

FOCUS

March
2001

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Working Together for Work Zone Safety

“Slow Down. It Won’t Kill You.” That’s the message motorists in Georgia are getting as they travel through work zones, thanks to a new campaign by the Georgia Department of Transportation (DOT). Drivers approaching work zones in Alabama, meanwhile, are being reminded that “People Work There.” These and other efforts to promote safety and mobility in work zones will be spotlighted during the second annual National Work Zone Awareness Week, to be held April 9–12, 2001. The week is being jointly sponsored by the American Association of State Highway and Transportation Officials (AASHTO), American Traffic Safety Services Association (ATSSA), and the Federal Highway Administration (FHWA).

The awareness week will kick off on April 9 with a media event on the National Mall in Washington, DC. This event will commemorate the 868 work zone fatalities that occurred in 1999 and highlight nationwide initiatives to improve work zones, as well as things individual drivers can do to make travel through work zones safer. These “Safety Tips to Live By” include turning on headlights in work zones, keeping up with the traffic flow, and refraining from changing lanes.

The first Work Zone Awareness Week, held April 2–8, 2000, prompted a number of observances by State and local transportation agencies. The Arizona DOT, for example, held a press conference near an Interstate work zone site in Phoenix that featured two DOT maintenance employees who had been involved in a work zone crash. The Virginia DOT, meanwhile, launched a campaign aimed at both

drivers and highway workers that promoted the theme of teamwork in construction zones. And the Connecticut DOT and its many partners, including the Department of Motor Vehicles and the Connecticut Construction Industries Association, showcased “Operation Big Orange.” This is a police enforcement effort designed to reduce speeds through construction and maintenance work zones.

The 2000 Work Zone Awareness Week was also observed by ATSSA members in 30 States. Events included a press conference held by the New Jersey chapter at Thunder Stadium in Trenton, New Jersey, and visits by members of the Florida chapter to State

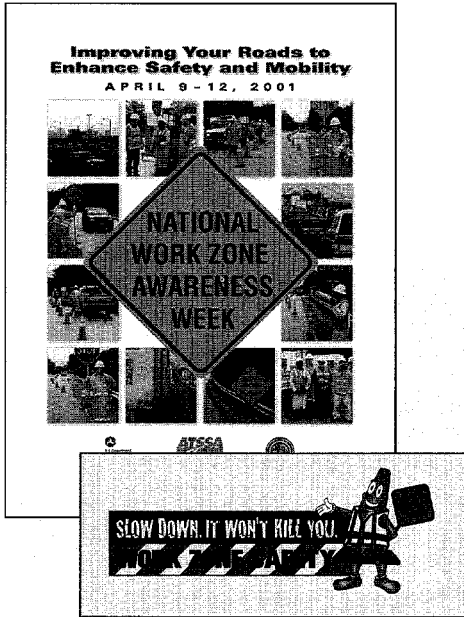
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“Accelerating Infrastructure Innovations.” This is the new banner for *Focus* found at the top of this page. It reflects our commitment at FHWA’s Office of Infrastructure to you the reader. Our goal is to provide information and assistance to help you build and maintain your roads and bridges in ways that are better, faster, safer, and more cost-effective. As always, we’ll continue to bring you the latest innovations in *Focus* each month. To find out even more about advancing today’s infrastructure, visit our Web site at www.fhwa.dot.gov/infrastructure/index.htm.



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In Brief...



legislators. "Work zone safety is a year long focus for our members," says Jim Baron of ATSSA. "Most of their days are spent in the work zone and many of them have suffered the loss of a worker. This is a subject near and dear to them."

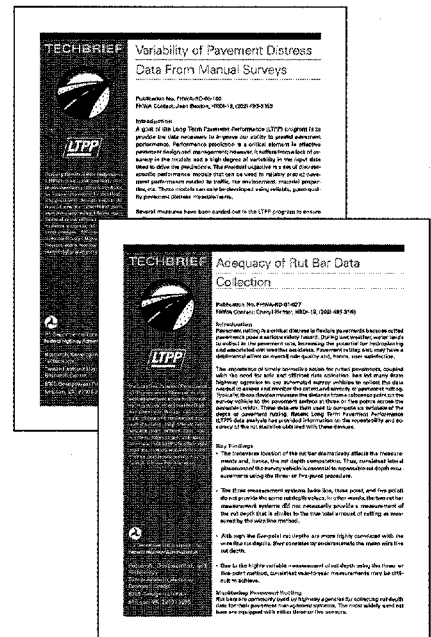
For more information on National Work Zone Awareness Week, contact Mike Robinson at FHWA, 202-366-2193 (email: mike.robinson@fhwa.dot.gov), Jim Baron at ATSSA, 540-368-1701 (email: jimb@atssa.com), or Jennifer Gavin at AASHTO, 202-624-3690 (email: jgavin@aaashto.org). Information is also available on the Web at www.atssa.com or safety.fhwa.dot.gov/fourthlevel/nwzaw01.htm. For more details on operating safe and effective work zones, contact the Work Zone Safety Information Clearinghouse (wzsafety.tamu.edu/). Sponsored by the American Road and Transportation Builders Association and FHWA, the Clearinghouse offers users a chance to check out what's new in work zone safety, ask questions, and submit information on their own best practices. You can also reach the Clearinghouse at 888-447-5556 (fax: 979-845-0568; email: workzone@tamu.edu). *

The Strategic Highway Research Program (SHRP) brought States the Superpave mix design system, long-term pavement performance program, and improved pavement maintenance techniques, among other successes. What will the Future SHRP (F-SHRP) bring? The F-SHRP Committee, formed in 1999, is scheduled to issue its report this fall. After extensive outreach to the transportation community, the committee is focusing on a number of potential research areas. These include:

- Achieving rapid, long-lived reconstruction of highways with minimum disruption. This topic may focus particularly on Interstates and freeways, but would also look at providing benefits for urban street networks.
- Improving the design of safety programs through indepth study of crash causation factors and development of prototype countermeasures for common crash types.
- Reducing user delay by developing better data analysis tools, traffic control technologies, roadway designs, and institutional strategies.
- Developing tools to help practitioners meet future highway demand in ways that support improved quality of life, economic growth, and community and environmental values.

For more information, check out the F-SHRP Web site at www4.nationalacademies.org/trb/newshrp.nsf or contact Ann Brach at TRB, 202-334-2242 (fax: 202-334-2527; email: abrach@nas.edu).

Two new TechBriefs are available from the long-term pavement performance (LTPP) program. *Adequacy of Rut Bar Data Collection* (Publication No. FHWA-RD-01-027) examines the accuracy of automated survey vehicles, which are being used by many State highway agencies to collect data on the extent and severity of pavement rutting. *Variability of Pavement Distress Data from Manual Surveys* (Publication No. FHWA-RD-00-160) assesses the collection of the data that drives pavement performance predictions. Both TechBriefs can be found on the Web at www.tfhrcc.gov/pavement/ltpplibrary.htm. They can also be obtained from the FHWA Research and Technology Report Center at 301-577-0818 (fax: 301-577-1421; email: marl.green@fhwa.dot.gov). *



Lessons Learned from European Work Zones

With work zone fatalities increasing from 658 in 1997 to 868 in 1999, the need for improved work zone safety is more evident than ever. To get a first-hand look at how other countries manage the flow of traffic through work zones, the Federal Highway Administration (FHWA) and National Cooperative Highway Research Program (NCHRP) organized a May 1999 scanning tour of Germany, the Netherlands, Belgium, Scotland, and France. The knowledge gained on this trip is highlighted in a new report available from FHWA, *Methods and Procedures to Reduce Motorist Delays in European Work Zones* (Publication No. FHWA-PL-01-001).

The ultimate objectives of the scanning tour team, led by Don Steinke of FHWA and Len Sanderson of the North Carolina Department of Transportation (DOT), were to improve highway construction and maintenance operations, reduce motorist's delays, and increase worker and motorist safety. The team members set off to accomplish these objectives by uncovering new methods already in use and identifying potential areas for research. "There are always opportunities to learn by looking at what others are doing," said team member Joe Wilkerson of FHWA. "The trip confirmed some of the things we have been trying to do and showed us some new ideas."

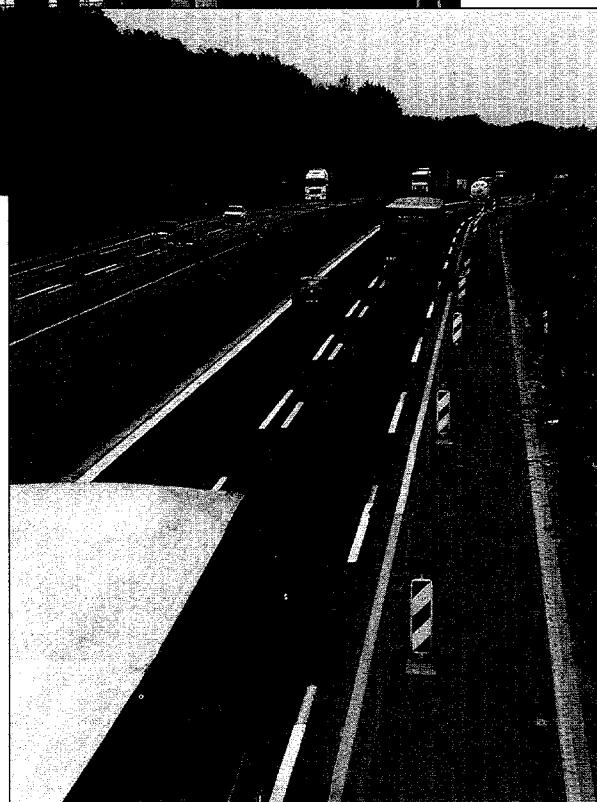
During the tour, the team members visited construction and maintenance sites and met with highway agency representatives. They found that most of the countries emphasize shorter construction periods and even encourage contract proposals that minimize project duration. There are incentives provided for work completed ahead of schedule, and disincentives for contractors that exceed the agreed upon completion date.

In all five countries, the tour members observed ambitious public outreach programs aimed at communicating with motorists both before and during project and



Overhead signs in the Netherlands (above) are used to display speed limits, which change in response to actual travel conditions.

On this German road (right), lanes have been narrowed prior to reaching a work zone area, allowing the highway agency to keep more lanes open.



maintenance work. German work zones, for example, are announced by "We Build for You" signs. The signs state the reason for the roadwork and list the duration and length of the work zone. France, meanwhile, distributes leaflets on scheduled roadwork to motorists in neighboring countries, as many of these individuals travel on French highways to vacation destinations. France also distributes 11 million free calendars each year that show when and where road projects are scheduled, as well as free roadmaps detailing recommended alternative routes to take while the projects are underway.

"I was impressed with the customer focus, particularly the amount of attention paid to how their projects may impact the

motorist and then the tools that they have available to manage or reduce the delays and improve safety," says team member John Conrad, then with the Washington State DOT. "In the U.S., we may tell the motorist 'delays ahead,' while in Europe they provide travel time estimates to well-known junctions. I would like to see us test some of the work zone devices and equipment being used in Europe."

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A QuickZone Tailor-Made for Maryland

The prototype version of QuickZone, a new work zone delay estimation software developed by the Federal Highway Administration (FHWA) and Mitretek Systems, is now available for use and assessment by highway agencies. One State getting ready to give it a real-world tryout is Maryland.

"We had an ongoing project with the University of Maryland where we were looking at capacity in work zones and trying to come up with a tool for estimating queues and delays," says Jawad Paracha of the Maryland State Highway Administration (SHA). "When we found out about QuickZone, we decided to combine the two efforts."

QuickZone, which is the first product to come out of FHWA's new Strategic Work Zone Analysis Tools (SWAT) program (see July/August 2000 *Focus*), can be used to compare the traffic impacts for work zone mitigation strategies and estimate the costs associated with these impacts. The costs can be estimated for both an average day of work and for the whole life cycle of construction. The software, says lead developer Karl Wunderlich of Mitretek Systems, "will help highway agencies better phase and stage their construction activities. It can help them determine what times of day and

what times of the year are best for a certain project, for example."

QuickZone's open source code has allowed the University of Maryland, under contract with SHA, to customize the program to better meet the State's needs. The university, for example, has added its own capacity estimation model to the program. In Maryland's version of the program, users can also define the criteria that will be used for analysis, such as setting a maximum allowable queue of

vehicles or length of delay. And the Maryland version uses a 24-hour traffic count, instead of the average daily traffic count found in the standard program.

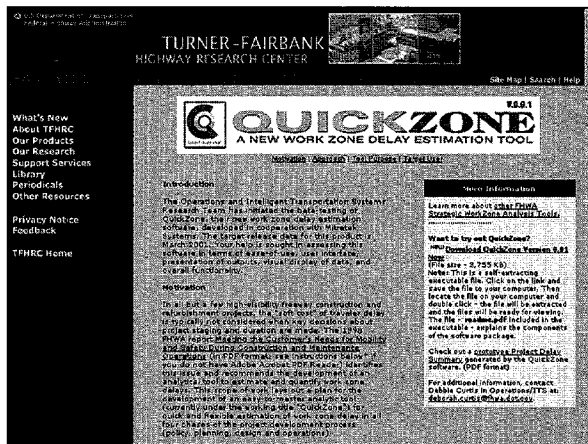
Maryland's version of QuickZone is scheduled to be ready this month. Copies will be distributed to all of the State's district traffic engineers so that they can perform validation testing and use it for general analy-

sis. "We believe that the program can guide the engineers in the right direction and provide a more accurate estimation of delays and queues," says Paracha.

A user need only have Microsoft Excel 97 or higher running on a Windows-based PC to use the QuickZone application. Version 0.91 can be downloaded from the Web at www.tfhr.gov/its/quickzon.htm. Version 0.99 of the prototype is due out in April, while Version 1.0 of the software is scheduled to be released in the fall of 2001. For more information on the software, contact Deborah Curtis at FHWA, 202-493-3267 (fax: 202-493-3419; email: deborah.curtis@fhwa.dot.gov). For more information on the Maryland version of QuickZone, contact Jawad Paracha at the Maryland SHA, 410-787-5891 (jparacha@sha.state.md.us).

FHWA is encouraging other States to customize QuickZone for their own use through its QuickZone Partnership Program. The partnership program will take advantage of QuickZone's open source code as a means of further improving the software and providing State and local agencies with a tool that best meets their needs. If you are interested in participating in the partnership program, please contact Matthew Hardy at Mitretek Systems, 202-863-2982 (email: matthew.hardy@mitretek.org).

QuickZone can be used to compare the traffic impacts for work zone mitigation strategies and estimate the costs associated with these impacts.



Work Zone Innovations: Get the Facts

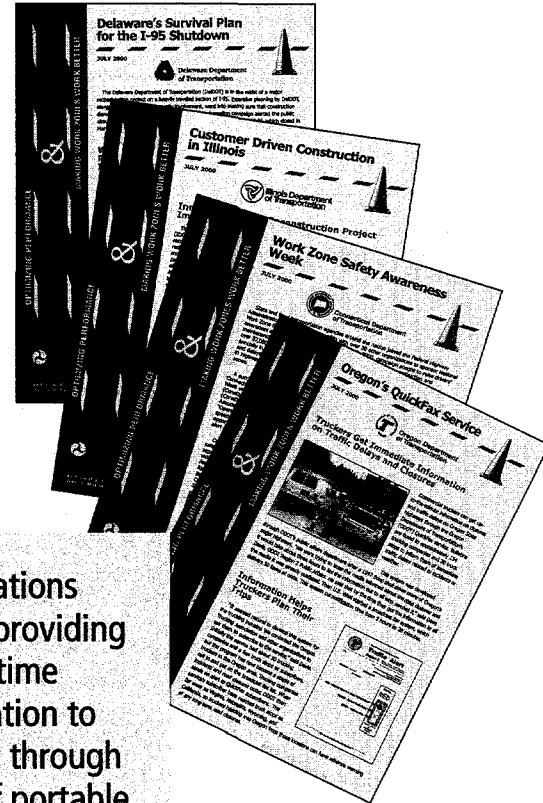
A new series of fact sheets available from the Federal Highway Administration (FHWA) describes how State highway agencies are using a lot more than flaggers and traffic cones to improve their work zones. *Oregon's Quick Fax Service* (Publication No. FHWA-OP-00-022), for example, details how the Oregon Department of Transportation (DOT) relies on a broadcast fax system to relay up-to-the-minute information on road closures and traffic delays to commercial truckers. Approximately 154 trucking companies and 30 truck stops, including those as far away as Virginia, Nebraska, and Wyoming, are on the notification list. The broadcast fax system can deliver 50 faxes at once, which has cut notification time from 3 hours to 20 minutes. For more information, contact Dave Davis at Oregon DOT, 503-986-5845 (fax: 503-986-5847; email: david.u.davis@odot.state.or.us).

The Delaware DOT took an equally innovative approach to planning a major re-

construction project on a busy section of Interstate 95, which is described in *Delaware's Survival Plan for the I-95 Shutdown* (Publication No. FHWA-OP-00-025). To keep disruptions to a minimum, a citizens advisory board reviewed several alternatives for performing the construction work and decided that closing all lanes on the side being rebuilt would be the fastest and least expensive way of completing the work. The DOT also mounted a year-long information campaign to let the public know of alternative travel routes. The campaign included newspaper ads and radio spots, as well as a survival guide that explained what was happening on I-95, when it would happen, and what the public should do to plan ahead. For more information, contact Darren O'Neill at Delaware DOT, 302-760-2274 (email: doneill@mail.dot.state.de.us).

Also described in the series is Illinois DOT's use of new strategies for a recent reconstruction project on Interstate 57 (*Customer Driven Construction in Illinois*, Publication No. FHWA-OP-00-023). Illinois Interstate projects are usually limited to 8 km (5 mi) of construction per project. However, with 29 km (18 mi) of I-57 needing rehabilitation and safety upgrades, the Illinois DOT decided to combine these multiple projects into one continuous work zone segment. This strategy limited the construction-related delays to one summer, instead of an estimated three to four construction seasons. Other innovations included providing real-time information to motorists through the use of portable message boards, using fast-setting patch mixes, and moving lane closures more of-

Innovations included providing real-time information to motorists through the use of portable message boards, using fast-setting patch mixes, and moving lane closures more often to reduce the length of the closures.



ten to reduce the length of the closures. For more information, contact Travis Emery at Illinois DOT, 618-549-2171 (email: emeryjt@nt.dot.state.il.us).

A fourth fact sheet, *Work Zone Safety Awareness Week* (Publication No. FHWA-OP-00-024), describes how some States observed the 2000 event (see related story, page 1). For more information or to obtain copies of the fact sheets, contact Phillip Ditzler at FHWA, 202-366-0855 (fax: 202-366-3225; email: phillip.ditzler@fhwa.dot.gov). The fact sheets are also available on the Web at ops.fhwa.dot.gov/wz/workzone.htm.

How is your State or local highway agency improving its work zone operations? Have innovative practices saved you time and money, improved safety, or reduced delays? FHWA wants to hear from you! The information received will be used to update FHWA's recently released *Work Zone Best Practices Guidebook* (Publication No. FHWA-OP-00-010) and will be highlighted in future fact sheets. To share your best practices or to obtain a CD-ROM copy of the current guidebook, contact Phillip Ditzler at FHWA, 202-366-0855 (fax: 202-366-3225; email: phillip.ditzler@fhwa.dot.gov). The guidebook is also available on the Web at ops.fhwa.dot.gov/wz/workzone.htm.

Highway Technology Calendar

The following events provide opportunities to learn more about products and technologies for building and maintaining better, safer roads.

Superpave Binder Course

March 26–28, 2001, Indianapolis, IN

The course will provide detailed instruction on the Superpave binder specifications and testing procedures. An overview of the binder aging methods and direct tension tests will also be provided. The course includes both classroom instruction and hands-on laboratory work.

Contact: For information about course content, contact Rebecca McDaniel at the North Central Superpave Center, 765-463-2317, ext. 226 (fax: 765-497-2402; email: rsmcdani@purdue.edu; Web: bridge.ecn.purdue.edu/~spave/). For registration information, contact Nona Schaler at Purdue University, 765-494-2756 or 800-359-2968, ext. 92N (fax: 765-494-0567; email: njschaler@purdue.edu).

National Work Zone Awareness Week

April 9–12, 2001

This nationwide event is dedicated to promoting safety and mobility in work zones. The event is being cosponsored by the American Association of State Highway and Transportation Officials, American Traffic Safety Services Association, and the Federal Highway Administration (FHWA).

Contact: Mike Robinson at FHWA, 202-366-2193 (email: mike.robinson@fhwa.dot.gov).

International Center for Aggregates Research (ICAR) 9th Annual Symposium

April 22–25, 2001, Austin, TX

Symposium topics will include alkali-silica reaction in concrete testing, frictional properties of aggregates in pavement surfaces, and aggregate classification and handling.

The event is being cosponsored by the Aggregates Foundation for Technology, Research, and Education; the National Aggregates Association; and the National Stone Association.

Contact: ICAR at 512-471-4498 (email: icar@mail.ce.utexas.edu; Web: www.ce.utexas.edu/org/icar/index.html).

2001 AASHTO Value Engineering Conference

July 10–13, 2001, San Diego, CA

The conference will feature main tracks on starting and maintaining a value engineering program and advanced tools and techniques for value engineering, as well as a number of case studies.

Contact: Earl Burgess at the California Department of Transportation, 916-653-4436 (fax: 916-653-1527; email: earl.burgess@dot.ca.gov; Web: www.dot.ca.gov/hq/oppd/value).

International Symposium on Transportation Technology Transfer

July 29–August 2, 2001, St. Petersburg, FL

The symposium will bring together transportation professionals from around the world to discuss their advances and experiences in technology transfer techniques. The event is being sponsored by FHWA, the Local Technical Assistance Program, World Road Association, Organisation for Economic Co-operation and Development, Transportation Research Board, and the Pan American Institute of Highways.

Contact: The Office of International Programs at FHWA, 202-366-9636 (fax: 202-366-9626; email: 2001symposium

@fhwa.dot.gov; Web: www.international.fhwa.dot.gov).

Fifth International Conference on Managing Pavements

August 11–14, 2001, Seattle, WA

The objective of the conference is to further enhance the understanding and use of pavement management by transportation agencies and practitioners. The event will bring together pavement management professionals from around the world to discuss and exchange experiences, ideas, and proposals relating to the conference theme. Sponsors include the Washington State Department of Transportation, Foundation for Pavement Research, Asphalt Institute, International Society for Asphalt Pavements, Transportation Research Board, and FHWA.

Contact: University of Washington Engineering Professional Programs Office, 206-543-5539 (fax: 206-543-2352; email: pavement@engr.washington.edu).

Context Sensitive Highway Design: Transferring Lessons from Our Collective Experiences

September 5–7, 2001, Missoula, MT

The goals of the workshop include sharing information on and advancing the practice of context-sensitive design for highway and other transportation projects. The workshop is being sponsored by the Montana Department of Transportation, Western Transportation Institute, and FHWA.

Contact: Meetings Northwest at 406-273-7224 (fax: 406-273-2494; email: csdworkshop@meetingsnorthwest.com).

European Work Zones

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Seventh International Conference on Concrete Pavements

September 9–13, 2001, Orlando, FL

Designed for pavement and geotechnical engineering professionals, the conference's focus is on using concrete to develop long-lasting pavement solutions for the 21st century. The event will highlight new technologies related to the design, construction, and rehabilitation of various types of concrete pavements. Another highlight will be a day of workshops and technical sessions on "Formulating the Long Range Research Needs for PCC Pavements."

Contact: Shiraz Tayabji at Construction Technology Laboratories, Inc., 410-997-0400 (fax: 410-997-8480; email: stayabji@ctlgroupp.com; Web: iscp.tamu.edu).

Beneficial Use of Recycled Materials in Transportation Applications Conference

November 13–15, 2001, Washington, DC

The conference will bring together experts from North America, South America, Europe, and Asia to address the use of recycled materials generated from transportation, industrial, municipal, and mining processes in transportation applications. Event sponsors include the University of New Hampshire's Recycled Materials Resource Center, FHWA, National Asphalt Pavement Association, and the National Association of Counties.

Contact: The Recycled Materials Resource Center at 603-862-4704 (fax: 603-862-3957; email: rmmc@rmrc.unh.edu).

Much information is delivered to motorists by signage not frequently used on American highways. For example, the European countries use clearly marked alternate route signs; numerous variable message signs; and overhead signs, which are considered harder for motorists to overlook, to relay pertinent traffic information. Symbols/pictograms, which are believed to be easier to recognize than text, are also frequently used, particularly in areas where drivers come from many different countries and may not speak the native language. The Europeans consider these signs to be more effective than the common static "Work Zone Ahead" signs used on U.S. roadways.

The team also found close coordination between the public-sector agencies and private-sector organizations involved in roadway work. This helps to ensure that all necessary road maintenance projects in one area, such as guardrail maintenance, bridge repairs, and pavement surface treatments, are scheduled concurrently, thus maximizing the improvements to the roads and minimizing the inconvenience to motorists.

Another strategy used to minimize work zone traffic delays in Europe is the narrowing of lanes, which eliminates the need for closing a lane and allows the flow of traffic to continue through work zones. A study done by the German highway agency found that narrow lanes also have a slowing effect on speed.

All of the countries visited require that the design and maintenance of roadways be done with an eye toward the future. This

"There are always opportunities to learn by looking at what others are doing."

might mean, for example, constructing road shoulders that can also serve as an extra lane while maintenance is being performed.

Quality control and quality assurance programs are also effectively used in the five countries to improve worker safety. For example, to improve work zone safety, Scotland employs an inde-

pendent evaluator to conduct safety audits, while French highway agencies construct job-specific traffic control plans, which can then be used by contractors to fit their needs.

Finally, the team members found an overall emphasis on and encouragement for innovation in the transportation community. The Netherlands, for example, has started a "Roads to the Future" program, with 14 pilot projects underway. Among the projects is one focused on carrying out maintenance work without creating obstructions to traffic.

The team recommends investigating all of the above methods for possible use on U.S. highways. A more in-depth discussion of the experiences and findings of the scanning tour can be found in the team's report, which is available on the Web at www.international.fhwa.dot.gov. To obtain a printed copy of the report, contact Hana Maier at FHWA, 202-366-6003 (email: international@fhwa.dot.gov). For more information on using innovative work zone strategies, contact Phillip Ditzler at FHWA, 202-366-0855 (fax: 202-366-3225; email: phillip.ditzler@fhwa.dot.gov).

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www.tfhrc.gov/focus/focus.htm

Additional copies of the CD-ROM, *Hot Mix Asphalt for the Undergraduate* (Publication No. FHWA-RD-99-073), are now available from FHWA. Originally issued in 1999, the CD-ROM contains course materials that are designed to introduce the Superpave system to students in civil engineering programs. The materials include instructor's notes, a laboratory instructor's guide, a student workbook, and homework problems. These can be used as either a supplement to existing undergraduate courses on materials and pavements or as a stand-alone segment of the course curriculum.

The CD-ROM is available from the FHWA Research and Technology Report Center (phone: 301-577-0818; fax: 301-577-1421; email: marl.green@fhwa.dot.gov). For more information, contact Lee Gallivan at FHWA, 317-226-7493 (fax: 317-226-7341; email: victor.gallivan@fhwa.dot.gov).



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