TECHNOLOGY NEWS
Iowa's Local Technical Assistance Program (LTAP): providing transportation technology transfer for Iowa's cities and counties

Ground speed applicators ease winter maintenance

Editor's note: This article, "Snowplowing tips from a couple of old hands," and "Removing snow traps with one person and one machine," both on page 3, are based on presentations given at the Iowa Maintenance Training Expo in September.

USING GROUND speed applicators on your snowplow spreaders makes the job of maintaining winter roads a little easier, says Brian Keltner, mechanic at the Iowa Department of Transportation, Anamosa. These small black boxes electronically control the amount of granular or liquid material being applied to the roadway based on the truck's speed. The units also record the amount of each material type used daily and even keep a year-to-date total.

Features of ground speed applicators

While ground speed applicators or controllers have been in use since the mid-1980s, recent improvements have made them smaller, allowing them to fit more easily into the cabs of snowplows, and more reliable.

In addition, the newer models have digital readouts that give snowplow operators such information as air temperature, pavement temperature, and the output of granular or liquid material at any given time. For granular materials, the controller gives a readout of pounds per mile or pounds per lane mile. For liquid deicing chemicals used as pre-wetting solution, the controller gives a readout of gallons per ton or, when the chemicals are used for anti-icing, gallons per lane mile .

Another attractive feature of ground speed controllers is that they "give operators the ability to change to any of three different types of material on the fly," according to Keltner. In other words, the operator can go from applying salt to sand to pre-wetting or anti-icing chemicals, changing the material to suit the need.

Benefits of using ground speed applicators

Keltner says that one of the main advantages of

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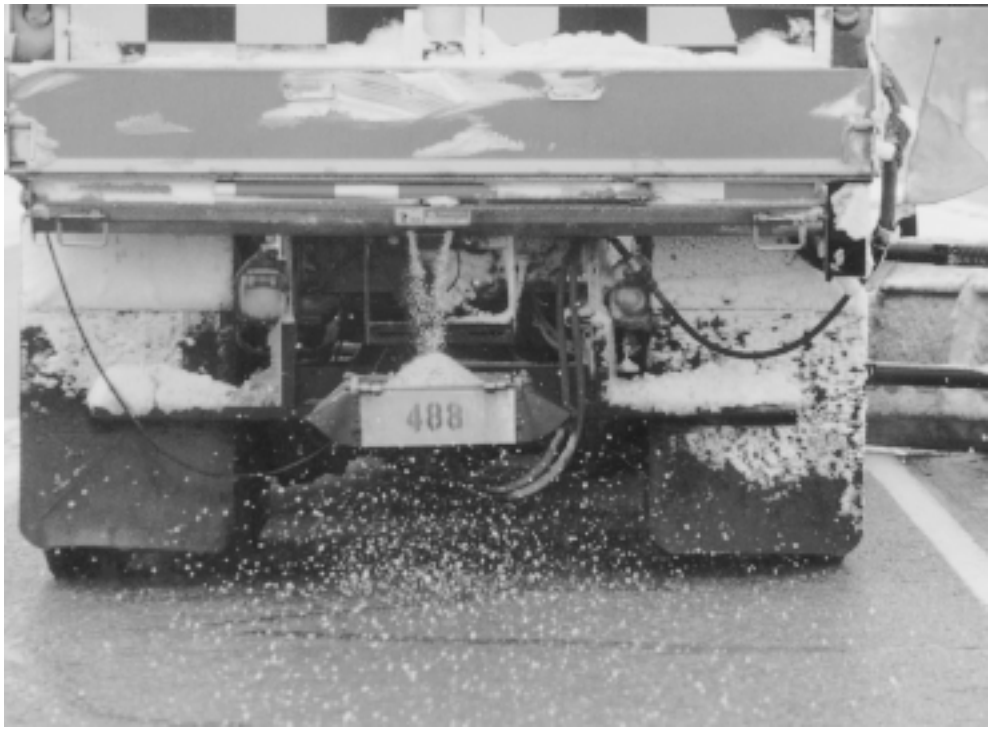

Ground speed applicators control the amount of salt spread by plows.
Photo courtesy of the Iowa Department of Transportation.

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.

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using this sophisticated equipment is uniform application. Once the machine is calibrated to dispense, for example, 200 pounds of sand or salt per lane mile, it will maintain that application rate regardless of the truck's speed. Without such equipment, the output of material is heavier wherever a truck slows down; the auger dispenses material at the same rate even though the truck is covering less distance.

Keeping track of material types and amounts used is also important to street and highway departments, according to Keltner. He says, "Sand is losing popularity as a winter road treatment because of environmental issues, so the amount of sand being used is a concern. If we apply sand to a bridge in the winter, we have to sweep it up in the spring. Most likely, that sand has become contaminated with motor oil, antifreeze, and battery acid dripping from cars. That means we can't just dump the sweepings anywhere, and disposal fees are high."

The overuse of salt can create problems, too. "At 28 to 30 dollars per ton, salt is relatively cheap," says Keltner, "but the costs can add up if we apply more than is actually needed." Keltner says that salt appears to be less of an environmental problem than sand because it eventually washes into a river or stream where it becomes diluted. In spite of the dilution, however, the concentration levels need to be monitored to prevent harmful effects to plants and wildlife.

Another benefit of ground speed applicators is that they can modify the rate of application of sand or salt to provide optimal motorist safety based on pavement and air temperatures. As Keltner points out, using too little sand or salt doesn't help motorists at all and using too much increases costs and possible environmental hazards while providing no additional benefit.

In addition to reducing material waste and keeping track of materials used, ground speed controllers can cut down on overtime expenses. The controller takes the guesswork out of the application process, so the need for reapplication of chemicals is often eliminated. "Operators more effectively put chemicals where they are needed," says Keltner. "For example, pretreating roads before a snowstorm cuts down on the time required to maintain the roads during the storm."

Before you buy

Initial cost for a ground speed controller can range, roughly, between 1,000 and 3,000 dollars. While the units can provide many benefits, Keltner says that initial cost is just one of the factors to consider before purchasing one.

For example, he says that training maintenance staff is important, particularly on the wiring and sensors that are part of the controller system. Calibration of the controllers goes hand-in-hand with wiring and sensor maintenance, so it is usually done by the mechanics. Keltner says the focus should be on the mechanics, who then become trainers for the operators. He says that one hour of training each season is usually adequate for the operators.

Departments must also evaluate the hydraulic systems of their trucks before purchasing ground speed controllers because they're not suitable for all trucks. "The hydraulic system is what runs the controller," says Keltner. "Or you can view the hydraulic system as the heart and the controller as the brain. If there are problems in the hydraulic system, such as bad motors, sticky valves, or electrical issues, they could be magnified by the use of a controller. The hydraulic system needs to be matched to the controller."

For more information about ground speed applicators, contact Brian Keltner, 319-462-3676. •

WWW links

http://www.usroads.com/journals/subjects.htm

Check "snow and ice control" for several articles such as "Good Ideas from Winter Maintenance Workshops" and "Using Salt and Sand for Winter Road Maintenance."

http://www.fhwa.dot.gov/infrastructure/asstmgmt/

FHWA's Office of Asset Management

Snowplowing tips from a couple of old hands

SNOWPLOWING TIPS and techniques were the focus of a panel discussion held at the Iowa Maintenance Training Expo in September. Bill Feldhahn, a panel representative and heavy equipment operator/ foreman for the City of Bettendorf Public Works, offered these tips:

- For years I've noticed that our trucks had difficulty turning left when pushing a heavy accumulation of snow. If you turn your reversible plow in the direction the truck is turning (left), it suddenly turns easier. As soon as you've completed the turn, return your plow to its proper angle.
- Practice good housekeeping in your truck's interior. Try to secure all necessary items, such as tools, pens, pads, and lunch boxes. Get rid of the stuff you don't need. Clear refuse like pop cans and food containers immediately. These are hard-hitting flying objects if you have an accident.
- Most important, wear that seat belt. To properly control your vehicle, you must remain seated. When you come out of that seat in an accident, you become a hard-hitting flying object.

Denny Amoss, equipment operator for the Iowa Department of Transportation office in Albia, was also a panel representative at the expo. His presentation was on techniques for winging, the process of clearing snow from the road shoulders to make room for disabled vehicles and snow from the next storm.

Amoss pointed out that this process requires two people in the truck because the passenger operates the wing, allowing the driver to concentrate on the traffic. Amoss offers the following suggestions:

- There are a lot of times you must move back onto the roadway to get around objects. Having a new operator operate the wing gives him or her a chance to learn how and to become familiar with the operations of the truck, so he or she can operate it when the time comes.
- Most shops will put some sort of shoe on the wing to keep it from digging into the shoulder. Just talking to operators after the presentation, I found there are a lot of good ideas out there. Some have even put a wheel on the wing to keep it at a certain level.
- A good way to learn the winging process is to ask any seasoned veteran operator in your shop. They are more than happy to teach you.

For more information about snowplowing techniques, a video called *Plowing Techniques* is an excellent resource. Developed by the Iowa Department of Transportation for its winter operations training program, this video served as a springboard for the panel discussion at the expo. The video is available for loan at the Center for Transportation Research and Education's (CTRE's) library. Contact Jim Hogan, library coordinator, 515-294-9481.

You can also contact Denny Amoss, 641-932-7171, or Bill Feldhahn, 319-344-4086. •

Removing snow traps with one person and one machine

ONE PERSON and one machine can remove a snow trap more quickly and efficiently than five people using five machines, says Ray Scherrman, maintenance manager of the Dubuque County Highway Department. A snow trap is a road location that traps drifting snow.

Old method of eliminating snow traps

Scherrman says that when he began working with the department 18 years ago, it took five workers to remove a snow trap. One person drove an excavator to dig the soil, three people drove single-axle dump trucks to haul the soil away, and one drove a road grader to straighten up the ditch.

Scherrman says that often the equipment operators would accomplish little in a day because of soil hauling problems. Back then, instead of being spread over the field, the excavated soil was hauled

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to any site the landowner chose, free of charge. Because the soil was usually wet, it would stick in the beds of the dump trucks, so less and less soil was being hauled and dumped each trip.

Such inefficiencies are what prompted Scherrman to search for a better solution and to develop his "one person, one machine" approach for removing snow traps.

New method of eliminating snow traps

Scherrman says this is the third season that Dubuque County has used the one person, one machine approach, and it has been working well. They've found that the machine that works best for eliminating snow traps is a 140-horsepower bulldozer.

Above, beginning the work of eliminating a snow trap. At right, the left side of the road has been leveled off to eliminate a snow trap. *Photos courtesy of Ray Scherrman.*

The first task is usually to remove fencing that borders the roadway. Once the fence is removed, it's rolled up and tightly compacted into a small mass and buried in a deep hole in the field so it's not likely to get caught in machinery later on.

The next step is to strip off all the top layer of black soil and push it back into a stockpile. If unsuitable soil like red gravel remains when the hill is leveled, the black soil can be used to cover it up.

When the bulldozer gets down to the clay bed, the operator pushes the clay into the low spots or valleys of the field. Once the hill has been reduced to the appropriate depth and slope, the topsoil stockpile is leveled off over the field to cover the clay or gravel.

The final step in the operation is to seed the newly formed ditch. "You can't even tell that anything has been done to the field once we get done with it," says Scherrman.

Because of last year's mild winter, the Dubuque County Highway Department was able to remove more snow traps than normal by using this method. Although Dubuque County does most of its snow trap removal in the fall and winter months, Scherrman says the work can be done in the summer if crops aren't growing in the affected fields.

Preliminary steps

Of course, there are some preliminary steps the Dubuque County Highway Department must take before any excavation work can begin. First, a representative from the department must obtain the landowner's signature on the encroachment agreement. This agreement gives the secondary road department authority to do the work and relieves the county of any liability for damages that might occur. If a landowner won't sign the agreement, the snow trap can't be removed.

The representative also informs the landowner that the county does not pay for any fencing and that fencing will be removed with a bulldozer and buried in the field. Landowners who don't want the fencing buried can haul it to a landfill themselves. "Farming is changing," says Scherrman. "Most farmers these days don't have livestock, or if they do, it's in a confinement. So, fences aren't needed anymore."

The county and landowner also need to agree on what to do with the excess soil once the hills are leveled off. If a landowner doesn't want the soil left on the field, the county can put it on a road right-of-way or haul it to another farm. Landowners who want the soil moved to another part of their own farm must hire a contractor for the job.

Once the landowner agrees to have the work done, the Dubuque County Highway Department notifies any utility companies that might be affected. Knowing where underground utility lines are located helps reduce the chances of accidentally cutting into them. To prevent utility poles from falling down once the soil around them has been removed, the electric company either lowers them or installs new ones.

For more information about removing snow traps, contact Ray Scherrman, 319-557-7283. •

How are we doing? You rate our training

Duane Smith, CTRE's Associate Director for Outreach

THIS IS A QUESTION we have to continually ask as we provide training opportunities throughout the state. Are we providing training that helps you do a better job? We ask this question in a number of ways. First we have an evaluation form filled out at each of our training sessions. These evaluations are reviewed and appropriate training content changes are made. The LTAP advisory board meets on a regular basis and provides feedback. Also, there is a planning committee for each of our training sessions and they meet after the training has been conducted to critique the event. And we sometimes send out a specific questionnaire to survey our effectiveness.

In August 2000 we did just that. A questionnaire was developed to answer the following questions: Are we meeting the needs of the people attending our workshops? Are we making a difference? First a draft questionnaire was distributed to city and county engineers and managers who send employees to training sessions. We asked for their critique and made appropriate changes to the document.

Then we sent the questionnaire to individuals who had attended training sessions during the last two years. We felt that two years was an appropriate time to assess if training had made an impact when implemented on the job, yet not so far into the past that people would not remember the training session. Approximately 10 percent of the people attending each training session were sent the survey. The training sessions selected included Flagger Workshop, Signing Workshop, Access Management, Iowa Secondary Road Maintenance Supervisors Annual Conference, Signing Conference, Construction Inspection, Motor Grader Operator, Walkable Communities, Excavation Safety, and the Pavement Markings Conference.

A total of 480 survey questionnaires were mailed and 84 were returned for evaluation. This response rate is adequate considering it was a cold survey and the audience didn't expect it to be coming.

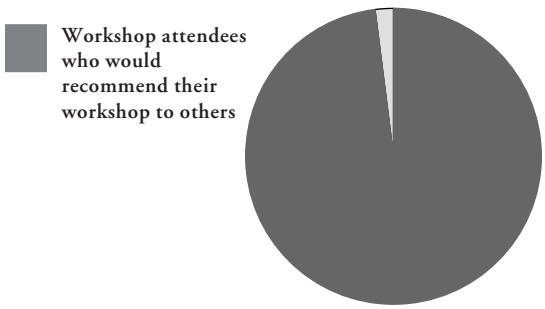
The survey included the following questions:

1. How valuable was the training to you?
2. How much difference has the training made in how you accomplish your job?
3. How significantly has the training improved your efficiency in performing your tasks?
4. Did the training include safety-related training? If yes, how significantly has your participation in the training improved safety in your organization? If safety has improved in your organization indicate which areas have improved.
5. Would you recommend this training session to others?
6. What training can we provide for you in the future?

Responses to three of the questions were particularly significant. In response to question 3, almost everyone indicated they experienced improvement. In response to question 4, many indicated a reduction in accidents and personal injuries. And, in response to question 5 (see Figure 1), nearly everyone noted that they would recommend the training to others.

The responses to our survey questionnaire are very encouraging. We know we are on track with the training we are developing and presenting. We have room to improve and we will. Of special interest is question 5. This is like asking "Would you buy a used car from these people?" Most (98 percent) said yes, they would recommend the training session to others.

Figure 1



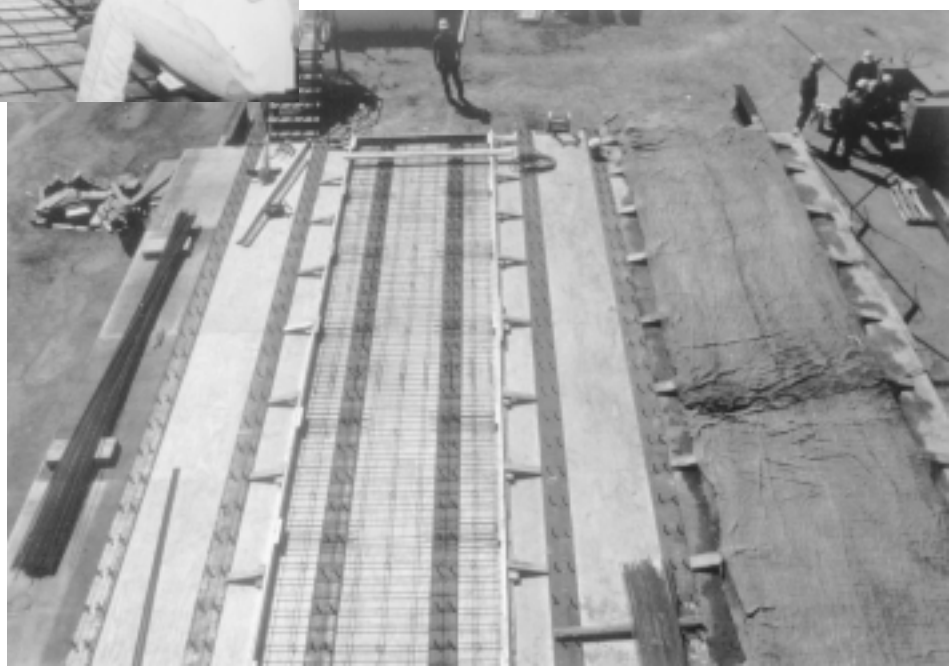
We want to offer a special thank you to the individuals who responded to this questionnaire and to their supervisors who provided the time to attend the training and complete the survey. •

Building steel beam precast unit bridges

This article is the second of three exploring low-cost bridge replacement alternatives.

HELPING COUNTIES find ways to cost-effectively replace and repair bridges has been an objective of several studies conducted by Iowa State University researchers Wayne Klaiber and Terry Wipf, both professors of civil and construction engineering. In their mid-1990s evaluation of bridge replacement alternatives for Iowa's county bridge system (Iowa DOT project HR-365), Klaiber and Wipf learned that 69 percent of Iowa counties had staff who were willing and able to design and construct fairly simple short span bridges (i.e., 40 feet or less).

Since that study, Klaiber and Wipf have supervised laboratory testing of a couple of alternatives and field tested one of them; both bridge replacement alternatives are primarily for low-volume roads. The method described in this article involves fabricating precast units made from two steel beams connected by a concrete slab. The precast units can be made by county workers and then transported to the bridge site where they are connected and the remaining portion of the deck is placed.



The Black Hawk County bridge crew worked with researchers to build the precast units (left). Below is an overhead view of the units. Photos courtesy of Wayne Klaiber.

Overview of steel beam precast units

The steel beam precast units can be constructed at a county shop. Either new or used steel beams may be used in the construction. Two beams are connected by a reinforced concrete deck four or five inches thick. The limited thickness keeps the weight of the precast unit manageable.

The number of precast units fabricated depends on the desired width of the bridge. Once the units are connected, a cast-in-place (CIP) reinforced concrete deck is placed and the bridge railing is attached.

The research

The researchers conducted laboratory "handling tests" to determine if the units were strong enough to resist the handling loads imposed on them during construction and transportation. They found that if the portland cement concrete is given enough time to cure, there should be no distress from lifting, transporting, or placing the units. (In the Black Hawk County demonstration bridge, the slabs were allowed to cure for 21 days.)

The research team also conducted tests of the connectors between the individual units, and found that they have adequate strength to resist highway loads.

Demonstration bridge

A 64-foot long, 30-foot wide demonstration bridge was constructed in Black Hawk County in 1998 using four, steel beam precast units. The units were made by the research team

and the county bridge crew. The demonstration bridge was a replacement structure.

The bridge took about two months to build, says Mike Kindischi, a technician with Black Hawk County, which is about the same construction time as other types of replacement bridges. The total time included removing the old structure, building abutments, and building the precast units.

Cost estimates are subjective for this project because there was a lot of design time since it was a research project, Kindschi says. Nevertheless he believes that, depending on the bridge span, this type of replacement bridge can be built by a county crew for less than $50,000. Some of the work, such as guardrail and dirt work, could be let to make sure the costs stay under $50,000, he says.

Dennis Edgar, currently assistant county engineer of Fayette County and former assistant county engineer of Black Hawk County, says the steel beam precast unit bridge "is a competitive alternative to concrete slab bridges." He sees it filling a niche between precast quad-T type bridges, which are available commercially, and concrete slab bridges.

Advantages

The steel beam precast unit bridge has several advantages:

- It can be used in simply supported spans up to 85 feet.
- Minimum field form work is required, which reduces the amount of time the road is closed; thus, inconvenience to the public is also minimized.
- Salvaged steel beams can be used, significantly reducing the materials costs (about $27,000 was spent on new steel beams for the Black Hawk County bridge).
- Various types of abutments may be used.
- Standard construction methods are used.
- It can be constructed with a limited staff.
- If a county has the room, the precast units could be built inside during the winter.

Kindischi points out that the steel beam precast unit bridge has better hydraulics because it is a single span structure; there are no piers to constrict flow or catch debris. Erecting the bridge in the field "is much quicker," he says. A single-span concrete beam bridge would be much more expensive and would require that the entire deck be formed and cured.

A couple of slight disadvantages Kindischi sees are the needs for a certified welder and special welding equipment for part of the construction and for large equipment to transport the slabs and move them into position.

Edgar sees a disadvantage in the two- to three-foot thickness of the beam and deck: The road grade has to be raised to accommodate the flood clearance level and the height of the bridge deck.

For more information

A slide show and video have been prepared of the steel beam precast unit bridge construction process. To obtain a copy of the final research report, *Investigation of Two Bridge Alternatives for Low-Volume Roads–Phase II: Concept I: Steel Beam Precast Units* (Iowa Highway Research Board project TR-410), contact Mark Dunn, Iowa DOT research engineer, 515-239-1447.

For information about Iowa's research, contact Wayne Klaiber, 515-294-8763, klaiber@iastate.edu, or Terry Wipf, 515-294-6979, wipf@iastate.edu. For information about the Black Hawk County bridge, contact Mike Kindschi, 319-833-3008, or Dennis Edgar, 319-422-3552. •

The precast units were set in place quickly.

The process for developing an asset management system

David Plazak, CTRE's Associate Director for Policy

Editor's note: In previous articles in this series, Tom Maze of Howard R. Green Company introduced the concepts behind transportation asset management and explained the relationship between asset management and the requirements of Government Accounting Standards Board Statement 34 (GASB 34). This article continues the series and explains some of the fundamental components of an asset management system. It also discusses some of the more important decisions that need to be made as an asset management system is designed and developed.

The two general approaches for meeting GASB 34 requirements

As noted in previous articles in this series (see www.ctre.iastate.edu/gasb34/), the need for state and local government transportation agencies to comply with the provisions of GASB34 is driving the development of asset management systems. GASB 34 requires, for the first time, many state and local transportation agencies to account for the value of their infrastructure assets.

GASB 34 is not written as a "one size fits all" standard and allows for considerable flexibility in reporting the value of infrastructure assets. Two general approaches are available to account for infrastructure assets:

- The depreciation approach. Under the depreciation approach, the agency determines an initial value for its assets (probably by broad classes of assets rather than by individual assets) and then applies standard depreciation schedules (such as straight-line depreciation) to estimate the current value of assets.
- The modified approach. The modified approach sets a minimum condition standard at which infrastructure is to be maintained. This standard is a policy decision of the governing board of the transportation agency. The agency must then regularly (on at least an every three year basis) assess the condition of its assets to assure that the minimum standard is being attained or exceeded. (If the minimum standard is not being met, an agency using the modified approach will have to revert to using the depreciation approach.) Adopting the modified approach effectively requires that an agency develop and maintain an asset management system.

Adopting the modified approach effectively requires that an agency develop and maintain an asset management system.

Smaller transportation agencies

In general, small transportation agencies with limited resources will be better off adopting the depreciation approach to comply with GASB 34. The additional resources required to implement a full-blown asset management system will not likely be worthwhile unless an agency also needs extensive information to make better decisions about infrastructure maintenance, rehabilitation, and replacement.

Larger transportation agencies

On the other hand, larger transportation agencies that are already investing in condition data collection and other elements that could be used to build an asset management system may find it beneficial to employ the modified approach. This is because the asset management system required to follow the modified approach will yield benefits to the agency in terms of having better information and making better decisions about maintenance, rehabilitation, and investments.

Asset management system development steps

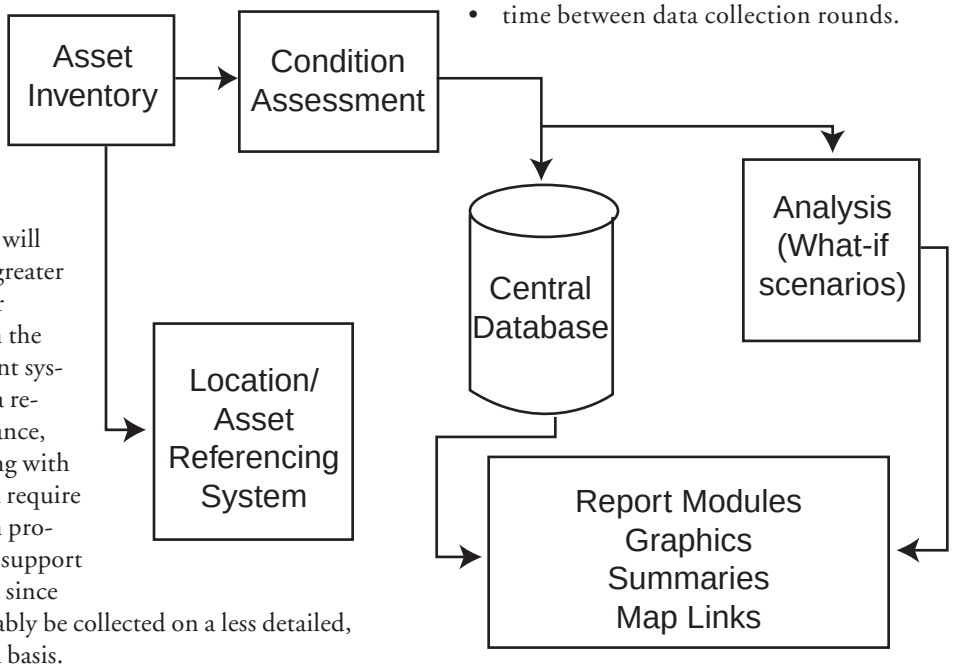
Assuming an agency has decided to move ahead with the modified approach and develop an asset management system, several steps are necessary early in the process. The first involves setting a framework for the asset management system. The framework depends on the objectives the agency needs to have satisfied by the system. A second major step involves a careful determination of data needs and the resources needed to collect data. The third step involves completing an assessment of the baseline condition of assets. Finally, a forecast of future asset condition should be prepared.

Establishing an asset management system framework or "game plan"

Developing a framework will provide the "game plan" for the entire asset management system development effort. How an asset management system is designed depends entirely upon the intended use or uses of the system. Knowing what you intend to do with the asset management system is the key to the design of its framework. If you don't know what your goals and objectives are in creating an asset management system, it will be very difficult to move toward implementing one or to justify investing in asset management.

An organization might establish any number of objectives for an asset management system. Some of the more common objectives could be

- satisfying the GASB 34 requirements.
- providing objective support for maintenance decisions.
- providing objective support for capital improvement programming, including the development of a Capital Improvement Program (CIP).
- forecasting future costs for maintenance, rehabilitation, and capital investment.
- having the ability to perform "what-if" analyses with different infrastructure investment strategies and programs.



Some objectives will require a much greater level of detail (or "granularity") in the asset management system and the data required. For instance, simply complying with GASB 34 would require far less data than providing objective support for maintenance since data could probably be collected on a less detailed, more aggregated basis.

Determining data needs and resources

The primary data requirement for any asset management system is a relatively current inventory of important assets. An asset inventory includes such information as the geographic location, facility type, age, size, and initial construction cost for each asset. Generally, agencies that choose to implement an asset management system will already have an extensive set of inventory databases in place and a system of data collection established to keep it current. However, if they do not, an assessment of the data needed to support asset management and an estimate of the cost to establish it and keep it up is critical early on. It should be remembered that data collected to support asset management could have other valuable uses for an agency. Data already being collected for other purposes could be used in an asset management system. For instance, existing bridge management system data used in a program such as PONTIS might naturally feed an asset management system.

A number of considerations will determine the cost of the data collection effort. These include such factors as the:

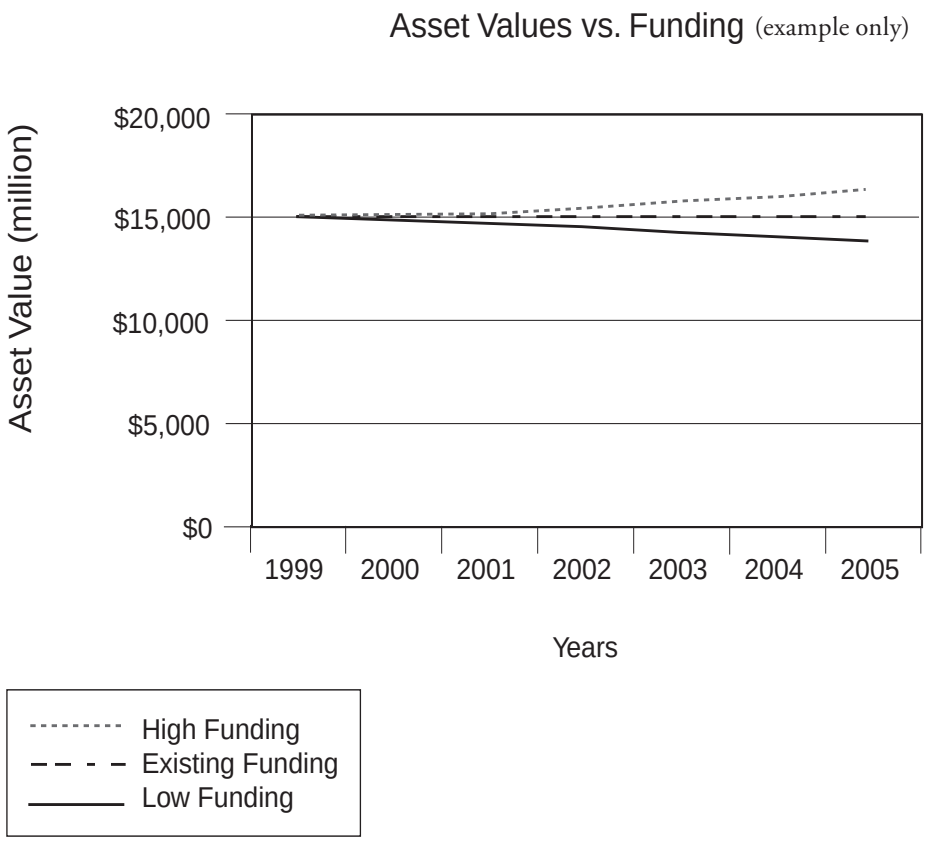
- level of detail at which data are collected (e.g., the length of pavement sections or the bridge elements considered).
- time between data collection rounds.
- extent of the geography or system covered by data collection.
- level of data quality needed.
- need to include pictures and video as data.
- ability to automate the data collection process.

Assessment of the current condition of assets

Once an inventory is in place, the next step in an asset management system is to perform a regularly scheduled assessment of the physical condition of all assets. For pavement assets, such physical condition assessments would include measuring characteristics such as distress and roughness. Both visual and automated assessment techniques are available. For example, in Iowa many pavements are assessed on a

Process . . . continued on page 10

Process . . . continued from page 9



regular basis by an automated process using a van; however, bridges are assessed visually. Condition assessments are stored as data to be used in the asset management system. The ability to relate all of the inventory and condition data collected implies that information management tools such as relational database programs and geographic information systems (GIS) will be the technological building blocks for most asset management systems.

Asset condition forecasting

Most major assets may be reasonably expected to decline in condition over time unless preventive maintenance and rehabilitation investments are made. A complete asset management system will contain methods that forecast the likely future condition of assets. Two approaches to asset condition forecasting are used. These are

- deterministic models. Deterministic condition forecasting uses tools like deterioration curves for pavements to make an estimate of future condition based on average observed performance.
- probabilistic models. These models estimate a statistical distribution of values of future conditions. Some bridges and pavements may deteriorate faster than other, similar assets.

No matter which way it is done, asset condition forecasting provides a valuable tool for transportation agencies since they can begin to see the magnitude of resources that will be needed in the future to keep up their asset base. This is also the step at which "what-if" analyses become feasible.

Next issue

In the next issue of *Technology News*, Omar Smadi, CTRE pavement management specialist, will discuss the use of resource allocation models as a final step in developing a complete infrastructure asset management system. •

Sioux Center wins safety award

Tom McDonald, Safety Circuit Rider

THE CITY of Sioux Center received the Iowa Traffic Control and Safety Association's (ITCSA) first annual Achievement in Transportation Safety Award for a local improvement of significant importance in highway safety.

In response to concerns for pedestrian safety, excessive vehicle speeds, and crash history, the City of Sioux Center took the innovative step of converting an approximately one-mile section of U.S. 75 through the central business district from four to three lanes (with a center left-turn lane) in 1999.

Reducing the number of lanes to improve safety is certainly innovative and, in the past, might even have been considered illogical. Despite some skepticism locally, the city undertook this improvement and achieved excellent results. Vehicle speeds and crashes were reduced and, after completion, public opinion was very supportive.

The cost of such a conversion is relatively low because it primarily involves re-painting pavement markings and installing descriptive signing.

ITCSA, an association of engineers, educators, law enforcement, and emergency care professionals with a dedicated interest in highway safety, developed this award to recognize notable achievement through physical improvements or programs which enhance public safety on Iowa's streets and highways. Criteria include efficiency, positive impacts on the community, innovation and originality, and local acceptance and involvement.

The City of Sioux Center is certainly to be congratulated for undertaking this innovative improvement to enhance public safety in their community! •

Installing steel sign posts

THE CLINTON County Highway Department has begun to use 1 3/4-inch steel sign posts. Advantages of these posts include

- a breakaway feature in case a vehicle comes into contact with the post.
- long life––the post won't rot off the way wood ones can.
- less chance of wind damage.

Since the steel posts are more expensive than wood posts, steel posts are being gradually phased in in Clinton County.

Raymond Myers, traffic control technician, thought he could use the same receiver on a hydraulic boom that he'd developed for pushing wood posts into the ground. To accommodate the steel posts, he created an adapter. The adapter consists of a two-inch steel mandrel to maintain the integrity of the inside of the base and two plates to hold it inside the wood post adapter. The plates measure 3/8 x 3 5/8 x 3 5/8 inches and match the inside dimensions of the four-inch wood post adapter.

One plate was welded to the base of the mandrel to take the "pushing" pressure. Myers cut a two-inch by two-inch section from the center of the other plate, which was then slipped over the mandrel, spaced 3/8 inches up from the bottom plate, and welded in place.

A 5/16-inch hole was drilled in the four-inch receiver to allow a bolt to go completely through the receiver and between the two plates of the adapter, restraining it inside the receiver.

Steel post bases must be positioned flush with the ground, so Myers made a three-foot adapter to lengthen the receiver because the hydraulic cylinders were not long enough to push completely to the ground.

The steel posts require a two-inch anchor installed in the ground first. The posts slip inside the anchor and are held in place with a bolt.

For more information about the original post receiver and/or this steel post adapter, contact Raymond Myers, 319-659-8230. •

tip from the field

Editor's note:
In the July–August issue of Technology News, *the "Tip from the field" was about eliminating leaning signposts. Raymond Myers has a tip in this issue that's related to his earlier invention.*

Steel post adapter.

library resources

Library news

ORDER library materials any of three ways:

- Order online at www.ctre.iastate.edu/Outreach/ltap/library/search.cfm.
- Use the order form on the back page.
- Contact Jim Hogan, CTRE library coordinator, 515-294-9481. During the winter he's in the office Monday, Wednesday, and Friday mornings.

New videos

V638 Smart Road. Virginia's experimental test road is described in this seven-minute video. The facility can create adverse weather conditions to evaluate items including lighting, signs, pavement markings, traffic operation, and driver behavior.

V634 Preventative Maintenance: Project Selection. This 30-minute video provides an understanding of the various factors, such as existing pavement condition and environmental effects, which must be considered when selecting the proper pavement for preventive maintenance. It also provides a general overview of the various preventive maintenance treatment options and their suitability for a given pavement condition.

V637 Pothole Repair: Proven Practices. This 14-minute video covers techniques to increase the quality of workmanship associated with permanent, semi-permanent, and temporary repair of potholes in Minnesota.

V636 Car Crash. The evolution of auto design from the Model T through tomorrow is covered in this 60-minute video. It shows how safety improvements such as padded dashboards, seat belts, safety glass, "crumple zones," crash tests, and air bags have evolved.

V639 It Only Takes a Second. The office and shop accident re-enactments and consequences shown in this four-minute video provide an excellent opener for safety training and meetings.

V640 Workzone Safety. A discussion of the concept of shop and office safety is included in this 13-minute video. It explains how to anticipate, locate, and remove hazards and discusses the relationship between communication and the security of work areas.

New publications

P1491 Access Management Handbook. This handbook emphasizes the importance of including access management principles in a community's comprehensive development plan. Appendices include the Iowa DOT Primary Road Access Management Policy, and examples of city and county ordinances.

P1492 Access Management Toolkit. This report is a companion piece to P1491 *Access Management Handbook*. It includes frequently asked questions regarding access management.

P1488 Ways of the World. This book gives a comprehensive history of the world's roads, highways, and bridges from prehistoric times to the present.

P1485 Roadside Use of Native Plants. This handbook covers the principles of ecological restoration and management. It includes natural vegetation zones and local expert contacts for each state, a comprehensive list of native plants, and contact names for information on invasive and noxious species.

New CD-ROMs

CR24 Snow Fighting Training Materials. This CD contains training information and materials on winter operations, survival lessons for public officials, and winter planning and organization. It also includes managerial and technical PowerPoint presentations.

CR25 Pavement Preservation: State of the Practice. This CD presents guidelines and technical information for pavement preservation programs from transportation agencies in California, Michigan, Minnesota, and Ohio. It includes decision-making criteria and technical specifications for using the full range of preventive maintenance techniques, as well as information on the costs, benefits, and effectiveness of a variety of innovative preservation strategies.

CR26 Work Zone Operations Best Practices. This CD contains descriptions and points of contact for work zone best practices, collected from across the nation, and covering all aspects of roadway improvement planning, design, and construction. A guidebook is available as item P1474.

New library coordinator

Jim Hogan has joined the staff as library coordinator. From 1965 until 1999, Jim worked for the Iowa division of the Federal Highway Administration as a design, traffic operations, and safety engineer. Before that, he did field construction with the Minnesota Highway Department in the Twin Cities metro area. He earned his MS degree in transportation engineering at Iowa State University. Jim maintains the Local Technical Assistance Program (LTAP) resource library. •

CTRE welcomes new employees

HAROLD SMITH joins the Center for Portland Cement Concrete Pavement Technology as part-time training and public works engineer. From 1960 until 1999, Harold worked for the city of Des Moines in various engineering positions, including city engineer for the last 29 years. Among his awards are Government Engineer of the Year, 1991, from the American Society of Civil Engineers and Top Ten Public Works Leader of the Year, 1979, from the American Public Works Association. Harold will be responsible for training and technical transfer of information and research regarding PCC pavements.

LORI WILDEMAN joins the Center for Portland Cement Concrete Pavement Technology as assistant to the director. Lori received her master's degree from Iowa State University in 1999. Before coming to CTRE, she worked as an administrative assistant in several ISU offices, including the Margaret Sloss Women's Center. Lori will coordinate technical conferences, manage industry committee activities, and oversee office operations. •

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