring new techniques for improving work zone safety, a national promotional campaign aimed at motorists, and a national clearinghouse of information relating to the improvement of work zone safety. The NHS bill also encourages the use of enforceable speed limits in work zones.

Ed Bigelow, Iowa's safety circuit rider, is pleased to see this strong push for work zone safety in the bill and emphasizes the importance of making drivers more aware and careful in work zones.

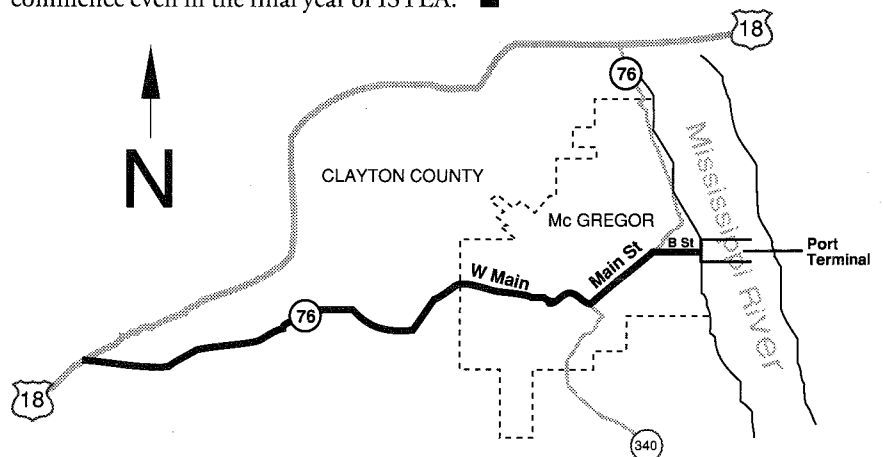
Bigelow, the instructor for Iowa's popular flagger training workshops, says, "I support these efforts wholeheartedly. We need to change drivers' point of view by helping them understand what it's like to be out there working, exposed, while cars are whizzing by."

Bigelow adds, "When I travel out of state and return to Iowa, I'm very proud of our work crews. They're very good about following the Manual on Uniform Traffic Control Devices."

**Construction projects are allowed to commence in the final year of ISTEA.** The NHS bill allows advance construction to begin on projects included in the State's Transportation Improvement Program (STIP). This provision addresses the requirement that federal funds must be authorized one year past the fiscal year for which a project has been approved before the project can progress. This requirement has generally meant that states could not begin a project in the final year of a multi-year authorization act like ISTEA. The NHS bill effectively guarantees that approved projects can commence even in the final year of ISTEA. ■

*[T]he NHS bill contains several provisions . . . that effectively give state and local transportation authorities more freedom in managing their roadways.*

Nearly four miles of roadway in Clayton County (portions of Iowa 76 and McGregor's Main Street and B Street) connect US Highway 18 with a port terminal for grain barges on the Mississippi River. McGregor is one of nine cities in Iowa with a section of street or streets that will be designated as NHS intermodal connection routes. (Map is not to scale.)



tip from  
the field



## Cart simplifies wing removal, storage

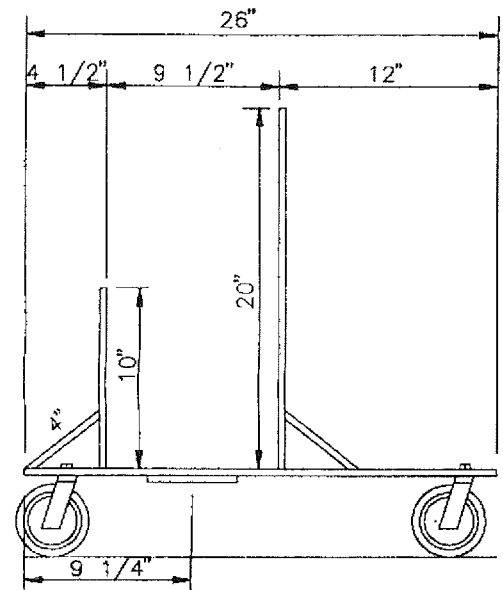
WHEN THE WINTER of '95-'96 finally ends, motor grader and snow plow operators will remove the heavy wings from their plows—a difficult and awkward task that usually requires more than one person. Paul Galles, Plymouth County motor grader operator, doesn't like waiting for someone to help him remove the wing, so he has devised a simple cart that allows him to remove the wing by himself, safely and easily, in only a few minutes.

Now Galles simply raises the wing, slides his cart under and lines it up the wing, lowers the wing onto the cart, and removes the rear push arm and main swivel bolt. He then rolls the wing on the wheeled cart to a storage area.

The frame of the cart is made from used snow plow and grader blades that would otherwise be thrown away. The blades are cut into various lengths and welded together (see the diagram for a single wing cart). The price of the wheels—six-inch, polyurethane-coated, ball-bearing swivels with grease zerks and a 1200-pound rating each—is the only expense for the cart, along with three to four hours of labor.

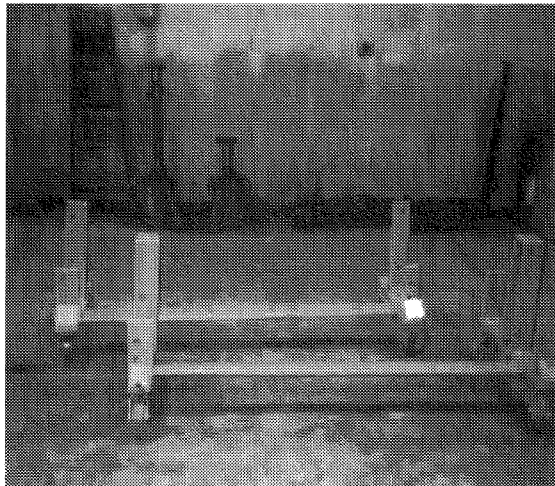
Plymouth County crews estimate the approximately \$150 price tag for each cart is justified because the carts make it easier for operators to remove their wings more often. When not needed for pushing snow, the attached wing can create some problems: It causes a blind spot for the operator and increases the grader/plow's fuel use. Also, when the ground thaws and becomes soft, the heavy wing can tear up unpaved shoulders.

### SINGLE CART



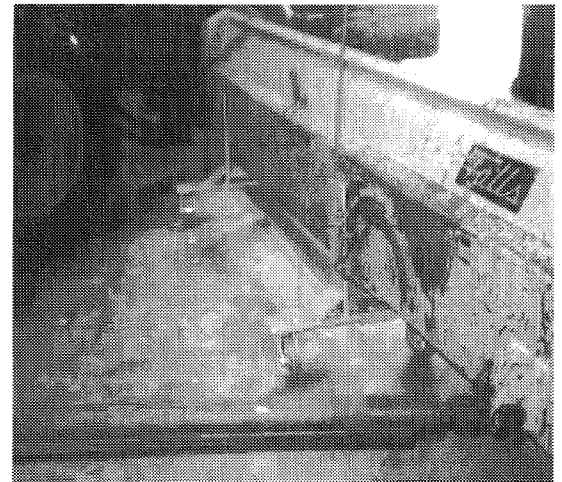
### SIDE VIEW

For more information and complete plans for single and double wing carts, contact Russ Hobson, secondary road superintendent in Plymouth County, 712-546-4559. ■

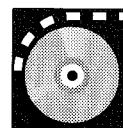


*Left:* Front views of double and single wing carts.

*Right:* With the wing in place, the cart has room for the push arm.



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| <p><b>An Engineering Study to Update the Iowa Transportation Laws Annotated</b> (Iowa Highway Research Board Project HR-234A, 1995) 354 pages.</p> | <p>This report includes those sections of the Iowa Code Annotated to which the DOT, counties, cities, and towns frequently refer.</p>   | <p>Request #P1069 <input type="checkbox"/></p> |
| <p><b>Self Instructional Math</b> (Iowa Highway Research Board Project HR-324, 1995) 345 pages.</p>  | <p>This course provides a basic knowledge of math for those involved in the planning, design, and construction of highways and streets.</p>   | <p>Request #P1080 <input type="checkbox"/></p> |
| <p><b>A Guidebook for Residential Traffic Management</b> (Washington State DOT, 1994) 128 pages.</p>   | <p>This report provides a comprehensive reference on initiating and running a residential traffic management program. The program takes a "tool box" approach to implementing projects.</p> | <p>Request #P1081 <input type="checkbox"/></p> |
| <p><b>Model Pedestrian Safety Program—User's Guide</b> (FHWA-RD-87-039, 1987) 43 pages.</p>  | <p>This guide describes how localities can plan, implement, and evaluate a pedestrian safety program.</p>   | <p>Request #P1124 <input type="checkbox"/></p> |



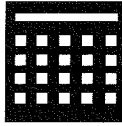
Stan Ring, library coordinator

**Videotapes**

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| <p><b>Maintenance Welding—General Welding Safety and Tank Repair</b> (Michigan Tech University, 1995) 52:00 min.</p> | <p>This excellent tape (one in a series of three) is directed to anyone welding in a shop and covers the dangerous aspects of welding and provides safety procedures and tips, with many examples.</p> | <p>Request #V439 <input type="checkbox"/></p> |
| <p><b>Maintenance Welding—Arc Welding</b> (Michigan Tech University, 1995) 50:00 min.</p>                            | <p>This excellent tape (one in a series of three) examines the characteristics of arc welding, the equipment required, and types of electrodes, and reviews safety precautions.</p>                    | <p>Request #V440 <input type="checkbox"/></p> |
| <p><b>Maintenance Welding—Gas Welding and Metal Identification</b> (Michigan Tech University, 1995) 87:00 min.</p>   | <p>This excellent tape (one in a series of three) emphasizes the safety aspects of the equipment and materials used in welding. It also discusses how to identify different types of metals.</p>       | <p>Request #V441 <input type="checkbox"/></p> |

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