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Plastic culvert liners the "in" thing

SLIPLINING A CULVERT with a high density polyethylene pipe "was real easy," says George Parris, a former Audubon County engineer.

Parris lined two culverts in Audubon County two or three years ago. One road had a new asphalt overlay that the board of supervisors didn't want torn up again, and the other culvert was buried under 12 feet of fill. "Replacement wasn't an option" on those particular sites, Parris says.

Speed of installing a plastic liner is much more favorable than doing a complete replacement, Parris says, which is where the cost savings are realized. For one of his projects, 102 feet of 32-inch liner was installed inside a 36-inch corrugated metal pipe culvert in three to four hours. Grouting took place on another day, but the whole project amounted to about a day, Parris says. The liner cost \$6,500.

The cost of the plastic liner can be up to five times the cost of corrugated metal pipe for diameters up to 32 inches, says Emerson Cernin of Oden Enterprises, Inc. in Nebraska, and slightly more for larger diameters. If the depth of fill is less than seven feet, it's cheaper to replace a culvert than line it, Cernin says. On the other hand, he says, it's more economi-



A Hamilton County employee uses a come-along to help snap two sections of liner together.

cal to line culverts if they're under more than seven feet of fill and the road is paved.

One of the largest plastic liner installation projects in Iowa involved lining a 339-foot culvert beneath county road R27 in Hamilton County in 1995. The 42-inch diameter culvert lay beneath 46 feet of fill. County employees installed the culvert liner, says Hamilton County Engineer Nicholas Konrady. The liner had a 32-inch diameter and measured 352 feet long. It cost \$21,655, not including labor. Compared to a projected replacement cost of about \$125,000, the liner was a bargain.

A road had to be built to get backhoes to the inlet end of the culvert, Konrady says, so that an area could be cleared and excavated to accommodate the 39-foot sections of liner. Half a day was spent sliding the liner inside the culvert. Grouting the space between the liner and the culvert with a flowable mortar took another half day using a contract pumper.

CULVERTS . . . continued on page 2

Another reason to get WIRED

One of CTRE's most popular technology transfer services—the lending library—is online via the World Wide Web. See page 3 for more information.

The preparation of this newsletter was financed through the Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa by the Federal Highway Administration and the Iowa Department of Transportation. Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation.

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CULVERTS . . . continued from page 1

The main problem on the project, Konrady says, was that the local ready mix didn't deliver the flowable mortar fast enough. The mortar was thicker than it should have been as it was being pumped into the low end where a special metal cap had been installed. The flowable mortar started to set up too soon and had to be pumped into the high end of the culvert too. As a result the void wasn't completely filled. Konrady says he suspects nearly 75 feet remain unfilled.

Hamilton County experimented before coming up with a mixture for the flowable fill. Suggested mixtures for flowable mortar are described in the manual that accompanies the plastic liner, Cernin says. "The Iowa DOT has some of the best" mixtures for flowable fill, he says.

Besides cost, the "big issue is not to inconvenience local traffic at all," Parris says. Not interrupting traffic, not cutting pavement, and avoiding the settling of the "speed bump" created by replacement are the main reasons Cernin says counties are choosing plastic liners over complete replacement.

For the Hamilton County project, traffic was reduced to one lane only during the grouting process when the truck was pumping the flowable fill through a long hose, Konrady says.

For more information about plastic liners, request publication number 1203 from the CTRE library by contacting Stan Ring, library coordinator, 515-294-9481, or contact Emerson Cernin, sales coordinator of Oden Enterprises, Inc., 402-443-4502. ■■



Key to maintaining gravel roads is good drainage

First in a series of tips for motor grader operators



A GRAVEL ROAD'S CRUST, the hard surface that's a mix of aggregate and fines, is its first defense against water. To create the water-shedding crust, the surface material must contain enough fines (silt and clay) to form a cement that binds the aggregate together.

Besides having a tough surface, a gravel road needs the proper shape to shed water. An A-shaped crown with 1/2 inch to 3/4 inches of slope per foot works best. To maintain the uniform slope of an A-shaped crown, blade a straight cross slope from the centerline to the shoulder and check your work with a slope meter.

If you carry a windrow, make sure water doesn't cause secondary ditches on its way to the road ditches. Leave weep holes in the windrow about every 100 feet by briefly angling the blade so it's perpendicular to the roadway.

Once the water makes it to the ditch it shouldn't just sit there because it will eventually seep into the road's base and cause it to fail. A ditch with a trapezoidal shape and a wide flat bottom will drain better and erode less than other shaped ditches. A minimum of a two percent grade is recommended to keep the water moving, but grades shouldn't be too steep or erosion may occur.

Culverts are also part of a gravel road's drainage system. Clear debris from inlet and outlet ends of culverts.

If you want a good road, take care of the water. It was there first. ■■

Backhoes help slide the liner inside the corrugated metal pipe culvert.
Photo here and on page 1 courtesy of the Hamilton County engineer's office.

BBS to shut down

CTRE's popular electronic bulletin board system (BBS) is coming to an end. The WATS telephone line service will be discontinued October 31.

After that date, users will be able to access the service temporarily by direct dialing 515-294-9784.

The BBS project began in December 1991 with funding through the Iowa Highway Research Board through December 31, 1997. It was sponsored jointly by CTRE and the Iowa County Engineers Association Computer Program and Information Coordinating Committee. The BBS has fulfilled three purposes: (1) to provide an electronic link between city and county engineering offices and other agencies for data sharing, (2) to provide a dial-up site for accessing data and files,

and (3) to provide a stepping stone to the world of electronic data transfer.

An informational meeting for BBS users will be held November 5, 1997, from 1:00–4:00 pm in CTRE's conference room. The purpose will be to discuss the shutdown of the BBS and, if users want continued access to the services now provided by the BBS, possible alternative avenues for providing these services. One option, for example, may be to make data files available via the World Wide Web.

Users are encouraged to attend this meeting or provide input by calling Saleem Baig, Iowa DOT Local Systems, 515-239-1051.

The BBS will be completely discontinued on December 31, 1997. ■■

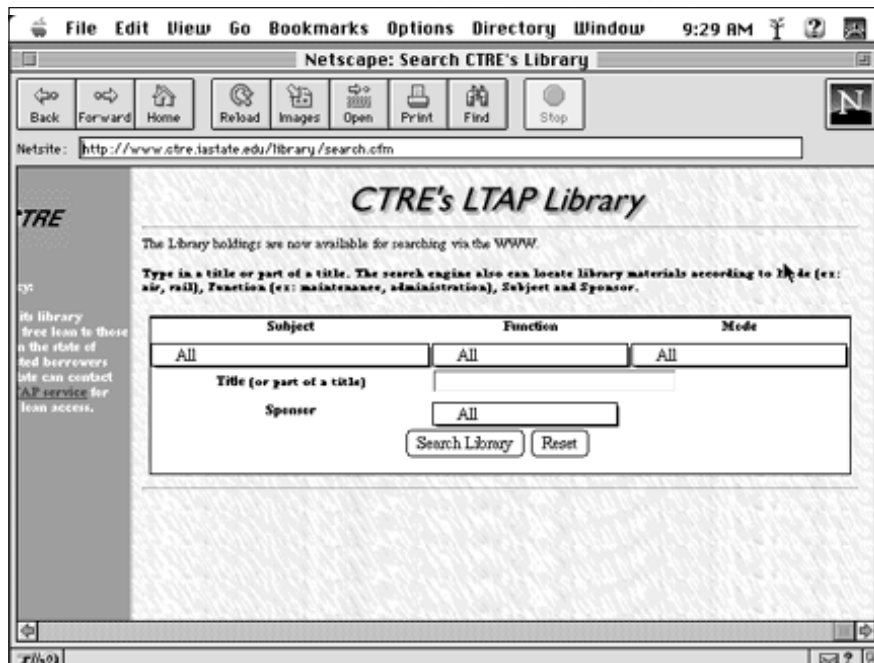
Another reason to get WIRED

IF YOUR OFFICE isn't yet wired for Internet service, here's a good reason to do it soon: CTRE's recently updated catalog of library materials is now online, complete with abstracts and a search engine.

Through the online catalog, you can use a simple search engine to find titles and abstracts of library holdings you might want to borrow. You can even order videos, publications, slide presentations, etc. online. No more mail-order forms, no more stamps, no more hunting for librarian Stan Ring's address or telephone number.

The search engine allows you to search by a word or word string that you think might be in the title; or by subject, mode, function, or sponsor; or by a combination of these. We are continuing to refine the

This is the screen you'll see when you connect to CTRE's LTAP Library on the Web.



search engine to help you define your searches even more narrowly.

Link to the "Online library catalog" from CTRE's home page: <http://www.ctre.iastate.edu/> ■■

LTAP Advisory Committee

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

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

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

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Iowa Department of Transportation



Center for Transportation Research and Education

IOWA STATE UNIVERSITY

Construction process for cold in-place asphalt recycling

CIPAR IS BEING PERFORMED on Iowa's secondary county roads and low volume state highways. The construction process generally consists of eight different phases:

- Planing the existing bituminous road to a predetermined depth which should be sufficient to destroy most existing distresses, while leaving sufficient load bearing capacity to support the construction equipment.
- Screening and sizing of reclaimed asphalt product (RAP) to desired size (typically 1–1.5 inches). During this process water is sprayed onto the RAP for lubrication, emulsion distribution, and dust control.

PROCESS . . . continued on page 5



The cold in-place asphalt recycled mat prior to compaction.

Performance of cold in-place asphalt recycling on Iowa's secondary roads

By Bryan R. Cawley, Research Assistant, Iowa State University

COLD IN-PLACE ASPHALT RECYCLING (CIPAR) has been performed successfully worldwide. It has been successful because it reuses aggregate and asphalt that already exists within the road. This makes it a "green" process. In Iowa the value associated with using this green process comes from economics.

CIPAR has been in use in Iowa since 1986. Because of this short history, generating pavement performance information in order to predict the expected service life of CIPAR roads is difficult. It was necessary to collect information about the present condition of CIPAR roads with varying ages.

Ascertaining the condition of these roads was performed by surveying a sample of CIPAR secondary roads in Iowa. The survey techniques consisted of a present serviceability index (PSI), a qualitative measure, and a pavement condition index (PCI), a quantitative measure. These two indices were combined, with equal importance, to produce a numeric index that would represent the user's perception of the road's condition and the road's structural condition.

Once the current condition of the roads was obtained, it was then possible to determine the expected life of the roads. Statistical analysis was performed to determine the expected life cycle. Ninety-five percent confidence intervals were used to determine how the average roads were currently

performing and would be expected to perform in the future. These predictions are based on maintaining current variables: maintenance procedures, traffic, truck traffic, weather conditions, etc.

A terminal life index value of 25 was chosen. This is based on the PCI concept of changing from poor to very poor at the index rating of

25. By using this value, an average life expectancy for CIPAR secondary roads was determined to be 15 to 26 years.



Koss Construction's sizing and rejuvenating portion of the old in-place asphalt recycling train. Photos courtesy of Bryan R. Cawley, ISU research assistant.

Interviews with 11 Iowa county engineers and assistants revealed that they expected the service life of a three-inch hot-mix bituminous overlay to be 10 to 22 years. Comparing the two methods of rehabilitation, CIPAR roads, on the average, will last four to five years longer than hot-mix bituminous overlays. These predictions are based on a continuation of the current maintenance programs, traffic loads, weather conditions, and other variables that can and will affect the performance of bituminous roads.

Reviewing CIPAR economic costs showed volatility in the market during the initial introduction of this rehabilitation technique. Since the initial break-in period, the cost of four inches of CIPAR has leveled out to approximately \$15,500 per mile of 22-foot-wide road. The material and construction costs of four inches of CIPAR are approximately equivalent to one inch of hot-mix bituminous overlay.

For a three-inch overlay the initial material and construction costs are approximately equivalent to CIPAR's four inches and an additional two-inch hot-mix bituminous overlay on the CIPAR road. Thus, there is no initial cost benefit for either method based on material and construction.

The economic benefit comes from deterring the occurrence of reflective cracking. The deterrence in cracking increases the duration between maintenance and increases the service life of the road. Mobilization costs are another concern, but were not addressed in this cost comparison.

In the state of Iowa the process of CIPAR secondary roads is economically beneficial. Compared to the alternative of a standard hot-mix bituminous overlay,

CIPAR . . . continued on page 5

Meetings and a little Monty Python

First in a series about management



AFTER BLUSTERING THROUGH several unsuccessful business meetings, former Monty Pythoner John Cleese learns how to improve his leadership skills in "Meetings, Meetings, Bloody Meetings," a 1994 interactive CD training program by Video Arts, Inc. The program uses humorous scenarios to demonstrate tips in making meetings efficient and productive, while allowing viewers to interact with the material on-screen. Each sketch shows Cleese's hapless businessman, Tim, making a series of meeting mistakes, then learning how to correct his blunders and prevent future problems.

Turning a meeting nightmare into a dream

The video divides its message into four sections: why meetings are important, Tim's meeting "nightmare," the five stages of meetings, and finally, a summary of the entire program. Most of the video is devoted to the five stages for improving communication, saving time, and getting significant results. Among its suggestions:

1. Plan clearly and concisely what the meeting is supposed to achieve, and prepare yourself as to the meeting's goals and priorities.
2. Inform all participants of the meeting's objectives. Write and distribute an agenda that explains what is being discussed, why it's being discussed, and what you hope to accomplish.

CIPAR . . . continued from page 4

CIPAR provides a longer life expectancy and decreases maintenance. The construction technique and physical characteristics of the resilient material contribute to the benefits. From an environmental perspective, this rehabilitation technique minimizes the quantity of natural resources consumed.

The data was acquired by funding from Iowa Highway Research Board, project HR 392.

For more information about cold in-place asphalt recycling on Iowa roads, contact Bryan Cawley, a research assistant in civil and construction engineering at Iowa State University, 515-294-4590. ■■

3. Prepare for the meetings by prioritizing items. Use time management to move the meeting along quickly; researching agenda items beforehand can streamline the schedule.
4. Structure and control the meeting's progress by stating your proposition, showing evidence to support it, coming to a group consensus, and then collaboratively deciding on the action to take.
5. Summarize and record what has been accomplished, especially how responsibilities and tasks have been allocated.

The bonus of CD-I

"Meetings, Meetings, Bloody Meetings" is available only in CD-I format, an interactive software program that allows the viewer to easily navigate among the various scenes, opt to take short quizzes on meeting strategy, and construct solutions to Tim's management troubles. The viewer becomes an active participant in the video, consequently making its lessons even more effective and memorable.

Although CD-I requires a special CD-I player, CTRE offers both the player and its CD-I collection for loan. Anyone interested in improving meetings while maintaining a sense of humor is encouraged to check out this program.

For more information on this video or others in CTRE's collection, contact Stan Ring, CTRE library coordinator, 515-294-9481. ■■



A productive meeting features a clear agenda and efficient scheduling.

PROCESS . . . continued from page 4

- Placing and mixing rejuvenating (usually asphalt emulsion) agent into the RAP material (typically 1–2 percent).
- Placing rejuvenated RAP.
- Primary compaction performed by pneumatic roller which must be performed during the curing of the rejuvenator.
- Secondary compaction using steel wheel roller which will remove pneumatic roller marks.
- Final curing of emulsion. This process is generally performed by allowing curing to occur over a two-week period. However, shorter and longer times have been used successfully. Because of the emulsion curing, the most favorable construction period is summer.
- Placing a surface course (typically 2–3 inches of hot-mix bituminous). ■■

The doctor is in

YOU HAVE A VIRUS. So you take some NyQuil, maybe a little ibuprofen, and wait it out. Too bad your computer doesn't have the same option. Computer viruses aren't easily alleviated, and waiting them out could be catastrophic to your machine. What can you do?

If your computer has developed behavioral problems and its programs are acting out, it's critical that you look for a possible virus. The sooner, the better. The sole mission of some computer viruses is to seek and destroy everything they can access, and failing to react can leave you with a big paperweight that happens to resemble a computer.

As defined by Galaxy, a specialized search engine for the electronic community, "a computer virus is one kind of threat to the security and integrity of computer systems; there are several problems similar to computer viruses. They too have colorful names: worms, bacteria, rabbits, and so on." Galaxy offers a lengthy discussion on viruses, from the common means of infection to coping techniques.

The worms crawl in, the worms crawl out
Not all virus attacks are caused by a vengeful computer hacker. Often a virus is unwittingly allowed into a machine via downloading and software sharing. An employee who brings a favorite program to the workplace may introduce the virus without realizing what has happened. Once this occurs, the virus can spread throughout the entire computer network. Similarly, infected software that has been downloaded might be installed without first being checked by a virus alert program. The World Wide Web is a cyber-logjam of safe, quality programs, but it takes only one flawed download to damage a computer. Furthermore, watch out for e-mail attachments that include executable programs (EXE); they also can cast a dark shadow.

There are other hidden mines to tiptoe around. For instance, "If people expect their virus scanner to work, they need to think about any data (DAT) files they might have," says Chris Pirillo, president of Lockergnome, LLC, an online service that analyzes downloadable programs and software. "If you've got three-year old DAT files, delete them. DAT files should be updated every two months.

Does this qualify for sick time?

Nope, but improper procedure could mean a permanent vacation for your computer. Galaxy recom-

mends that your workplace take some commonsense precautions:

- Use good, general security practices.
- Keep good backups of critical data and programs.
- Use access control facilities to limit access to information by users (you shouldn't be surfing the net on the job, anyway).
- Put mechanisms in place to detect viral infections quickly.

"I watch what I download, and a lot of programmers virus scan before posting their material if only so they don't get yelled at," says Pirillo. "I also recommend viewing documents instead of opening them (from within a program)." Windows users can do this by installing a free program such as Quick View Plus and certain Microsoft viewers.

Coping with a virus

No plan is foolproof and if a particularly wily virus manages to infect your system, Galaxy recommends that you report it to your workplace immediately. This will enable coworkers to protect and save their own files from corruption. Depending on the type of virus and its prevalence in the system, a virus detection program can rectify the problem. Like computers themselves, however, viruses are continually evolving into new forms, so make certain that your cures are also up-to-date. ■■

Virus detection software

WHEN DECIDING on a virus detection package, look for software that recognizes the latest virus strains, such as the new macro viruses. Avoid complacency with your program; keep the detector up-to-date by installing plug-ins or upgraded software. The Web sites of many virus detection companies offer plug-ins free of charge for their customers. Below are some of the more common names in the virus detection market.

Safetynet's VirusNet: This program is fully aware of newer macro viruses and also features a Rescue Disk

Often a virus is unwittingly allowed into a machine via downloading and software sharing.

VIRUS . . . continued on page 7

Beware wooden horses

IT'S NOT DIFFICULT for a disguised virus to sneak into your computer and, once inside, wreak all sorts of cyber-havoc. The latest news in virus infections concerns the macro viruses, which can proliferate with greater ease. While it's impossible to be fully educated about every virus, basic awareness of the prevalent viral strains is important in order to keep your computer safe.

The Dr. Solomon Website, <http://www.drsolomon.com>, lists several common virus forms:

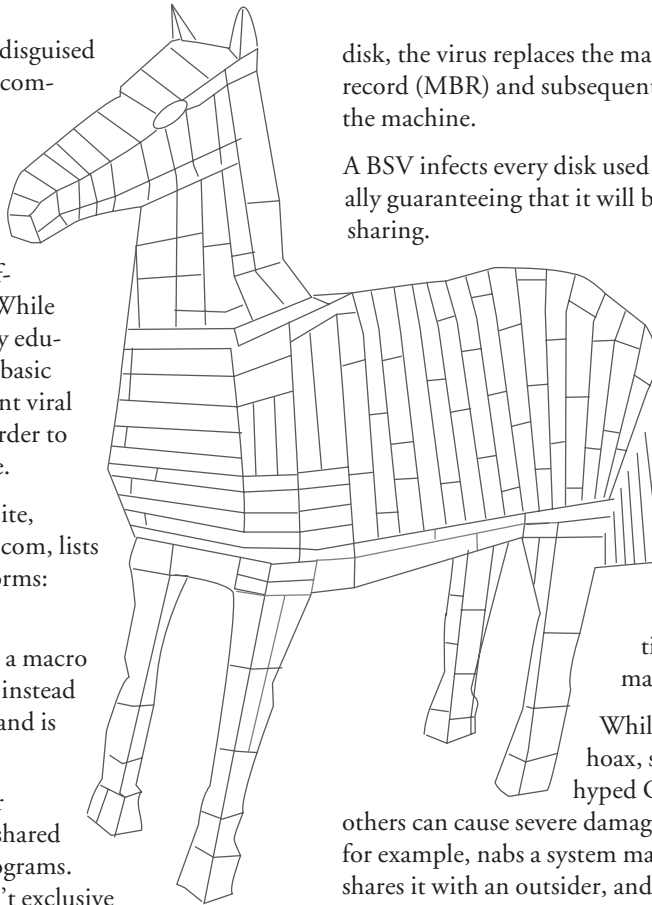
Macro virus

Unlike previous viruses, a macro virus infects documents instead of executable programs and is written in WordBasic.

Macros can spread faster because documents are shared at a greater rate than programs. Also, macro viruses aren't exclusive to either DOS or Macintosh operating systems; anything is fair game.

Boot sector virus (BSV)

When a computer starts up from an infected floppy



disk, the virus replaces the machine's master boot record (MBR) and subsequently is used to boot up the machine.

A BSV infects every disk used in the A drive, virtually guaranteeing that it will be spread via disk sharing.

Multipartite virus

This open-minded virus doesn't discriminate and will infect an MBR plus .EXE and .COM programs.

A greater number of programs can fall prey, causing widespread infection throughout a machine.

While some viruses are a hoax, such as the well-hyped Good Times virus, others can cause severe damage. The Cheeba virus, for example, nabs a system manager's password, shares it with an outsider, and creates unlimited access to that system. Virus detector packages and a standard operating procedure for virus prevention can keep your computer healthy and safe from intrusion. ■■

While some viruses are a hoax, such as the well-hyped Good Times virus, others can cause severe damage.

VIRUS . . . continued from page 6

for rebooting a system that otherwise can't restart.

Dr. Solomon's AntiVirus Toolkit: Dr. Solomon's FindVirus program can detect over 12,000 viruses, including the WM.Concept virus, and it can repair some macro viruses.

McAfee's VirusScan: This program keeps tabs on a system for existing and incoming infections and also looks out for local and network connections.

Symantec's Norton AntiVirus: Norton is another popular program that scans whatever files are activated. Its Auto-Protect function alerts the user when a virus appears and asks for further instructions whether to delete, fix, or ignore the problem. It also

offers LiveUpdate as a monthly upgrade package for the latest virus developments.

TouchStone's PC-Cillin: This program covers both files and dialing systems such as modem and Winsock connections. It's also a fast scan for .zip files, which often take time to analyze.

Check out these Web sites for information about the virus detection programs described above:

<http://www.safe.net/indexnf.htm>

<http://www.drsolomon.com/home/home.cfm>

<http://www.mcafee.com/>

<http://www.symantec.com/pys95nt.html>

<http://www.checkit.com/low/tshome.htm> ■■

Electric vehicles on the Web

TWO WORLD WIDE WEB sites that offer information about electric vehicles can be found at <http://www.calstart.org/services/evfaq.html> and <http://www.chattanooga.net/chamber/bus.html> ■■

Five Seasons Transportation takes charge with its electric transit buses. Photo courtesy of Five Seasons Transportation.

Watts up in Cedar Rapids? Electric buses

Third in a series about transportation and the environment



ELECTRIC TRANSIT VEHICLES accomplish two purposes: they are good for the environment because they do not emit any emissions and they reduce dependence on imported energy. Five Seasons Transportation and Parking, Cedar Rapids' public transit system, currently operates four dedicated electric buses in a fleet of 48 vehicles. One hybrid electric bus will be delivered soon. Director Bill Hoekstra says they're working on obtaining four more electric buses.

Five Seasons has a reputation for experimenting with alternative fuels and for being a good steward of air quality. It's no surprise that Five Seasons receives economic development requests from the private sector. "We were asked by the local utility, IES, to test electric transportation," Hoekstra says.

A grant from the Federal Transit Administration, funding from the Iowa Department of Transportation, municipal tax funds, and cost shares from IES, Northrop Grumman, and Blue Bird Industries allowed Five Seasons to acquire its first electric buses and build two charging stations at its garage.

Five Seasons' partnership with IES, Northrop Grumman, and Blue Bird has developed into the Cedar Rapids Electric Transportation Consortium. Five Seasons functions as a beta test site for the consortium.

Testing a new generation of transit vehicles is good business, Hoekstra says, because he can see what kind of buses Five Seasons may want in the future.

The future is here

Five Seasons is "on the cutting edge," Hoekstra says, and will test various technologies. Each electric bus uses one 230 horsepower electric traction motor to run the two rear wheels. The motor is powered by four packs of 28 gel lead acid batteries that must be recharged every 80 miles, an average of once every seven hours.

The biggest stumbling block Hoekstra sees to other communities buying electric transit vehicles is the cost of acquiring the charging station, which can cost up to \$100,000.

Since electric buses are currently not mass produced, they cost about 130 percent of a traditional diesel bus, Hoekstra says. But the purchase price can be nearly recouped in operation and maintenance costs over four to five years, he says. An electric engine has six major parts compared to thousands in a diesel engine. Electricity for a day's operation of one bus costs \$2.70 compared to \$52 a day for diesel.

Five Seasons charges all the buses' batteries, and extra batteries that are used for recharging buses during the day, during the non-peak times of 8:00 pm to 7:00 am. By charging during non-peak times, the cost is seven cents or less per kilowatt compared to 14 cents per kilowatt during peak hours.

Electric vehicle technology

Batteries need to evolve so they can go longer between charges, Hoekstra says. The technology has not been as well researched for batteries in larger vehicles like transit buses, Hoekstra says, compared to batteries used in smaller passenger vehicles.

Technology for electric vehicles has evolved "enough that in certain situations and in certain cities it might work," Hoekstra says. He emphasizes the need for partners in the private sector, for the strong support of the city, and for a quality staff. "We're fortunate," Hoekstra says, "to have a good maintenance staff."

You "have to look at all types of technology," Hoekstra says, and "see what you can make work."

For more information about Five Seasons Transportation's electric buses, contact Bill Hoekstra, 319-398-5367. ■■



Storage rack increases space and accessibility

EMPLOYEES FROM the City of West Des Moines Department of Public Works recently solved space and accessibility problems in the shop with the help of a simple storage device.

During extended periods of good weather, West Des Moines stores its wing plows in the shop. Although removal and storage minimizes wear and tear on the plows, employees experienced some problems.

Limited shop space forced workers to store plows in a corner. When workers stored other equipment, the plows became inaccessible. This made access difficult during emergency events, when plows must be installed quickly and efficiently.

To simplify installation and storage and increase accessibility, a group of employees built a portable storage rack out of agricultural running gear and scrap metal. The rack, which workers fabricated for about \$500, enables operators to quickly remove, store, and replace plows. In addition, the rack can

be stored outside, thus increasing storage capacity and efficiency in the shop.

For more information, contact Bret Hodne, West Des Moines superintendent of public works, 515-222-3480. ■■



**tip from
the field**



A storage rack assembled from scrap metal offers storage for wing plows. Photos courtesy of West Des Moines Public Works.

This storage rack provided the needed space and accessibility for wing plows.

Getting defensive about your driving

EACH YEAR, 200,000 employees are injured in work-related automobile accidents in the United States. The Coastal Video, "Defensive Driving: A Crash Course," offers suggestions for freeway, city, and rural driving and developing a defensive attitude on the road.

Defensiveness doesn't necessarily mean aggression. A defensive driver "recognizes hazards before something goes wrong. A defensive driver is an alert driver." Commonsense prevention is the key. The video recommends preparing both your vehicle and yourself to get to your destination safely.

For longer trips, review a road map and plan a route. Be aware of construction sites, detours, and other situations that would lengthen or alter your route.

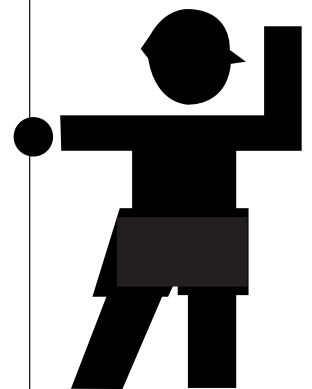
Inspect the vehicle thoroughly before starting the trip, especially if you're unaccustomed to it, like the company vehicle or a rental. Look for leaks, check the tire pressure, and learn the location of the vehicle's panel controls.

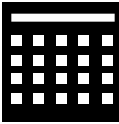
Once you're ready to go, get into a defensive mindset for driving. Look out for drivers exhibiting "road rage," and take note of your own emotions, especially frustration, fear, and even joy. Emotion-induced driver error causes 80 percent of auto accidents. The most common driver error? Tailgating. Another mistake is driving under the influence of drugs and medications, which leads to 55 percent of accident fatalities.

Defend yourself from distractions too. Cell phones are handy, sure, but they also divert your focus from the road. If phone calls are a significant part of your travel, preschedule calling times and pull off the road before picking up the phone. Keep an eye out for other drivers who aren't paying attention, especially apparently intoxicated drivers and those who are trying to merge into your traffic lane.

For more information on this video or others in CTRE's collection, contact Stan Ring, CTRE library coordinator, 515-294-9481. ■■

**safety
short**





ALAS workshops

The Accident Location and Analysis System (ALAS) is a DOS-based computer database that stores traffic accident information. ALAS helps agencies analyze accident data to identify high-accident locations, determine driver characteristics and contributing circumstances, develop crash statistics for specific locations, etc.

Several free, one-day ALAS workshops will be held this fall and winter in Ames. The workshops help new users learn ALAS and current users get more out of ALAS's analysis and reporting capabilities. Participants receive hands-on instruction in a small-group setting.

For more information, contact Safety Circuit Rider Mike Jorgensen, 515-294-6384.

Read the brochure online and register online at <http://www.ctre.iastate.edu/outreach/conf.htm>

October 1997

		Location	Contact
21	Accident Location and Analysis System The one-day ALAS workshop is a free training program designed to help new users learn ALAS and help current users get more out of ALAS's analysis and reporting capabilities.	Ames	Mike Jorgensen 515-294-6384
21	Excavation Safety This workshop explains the hazards of excavation and trenching, how accidents happen, and how worker protective measures should be applied.	Sioux City	Mike Jorgensen 515-294-6384
22	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384
23	Excavation Safety	Waterloo	Mike Jorgensen 515-294-6384
23-24	Iowa Traffic Control and Safety Association Conference Conference topics include the Iowa State Patrol's safety tips program, the "No Zone" safety campaign, and laser speed detection.	Ames	Continuing Education 515-294-6222
29	Excavation Safety	Ottumwa	Mike Jorgensen 515-294-6384

November 1997

5	Iowa Section ASCE Transportation Conference	Ames	Don Wall 515-294-3811
6	GIS & Safety Data Conference This conference explains how GIS tools can be used for safety data analysis for highway and traffic safety purposes.	Ames	Tim Strauss 515-294-3230
6	Better Concrete Conference	Ames	Jim Cable 515-294-2862
13	Stream Stability and Scour at Highway Bridges	Ames	Jim Cable 515-294-2862
14-18	AASHTO Annual Meeting	Salt Lake City, UT	Tom Maze 515-294-8103
18	Short Span Steel Bridges/Structural Engineering Workshop	Ames	Jim Cable 515-294-2862
18	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384
19	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384

December 1997

2-4	Iowa County Engineers Association Annual Conference	Ames	Jim Cable 515-294-2862
10	Iowa LTAP at CTRE	Ames	Duane Smith 515-294-8103
16	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384
17	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384
18	CCE Least Squares Workshop	Ames	Jim Cable 515-294-2862
19-20	Surveyors Workshop, Least Squares Adjustment	Ames	Don Wall 515-294-3811

January 1998

11-16	TRB Annual Meeting	Washington, D.C.	Duane Smith 515-294-8103
27	AC Paving Conference	Ames	Jim Cable 515-294-2862
27	Accident Location and Analysis System	Ames	Mike Jorgensen 515-294-6384

Publications

Intersection Geometric Design and Operational Guidelines for Older Drivers and Pedestrians (US DOT-FHWA, 1997) 249 pages

This publication presents guidelines for changes in the geometric design and operations at intersections with the greatest potential to aid in their use by older drivers and pedestrians.

Request #P1256

Factors Influencing Stability of Granular Base Course Mixes (Iowa DOT-HRB) 108 pages

This research was conducted to evaluate the various factors influencing the stability of granular base course mixes.

Request #P1260

Traffic Signing Handbook (ITE, 1997) 347 pages

This handbook contains information on types of signs, existing standards, planning and engineering studies, etc.

Request #P1261

Settlement of Bridge Approaches (NCHRP, 1997) 75 pages

This synthesis of highway practice describes the current state of the practice for the design, construction, and maintenance of bridge approaches to reduce, eliminate, or compensate for settlement at the bridge/abutment interface.

Request #P1265

Guidance on Sharing Freeway and Highway Rights-of-Way for Telecommunications (AASHTO, 1996) 44 pages

The purpose of this guidance is to identify key elements involved in the implementation of shared resource projects. The rapid construction of communication networks has spurred interest in public-private arrangements.

Request #P1268

Accelerated Construction Methodology for Concrete Pavements at Urban Intersections (TTI, 1996) 204 pages

This publication will assist in organizing, planning, and executing reconstruction of concrete pavement intersections.

Request #P1272

Design and Construction of Driven Pile Foundations, Vols. I and II (US DOT-FHWA, 1996)

This publication serves as a primary reference of recommended practice for driven pile foundations.

Request #P1265

Videotapes

Low Volume Road Series (IRF, 1997) 38 minutes

This videotape covers: Selecting maintenance priorities for low volume roads, 19 min.; and Managing maintenance for low volume roads, 19 min

Request #V523

Construction Management Systems Series (IRF, 1997) 95 minutes

This videotape covers: Construction management system overview, 19 min; Construction management system planning, 19 min; Developing contract staffing guidelines and planning values, 19 min; Manpower budgeting/scheduling procedures, 19 min; Construction management system monitoring and updating procedures, 19 min.

Request #V524

Equipment Management Series (IRF, 1997) 114 minutes

This videotape covers: Introduction to equipment management systems, an overview, 19 min; Equipment inventory, 19 min; Equipment maintenance, 19 min; Parts and supplies management, 19 min; Financial management, 19 min; Equipment management information sub-system and EMS implementation, 19 min.

Request #V525

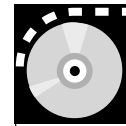
Access Management Overview (US DOT-FHWA, 1997) 14 minutes

This videotape describes the concept of access management as controlling access points to improve the efficiency, safety, and capacity on streets and highways by reducing conflict points.

Request #V527

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