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Taking a turn for the better



PICTURE IT: you're navigating rush hour traffic on your way home from work, cruising on the inner lane of a four lane highway, when the car in front of you suddenly puts on its left turn-signal. Your heart sinks and your car slows as you wait for the slim chance to move into the outer lane and pass by.

It's a common situation and often a frustrating one that can lead to rear-end and side-swipe mishaps. In response, the construction of three lane highways with a left turn lane (TWLT) is increasingly preferred as a safer and efficient alternative to four lane undivided highways in urban areas.

Engineers have been utilizing the TWLT design for the past two decades, but converting those four lane undivided highways that already exist is "a very recent concept," explains Transportation Safety Engineer Tom Welch at the Iowa Department of Transportation (Iowa DOT). Most conversions have happened in the past few years and are encouraged by an increasing number of transportation officials.

"It's becoming the consensus," Welch says. "Many four lane undivided roadways would provide improved safety to motorists and pedestrians if they were converted."

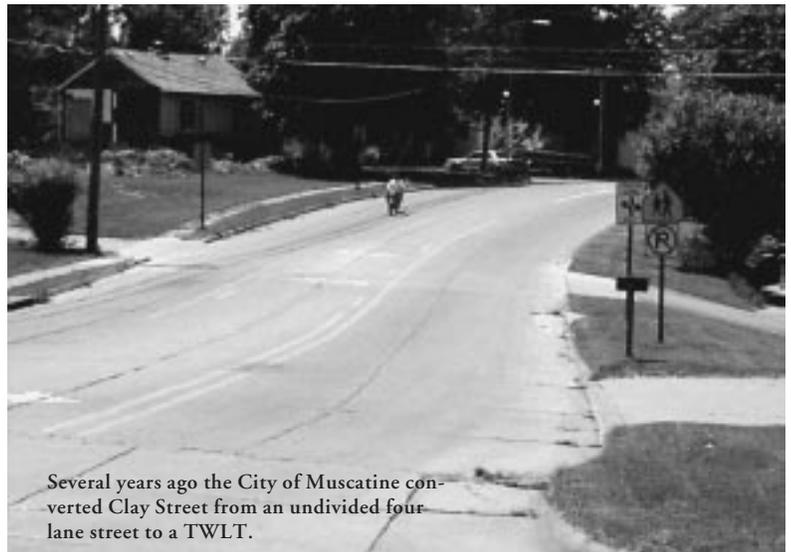
Because its turning lane is reserved for left-turning traffic, a three lane roadway allows for improved sight distance for turning vehicles, eliminates lane changes, and discourages those speeders who otherwise would hustle to pass around turning traffic.

Welch says, "If there is a safety problem along a four

lane undivided highway, in the past the primary alternative was to consider widening to a five lane or four lane divided roadway, both of which are very expensive and difficult to do. Now we have another 'tool' in our traffic safety 'tool box'—restripe the four lane to a three lane roadway." This alternative is most applicable to roadways with less than 15,000 vehicles per day.

The difference in traffic volume capacity between four and three lane highways is negligible, given that the traffic on inside lanes of a four lane highway is typically slowed by turning vehicles. Before 21st Avenue East underwent conversion in Duluth, Minnesota, articles in the *Duluth News-Tribune* pleaded, "Don't limit 21st Avenue East," and "it's not too late to keep [it] a four lane street." Once the reconstruction was completed, however, an April 1998 editorial urged, "Admit it, 21st East works ... the change has eased congestion and reduced drivers' speed, making it easier for pedestrians."

TURN . . . continued on page 2



Several years ago the City of Muscatine converted Clay Street from an undivided four-lane street to a TWLT.

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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, to improve the quality of life for Iowans.

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Making roadsides safer



SOON, new or replacement highway safety devices on the National Highway System (NHS) must meet enhanced standards for crashworthiness. Technically, most local transportation agencies do not have to worry about the new standards because safety devices on non-NHS roads do not have to comply. Practically, however, local agencies should pay attention.

ISTEA raises standards

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required that roadside safety features must be designed to better accommodate crashes by the kinds of vehicles being driven on today's roads: pickups, vans, and four-wheel-drive vehicles. To fulfill this requirement, the Federal Highway Administration (FHWA) eventually adopted crash testing standards developed through the National Cooperative Highway Research Program (*Recommended Procedures for the Safety Performance Evaluation of Highway Features*, NCHRP Report 350). Some roadside safety devices must meet the new crash standards beginning October 1, 1998.



TURN . . . continued from page 1

The City of Storm Lake, Iowa, experienced similar conversion of a four lane road. Dick Hakes, president-elect of the Storm Lake Chamber of Commerce, witnessed the changes. "Flindt Drive had very narrow lanes and it was pretty hair-raising to be driving down it, alongside a large semi full of hogs headed to our local packing plant," he says. "There was no shoulder, of course, so if you had to 'escape' in an emergency, you would have to jump the curb."

Now, "with our three lanes, left-turning traffic can get out of the way and through traffic can flow smoothly," Hakes says.

Welch says that three lane facilities are not necessarily a cure-all for traffic congestion. And Hakes says that unfamiliarity with a three lane system may occasionally lead to confusion, "such as when you are preparing to turn left and the car coming toward

you is doing the same and it appears you may be trying to occupy the same space."

"The only other potential problem," he adds, "is that lanes need to be very well marked in order for this system to work properly, and sometimes with our Iowa winters and substantial snow cover, lane markings are worn down or obscured."

Welch says, "There may be unique situations where a four lane undivided roadway is the most appropriate design. Each project needs to be evaluated on its own merits. Iowa has only recently become aware of the concept and is making an effort to inform Iowa DOT staff as well as city staff and traffic consultants about this new alternative."

For more information on this concept or a copy of a relevant discussion paper, contact Tom Welch at the Iowa DOT, 515-239-1267.

Thanks to Tom Welch for suggesting this story idea. If you have a story idea, see the back page for info. ■■

include a time frame for requiring the implementation of crashworthy traffic control devices in work zones. The memo will require that traffic control devices used in all work zones (including construction and maintenance zones) on the NHS be of an approved crashworthy design.

Bortle notes that some existing work zone devices, such as rubber cones, flexible delineator devices, and plastic drums without lights, already meet the new guidelines. All other devices will need to pass a crash test to be approved by the FHWA for use on NHS highways.

Heads up to locals

Even without a mandate to use NCHRP-350 compliant devices on non-NHS roads, local transportation agencies have good reason to analyze their own roadside safety devices in light of the new standards.

John Hibbs, technology exchange engineer at the Kentucky Transportation Center, points out that motorists don't distinguish between NHS and non-NHS roads; they expect the same level of safety on all roadways. As NCHRP-350 compliant devices become more prevalent on NHS roadways, they will become the accepted standard. Hibbs warns that continuing to use devices that do not meet the new crash testing criteria may leave a transportation agency vulnerable to liability suits. Of course, criteria for devices used on lower order roads reflect different safety needs for those roads (lower speeds, etc.).

The current focus on crash standards should encourage local agencies to consider the crashworthiness of their work zone safety devices, particularly shop-made devices like portable sign trailers. South Dakota LTAP field operations manager, Ken Skorseth, suggests that, although they are convenient to use in fast-moving work zones, such trailers—which are often constructed of scrap materials like old car axles and grader blades—can be dangerous, unforgiving obstacles to wandering vehicles.

Skorseth recommends analyzing work zone devices according to criteria considered important by crash testing experts:

- Use lightweight material that will yield or collapse when hit.

- All elements of the device should be secure (for example, no loosely mounted flashing lights that could fly through a window when hit).
- The framework should permit sandbags used for ballast to be placed at or very near ground level.
- Any wheels should be small and lightweight. (When hit, wheels may tend to cause the striking vehicle to roll over.)

For more information

Mark Bortle may be reached at 515-239-1587; John Hibbs at 606-873-6270; Ken Skorseth at 800-422-0129.

Find specifics of the new crashworthiness standards, along with contact information for FHWA staff regarding different categories of roadside safety devices, online at www.fhwa.dot.gov/engineering/HNG10/ROADSIDE.html. ATSSA also has online information at www.ATSSA.com (click "Report on NCHRP350").

Thanks to The Link and The Connection, technology transfer newsletters of the Kentucky and South Dakota LTAP centers, respectively, for their helpful information on this subject.

WWW links



www.pchelponline.com

This site offers links to hundreds of individual software and hardware companies (PC only) for technical support. A great resource for preparing computer systems for the year 2000.

www.ferretsoft.com/netferret/download.htm

WebFerret is an "intelligent" agent that can automate information searches on the web. It may be downloaded for free. A version of WebFerret with more features may be purchased from the site.

search.shareware.com/

Search for keyword "ispeed." This program may be downloaded free (available for PCs only). It will maximize the throughput of your dial-up Internet connection.

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.

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Preventing washboarding

This article was adapted from Special Bulletin #29 in the summer 1998 issue of The Connection, the technology transfer newsletter published by the South Dakota Local Technical Assistance Program.

Ken Skorseth, Field Operations Manager, South Dakota Local Technical Assistance Program



ONE OF THE MOST aggravating gravel maintenance problems that plagues motor grader operators, managers, and elected officials is corrugation or “washboarding.” This problem generally brings more complaints from the public than any other gravel maintenance problem. It not only produces an uncomfortable ride, but moderate to severe washboarding can cause a driver to have less control of his or her vehicle. It actually becomes a safety problem.

Causes

One myth is that motor graders cause washboarding. They do not! It is true that graders can cut certain distortions into a gravel surface. When an operator runs a grader too fast, the machine can begin to lurch or bounce. The humps and dips this causes will be farther apart and will be cut at an angle across the roadway, the same angle that the moldboard is adjusted to while blading.

It is impossible to deal with the problem of washboarding if you don't clearly understand what the main causes are.

1. Lack of moisture

When frequent rainfall occurs, washboarding is greatly reduced. But that is not guaranteed, and in high traffic areas just a few days without rain can really cause problems. Prolonged dry weather can cause washboarding in almost any situation, even with relatively low traffic.

2. Traffic

People's driving habits can really aggravate washboarding. Hard acceleration or hard braking are the greatest problems. Consequently washboarding will appear at locations such as intersections, coming into or going out of sharp curves, business entrances, and sometimes even at driveways. As vehicle tires lose a firm grip on the road and begin to spin or skid just a little, a slight amount of gravel will be displaced. After this is repeated a number of times, the material will align itself into the washboard pattern. A U.S. Forest Service study has shown that light vehicles with small wheels and light suspensions cause more washboarding than trucks.

3. Poor quality gravel

There are several things to consider in determining quality. Washboarding will almost certainly develop if the surface gravel has poor gradation, little or no binding characteristic, and a low percentage of fractured stone.

What can we change?

We cannot predict rainfall, and in some areas prolonged dry weather can be expected. With the exception of a few special situations, it is cost prohibitive to haul water. The amount of moisture available is something we cannot change.

It is all but impossible to change the driving habits of people either. Some departments have made an effort to educate the public in this matter. The results have been disappointing. People are generally in a hurry and will continue to accelerate hard, drive fast, and apply their brakes firmly.

Of the three major causes, it becomes obvious that gravel is the only one that we can change. In prolonged dry weather, almost any section of road with a high traffic count will develop some corrugation, but good gravel will definitely reduce the problem.

What is good gravel?

Good surface gravel should have a nice blend of stone, sand, and fines. Generally, the maximum size stone should be 3/4 inch. Crushed gravel that has a high percentage of fractured stone will have much better aggregate interlock and will stay in place on the road surface better than rock with a naturally rounded shape. This also gives the road better strength. There must also be a good mix of sand-size particles and fines. The ideal blend produces a gravel that will compact into a dense, tight mass with an almost impervious surface. This will reduce washboarding dramatically.

Perhaps the least understood factor in obtaining good surface gravel is the right percentage and quality of fine material. This is the percentage of material that passes the #200 sieve. In order to resist washboarding, the gravel must have a good cohesiveness or binding characteristic. There are commercial binders available, but in South Dakota we generally rely on natural clays. A true clay, when it is separated down to individual particles, will be so fine that you cannot see the individual particles with the naked eye. These particles, when exposed to moisture, will

“In prolonged dry weather, almost any section of road with a high traffic count will develop some corrugation, but good gravel will definitely reduce the problem.”

cling together tightly, and this is what we want in our gravel.

However, some fines can also fall into the silt category and will not give the cohesive characteristic needed. The only way to determine which type of fines you have is to do one further test. The result of that test is called the plasticity index (PI). This test must be performed in a lab, but it is very valuable. Fine material that has a low PI or is actually nonplastic will not perform as well in the field. While you may be able to compact it into a dense mass, it will loosen more quickly under traffic and will cause more dust in dry weather.

The sampling and testing of gravel is the only sure way to determine gravel quality. Gravel that is short of stone will not have strength in wet weather. Too much stone will make the gravel hard to compact and it will “float” in dry weather, piling up between the wheel tracks and along the shoulders. Too few fines will not allow the gravel to form a crust, but excess fines will make the road slick in wet weather. Testing is the answer to reduce these problems.

Work to obtain good gravel

Obtaining good gravel in the field is the real challenge. Yet this is the place to begin fighting washboard problems. Start by establishing good specifications. We generally see close control of materials used in the base and the asphalt or concrete on our major constructions projects. However, when surface material is produced for the “plain old gravel road,” very little attention is given to the specification. We have seen everything from no specification at all to a few cases where very good specification is established. The difference in how the material performs on the road is dramatic!

The real keys are to increase your knowledge of materials and then follow through by specifying what you want. Make this clear before you let bids for crushing and/or supplying gravel. Communicate with your supplier. Some pits or quarries do not have a good natural blend of material. In some cases, material such as clay or stone may have to be hauled in and blended at the plant. However, material can often be improved by simply working the pit differently.

Sometimes changes have to be made while the material is being produced. We are aware of one situation where clay on the surface of a pit became too

wet to process through the crusher. The contractor and the buyers agreed on an arrangement to rent an ag tractor and chisel plow to use for drying the clay quickly in order to process it into the gravel. This increased the cost of the material, but they knew the long-term benefit would be better gravel that would require less blading, would remain bound and stay in place longer, and would reduce washboarding.

Don't overemphasize a cheap initial cost for material. You will pay either way: by purchasing cheaper material up front, spending more to maintain and replace it over the years, and taking more complaints from the public, or by paying more for quality material that requires less maintenance, lasts longer, and generates fewer complaints. Remember also that trucking is often 70 percent or more of the total cost of gravel placed on the road. Spending more to increase the quality of the gravel itself does not change the total cost as much as you might think.

We also understand that truly good quality gravel is very hard to obtain in certain areas. At the very least, you should consider hauling the best material you can find to real washboard trouble spots. Use regular material available to you for the rest of the road system. For example, one township in South Dakota used millings (recycled asphalt) near busy intersections and found that this material reduced washboarding dramatically. They certainly could not afford this for the whole road system, but they found it cost effective for troublesome areas. ■■

“... gravel that will compact into a dense, tight mass with an almost impervious surface ... will reduce washboarding dramatically.”

Corrugations that extend from one side of the road to the other create headaches for drivers, motor grader operators, and road superintendents.



Getting rid of washboards

This article was adapted from Special Bulletin #29 in the summer 1998 issue of The Connection, the technology transfer newsletter published by the South Dakota Local Technical Assistance Program.

Ken Skorseth, Field Operations Manager, South Dakota Local Technical Assistance Program

This article is part of a continuing series of tips for motor grader operators.



IT IS NOT ALWAYS possible to haul new and better quality gravel to reduce our washboarding problems. What can a grader operator do to reduce the problem? Once again, the operator has to do whatever is possible to change the material. Simply blading over washboards and filling the depressions between the ridges is almost useless. The best way to handle this is to cut all of the material loose to a depth of one inch or more below the bottom of the washboard area. This also brings up some fines to mix with the surface material. Then re-lay the material to the proper crown and shape. But remember that one cause of washboarding is dry conditions. This should never be done without good moisture in the material. It may pay to quickly run to the problem areas after a good rain, work them, and then resume normal blading.

Another useful tool is the replaceable bit-type cutting edge. This type of cutting edge tends to have a shallow scarifying effect and makes it easier to cut material loose and mix it. One of the most effective ways we've seen these used is on a front mounted dozer blade. The operator can drop the dozer to cut out a washboard area and use the moldboard to shape the area. The use of a conventional scarifier also works, but be careful about going too deep and bringing up dirt and large rock from the subgrade. This will contaminate the gravel.

Another method in trying to change the gradation of material is to pull in material from the shoulder area of the roadway and mix it with the loose gravel

on the surface. This works best in the spring before too much vegetation grows on the shoulder and moisture is present. This material is generally not the best binder, but it does have some benefit in restoring some fines to the gravel.

There are also a couple of more advanced methods that work well, but are probably affordable only in high traffic locations. One of these is treatment of the gravel with either calcium or magnesium chloride. These products are not binders, but they are a tremendous aid in keeping gravel in place. They work by simply drawing moisture from the air. The real key to success with these products is to treat gravel that has a very nice gradation, particularly a good natural binding characteristic. The chlorides then take over by keeping the surface slightly damp and the gravel will remain tightly bound.

The other method is to use reclaimed asphalt as part of your surface gravel. This product is not available everywhere, but as more of our pavements reach the end of their lives, they are being recycled in various ways and the material is sometimes available to local agencies. It is usually a high quality product. We have seen the best results with a 50/50 blend of recycled asphalt and virgin gravel. In this mix, the asphalt becomes the binder and the material usually has a good binding characteristic and will resist washboarding, yet it can still be worked with a grader. It should be placed at a minimum compacted depth of three inches. If this is not affordable for a whole section of road, it works well in trouble spots.

Here is another tip. When placing new material on a washboarded area, always cut and rework the area before adding the new material. If this is not done, the washboard pattern in the original surface will invariably reflect right up to the new surface and your problems begin all over again. It is also important to have the road properly crowned and shaped. Sometimes the original material will have to be cast to the side and used as shouldering material since adding a depth of new material will make the finished surface too high.

There are some things we can do on the road to modify the gradation of gravel by scarifying, pulling more fines from shoulders, etc., but the real key is to make a great effort to get a high quality surface gravel in place, particularly in washboard-prone areas. With high traffic in prolonged dry periods, even this will not guarantee elimination of washboarding, but it will definitely reduce it. There will also be a real bonus in reduced blading requirements, less material loss from whip-off, and less dusting. ■

When the dust flies like this, it's probably too dry to do extensive maintenance on gravel roads.



Time's running out



IF YOU HEAR a ticking noise, it's probably the countdown to the year 2000, when many computers will decide to call it quits. Because so many older computer models can read only the last two digits of the year, the year 2000 (or "Y2K") will be read as 1900 instead, effectively bringing to a halt scores of non-upgraded systems throughout the world. This date discrepancy also can disable embedded computer chips, which operate millions of structures such as climate control and security systems. Programmers are racing to fix the problem before the ball drops in Times Square less than two years from now.

In late July 1998, Deputy Transportation Secretary Mortimer Downey warned an assembly of transit and traffic representatives that "the delays and risks to safety are potentially enormous" if local transportation agencies do not become Y2K compliant in time. His comments painted future scenes of failed traffic lights and unmanaged bus and train schedules. Downey added that several categories of funding under the recently passed highway bill could be implemented for the upgrade process.

In addition to transportation, other government agencies are beginning to take note. The State of Minnesota, for instance, has issued a *Best Practices* handbook that breaks down the process of identifying, funding and correcting its governmental noncompliant technology. At the Iowa Year 2000 Project Office, Director Paul Carlson says that the state began addressing this problem early in 1997. Some Iowa state offices, alerted by their use of projection analysis data, have been anticipating the Y2K conversion for quite some time. Thirty State of Iowa agencies have developed their own procedures to make their technology compliant, with Maryland firm CTA Incorporated assessing the overall effort.

Carlson emphasizes that hiring a third party secures a more precise result. "The check and balance system is very important in this process," he says. "I think it's the only way to manage this project."

The State of Iowa has appropriated \$20 million towards the effort, in addition to the \$4.5 million from federal funding. Carlson says it is money well-spent. "This is something that can't be avoided. You can't use the economy model to address this issue."

In scheduling the process to upgrade its technology, the state has established a March 1, 1999 deadline for its most critical operations (such as issuance of driver's licenses, unemployment notifications, and tax processing) and a June 1, 1999 deadline for its other operations. CTA monitors each step in an agency's operating procedure and administers a final test to ensure successful technology compliance.

On a local level, Iowa counties are working steadily toward their respective upgrade agendas. Story County Information Systems Director Bob Olson explains that the county began addressing Y2K over a year ago. "First we had to determine the critical components in our system's hardware, operating system and [software] applications," he explains. "We looked at what was already compliant, what was compliant with restrictions, and what upgrades were necessary."

The county established specific timetables for its objectives and intends to be 85 percent compliant by the beginning of 1999. Olson adds that "we'll be 99.9 percent ready" when Y2K finally arrives. "We've taken [the computer system] through all sorts of tests, moved up the dates to see what works and what doesn't," he says. In terms of working within a governmental budget, "We fund bits and pieces every year until the final switchover."

Y2K won't fix itself, no matter how it's perceived. "Some say this isn't a computer problem anymore, it's a management problem," muses Chris Pirillo, whose electronic magazine, *Lockergnome*, covers breaking news in technology. "But the ramifications go beyond your home. This is about community, city, state, country, and international problems. We have small solutions in place, but they're equivalent to someone using a bucket to try to empty out the *Titanic* before it completely sank."

A list of state Web sites concerning Y2K can be found at www.yahoo.com/Computers_and_Internet/Year_2000_Problem/Government_Policy/U_S/_U_S_States/. Another site that lists Year 2000-related vendors is located at www.year2000.com. ■

Learning about Y2K

WHILE governmental agencies work to upgrade their systems, what should you be doing at home to prepare for the new millennium? Will your personal computer still work? The following Web sites offer helpful advice on Y2K preparation, both personal and technological:

www.cnet.com/Content/Reports/Special/Y2K/

CINet monitors and discusses Y2K's impact on personal computers and software.

www.sitewave.net/y2ksb/

At Y2K Immunity, there are several links to related sites, a search engine, and commentary on the situation.

www.nstl.com/html/yemark_2000.html

NSTL offers a free, downloadable testing program for computer hardware.

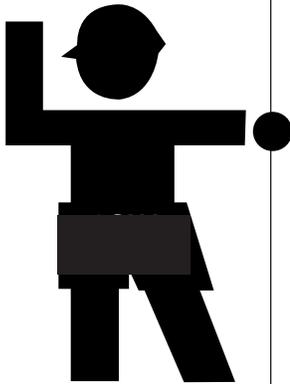
www.zdnet.com/pcmag/special/y2k/index.html

PC Magazine has established a resource center for anyone with a personal computer concern.

www.y2ktimebomb.com/

Westergaard Year 2000 is an extensive site that addresses economic, industrial, litigious, and personal Y2K issues. ■





MUTCD and low volume roads

Tom McDonald, Safety Circuit Rider

THE MANUAL on Uniform Traffic Control Devices (manual or MUTCD) is being completely revised and improved by the Federal Highway Administration (FHWA). That seemingly overwhelming task has been underway for several months, with completion and publication anticipated by 2001.

New look for manual

The new edition (last fully published in 1988) will feature rewritten, up to date text, and the actual style and format of the document will also be new and easier to use. Instead of a single, bound copy, the new manual is proposed to consist of a three-ring binder with an 8 1/2-inch page size containing each of 10 parts printed individually. Not only could the parts be removed and later revised as needed, but each could be purchased separately, depending on users' needs and interests.

The text of the new MUTCD will be presented in columnar form with four categories: standards, guidance, options, and support. The first three categories relate to the shall, should, and may conditions currently featured in the 1988 edition. This format should ease the task of identifying different situations in design, location, and application of traffic control devices.

In addition, although rewritten sections will feature dimensions in both English and metric units for review and comparison purposes, it is antici-

pated that the final edition of the manual will utilize only metric measurements.

Several revised sections of the MUTCD have been completed or are nearing that stage. These include Parts I, III, IV, VII, and VIII. Part II, Signs, the largest category, will be broken into separate parts for review and comment.

Low volume roads

One issue of particular interest and excitement for counties is the proposed development of Part V, Traffic Control Devices for Low Volume Rural Roads. Although the current edition of the manual includes reference to low volume applications, specific recommendations for the type of roadways counties deal with on a daily basis were absent. Now with this new section, the manual will directly address traffic control needs on our truly low volume rural roads. Discussion will include sign descriptions, placement, and types as well as markings and railroad crossings. Early draft versions of Part V have been made available, and it is anticipated that the entire section will be included in the Federal Register for comment this fall.

Comments and information

Those with interest in this subject should watch for notice of publication and submit comments. Additional information on this and many other areas of interest in transportation can be accessed on the FHWA website at www.ohs.fhwa.dot.gov, or call Jim Hogan at the FHWA Division Office in Ames, 515-233-7305, or Tom McDonald at CTRE, 515-294-6384. ■■

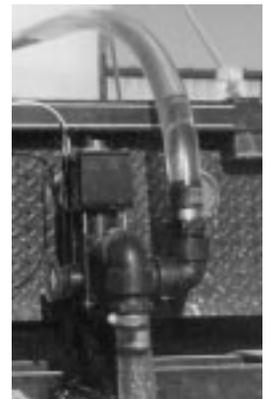


Simple calcium chloride tank

THE DES MOINES County Secondary Road Department developed a simple, low-cost anti-icing tool. Employees set up a calcium chloride distributor on a one-ton work truck they had in service. They used a 250 gallon tank set on a wooden pallet that they can handle with a fork lift. All quick couplers were used from the tank to the distributor bar that is mounted in a two-inch square receiver hitch (see photo at right). A cab switch

controls the 1 1/4 inch 12-volt plunger valve.

For more information about setting up your own calcium chloride anti-icing tank, contact Richard Mapel, general superintendent, 319-753-8154. ■■



Photos courtesy of the Des Moines County Secondary Road Department.

Value of a good snow policy



EL NIÑO wreaked havoc with snowstorms and ice, and although it will be gone next winter, it's a safe bet that bad weather will return. That's why a municipal snow and ice removal policy is so valuable; it establishes a uniform procedure for maintenance operators and anticipates possible litigation scenarios in the future.

In 1984, Iowa Code mandated that the state or municipality could not be held liable if it could demonstrate fulfillment of its snow and ice policy, prompting many local agencies to commit their procedures to paper. Iowa's Johnson County Board of Supervisors passed a snow ordinance a year later concerning its secondary roads. County Engineer Mike Gardner says little change was necessary between the procedure already in place and the newly approved ordinance. "All counties were moving towards this," he explains. "We just put down in writing what was already in practice." That the policy has remained unaltered for thirteen years speaks to its effectiveness.

Iowa Code also states that "The county engineer . . . shall adopt such methods and recommend such personnel and equipment necessary to maintain continuously, in the best condition practicable, the entire mileage of said system" (309.67). Accordingly, Johnson County maintenance staff attend an annual in-house review of its policy, and participation is encouraged at the winter training expo held every year at Iowa State University (see page 11).

Although it's located within Johnson County, Iowa City maintains its own policy to address its unique needs. The current policy was passed in 1984, but Public Works Director Chuck Schmadeke says that two removal routes have since been added to accommodate Iowa City's growth and development.

When drafting the policy, important considerations included "timing, such as how quickly we get vehicles out on the street, clearing the hospital and bus routes, assigning what equipment will be available and when, and when we start operations," Schmadeke says.

To be a helpful legal document, a carefully detailed policy makes all the difference. City of Clive (Iowa) Public Works Director Willard Wray emphasizes this trait in his 1996 article to the *APWA Reporter*, describing specificity in a snow removal procedure as "vital," "critical" and "very important." Johnson County's policy, for example, envisions many probable scenarios, from its standard "sequence of service,"

which places road types on a priority list for snow clearance, to filing a claim for a mailbox that's been damaged by a snow plow.

Lawsuits aside, a well-written policy also addresses the relationship between a municipality and its residents by clarifying the objectives during snow removal, the responsibilities of the maintenance operators, and the procedure for submitting any suggestions or complaints. This reduces misunderstandings or frustrations that might otherwise develop into a litigious situation. Schmadeke said he could not recall of suit being filed against Iowa City in regards to its policy.

There is a general consensus as to the criteria for a successful snow and ice removal policy. High on the list is a priority schedule, including which roads will receive attention first and the intended results. Most policies also specify the hours in which maintenance vehicles will be in operation. A list of the materials and equipment that will be used in the removal process is also important, as are disclaimers.

Iowa City's policy, for example, has two teams of maintenance operators, each responsible for a 12-hour shift. Team captains are assigned each fall before the onset of bad weather.

Another critical policy component is an established communication network between municipal representatives and the public, which Wray advises is "a technical, and not a political call. Assign all responsibility for monitoring conditions, weather reports, and media notification." Keeping the public apprised of the snow policy alerts traffic to the existence of maintenance equipment and encourages residents to clear obstacles from the equipment's intended paths. ■■



A good snow policy clarifies snow removal objectives. ■■

Snow policy resources

THE FOLLOWING sources (including index numbers) are available from the LTAP library at the Center for Transportation Research and Education (CTRE):

"ISAC Model Ordinance—Snow and Ice Removal" (P1295) describes the Iowa State Association of Counties' policy in clearing and maintaining roads during inclement weather.

The Federal Highway Administration's 1991 research report, "Safety Restoration During Snow Removal—Guidelines" (P763) discusses the dangers of nonfunctioning highway safety features during a snow removal procedure and how these dangers can be addressed.

For more information on these and other materials, contact Stan Ring, CTRE's library coordinator, 515-294-9481.

In addition, many snow removal policies are available online, such as Johnson County's secondary roads policy at www.jccn.iowa-city.ia.us/~jcgovis/secondaryroads/snow_policy.htm and the Jones County (Iowa) site at www.netins.net/showcase/jonescounty/. ■■

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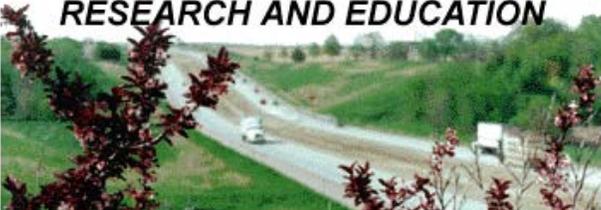
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Library catalog on-line

LIBRARIAN Stan Ring reminds readers CTRE’s tech transfer library catalog is easily accessible through CTRE’s World Wide Web site. Users can search the catalog for topics or titles, read abstracts of holdings, and order library materials, all on-line. Check it out at www.ctre.iastate.edu/. ■■

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September 1998

		Location	Contact
1	9th Annual Iowa Snowplow Rodeo	Ames	Duane Smith 515-294-8103
2-3	2nd Annual Iowa Winter Training Expo	Ames	Duane Smith 515-294-8103
13-17	APWA International Congress	Las Vegas	Duane Smith 515-294-8103
17	Midwest Maintenance Innovations '98	St. Joseph, Missouri	Clif Jett, MoDOT 573-751-2838
28 & 30	GIS and Improved Local Decision-Making Workshop	ICN sites	Linda Kennedy, ISU Extended and Continuing Ed. 515-294-8397
29-30	Midwest Concrete Consortium Fall Meeting	St. Louis, Missouri	Jim Cable 515-294-2862

October 1998

7	Transportation Agencies and the Internet: A Satellite Workshop, Session One	various downlink sites	Duane Smith 515-294-8103
14	Transportation Agencies and the Internet: A Satellite Workshop, Session Two	various downlink sites	Duane Smith 515-294-8103
14-15	Iowa Secondary Road Maintenance Supervisors Association Annual Conference	Ames	Sharon Prochnow 515-294-3781
21	ASCE/ICEA Surveying Conference	Ames	Duane Smith 515-294-8103
22-23	ITCSA Fall Conference	Ames	Tom McDonald 515-294-6384

November 1998

4	ASCE Transportation Conference	Ames	Duane Smith 515-294-8103
5	Better Concrete Conference	Ames	Duane Smith 515-294-8103
10	ICPA Concrete Pavement Restoration Workshop	Council Bluffs	Duane Smith 515-294-8103
12	ICPA Concrete Pavement Restoration Workshop	Des Moines	Duane Smith 515-294-8103
13	ICPA Concrete Pavement Restoration Workshop	Davenport	Duane Smith 515-294-8103



conference
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Fun in the sun before the snow flies

Iowa Snow Plow Rodeo and Iowa Winter Training Expo September 1-3, 1998 Iowa State Center (Scheman Building and Hilton Coliseum) Ames, Iowa

YOU'LL SEE BIG CHANGES in this year's Snow Plow Rodeo, Tuesday, September 1. The course is longer and more complex, all drivers will compete in a neutral vehicle rather than in their own trucks, and the championship round has been eliminated.

After Snow Plow Rodeo participants have completed the driving course, they may want to try their skills in a Motor Grader Rodeo which will be held concurrently with the Snow Plow Rodeo. Motor graders will be provided.

Stick around September 2-3 for the Iowa Winter Training Expo. Learn about taking care of snow removal equipment; choosing and applying chemicals and abrasives, while protecting the environment; keeping roadways dry with anti-icing strategies; plowing snow with V-plows and handling big drifts; and dealing with the stress of long hours fighting winter storms and juggling family life. Like last year, you'll have plenty of opportunities to swap ideas with your peers and visit equipment displays and demonstrations.

Registration materials are in the mail. You can also view the registration brochure online at www.ctre.iastate.edu/whatsnew.htm. The expo is sponsored by the Iowa Department of Transportation, Iowa County Engineers Association, American Public Works Association, Iowa Secondary Road Maintenance Supervisors Association, and the Center for Transportation Research and Education. ■■■

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