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Acronyms in this issue

AASHTO American Association of State Highway and Transportation Officials
 CTRE Center for Transportation Research and Education
 FHWA Federal Highway Administration

Iowa DOT Iowa Department of Transportation
 ISU Iowa State University
 LTAP Local Technical Assistance Program
 MUTCD Manual on Uniform Traffic Control Devices

Tailoring traffic control plans for specific projects

THE 2002 construction season is right around the corner. As you prepare bid documents, remember to include a carefully thought-out traffic control plan.

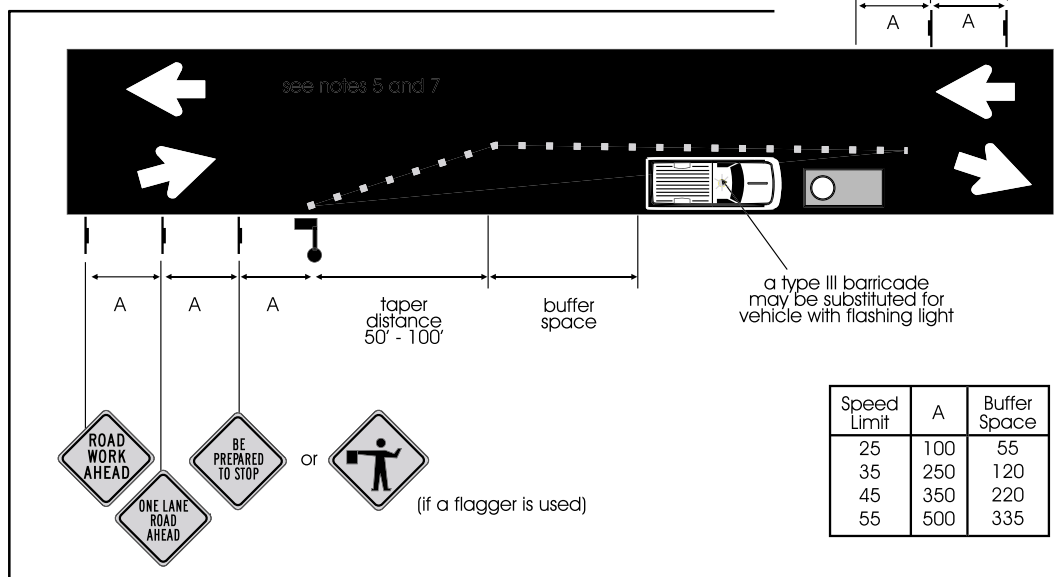
Developing a traffic control plan specific to each work site can help transportation agencies protect road workers and users, minimize inconvenience to motorists, and reduce agencies' potential exposure to tort liability.

Goals for a traffic control plan

The level of detail in traffic control plans for work zones may vary, but at a minimum such a plan should

- implement MUTCD recommendations, state and city specifications, and your agency's policies,

TRAFFIC continued on page 2



Even a typical traffic control plan for a one-lane closure of a higher volume, two-lane gravel roadway should be finetuned for the specific project and site. (This and other "standard" traffic control plans are discussed in *Iowa Traffic Control Devices and Pavement Markings: A Manual for Cities and Counties.*)

Technology News is the newsletter of Iowa's Local Technical Assistance Program (LTAP). LTAP is a nationwide effort financed jointly in Iowa by the FHWA, Iowa DOT, Iowa Governor's Traffic Safety Bureau, Iowa Highway Research Board, and Iowa State University Extension.

Subscriptions to *Technology News* are free. To subscribe or obtain permission to reprint articles, contact the editor (below).

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

Iowa's LTAP is housed and administered at Iowa State University's Center for Transportation Research and Education (CTRE):

ISU Research Park
2901 S. Loop Dr., Suite 3100
Ames, IA 50010-8632
515-294-8103 (voice)
515-294-0467 (fax)
www.ctre.iastate.edu/

Stephen J. Andrle
Director of CTRE
andrle@iastate.edu

Duane Smith
Director of Iowa LTAP
desmith@iastate.edu

Marcia Brink
Editor
mbrink@iastate.edu

Tom McDonald
Safety Circuit Rider
tmcdonal@iastate.edu

Sharon Prochnow
Program Coordinator
prochnow@iastate.edu

Melanie Auen
Bridget Moore-Riannon
Michele Regenold
Contributing Writers

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TRAFFIC continued from page 1

- be consistent throughout,
- allow for adequate protection in the work zone,
- reduce liability exposure,
- lessen contract administration conflicts, and
- minimize traffic disruption.

On site and pre-/post-bid planning

Development of a work zone traffic control plan should begin with a field review of the site. During such a review,

- determine the degree of roadway restriction that will be necessary,
- anticipate effects on traffic of potential traffic control measures,
- record existing traffic control alternatives, important road features, traffic volumes and speed, and type of traffic control devices needed, and
- consider homeowners, businesses, and services when planning closures and detours.

Back in the office, use field notes, specifications, recommendations, and experience to develop alternative traffic control plans for the work zone. When preparing a cost analysis for high traffic volume locations, consider traffic delay time, out of distance travel, and effects on project schedule (see the note about QuickZone on the next page).

Include your final traffic control plan with your bid documents. When the project is let, be open to the contractor's suggestions for alterations to the plan that might improve safety, efficiency, and cost effectiveness.

Ongoing inspection

Once temporary traffic control for a work zone is established, it will require ongoing inspection, monitoring, and documentation.

Begin with an initial detailed inspection immediately after implementation. Inspections should compare the traffic control plan to actual conditions at the work site, carefully considering visibility of traffic control devices and the overall effectiveness of the traffic control setup.

If any traffic flow problems are observed, alter the setup.

Many local and state transportation agencies have developed standard forms for assessing temporary work zone traffic control conditions. Inspection forms include information about traffic control devices and flagger operations.

Colorado's LTAP suggests using the following simple checklist for regular, day and night drive-through inspections, asking yourself, "What does the driver see?"

1. All devices meet specifications and quality standards.
2. Traffic control flaggers and other staff are adequately trained and equipped.
3. All signs are properly installed and legible and are covered, turned, or removed when not needed.
4. Arrow displays and portable changeable message signs are properly aligned and maintained.
5. Taper and buffer lengths meet specifications.
6. Channeling devices are clean, aligned, and appropriately spaced.
7. Temporary barriers and attenuators are properly installed and maintained.
8. Pavement markings are in place at the end of the work shift.

For more information

Developing, implementing, and maintaining an effective traffic control plan may be time consuming, but the benefits for road workers and users make the investment worthwhile.

For more information about developing a traffic control plan for work zones, contact Tom McDonald, Iowa's Safety Circuit Rider, 515-294-6384, tmcdonal@iastate.edu. •



Get "Quick" help evaluating temporary traffic control scenarios

AN IMPORTANT factor when evaluating alternative traffic control plans is how they will affect motorists. QuickZone 1.0, a new software developed by the FHWA, can help you accurately estimate delay times, and the costs of those delays, for various scenarios in urban and inter-urban areas.

Want to try it out? You can download a free, self-extracting file (QuickZone 0.99) from various locations on the FHWA's website. You need Microsoft Excel 97 or higher running on a Windows-based PC. You'll need to enter data such as location, detour routes, anticipated traffic volumes, and construction dates and times.

Download Quickzone 0.99 and learn about other Strategic Work Zone Analysis Tools (SWAT) from the FHWA's Turner-Fairbank Highway Research Center site:
www.tfsrc.gov/its/quickzon.htm.

You can also download the free software and learn more about both SWAT and FHWA's Work Zone Mobility and Safety Program at the FHWA Operations Work Zone site:
www.ops.fhwa.dot.gov/wz/workzone.htm.

Use "Road (Street) Closed" signs correctly

WHEN DEVELOPING traffic control plans for work sites involving road closures, give proper notice to motorists and avoid possible litigation by using the correct signage. Incorrect use of "Road (Street) Closed" signs encourages noncompliance by motorists and does not protect you from liability.

Sections 2B.42 and 6F.08 of the MUTCD contain guidelines for the proper use of signs involving road closures:

- Install "Road (Street) Closed" (R11-2) signs where roads have been closed to all traffic (except authorized vehicles).
- Use "Road Closed – Local Traffic Only" (R11-3) and "Road Closed to Thru Traffic" (R11-4) signs
 - where through traffic is not permitted or
 - in advance of a closure where the highway is open for local traffic up to the point of closure.

Section 2B.42 of the MUTCD includes this standard for "Road Closed" signage:

The Road Closed (R11-2, R11-3, and R11-4) signs shall be designed as horizontal rectangles. **These signs shall be preceded by the applicable Advance Road Closed warning sign with the secondary legend AHEAD and, if applicable, an Advance Detour warning sign (see Section 6F.19) [emphasis added].**

Section 6F.08 the MUTCD includes this standard:

The Road (Street) Closed sign shall **not** be used where road user flow is maintained or where the actual closure is some distance beyond the sign [emphasis added].

The Iowa DOT Standard Road Plans RS-26A and RS-26B, Situation 1, contain an illustration of the proper use of regulatory signs for road closures.

For more information

Consult the millennium edition of the MUTCD, available online, www.mutcd.fhwa.dot.gov. Or contact Tom McDonald, Iowa's Safety Circuit Rider, 515-294-6384, tmcdonal@iastate.edu. •

LTAP Advisory Board

The people listed below help direct the policies and activities of Iowa's Local Technical Assistance Program (LTAP). Contact any of the advisory committee members to comment, make suggestions, or ask questions about LTAP.

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

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

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

John Goode
Monroe County Engineer
641-932-7123

Neil Guess
Howard R. Green Company
515-278-2913

Bret Hodne
Public Works Superintendent
City of West Des Moines
Telephone: 515-222-3536

Tom Parham
Local Systems
Iowa Department of Transportation
Telephone: 515-239-1256

Susan Klekar
Iowa Division, Federal Highway Administration
Telephone: 515-233-7302

Wally Mook
Director of Public Works
City of Bettendorf
Telephone: 319-344-4128

Bob Sperry
Story County Engineer
Telephone: 515-382-7355

Wade Weiss
Greene County Engineer
Telephone: 515-386-5650



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Working with Indian tribes during project planning: a "template" for local agencies

Duane Smith, Iowa LTAP Director

A NEW foundation of trust and understanding among various Indian tribes and Iowa's state and federal transportation agencies: This was perhaps the most important outcome of Iowa's May 2001 Tribal Summit on Historic Preservation and Transportation (see the sidebar). Tribal and agency representatives learned about their very different communications needs and styles and identified some common ground regarding transportation projects in Iowa.

To build on this foundation and continue working toward consensus on an agency-tribal consultation process, tribal representatives suggested they would like to visit an in-progress state transportation project. In response, a two-day follow-up workshop was held in October 2001.

Seeing is understanding

On day one of the workshop, tribal and agency representatives discussed the Iowa DOT's project development, or "Can DO," process. Discussions focused on steps in the process that address cultural resources, descriptions of the three phases of archaeological investigation, and tribal concerns about burial sites and other culturally significant places. Agencies also introduced a proposed tribal consultation process for Iowa.

The second day consisted of a field tour of a major highway project west of Mount Pleasant on US 34 (a section of the "34 Bypass" project). The tour focused on ongoing archaeological investigations and the role of these investigations in the Can Do process.

The group inspected two data recovery sites on foot, receiving explanations of site history and findings to date. Actual artifacts recovered were observed.

The Mount Pleasant location was particularly instructional because it provided an opportunity to view all common cultural resource mitigation efforts simultaneously. Those efforts can include avoidance, acquisition and preservation, and a special design for protection.

Progress made—and more to come

As a result of the workshop discussions and site visit, the participating tribes and agencies agreed on two important issues:

- for Iowa DOT roadway projects, the specific points during the Can Do (project development) process when consultation with the tribes will be initiated, and
- the format of a Tribal Notification Form that will be used to initiate consultation.

These decisions reflected major progress in developing an effective consultation process. However, concerns raised by tribal representatives during a post-site visit debriefing suggest that the decisions reached during the workshop should be viewed as only the

"Tribal consultation": what it is and why local agencies should care

WHEN DEVELOPING a modern highway improvement, agencies must consider a myriad of concerns, many of which are environmental and cultural. One such issue—protecting historic and culturally sensitive properties—is addressed by the National Historic Preservation Act (NHPA) of 1966.

This act contains specific requirements for federal oversight of any program or activity in which the federal government is involved; that is, generally, one that is on federally controlled property, receives federal funds, or requires a federal license or permit.

Some city and county street and road projects may therefore come under the act's jurisdiction.

Revised in January 2001, the regulations implementing Section 106 of NHPA require agencies to consult with Indian tribes when planning and developing a federal project. This "consultation" is particularly important when a historic property with potentially significant religious and/or cultural tribal interests is or may be affected.

The regulations affect projects both on and off tribal lands and apply to any tribe with current or historic interest in the affected properties.

To establish a process for complying with Section 106 consultation requirements, the Iowa Division of the FHWA and the Iowa DOT held a tribal summit in May 2001. (An article in the May–June 2001 issue of *Technology News* provides an overview of the summit and the implications of Section 106 for local governments.) An important follow-up workshop is described in the accompanying article on this page.

beginning of an ongoing effort to meet tribal and agency needs and expectations. Achieving satisfactory levels of trust and communication could take several years.

Involving local agencies

Because of tribal sovereignty, consultation must be conducted on a "government to government" level. That is, the Iowa Division of the FHWA, representing the federal government, consults directly with sovereign tribes regarding the protection of possible historic and culturally sensitive properties on all Iowa roadway projects. However, tribal representatives have agreed that the Iowa DOT's Office of Environmental Services will be the point of contact for consultation between tribes and the FHWA.

For state roadway projects, the Iowa DOT is already working through the Office of Environmental Services to implement the Tribal Notification Form and other aspects of the consultation

process agreed on to date. An important next step, and a priority for tribal representatives, is for local agencies to understand and implement the consultation process for local projects as soon as possible. The Iowa DOT's Office of Local Systems will soon direct this initiative.

Tribal consultation is required by law only regarding projects in which the federal government is involved (see the sidebar at left). However, consistently following the established consultation process for all state and local roadway projects will enhance trust and improve communications between tribes and agencies.

For more information

Contact any of the following:

Saleem Baig, Office of Local Systems, Iowa DOT, 515-239-1051, saleem.baig@dot.state.ia.us

Gerald Kennedy, Iowa Division, FHWA, 515-233-7317, gerald.kennedy@fhwa.dot.gov

Mark Kerper, Iowa DOT, 515-239-1591, mark.kerper@dot.state.ia.us

Doug Jones, State Historic Preservation Office, 515-281-8744, doug.jones@dca.state.ia.us

Jim Rost, Iowa DOT, 515-239-1798, james.rost@dot.state.ia.us

The FHWA, Iowa Division, and Iowa DOT sponsored the tribal workshop and planned it with assistance from the State Historical Preservation Office (SHPO), Iowa Indian Advisory Committee, CTRE, and Louis Berger Consultants. •



Participants in the field trip to the "34 Bypass" project near Mount Pleasant observed two data recovery sites, viewed artifacts recovered, and discussed the site history, including avoidance efforts to date.



Other activities to improve agency-tribal communications

IN ADDITION to including local agencies in Section 106 tribal consultation, the FHWA and Iowa DOT are embarking on several other activities to enhance communication with tribes. These activities may also be important for local agency-tribal consultation (think "local agency" wherever you see "Iowa DOT," below).

- Develop a continuing process for ensuring (and for assuring tribes) that the FHWA and Iowa DOT share Indians' particular sensitivities regarding certain cultural features such as burial and other sacred sites. This will include developing a standard procedure to protect such sites in perpetuity, and sharing this information with affected tribes.
- Develop guidelines for providing information to the public, media, and property owners regarding cultural features and archaeological recovery sites. The Iowa DOT will consider developing site-specific, one-page site or project summary handouts. These summaries may be prepared by project

consultants and will be reviewed by SHPO, FHWA, Iowa DOT, Office of the State Archaeologist, and consulting tribes prior to public release.

- Establish one point of contact at the Iowa DOT for tribal consultation. This person will address tribes' questions and concerns and provide a trustworthy communication conduit between the agency and tribal representatives.
- Consider developing a workshop for planners, designers, and consultants to explain the Section 106 consultation process and how it relates to Iowa DOT project development procedures.
- Develop a "programmatic agreement" among agencies involved with tribal consultation (FHWA, Iowa Division; Iowa DOT; State Historic Preservation Office, and the FHWA's Advisory Council on Historic Preservation) to identify and integrate the various agencies' Section 106 responsibilities and standard procedures.
- Schedule a supplemental tribal workshop to review the consultation process and discuss the development of "memoranda of understanding" outlining mitigation procedures when projects will adversely and unavoidably affect a historic property. •

Signing for weight restrictions

Tom McDonald, Safety Circuit Rider

PROTECTING roads and structures from damage caused by heavy loads has always been a concern of Iowa's local agencies.

Section G10, Weight Restrictions, of *Iowa Traffic Control Devices and Pavement Markings: A Manual for Cities and Counties*, describes signing and procedures that can be employed to help protect transportation infrastructure. The manual's appendix includes sample embargoes and overweight permits.

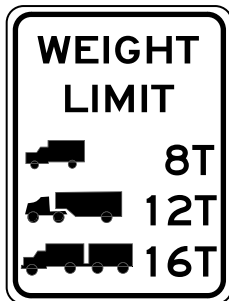
Signs R12-1 through R12-5 (from Section 2B.43 of the MUTCD) are commonly used to restrict loads on posted structures. Most popular in Iowa are R12-1, "Weight Limit," and R12-5, "Weight Limit Symbol." Iowa's manual illustrates layouts for signing restricted bridges.

Restricting implements of husbandry

Provisions of the Code of Iowa addressing load restrictions for structures apply primarily to substandard bridges or culverts that, for whatever reason, no longer meet established state or federal standards. These structures must be "posted." Even implements of husbandry, which the Code exempts from most highway weight and size restrictions, must comply with weight limits on posted bridges.



R12-1



R12-5



R12-4

As the use of many kinds of large-capacity grain-hauling units and mobile tanks for removing waste from hog confinement facilities grows, county agencies are becoming increasingly concerned about protecting unposted structures in their jurisdictions. The heavy loads of such agricultural equipment, which can exceed 50,000 pounds on a single axle (far in excess of that allowed for commercial vehicles), have caused damaging stresses to roads and structures in many areas of the state.

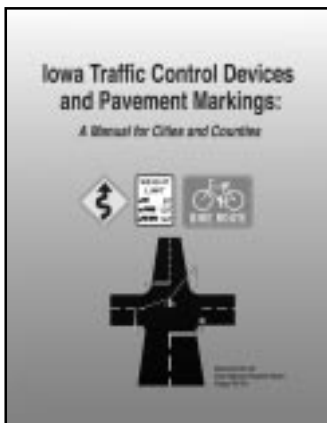
One possible solution might be to post structurally sound bridges that may be at risk, a subject on which the Code of Iowa is silent. This practice has been seen in Missouri and Michigan, and some county engineers in Iowa are contemplating posting otherwise unrestricted bridges that are showing signs of stress. The preferred signing would likely be R12-4, "Weight Limit Axle-Gross."

What do you think?

During a recent presentation on weight restrictions at the Iowa County Engineers Association conference, it was suggested that Section G10 in Iowa's manual could be modified to better explain possible options for signing and other procedures to help protect unrestricted structures that may be vulnerable to stresses caused by heavy agricultural loads. We would appreciate your recommendations for such a revision.

Please review this section of Iowa's manual and send your comments to Tom McDonald, Iowa's Safety Circuit Rider, 515-294-6384, tmcdonal@iastate.edu. •

We would appreciate your recommendations for explaining signing options for restricting weight on unposted structures.



Editor's note: This article is part of a series about Iowa Traffic Control Devices and Pavement Markings: A Manual for Cities and Counties. The manual was funded by the Iowa Highway Research Board (TR-441) and supplements the MUTCD. It is available online, www.ctre.iastate.edu/pubs/itcd/index.htm. Or contact Tom McDonald (see contact information above).

Got a question about the millennium edition of the MUTCD?

Tom McDonald, Safety Circuit Rider

If so, you're not alone.

Last fall LTAP Director Duane Smith and I conducted several workshops around the state to introduce the millennium MUTCD to users and clarify some of its new requirements and guidelines. Participants had many questions. Here are some of the most frequently asked questions, along with responses from CTRE staff (all references to the MUTCD indicate the millennium edition):

Is a maximum height for End of Road markers specified?

Section 3C.04 of the MUTCD requires that these devices be mounted at a minimum height of 4 feet but does not specify a maximum height. While recommendations for delineator placement in Section 3D.04 do include a recommended maximum height, no similar requirement or recommendation is given for End of Road markers. Neither does Iowa DOT Road Standard RE-3B stipulate maximum height for these markers.

When deciding how high to mount End of Road markers, exercise your good judgment to provide maximum visibility for the road user, in compliance with Section 1A.04. There may be situations, such as locations on hills or curves, where increased mounting height for these devices is advisable.

Explain the use of Lane Reduction signs, W4-2.

Certain symbol signs have been somewhat controversial for several years because their meaning may not always be readily comprehensible. One of those symbol signs, W4-2, the Lane Reduction sign, was even considered for removal from the millennium edition of the MUTCD. Although the word message sign is thought to be more effective by some practitioners, the symbol sign W4-2 is still the primary sign for lane reduction applications.

Sections 2C.28 and 2C.30 of the new manual mention this sign, but the illustration from comparable sections of the 1988 edition is not shown. However, Figure 3B-12 in Section 3B.09 does illustrate the correct use of W4-2 signs.

Is fluorescent yellow green mandated by the MUTCD in certain applications?

In June 1998, the FHWA published a Final Rule in the Federal Register allowing the optional use of

fluorescent yellow green (FYG) in certain applications related to pedestrians, bicycles, and schools. The millennium MUTCD includes several references to the use of FYG, including Section 1A.12 and Table 2A-4 in Section 2A.11.

While Section 1A.12 seems to indicate FYG shall be used for the applications mentioned above, both Table 2A-4 and Section 2C.37 indicate quite clearly that using FYG is still an option, not a requirement.

However, when installing FYG signs, agencies should adhere to guidance in 2C.37: Do not mix FYG with standard yellow and black warning signs within a particular site.

Explain colors allowed for curb markings.

Section 3B.21 contains a standard requirement that curb markings comply with the general marking colors listed in Section 3A.05. For most two-lane street applications, that color is white.

However, an option in 3B.21 allows local agencies to use special colors on curbs to supplement parking regulation signing. Review this section carefully for other requirements for parking restriction applications. All such regulations should be backed by proper ordinances.

What is the minimum number of channelizing devices for a taper?

The MUTCD does not specify a definite minimum number of channelizing devices in a taper. Good practice, however, would suggest that at least five devices would provide adequate visibility for approaching drivers and redundancy if one or more devices are displaced by passing vehicles.

The manual does provide guidance about spacing channelizing devices in various taper situations:

Section 6F.55 includes general guidance for determining the number of feet between channelizing devices in a taper: 1.0 times the speed limit.

Section 6C.08 recommends spacing these devices 20 feet apart in shorter tapers (100 feet maximum length), such as those used for flagging or a temporary traffic signal.

For tapers shorter than 100 feet, no spacing guidelines for channelizing devices are given. Illustrations of several typical applications, however, such as TA-10 and TA-11, show five or six devices.

Using fluorescent yellow-green is still an option, not a requirement.

More MUTCD workshops coming

BECAUSE of the wide interest shown in the fall workshops on the millennium edition of the MUTCD (almost 200 people from cities, counties, and consulting firms across the state participated), additional MUTCD workshops will likely be scheduled in 2002. We'll keep you posted.

What is the recommended signing for the new Iowa DOT left-turn storage lane design?

To improve operations and reduce crashes at intersections, the Iowa DOT has developed and implemented a revised design for left-turn storage lanes. The new design provides better angle for road users to observe approaching vehicles. However, signing recommendations for such lanes remain the same.

Iowa DOT staff are monitoring operations at new left-turn storage lanes and, if modifications in sign messages and/or location are appropriate, the department will revise the standard recommendations.

Do Street Name signs, D3, require borders?

The 1997 FHWA requirements that Street Name signs be retroreflective and have larger letters underscore a growing emphasis on the importance of these specific guide signs. Section 3D.38 contains the FHWA standards for retroreflectivity and letter size, as well as many other guidelines and options for Street Name signs.

One of the guidelines addresses colors for Street Name signs—white on green—and states that borders, *if used*, should be the same color as the legend. Although borders may add to Street Sign visibility, this guideline implies that they are not required.

Can AASHTO/Iowa DOT criteria be used for defining the clear zone on local roads?

Several sections of the MUTCD include standards mandating that roadside sign supports located in the clear zone be crashworthy: breakaway, yielding, or shielded. For low-volume roads, this requirement can be found in Section 2A.19 and again in Section 5A.04.

However, while Section 1A.13 provides a general definition for clear zone, nowhere in the MUTCD are specific dimensions given for the clear zone or guidance for computing the dimensions. Applying the Iowa DOT's primary road standards for clear zones would be quite burdensome for local agencies. But both the AASHTO design guides and Iowa DOT standards for local roads contain dimensions for clear zones ranging from 40 feet from the traveled way on farm-to-market roads to 10 feet from the traveled way on collectors and local service roads.

Both Iowa DOT and CTRE staff believe these guidelines for determining clear zones are acceptable for local agencies. Thus, any sign support located outside of clear zones as defined by these guidelines would not need to comply with crash-worthiness requirements. •

New MUTCD means new flagger training

Tom McDonald, Safety Circuit Rider

REVISIONS in the millennium MUTCD regarding work zone traffic control—new equipment and apparel, improved methods, etc.—are affecting the content of flagger training in Iowa.

Specifically, the Iowa DOT's 1997 edition of the Flagger's Handbook has been replaced with an updated 2002 edition, and the department's Professional Flagging video, taped about 10 years ago, is being redone. The video will be completed by late spring.

The handbook and video are part of a training package sponsored by the Iowa DOT and offered by CTRE. By participating in this program, agencies and contractors can meet flagger training requirements in both the MUTCD and Iowa DOT specifications.

How to take advantage of these new resources

Now's the time to schedule updated training for your staff who will be flagging in work zones during the upcoming construction season. CTRE's flagger workshops—both Principles of Flagging and Registered Flagger—will use the new handbook and video to reflect and reinforce the content of the millennium MUTCD.

Workshops can be conducted at your convenience at your agency.

The 2002 Flagger's Handbook will also be distributed to all participants in the Iowa DOT's work zone safety workshops, scheduled to begin in January (see a complete schedule on page 11).

Questions?

Contact Susan Fultz, Iowa DOT, 515-239-1076. To schedule a flagger workshop, contact Tom McDonald, Iowa's Safety Circuit Rider, 515-294-6384, tmcdonal@iastate.edu. •





These websites work for you

WANT TO decrease traffic congestion? manage growing travel demand? improve air quality and reduce fuel consumption? reduce aggressive driving behavior and the number of severe accidents? save time for emergency vehicles?

Something as relatively simple and inexpensive as optimizing signal timing has been demonstrated to help agencies accomplish these critical goals, and FHWA's new video, "It's About Time, Traffic Signal Management: Cost Effective Street Capacity and Safety," demonstrates how. This effective video will help elected officials understand the importance of installing up-to-date, optimally timed traffic signals in your community. Find out more or order the video online: www.ops.fhwa.dot.gov (click on "Arterial Toolbox"). The video is also available for loan through the LTAP library. Contact Jim Hogan, library coordinator, 515-294-9481, hoganj@iastate.edu.

Speaking of air quality . . . The FHWA, FTA, and EPA have teamed up to produce a guide to help state and local agencies comply with requirements in the Clean Air Act amendments of 1990. This updated version reflects recent legislation and legal decisions. Check it out online. www.fhwa.dot.gov/environment/conformity/basic_gd.htm.

Need to find an expert on (you name it)? To find just the right person or service in the vast network of FHWA's four regional Resource Centers, access Expertise Locator, a new, web-based customer interface. Expertise Locator presents all the centers' talents through one virtual interface. Browse the site and connect with a real person! <http://highwayexpertise.fhwa.dot.gov>.

Stre-e-tch local agency funds. The FHWA's Technology for Local Governments site includes a list of topics on resource management, along with contact information for an expert on each topic. www.fhwa.dot.gov/region8/ushowus/index.htm.

Virtual government: get the latest info. The Government Technology website provides "solutions for state and local government in the information age." Its primary offering is a set of links to technology-in-government-focused, online publications: *Mobile Government*, *Tech Trends*, *Local.US*, *Visions*, and more. www.govtech.net/.

The latest FHWA notices, publications, training events. A good site to bookmark, this page lists day-by-day additions to FHWA's website. www.fhwa.dot.gov/new.html.

Practical research findings. Check out bicycle-friendly rumble strip designs from Pennsylvania, a computer analysis model for broken-back culverts from Nebraska, using tire chips as a base course on a local Vermont road (and many other applications for shredded tires), a method used in California to replace damaged signs in just ten minutes, and more at AASHTO's Research

Advisory Committee's High Value Research website: www4.nationalacademies.org/trb/scor/states.nsf.

A new tool for metropolitan planners. The Metropolitan Capacity Building (MCB) program provides information on the planning process and a means for sharing examples of good practice. The MCB website is a "one-stop" shop for information on designing and operating effective transportation facilities in the face of challenges like financial constraints, growth issues, air quality and congestion issues, etc. The site is sponsored by FHWA and FTA. www.mcb.fhwa.dot.gov/.

Beyond sign management systems. Electronic or manual, a sign management system (see the December 2001 issue of *Technology News*) is only as effective as the crew that maintains your signs. A new FHWA training resource, *Maintenance of Signs and Sign Supports for Local Roads and Streets*, clearly describes the safety implications of well-maintained signs, as well as straightforward how-to's. This pamphlet can be downloaded and modified for local use from the FHWA Safety Core Business Unit's What's New website. http://safety.fhwa.dot.gov/whats_new.htm.

Speaking of safety . . . Iowa's been teaming up with five other states to identify best safety practices. Their conclusions are described in a recent report, *National Review of the Highway Safety Improvement Program*, which will soon be posted online: <http://safety.fhwa.dot.gov/>.

And more safety . . . The compliance date for installing certain "crashworthy" roadside safety hardware (as defined in NCHRP Report 35) on National Highway System roadways has been extended to October 1, 2002. For a list of crashworthy hardware, copies of FHWA acceptance letters for each of them, links to manufacturers' websites, and an "Ask the Experts" service where you can address questions about NCHRP Report 35, see the FHWA's website on roadside hardware: http://safety.fhwa.dot.gov/programs/roadside_hardware.htm.

And more . . . Do you know how to predict the safety performance of existing or proposed rural, two-lane highways? The FHWA's Turner-Fairbank Highway Research Center can help with its report describing a newly developed algorithm. The algorithm forms the basis for Crash Prediction Module software, which is being beta-tested in early 2002. An abstract of the final report, and ordering information, are online: www.tfirc.gov/safety/99207.htm.

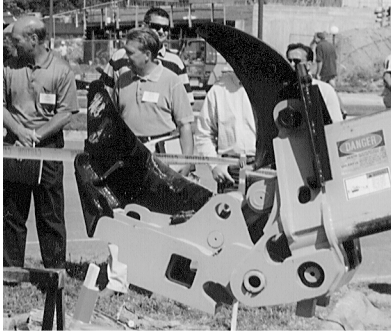
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Come to think of it, FHWA's Safety Core Business Unit's site is a cornucopia of safety information. <http://safety.fhwa.dot.gov/index.htm>.

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And just for fun . . . Want to know how hydraulic cranes work? How oysters make pearls? If you're just plain curious about how stuff works, this site's a gold mine. www.howstuffworks.com. •

Prune trees easily with the limb lopper



Closeup of the blades



The limb lopper is mounted
on a Gradall boom.



Slicing through a
branch is a piece of cake.

BRUSH CONTROL on county roads can be a major challenge. Low hanging branches can interfere with motor grader and truck operations and act as a snow trap during the winter.

Two Marion County Road Department employees, mechanic Mark Fee and assistant foreman Timothy Van Roekel, designed and built a “limb lopper” to address this problem.

The limb lopper works like giant pruning shears. It is mounted on the boom of an XL4100 Gradall. The Gradall will reach 22 feet high and 25 feet out, providing plenty of mobility to prune trees hanging over the traveled portion of a roadway.

The limb lopper was built in the Marion County Road Department’s mechanic and maintenance shop. While deciding where and how to mount the limb lopper, Fee and Van Roekel considered two things: the best vantage point for the operator to see the cutting edge and using the full mobility of the machine.

Once they decided where and how to mount the pieces, they made cardboard patterns and held them on with clamps to check the operator’s view and the machine’s mobility. After finetuning the patterns, they traced them on flat steel and cut them out with a torch and plasma cutter. After cutting the pieces and forming the cutting edge, they hard-surfaced it to hold a sharper edge longer. Future plans include adding a replaceable cutting edge.

The limb lopper trims branches up to about five inches in diameter depending on the kind of tree, whether it’s alive or dead, and the time of year. The cutting angle can also make a big difference because the operator can’t always cut at a 90 degree angle.

For more information about the limb lopper, contact Mark Fee or Timothy Van Roekel, 641-828-2225. •

Editor’s note: The “limb lopper” is one of several winning innovations from the “Better Mousetraps” competition at the Iowa Maintenance Expo in September 2001. In each issue of Technology News we’re highlighting one of the winners. For information about other winning “mousetraps,” see CTRE’s website: www.ctre.iastate.edu (see “CTRE News”).

Meet national experts on today's hot transportation topics

EVERY FRIDAY morning from 10:00 to noon through early May, transportation professionals in Iowa are invited to attend a free, two-hour transportation seminar at Iowa State University or the University of Northern Iowa. The seminars feature regional and national experts on a variety of topics.

This year's seminars emphasize

- transportation security and
- transportation asset management.

The seminars are broadcast to and from four Midwestern universities. You're welcome to attend any of the seminars, but those featuring "live" speakers at ISU or UNI are listed below. For a complete schedule, see www.ctre.iastate.edu/educweb/scholars.htm. (Changes may be made as needed.)

Locations and contact information

University of Northern Iowa (UNI)
Contact: Tim Strauss, 319-273-7467,
tim.strauss@uni.edu

*Please contact for seminar location.
Seating may be limited.*

Iowa State University (ISU)
Contact: David Plazak, 515-294-8103 or
515-296-0814, dplazak@iastate.edu

*Seminars are held in the videoconference
room at the Center for Transportation
Research and Education, ISU Research
Park Bldg. 3, 2901 South Loop Drive,
Suite 3100, Ames, Iowa.*

Seminar schedule

Date, Speaker's Location	Speaker	Topic
Feb. 1, ISU	Jim Lafrenz, American Concrete Paving Association	Terrorism and Design of the Built Environment
Feb. 15, ISU	Bill Flannery, Manager, Des Moines International Airport	Aviation Security: Past, Present, and Future
Feb. 22, UNI	Carl Adrian and others, Cedar Valley Economic Development Corp.	Transportation and Economic Development: Site Selection
Mar. 15, ISU	Louis Lambert, Director of Planning, Michigan DOT	Implementing Asset Management in a State DOT
Apr. 5, ISU	Floyd Barwig, Director, Iowa Energy Center	The Future of Energy and Transportation
Apr. 12, UNI	John Snyder, Livingston Aviation	The Air Charter Business
Apr. 19, ISU	Ellen Gordon, Director of Homeland Security for Iowa	Security and Transportation after September 11
May 3, ISU	Dr. David Forkenbrock, Director, U. of Iowa Public Policy Center	Re-inventing Highway Taxes and Finance

“Click, Listen, and Learn”: practical, web-based training modules

THIS NEW “virtual” training format for local agencies combines speaker telephone (audio) with the Internet (visual). For \$125, several staff at one location can participate in brief but substantive in-house training.

Several upcoming, two-hour Click, Listen, and Learn workshops are the joint effort of APWA and LTAP to make quality training opportunities convenient and affordable for local governments.

Bret Hodne, street superintendent for the City of West Des Moines, has participated in a couple of these workshops. He says, “Our department thinks that this is an excellent format since you can train several employees at once on site. We also feel that it is cost effective.” One drawback, Hodne adds, is that the format somewhat limits the amount of back-and-forth interaction between the trainer and participants.

A few upcoming topics:

- February 5: **EPA Phase II storm water regulations**
- March 5: **dirt and gravel road maintenance**
- May 21: **conflict solving for the new supervisor**
- July 17: **implementing GASB 34**
- October 29: **chemicals/abrasives for winter maintenance**
- December 5: **risk management and tort liability**

For more information and a complete calendar of workshops, or to register for a workshop, see the APWA website: www.apwa.net/Education/CLL/. Or contact Michael Long, APWA’s project manager of adult learning programs, 816-472-6100. •

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