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## Quick, simple, effective scrub seal



THE MISSOURI Department of Transportation (MoDOT) showed off its scrub seal maintenance treatment during the Iowa Summer Maintenance Expo April 19.

MoDOT implemented its first scrub seal in 1996 with the support of the Federal Highway Administration's Office of Technology Applications. By the end of the 1999 construction season, MoDOT will have added 250 miles of scrub seal, for a total of 500 miles.

Scrub seal material is an anionic charged, polymer modified, asphalt agent that is applied to asphalt

pavement surface. The material rejuvenates a dry, oxidized, and cracked surface, but it does not improve the structural condition of the pavement.

The process is simple. The oil-based agent is sprayed on and then scrubbed into cracks and voids by a truck dragging a 12-foot wide, X-shaped tool with about three dozen broom heads attached. The asphalt is quickly followed by a layer of small aggregate such as sand or cinders, which is scrubbed into cracks and voids by a second broom. A pneumatic tire roller then rolls the seal. Under ideal weather conditions of 70–90 degrees F. (air temperature), the road can be opened to traffic within two hours.

Compared to other preventive maintenance treatments such as a one-inch hot mix overlay or a chip seal, a scrub seal is faster to apply. It lasts about four years, and it's basically maintenance free. At about \$3,000 per mile, scrub seal is also significantly cheaper. The downside? Since it's meant as a preventive maintenance treatment, it is only appropriate for pavements in sound condition.

For more information, contact Ivan Corp, senior research development engineer, MoDOT, 816-889-6403. •



The first truck (left) sprays the asphalt agent and scrubs it into the pavement. A second truck follows, spreading sand and scrubbing that into the pavement as well.



### We're moving!

In late June the Center for Transportation Research and Education is moving to a larger space across the street. Our new address is 2901 S. Loop Dr., Suite 3100, Ames, IA 50010-8632. Our phone and fax numbers stay the same.

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. 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, to improve the quality of life for Iowans.

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nameplate was designed by  
Jennifer Reed.



## A heavy burden: Overdimensional/overweight permits



LEARNING the hard way about overdimensional/overweight permits is a costly lesson for haulers. While the fee in Iowa for a single-trip permit is \$10, a permit-less vehicle may incur much more expensive fines.

The Iowa DOT Office of Motor Carrier Services (MCS) wants haulers to know that they must have an overdimensional/overweight moving permit whenever their size or weight exceeds legal standards. Iowa Code 321E defines three types of overdimensional/overweight permits: annual, single-trip, and multi-trip. Each permit has particular restrictions governing weight, dimensions, and length of validity (see related article on this page).

"It's really important to get the word out about these permits," states Story County financial data technician Angie Sheeley, who is experienced with the permit application paperwork. "A lot of people aren't even aware they need one, and some get ticketed before they realize it."

As an educational effort, MCS devotes part of its annual statewide seminar to a discussion of permits, and its representatives work with counties when a legislative change has affected the permit application process. It was during an MCS fall seminar that Sheeley learned about the intricacies of the permit types, the laws governing the process, and other permit concerns such as axle weights and road dimensions (for example, a vehicle or load more than 8 feet 6 inches wide must have a permit). All of these issues must be

considered whenever one of Story County's roads and bridges is subjected to a particularly heavy or sizable vehicle.

To initiate the overdimensional/overweight permit application process, commercial and private enterprises solicit either their county or the state, depending on the roads intended for travel. While some Iowa counties have varying application forms, some share the same forms as the state. Sheeley says that the dimensions and weight and the routes that will be used are primary determinants of the type of permit needed.

No matter the permit type or route itinerary, though, most operators of large and heavy vehicles agree that well-preserved roads and bridges are important to a business's efficiency. And with the governor's recent approval of a law aimed at improvements of husbandry (see article on page 3), more overdimensional/overweight vehicles will be contributing to the preservation effort.

To learn more about overdimensional/overweight permits, contact MCS at 515-237-3264 or visit its web site at [www.state.ia.us/government/dot/mvd](http://www.state.ia.us/government/dot/mvd).



Once this oversize load reaches a road, it will require a special permit.

### Permit review

IOWA CODE 321E stipulates three types of overdimensional/overweight permits and the particular requirements of each. The following is a general description of annual, multi-trip, and single-trip permits:

Annual Permits: to travel on state highways

All-System Permits: to possess a variant of the annual permit; to travel on state highways (unless

restricted by embargo maps or posted limits) and specified city streets and county roads

Multi-Trip Permits: to carry indivisible loads, including construction machinery, mobile homes, and factory-built structures

Single-Trip Permits: to transport exceeding statutory size or weight limits from the point of origin to the point of ultimate destination

## Bridges v. implements of husbandry



A MAY 20TH editorial in *The Des Moines Register* hailed a recently signed state law “that will put the Iowa Code in harmony with gravity” by requiring implements of husbandry to comply with weight embargoes posted on bridges. After July 1, 2001, certain newly manufactured implements of husbandry, including tank wagons and grain carts, must also comply with legal weight limits on Iowa roads. Equipment manufactured before that date is “grandfathered in” and exempted from restrictions until July 1, 2005.

Iowa Governor Tom Vilsack signed House File 651 the same day a weight-embargoed Boone County bridge collapsed as a tractor and field cultivator crossed over. Both the equipment and bridge ended up in Beaver Creek. Fortunately, no one was seriously injured, but the incident fuels the argument that overweight vehicles severely stress Iowa’s roads and bridges. The Iowa Department of Transportation and the Iowa County Engineers Association, along with many individuals, have been concerned with this issue for a number of years.

As for the bridge that once spanned Beaver Creek, it had been slated for reconstruction this fall until its unexpected collapse prompted rescheduling a closer work date.

More information about legislation regarding implements of husbandry can be found at the ICEA Service Bureau web site, [www.iceasb.org](http://www.iceasb.org).



A Boone County bridge was no match for the tractor and field cultivator that crossed on May 10, causing the equipment and bridge to fall into Beaver Creek. *Photo courtesy of the Boone County Engineer.*

## Apply for a “smart growth” grant

COMMUNITIES that would like help solving interrelated problems involving transportation, land development, environmental protection, public safety, and economic development can apply for grants through the Transportation and Community and System Preservation program (TCSP).

TCSP was established in the Transportation Equity Act for the 21st Century (TEA-21). The program is administered by the Federal Highway Administration (FHWA).

“This financial tool will help make communities more liveable by preserving green space, easing traffic congestion, and employing ‘smart growth’ strategies,” says U.S. Department of Transportation Secretary Rodney Slater. “Through funding like this, we can protect our environment while growing out economy . . . .”

TCSP funds will be used to help achieve locally determined goals such as improving transportation efficiency; reducing the negative effects of transportation on the environment; providing better access to jobs, services, and trade centers; reducing the need for costly future infrastructure; and revitalizing underdeveloped and brownfield sites. Grants also can be used to examine urban development patterns and create strategies that encourage private companies to work toward these goals in designing new developments.

Thirty-five proposals totaling \$13.1 million will receive funding this year. The projects were selected from an initial pool of 524 applicants and evaluated by a multidisciplinary panel from the Environmental Protection Agency, the FHWA, the Federal Transit Administration, and the U.S. DOT’s Research and Special Programs Administration.

The deadline for fiscal year 2000 grants is July 15, 1999. For more information about the program, contact John Cater, FHWA TCSP field coordinator in Iowa, 515-233-7315, [John.Cater@fhwa.dot.gov](mailto:John.Cater@fhwa.dot.gov). See also the program’s web site at <http://tcsp-fhwa.volpe.dot.gov/index.html>.

### LTAP Advisory Board

The people listed below help guide and direct the policies and activities of the Center for Transportation Research and Education’s Local Technical Assistance Program (LTAP). The board meets at least annually.

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

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Iowa Department of Transportation  
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Center for Transportation  
Research and Education

## The changing face of Iowa's gravel roads, part 2

Part one of this two-part series explored the decision process of paving a gravel road. Part two examines how local transportation agencies are facing the challenges of Iowa's shifting population and the impact on gravel roads.



RURAL COUNTIES facing little growth in funds for their secondary road departments need to be innovative as they juggle maintenance costs for their gravel roads.

### Financial pressure

Hamilton County wants to put more money and effort into its better roads by closing or downgrading about 70 miles of gravel roads. "We're trying to cut down the miles we maintain so we can maintain the miles we've got *better*," says Rod Rockman, Hamilton County supervisor.

The roads under consideration are not heavily traveled; most segments are traveled by five to 50 vehicles per day. A glance at the plat map shows that the roads are scattered around the county, and a few segments are county line roads.

Hamilton County Engineer Nicholas Konrady would like to convert about 42 miles of gravel roads to class B roads. Konrady proposes creating two different levels of class B roads. Type B1 would be maintained as granular surface roads with "spot type applications at our convenience," Konrady says, and no snow plowing. Type B2 roads would be allowed to revert to dirt. The county currently has 2.2 miles of class B roads.

Miles Butler, chair of the Hamilton County Board of Supervisors, is more concerned with the reclassifications than the vacations. Converting roads to class B would mean that those roads are essentially closed five months of the year.

Konrady sees potential savings in liability claims with class B roads. As long as a road designated class B meets the minimum standards of that class, there is no liability. Motorists use the road at their own risk.

Criteria for selecting the proposed vacations and downgrades were that 1) no one lives on these roads. There are a couple of grain bins but no hog confinements. 2) The condition and plowing needs of the roads are such that they're expensive to maintain. 3) The roads are out of the way of travel demands.

For the sections of county line gravel roads, the Hamilton County Board of

Supervisors is working with the adjacent counties' boards to work things out. Once the Hamilton County board has adopted and published the ordinance that sets up a level B system and the procedures for adding roads to it, the hearing process can begin. One public hearing will be held for all the reclassifications to class B.

Registered letters will be sent to surrounding landowners notifying them of the proposed vacation, and then public hearings will be held for each proposed vacation. Hearings will be conducted this summer and early fall.

Konrady says that one trade-off the county is making by eliminating mileage from the road system is that the county is also limiting its needs, albeit slightly, for the next Iowa Department of Transportation needs study.

### Political pressure

As one of a handful of Iowa counties expected to grow significantly in the next 20 years, Johnson County is struggling with issues of land use, development, and the impact on the county's roads. During the last 30 years, says Jeff Davidson, director of the Johnson County Council of Governments (JCCOG), the "formerly rural agricultural areas in Johnson County have experienced a population boom of unprecedented magnitude."

Most of the growth is in the North Corridor, an unincorporated area of about 50 square miles north of Iowa City/Coralville and east of I-380. The North Corridor is characterized by the Iowa River valley topography, which is both beautiful and marginal for agriculture, and it is "virtually all zoned residential," Davidson says.

The residential zoning causes property owners and land speculators to have certain expectations, Davidson says, such as having safe public roads. While developers pay for all the streets (and other infrastructure) within their developments, they rarely kick in any extra for improving the public roads. The obvious problem,



Some of the gravel roads Hamilton County would like to downgrade are county line roads. The Hamilton County Board of Supervisors met with neighboring county supervisors and engineers to discuss the issue.

Clockwise from bottom left: Donovan Olson, Boone County supervisor; Nicholas Konrady, Hamilton County engineer; Rod Rockman and Dick Barkema, Hamilton County supervisors; Harold Jensen, Story County engineer.

Davidson says, is that tax revenue from “development doesn’t pay for needed road improvements.”

The American Farmland Trust summarized the results of 58 cost-of-community-services studies done during the 1990s. The studies, which are snapshots in time, compared the cost of public services for commercial, agricultural, and residential uses in states all across the country, including Minnesota and Wisconsin. In unincorporated areas, for every dollar of tax revenue generated by commercial or agricultural land uses, 25–75 cents worth of services were needed. For every tax dollar generated by residential uses, services cost \$1.10–1.35.

Davidson says the land use question in Johnson County comes down to two options for the board of supervisors: 1) commit to providing the needed road improvements in areas zoned residential or 2) downzone certain areas where road improvements would be too costly. Either option puts board members in a difficult political situation.

Last year the board asked the JCCOG to study several roads experiencing development pressure, with the possible result of developing a county road management system that would help the board make decisions about rural subdivisions based more on fact than emotion.

The case study included data about existing and projected traffic volumes, the 85th percentile speed, the percentage of trucks, the road’s surface type (three were gravel and one was chip seal), the horizontal and vertical geometries, the accident history, the road surface condition (including recommendations about reconstruction), and preliminary cost estimates. Paving these roads would cost several hundreds of thousands of dollars or more, depending on the design. Davidson says the density of residential development in the rural county is creating the need for streets formerly thought of as more appropriate for a city.

The board of supervisors appreciated having the information, Davidson says, but chose not to adopt a road management system. Even if the county adopted such a system, there are such big differences among roads, he says, that they’d still need to “look at each road on an individual basis.” Davidson says his office is evaluating five additional county roads this year.

### **Scott County’s approach**

Scott County is successfully managing growth, the resulting land use, and the impact on the county’s transportation infrastructure in large part through the county’s development plan, land use regulations, and the continued, across-the-board support of county residents.

Larry Mattusch, Scott County engineer, says the zoning laws don’t allow subdivisions on gravel roads, and that “works well for us.” Mattusch says there are plenty of places to build along a paved road in the unincorporated parts of the county.

In 1949 Scott County became the first county in Iowa to adopt a zoning ordinance, which allowed single-family homes with a minimum lot size of 30,000 square feet (.69 acres). During the 1970s when environmentalism was on the rise, a chapter of the League of Women Voters gave a slide presentation to the Scott County Board of Supervisors about the problems of rural subdivisions. This combination of factors helped move the county to greater land use regulations, revised zoning ordinances, and a development plan, says Tim Huey, Scott County planning director.

The county adopted its first subdivision ordinance in 1979 “to encourage orderly development and provide for the installation and enforcement of standards for public and private improvements to serve those developments.”

During the 1980s Scott County adopted land use policies and revised zoning ordinances with the overall goals of protecting prime farmland and guiding growth and development to areas of the county deemed most appropriate. Rural housing developments were encouraged in four main areas of the county, primarily the land along the Mississippi River. Since 1993 75 percent of building permits have been issued for new homes within those four townships, and 25 percent in the other nine townships. According to Huey, this is evidence of Scott County’s success in directing growth.

The county’s policies have had the support of farmers and urban dwellers since 1980, and support continues as policies are updated approximately every three years. Huey says he still finds “tremendous support” for the land use restrictions, especially among farmers.

According to an Iowa State University land use inventory, from 1983 to 1998 unincorporated Scott County averaged less farmland loss per year, 3,267 acres, than half the counties in Iowa. “People want to preserve our precious, rich, productive, Scott County ag land,” Huey says.

For more information about

- the American Farmland Trust, see the organization’s web site, [www.farmland.org](http://www.farmland.org).
- Scott County’s zoning ordinances, contact Tim Huey, 319-326-8643.
- Hamilton’s County’s reclassification process, contact Nick Konrady, 515-832-9520.
- Johnson County’s land management case studies, contact Jeff Davidson, 319-356-5252. •

## Workshop results

DURING the National Workshop on Sign Vandalism, participants worked in break-out sessions to explore the problem and brainstorm solutions.

### Session I: Problem Identification

- Lack of public awareness
- Lack of prosecution
- Lax penalties
- Difficulties in communicating the problem

### Session II: Solutions/Applications

- Education of the public
- Development of statistics
- Inclusion in 911 reporting
- Involvement of the insurance industry

### Session III: Future Directions

- Develop a "kit of tools"
- Establish a national clearinghouse
- Develop federal recognition

For more information on the workshop, contact Duane Smith, CTRE, 515-294-8103, [desmith@iastate.edu](mailto:desmith@iastate.edu).

## Signs of improvement

"IF YOU TAKE A TRAFFIC SIGN, you could be contributing to taking a life. And the same is true if you see that a sign is missing, but don't report it," says Jim Ellison, Pierce County, Washington engineer.

It's an alarming idea, but one that Ellison and Wil Brannon, traffic operations supervisor, have been spreading across Washington State in an attempt to stop sign vandalism. Ellison and Brannon are not alone in their efforts. Recognizing the high cost of sign vandalism—not just fiscal but mortal—transportation officials across the nation are working to deter sign vandalism and encourage public reporting of such damage.

There unfortunately exists an enduring need for a campaign to end sign vandalism. In 1996, *Technology News* conducted a nonscientific poll in which 97 percent of surveyed Iowa counties stated that they had experienced burglary and deliberate damage of 911 signs. Three years later, the high rate of sign vandalism still is a concern throughout the state, as the Iowa Department of Transportation and local transportation agencies struggle to maintain broken, defaced, and stolen traffic signs.

Nor is this problem limited to particular geographic regions. In March 1999, sign vandalism cost a Texas man his life when two cars collided at an intersection. The police report revealed that a stop sign had been removed at the intersection.

On a national level, an organized endeavor to stop vandalism was initiated with the two-day "National Workshop on Sign Vandalism: An Invitation to Make a Difference," held March 16-17, 1999 in Kansas City, Missouri. Florida prosecutor Leland Baldwin spoke to workshop participants about the 1997 manslaughter conviction of three teenagers who stole a stop sign at a major Tampa intersection. The signless intersection was the site of a collision and subsequent deaths of several young victims.

Ellison, who with Brannon attended the workshop, went with "a hope that we could change societal thinking that sign vandalism is not merely a prank. One of my

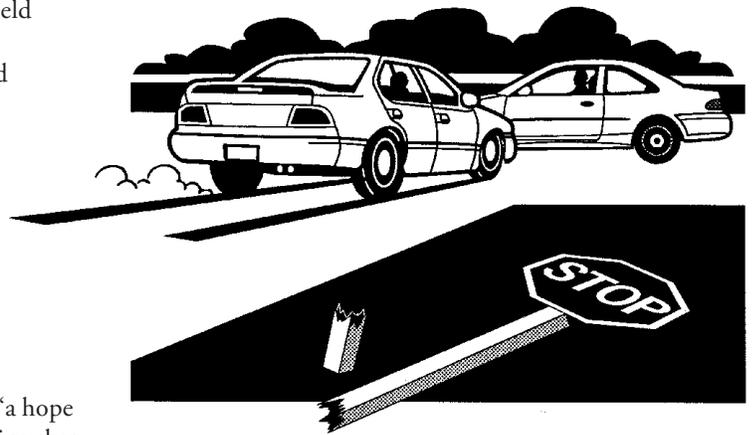
dreams is that we can start a national effort [with this workshop]."

Jim DeLozier, Taylor County, Iowa engineer, chairs a national committee on sign vandalism and was a primary initiator of the workshop. He states that the 48 attending representatives from city, county, and state transportation agencies and organizations such as the Federal Highway Administration "couldn't have been a better distribution of interests from across the nation."

"Our agenda was to create a consensus of direction for the future," DeLozier says. "The issue usually isn't seen as important enough to actually participate in, even though people do want information about it."

Ellison concurs, citing the popularity of Pierce County's award-winning video, *Stop and Think*, as an example of transportation agencies' desire to spread the word about the dangers of sign vandalism. "When people see the video, a light goes on and they realize that this is a serious issue," he says. "The workshop was a confirmation that our number one need is to educate the public."

During the first day of the workshop, participants worked in small groups to define the specific problems related to sign vandalism and develop solutions to remedy the problem. Duane Smith, associate director for outreach at the Center for Transportation Research and Education (CTRE) at Iowa State University, prompted discussion about sign vandalism by describing the results of a nonscientific national survey of state, county, and city transportation agencies. Responses indicated that a comprehensive under-



A national workshop on preventing sign vandalism was held March 16-17 in Kansas City, Missouri.

## Iowa APWA and LTAP joint outreach

by Duane Smith, Associate Director of Outreach



CITIES AND TOWNS, take note: the Iowa Chapter of the American Public Works Association (APWA) and Iowa's Local Technical Assistance Program (LTAP) are here to serve *you*.

Iowa's APWA and LTAP are partnering to provide information about their programs to Iowa's cities and towns, particularly those that may not currently be taking advantage of LTAP resources and/or the benefits of APWA membership.

This fall, the LTAP center and APWA will highlight their services at half-day meetings held around the state. City engineers, public works directors, and city administrators will be invited to find out how APWA membership and LTAP programs can help them do a better job.

Several meetings are being planned, one for personnel from Iowa's cities and towns in each of the Iowa Department of Transportation's six regions, so that no one has to travel far to attend. The agenda will begin at 10:00 and end at 2:00 to ensure that anyone making the short commute can do so during normal working hours.

APWA membership benefits include

- Educational opportunities
- Technical information on relevant subjects and requirements
- Interaction with other professionals
- Regularly scheduled meetings

LTAP resources include

- Workshops and other training opportunities
- Safety Circuit Rider activities
- Library resources
- *Technology News* and other publications

We hope you'll respond to the invitation to attend the meeting in your region and find out how APWA and LTAP can help you do a better job. •

standing of vandalism is needed to combat the estimated national \$274 million yearly price tag to repair and replace signs. This expense breaks down to an average of almost \$5.5 million per state. Most important, this figure doesn't take into account the costs of injuries and deaths due to accidents implicating sign vandalism.

Ellison explains that the difficulty in quantifying the safety impact of sign vandalism became clear during the workshop sessions. "We know from the records of local agencies about the financial cost, but it's a bit more difficult to get a handle on the safety aspect," he says. "There's no national clearinghouse, for example, to keep track of accidents where a sign was tampered with."

On the second day of the workshop, participants brainstormed solutions and application procedures to address sign vandalism in their respective states. Suggested initiatives included developing public education programs and improving communication networks among transportation agencies. The workshop concluded with a commitment to the proposed courses of action (see sidebar on page 6).

Despite the potentially mortal danger of vandalism, DeLozier points out that "it's just so hard to squeeze this issue in among the other, higher priority issues that local officials have to deal with."

Adds Ellison, "[This effort] seems like a never-ending battle and until we educate the public, the vandalism is just going to continue."

However, the workshop participants have reconfirmed their dedication to the fight by working for more public programs. Pierce County, for example, currently is pursuing funds to make its Washington-specific video relevant to any audience in the country.

For information on the efforts to combat sign vandalism, contact Jim DeLozier, 712-523-2167. For information on Pierce County's video, *Stop and Think*, contact Jim Ellison, 253-798-7250. •

## APWA/ LTAP outreach coordinators

The following APWA members will coordinate fall meetings across Iowa:

Membership Chair  
Ron Tekippe, HGM Associates

Central Iowa  
Bret Hodne, City of West Des Moines

Northeast Iowa  
John Klosterman, City of Dubuque

Northwest Iowa  
Kevin Rogers, City of Storm Lake

Southwest Iowa  
Mike Wallner, City of Council Bluffs

Southeast Iowa  
Ron Knoke, City of Burlington

East Central Iowa  
Scott Peppler, City of Cedar Rapids

Iowa LTAP center  
Duane Smith,  
Director •

## Off-street parking: The forgotten link

This article is the final one in a series by Keith Knapp. Due to the popularity of his articles, you'll be hearing more from Keith from time to time in future issues of Technology News. To suggest a specific article topic related to traffic engineering and traffic safety, contact Keith (see contact information at the end of the article).

by Keith Knapp, Manager, Traffic Engineering and Traffic Safety Programs

IN EVEN THE SMALLEST urban areas, the size, layout, and location of off-street parking facilities can have a significant influence on the operation of nearby public roadways and the success or failure of private economic development.

### Size

The size of off-street parking facilities (generally, the number of vehicles they can accommodate) should be related to parking demand. Typically, size requirements are specified in local zoning ordinances.

One approach to determining size requirements is the use of a formula that relates parking demand to a land use characteristic (e.g., so many parking spaces per dwelling unit). Preferably, such formulas are based on a significant number of local parking studies, although communities may not be able to conduct such studies due to staff and budget constraints. Also, applying this relatively strict approach may result in too few or too many parking spaces for particular developments or areas of a community.

Formulas that establish a minimum, rather than optimal, size requirement for off-street parking facilities may be preferable to ones that try to establish an optimal size. The minimum size requirement may be combined with a maximum size

limitation. This approach allows developers the flexibility to add more spaces—but not too many—for reasons of economic viability.

Flexibility of approach is the key to matching parking supply to demand, but it also requires vigilance by city staff.

Communities can find national databases and suggested zoning ordinances for parking and off-street loading spaces through the Institute of Transportation Engineers (ITE), Eno Foundation for Transportation, and National Parking Association/Parking Consultants Council.

In *Planning for Parking*, Paul Shaw found that most off-street parking ordinances in communities in Iowa, Minnesota, and Wisconsin require more—possibly excessive—parking than ITE standards.

### Layout

The layout of parking lots should be considered early in the development process. Off-street parking facilities are typically designed after the preferable building footprint or layout has been determined. This may result in the correct number of parking spaces but improper access point locations, parking lot circulation, and layout. Another approach to site design is to locate and design the access points first, followed by the parking lot and then the building footprint.

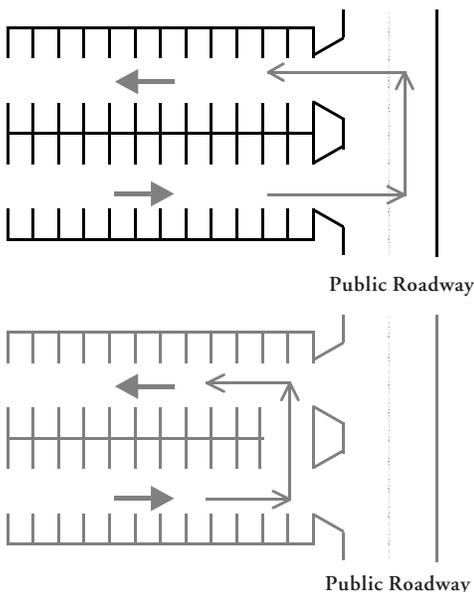
The functional layout of a parking lot should encourage traffic flow similar to a well-designed collector/local roadway system, with a parking space as the “destination.” The driveway from the arterial or frontage roadway should be considered the collector for the parking lot. For arterial operation and safety reasons, these “throat” lengths should be two to 15 car lengths, depending on development and access point characteristics. Such a design improves parking lot flow by collecting and distributing traffic to the “local street” (parking lot aisle) system.

A properly designed parking lot also allows full and smooth circulation within the facility. In other words, no parking lot circulation should have to occur on adjacent public right-of-way (see the accompanying graphic).

Also, parking lots should be dimensioned for a design vehicle. Turning radii, space sizes, aisles, and exits/entrances should accommodate the design vehicle flow even when all the parking spaces are occupied. If possible, acceptable design vehicle circulation should be verified and confirmed through the use of templates. Some of the references at the end of this article discuss parking lot geometry and design impacts of serving smaller vehicles; the impacts of the increase in pick-ups and sport utility vehicles has yet to be explored.

It should be remembered that off-street parking facilities are also pedestrian facilities. After all, the final destination of the vehicle driver is not the parking space but the “land use.” Adequate, safe, and clear pedestrian flow paths to the land use should be provided.

A well designed off-street parking facility allows full circulation within the facility (bottom) rather than on the adjacent public roadway (top).



A properly designed parking facility will not have significant conflicts between high-speed vehicles and pedestrians. That is, well designed parking facilities help drivers adjust to driving along a different type of facility and discourage drivers from using the parking facility for through trips. If at all possible, parking lot aisles should not be used by through vehicles. In many cases, speed bumps/humps or stop signs have been added to slow or stop through vehicles (and usually a percentage of non-through vehicles). This approach may result in diverting some through vehicles to another route, but it might also result in an apparent increase in congestion within the parking lot and some possible vehicle/pedestrian safety tradeoffs.

Improper vehicle flow across aisles can be avoided through the use of landscaped boulevards, but these require additional maintenance by the landowner.

#### Location

Sometimes jurisdictions must provide off-street parking facilities, especially in areas with higher density land uses. The objective should be to locate these facilities as close as possible to drivers' destinations. This is one of the reasons businesses typically want parking spaces at their front entrance. If an off-street public parking facility must be provided, however, there should be an area-wide examination of parking characteristics, including where and when parking demand exists within the area of interest. Then potential sites can be investigated at or near locations requiring additional parking spaces.

Remember that 100 percent occupancy for a parking lot may indicate a high demand for parking but may not be a complete measure of demand. More people may have wanted to park in the facility but, because it was fully occupied, have parked elsewhere. The details of parking studies are discussed in several of the references listed at that end of this article (e.g., the ITE Manual of Transportation Studies).

#### For more information

For more information about off-street parking facilities, contact Keith Knapp, 515-294-8103, [kknapp@ctre.iastate.edu](mailto:kknapp@ctre.iastate.edu).

Information is also available from organizations mentioned in this article via their web sites:

(ITE) [www.ite.org/](http://www.ite.org/)

(Eno Transportation Foundation)  
[www.enotrans.com/](http://www.enotrans.com/)

(National Parking Association) [www.npapark.org/](http://www.npapark.org/)

References used for this article include the following:

Institute of Transportation Engineers. *Parking Generation*, 2nd Edition, 1987.

Shaw, J.G. *Planning for Parking*. University of Iowa Public Policy Center, 1997.

Institute of Transportation Engineers. *Manual of Transportation Engineering Studies*, 1994.

National Parking Association/Parking Consultants Council Ordinance Standards Committee. *Recommended Zoning Ordinance Provisions for Parking and Off-Street Loading Spaces*. 1992. •

## How many spaces in a parking lot?

FORMULAS THAT TRY to match off-street parking lot supply to demand (see accompanying article) are not the only technique for determining the size of off-street parking facilities. Some communities use a laissez-faire approach. Instead of establishing ordinances for off-street parking, they assume that the economic survival of a development will force the developer to evaluate and construct an adequate number of parking spaces. Such an approach requires strict enforcement of on-street and adjacent-site restrictions. This is often cost and staff prohibitive.

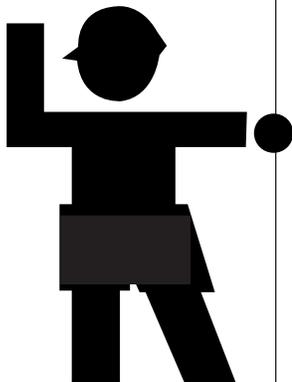
The performance standard approach offers some flexibility. Performance standard requirements usually state that the parking demand of a development must be accommodated but do not require a minimum number of spaces. Again, this approach is based on a good faith effort by the developer to determine the number of spaces needed for a land use, and it requires monitoring by city staff. The lack of specific standards in this approach, however, appears to make courts hesitant to rule for the city in judicial disagreements with the developer.

Finally, there is the minimum requirement approach. This approach requires a specific minimum number of parking spaces but allows the developer to provide more parking spaces if desired. The parking requirement is based on a variable of the land use, but no attempt is made to match parking demand to parking supply or to specify the optimum or even most desirable number of parking spaces. This approach simply guarantees that a minimum number of spaces will be constructed. One disadvantage to this approach is that the minimum number of parking spaces may be inadequate and additional spaces will need to be built by the developer or the city. The Eno Foundation for Transportation has published at least one document with suggested minimum parking space requirements. •

## Iowa's strategic highway safety plan

by Tom McDonald, Safety Circuit Rider

safety  
short



THE IOWA SAFETY Management System Coordinating Committee (SMSCC) has sponsored and supported many successful studies and reports in such areas as vehicle speed on our highways, access management, and deer-vehicle collisions. The SMSCC consists of representatives from Iowa's safety interests, including all levels of government, law enforcement, education, and other interested parties whose continued participation is critical to the ongoing success of this important safety effort in Iowa.

The SMSCC's most recent undertaking may have more far reaching effects than any of its previous projects. Using the AASHTO Strategic Highway Safety Plan of September 1997 as a model, the SMSCC developed long range strategies for transportation safety improvements. The plan emphasizes 25 key topics in several categories ranging from driver needs to vehicles and highways to emergency services and management. The plan is being distrib-

uted in draft form to Iowa's planning agencies, cities over 5,000 population, counties, interested agencies, and others. You may have already received your copy.

After the review and comment period, a final plan will be prepared and individual strategies selected for prioritization and action. Dedicated safety funding will be used initially to implement selected strategies. Additional funding support as needed will be sought from public and private partners for future activities.

Iowa is fortunate that cooperating agencies such as the Governor's Traffic Safety Bureau, the Federal Highway Administration, the Iowa Department of Transportation, and many other offices work together to provide safe transportation facilities here in this state. Please take the time to review this important draft safety plan and provide any comments or suggestions you may have. All comments are welcome. •

tip from  
the field



### Safe, simple tool for culvert extensions

AS FARM EQUIPMENT grows larger, driveways and field entrances need to be widened, which means that the corrugated steel culverts beneath these driveways need to be longer. The Clinton County Highway Department lengthens steel culverts by installing an extension, joining the existing culvert with a new piece to make the appropriate length.

To keep the two pieces together, a corrugated steel band is placed around both pieces and held with bolts. Something was needed to spread the band to facilitate entry onto the existing culvert and then keep it spread while the new piece of culvert is inserted into place. Formerly this process was done literally by hand—a safety problem because if the

band slipped back together while being installed, workers could lose fingers.

Raymond G. Myers, Clinton

County's mechanic and welder, developed a solution. His invention is a piece of half-inch redi-bolt, 15 inches long, with a swiveling spreader jaw on one end and another jaw welded to a half-inch nut on the other end. Two nuts are welded together at the drive end, and the unit is inserted between the split in the band. Turning the drive nut causes the outer jaw to swivel on the threaded rod while the other jaw moves toward the drive end thus spreading and holding the band open to accept the tube. When the band is in the proper position, the procedure is reversed and the band will contract around the two tubes. Since Clinton County's new digging machines have air compressors on them, the county has purchased air impact guns to further speed this procedure.

Using the tool is simple, fast, and safe, not to mention inexpensive. All Clinton County sub-foremen now use the tool, and other counties have seen it and made their own.

For more information about how to create your own tool, contact Myers, 319-659-8230, or [Rgimyers@juno.com](mailto:Rgimyers@juno.com). •



## Spin your web: Choosing and organizing content

This is the third article in a series about web site development for local transportation agencies. The first two articles covered planning a web site and acquiring the tools for creating it.



HELPFUL, INTERESTING information is the meat of a good web site. Web users will forgive many things, but if your site is light on information, they won't visit again.

Before you decide what meaty content to include, think about the site's overall purpose and who will be using it. The main purposes of a transportation agency's web site are probably to inform and perhaps interact with users.

### Users know what they want to know

Selecting appropriate content for your site will be easier once you analyze your potential users and think about the specific kinds of information they want or need. Potential users include

- people who live in your city or county
- visitors to your area
- other city or county agencies/departments
- your city council or board of supervisors
- utility companies
- local businesses
- contractors
- job seekers
- news media
- your employees
- and many others

Following are sample questions a typical web user might pose:

- Where and when (and possibly why) will streets/roads be reconstructed, repaired, or maintained?
- Main Street's been torn up for two weeks; when is it going to be done?
- In the winter, what streets/roads are passable?
- When will my street/road be plowed?
- When are you going to fix that pothole on Center Street?
- Will you put a stop sign at Second Street and Park Avenue?
- Do you have any job openings?
- How much is the department spending to replace the bridge over Iowa Creek?
- When will you be accepting bids on the Strawberry Lane resurfacing project?

Does all of this sound familiar? Your agency is probably used to answering these kinds of questions. Make a list of common information requests that you'd like your web site to satisfy. Putting information such as snow policies and road construction plans on the web may reduce some phone inquiries.

Some information requests will be the same for more than one category of users. The condition of winter roads, for example, is a concern of local residents, travelers, your employees, the news media, and more.

Understanding the kinds of information your users are looking for will help you determine not only what kinds of information to include, but also some effective ways to organize it all. The kinds of information you want to publish on your web site should be the ultimate guide to the organizational scheme you choose.

### Putting your house in order

So far this whole web site thing may sound like a piece of cake, especially if you're an old hand at writing news releases, and your office staff is topnotch at handling customer and business calls. You may know exactly what information you want to publish online.

Consider this: When you respond to a customer or vendor call or fax a news release, you are providing information but you are not providing a context or organizational structure for that information. In other words, you are providing a piece of lumber, not the whole house.

A web site provides lots of information, lots of pieces of lumber, within the context of your agency—the house. To help users find their way to the information they want, your web site needs to present a clear, understandable structure, not stairways that go nowhere.

One organization scheme for your web site that seems simple and natural is to follow your agency's own internal structure. For example, all information connected to traffic engineering would be found via a link to the traffic engineering department. There are at least two problems with this approach: 1) It can be confusing. What seems like an obvious arrangement of information to an internal audience can be obscure to an external one. 2) It may not support good public relations. External audiences may infer from this organization that you don't really want to share information with the public.

So what are some other options? You can organize information by topic, by task, and by type of user. Topical schemes can be one of the most useful forms of organization. San Francisco, California's public works department web site ([www.sfdpw.com/direct.htm](http://www.sfdpw.com/direct.htm)) is neatly divided into topics such as disability access, pothole repairs, street cleaning, and utility excavation.

A task-oriented scheme organizes content and applications into a collection of functions or tasks that users will want to perform,

SPIN YOUR WEB . . .continued on page 12



### July 1999

14-15	Iowa County Engineers Association (ICEA) Mid-Year Conference	Ames	Jim Cable 515-294-2862 jkcable@iastate.edu
28	4th Annual Iowa GIS Users Conference	Buena Vista University Storm Lake	Michelle Lantermans 515-281-4293 michelle.lantermans@its.state.ia.us

### August 1999

18-19	Iowa Chapter American Public Works Association (APWA) Fall Conference	Cedar Rapids	Jim Cable 515-294-2862 jkcable@iastate.edu
19-21	Iowa Bike Conference	Ames	Nancy Burns 515-239-1621

### September 1999

27-29	Iowa Winter Maintenance Expo and Snow Plow "Rodeo"	Ames	Duane Smith 515-294-8103 desmith@iastate.edu
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## Library temporarily closed

The LTAP Library will be closed until July 9 while CTRE moves to its new location across the street. You may return materials and submit requests, but no requests will be filled until after the move is complete.

#### SPIN YOUR WEB . . .continued from page 11

such as applying for a license or bidding on a job. While a transportation agency's entire site would not fit this scheme, it may be helpful to think about what kinds of tasks you'd like users to perform on your site. For example, St. Paul, Minnesota's public works department ([www.ci.saint-paul.mn.us/publicworks/](http://www.ci.saint-paul.mn.us/publicworks/)) offers a "pothole reporting station," and every good web site has an e-mail link for questions or comments.

Organizing your content according to specific user groups may make sense for a transportation agency with clearly defined users such as area residents, travelers, contractors, and news media.

It's also possible to try a mixture of organization schemes. The King County, Washington Department of Transportation ([www.metrokc.gov/kcdot/](http://www.metrokc.gov/kcdot/))

uses primarily a topical scheme combined with some task-oriented links.

Whatever type of organization you choose, it's helpful to get feedback about it from people outside your agency. In fact, if you spend any money on outside assistance, this would be a good area to get help on. By paying careful attention to what your users want to know and anticipating where they might look for it, you'll be able to develop a coherent, easily navigable web site that people can trust.

The next article in this series will cover navigation and labeling, the keys to helping users find their way around your site. This series to date, as well as additional resources, is available online at [www.ctre.iastate.edu/outreach/web/](http://www.ctre.iastate.edu/outreach/web/).•

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