

**Focus on the effect of new storm water regulations on Iowa's transportation agencies:**

- 2 Background of EPA's Phase II storm water rule
- 4 Entities affected by Phase II storm water rule
- 5 Phase II and "no exposure" certification
- 6 GASB 34: the "modified reporting approach" as part of an asset management system
- 9 Why roadside management?
- 10 HF 2528 removes hurdles to exercising power of eminent domain
- 11 Streamlining the construction project development process
- 12 Implements of husbandry: the impact study
- 13 Catch up on the latest in pavement markings
- 14 Library news
- 15 A home for Iowa's transportation history
- 15 Conference calendar

## How new storm water rule will affect city and county transportation agencies



EVERY COUNTY IN IOWA not already covered by Phase I of the Environmental Protection Agency's (EPA) storm water program will be affected by its Storm Water Phase II Final Rule. The Phase II rule, issued in December 1999, expands the Phase I program (see related background article on page 2).

According to Joe Griffin of the Iowa Department of Natural Resources (IDNR), hundreds of entities across the state will be required to apply for a National Pollutant Discharge Elimination System (NPDES) permit. The goal of the NPDES permitting program is to reduce pollutants in storm water by requiring entities to obtain authorization to discharge storm water. The IDNR serves as the NPDES permitting authority for the state of Iowa.

Griffin, who is the storm water NPDES program coordinator for the IDNR, says that entities affected by Phase II include towns with populations under 100,000, developers, and industries. "Virtually all of Iowa will be included under Phase II," says Griffin.

Iowa city and county transportation agencies can be classified as Phase II-affected industrial entities in primarily two ways: 1) if they operate many types of industrial activity, including transportation facilities with maintenance or fueling activities ("transportation facilities"), and 2) if they operate small construction activity.

**Entities affected by Phase II**

Perhaps most important for counties, Phase II has ended the Intermodal Surface Transportation Efficiency Act of 1991 moratorium that temporarily

*PHASE II . . . continued on page 2*



The EPA's Phase II storm water rule affects operators of some small municipal separate storm sewer systems (MS4s) and small construction sites. It also requires permits for several classes of industrial activities, including transportation facilities with maintenance or fueling activities, unless they can certify they have nothing—like storage drums—exposed that might pollute storm water runoff.

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. The mission of Iowa's LTAP: To foster a safe, efficient, environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

Subscriptions to *TECHNOLOGY NEWS* are free, and we welcome your comments, questions, and suggestions. To subscribe, or to obtain permission to reprint articles, contact the editor at the address below.

Center for Transportation  
Research and Education  
2901 S. Loop Drive, Suite 3200  
Ames, Iowa 50010-8632  
Telephone: 515-294-8103  
Fax: 515-294-0467  
www.ctre.iastate.edu/

Stephen J. Andrle  
Director  
andrle@iastate.edu

Duane Smith  
Associate Director for Outreach  
desmith@iastate.edu

Marcia Brink  
Editor  
mbrink@iastate.edu

Tom McDonald  
Safety Circuit Rider  
tmcdonal@iastate.edu

Sharon Prochnow  
Program Coordinator  
prochnow@iastate.edu

Stan Ring  
Library Coordinator  
sring@iastate.edu

Mark Anderson-Wilk  
Adrienne Lamberti  
Melanie Mauen  
Connie Regenold  
Contributing Writers

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

Iowa State University and the Center for Transportation Research and Education provide equal opportunities and comply with requirements of the Americans with Disabilities Act in programs and employment. Call the Affirmative Action Office, 515-294-7612, to report discrimination.

## Background of EPA's Phase II storm water rule



NEARLY 40 PERCENT of U.S. water bodies surveyed in 1996 don't meet water quality standards because they are impaired by polluted storm water runoff. Polluted runoff is discharged, often untreated, over land or through storm sewer systems directly into local water bodies.

Left uncontrolled, this water pollution can destroy fish, wildlife, and aquatic life habitats and diminish the aesthetic value of lakes and streams. Water pollution also threatens public health by contaminating food, drinking water, and recreational waterways.

The 1972 amendments to the Federal Water Pollution Control Act, later referred to as the Clean Water Act (CWA), have resulted in dramatic improvements in the nation's water quality by focusing on reducing pollutants in industrial process waste water and discharges from municipal sewage treatment plants.

In 1987, Congress again amended the CWA by charging the Environmental Protection Agency (EPA) with the responsibility to develop and implement a comprehensive national program that would address the problem of storm water discharges from nonagricultural sources.

As a result of that amendment, the EPA developed the National Pollutant Discharge Elimination System (NPDES), a permitting mechanism designed to help prevent harmful pollutants from being washed by storm water runoff into local water bodies.

Phase I of the NPDES Storm Water Program was implemented in 1990 and requires NPDES permits for medium and large municipal separate storm sewer systems (MS4s) generally serving cities or counties with populations of 100,000 or more and eleven categories of industrial activity, including construction activity that disturbs five or more acres of land. •

*PHASE II . . . continued from page 1*

exempted some industrial activities operated by cities and counties with populations under 100,000 from the need to apply for these permits.

However, finding Phase II rule information that pertains specifically to transportation facilities can be difficult. Phase II primarily focuses on operators of some small municipal separate storm sewer systems (MS4s) generally serving populations of less than 100,000 and operators of small construction sites disturbing between one and five acres of land (see related article on page 4; operators of medium and large MS4s and large construction sites that disturb five or more acres are already regulated under Phase I).

Under Phase II these entities must apply for NPDES permits, a process that will require such operators to implement methods of controlling polluted storm water runoff.

The deadline for transportation facilities to obtain NPDES permit coverage will be no later than March 10, 2003.

"Here in Iowa, the deadline could come as soon as December 1, 2000. That's the tentative effective date of the Phase II rules we just finished writing," says Griffin.

The rules have been submitted to a review board and won't become effective until after the review is completed. Griffin says, "The effective date could be as early as the date the rules are adopted and as late as March 10, 2003, the deadline in the federal regs for entities to submit their permit applications under Phase II."

### Transportation facilities and the "no exposure" exclusion

Phase II has expanded the original "no exposure" provision of Phase I. Transportation facilities operated by cities and counties with populations under 100,000 are no longer exempt, *but* the good news is that they may qualify for the expanded "no exposure" exclusion.

Under Phase II transportation facilities and many other "industrial activities" will be able to apply for a "no exposure" exclusion. If they can certify that all industrial materials and activities are protected from exposure to storm water and runoff, transportation facilities will not have to apply for an NPDES permit.



According to Fact Sheet 4.0 of the EPA's Storm Water Phase II Final Rule, "No exposure means all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, byproducts, final products, or waste products."

To qualify for the no exposure exclusion, Griffin says that, basically, transportation facilities can't have anything exposed that might pollute storm water runoff. For example, an uncovered dumpster is considered exposure, as are uncovered loading and unloading facilities.

Drums stored outside are another type of exposure unless they are sealed and have no valves. Creosote from stockpiles of treated fence or telephone poles creates an environmental risk. Even seemingly impervious materials like guardrails, in large stockpiles, can leech zinc into the ground and contaminate the water supply.

The exposure checklist portion of the IDNR No Exposure Certification form asks eleven simple questions, and just one "yes" answer makes an entity ineligible for the no exposure exclusion (see related article on page 5).

#### Small construction activity

The Phase II guidelines for small construction activity will also have an impact on Iowa cities and counties. "For example," says Griffin, "a town with a population of one will need a storm water permit if it owns a road construction site that is extending a street that covers over one acre of land."

Griffin says this would be true of other types of construction as well. For example, a town that is building or expanding a school would need a storm water permit.

When the construction activity is owned by the city, the contractors who push the dirt around and construct the buildings sign on as co-permittees with the city—they are all equally responsible.

For residential or commercial developments, the developer will be the co-permittee with the city if the city owns the property. "The owner is ultimately responsible for obtaining the NPDES permit," says Griffin. "Any development activity, whether it's building houses or schools or bringing fill into an area, needs a permit."

#### General and individual permits

Griffin says that about 90 percent of Iowa entities required to obtain NPDES permits under Phase II will be eligible for *general* permits and that the permit structure will be similar to that of Phase I. *Individual* permits are issued by the IDNR on a case-by-case basis, usually when a general permit is deter-

mined to be inadequate. An individual permit is stricter than a general permit.

The application process for a general permit is quite straightforward, according to Griffin. He says the industry operator needs to complete the two-page application form, also called a Notice of Intent. Along with the form, the industry operator must submit a check for the permit fee and proof that two notices were placed in the local newspaper. The cost for a one-year permit under Phase I is \$150, and a three-year permit costs \$300.

Although the application process is simple, the preliminary steps are much more complex. An industry operator must develop a pollution prevention plan before submitting the Notice of Intent. Specific requirements for the pollution prevention plan are listed in the general permits.

#### Costs of Phase II compliance

Regarding the potential statewide costs of complying with the Phase II regulations, Griffin says, "It's impossible to estimate because there are too many variables, but there should be no great cost to any one entity." He adds that many entities will probably hire consultants to help them develop their pollution prevention plans and prepare the NPDES permit applications, and that's where much of the cost will be realized.

PHASE II . . . continued on page 5

*"Here in Iowa, the deadline could come as soon as December 1, 2000."—Joe Griffin, Iowa Department of Natural Resources*

#### LTAP Advisory Board

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 board meets at least annually.

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

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

Jennifer Balis  
Iowa Division, Federal Highway Administration  
Telephone: 515-233-7304

Gary Fox  
Traffic and Transportation Director  
City of Des Moines  
Telephone: 515-283-4973

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

Neil Guess  
Director of Public Works  
City of Newton  
Telephone: 515-792-6622

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

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

Larry Jesse  
Local Systems  
Iowa Department of Transportation  
Telephone: 515-239-1528

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



Center for Transportation  
Research and Education

IOWA STATE UNIVERSITY

## Entities affected by Phase II storm water rule

The Environmental Protection Agency's Phase II storm water rule added small municipalities and small construction sites as new categories of regulated dischargers. Phase II also modified Phase I rules regarding industrial dischargers. Below are brief descriptions of the entities that will be affected by Phase II rules. (The Iowa Department of Natural Resources (IDNR), as Iowa's storm water permitting authority, has the power to require permits of entities that do not fall within these guidelines, but whose discharges can impair water quality.)

Industrial activities <sup>x</sup>	Small MS4s <sup>✓</sup>
<p>The following categories are defined in federal regulations as sources of storm water discharge associated with industrial activity:</p> <ul style="list-style-type: none"> <li>(i) Facilities with effluent limitations</li> <li>(ii) Manufacturing</li> <li>(iii) Mineral, metal, oil, and gas</li> <li>(iv) Hazardous waste treatment, storage, or disposal facilities</li> <li>(v) Landfills</li> <li>(vi) Recycling facilities</li> <li>(vii) Steam electric plants</li> </ul>	<p>Operators of some small municipal separate storm sewer systems (MS4s) generally serving populations of less than 100,000 are required to obtain NPDES permits. (MS4 regulations don't pertain to transportation agencies, but the MS4 regulations are a big emphasis of the Phase II rules.)</p>
<p><b>(viii) Transportation facilities</b> with maintenance or fueling activities were temporarily exempt from National Pollutant Discharge Elimination System (NPDES) permitting requirements under the Intermodal Surface Transportation Efficiency Act of 1991. That temporary exemption has ended under Phase II, but all categories of industrial activity except construction are eligible to apply for the conditional no exposure exclusion under Phase II.</p>	
<ul style="list-style-type: none"> <li>(ix) Treatment works</li> </ul>	
<p><b>(x) Construction activity</b><sup>✓</sup> – Operators of small construction site activities that disturb between one and five acres of land are required to obtain NPDES permits. Site activities disturbing less than one acre also require permits if they are part of a larger development of one acre or more.</p>	
<ul style="list-style-type: none"> <li>(xi) Light industry</li> </ul>	

✓ New under Phase II.

<sup>x</sup> Specific descriptions and standard industrial classification codes for each of the 11 industrial activities listed can be found in a publication titled "Understanding Storm Water NPDES Permitting Requirements" available on the IDNR web site: [www.state.ia.us/government/dnr/organiza/epd](http://www.state.ia.us/government/dnr/organiza/epd).

= transportation related.

## Phase II storm water rule and “no exposure” certification



TO QUALIFY for the no exposure exclusion, transportation facilities (and other industrial activities) will have to answer “no” to all eleven questions on the certification form. Even one “yes” answer means that the entity must apply for an NPDES permit.

The following paraphrased questions were taken from the IDNR No Exposure Certification form:

1. Do you use, store, or clean industrial machinery or equipment or have areas where residuals from using, storing, or cleaning industrial machinery or equipment remain and are exposed to precipitation now or in the foreseeable future?
2. Are materials or residuals on the ground or in storm water inlets from spills/leaks exposed to precipitation now or in the foreseeable future?
3. Are materials or products from past industrial activity exposed to precipitation now or in the foreseeable future?
4. Is material handling equipment (except adequately maintained vehicles) exposed to precipitation now or in the foreseeable future?
5. Are materials or products during loading/unloading or transporting activities exposed to precipitation now or in the foreseeable future?
6. Are materials or products stored outdoors exposed to precipitation now or in the foreseeable future?
7. Are materials contained in open, deteriorated, or leaking storage drums, barrels, tanks, and similar containers exposed to precipitation now or in the foreseeable future?
8. Are materials or products handled/stored on roads or railways owned or maintained by the discharger exposed to precipitation now or in the foreseeable future?
9. Is waste material exposed to precipitation now or in the foreseeable future? (Waste must be in nonleaking containers that are covered by a storm resistant shelter. In other words, if your dumpsters are not stored inside a shelter, you must answer “yes” to this question.)
10. Is application or disposal of process waste water (unless otherwise permitted) exposed to precipitation now or in the foreseeable future?
11. Are particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow exposed to precipitation now or in the foreseeable future?

*PHASE II . . . continued from page 3*

### **For more information**

For additional information about Phase II, contact Joe Griffin, Iowa Department of Natural Resources, 515-281-7017, Joe.Griffin@dnr.state.ia.us.

A series of 14 downloadable fact sheets about the Storm Water Phase II Final Rule can be found on the Environmental Protection Agency web site, [www.epa.gov/owm/sw/phase2](http://www.epa.gov/owm/sw/phase2).

Iowa’s Phase II information is not yet available, but the IDNR says it will be similar to information for Phase I. Downloadable Phase I general permits that include guidance for developing pollution prevention plans can be found by clicking the “Stormwater” link on the Iowa Department of Natural Resources web site, [www.state.ia.us/government/dnr/organiza/epd](http://www.state.ia.us/government/dnr/organiza/epd).

The IDNR No Exposure Certification form will soon be available on the IDNR’s web site also.

Worksheets to help facilitate the development of pollution prevention plans can be obtained by calling the Iowa Department of Natural Resources, 515-281-6782.

Thanks to Steve Jones, Iowa State University extension communications specialist in civil and construction engineering, who provided background information for this article. •

***Even one “yes” answer means that the entity must apply for an NPDES permit.***

## GASB 34: the “ modified reporting approach ” as part of an asset management system

Tom Maze, Vice President, Howard R. Green Company, contributed to this article.

*Editor's note: This is the third article in a series on GASB 34. Here's a brief summary of the first two articles: The Governmental Accounting Standards Board (GASB) sets Generally Accepted Accounting Practices (GAAP) for governmental agencies. In June 1999, GASB Statement No. 34 (or GASB 34) set new GAAP requirements for reporting major capital assets, including infrastructure like roads, bridges, water and sewer facilities, and dams. Under GASB 34, over the next few years Iowa's governmental agencies must begin showing the value of these assets in their financial reports. Agencies may report assets using either depreciation methods or a “modified approach.”*



TO USE the modified approach for asset reporting, agencies must demonstrate that they do the following:

- maintain an up-to-date inventory of infrastructure assets,
- regularly assess the condition of all infrastructure and summarize the results using a measurement scale, and

- annually estimate the cost required to maintain the assets at a minimum condition level.

Clearly, the modified approach requires more data collection than does the depreciation approach. In addition, processes for valuing infrastructure assets under the modified approach are undefined in GASB 34; agencies are merely required to use “consistent” and “reasonable” methods for valuing assets.

With more front-end work and so much ambiguity, why would agencies choose to use the modified approach?

### Benefits of the modified approach

Perhaps the most significant advantage of the modified approach is that the reported value of assets will reflect the positive effects of maintenance activities—particularly preventive maintenance—on the condition (and therefore the value) of roads, bridges, and other assets. Such an approach reflects a more accurate portrayal of actual infrastructure value than does the use of a calculated depreciation. Using depreciation does not take into account the value added or maintained due to maintenance efforts.

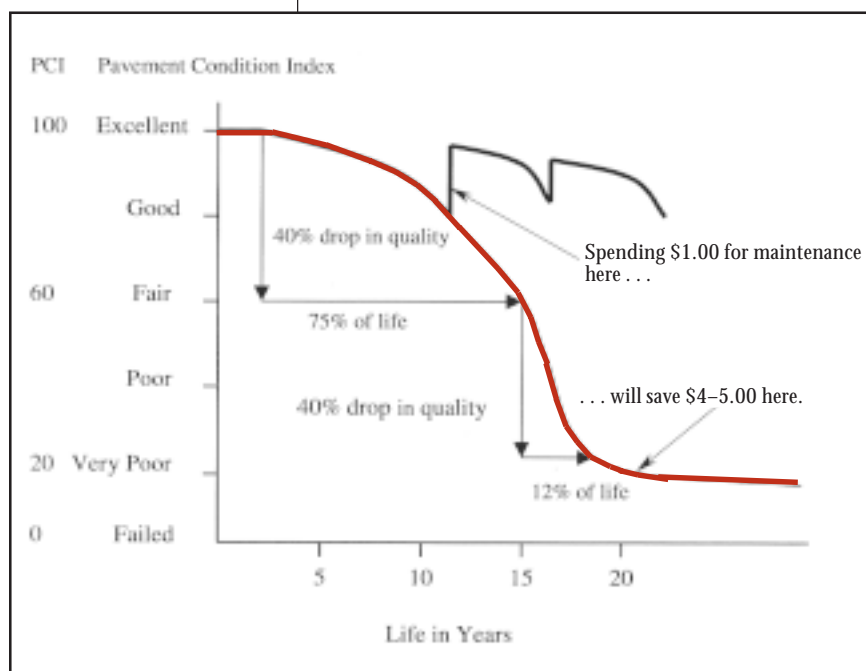
For example, an ongoing study for the Iowa Department of Transportation by Iowa State University's Charles T. Jahren, associate professor of civil and construction engineering, has cited literature reporting that strategic applications of maintenance treatments improve pavement life cycles, as demonstrated in Figure 1.

The red curve shows a presumed life cycle of a new pavement with no preventive maintenance; note the accelerated deterioration of pavement condition after about 10 years. The black curves show how strategically timed, relatively low-cost applications of preventive maintenance treatments *before* accelerated deterioration begins can restore the pavement to near-excellent condition (and therefore near-new value).

Using calculated depreciation, the depreciated value of this pavement over the years does not reflect the significant value added by preventive maintenance activities. Under the modified approach, the pavement manager assigns a more realistic value to this pavement, based on its actual condition following preventive maintenance activities.

**[B]y offering the modified approach . . . , GASB 34 provides a strong incentive to agencies to take steps toward developing a full-fledged asset management system.**

Figure 1 Typical pavement life cycle



In addition, GASB 34's requirements for using the modified approach (maintaining up-to-date inventories, regularly assessing infrastructure conditions, and estimating maintenance costs) will result in agencies having better information about their infrastructure systems; this information will help guide and plan overall resource allocation decisions.

#### **GASB 34 and asset management systems**

GASB 34 requires that agencies report the current value of infrastructure assets and does not require that they develop a system for managing those assets. However, GASB allows agencies to use a modified approach as a more realistic and useful alternative to depreciation. The modified approach provides a strong incentive to agencies to take steps toward developing a full-fledged asset management system.

How?

The required elements of the modified approach are also the basic elements of an asset management system. In fact, if an agency develops a thorough infrastructure inventory and then regularly assesses the condition of its infrastructure (the first two requirements of the modified approach), it has completed most of the work involved in establishing an asset management system.

#### **What is asset management?**

According to the Federal Highway Administration's (FHWA) web page, asset management systems assess the economic trade-offs among alternative investment options, providing information that helps decision makers make cost-effective investment decisions.

"The advent of increasingly powerful computer systems has made the practice of asset management possible. These computer systems not only put sophisticated analytical tools at a highway staff's fingertips but also allow agency officials to perform 'what if' analyses . . ."

Many agencies already systematically manage various physical assets through pavement management systems, bridge management systems, etc., which help decision makers allocate resources among construction, maintenance, and other needs *within* each system. These individual management systems can be the building blocks for the type of broad asset management system described by the FHWA and supported, at least implicitly, by GASB 34. Such an asset management system helps decision makers allocate resources effectively *among a variety of*

*different systems* (e.g., pavements, bridges, and sewers) that compete for an agency's resources.

A basic flow chart of an asset management system is shown in Figure 2 (see page 8). The elements of an asset management system that are also required for GASB 34's modified approach to asset valuation are shown in red; elements of an asset management system that are not part of GASB 34's modified approach are shown in black and labeled "optional."

Start with the upper left corner: conducting an inventory of infrastructure assets. The resulting inventory of road segments, bridges, sewer lines, dams, etc., is the foundation of an overall asset management system. The inventory includes basic information on construction cost, location, design characteristics, and construction history but may include more detailed information on maintenance performed, use (e.g., traffic characteristics), conditions during construction (weather, temperature, etc.), materials specifications and origin, etc.

The next element is the process of conducting field observations to determine the current condition of assets identified and described in the inventory.

The next three elements in Figure 2 are not explicitly required as part of GASB 34's modified approach. However, using these processes, which are central to an asset management system, will greatly enhance agencies' ability to accurately predict needed annual expenditures to preserve assets at or above the level they have prescribed.

A multiyear asset management system involves computer programs that forecast the condition of assets, based on possible maintenance activities, and another module that allocates resources for asset maintenance and rehabilitation, given a multiyear budget.

#### **What's next?**

The final article in our series on GASB 34 will discuss using asset condition information to estimate an asset's value under the modified approach. We will follow this series with a new one about asset management systems, covering topics such as

- assessing baseline conditions of infrastructure assets,
- forecasting asset conditions,
- resource allocation modeling, and
- infrastructure budgeting.

***[U]sing these processes, which are central to an asset management system, will greatly enhance agencies' ability to accurately predict needed annual expenditures to preserve assets at or above the level they have prescribed.***

*GASB 34 . . . continued on page 8*

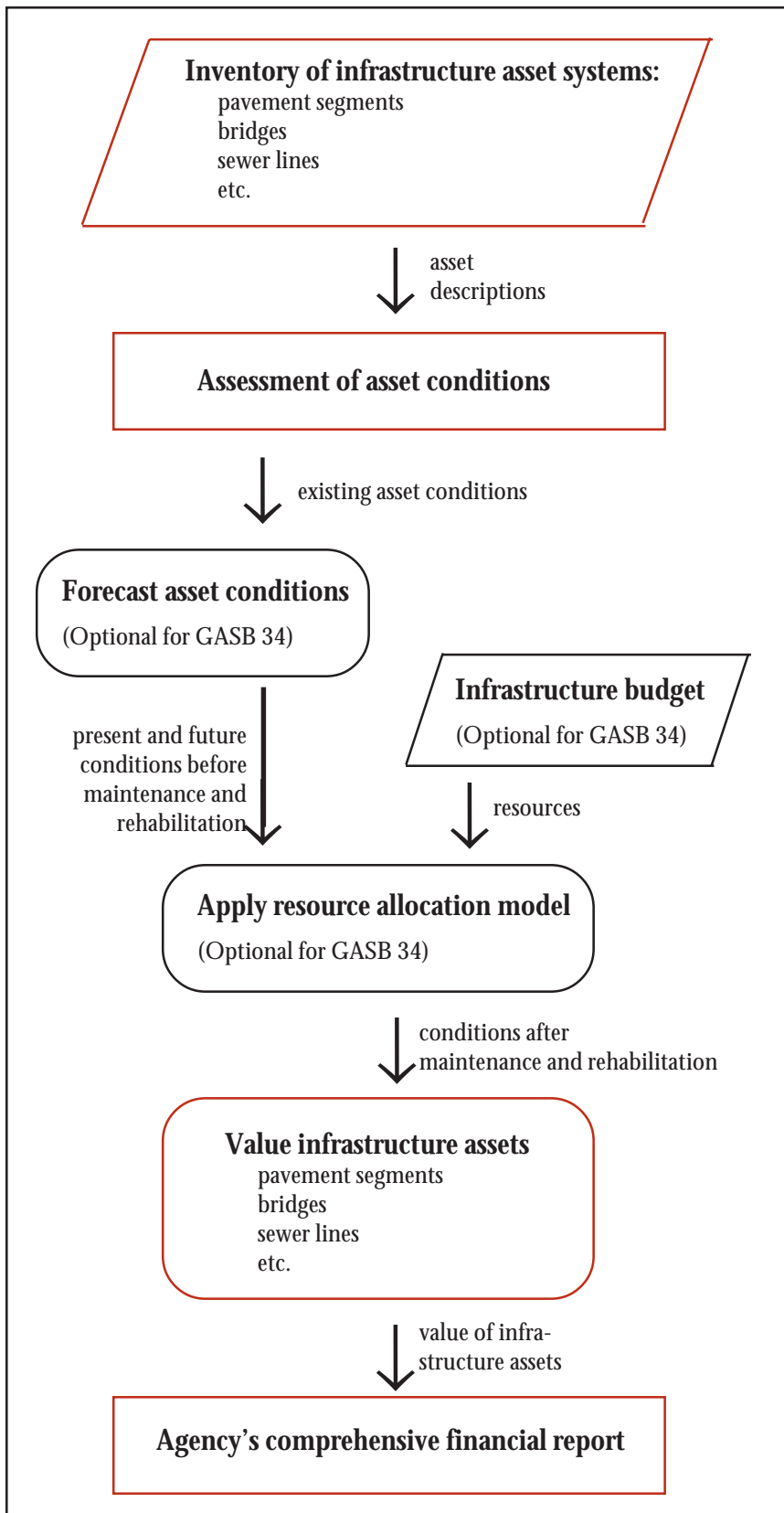


Figure 2 Components of asset management system. (Red components signify elements that must be implemented by agencies using GASB 34's modified approach to valuing capital assets.)

*GASB 34 . . . continued from page 7*

As deadlines for complying with GASB 34 near, *Technology News* will periodically provide updated information.

**Upcoming GASB 34 training**

The Center for Transportation Research and Education (CTRE) is participating in two upcoming training workshops that will help city and county transportation agencies understand issues involved in complying with GASB 34.

On August 31, 2000, the "GASB 34 Educational Conference," Holiday Inn Airport, Des Moines, will provide information to agency decision makers and financial officers who are responsible for GASB 34 reporting. This event is cosponsored by the Iowa League of Cities, Iowa State Association of Counties, and CTRE. Watch your mail for registration brochures.

Perhaps more important for Iowa's city and county engineers, "An Introduction to Asset Management and GASB 34 for Transportation Agencies" is being planned for late fall 2000. This workshop will be helpful for agency staff who will ultimately be responsible for providing inventory and value information regarding physical transportation infrastructure to financial officers for the GASB 34 reporting process. Workshop partners include the FHWA, Iowa State Association of Counties, Iowa League of Cities, the Iowa Department of Transportation, the state auditor's office, Howard R. Green Company, and CTRE.

**Help us help you!**

To help us plan upcoming workshops, we are distributing a brief survey to Iowa's transportation agencies soliciting input about training needs regarding GASB 34. Watch for the survey in the Iowa Department of Transportation's weekly mailing.

**For more information**

For a summary of GASB 34, visit the web site of the Governmental Accounting Standards Board, [www.rutgers.edu/Accounting/raw/gasb/](http://www.rutgers.edu/Accounting/raw/gasb/).

For information about asset management systems, contact Omar Smadi, CTRE's pavement management specialist, 515-294-8103, [smadi@iastate.edu](mailto:smadi@iastate.edu), or David Plazak, CTRE's transportation policy analyst, 515-294-8103, [dplazak@iastate.edu](mailto:dplazak@iastate.edu). •



## Why roadside management?



**LOWER FUEL COSTS.** Less weed spraying and roadside mowing. Pesticide-free drinking water. What county agency doesn't want these things? With a roadside vegetation management program, such benefits are possible. In the past 15 years, over a third of Iowa counties have reintroduced the state's native prairie grasses (including big bluestem, Canada wild rye, and Indian grass) and wildflowers (such as black-eyed susan, partridge pea, and stiff goldenrod) to build roadway vegetation systems.

These local programs have been inspired by a similar trend on a federal level. Under the Surface Transportation and Uniform Relocation Assistance Act of 1987, the Federal Highway Administration (FHWA) transformed its "Operation Wildflower" program into a more comprehensive roadside vegetation management program, which works to harmonize America's ecological treasures with its interstates and rights-of-way. As the FHWA web site states, "This land requires care that assures water quality, improves erosion control, increases wildlife habitat . . . and protects natural heritage."

"Following natural laws was a better way of doing things," says Russ Prichard, Black Hawk County roadside botanist. "We went by the rule that native plants were a lot more competition for unwanted vegetation [than just mowing and spraying]." The county was one of the first in Iowa to plant heavily sprayed areas with native plants as a method of alleviating "the rise in fuel costs and shortage of manpower—just the logistics of getting the roadside mowed," Prichard says.

Such fiscal challenges "put the bug in people's ear" about the benefits of managed roadside vegetation, says Story County Roadside Biologist Joe Kooiker. Story County turned its attention to roadside management in 1987, when the money annually spent on contract spraying and herbicide purchase was redirected to hire "someone who knew plants. It had been a vicious circle—spray weeds so that you can spray them again," Kooiker explains.

Instead, the county attempted a "more integrated approach, to use plants that actually belong here. A roadside is a huge place of disturbance," Kooiker explains. "The goal is to keep the soil from moving." Traffic, building development, weather patterns, and many other factors can mean extensive

ecological damage and soil erosion. Native vegetation offered an efficient, proactive answer.

A county doesn't need new equipment or a certified biologist to institute a roadside vegetation program. Prichard explains that any county using modern equipment probably would not need to make new purchases. In addition, county agencies can qualify for support from the Living Roadway Trust Fund at the Iowa Department of Transportation (Iowa DOT). The biggest need is operator education about "what stage the plants are in. The operators just need an understanding of the vegetation's growth," Prichard says.

Operator education and county assistance are available from the Integrated Roadside Vegetation Management (IRVM) program, established in 1989 at the University of Northern Iowa (UNI). "There are all sorts of different levels where someone can start [a program]," explains UNI's Native Roadside Vegetation Center Director Daryl Smith. IRVM currently is working on the Iowa Ecotype Project to develop vegetation ecotype seed that is as economical as cultivars, and the Native Roadside Vegetation Center is scheduled to open next year to serve anyone dedicated to Midwestern roadside vegetation programs.

Many counties that institute roadside vegetation programs are receiving strong public endorsement. Kooiker says that many residents now support managed roadside vegetation and inquire about planting similar vegetation on their own land. Story County rents seed drills to landowners and will plant seeds for a fee; over 400 acres of land are slated for prairie seeding this year.

"I ask them, do you want to mow your ditch or do you want to throw the ball with your kid in the backyard?" Kooiker states. "It's about time and energy, and most people would rather have the time for themselves."

To inquire about the Living Roadway Trust Fund, contact Steve Holland at the Iowa DOT, 515-239-1768. For more information on roadside vegetation management, contact Kirk Henderson, IRVM roadside program manager, 319-273-2813; Joe Kooiker, Story County roadside biologist, 515-382-7367; or Russ Prichard, Black Hawk County roadside botanist, 319-291-2510. •

Native wildflowers like black-eyed susans are an economical—and beautiful—alternative to roadside mowing and spraying.



# HF 2528 removes hurdles to exercising power of eminent domain

by Duane Smith, Associate Director of Outreach



TWO RECENT IOWA LAWS have changed the way that local governments are able to acquire right of way for public improvement projects using the power of eminent domain (condemnation). House File 476 (HF 476), passed in 1999, put some requirements in place that had not previously existed, some of which were quite restrictive and stopped some public improvement projects in process. House File 2528 (HF 2528) was passed in 2000 to remove some of the hurdles created by HF 476.

## Why this is important to local governments

Prior to HF 476 local governments could undertake public improvement projects involving condemnation of land without providing an opportunity for public input before the project was authorized. Now, when acquiring agricultural land, they must give a 30-day notice and allow public input. They are required to make an offer that is at least the amount of the fair market value appraisal, and they must negotiate in good faith with the property owner. When the compensation commission meets to assess damages for taking property, it must keep minutes of the meetings, record all votes taken, and make them public.

## How local agencies view this legislation

Larger cities frequently use condemnation to acquire land for projects. Terrence Timmins, deputy city attorney for Des Moines, says that HF 476 "put us out of business for most of 1999." The city of Des Moines had to start over on most of its public improvement projects, and many were midstream in the planning and design process, Timmins says. The city backed up, gave notice, and held hearings. Projects were reapproved, and reauthorization was received for condemnation. With HF 2528 in place, the city is back on track.

Henry County Engineer Clarence Perry's main concern with the changes in legislation is in assembling a compensation commission. The county board of supervisors is required to provide a list of names from which the judge can select commission members. However, some people are declining to serve. Now that minutes are kept of all meetings and subsequently made public, some potential commission members believe serving on a such a commission could compromise their ability to conduct business with others in the community.

## Resources for agencies acquiring land

The Iowa Department of Transportation (Iowa DOT) has a document for local agencies, "Iowa Local Public Agency Right of Way Manual." In addition, Local Public Agency coordinators are available at the Iowa DOT to assist you. For help in either of these areas contact Doug Bates, chief property manager in the Office of Right of Way, Iowa DOT, 515-239-1278, dougcbates@yahoo.com. •

## A comparison of Iowa's recent eminent domain legislation

The following table illustrates the hurdles put in place by HF 476 and how some of them were removed in HF 2528.

HF 476 (1999)	HF 2528 (2000)
All property owners had to be notified and input received 30 days before project approval.	The 30-day notice applies only to agricultural land.
Notice had to be given and a hearing held before project approval.	Notice must be given and hearing held before funding final project design or selecting final project route or location.
Contained no provisions for changes in property ownership.	Allows time to research auditor's records so notice is given to property owner and contract purchasers.
Required in the notice was a statement of property owners' rights.	Mailed notice must include the statement of rights; published notice need not.
There was no exception to the 30 days for emergency projects requiring construction or repair in order to avoid immediate danger to public health, safety, or welfare.	There is an exception to the 30-day notice for emergency projects.
Agency had to negotiate in good faith before filing an application to condemn.	Agency shall not make an offer less than the fair market value appraisal but does not need to exceed that amount to be negotiating in good faith.
Agency could not condemn until necessary permits were in place and project was approved. This was problematic because some permits require that the property be owned by the permittee before it can obtain a permit.	Agency may use condemnation as long as there is a reasonable expectation that the agency will comply with all applicable standards and obtain necessary permits.
Compensation commissions had to meet in open sessions for receiving evidence and for deliberation.	Compensation commission must meet in open session to take evidence but may deliberate in closed sessions. Minutes of all meetings and votes taken are made public.

## Streamlining the construction project development process



MAJOR ROAD construction projects can be a headache for all those involved, whether at the state, county, or city level. However, the Iowa Department of Transportation (Iowa DOT) has developed a system, called the Can Do process, to streamline the development process from planning through contract letting, especially in respect to environmental controls. The Can Do process benefits county and city departments in regard to state construction projects in their jurisdictions and can be adapted to streamline local development projects.

### Benefits to local agencies

Because it involves local officials early in the planning stage, the Iowa DOT's Can Do process benefits local officials and agencies. Agencies will be able to budget more effectively ahead of time, and the public gains an outlet for questions about Iowa DOT projects.

"[With the Can Do process], we'll be getting input [from local officials] earlier and we'll be able to coordinate Iowa DOT projects more closely with the effects on cities and counties," explains Mark Kerper at the Iowa DOT Office of Corridor Development and Pre-location Studies. Kerper served on the process development improvement team that developed the Can Do process.

### The process of streamlining

"With a few modifications, the Can Do process could be used to streamline major projects on city or county systems," explains Kerper. Such a process at the local level would reduce time needed to complete major projects, provide more accurate cost estimates during planning, improve project quality, reduce the need for rework, and increase support among stakeholders.

The process revolves around four key components—the project management team, digital terrain models (DTMs), wider corridors with more detailed data collection, and public involvement.

Although city and county projects are generally smaller than Iowa DOT projects, the four components could still apply. "A project management team is beneficial to any project," states Kerper. And public involvement is the key to success, not only on Iowa DOT projects, but on smaller-scale city and county projects as well.

**Project management team** The project management team, composed of key individuals involved in all stages of a project from planning to contract letting, addresses concerns such as schedule and budget throughout the entire project. "The project management team ensures a seamless transfer of the project from the planning stages to design and subsequent stages," Kerper explains.

**Digital terrain models** DTMs are computer-simulated models of land formations of the proposed corridor that provide engineers and designers with more accurate and detailed information than the topographical maps they previously relied on during the project concept development phase.

According to a report published by the process development improvement team in October of 1997, "the DTM becomes the base [of the project] because it has sufficient accuracy for the most detailed work (design) required in the process." By building on the DTM, engineers and designers can develop the alignment and grades of roads on the site in the most accurate manner possible.

**Wider, more detailed corridors** Project planners gather detailed information, such as a detailed archaeology of the project corridor and the location of any wetlands or borrow sites within the proposed area, on an area one-quarter mile wide, as compared with about 400 feet in the old system. With increased knowledge of environmental factors of a proposed corridor, engineers and designers can select the best alternative from an avoidance perspective instead of a mitigation perspective. "This process will help preserve and protect valuable historic and cultural resources and environmentally sensitive lands," the report continues.

**Public involvement** "Early and continuous public involvement, including stakeholders such as the general public, resource agencies, and local officials, is key to the Can Do process," Kerper says. Public involvement provides the Iowa DOT with information concerning issues unique to the area and provides an outlet for the public to air concerns about the project. Public information meetings held throughout the project maintain public involvement and support.

Resource agencies such as the Environmental Protection Agency, U.S. Army Corps of Engineers, and the Department of Natural Resources play a key role in the Can Do process. The Iowa DOT contacts these environmental agencies early on in the development stage, involves them throughout all project stages, and utilizes input from these environmental agencies to aid in the development of the alternative alignments for the project.

### For more information

For more information about the Can Do process, contact Mark Kerper, 515-239-1591. •



Public information meetings contribute to the success of the Can Do process.  
Photo courtesy of the Iowa DOT.

## Implements of husbandry: the impact study



“As THE SIZE of the average farm in Iowa has increased, so have the size and weights of implements of husbandry,” explains the Center for Transportation Research and Education (CTRE) report “Response of Iowa Pavements to Heavy Agricultural Loads.”

### Initial legislation

“[Iowa] House File 651, a couple years in the making, was landmark legislation,” according to Sixth District State Representative David Johnson. Passed in spring of 1999, House File 651 stated that implements of husbandry manufactured on or after July 1, 2001, and all implements after June 30, 2005, must be within 20 percent of commercial vehicle axle weight restrictions. The legislation also mandated that the Iowa Department of Transportation (Iowa DOT) study the impact of farm implements on Iowa’s roadways.

### First phase of study

The CTRE study, sponsored by the Iowa DOT and the Iowa Highway Research Board (TR-1075), was conducted by Fouad Fanous, principal investigator and professor of civil and construction engineering, Brian Coree, co-principal investigator and assistant professor of civil and construction engineering, and Douglas Wood, co-principal investigator and manager of Engineering Research Laboratories, all at Iowa State University.

Examined by the study were a section of portland cement concrete pavement in Jones County and a section of asphalt cement concrete pavement in Sioux County, both instrumented for testing. The instruments measured strains in the pavement

under different load types. The temperature and moisture of the soil beneath the pavement were also measured. Using different software programs, the two pavement sections were then analyzed under the loads used in the testing as well as under other load types. The field tests and analytical modeling yielded similar results.

“The analyses illustrated that during the spring season, a single-axle, single-tire grain cart or liquid manure tank (‘honey wagon’) with flotation tires and an axle load of approximately 24,000 pounds induces the same strain as that caused by a 20,000-pound, single-axle, dual-tire semitrailer,” reported Fanous. “Due to the seasonal change in soil subgrade reaction, this load capacity would increase to 28,000 pounds during the fall season.”

### Follow-up legislation

Subsequently, the Iowa General Assembly passed the new House File 2368, which amended the legislation to state, “The weight on any one axle of a fence-line feeder, grain cart, or tank wagon operated on the highways of this state shall not exceed twenty-four thousand pounds from February 1 through May 31 or twenty-eight thousand pounds from June 1 through January 31,” effective immediately.

Johnson, who guided both pieces of legislation through debate, notes that “the changes we made [in House File 2368] benefit in many ways the smaller farmer using smaller or midsize equipment.”

### Collaborative effort

“What really made it [House File 2368] a better bill,” said Johnson, “was that we had support from representatives from a broad range of interests—we had great input from everyone involved. I heard a number of comments from legislators—and citizens—that it is about time we make legislation based on the studies we do!”

County engineers and their staffs, for example, have been very helpful in facilitating the research. Manufacturers have also been very cooperative. Balzer, Inc. (Cedar Falls, Iowa), Eldon C. Stutsman, Inc. (Hills, Iowa), and Kinze Manufacturing, Inc. (Williamsburg, Iowa), all provided equipment for the field tests.

### Second phase of study

The study was scheduled to test the roads this spring because spring usually creates the kind of soft

***“The weight on any one axle of a fence-line feeder, grain cart, or tank wagon operated on the highways of this state shall not exceed twenty-four thousand pounds from February 1 through May 31 or twenty-eight thousand pounds from June 1 through January 31.”—  
House File 2368***

Loaded Kinze tracked grain wagon used in spring field tests. Photo courtesy of Brian Coree, Iowa State University.



conditions ideal for testing pavement durability and damage. Unfortunately, this spring was atypical—after a dry fall and a winter with only mild, insignificantly deep freezing, there was not the thawing required for ideal, “soft” testing conditions. Nevertheless, this spring the two pavement sections were field tested with Kinze tracked and untracked grain wagons. Testing is done, and investigators are analyzing the data. The final report is scheduled for September 2000.

#### Future research needs

“It’s better than what we had before,” said Royce Fichtner, Marshall County engineer, referring to House File 2368. Fichtner, however, notes some limitations of the study and legislation:

“Subgrade strengths are not based upon time of the year. Subgrade strengths are primarily the result of the subgrade’s moisture content.” Usually conditions are softest and roads most vulnerable in spring, but the legislation doesn’t account for nonnormal conditions.

In addition, Fichtner notes that implements of husbandry sometimes are so wide that the tires on one side ride on the earthen shoulder rather than on the pavement, which could result in some damage. Gravel roads, he notes, are also subject to the impact of heavy farm loads.

Coree points out that the study’s objective was specifically to look at pavement damage. Unpaved roads and shoulders were beyond the scope of the project.

“You go out to the shoulder, and [subgrade] conditions change much faster than under pavement, which is effectively sealed. County roads have so many variables, it’s like trying to get a hold of a jellyfish.”

Fanous suggests that study be continued to answer the concerns of Fichtner and to address the effect of dynamic loads on pavement induced by husbandry implements and semis.

“We will continue to address [the issue of the impact of implements of husbandry] as years go by,” said Johnson. “Iowa is still a farm state, and agriculture continues to change. As farm equipment increases in size and weight, we need to accommodate it as much as possible, but there are limits to the loads that roads and bridges can carry.”

#### The response

Limitations noted, Johnson believes “we have come a long, long way.” Iowa has traded controversy for cooperation in coming this far.

The legislation was “well received by industry and everyone involved,” said Johnson. “Manufacturers just want to know where Iowa wants to go so they can make modifications to their equipment.”

“By taking this step, in cooperation with CTRE, we have become a place where the ag. states look—Iowa is a leader in this area. I have gotten some calls from Minnesota and South Dakota. Many loads cross the state lines.”

#### Additional information

For more information on the study, contact Fouad Fanous, 515-294-9416, fanous@iastate.edu; or Brian Coree, 515-294-3973, bcoree@iastate.edu. For more information on the legislation, contact Representative David Johnson, 712-758-3280, djohnso@legis.state.ia.us. •

## Catch up on the latest in pavement markings



DID YOU MISS Iowa’s March 29 conference on pavement markings? The Center for Transportation Research and Education is compiling a brief synopsis of each speaker’s presentation, along with speaker contact information. To receive this information, contact Safety Circuit Rider Tom McDonald, 515-294-6384, tmcdonal@iastate.edu.

Over 135 engineers and technicians representing all levels of governments, contractors, and material suppliers attended the conference. A knowledgeable group of speakers from six states, as well as state-of-the-art vendor exhibits, made this a very worthwhile event. Presenters provided a variety of perspectives and insights regarding pavement marking issues and solutions.

The agenda included a wide range of topics, including revisions to the Manual on Uniform Traffic Control Devices, the American Association of State Highway and Transportation Officials’ task force on retroreflectivity, and current pertinent research, together with new materials, equipment, and methods.

This year’s program also featured separate operations and management sessions. Operations topics included optimizing materials applications, durable marking placement, and various application techniques. Management issues included markings’ service life, management systems, and safety impacts of high-performance markings. •

*“[W]e have become a place where the ag. states look—Iowa is a leader in this area.”—Representative David Johnson*

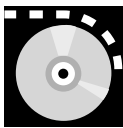
## Useful web links

<http://tris.amti.com/> This is the web version of the Transportation Research Information Services bibliographic database, including 400,000 records covering research in a variety of media.

[www.ctre.iastate.edu/pubs/midcont/index.htm](http://www.ctre.iastate.edu/pubs/midcont/index.htm) The Mid-Continent Transportation Symposium proceedings are available online. Paper topics include access management, using intelligent transportation system (ITS) technologies, safety, and many others.

[www.walkinginfo.org/pedsmart/](http://www.walkinginfo.org/pedsmart/) This web site addresses problems pedestrians face when crossing streets and how ITS technologies can help solve these problems. Included on this site are links to communities that have installed ITS devices to meet pedestrians’ needs.

[www.bicyclinginfo.org/main/index.htm](http://www.bicyclinginfo.org/main/index.htm) This web site provides information about bicycle safety, rails and trails, and transit. Sections on design and engineering and research and development are still under construction.



CHECK OUT these new publications and compact disks available from Iowa's Local Technical Assistance (LTAP) library:

### Publications

**P 1424 Access Management Documenting Practices External to Minnesota.** This paper presents a summary of access management goals regulatory/policy approaches, and successes/conclusions of other states and countries.

**P 1429 A Guidebook for Residential Traffic Management.** This report provides a comprehensive reference on initiating and running a residential traffic management program. It takes a toolbox approach with chapters on how to proceed.

**P 1446 Use of Railroad Flat Cars for Low-Volume Road Bridges.** This research was to determine whether railroad flat cars are structurally adequate and potentially feasible for use on low-volume roads. The results indicate they are suitable as a bridge alternative.

**P 1458 Roundabout Design Guidelines.** Based on the evidence that roundabouts reduce accidents, the Maryland DOT has developed this guide to set forth a standard approach to the planning, design, and construction of roundabouts. These guidelines are based on Australian practices.

**P 1459 Jump a Dead Battery the Right Way.** This pocket-size card describes what to check for when your battery is dead, how to position the vehicles, how to properly connect the batteries, and how to start the engine.

**P 1460 Inspector's Job Guide and Highway Maintenance Tables.** This pocket-size guide covers the very basic duties of inspection of various types of construction as well as a number of easy to use tables.

**P 1462 Roundabout Design Guidelines.** This manual presents the current state-of-the-art in roundabout design based on England's design experience and guidelines developed there and in California. It has been used as the basis of a number of successful U.S. roundabouts.

**P 1464 Accessible Pedestrian Signals.** The TEA-21 bill directs that pedestrian safety considerations, including the installation of audible traffic signals, where appropriate, be included in plans and

projects. This publication provides an overview of the state-of-the-art on the subject for planning and design purposes.

**P 1466 Dust Palliative Selection and Application Guide.** This Forest Service publication will help practitioners understand and correctly choose and apply the dust palliative that is appropriate for their particular site, traffic condition, and climate.

**P 1467 Roundabout Design Concepts and Guidelines—Student Notebook.** This publication contains the course notes from a workshop on the planning, operation, and design of roundabouts held May 17, 2000, in Ames, Iowa.

### CDs

**CR 17 Work Zone Safety for Iowa DOT Construction Projects.** This CD covers the safety aspects of work zones for Iowa DOT construction projects.

**CR 19 MUTCD on CD-ROM.** The entire 1988 edition of the MUTCD is on this CD, including Revision 3 and the Errata of Part VI.

### Ordering information

Order LTAP library materials any of three ways:

- Order online at [www.ctre.iastate.edu/Outreach/ltap/library/search.cfm](http://www.ctre.iastate.edu/Outreach/ltap/library/search.cfm).
- Use the form on the back of this newsletter.
- Contact Stan Ring, library coordinator, 515-294-9481, [sring@iastate.edu](mailto:sring@iastate.edu).



Stan Ring,  
LTAP library coordinator

## Training resources

The LTAP library has several interactive CD (CD-I) players, which may be borrowed for three months. Popular interactive training CDs are *Management Training*, *Motor Grader Operations*, and *Snow and Ice Control*.

## July 2000

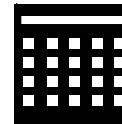
11	Motor Grader Operator Workshop	Marshalltown	Sharon Prochnow 515-294-3781, prochnow@iastate.edu
12	DOT Flagger Training	Ogden	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
13	DOT Flagger Training	Newton	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
13	Iowa County Engineers Midyear Conference	Ames	Jim Cable 515-294-2862, jkcable@iastate.edu
25	Motor Grader Operator Workshop	Cherokee	Sharon Prochnow 515-294-3781, prochnow@iastate.edu

## August 2000

8	Motor Grader Operator Workshop	Mason City	Sharon Prochnow 515-294-3781, prochnow@iastate.edu
16	DOT Flagger Training	To be determined	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
17	DOT Flagger Training	To be determined	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
31	GASB 34 Educational Conference	Des Moines	David Plazak 515-294-8103, dplazak@iastate.edu

## September 2000

6	DOT Flagger Training	To be determined	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
7	DOT Flagger Training	To be determined	Tom McDonald 515-294-6384, tmcdonal@iastate.edu
12-13	Iowa Maintenance Training Expo	Ames	Duane Smith 515-294-8103, desmith@iastate.edu
14	Snow Plow Rodeo and Motor Grader Rodeo	Ames	Duane Smith 515-294-8103, desmith@iastate.edu



conference  
calendar

## A home for Iowa's transportation history

THE STATE OF IOWA has played a key role in America's transportation history. Not only did Council Bluffs mark the starting point for the Union Pacific railroad system, but the historic Lincoln Highway and Interstate 80 (the "Main Street of America") wind their way through the state as well. In recognition of these and other transportation legacies, the Iowa Transportation Museum (ITM), formed just last year, plans to develop exhibits to tell its story.

While the funding, location, and timeline for the museum have yet to be confirmed, the reasoning behind the museum is clearly apparent. "We felt a lot of history and artifacts were starting to disappear," says Dwayne Garber, ITM president. "Some of the machinery was rusting away, and documentation is hard to store, so we needed one place to keep all of it."

In addition, the ITM hopes to educate visitors about transportation and ecological preservation, collect transportation artifacts, assemble visual displays of historical events and materials, and promote transportation scholarship both for enthusiasts and academic researchers.

"We're hoping to make our simulation displays interesting and fun," Garber explains.

The museum has other educational objectives as well. "Transportation has had a tremendous impact on Iowa's economic development," Garber says. "We want people to fully understand that. Transportation is mostly taken for granted, so we hope that the public can get a good feel for the transportation system itself."

MUSEUM . . . continued on page 16



Surveyors take a break from their duties on the road, circa 1920s. Photo courtesy of Iowa Department of Transportation.



Workers using an early concrete pavement finisher, circa 1920s.  
Photo courtesy of Iowa Concrete Paving Association.

MUSEUM . . . continued from page 15

The ITM hopes to solicit enough public endorsement to make its operation self-sustaining. Garber states that individual transportation enthusiasts already have offered their support, and interested groups such as the Lincoln Highway Association also are contributing to the museum.

For more information about the museum, contact Dwayne Garber, 515-754-6746, garber@adiis.net. In addition, the following resources about Iowa's transportation history are available through the Center for Transportation Research and Education's (CTRE) library: *Discovering Historic Iowa Transportation Milestones* (P1390), *The Lincoln Highway—Main Street Across America* (P1451), *Building Better Roads: Iowa's Contribution to Highway Engineering* (P1288), and *A History of Iowa's Rivers, Roads, Rails and Runways* (V580). Contact Stan Ring, CTRE library coordinator, 515-294-9481, sring@iastate.edu.

## Update your address/order library materials

To make a change to the Technology News mail list or to order library materials, please complete the information at right and mail this entire page (including mail label) to CTRE's address below.

Thank you!

Add the following name/address to the Technology News mail list.

Correct the name and/or address below on the Technology News mail list.

New or corrected mailing information:

Name \_\_\_\_\_

Title \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Organization \_\_\_\_\_

Delete the name/address below from the Technology News mail list.

Send the following library materials to the address below (or the corrected address above) (when ordering, include publication or video title and number): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Send a complete library catalog to the address below (or the corrected address above).

P486-0524

### TECHNOLOGY NEWS

Center for Transportation Research and Education  
ISU Research Park  
2901 S. Loop Drive, Suite 3100  
Ames, IA 50010-8632

RETURN SERVICE REQUESTED