



KUTC Newsletter

Summer 2007

A quarterly newsletter of the Kansas Local Technical Assistance Program (LTAP) at the University of Kansas Transportation Center with funding from Kansas DOT and the Federal Highway Administration

An issue on road-related training, liability and more

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Browning helps sheds light on local issues at national focus group on retroreflectivity

... by Lisa Harris

How does the federal government develop and revise language in the MUTCD? Keith Browning, Douglas County Engineer, had a chance to find out first-hand, and provide some suggestions for how some regulations will be written.

This past August, Browning was invited by the Federal Highway Administration to participate in a focus group on pavement marking retroreflectivity standards. He was one of a few local agencies, and several DOTs, that reviewed research on pavement marking retroreflectivity and helped draft suggested language for minimum maintained standards, mandated by Congress, for when to replace signs. FHWA held two focus groups, one in Denver and one in Pittsburgh, where Browning attended.

The process

Each focus group reviewed research primarily conducted at the Texas Transportation Institute (TTI) about pavement marking retroreflectivity. The attendees then completed some exercises with the goals of: 1) developing suggested minimum standards for pavement marking retroreflectivi-

ty, and 2) identifying ways to measure retroreflectivity along with a management process for replacing stripes.

The attendees

Most of the attendees were from DOTs with expertise in pavement markings, but a few in each group were from local governments (see sidebar for the Pittsburgh group). Browning said "Most were state DOT people—and pavement markings is their only job. It was not like I was an expert among these folks. But I could certainly give a

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New training coordinator at Kansas LTAP



*Kansas LTAP welcomes **Kristin Kelly**, above, as its new training coordinator, taking over for Rose Lichtenberg, who has retired. More on page 6.*

Pavement retroreflectivity,

continued from page 1

county perspective. We can't go around and stripe whenever we want."

Local issues

The local agency participants pointed out the need for reasonable standards. For example, Browning described a typical county situation where many hard-surfaced roads are chip-sealed or overlaid in the summer, and striped after that. He said that if the county measures retroreflectivity in February, and it is found to be below standards, it does not make sense to re-stripe roads that will be resurfaced that coming summer, covering-up the new stripes. His group suggested having some wording in the standards that allow for restriping after scheduled maintenance work is done. Other roads that are not planned for maintenance could be re-striped sooner. The Denver group had a similar recommendation.

Focus group suggestions

Each focus group (Denver and Pittsburgh) independently developed their own suggestions retroreflectivity standards and assessment/action. Browning said it was interesting to compare the suggestions, as they did not always agree. The following is not a complete summary of the ideas suggested by the focus groups, but it provides the main themes.

Standards. Participants were asked to suggest minimum maintained retroreflectivity levels for roads, and they identified several considerations, including:

- whether the road had raised retroreflective pavement markings (RRPMs) or lighting
 - whether the striping is yellow or white
 - the average nighttime driving speed
 - whether the stripe is a center line or edge line
- Some participants argued for keeping

Pittsburgh Focus Group Attendees

Keith Browning, Douglas County, KS
 Derrick Castle, Kentucky DOT
 Eric Hedman, 3M
 Joe Hursen, Allegheny County, PA
 Allen Lee, City of Lincoln, NE
 Mark McConnell, Mississippi DOT
 Meredith McDiarmid, North Carolina DOT
 Jill Morena, Michigan DOT
 Eric Pitts, Georgia DOT
 Tobey Reynolds, New Hampshire DOT
 Steve Smallhoover, Allegheny County, PA
 Jay Smith, Missouri DOT
 Ken Williams, Pennsylvania DOT
 Roy Wright, Texas DOT

Retroreflectivity Team

Greg Schertz, FHWA-Retroreflectivity Team Leader
 Matt Lupes, FHWA-Office of Safety
 Bruce Friedman, Kimley-Horn and Associates, Inc.
 Paul Carlson, TTI
 Kathy Falk, Kimley-Horn and Associates, Inc.

the standards simple to understand and apply, such as having one standard for stripes regardless of color, for roads over 50 mph, a lower standard for roads 50 mph or lower, and the lowest standard for roads with RRPMs, lighting, or some other kind of delineation.

Other participants suggested more complex standards to reflect findings in the research. For example, white markings degrade faster than yellow, so they suggested a different standard for white markings. Some suggested having fairly high standards for applying stripes, but lowering those standards if the stripes are used in combination with RRPMs.

As for speeds, some advocated a simple breakdown into two ranges, with 50 mph generally being the break point, and some recommended up to three ranges, with freeways having a separate and more rigorous standard.

The Denver group suggested having a very high retroreflectivity

standard for roads with centerlines only, and lowering that standard if centerlines are used in combination with edge lines. Research supports the added safety benefit of edge lines.

The groups differed on whether transverse and object markings should be held to the same standards. "About half of our Pittsburgh group thought that if a pavement marking is considered necessary, it ought to be visible," said Browning, and the group recommended that those markings

follow the same standards as lane striping. The other half of the Pittsburgh group thought that, considering that traffic speed is lower where those markings are placed, and they wear faster because they often run crosswise to traffic, having the same standards is unrealistic.

Measurement/replacement. The Pittsburgh group identified a couple of different options for assessing retroreflectivity levels, including having an inspector compare the road stripe to a sample stripe on a panel, or the more usual way, using a retroreflectometer.

Other ideas were to dispense with measuring retroreflectivity altogether and instead schedule blanket replacement of stripes or track the expected life of markings and replace according to a schedule.

Lessons learned

While Browning participated to provide a county perspective, he learned a few things as well. "The interesting part was how much thought goes into

the whole thing,” he said. “Most of these people [in the focus group and on FHWA’s team] really know what they are doing. I thought it was good that they included locals.”

TTI’s research showed the value of edge lines in delineating a road. “The value of edge lines was really hammered home to us,” said Browning. “I was already aware of the safety benefits, but the research showed just how beneficial edge lines are. I think the days of having just a center line on a paved rural road are coming to an end,” he said.

What’s next?

FHWA is analyzing the results of the focus groups and expects to release a summary report at the end of October. The next step for FHWA was to assist with a focus group AASHTO formed for the same purpose. That group will create an AASHTO resolution on the subject that will be sent to FHWA. The FHWA will then evaluate all the recommendations received, evaluate all the existing research on their own, and start drafting proposed language for the MUTCD.

FHWA will eventually issue a Notice of Proposed Amendment, to allow all interested people to comment on the proposal. The anticipated release date of the NPA is in 2008. We will let you know when the NPA is released so that you can add your comments to Browning’s in developing retroreflectivity standards that add a measure of safety to public roads and are reasonable for local governments to comply with.

For more information on the research shared with the focus groups, contact Paul Carlson at TTI at (979) 847-9272. ■

2007 road scholar grads, to date

The following participants have earned a Kansas Road Scholar certificate since November 2006. Fall 2007 graduates will be listed in our next issue. Congratulations to all!

Level 1 – Technical skills

- John AchatzRice County
- Lyle Blankenship . . Bruno Township,
Butler County
- Doug ByarlayRiley County
- Joe CollinsRiley County
- James HerzetMarion County
- Curt HoffmanEllis County
- Roger HoltzMiami County
- Gary KoehlerDouglas County
- James KraftCoffey County
- Leland KraftCoffey County
- Charlie NicholsDouglas County
- Bill OsborneBruno Township,
Butler County

- Darren Ramsey . . .Miami County
- Harold Starkebaum Douglas County
- Dennis Stottlemire Johnson County
- Brian WhiteJohnson County
- Larry WilsonDouglas County
- Dennis WrayRice County

Level 2 – Supervisory skills

- Curt HoffmanEllis County
- Roger HoltzMiami County
- Jeff McGuireMiami County
- Darren Ramsey . . .Miami County
- Glen TysonOsage County
- Dennis WrayRice County



Bob Strait, left, Coffey County road supervisor, presents Leland Craft, equipment operator, with his road scholar certificate at the Coffey County Highway Department shop.

Notice to cities: The Kansas Road Scholar program is now available to city employees. Call Kristin Kelly to receive a brochure about the program and to learn more about how to register your employees—or yourself!

Kristin Kelly, Training Coordinator
 Kansas LTAP
 (785) 864-2594

Kansas LTAP receives RSA grant



... by Mehrdad Givechi, PE, PTOE

Most of Kansas's roadway networks are owned and maintained by counties, towns, townships, and small municipalities, and most of the state's severe crashes happen on those roads. An effective tool for identifying safety problems and potential roadway

LTAP plans to train communities to perform their own RSAs.

improvements is a Road Safety Assessment (RSA). However, we are aware that many local agencies in Kansas do not have the expertise and in-house resources to conduct an RSA. Kansas LTAP is responding to that need by providing training and limited on-site assistance to local communities interested in conducting RSAs. Here's a summary of activity to date, and what's planned under a new project to enhance this effort.

—Kansas LTAP took the initiative in promoting the use of the RSA process on local road systems by developing a two-day course on the topic. "Fundamentals of Road Safety Assessment" was held this past spring in El Dorado, Lawrence, and Great Bend.

—A pilot project is under way for an assessment team to conduct RSAs for two sites on local roads. Sites were

Intersection safety workshop at APWA meeting

This year Kansas LTAP was invited to conduct a pre-conference course at APWA's Kansas Chapter spring conference held in Junction City. The course was *Common Sense Solutions to Intersection Safety Problems*. The agenda for the seven-hour workshop included:

- crash statistics
- who's involved
- road safety study
- intersection problems
- intersection evolution
- local crash data
- sight triangles
- roundabouts
- signs
- signals
- pedestrians
- red light running

The workshop provided instruction on general safety problems at intersections, low cost safety improvements that would enhance the intersections and the need for safety evaluations of intersections. Attendees represented counties, cities and consultants. The evaluations indicated that the workshop was well received by the participants. Instructors were LTAP trainers Mehrdad Givechi and Johnny Dahl.

suggested by participants in the fundamentals class, and two were chosen by Kansas LTAP and Norm Bowers, the Local Road Engineer at the Kansas Association of Counties (KAC). Results of the assessments will be used as case studies in upcoming RSA courses.

—LTAP will offer a course entitled "Road Safety Assessment, Concept and Procedure" this fall in Lawrence and Wichita (see page 14).

New RSA project

Recently, the Kansas LTAP Center obtained federal funding to enhance its RSA outreach program using the process outlined in *FHWA Road Safety Audit Guidelines*, FHWA-SA-06-06. As part of this effort, LTAP will establish a statewide working group to guide development of the RSA process for local roads. Members will include a representative from the KDOT's Bureau of Traffic Engineering, Kansas LTAP staff, a representative from the Kansas County Highway Association, a representative of the APWA Kansas Chapter and at least

two other local county and/or city engineers. Norm Bowers will also participate for the KAC.

The group will:

- assist LTAP with project selection;
- help develop suggestions for roadway improvements at the selected sites;
- help develop a plan to train local agencies to conduct their own RSAs,
- develop recommendations for future funding and partnering for Kansas LTAP's RSA program.

Under this grant, the assessment team will establish the RSA process in at least six communities in the state and assist with site selection (at least one site per community). The team will help each community form an independent, multi-disciplinary RSA team with representatives from engineering, law enforcement, traffic operations and other local stakeholders, including the general public, to share information and different perspectives on particular safety problems.

LTAP's RSA team will submit a written report to each community with suggestions* for roadway improvements. The local agency will be asked to respond in writing as to

KDOT also has RSA process

. . . by Lisa Harris, Kansas LTAP . . .

The roadway safety assessment/audit (RSA) process is not new to Kansas. The Kansas Department of Transportation (KDOT) began its own version of an RSA in 1997 for the state highway system. KDOT's program was started before FHWA published its guide on the process, but the program has similar goals.

Many entities participate in KDOT's RSA process (cities, counties, KDOT districts/areas). The Bureau of Traffic Engineering is responsible for completing RSA reports.

KDOT's goal is to select six counties for review per district engineer each year, said Brian Gower, State Traffic Engineer, Kansas DOT. Each county is field-reviewed and scheduled for data collection throughout the year. KDOT staff engineers complete the RSA reports. KDOT will also conduct a "spot" RSA when an urgent need is identified.

Gower said the state has seen many benefits from KDOT's RSA program, including:

- a proactive approach to completing traffic studies,
- better use of staff resources,
- comprehensive review of the state highway system,
- consistency along the state highway system,
- a good working relationship with cities/counties,
- identification of high crash locations, and
- development of projects to address high crash locations.

The RSA process has allowed KDOT the opportunity to review speed limits, traffic signals, sight distance, signing, and identify high crash locations for the complete state highway system. As a result they have installed rumble strips, advance speed limit signs, larger stop signs, chevrons at curves, and other countermeasures to increase safety.

A few examples of sites that have been (or are planned to be) improved as a result of the RSA process include:

- US 81 and 55th Street, Wichita, traffic signal and left turn lane
- US 400 and K-47, Fredonia, rural roundabout
- US 400 and K-66, Riverton, rural roundabout
- Highways 59 and 56, Baldwin City, adjusted speed limit

For more information on KDOT's RSA Program for roads in the state system, call Brian Gower at (785) 296-1181.

how they will or why they cannot implement suggestions provided. These six reports, as case studies, will be incorporated into the course "Road Safety Assessment, Concept and Procedure," as local examples of RSAs in action.

For more information on LTAP's RSA program for local agencies, call Mehrdad Givechi at (785) 864-2593.

Mehrdad Givechi is a Research Engineer at the KU Transportation Center and a trainer for the Kansas LTAP. ■

*It is important to note that the RSA team provides suggestions and not recommendations. The local government has sole discretion to act on anything suggested in the report.

Q's and A's about new sign regs



The Federal Highway Administration has been working toward a new standard for traffic signs known as the *Minimum Maintained Retroreflectivity Standard*, for a number of years. It is expected that the proposal will become a rule late in 2007, and will eventually become incorporated into the MUTCD.

There has been some confusion and concern about the proposed rule-making, especially regarding sheeting selection and use—and whether engineering grade sheeting will still be allowed.

Sign-material manufacturer Avery Dennison has provided answers to some frequently asked questions (FAQs) about common concerns and misconceptions in interpreting the proposed rule. See below.

Will I be able to use "EG" (ASTM D4956 Type 1 — Engineering Grade)?

Yes. Under the current proposal it will still be possible to use EG for many signs. Red Series (Stop, Yield, etc.) signs and some black-on-white signs can use EG and will still conform to the proposed rule. These signs will still have to meet the minimum maintained retroreflectivity, but that does not prevent the use of EG.

For which signs can I not use EG?

In the proposed rule, EG is prohibited for any of the following signs:
—Yellow series (warning signs,

continued on next page ►

Sign regulations Q's & A's,
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chevrons, etc.)

—Orange series (construction work-zone signs, etc.)

—White letters on green backgrounds (guide signs, street-name signs, etc.

This means that EG should not be used for white letters but can be used for the green background.)

What is the minimum material requirement for Yellow and Orange signs? The proposed rule establishes minimum maintained retroreflective levels. ASTM D4956 Type II (or SEG) is the minimum ASTM type that meets the minimum proposed levels for Yellow and Orange series.

What is the proposed minimum material requirement for Green and White signs? ASTM D4956 Type I (EG) is the minimum material that will meet FHWA requirements for the Green background. For ground mounted signs, ASTM D4956 Type II is the minimum material that will meet the proposed requirement for the white legend. For overhead signs, ASTM D4956 Type III *prismatic* is the minimum material that will meet the proposed requirement for the white legend.

Are all signs included in the proposed rule? No. Parking, Standing and Stopping signs (R7 and R8), Walking/ Hitchhiking/Crossing signs (R9 series, R10-1 thru 4b), Adopt-a-Highway, any signs with blue or brown backgrounds (recreational signs), and bike-path signs are not included. These signs are not proposed to have minimum maintained retroreflective requirements.

Contact Mark Kleinschmit at Avery Dennison at (847) 588-7262 for further answers about the proposed rulemaking. ■

Proposed Minimum Maintained Retroreflectivity Levels

Sign color	Sheeting type (ASTM D4956-01a) ¹				Additional Criteria
	Beaded sheeting		Prismatic Sheetting		
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250 ; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120 ; G ≥ 15			Ground-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50 ; O ≥ 50			See Note 2
	Y*; O*	Y ≥ 75 ; O ≥ 75			See Note 3
White on Red	W ≥ 35 ; R ≥ 7				See Note 4
Black on White	W ≥ 50				

Notes:

1 – The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2 degrees and an entrance angle of -4.0 degrees.

2 – For text and fine symbol signs measuring at least 1200 mm (48 in) and for all sizes of bold symbol signs

3 – For text and fine symbol signs measuring less than 1200 mm (48 in).

4 – Minimum Sign Contrast Ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity).

* This sheeting type should not be used for this color for this application.

Source: Avery Dennison, from FHWA-HRT-07-042, April 2007: "Maintaining Traffic Sign Retroreflectivity: Impacts on State and Local Agencies"

LTAP honors Lichtenberg; welcomes new training coordinator

... by Lisa Harris

Kansas LTAP is pleased to welcome a new face to its tech transfer team—Kristin Kelly (see photo on page 1). Kristin is taking over for Rose Lichtenberg who had been KUTC's training coordinator for 18 years. Rose retired in July, and her years of service were honored at a retirement party at the Dole Institute of Politics on the KU campus. Many people attended to wish her well, including KDOT officials, LTAP staff and trainers, KU faculty and staff, and local road and bridge departments. Rose was honored for her leadership in developing KS LTAP's training program and her participation in the team that created the Kansas Road Scholar Program.

Kristin is a recent graduate of Washburn University with a degree in

Communication. She previously worked at the Kansas Bureau of Investigation and the Department of Criminal Justice at Washburn. She has previous experience coordinating training for the KBI.

Kristin started with a bang, and attended the national LTAP conference after her first week on the job. She has also staffed booths at events sponsored by the Kansas Chapter APWA, the Kansas League of Municipalities, and KDOT. Look for her at the LTAP booth at the KAC fall meeting in Wichita.

Kristin is in the process of identifying sites and speakers for LTAP's fall and spring workshops. She has a primary role in administering the Kansas Road Scholar Program.

You can read Kristin at (785) 864-2594 or at kbkelly@ku.edu. ■

National council to help transportation agencies identify needed skillsets—and training and trainers

. . . Jacob Bustad and Lisa Harris . . .

The Transportation Curriculum Coordination Council (TCCC) was formed in 2000 with a goal to “increase training opportunities for transportation infrastructure workers across the nation.” In the latest step in that direction, the TCCC recently announced the development of a suggested “core curriculum” for training that any highway agency can use. It creates a national road scholar curriculum of sorts, with suggested skills for different levels of workers in a transportation agency.

About the TCCC

The Council is a public-private partnership composed of five regional DOT training /certification groups, FHWA and its National Highway Institute (NHI), AASHTO subcommittees, and industry associations and other certification entities. The TCCC’s Web site is hosted by NHI.

Core curriculum

The core curriculum was developed using funds from a 5-year State pooled-fund. The Council identified “core skill competencies”— skills required of the highway transportation workforce—that would help create a base program that any agency could use. The program can be tailored to meet individual agency needs.

These competencies were split into five broad categories:

- construction;
- employee development;
- maintenance;
- materials; and
- safety and work zones.

Each of these categories was then split into two matrices – a **competency**



Photo from ESRI

Example of a competency matrix:

Category = Safety and work zone

Subject area = Signing

Discipline = Sign maintenance

Competencies:

- Level I—Corrects worn, missing, vandalized, or obscured signs with repairs, cleaning, and vegetation control
- Level II—Recognizes and reports worn, missing, obscured, and non-standard signs
- Level III—Recognizes situations requiring change in signing, manages maintenance program, plans corrections, recommends and supervises maintenance

matrix that details the disciplines and skills required, and a **training matrix** that lists training available that could be most valuable towards development. Using these matrices, which are online (and still under development), an employer can help determine which skills are needed for particular jobs and where to find the training.

Because the five subject categories are quite broad, the competency matrix for each category is further subdivided into subject areas, disciplines, and skill levels.

Level I – Entry;

Level II – Intermediate;
Level III – Advanced;
and
Level IV – Project Manager/Administrator/Supervisor.

See an example of a competency matrix on this page. The different skill levels speak to a career progression, if a worker chooses to advance and the opportunity is there.

TCCC and LTAP

While the TCCC’s efforts have been primarily aimed at the state DOTs, the TCCC intends to reach beyond the states to local governments. To that end, LTAP has been invited to participate in the TCCC, along with other local stakeholders, like NACE. Ed Stellfox, Maryland LTAP, served on the TCCC committee that developed competencies in the Safety

and Work Zone category. Stellfox also chairs a work group of the National LTAP Association that is examining gaps in training identified by the LTAP Centers and how they might be filled. The work group’s training needs assessment form uses TCCC categories. LTAP has been asked to populate the TCCC’s training matrix with LTAP courses and to help develop courses for competencies for which no training currently exists.

For more information on the TCCC, go to:
<http://www.nhi.fhwa.dot.gov/tccc/> ■

A Leg Up

Tips for designating bike routes



... by Collin Koranda

With the rising cost of fuel and increased awareness about health, bicycles are becoming more popular for day to day travel. In developing areas, as traffic congestion increases, the coexistence of the many modes of transportation must be addressed. The proper layout of a bike route is important so that bicyclists can travel from point to point with some measure of comfort and safety.

The majority of the bicycle travel in the United States takes place on shared roadways without bikeway designation. Sometimes it is neither feasible nor necessary to sign and stripe roadways for bicycles. If a road has a posted speed limit less than 30 mph or has traffic volume less than 2,000 vehicles per day, it is not necessary to designate a bike lane.

Signed shared roadways can serve to provide continuity to other bicycle facilities, or designate preferred routes through high-demand corridors.

According to the *Guide for the Development of Bicycle Facilities* by the American Association of State Highway and Transportation Officials (AASHTO, “as with bike lanes, signing of shared roadways should indicate to bicyclists that particular advantages exist to using these routes compared with alternative routes. This means that responsible agencies have taken actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Signing also serves to advise vehicle drivers that bicycles are present.”

Bike lanes require proper pavement markings as well as street signs to designate the corridors, and are meant to improve riding conditions for bicyclists on the streets. Bike lanes are the best way to improve bicycle travel, but it is still important to consider the needs of the motorists when considering bicycle lanes. The Fall 2005

KUTC Newsletter had an article titled, “Bicycling in congested areas: What municipalities can do to help increase safety” that addressed the proper circumstances in which a bike lane can be a positive addition to a road.

Finally, a shared use path is a way to connect corridors that are typically not served by streets or highways, such as pathways along rivers, former or active railroad rights-of-way, or within college campuses. However, it is best to maintain continuity with the chosen type of facility. For example, it is strongly discouraged to alternate segments of a route between a bike lane and a shared use path as the bicyclist’s “driver” expectancy will constantly be changing.

A major concern when it comes to the designating and signing of bike routes is liability. According to Aaron Bartlett, who is the Bicycle/Pedestrian Transportation Planner for the Mid-America Regional Council, most

When looking to sign a bicycle route, AASHTO has recommended the following criteria be followed:

- a. The route provides through and direct travel in bicycle-demand corridors.
- b. The route connects discontinuous segments of shared use paths, bike lanes, and/or other bike routes.
- c. An effort has been made to adjust traffic control devices (e.g., stop signs, signals) to give greater priority to bicyclists on the route, as opposed to alternative streets. This could include placement of bicycle-sensitive detectors at traffic signals where bicyclists are expected to stop.
- d. Street parking has been removed or restricted in areas of critical width to provide improved safety.
- e. A smooth surface has been provided (e.g., adjust utility covers to grade, install bicycle-safe drainage grates, fill potholes, etc.)
- f. Maintenance of the route will be sufficient to prevent accumulation of debris (e.g., regular street sweeping).
- g. Wider curb lanes are provided compared to parallel roads.
- h. Shoulder or curb lane widths generally meet or exceed width requirements.

To plan a bicycle facility of any kind, first consider the purpose of the route and consider the people who will be using it. According to AASHTO's 1999 *Guide for the Development of Bicycle Facilities*, a bicycle user will require a minimum operating space four feet wide. In heavier traffic, five feet is suggested.

It is also important to consider the type of rider that will be using the bicycle facilities. The Federal Highway Administration (FHWA) has classified three basic types of bicycle users.

1) "Advanced" or experienced riders generally ride for convenience and speed—and desire direct access to destinations. This type of rider is typically comfortable riding with motor vehicles, but it is still desirable for them to have their own lane so that they do not interfere with the movement of traffic. Facilities will include highways and other types of shared roadways.

2) "Basic," or less confident adult riders may use their bicycles for day to day transportation, but prefer riding with less traffic. Generally, this sort of rider is comfortable on neighborhood streets or properly designated bike lanes or wide shoulders. These types of facilities can include signed shared roadways or roads with established bike lanes.

3) A third category is children riding with or without a parent, who still require access to destinations in their community. Children should be comfortable on streets with low traffic volumes or in areas where there is clear distinction between bike lanes and motor vehicle lanes. Children can also use a shared use path, on which motor vehicles are not allowed, until they become confident enough to ride on a road with traffic.

Once you understand the type of rider that you are designing a bicycle facility for, and other aspects including existing conditions and cost, you can identify the bicycle facility that is best suited for the situation.

"As with bike lanes, signing of shared roadways should indicate to bicyclists that particular advantages exist to using these routes compared with alternative routes. This means that responsible agencies have taken actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Signing also serves to advise vehicle drivers that bicycles are present."

communities will adopt traffic ordinances when setting things like speed limits and designating truck routes, and bike routes are treated much the same. In order to properly place the signs for a bike route, most communities follow Chapter 9 of the Manual on Uniform Traffic Control Devices (MUTCD), as it is the accepted standard across the country and in

Kansas. The standard signs for designating bike routes use white lettering with green backgrounds and should be placed at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists.

In *Jorstad v. City of Lewiston* (Idaho 1969), it was found that violation of the MUTCD can constitute

negligence. Lawsuits not only exist at the state level, but also at the local level of government over negligence of bike routes, and the road owners frequently lose. Rarely do state statutes exist addressing the issue of the liability. However, Kansas has created immunity for highway design functions that a government entity is not liable for due to plan or design of a highway provided that it was prepared in conformity with existing standards.

It is important to note, though, that design immunity is not absolute. In general, liability of riders on the highway systems is placed on the highway agency responsible for the upkeep of that system. Laws that are established dealing with bicycle liability happen through court decisions in response to supposed acts of negligence. A list of current annotated Kansas bicycling statutes can be found at the end of this article.

Another set of rules that are often considered in determining the liability of bike routes is the *Uniform Vehicle Code*, which are proposed traffic laws prepared by the National Committee on Uniform Traffic Laws and Ordinances. Chapter 11, Article XII covers the operations of bicycles, "other human-powered vehicles," and mopeds. It is similar to the Kansas bicycling statutes, but addresses more topics.

The issue of liability frequently addresses the problems of bicyclists injured while riding on the highway system rather than on a bikeway. In the state of Kansas, bicyclists are not allowed on the interstate system, but they can access all other highways. The Kansas Department of Transportation (KDOT) recommends that, "only those experienced bicyclists defined as being 16 years or older, having a valid driver's license and having several years of bicycling experience should ride on the Kansas State Highway System without an experienced adult riding partner. Novice adults and younger bicyclists are

continued on page 11 ►

Risk management and effective roadway management go hand in hand

[There is an element of risk in most of the actions undertaken by public officials to provide and maintain roadways. Road departments can minimize their risk exposure by identifying, monitoring, and improving hazardous conditions on their roadway system.]

A car traveling 55 mph crashes into a tree. The driver dies. The tree is in a town's right-of-way. Who is at fault? The driver, the municipality or both?

If negligence or the failure to act in a reasonable manner is proven in court, the municipality may be liable. Municipalities are often among the parties that have the "greatest ability to pay" or the "deepest pockets." Ultimately, the municipality might have to pay the entire judgment.

Reducing liability

The following are some ways to reduce your exposure to liability.

Traffic control devices

- Replace missing or damaged signs; give STOP signs priority.
- Remove brush, tree limbs or other vegetation blocking visibility of signs.
- Inspect placement of signs and be sure they comply with the *Manual of Uniform Traffic Control Devices* (MUTCD).
- Inspect signs at night for reflectivity.
- Place STOP AHEAD signs where necessary, properly warn of railroad crossings, T-intersections and narrow or load-limited bridges.
- Establish and post speed limits according to municipal requirements and state regulations.

Design

- Develop or seek professional advice on reasonable standards for road and bridge design.
- Consider adopting AASHTO's latest guidelines for low-volume roads.
- Be sure all designs for roadway projects meet the approval of professional engineers qualified in traffic safety and operations.
- Review the design and operation of new facilities and altered traffic control situations to be sure they are functioning as planned.
- Inspect completed projects for effective traffic operation as well as for integrity of construction.



Sight distance considerations should be thoroughly scrutinized at the planning, design, and construction phases of driveway permitting for all commercial land development and for residential access points to roads or streets with existing or anticipated operating speeds exceeding 30 miles per hour.

Construction

- Require contractors to submit and obtain approval of their traffic control plans (TCPs) before work begins; be sure established practices routinely require approval of changes in TCPs by qualified traffic personnel throughout construction.
- Obtain proof of contractor's insurance.
- Know and comply with the traffic control procedures for construction operations in the MUTCD.

- Provide properly functioning traffic control devices at work sites; inspect work zones day and night for placement and visibility of warning devices.
- Document the traffic control procedures and devices being used at work zones during construction.

Maintenance

- Train employees in the safe and efficient operation of equipment.
- Regularly conduct on-site inspections of road conditions, signs, bridges and drainage facilities; implement maintenance procedures.
- Conduct special inspections when emergency maintenance may be

required due to high winds, heavy rain, snow or ice.

- Promptly repair potholes.
- Establish a policy for replacing or updating safety devices such as guiderails.
- Develop a policy to keep the public right-of-way clear.
- Avoid driver exposure to uneven lanes, milled edges and pavement or shoulder drop-offs. Use engineering judgment in selecting the type of treatment (warning device or protec-

tive barrier or both) for pavement edge drop-offs.

- Require employees to wear approved safety clothing and use safety equipment properly. Train them to do so.
- Keep good records, document all complaints and record solutions.
- Inspect all equipment and keep it in good repair.
- Remove debris and loose gravel from roadways and from shoulder areas near travelways.
- Be sure all employees know that they should promptly report any road hazards caused by residents. For example, prompt and definitive actions should be taken to be sure that signs, fences, trash receptacles, trees and greenery, and similar obstructions are not allowed to restrict the sight distances most drivers would need to safely enter intersecting roadways. These considerations should be thoroughly scrutinized at the planning, design, and construction phases of driveway permitting for all commercial land development and for residential access points to roads or streets with existing or anticipated operating speeds exceeding 30 miles per hour.
- An agency's snow and ice removal policy should be part of the risk management plan. Procedures should be documented and any changes in the policy should be recorded. Guidelines about bridge treatment practices and about who should be notified of problems or unusual circumstances should be clearly stated.
- The Summer 2004 issue of the *KUTC Newsletter* contains a liability checklist for local agencies. You can download a copy of this issue at www.kutc.ku.edu.

Adapted from the Cornell Local Roads Program *Nuggets & Nibbles*, Fall 1996 article "An ounce of prevention is worth a pound of cure," by Lori French. Reprinted with permission. ■

Bike routes,

continued from page 9

encouraged to begin using off-road trails and gain skills in a bicycle-only environment."

There still is a question of who incurs the liability when a bike route is designated. "Only a designation by

Bike routes should meet accepted design *and* maintenance standards to ensure safe conditions.

the government entity which has responsibility for the bikeway will have any potential impact on liability." Also, government agencies are more likely to lose cases of potential liability that deal with defects or hazardous conditions of the designated route.

Rather than not designating bike routes to avoid liability, government agencies should work to reduce the potential risk of accidents on safe and efficient routes. Not only should the designation of bike routes meet standards such as those in the MUTCD, the facilities should also meet accepted maintenance standards to ensure safe conditions. Maintenance should include regular inspection of the facilities to try to identify potential hazards to bicyclists. By reducing the risk to the riders in the system, it is possible to reduce the potential liability.

Source: *Guide for the Development of Bicycle Facilities*, American Association of State Highway and Transportation Officials (AASHTO), 1999. ■

Kansas statutes related to bicycling

8-1405. "Bicycle" defined: Definition of a bicycle.

8-1586. Unlawful acts; application of regulations: States circumstances that 8-1587 to 8-1592 are applied.

8-1587. Traffic laws apply to persons riding bicycles: Rights of the bicyclist and including that all traffic laws apply to bicyclists.

8-1588. Riding on bicycles: Limitations specified on the number of riders per bicycle.

8-1589. Same; clinging to other vehicles prohibited: Bicyclists cannot cling to motor vehicles.

8-1590. Riding on bicycles or mopeds; riding on roadways and bicycle paths: Bicyclists and mopeds must ride to the right while operating at less than the normal speed of traffic, unless they meet special circumstances.

8-1592. Lamps, brakes and other equipment on bicycles: The sale and use of bicycle equipment must be proper standards.

8-1592a. Application of 8-1586 to 8-1592 shall be applicable to motorized bicycles, and every person operating a motorized bicycle shall be subject to the provisions thereof.

8-1592b. Low power cycles; traffic law application; no registration or driver's license required: Vehicle registration and driver's license shall not be required for operation of a low power cycle. Traffic regulations applicable to bicycles shall apply to low power cycles except tricycles with no brake horsepower.

KDOT Korner

Transportation projects jeopardized by potential federal funding shortfall

[Many of our readers are probably already aware of the potential transportation funding problems the state is facing. However, for those of you who are not, here are the facts from KDOT, along with what a reduction in funds might look like for programs that affect local government transportation programs. The numbers are sobering.]

In anticipation of a potential significant shortfall in the federal Highway Trust Fund in fiscal year 2009, Kansas Department of Transportation leaders have begun to discuss contingency plans.

Although no changes have been made in the scope or schedule of projects remaining to be constructed under the state's 10-year 1999 Comprehensive Transportation Program (CTP), a significant cut in federal funds could result in projects being delayed or eliminated.

"There is a potential problem facing Kansas and all other states due to the possibility of the shortfall in federal funds," said Secretary of Transportation Deb Miller, who spoke during a Sept. 25 federal funding forum at KDOT headquarters. "We are moving forward with our scheduled projects in hopes that the issue will be resolved. But, we must be prudent and make contingency plans."

The Bush Administration's FY 2008 mid-session budget review estimated that revenues going into the Highway Trust Fund would fall short of the commitments in SAFETEA-LU—the current federal transportation funding bill. The review predicted an estimated \$4.3 billion shortfall for FY

Example of proportional reduction to locals

Local program	2009 planned federal funding	Proportional reduction
Counties	29 million	11 million
Metro	20 million	8 million
Small urban	11 million	4 million
Congestion mitigation	6 million	2 million
TOTAL	25 million	

Source: KDOT Bureau of Transportation Information, 2007.

2009. Earlier in the year, the shortfall was estimated to be a much smaller \$700 million.

The larger federal shortfall has been blamed on lower-than-expected heavy truck sales resulting from new diesel emissions standards, increased outlays during the latter years of SAFETEA-LU (which runs through FY 2009), and flat motor fuels tax revenue.

The \$4.3 billion shortfall in revenues may result in a projected \$16 billion cut in spending in FY 2009. Kansas' share of the anticipated \$16 billion cut is between \$130 million and \$150 million.

"A reduction of this magnitude to Kansas would not only impact the remaining CTP projects, but it would

have an adverse effect on local projects that depend on federal funding, safety construction programs, planning and special projects, including federal earmarks," said Secretary Miller. She

called on members of the state's Congressional delegation to support action that would assure that the funding commitments of SAFETEA-LU remain intact.

In September, the Senate Finance Committee considered \$5 billion in options, mostly involving General Fund transfers and tax evasion enforcement measures, to offset the Highway Trust Fund deficit in 2009.

"We want to commend the Finance Committee

for addressing this crisis, but we need to understand that we will face the same problem in the next fiscal year. That is a matter that will be addressed in the reauthorization of SAFETEA-LU," said Jack Basso of the American Association of State Highway and Transportation Officials. Basso was in Topeka to participate in the Sept. 25 funding forum, which attracted about 70 stakeholders, legislators, partners and reporters.

Secretary Miller said KDOT staff will remain in communication with the state's Congressional delegation and share information with local officials and stakeholders.

Source: KDOT Public Information Office, 2007. ■

Where can I find someone trained in GIS?

... By Jacob Bustad ...

A GIS (Geographic Information System) can track the maintenance of bridges, railroad crossings, signs, culverts, water lines, and more, but using this tool requires special skills. The table below summarizes GIS programs in the state of Kansas as well as the greater region. The list covers both undergraduate and graduate programs and also “stand-alone” GIS certificates. If you are looking for a GIS grad, now you know where to call. ■

Kansas University

Lawrence, KS
Geography Department
785-864-2701
www.ku.edu

B.S. Geographical Information and Analysis, with optional Minor in GIS

—Requiring Maps and Mapping OR Computers, Maps, and Geographical Analysis; Methods of Analyzing Geographical Data; Principles of GIS; and three other courses at the 300 level or above

Kansas State University

Manhattan, KS
Geography
785-532-6011
www.k-state.edu

Graduate Certificate in GIScience

—For agencies in the public sector
—May be awarded as “stand-alone” certificate
—Administered by Dept of Geography and supervised by multidisciplinary group across K-State campus.
—Courses may be waived if student can demonstrate previous coursework or significant prior experience

Missouri University- Columbia

Columbia, MO
Geography
573-882-7787
www.missouri.edu

B.A. Geography

—Optional emphasis in GIS

GIS Certificate Program

—Interdisciplinary program for both undergraduate and graduate students – graduate certificate may be earned as “stand-alone” but undergraduate certificate must be completed with degree
—Student must complete 16 hours of coursework; also must complete either a 4 hour GIS project, or an additional 2 courses from the GIS curriculum

University of Missouri- Kansas City

Kansas City, MO
Geosciences
816-235-1001
www.umkc.edu

Advanced Certificate in GIS

—Designed for both current students as well as professionals in public/private spheres – can be earned as “stand-alone” certificate
—Fundamental and advanced training in GIS and related computational methods, with emphasis on environmental studies, urban planning and crime analysis
—Program consists of 15 hours (five related courses)

University of Nebraska- Omaha

Omaha, NE
Geography/Geology
402-554-2800
www.unomaha.edu

B.S. Geography with optional GIS Certificate

—In addition to the regular coursework for the B.S., the student must complete 9 credit hours of Computer Science; Mathematical Statistics; 2 other upper-level math courses, as well as Cartography and GIS; Cartography and GIS Lab; and either Computer Mapping and Visualization or Geographic Information Systems I

Oklahoma State University

Stillwater, OK
Geography
405-744-5000
osu.okstate.edu

GIS Certificate Program

—Admission is open to any undergraduate, graduate or special student at OSU
—Program consists of 21 credit hours from different course “Groups,” from beginning to advanced

Reviews

... by Lisa Harris

You Show Us—2006

South Dakota's LTAP Center has a Special Bulletin series with excellent information for local transportation agencies. One of their recurring topics is the results of their annual "You Show Us" showcase of innovative ideas in local road departments. Ideas in the 2006 issue include adding binder to gravel, a low-aggregate method of chip-sealing, extendable truck flat bed, and custom-made forms for auto gate (cattleguard) bases. South Dakota LTAP Special Bulletin #56, Fall 2006, Part 1. 6 pages.

Tips from the field: trucks and loaders

The Iowa Transportation Center at Iowa State published this guide in 1995, and it is still useful today. Similar to South Dakota's "You Show Us" bulletin, this guide contains 20 innovations developed by road departments to make their trucks and loaders better meet their needs. 22 pages.

SSShhh...It's Quiet Pavement

This is a technical bulletin on how "quiet pavement" is constructed, how to maintain it, and success stories. South Dakota LTAP Special Bulletin #56, Fall 2006, Part 2. 3 pages.

Working Safely in Trenches

This safety card shows tips for working in trenches. Tips include protective systems for trenches, recommended distances for placement of excavated materials, and a safe means of egress. The card is written in both English and Spanish. The information was provided by the Occupational Safety and Health Administration; more information can be found at www.osha.gov. ■

Calendar

See our Web site for even more calendar listings. Go to www.kutc.ku.edu and click on "Training Calendar."

... 2007

November 6
10th Annual Local Roads Seminar
Hosted by the Missouri/Kansas Chapter-ACPA, Overland Park, KS.
For more information, contact Cindy Allen at 913-381-2251

*Bridge Maintenance Workshop
Hays- November 13
Salina - November 14
Topeka - Nov. 15

November 18-20
Kansas Association of Counties Conference & Expo (and KCHA mtg)
Wichita, KS
Contact: Sarah Meyer, KAC
Phone: 785-272-2585

*Road Safety Assessment, Concept of Procedure
Lawrence—Nov 28
Wichita—Dec 5

December 6
51st Annual Asphalt Paving Conference
University of Kansas Union, Lawrence, Kan.
877-404-5823 toll free

December 13
TARGET Emergency Preparedness #1: Before the Disaster
APWA Click Listen & Learn
Call Carrie at APWA at 800-848-2792

... 2008

MUTCD for Technicians
Jan 8—Topeka
March 18—Garden City
May 20—Salina
1-800-432-8222

January 9
Geometric Design of Very Low Volume Roads
Topeka, KS
1-800-432-8222

*January
GIS

MUTCD for Emergency Response Personnel
Jan 10—Topeka
March 20—Garden City
1-800-432-8222

* Workplace and Job Site Safety ▲T
Feb 21—Hays
Feb 22—Salina
Feb 28—El Dorado
Feb 29—Topeka

*Early 2008
Gravel Road Maintenance ▲T
4 sites

*Early 2008
Project Planning and Management ▲M
3 sites

February 6
Environmental Engineering Conference
KU - Continuing Education
877-404-5823 toll free

March 6
Structural Engineering Conference at KU
877-404-5823 toll free

*March
NHI: Interactive Highway Safety Design Model

April 15-16
Kansas Transportation Engineering Conf.
Manhattan, KS
Contact: Kansas State University-Division of Continuing Education
Phone: 785-532-5569

Spring 2008
APWA Kansas Chapter Snow Rodeo

May 5-7
Kansas County Highway Association Spring Conference
Manhattan, Kansas
Phone: Daryl Lutz at (316)322-4101
email: dlutz@bucoks.com

*For information on calendar items indicated with an * or to suggest a topic for an LTAP workshop, contact: Kristin Kelly, LTAP Training Coordinator, 785/864-2594, kbkelly@ku.edu.

▲T = KS Road Scholar Program—Level 1
Technical skills required course
▲S = KS Road Scholar Program—Level 2
Supervisory skills required course
▲M = KS Road Scholar Program—Level 3
Master Road Scholar required course

May 7-9
APWA Mid-Am Conference
Overland Park, KS
Call Andy Haney at 785-229-3630

May 18-21
National Roundabout Conference
Kansas City, MO
Contact: Richard Pain, TRB
Email: RPain@nas.edu

Coming in 2008:
*Asphalt Roads Maintenance ▲T

*Bridge Maintenance KS LTAP

*Gravel Road Maintenance ▲T

*Culvert and Drainage Workshop ▲T

*Local State Project Coordination ▲M

Free Resources

Check off your selections, fill in the bottom portion, and return this form to:

KUTC Materials Request, 1530 W. 15th St., Room 2160, Lawrence, Kansas 66045
or fax to 785/864-3199

Videos

We offer video presentations in DVD (to keep) or VHS (to rent) format. Search for videos at www.ksltap.kutc.ku.edu.

Another source for video presentations is **streaming video** available at the California LTAP's web site:
<http://www.techtransfer.berkeley.edu/videos/streaming.php>

About 50 programs are available at the CA LTAP site for viewing on your computer. You will recognize some of the titles from the Kansas lending library, but there are some others we do not have. Check it out!

Publications

You are free to keep these unless otherwise noted. See descriptions on page 14.

- You Show Us—2006**
South Dakota LTAP, 2006.
- Tips from the field: Trucks and loaders**
Iowa LTAP, 1995.
- SSShhh...It's Quiet Pavement**
South Dakota LTAP, Fall 2006.
- Working Safely in Trenches**
OSHA, 2005.

Equipment

We offer turning movement counter boards for loan to local highway agencies. Call us at (785) 864-5658 to arrange a loan. There could be a waiting list for these items.

- Turning Movement Counter Board DB-400, Jamar Technologies, Inc.**
A basic model for recording turning movements at intersections. The board is is lightweight and comes with its own case.
- Turning Movement Counter Board TDC-8, Jamar Technologies, Inc.**
Can be used to do turning movement counts, classification counts, gap studies, stop-delay studies, speed studies, and travel time studies. The board is lightweight and comes with its own case.

Order Form

_____		_____
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- send materials indicated
- address correction
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Note: Our video and publication catalog is accessible online, in a searchable format. Visit: www.ksltap.kutc.ku.edu

*For requests outside the United States: After receiving your request, we will notify you of the postage cost and will send materials after receiving payment for postage.

Kansas LTAP

Let us at the KUTC help you find the answers to your transportation-related questions.

KUTC, 1530 W. 15th St. #2160, Lawrence, KS, 66045
Call 785/864-5658 (fax 785/864-3199)
www.ksltap.kutc.ku.edu

The Kansas Local Technical Assistance Program (LTAP) is an educational, research and service program of the Kansas University Transportation Center (KUTC), located in the University of Kansas School of Engineering. Its purpose is to provide information to local and county highway agencies and transportation personnel by translating into understandable terms the latest technologies in the areas of roads, highways and bridges.

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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