# Technology 114MS



Providing transportation technology transfer for lowa's cities and counties

# **Inside this issue**

- 2 Check It Out
- 3 Conference calendar
- 4 Stanley L. Ring Memorial Library new acquisitions
- 5 Tear-out on best safety practices
- 7 Overview of 2009 Manual on Uniform Traffic Control Devices

Don't miss the tear-out on best safety practices included in this issue.

**IOWA STATE UNIVERSITY** 

**Institute for Transportation** 

# Circling the roundabout

The Insurance Institute for Highway Safety (IIHS) surveyed drivers in 2000 before and after the construction of roundabouts in their areas. Before construction, 31 percent of drivers were in favor of the roundabout and 41 percent were strongly opposed. A few months after construction, 63 percent of drivers were in favor of the roundabout and only 15 percent strongly opposed it.

Modern roundabouts are no longer unique in Iowa. But they're not all that common either, for several reasons:

- Public officials and the driving public may not understand the potential operational and safety improvements of well-designed roundabouts.
- Street and road agencies do not necessarily know when, where, and how to consider a roundabout design.
- Roundabouts are still somewhat new, and drivers may be uncomfortable navigating them.

A resource developed at InTrans, *Planning-Level Guidelines for Modern Roundabouts* (2008), can help local agencies address these challenges and, when appropriate, take advan-

tage of roundabouts' potential benefits. Funded by the Iowa DOT, the guidelines were authored by Shauna Hallmark, transportation engineer at InTrans, and Hillary Isebrands, an Iowa State University doctoral student in civil, construction, and environmental engineering who is now working with the FHWA.

# Why roundabouts?

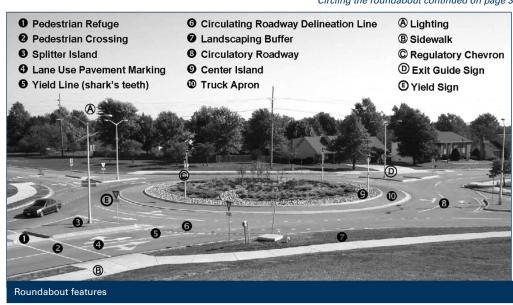
Roundabouts can have several benefits. At well-designed roundabouts,

- Traffic naturally slows but moves at a steady pace through the intersection.
- U-turns can be made easily.
- Safety is improved, with generally lower crash rates than at two-way stop-controlled or signalized intersections.

"Communities are encouraged to consider roundabouts wherever intersection reconstruction or a new intersection is being considered," says Isebrands.

Roundabouts are one of nine intersection safety countermeasures that are strongly supported by the FHWA. Roundabouts should be considered as a design alternative for all proposed new intersections on federally-funded highway projects and for all existing intersections that need major safety or operational improvements.

Circling the roundabout continued on page 3



#### Acronyms in *Technology News*

AASHTO American Association of State High-

way and Transportation Officials

APWA American Public Works Association
CTRE Center for Transportation Research

and Education

FHWA Federal Highway Administration

IHRB Iowa Highway Research Board

InTrans Institute for Transportation (at ISU)

Iowa DOT Iowa Department of Transportation

ISU Iowa State University

LTAP Local Technical Assistance Program

MUTCD Manual on Uniform Traffic Control

. \_\_

NACE National Association of County

Engineers

TRB Transportation Research Board



U.S. Department of Transportation Federal Highway Administration



LTAP is a national program of the FHWA. Iowa LTAP, which produces this newsletter, is financed by the FHWA and the Iowa DOT and administered by the Institute for Transportation.

Institute for Transportation ISU Research Park 2711 S. Loop Drive, Suite 4700 Ames, Iowa 50010-8664 Telephone: 515-294-8103 Fax: 515-294-0467 www.intrans.iastate.edu/

Any reference to a commercial organization or product in this newsletter is intended for informational purposes only and not as an endorsement. The opinions, findings, or recommendations expressed herein do not necessarily reflect the views of LTAP sponsors. All materials herein are provided for general information, and neither LTAP nor its sponsors represent that these materials are adequate for the purposes of the user without appropriate expert advice. ISU makes no representations or warranties, expressed or implied, as to the accuracy of any information herein and disclaims liability for any inaccuracies.

Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3680 Beardshear Hall, 515-294-7612.

#### Subscribe to Technology News

Subscriptions to *Technology News* are free. We welcome readers' comments, questions, and suggestions. To subscribe, or to obtain permission to reprint articles, contact the editor (see page 4).

#### Subscribe to *Tech E-News*

For brief e-mail reminders about upcoming workshops and other LTAP news, subscribe to Iowa LTAP's free service: Tech E-News. Send an email to Marcia Brink, mbrink@iastate.edu. Type "Subscribe Tech E-News" in the subject line.

# **Check It Out**



As new Iowa LTAP Director, I considered many potential topics for this first column.

First, I wanted to let you know that after traveling to different parts of this great country during the last decade, I'm happy I ended up right back here in Iowa. Over the last ten years, I've done training, research, and consulting and most recently worked at the University of Minnesota's Center for Excellence in Rural Safety. I've also been telling anyone who's willing to listen how important local transportation agencies are to the safety and efficiency of the nation's transportation system. I am looking forward to providing effective, efficient outreach, training, and technology transfer to you all here in Iowa.

I also wanted to say something about what's been going on here at Iowa LTAP since my arrival in June. Well, like many of you, we are trying to "do more with less" during some tight economic times and with a significant turnover in staff. We've started a major initiative to upgrade our internal mail lists and events database system. Unfortunately, some of our website capabilities will be temporarily out of service during this upgrade. But the upgrade will help us improve our mailings, more efficiently track Roads Scholar participation, and provide online registration and payment options. We'll also be working to update our contact information. In short, to do "more with less" in the coming years, Iowa LTAP has to do more electronically. Even one email address per agency can be used as a communication portal, with a note to "pass it on." This contact information can be used to "Overall, our objective is to continue doing what we've always done well for you, while improving events and courses and responding to your needs in the coming years."

announce information about online training (sometimes free) offered by different organizations, important news, important changes, registration confirmations, LTAP library loans, and event billing.

We've continued to offer training throughout the summer, and this September we hosted snow plow operator training, the Snow Roadeo, and the Streets and Roads Conference and Workshop. Special thanks are due to the many committee members and volunteers who make these events happen successfully each year. This fall we have smaller events planned that will cover geosynthetic materials use and safety. We included a training needs questionnaire in our last newsletter, and we'll continue to gather your information in different ways, possibly as part of some regional training sessions. Overall, our objective is to continue doing what we've always done well for you, while improving events and courses and responding to your needs in the coming

As always, we need your input and feedback. Feel free to call me any time at 515-294-8817 or email me at kknapp@ iastate.edu.

In upcoming newsletters, my column will focus on what Iowa LTAP staff are doing and some subject areas that I hope will be of interest to you all. For example, did you know that Minnesota just released **a snow plow calibrator guide?** It can be found at www.lrrb.org/pdf/2009RIC08TS.pdf. Check it out

Keith Knapp

# Location, location, location

Planning-Level Guidelines for Modern Roundabouts provides basic advice for planning roundabouts. The guidelines include detailed tables that help agencies evaluate the suitability of potential roundabout locations.

Roundabouts may be recommended at locations with any of the following situations:

- Delays from high traffic flow, traffic signals and stop signs, and turning movements
- Speed changes and areas requiring traffic calming
- Large numbers of right-angle and left-turn crashes
- Frequent red light and stop sign running
- Difficult intersection geometries (e.g., skewed, more than four legs, within 100 feet of a driveway, etc.)

Special consideration must be given to the proximity of the potential roundabout location to nearby traffic signals and railroad crossings. Traffic signals and roundabouts can co-exist on the same roadway, but proper signal timing and coordination is necessary. If an at-grade railroad crossing is nearby, a careful analysis of its distance from the intersection, train frequency and length, and roadway traffic volumes is necessary to determine if a roundabout is feasible.

Roundabouts are not recommended when stopping sight distance is inadequate at the entrance approach, within the roundabout, and/or on the exit from the roundabout.

Tim Simodynes, in the Iowa DOT's Office of Traffic and Safety, believes there are many opportunities to implement roundabouts on Iowa's streets and roadways.

"I see roundabouts being beneficial in several situations," he says. "These include freeway ramp terminals to save on bridge costs, and locations near schools where there are young pedestrians, young drivers, aggressive drivers, and peaking traffic."

# Features and geometric elements

Planning-Level Guidelines for Modern Roundabouts includes information about key features of modern roundabouts. The locations of some of these features are shown in the figure on page 1. The guide also includes descriptions of key geometric design elements of a modern roundabout. For example, the recommended maximum single-lane roundabout entry design speed is 25 mph for rural locations and 20 mph for urban locations.

### **Public education**

The driving public can be wary when agencies suggest a roundabout as an intersection improvement alternative.

A thorough public information and education effort undertaken early in the proposal, planning, and preliminary design process is essential to public understanding and acceptance. Such a campaign should continue through the construction stage and after its opening.

Some motorist resistance is understandable. Many people do not understand the differences between modern roundabouts and other circular intersection designs (e.g., rotaries on the East Coast and neighborhood traffic calming circles).

Old-style rotaries allow higher speeds within the circle, and drivers can have difficulties entering. Traffic can also queue within the rotary. Neighborhood traffic calming circles, on the other hand, generally slow traffic, but their small diameters typically can't completely accommodate large vehicles.

Well-designed roundabouts resolve problems associated with rotaries and traffic circles. Modern roundabouts slow all vehicles to consistent speeds between 10 and 25 mph and can accommodate just about any size vehicle. Another cause of public resistance is often a lack of knowledge about and experience with navigating roundabouts. It's important for drivers to understand that roundabouts do not change the basic principles of navigating through an intersection. For example, drivers at the entrance to a roundabout should position their vehicles in the same manner as at a typical intersection entrance; then, if the roundabout is properly marked and signed, the movement should be clear.

# Help for local agencies

The Iowa DOT offers Iowa communities no-cost expert reviews and advice about the feasibility, planning, design, and operation of roundabouts. For this kind of assistance, contact Tim Simodynes, 515-239-1349, tim.simodynes@dot.iowa.gov.

### For more information

Planning-Level Guidelines for Modern Roundabouts is available online, www.intrans. iastate.edu/reports/roundabout\_guidelines. pdf. To borrow a copy from the LTAP library, contact Jim Hogan, LTAP librarian, 515-294-2981, hoganj@iastate.edu.

Many educational resources, including opportunities to "test drive" a variety of roundabout designs, can be found on the Iowa DOT's website, www.iowadot.gov/roundabouts/roundabouts.htm. The IIHS also offers resources on its website, www.iihs.org/research/topics/roundabouts.html.

For more information, contact Shauna Hallmark, 515-294-5249, shallmar@iastate. edu. ■

# **Conference calendar**

Oct	ober 2010			
20	Iowa Local Agency Safety Workshops – A Multi-Disciplinary Approach to Safety	InTrans, Ames	Robert Sperry 515-294-7311 rsperry@iastate.edu Robert Sperry	
21	Iowa Local Agency Safety Workshops – A Multi-Disciplinary Approach to Safety	Western Iowa Tech Community College, Sioux City		
27	Iowa Local Agency Safety Workshops – A Multi-Disciplinary Approach to Safety	Iowa Western Community College, Council Bluffs		
Nov	ember 2010			
2	Iowa Local Agency Safety Workshops – A Multi-Disciplinary Approach to Safety	Indian Hills Community College, Ottumwa	Robert Sperry	
3	Iowa Local Agency Safety Workshops – A Multi-Disciplinary Approach to Safety	Red Fox Inn, Waverly	Robert Sperry	
9	Leadership Academy Module:	InTrans, Ames	Robert Sperry	

#### **Iowa LTAP Mission**

To foster a safe, efficient, and environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

#### **Staff**

#### Shashi Nambisan

Director of InTrans shashi@iastate.edu

#### Keith Knapp

Director of Iowa LTAP

#### Tom McDonald

Safety Circuit Rider tmcdonal@iastate.edu

#### **Bob Sperry**

Local Roads Safety Liaison rsperry@iastate.edu

#### Marcia Brink

Communications Manager and Editor mbrink@iastate.edu

#### Mina Shin

Graphic Designer

#### Kris Angaran

Secretary

krisa@iastate.edu

#### **Advisory Board**

The professionals listed below help guide the policies and activities of Iowa LTAP. Contact any of the advisory board members to comment, make suggestions, or ask questions about any aspect of LTAP.

#### **Donna Buchwald**

Iowa DOT, Office of Local Systems 515-239-1051 donna.buchwald@dot.iowa.gov

#### Gary Fox

Traffic Engineer, City of Des Moines 515-283-4973 glfox@dmgov.org

#### **Tim Herrstrom**

Road Maintenance Foreman 515-795-2825 bctjh@iowatelecom.net

#### **Bret Hodne**

Director of Public Works, City of West Des Moines 515-222-3480

#### bret.hodne@wdm-ia.com

#### Joe Jurasio

Transportation/Construction Engineer, FHWA-lowa 515-233-7321

#### joe.jurasic@fhwa.dot.gov

#### Ron Knoche

City Engineer, City of Iowa City 319-356-5138 ron-knoche@iowa-city.org

#### Charlie Purcell

Iowa DOT, Office of Local Systems 515-239-1532

charlie.purcell@dot.iowa.gov

#### Roger Schletzbaum

Marion County Engineer 641-828-2225 schletzbaum@co.marion.ia.us

#### **David Shanahan**

Cherokee County Engineer 712-225-6715 dshanahan@co.cherokee.ia.us

#### **Christy Van Buskirk**

Keokuk County Engineer 641-622-2610 cvanbuskirk@keokukcountyia.gov

#### Wade Weiss

Greene County Engineer 515-386-5650 wweiss@co.greene.ia.us

Printed with soy ink



# Stanley L. Ring Memorial Library: Current materials

Note about delivery of materials: The library now sends orders through the U.S. Postal Service. This change is resulting in important savings for LTAP, but ordered materials do not arrive as quickly. If you have an urgent need for library materials, let us know when you place your order and we will arrange faster delivery.

# Three ways to order LTAP library materials

- Use the online catalog, www.intrans. iastate.edu/ltap/library/search.cfm.
- Contact Jim Hogan, library coordinator, 515-294-9481, hoganj@iastate.edu, fax 515-294-0467.
- Mail or fax the order form on the back cover of this *Technology News*.

### **Publications**

### P 1753 Soil and Water Road-Condition Index Field Guide

This publication, produced by U.S. Department of Agriculture's Forest Service, describes key indicators for identifying potential soil and water problems on a road or road segment. The guide incorporates photographs of road conditions that illustrate functional and at-risk indicators.

#### P 1754 Soil and Water Road-Condition Index Desk Reference

Based on referenced research findings, this Forest Service-produced resource describes road attributes, identifies questions each attribute addresses for a watershed-scale road analysis, and identifies related indicators and the usefulness of the attribute in identifying road impacts to soil and water resources.

# P 1755 Stabilization Selection Guide for Aggregate and Native-Surfaced Low-Volume Roads

The purpose of this Forest Service-produced guide is to help users select modification/stabilization agents and techniques for aggregate- and native-surfaced low-volume roads. It includes information on available stabilizing agents, appropriate conditions for their use, selection procedures, quantity determination, and contact information for manufacturers and suppliers.

# CDs/DVDs

#### CR 99 Roundabouts: A Safer Choice

This new FHWA video explains the many benefits of roundabout intersections. Presented in a nontechnical manner, it is intended primarily to help decision makers in state and local agencies overcome common misconceptions, barriers, and reasons for not considering or selecting roundabouts as intersection alternatives. It could also be presented at public meetings as part of a public information campaign.

#### DVD 267 Recognize—React—Recover: Using Rumble Strips to Prevent Run-Off-Road Crashes

This 15-minute basic flagger training resource was produced by Colorado DOT.

#### **DVD 268 Flagger Training**

This 18-minute DVD produced by the Roadway Safety Foundation details the benefits and best practices for deploying rumblestrips to prevent run-off-road crashes.

### DVD 269 Forest Applications Training (Chain Saw Safety)

Produced by the U.S. Department of Agriculture, this new (2010) chain saw safety training resource covers personal protective equipment, cutting a tree down safely, bucking and cutting, and chain sharpening.

### **DVD 270 Portable Crossings for Forest Roads & Skid Trails**

Produced by the U.S. Department of Agriculture, this resource presents results from comprehensive field trials conducted on crossing systems and materials for vehicles and equipment over sensitive sites and soils with low bearing capacity. The crossings discussed are portable, economical, reusable, made of readily available materials, and useful for aiding short-term access needs.

### DVD 271 Modern Timber Bridges: An Attractive Option

Another resource produced by the U.S. Department of Agriculture, this DVD facilitates the use of modern bridge technology to improve the nation's rural transportation network, expand the range of materials for wood products, and promote innovation leading to cost-saving strategies and improved performance of existing designs.

#### **DVD 272 Spanning Time: America's Covered Bridges**

This FHWA video guides viewers through an instructional and entertaining look at covered bridges: their cultural significance, history, construction techniques, preservation efforts, and tourist activities surrounding covered bridges throughout the United States. •

# Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads | Excerpt 6 — Lighting and Intersections

This is the sixth and last in a series of summarized excerpts from the manual Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads. This excerpt is based on Chapter 6: Lighting and Chapter 8: Intersections. Remove this page and post it, or photocopy it and distribute it to your staff.

# **Breakaway Light Poles**

Street and roadway lighting can be essential for providing nighttime visibility, but the light poles themselves can be a hazard, especially when located in or near a clear zone. When light poles must be located in or near the clear zone, use poles with a breakaway or slip base. If hit by an errant vehicle, such poles are designed to shatter, bend easily, or separate from a solid foundation, adding a degree of driver protection.

#### **Project contact**

**Jeff Cunningham Iowa DOT, Office of Local Systems** 2300 S.E. 17th **Grimes, IA 50111** Phone: 515-986-5461



Close-up of a breakaway base on a lighting pole. (Courtesy of the lowa DOT)

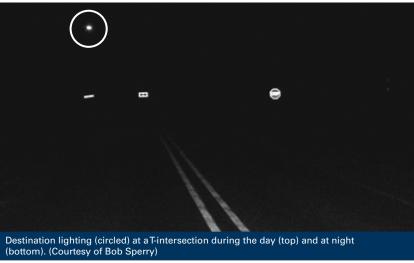
### **Destination Lighting**

The goal of destination lighting at roadway intersections is not to totally illuminate an intersection, but to act as a visual guide for nighttime travelers. Destination lighting can be a good countermeasure for rural intersections where nighttime crashes involve Stop sign running or a failure to yield. Each light costs approximately \$250 to \$750 to install and approximately \$8 to \$15 a month to maintain. Most counties that are allowed to pay a monthly rental charge (similar to homeowner "yard lights") choose to do so instead of paying for a fully metered light. Grundy County has installed destination lighting at intersections of two paved rural roads.

#### **Project contact**

Darren Moon, P.E. **Story County Engineer** 837 N Avenue Nevada, IA 50201 Phone: 515-382-7355 engineer@storycounty.com





# Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads | Excerpt 6 — Lighting and Intersections

This is the sixth and last in a series of summarized excerpts from the manual Best Practices for Low-Cost Safety Improvements on Iowa's Local Roads.

This excerpt is based on Chapter 6: Lighting and Chapter 8: Intersections. Remove this page and post it, or photocopy it and distribute it to your staff.

# **Offset Right Turn Lane**

The purpose of an offset right turn lane is to move turning traffic out of the line of vision of vehicles stopped at the intersecting road Stop sign. This system increases the visibility of vehicles on the throughway and reduces the potential of a broadside crash. On IA-137 in Monroe County, an offset right-turn lane was constructed in 2005 as part of a "RISE" economic development project to accommodate right-turning traffic to an ethanol plant near Eddyville.

#### **Project contact**

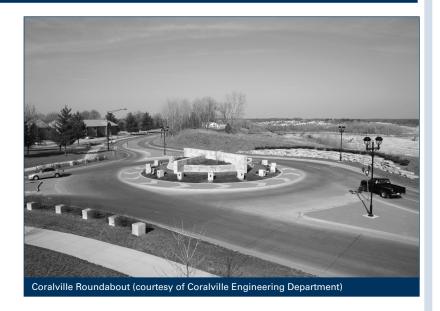
John Goode, P.E. Monroe County Engineer 10 Benton Avenue E. #6 Albia, IA 52531 Phone: 641-932-7123 igoode@monroecoia.us



### Roundabouts

(See the feature article on page 1)

A roundabout is an intersection design that provides traffic control without stops and often increases traffic volume capacity and reduces turning conflicts. In 2002, as part of a larger \$1.5 million street improvement project, Coralville constructed a roundabout to replace an awkwardY intersection. Upon opening, the roundabout's benefits were evident: Vehicle speeds through the intersection were greatly reduced, and peak-hour delays dropped significantly. Non-peak performance has also been outstanding compared to that of all-way stop- or signal-controlled intersections. For more than 20 hours a day, traffic is basically free flowing in all directions. This project experienced cost savings compared to the option of widening the streets for left-turn lanes and installing traffic signals. A majority of the savings, however, were spent on substantial roundabout streetscaping at this "city gateway." As a result of its success with this intersection, Coralville has constructed additional roundabouts, and others are being planned.



#### **Project contact**

Scott Larson, P.E.
Assistant City Engineer
1512 7th Street
Coralville, IA 52241
Phone: 319 430-6262
slarson@ci.coralville.ia.us

# **Overview of 2009 Manual on Uniform Traffic Control Devices**

Notice of Proposed Amendment in Federal Register – January 2, 2008

Final Rule Published - December 16, 2009

The following is a list of revisions to the 2003 edition of the MUTCD. Formatting in the 2009 edition has also been changed throughout the manual.

#### Introduction

- MUTCD Applicable to Private Roads
- New and Revised Compliance Dates

#### Part 1 — General

- New Purple Color
- 70 New Definitions
- New Section 1A.14

#### Part 2 - Signs

#### Chapter 2A — General

- Several New Symbols
- Recommended Lettering Size Increase
- Options for Sign Conspicuity Enhancement

#### Chapter 2B — Regulatory Signs

- Larger Sizes Recommended for Stop Signs
- New Guidance for Establishing ROW Control
- Certain Stop Sign Plaques Prohibited
- Size Restrictions for Back-to-Back Mounted Signs
- Crashworthy Requirements for In-Street Pedestrian Signs
- Signing Guidelines for Divided Roadway Intersections
- New Regulatory Signs for Roundabouts
- Required Signs for Emergency Vehicle Hybrid Beacons
- Several New Regulatory Signs and Plaques
- Barricades and Gates Moved from Part 3

#### Chapter 2C — Warning Signs

- Some Word Message Signs Deleted
- Expanded Use of Fluorescent Yellow-Green Color
- Revisions to Table 2C-4 for Advance Placement of Warning Signs

- New Criteria for Determining Advisory Speeds
- Several New Warning Signs and Plaques
- New Guidance for Chevron Signs
  - · Option for Lower Mounting Height
  - New Table for Spacing
- Object Markers Moved from Part 3

# Chapter 2D — Guide Signs for Conventional Roads

- More Color Options for Street Name Signs
- New Table for Letter Heights on Street Names Signs

#### Part 3 — Markings

- New Guidance for Colors
- New Requirements for Types of White Lane Line Markings
- New Requirements and Guidance for Stop and Yield Lines
- Revised Guidance for Marked Crosswalks
- New Chapter 3C Pavement Markings at Roundabouts
- New Guidance for Use of Delineators for Guardrail
- New Rumble Stripe Guidance

#### Part 4 — Highway Traffic Signals

- Steps for Signal Removal Changed from Option to Guidance
- New Guidance and Revisions to Signal Warrants
- Optional Use of Flashing Arrows
- Larger Signal Faces for New Installations
- Recommendations for Number, Location, and Design of Certain Signal Faces
- New Requirements for Countdown Pedestrian Displays
- New Requirements and Guidance for Accessible Pedestrian Signals and Detectors
- New Pedestrian Hybrid Beacon

# Part 5 — Traffic Control Devices for Low Volume Roads

 Revised to Comply with Part 2 for Sign Sizes and Part 3 for Certain Pavement Markings

- Stop or Yield Control Required for At-Grade Rail Crossings
- New Chapter 5H for Traffic Control at School Areas

#### Part 6 — Temporary Traffic Control

- Added Minimum Length for One Lane, Two Way Tapers
- Expanded Requirements for Wearing of High-Visibility Apparel
- Option for Use of Automated Flagger Assistance Devices
- New Diamond Display for Arrow Panel
- Temporary Traffic Control Plan Recommended for Special Events

#### Part 7 — Traffic Control for School Areas

- · Several Sections Deleted
- Restricted Use of Minimum Size School Signs
- Fluorescent Yellow-Green Color Required for All Warning Signs
- New Plaques for School Area Signing
- New Symbol Sign to Replace School Bus Stop Ahead Sign
- New Requirements for School Crossing Guards, Including Use of High-Visibility Apparel

#### Part 8 — Traffic Control for Railroad Grade Crossings

- Parts 8 and 10 Are Combined
- Stop or Yield Signs Required at All Passive Highway-Rail Grade Crossings
- Stop Lines Required at Signalized Crossings
- Stripes on Gate Arms Must Be Vertical
- Engineering Study for Potential Queuing at Crossings near Circular Intersections
- New Chapter 8D for Pathway Grade Crossings

#### Part 9 — Traffic Control for Bicycle Facilities

- Requirements for Lateral Offset and Mounting Height
- New and Revised Signs and Plaques
- New Shared Lane Pavement Marking Symbol

#### P 486-0524

### July-September 2010 Technology News

Institute for Transportation ISU Research Park 2711 S. Loop Drive, Suite 4700 Ames, IA 50010-8664

#### **RETURN SERVICE REQUESTED**

15	Α	n	N /	1			п
	Δ	μ	W	12	וםי	ria	I
			IIV	101	ш		П

			_		
11	Orc	lor li	hrory	motorio	0
V	Ulu	IU III	nıaıy	material	2

 $\sqrt{\ }$  Add a name to our mail list

 $\sqrt{\phantom{0}}$  Correct your mailing information

To make a change to the *Technology News* mail list or to order library materials, please complete the information below and mail or fax this page (including mail label) to the InTrans address below:

#### Institute for Transportation

2711 S. Loop Drive, Suite 4700 Ames, IA 50010-8664

**Fax**: 515.294.0467

- ☐ Add the name/address below to the *Technology News* mail list.
- ☐ Delete the name/address below from the *Technology News* mail list.
- ☐ Correct the name and/or address below on the *Technology News* mail list.

### New or corrected mailing information:

Name\_\_\_\_\_

Title \_\_\_\_\_\_Organization \_\_\_\_\_

Address \_\_\_\_\_\_

State \_\_\_\_\_Zip \_\_\_\_

☐ Send the following library materials to the address above:

Title:

P-, V-, DVD or CR-number: \_\_\_\_\_

#### Subscribe to Technology News online at

www.intrans.iastate.edu/pubs/Newsletter\_Request/mailform.cfm.