An issue on roadway safety and liability

There are limits... to speed limits
Why some measures to control speed just don’t work

by Laura Snyder

It may seem simple enough to the average person: post a lower speed limit, and the traffic on that road will slow down. Transportation professionals, however, know this isn’t the case. Every 2 to 4 years, the commissioners in Miami County ask Penny Evans, county engineer, to post lower speed limit signs on rural roads. Each time, Evans says she educates the commissioners about the ineffectiveness of posting lower speed limits.

Why it doesn’t work
The two big reasons that posting lower speed limits doesn’t work are: 1) the drivers and 2) enforcement. Drivers historically do not slow down when lower speed limits are posted.

According to the U.S. Department of Transportation Federal Highway Administration, drivers rely more on road conditions and traffic volume than on speed limit signs. Also, law enforcement agencies are ill-equipped to monitor rural roads and issue speeding tickets.

Even on roads with no speed limit posted, it is difficult to enforce safe driving. A driver who drives dangerously fast on a rural road with no speed limit posted might be issued a ticket for reckless driving if a police officer sees the car fishtailing, Evans says. Unfortunately, it is difficult for police officers to patrol all rural roads looking for reckless drivers. “A sheriff can’t be on 900 miles of road with just three patrol cars to enforce the speed limit,” Evans says.

In addition, posting lower speed limits can also cause more accidents. “I think the political bodies think if they lower the speed limit, they make it safer,” says Evans. “They don’t realize that lowering the speed limit can cause rear-end accidents if only some drivers slow down.”

Weighing the expense against the benefit
Signing every mile gets expensive, too. If only about one out of 200 drivers speeds on a road, Evans finds it difficult to justify spending the estimated $130,000 it would cost Miami County to post speed limit signs every mile on 900 miles of country road. “We could spend that $130,000 in improving roads somewhere else, on roads with higher traffic volumes,” Evans says.

Tony Herrman, Seward County road and bridge supervisor, agrees. Seward County posts signs on paved roads, about
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150 miles, but not on the 550 miles of unpaved roads. “It’s a waste of money, especially when no one would adhere to the speed limit anyway,” he says. “On a good, smooth dirt road, people will drive as fast as they would on a highway.” Herrman estimates the cost of each speed limit sign at $50. However, that doesn’t include maintenance and replacement of the signs, which are often stolen or vandalized.

Gary Ditty, public works director for Leavenworth County, says his county posts signs eight miles apart on rural roads, mainly because of theft problems and the expense of replacing signs. “We’re pretty stingy with our speed limit signs,” he said.

If you post anyway...

If your county decides to post lower speed limits, the Manual on Uniform Traffic Control Devices (MUTCD) requires counties to first do an engineering study to show that these speed limits are appropriate. If the study is performed incorrectly, and a speed limit is set higher or lower than a particular road can handle, you are opening yourself up to lawsuits. Speeds for each road are set by establishing an “85th percentile” speed, as recommended by the MUTCD. In other words, a speed limit is set that reflects the speed of 85 percent of the drivers on that road. (See sidebar on page 4).

Also, keep in mind that the decision is permanent. Once you perform the engineering study that shows what speed is necessary, you cannot decide later to remove the signs. Nor can you decrease or increase the speed, unless the width, curve, shape, etc., of the road changes.

If you pave a gravel road, there is the expectation that you have done something to make the road safer for higher speeds, says Evans. But the drivers’ expectations for how fast to drive do not depend solely on the surface type. Evans says drivers look more at the width of the road and the traffic volume. “If you have a wide road with no traffic, people are pretty comfortable driving fast on it, whether it’s paved or not,” she says.

What about blanket speed zones?

Instead of posting individual speeds on each road, some counties have blanket speed zones. No engineering study is necessary to set blanket speed zones. Instead, county commissioners pass a resolution that all paved country roads will have one speed limit, and all unpaved country roads will have another speed limit. This is sometimes how county commissioners try to lower speeds using blanket speed limits. This strategy poses problems, too. Thirty-five mph may be too slow for the widest road, but too fast for the narrowest road. Then the county has a speed posted that is inadequate for a particular road. Situations like these create a safety hazard and the possibility of lawsuits.

Commissioners sometimes try to lower speeds using blanket speed limits. This strategy poses problems, too. Thirty-five mph may be too slow for the widest road, but too fast for the narrowest road. Then the county has a speed posted that is inadequate for a particular road. Situations like these create a safety hazard and the possibility of lawsuits.

Weather conditions also contribute to the variability of a safe speed for a road. A speed limit of 45 mph might be appropriate for a paved road is to simply let the road deteriorate, or mill it back to gravel. Drivers tend to go slower on unpaved roads. On a paved road, such as one leading to an internal subdivision, you can paint stripes along the edges of the road to make it appear narrower. But Evans cautions against using more drastic traffic-calming strategies on most country roads. County section line roads, for example, are designed to facilitate traffic movement and serve as collectors to move traffic from gravel roads to highways or towns. You want to keep traffic moving, she says.

Oftentimes, the concerns Evans hears from her commissioners about speed limits are too localized to justify taking action. “There’s that neighbor

continued on page 4
Are your signs sporting holes? It could be the post.

Wood preservative corrodes signs

Aluminum signs started falling off their wood posts in less than a year after WisDOT switched to posts treated with ACQ (ammoniacal copper quat). Previously, they had used posts treated with the preservative CCA (chromated copper arsenate). The change took place about two years ago because of a US EPA requirement.

“The problem is the copper in the preservative. It reacts with the aluminum in the signs,” says Matt Rauch, WisDOT State Signing Engineer. “Where CCA has about 16 percent copper, ACQ has 66 percent.”

As of December 2004 WisDOT has returned to using only CCA treated posts and is alerting municipalities and signing contractors to the problem. Some counties have also reported the problem, which also affects wood guard rail posts and bridge timbers.

First, find out if you have a problem. Check posts in stock, invoices or posts in the field for the type of preservative. They will have a tag on one end specifying the treatment (“ACQ” or “CCA”). If you have a sign inventory, you can locate wood posts installed since ACQ sign posts became widely available in 2002.

Removing posts is not necessary, Rauch says. “We have 25,000-30,000 signs already on these posts.” You can seal signs that are corroded, if the base material is still good, by cleaning with a wire brush and spraying with XIM-400, or equivalent product, which is a clear metal primer for aluminum. Then put plastic or foam spacers between the sign and the post. WisDOT is using 3-1/2” square plastic spacers.

“We’re also recommending use of stainless steel lag bolts and washers to mount the signs,” Rauch says. “We have seen corrosion and deterioration on galvanized bolts and washers.” You can use up existing stocks of ACQ-treated posts by installing signs with spacers and stainless hardware.

Municipalities and state agencies can purchase CCA-treated wood for roadway uses. However, EPA has not eased its rules for residential uses; ACQ treated wood is required for wood decks and other home projects.

“The problem is the copper in the preservative. It reacts with the aluminum in the signs.”

For more information (and photographs of corrosion damage), call Evans at (913) 294-9533.

Reprinted courtesy of the Wisconsin Transportation Information Center, part of the nationwide Local Technical Assistance Program. ■
Straight from the source

We’ve reprinted for you Section 2B.13 from the MUTCD, which explains the process for setting speed limits:

**Standard:** After an engineering study has been made in accordance with established traffic engineering practices, the Speed Limit (R2-1) sign shall display the limit established by law, ordinance, regulation, or as adopted by the authorized agency. The speed limits shown shall be in multiples of 10 km/h or 5 mph.

**Guidance:** At least once every 5 years, States and local agencies should reevaluate non-statutory speed limits on segments of their roadways that have undergone a significant change in roadway characteristics or surrounding land use since the last review.

No more than three speed limits should be displayed on any one Speed Limit sign or assembly.

When a speed limit is to be posted, it should be within 10 km/h or 5 mph of the 85th-percentile speed of free-flowing traffic.

**Option:** Other factors that may be considered when establishing speed limits are the following:
A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
B. The pace speed;
C. Roadside development and environment;
D. Parking practices and pedestrian activity; and
E. Reported crash experience for at least a 12-month period.

Two types of Speed Limit signs may be used: one to designate passenger car speeds, including any nighttime information or minimum speed limit that might apply; and the other to show any special speed limits for trucks and other vehicles.

A changeable message sign that changes the speed limit for traffic and ambient conditions may be installed provided that the appropriate speed limit is shown at the proper times.

A changeable message sign that displays to approaching drivers the speed at which they are traveling may be installed in conjunction with a Speed Limit sign.

**Guidance:** If a changeable message sign displaying approach speeds is installed, the legend YOUR SPEED XX km/h (MPH) or such similar legend should be shown. The color of the changeable message legend should be a yellow legend on a black background or the reverse of these colors.

**Support:** Advisory Speed signs are discussed in Sections 2C.36 and 2C.46 and Temporary Traffic Control Zone Speed signs are discussed in Part 6.

—MUTCD 2003 Edition, Revision 1

Posting lower speed limits, continued from page 2

who’s a teenager and just learning how to drive, with his Camero going 75,” she says. “We can’t change that speed limit for just one person.”

Commissioners also get complaints from parents who want speed limits lowered so their children can play in the street, or people who want to be able to ride their horses in the street. Residents in older houses built close to the road suffer the dust from gravel roads, and think lowering speeds would help. In each of these cases, Evans says talking with the constituents usually solves the problem.

Meanwhile, Evans’s advice is to focus on making your roads safer, not necessarily slower. “We add 2-foot shoulders to the road so if a car leaves the road, it has a place to recover,” says Evans. Also focus on ditches and drainage. There are only a few reasons to consider posting a lower speed limit, says Evans—if you have a high accident rate on a road, or if you have many points of conflict that can’t be addressed in other ways. But even speed zoning may not fix those problems.

For more information, contact Penny Evans, Miami County Engineer, at (913) 294-9533.

Sources

**Signs, signals, and crosswalks,** Kansas City Department of Transportation, Road Services Division, Oct. 17, 2003, http://www.metrokc.gov/kcdot/roads/traffic/faqsign.cfm


As chip-sealing technology has improved in recent years, the question of whether or not to stripe these roads has arisen. The new sealants are longer-lasting, which makes striping chip-sealed roads more cost-effective. Now chip-sealed roads don’t have to be re-striped as often. But what should you take into account when deciding whether or not to stripe chip-sealed roads?

**The MUTCD requires...**

The Manual on Uniform Traffic Control Devices (MUTCD) gives requirements and guidelines for marking rural roads with center lines, without specifying any difference between paved, gravel, or chip-sealed roads. Instead, whether or not to stripe rural roads depends on volume and width of the road. According to Section 3B.01 through 3B.07, edge lines must be put on roads that are 20 feet or wider, and have an Average Daily Traffic (ADT) of 6,000 cars or greater. Center lines must be painted on roads over 20 feet wide, with an ADT of 6,000 or greater. These guidelines leave some decision-making up to engineering judgment.

Although striping the roads that are recommended (but not required) to be so may be expensive, it does make the roads safer and the public happier.

“If we don’t stripe a road quickly, get a lot of complaints,” says J.R. McMahon, public services director of Miami County. “If we keep it up and do it quickly, we get a lot of compliments.”

Dustin Conner, road supervisor for Wilson County, says striping makes roads safer. “Especially at night, when it’s raining, the striping makes a big difference,” he says. “You can see a lot better with the stripes.”

However, Mark Borst, traffic engineer for Sedgwick County, says it’s important to remember that nothing absolutely “insures, ensures or assures” the safety of streets, roads and highways. “The use of markings is just one way to help drivers navigate the roads,” he said.

**If you stop striping...**

If you decide to stripe the “recommended” chip-sealed roads, think carefully about whether you will continue striping in the future. A court ruling in Schaeffer vs. KDOT shows you’d better have a good reason to stop using a device to guide traffic. In that case, KDOT was found liable for failing to fix a curve warning sign that had fallen down. Letting the striping on your chip-sealed roads fade could result in a lawsuit.

If you do decide you don’t want to stripe anymore, Vicky Johnson, attorney for KDOT, says, be prepared to convince a jury that it was a reasonable decision to stop striping.

If it’s a financial decision to stop striping, make sure to document budget cuts and why you decided to cut funding in certain areas. Still, that may not hold up in court. “Once you start striping, you’re showing that you think it’s necessary,” says Borst.

“Economic reasons for stopping a maintenance function are hard to hold up in court unless you docu-

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Are you ready for commitment?  
If you stripe a chip-sealed road, you’d better be.

... by Laura Snyder  

LTAP Clearinghouse photo collection  

continued on next page ➤
Quickzone updated to include flagging

Quickzone, a work zone planning tool developed by FHWA, has been upgraded. This Microsoft Excel-based software compares traffic impacts for various work zone configurations and estimates their costs and potential traffic delays.

Version 2.0 includes new features users have requested and reflects lessons learned from using earlier versions of the software. The new features include enhanced detour modeling and improved two-way, one-lane operations modeling, including flagging. “The inclusion of modeling capabilities for flagger operations is a significant change,” says Deborah Curtis of FHWA.

A beta (draft) version of Quickzone 2.0 is available for download at http://quickzone.mitretek.org/updates. It is not yet supported. Once beta testing is complete, the software will be available for purchase from Kansas’s PC-TRANS (785) 864-2593 or McTrans at (800) 226-1013.

Try to use darker chips so the painted stripes show up better.

Are you ready for commitment?

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ment your actions and justifications for doing so.”

Striping on a budget

Striping can cost $800 to $900 per mile, but to save costs in the long run you can stripe less often by choosing materials that are more durable. If you have access to them, pave with smaller chips so the paint won’t sink down into the cracks as much—and out of view. Try to use darker chips, so that the white and yellow stripes show up better and don’t have to be repainted as often.

The type of paint you use will also make a difference in how often you have to stripe. Also, according to Borst, one of the most common reason for restriping—and for litigation involving pavement markings—is the loss of retroreflectivity (see our article on retroreflectivity “Seeing the Light” in this issue).

Even if you follow this advice for installing longer-lasting stripes, remember that weather is an uncontrollable factor that also affects how often you will need to re-stripe.

For more information on striping chip-sealed roads, contact Mark Borst, traffic engineer of Sedgwick County, at (316) 383-7901 or mborst@sedgwick.gov.

Source

Manual of Uniform Traffic Control Devices, Sections 3B.01 and 3B.07.

“Where can I get accident data for my local roads?”—and other questions

You might know about—and interact with—Kansas LTAP mostly by reading this newsletter, or borrowing videotapes from lending library, or taking our training programs around the state. But you might not know that Kansas LTAP is also a resource for one-on-one advice. We’re just a phone call or email away.

For example, a county recently contacted us because they were trying to determine which roadways to improve based on a weighted formula, with one criterion being traffic accidents over a five-year period. We were asked if the KU Transportation Center keeps a record of traffic accidents in Kansas. We don’t, but we know who does. Here was Pat Weaver’s response to the inquiry:

The Kansas Department of Transportation maintains statewide accident records and should be able to help you. Some of the information is available on the Web at the city and county level by going to www.ksdot.org/burtransplan/prodinfo/accista.asp. These data are provided by type of roadway segments, type of vehicle, weather, time of day and month, and other factors. However, it appears that you’re looking for information on specific roadway segments within [your] county, which means that you’ll probably need to ask for that specific data from KDOT. You can email your request to Accidentsdata@ksdot.org or call 785-296-5169.

I hope this is helpful to you. Please feel free to contact us again if you need more information on this topic or others.

—Pat

That last bit applies to you, too. Give us a call! We’re happy to help. See contact information on the back of this (and every) KUTC Newsletter.

Try to use darker chips so the painted stripes show up better.
Road scholar program honors technical and supervisory proficiency

Above, the first graduates of the supervisory-level program are all smiles after receiving their certificates at the Spring 2004 KCHA/APWA meeting in Salina. From left, Ron Sitts, Sandra Krider, Dennis Elias and Curtis Houser. Not pictured: Mike Graf.

. . . by Lisa Harris . . . . . . . . . . . . . . .

The Spring 2005 Kansas County Highway Association meeting provided an opportunity to recognize—in person—the most recent recipients of county road scholar certificates.

Sixteen county employees were recognized for completing technical skills training. That makes 62 graduates at this level so far, with 136 more currently enrolled. Each of these “road scholars” attended 10 different training sessions, at a total of at least 50 hours of instruction. The instruction was provided by the Kansas Association of Counties, Kansas LTAP, the TASK program, Kansas State University in Salina, and the National Highway Institute.

Each year the number of counties participating in the program has increased. Currently 30 are involved, or nearly a third of all Kansas counties.

This Spring KCHA also honored its first “graduating class” of road scholars at the supervisory level. Five individuals were recognized at the KCHA meeting. These individuals have attended about 100 hours of technical and supervisory instruction provided by the Kansas Association of Counties, KU, and K-State.

The names of all the recent road scholar graduates (and their counties) appear below:

**Technical skills certificates:**
- Ray Burns, Riley
- Barb Coddington, Miami
- Jason Crawford, Osage
- Chris Ducharme, Saline
- Thomas Gouge, Jefferson
- Mike Graf, Ellis
- Delmar Hammond, Hamilton
- Steven Kinion, Saline
- Jimmy McRoberts, Miami
- Dale Phannenstiel, Trego
- Gary Schoschke, Saline
- Patrick Sieve, Jefferson
- Brian Stolzenburg, Saline
- Greg Vidrine, Saline
- Jeff Welton, Franklin
- Kyle Zimmerman, Riley

**Supervisory skills certificates:**
- Ron Sitts, Edwards
- Sandra Krider, Labette
- Dennis Elias, Rush
- Curtis Houser, Stanton
- Mike Graf, Ellis

For more information about the Kansas County Road Scholar Program, call Rose Lichtenberg, Kansas LTAP, at (785) 864-2594.
Seeing the light

... by Nishtha Mehta ..............

D uring the day and in good weather, road signs are usually easy to see. At night or during bad weather, not so much. In those instances only a few road signs may be clearly visible. Regulatory and warning signs are made with retroreflective sheeting, which returns light from vehicle headlights back to drivers, allowing them to see better during poor visibility conditions.

All retroreflective materials are not created equal. This article will talk about the different types of retroreflective materials and examine factors such as relative cost and service life.

Federal standards
In 1980, the FHWA designated “in-service” retroreflectivity¹ as the subject of a High-Priority National Program Area. FHWA then sought to define the minimum nighttime visibility requirements for traffic signs and develop the measurement devices and computer management tools to effectively implement the requirements. This resulted in guidelines for in-service sign retroreflectivity. The minimum levels are considered thresholds beyond which the sign would be considered inadequate and would have to be replaced.

These guidelines also indicate what material should be used for improving visibility at specific distances.

These standards are not yet in place as all states have been unable to reach a consensus regarding their feasibility and given the variability of measurements detected by different types of retroreflectometers. The FHWA has been evaluating retroreflectometers, which is a time consuming process.

In July 2004 a notice for proposed amendments to the Manual of Uniform Traffic Control Devices (MUTCD) regarding minimum retroreflectivity was posted in the Federal Register for comments. Comments and suggestions are currently under review for creating minimum retroreflective standards. The current guidelines, however, only indicate that the sign should be retroreflective or illuminated enough to be read.

Types of materials
The American Society of Testing Materials (ASTM) describes retroreflective sign sheeting as a material having a thin continuous layer of small retroreflective elements on or very near its exposed surface.

There are two technologies used to create retroreflective sign sheeting. The first involves including very small glass beads or spheres in the sheeting. The roundness and transparency of the beads enhance their retroreflective properties. The transparency allows the light to pass through them and the roundness causes the light to be refracted, sending the reflected light back at a slightly different angle than the angle at which it entered the bead.

The second technology uses prismatic cube corner reflectors. The light beam from the vehicle’s headlights enters the reflector and bounces off the sides of the cube, sending the reflected light back to the driver. Numerous prismatic cube reflectors are embedded in this sheeting type.

These two technologies have been used to create several types of materials. ASTM classifies nine different grades and recognized simply as Type I through Type IX.

Type I is also known as engineer grade. It is the basic reflective material sheeting made up of very small glass beads included in a translucent pigmented substrate. The service life of this material is seven years. The wear and tear of this material can be minimized if the sign is north-facing. It is a medium intensity material and is the cheapest retroreflective sign sheeting available.

Type II is also known as the super engineering grade. It is similar in construction to Type I but the beads are larger in size, providing twice the reflectivity of the Type I sheeting. The service life is approximately 10 years and the cost is less than twice that of the Type I.

Type III is also known as high intensity or encapsulated lens sheeting. It is made of an outer translucent pigmented layer and an inner reflective layer faced with glass beads. These layers are connected by a lattice, creating a distinctive “honeycomb” appearance. This material is four times brighter than Type I and costs twice

¹The term “in-service” refers to already-installed signs.
as much. The service life is 10 years.

Type IV is a multi-layer material that uses the prismatic cube corner technology. The construct is similar to Type III, but the reflective layer is made up of microscopic cube-corner reflectors. This layer is known as the microprismatic layer. This sheeting is about seven times as bright as the Type I and similar in cost to Type III. The service life is approximately 10 years.

Type V also uses the prismatic cube corner technique and is made of metallized microprismatic material. It is usually used for raised pavement markers. The cost is approximately five and half times that of Type I and the service life is five years.

Type VI is a vinyl backed microprismatic material. Its composition differs from other materials as it contains a flexible vinyl cloth. This material can be used for roll-up signs and clothing. It costs six times as much as the Type I sheeting and is not very durable, with a service life of two years.

Type VII is also a microprismatic sheeting type. A diamond-shaped lattice connects the layers and there is a coarse grain to the microprisms. It is approximately 14 times brighter than Type I at shallow viewing angles. Its visual impact is stronger from further away and diminishes as the sign is approached. The cost is approximately five times that of Type I and the service life of the material is 10 years. The light is reflected back in a very tight cone.

Type VIII is a microprismatic sheeting type about eight times brighter and five times more expensive than the Type I sheeting. The performance is similar to Type III but it uses the prismatic technology rather than the honeycomb structure. The service life is 10 years, similar to Type VII.

Type IX differs in construction from Type VII due to the presence of fine-grain microprisms. The visual impact becomes stronger as you get closer to the material. It is used for the new fluorescent yellow-green non-motorized warning signs. The sheeting is six times brighter and five times more expensive than Type I. Its service life is considered to be 10 to 12 years. The material spreads the reflected light out at a greater angle than any of the other sheeting types.

Which type to use?
According to Richard Schwartz, chief chemist at Kansas Department of Transportation, the best way to know what material to use at a particular site is to check its visibility at that particular site under typical conditions. The material should be bright enough to be visible under the existing illumination conditions on the road. Tom Bliss, of 3M, says all critical signs should be made with higher grade sheeting types as they are brighter and more visible at night. Higher grade sheetings can make a dramatic difference in a driver's ability to see a critical sign, like a stop sign at an intersection with a busy through-street.

Color considerations
A sign's color also affects its reflectivity. Color can improve the visibility of a sign as much as using a higher grade material. According to Joseph Hummer, civil engineering professor at North Carolina State University, a 1997 study at Howard University found that during daytime, white is the best detected color on signs, followed by yellow. These patterns are different at night. An FHWA study concluded that the black-on-orange combination was best detected at night followed by black-on-green and then black-on-white. The same study also found that red and orange are better for night-time long distance detectability as compared to green, yellow and white.

The colors for particular signs are pre-decided and stated in the MUTCD. Colors were chosen based on the visibility of colors under all illumination conditions. Most sign colors were decided based on the premise that they should look the same—as much as possible—during daylight and at night, when illuminated by headlights.

Checks signs regularly
Timely checks of sign-retroreflectivity can help transportation agencies remain in compliance with the current federal regulations. One way to help keep good records and keep track of your signs is to use a sign management system. There are many good computer-based programs available, some tied to GIS packages. [See the article “Computer-based sign management,” in the Fall 2001 issue of this newsletter.]

For more information, visit the safety section of FHWA’s Web site. They have a list of resources on retroreflectivity at http://safety.fhwa.dot.gov/roadway_dept/retro/sign/resource_mat.htm. This includes a publication for download called Maintaining Traffic Sign Retroreflectivity.

Sources
Interviews with Richard Schwartz, chief chemist, Kansas Department of Transportation; Dr. Joe Hummer, professor, Department of Civil Engineering, North Carolina State University; and Tom Bliss, representative for 3M (a manufacturer of retroreflective material).

Rules about truncated domes are changing (again)—but for the better

Brand-new forum for information and discussion about detectable warnings

FHWA is hosting a new online discussion forum called the Detectable Warnings (DW) Community of Practice (CoP) to facilitate discussions about truncated dome detectable warnings. Questions are welcome about construction, maintenance, product evaluations, research, and regulatory issues. Participants will also be able to register their membership, as well as set their personal preferences to get a daily update on postings from the previous day. Discussions can be posted by anyone. The CoP site will also act as a central Web site for related documents. Facilitators include FHWA staff Barbara McMillen and Mark Chandler, and U.S. Access Board Research Coordinator Lois Thibault.

Recent discussion threads have covered questions about railroad crossings, distance from curb line, and sidewalk width.

In researching this article, we found that rules about truncated domes are confusing at best. The folks in Washington who are making, revising, and implementing the rules have created this forum to help. It provides direct access to national experts as well as peers across the country struggling with similar questions.

To learn more or sign up, go to http://knowledge.fhwa.dot.gov/cops%5Chcx.nsf/home?openform&Group=Detectable%20Warnings.

A Leg Up

. . . by Laura Snyder and Lisa Harris

I
n our Spring 2004 issue, we described rules that were suspended, but are now back in effect, for the installation of truncated domes on sidewalk ramps and on level and blended connections to the street. Before you rush out and buy a five year supply of dome materials, you’ll want to pay close attention to what’s happening now with the Americans with Disabilities Act Accessibility Guidelines (ADAAG). More changes are coming.

A little history
Truncated domes are “detectable warnings,” that is, raised bumps that advise people with visual impairments about where the street begins. But because of some controversy over problems navigating dome-covered surfaces by wheelchair users and claims that the uneven surface was causing pedestrians to trip and fall, the standards for domes were temporarily suspended in 1994 for further study. After a great deal of research into these matters, the domes were found to be both effective and safe, and the suspension was allowed to expire.

In 2001 the standards were reinstated.

Regulatory split
Meanwhile… in 1995, while the dome standards were suspended, the Access Board—a federal agency that develops guidelines for accessibility for people with disabilities, and authors of ADAAG—started reviewing the Guidelines for overall revision. A draft of the new guidelines for public rights-of-way (ROW) was published for public comment in 2002. Comments received showed that the majority of persons with disabilities favored truncated domes on ramps.

Recently, the Access Board decided to split off the public rights-of-way (ROW) chapter (which includes sidewalks and street crossings) and create a separate document—called the Draft Guidelines for Accessible Public Rights-of-Way—to address these and related issues. A separate committee helped develop that document—the Public Rights-of-Way Access Advisory Committee (PROWAAC)—which includes representatives from disability organizations, transportation and traffic engineering groups, the design and civil engineering professions, government agencies, standards-setting bodies, and public works departments.

Draft has new specs
The current ADAAG (1991) has a standard that says strips of domes must cover the full length of the ramp. The Draft Guidelines for Accessible Public Rights-of-Way have a new set of recommendations for truncated domes. These technical specs require only a 2-ft. strip across the width of a ramp, and the dome pattern should run parallel, not diagonally, making it easier for wheelchair users to cross. This recommendation grew out of a consensus of a
ADAAG originally required the detectable warning surface on the entire width and depth of curb ramps, excluding the flare. To minimize the possibility of problems for persons with mobility impairments and to provide consistent information about the location of the street to individuals who are blind, researchers Bentzen and Barlow (1995) recommended that 24 inches (610 mm) of truncated dome detectable warning be installed along the bottom of curb ramps. That amount had previously been demonstrated to be sufficient to enable detection and stopping on most approaches and was consistent with the depth of detectable warning used at the edges of transit platforms having a drop-off.

[This 24 inch standard] is the current recommendation of American Council of the Blind and of the Association for the Education and Rehabilitation of the Blind and Visually Impaired and is consistent with the ADAAG requirement for truncated dome detectable warnings at transit platforms. This is also the recommendation of the Public Rights-of-Way Access Advisory Committee (PROWAAC), Access Board, 2001.

Source: http://accessforblind.org/dw_abt.html

PROWAAC subcommittee that included groups representing disabled individuals (see box, above).

What's happening now
Neither the revised ADAAG (2004) nor the Draft Guidelines for Accessible Public Rights-of-Way have been published in final form or adopted by the U.S. Departments of Justice or Transportation. Both are in various stages of “rulemaking,” when public comments are accepted and reviewed. Spring 2005 was the goal for making a decision on each set of guidelines, but that has been delayed.

Both sets of guidelines may not be approved at the same time; if the new ROW guidelines are published after the revised ADAAG, there will be a period of time between the two approvals without official dome standards for curb ramps, blended transitions and level landings. However, according to Lois Thibault of the Access Board, FHWA/USDOT already requires detectable warnings as a condition for federal funding, and now encourages the use of the 2 ft. spec, regardless of the timing of the official approvals and plans to adopt the revised standards regarding detectable warnings. (Go to www.accessboard.gov/adaag/dws/update.htm and scroll to the bottom for a link to the US DOT’s May 2002 memo on the subject.)

The Access Board has also stated their belief that [the 2 ft. spec] “provides a level of access substantially equal to or greater than that currently specified by ADAAG,” and as such, it can be considered equivalent facilitation, allowed under the ADAAG.

What does this mean for your road department?
Even though the 1991 ADAAG is still technically in effect, which requires truncated domes to cover the entire surface of the ramp, many road departments are installing 2-ft. deep strips as proposed in the Draft Guidelines for Accessible Public Rights-of-Way. That’s because, as mentioned above, FHWA/USDOT and U.S. Access Board are encouraging states to use the draft provisions for detectable warnings until the rulemaking process is completed. KDOT is following this guidance, and is installing a 2-ft. strip at the bottom of each ramp, the full width of the ramp, says Scott King, road design leader for KDOT.

“We used Part II of FHWA’s Designing Sidewalks and Trails for Access—given to us by FHWA—to design our specs,” King said. “Our standard [ramp] drawing has been approved by FHWA’s office in Topeka.” [Part II of this design guide can be downloaded from www.fhwa.dot.gov/environment/sidewalk2/]

If you don’t comply with regulations for installing domes, you risk a complaint or court case. You also risk becoming ineligible for federal funding because of FHWA requirements to install domes.

To view the comments about the current draft of the Draft Guidelines for Accessible Public Rights-of-Way, go to: http://www.access-board.gov/prowac/index.htm. Those comments are being considered in preparing the next draft for the rulemaking process.

What's next?
The Access Board hopes to publish a second draft this fall. From this, a regulatory assessment (cost-benefit analysis) can be developed. Once approved by the U.S. Office of Management and Budget (OMB), the draft can be published as a Notice of Proposed Rulemaking, seeking another round of public comment before it becomes a final rule.

For updates on the adoption of ROW guidelines, check http://www.access-board.gov/prowac/status.htm. You can also contact Scott King at KDOT, (785) 296-6970.

Sources
Interviews with Scott King and Gelene Savage, KDOT, and Lois Thibault, U.S. Access Board.


Intersection maintenance agreements should prevent confusion about who does what

Preventing confusion
The new countywide maintenance agreement should fix this problem. The comprehensive agreement tells both counties and KDOT exactly who will maintain which parts of an intersection or interchange. Diagrams represent generic types of intersections and interchanges, and show where the line of maintenance lies.

The draft
The current draft of the agreement is four pages long with several attachments at the end. It defines the purpose of the agreement, gives definitions, and lists what the county agrees to do, as well as what KDOT agrees to do. There is also a page for signatures.

Benefits for all
Although the agreement is voluntary, KDOT and KCHA hope counties will see the benefit of signing it. Don Drickey, KDOT District 2 Engineer, says the agreement should eliminate confusion. “Now, when a new guy takes over in the county, he can look at the agreement and see which roadways they take care of,” says Drickey. “He won’t have those moments of panic.”

Some counties have been a little apprehensive about the agreement, due to fear of change and not knowing exactly how it will work yet. “You’re never going to satisfy everybody one hundred percent, but hopefully everyone will be reasonably pleased,” says Graf.

The problem
Currently, verbal agreements between counties and KDOT mean that when workers retire, new workers have no idea what they are responsible for, says Larry Emig, chief of local projects at KDOT. Handshake agreements are made for individual sites; with thousands of intersections and interchanges in the state, this has led to inconsistencies in maintenance. Confusion opens the door for lawsuits if an accident occurs in a place that neither KDOT nor the county is maintaining.

Attachments include diagrams of several types of intersections and interchanges, and a page that allows for amendments, in case a particular intersection or interchange is not addressed by the diagrams. Another attachment provides a log for county workers to list intersections and interchanges and which diagram to use with each. Right now, the diagrams are color-coded, but Emig says they are working on converting them to black and white, while maintaining their readability.
Project seeks to reduce driver frustration when waiting for pilot cars

A demonstration project to give more information to motorists in pilot-car guided rural work zones is helping improve safety and reduce stress.

Several years ago, the idea came about that if motorists knew how long the wait was going to be in work zones where pilot cars are used, they would not be as frustrated. KDOT began working on this idea and it was approved in 2002 as an Intelligent Transportation System (ITS) set-aside project.

“The whole concept is—waiting under uncertainty produces stress,” said Stan Young, research engineer in KDOT’s Materials and Research Bureau. “If you tell people they are going to be waiting 13 minutes, they are much happier than sitting there and not knowing how much longer it’s going to be.”

Students at Kansas State University visited construction zones and put together a prototype system, Young said. The system had to be portable and meet certain crash criteria for safety. The signs are based on standard sign placard and are four feet square.

One or more signs (depending on each project) would be placed near the flagger at each end of the construction zone, with a time counter at a location visible to motorists. Wireless communication using GPS technology would track the pilot car through the construction zone. Depending on the terrain, more than one antenna could be necessary to continually track the pilot car. The time on the signs would then be automatically updated and keep drivers informed about how long the wait would be at any given time.

“KDOT is very concerned that people don’t wait more than 15 minutes,” Young said. “This system also provides verification of what the waits in the queues actually are.”

All the times measured by the system can be saved and the data can be recorded.

Three demonstrations of this system took place in Fall 2004 on an overlay project on US-24/US-77 north of Manhattan. According to Cliff Hobson, bituminous research engineer, each trial led to improvements in operation.

“Survey cards were distributed to the motorists waiting in the queue to get their input, and a telephone number was listed on the sign so that motorists could call to get information about the project or leave their own comments,” Hobson said. “We received useful comments from motorists, the contractor, and KDOT personnel.”

A fully-operational system is scheduled to be tested this year. Once operational, Young said other uses for the wireless data communication system may be possible.

“We spoke to a few flaggers and they welcome it,” Young said. “They welcome anything that will grab the drivers’ attention.”

Source: Translines, December 2004, a publication for KDOT staff.
Flagger Safety Training—English and Spanish Versions, Kansas DOT, 2004, produced with the assistance of the Kansas Contractors Association. This tape depicts a flagger's first day on the job and his recollection of the important information he learned in flagger training. Basic safety tips are covered and shown on-site, such as wearing the appropriate vest and hat, how to use the stop/slow sign, and how to direct traffic that will follow a pilot car. Special situations are also covered, such as directing an emergency vehicle through a work zone, and responding professionally to an irate driver.

This tape was produced in Kansas and describes conditions found in Kansas work zones, like high winds and intense sun.

This is an excellent production, and should become part of every road department's training for new flaggers. The presentation is 11 minutes long, and features an English version followed by a Spanish version.

Speaking of Spanish versions... The Kansas LTAP has several other videotapes in Spanish on basic road maintenance activities. All were originally produced in English and have been dubbed in Spanish. [We carry both versions of each tape.]

See page 15 for a list of our tapes in Spanish. You are welcome to borrow them; please limit your requests to two at a time, as we have limited copies of each.

This slim, 8-page brochure describes how families can help their family members who work long hours or nonstandard shifts get the rest they need to do their jobs well. The brochure's premise is: “When the shift worker loses sleep, it's a family affair.” Published by the US DOT’s National Highway Traffic Safety Administration.

Reviews . . . by Lisa Harris . . . . . . .

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The KUTC Newsletter is one of the KUTC’s educational activities. Published quarterly, the newsletter is free to counties, cities, townships, tribal governments, road districts and others with transportation responsibilities. Editorial decisions are made by the KUTC. Engineering practices and procedures set forth in this newsletter shall be implemented by or under the supervision of a licensed professional engineer in accordance with Kansas state statutes dealing with the technical professions.

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