



KS LTAP Newsletter

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

Inside

- Traffic counters and how they compare
- The science of highway safety: new Highway Safety Manual
- Finding a sign management tool to fit your needs
- New driving laws in Kansas target safety
- Sign-related deadlines are approaching
- Designing for pedestrian safety
- Upcoming workshops and meetings
- New resources from Kansas LTAP

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- administration
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Steps for Adding or Removing Traffic Control Devices

By Nate Vander Broek

What federal and state manuals say, and advice from practitioners.



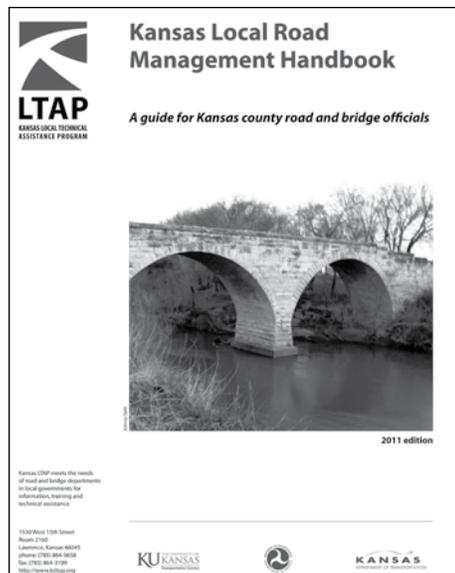
If you're in charge of a road and bridge or public works department in Kansas, you may have been asked to add or remove a traffic control device. What steps do you take? Who do you contact? Are there regulations that you must follow? Can you make this decision if you are not an

engineer? These are the sorts of questions this article will address.

The evolution of traffic control devices in the United States

First, some history. Approximately 100 years ago, it was common for motorists to get lost while driving because of the poor condition of (or even lack of) signs. In an attempt to provide guidance for automobile drivers and also to direct them to specific sites, automobile clubs formed and helped to create and maintain their own traffic signs on local highways. Automobile clubs originated with automobile enthusiasts who were looking to improve the condition of roads and the safety of its drivers. Due to the

Continued on next page



New Handbook

We at Kansas LTAP are pleased to announce the publication of a new resource on county road and bridge management. Written by Norm Bowers, P. E., the *Kansas Local Road Management Handbook* provides an overview of the administrative, political, and legal framework for running a county road department.

Each county in Kansas will receive a hard copy this Spring. Additional copies are available to Kansas counties (limited quantity)—call (785) 864-2590. The handbook is also available online at <http://www.ksltap.org> under "What's New" or "Resources to Download."



Traffic control devices *Continued from page 1*

high number of automobile clubs and competition among automobile clubs, “it was common to encounter as many as eleven different signs for one single trail or route” (Manual on Uniform Traffic Control Devices—The Evolution of MUTCD, 2009).

At the same time the automobile clubs were adding their signs, cities were creating their own traffic control devices, such as the first electric traffic signal in Cleveland in 1914 and the first stop sign in Detroit in 1915.

In an effort to create uniform signs and markings, representatives from Wisconsin, Minnesota and Indiana toured several states and eventually reported its findings to the Mississippi Valley Association of Highway Departments in 1932. Their plan organized street signs by the shape of the sign; round signs designated the most danger (railroad crossing), octagon shapes were a little less dangerous (stop sign), triangle signs even less danger (yield sign) and finally rectangular signs provided regulatory information.

Meanwhile, in 1924 the First National Conference on Street and Highway Safety (NCSHS) proposed standardized colors for traffic control devices. Also in 1924, the American Association of State Highway Officials, or AASHO (precursor to AASHTO) attempted to standardize sign shapes and colors. Having two different sets of standards would be problematic, so in 1932, AASHO and NCSHS formed the first Joint Committee (JC) on Uniform Traffic Control Devices and created the *Manual on Uniform Traffic Control Devices* (MUTCD) in 1935. About 40 years later(!), the MUTCD was approved as the national standard for all highways open to public travel.

The regulations

The MUTCD. The MUTCD sets a national uniform standard for traffic control devices, which increases safety, efficiency and reduces congestion. The most recent version of the MUTCD is the 2009 edition, which was adopted federally on January 15, 2010. States that do not have a state supplement to the MUTCD, such as Kansas, have a two year period to adopt the plan. Kansas must adopt the national MUTCD by January 15, 2012 or it will be at risk of losing federal funding. Along with losing federal funding for noncompliance, there is also a risk of liability. If a municipality doesn't adopt the MUTCD and there is a crash,

the municipality in charge of the traffic control may be held liable. It is expected that Kansas will adopt the 2009 MUTCD by the deadline.

The MUTCD is available to view at http://mutcd.fhwa.dot.gov/kno_2009.htm. The 2009 edition of the MUTCD has several changes from the earlier 2003 edition. For instance, metric conversions have been removed in the 2009 edition and new chapters have been added for toll plazas, managed lanes and preferential lanes.

State of Kansas guidance.

The Kansas DOT published two books that provide supplementary material for the 2003 MUTCD:

- *Handbook of Traffic Control Practices for Low Volume Rural Roads* and
- *Handbook of Traffic Engineering Practices for Small Cities*.

According to Tom Mulinazzi, project director of the rural handbook and professor of engineering at the University of Kansas, the *Handbook of Traffic Control Practices for Low Volume Rural Roads* seeks to “take the MUTCD and apply common sense for low volume roads.” He explained that these roads carry fewer than 400 vehicles per day and are driven mainly by familiar drivers. The handbook’s target audience is road supervisors and counties without engineers on staff and who may not have the funding to implement all the recommendations found in the MUTCD. Some of the topics of the handbook include narrow bridges, culvert and roadside obstacles, and temporary traffic controls.

The second book, the *Handbook of Traffic Engineering Practices for Small Cities*, serves the purpose of assisting local officials in the application of traffic engineering practices within their community. The book is organized in a question and answer format to provide day-to-day guidance to small cities without professional traffic engineering on staff. Some of the questions answered in this book include: What types of traffic control signs, signals, and devices require an ordinance? Do all signs have to meet certain specifications in size, shape and coloring? When should a stop sign be used at an intersection?

Primary considerations for adding traffic control

Emotional responses to crashes can prompt a request for adding a control device. For instance, if someone had a crash at a particular intersection, a request may be made to the city or county commissioner to add a stop sign or some other type

It is important to understand why public pressure is not reason enough to add traffic control devices.

Sources:

- *Handbook of Traffic Control Practices for Low Volume Rural Roads*, 3rd Edition. Kansas Department of Transportation. (2005). Kansas State University.
- *Handbook of Traffic Engineering Practices for Small Cities*, 2nd Edition. Kansas Department of Transportation. (2005). Kansas State University.
- *Manual on Uniform Traffic Control Devices—The Evolution of MUTCD*. (2009, December 28). Retrieved February 16, 2011, from U.S. Dept of Transportation Federal Highway Administration: <http://mutcd.fhwa.dot.gov/kno-history.htm>.





Another Good Resource for Locals

Minnesota's Local Road Research Board and Minnesota's LTAP have developed a traffic sign handbook

that includes insight on removing unnecessary and ineffective signs. This best practices handbook provides assistance to local agencies to better manage and maintain their traffic signs and meet retroreflectivity requirements for traffic signs (Turn to page 12 for information about those requirements).

The Minnesota sign handbook describes sign maintenance, assessment and management methods and helps agencies decide which methods are best for them. There are sections on budgeting for signs, policy development (with examples), how to know when signs are not working or are not needed, and how to implement sign policies. There are many case studies for effective and improved signing provided from cities and counties.

The handbook is available for a free download at the following link. Any local agency can benefit from looking at this excellent resource. Go to: <http://www.lrrb.org/PDF/2010RIC10.pdf>



of traffic control device to that intersection to increase safety and help prevent a similar crash from occurring in the future.

It is important to understand that public pressure is not reason enough to add traffic control devices. Before adding or removing a device, steps should be taken to make sure there is a legitimate need to install (or uninstall) the device.

According to Mehrdad Givechi, research engineer at the Kansas University Transportation Center, traffic volumes, crash history, traffic speed and capacity reports (among others) should first be taken to ensure the traffic control device is warranted and will not cause unnecessary traffic inefficiencies or additional safety concerns. All final designs or decisions must be approved by a professional engineer.

If your jurisdiction does not have an engineer on staff, you may seek financial assistance for hiring an engineering consultant through KDOT's Traffic Engineering Assistance Program, or TEAP. If you have questions about the process or whether funding will be available in your project, call Lynn Berges at (785) 296-0410. Berges will determine if adding or removing a traffic control device in your case sounds prudent, and if so, he will ask that you complete an application form. Once approved, Berges will assign a traffic engineer to you. You may also read about the program's opportunities online at http://www.ksdot.org:9080/PDF_Files/OpsFieldGuide.pdf.

Advice from the field

Some agencies review and remove signs on a yearly basis. **JR McMahon**, Miami County road supervisor, explains how their county removes rural school bus stop ahead signs at the end of every school year. This is done to prevent an oversaturation of signs that are no longer needed after students have graduated or are no longer taking the bus. They replace these signs in the fall. If there is a need for the sign in the summer, the schools must make the request. McMahon said it's important to review all signs on a regular basis to prevent an overabundance of unnecessary signs.

Norm Bowers, a retired Johnson County engineer, outlined the steps that typically take place when adding traffic control devices. He said the first step is to check out the location of the proposed sign, which is oftentimes the scene of a crash, to investigate the complaint. Next, review the MUTCD to verify that the reason for adding the sign is a valid one. If it's reasonable, have an engineering study performed. While this step isn't enforced, Bowers said it is in your best interest to have a study done to avoid potential liability issues if there is a crash there in the future. Depending on the type of sign, it may require a resolution or ordinance from the governing body. Once the request has been approved, you can purchase the sign from your supplier and have it installed according to proper specifications as stated in the MUTCD.

Mark Borst, traffic engineer for Sedgwick County Public Works, noted that some of the work mentioned by Bowers doesn't need to be performed by an engineer. For instance, data collection can be completed by a traffic technician. But he points out that only traffic engineers can make recommendations. He suggests reading past LTAP articles for helpful information and networking with peers and traffic engineering faculty for advice. Borst also said to be very careful when removing traffic control devices. When someone drives the same roads every day, they're less likely to notice changes to the road. Moving or removing signs at an intersection could have devastating consequences.

Borst added that "while there can be more than one answer to why type of control to have in a particular situation, there are typically better solutions than others." He said that, most of the time, one solution is the clear choice.

Borst also said "To choose to not modify traffic control because it might create the opportunity for incidents is not more correct than to maintain traffic control that is unnecessary, as this, too, can create the opportunity for incidents. The bottom line to me is that good judgment combined with appropriate notification of any changes makes for the best situation in the long run. Any change [in] reducing or increasing traffic control requires road users to modify their actions, and either one can increase the opportunity for incidents if not properly presented [along with] additional notification, either temporary or permanent."

Even when following the correct procedures for adding or removing traffic control devices, crashes can occur.

Borst states that they "had a high-profile fatality crash at an

Continued on next page



Traffic control devices *Continued from page 3*

old 4-way stop controlled intersection due to a motorist choosing not to stop and hitting the vehicle that had the right-of-way. As Vicky Johnson, [former] KDOT legal counsel, used to say, ‘We do not insure, ensure or assure the safety of the road.’ All we can do is provide reasonable control and guidance so that the reasonable operator can travel from one point to another point with reasonable expectations to not encounter a problem.”

David Woosley, traffic engineer for the City of Lawrence, outlined the steps he recently took in establishing an all-way stop at an intersection in Lawrence. He said the request was first made by a citizen at a city commission meeting. Next, traffic counts were obtained during a 24-hour period for each approach to the intersection. The traffic counts were compared to the requirements in the MUTCD and met the minimum requirements for consideration of an all-way stop.

Woosley said this is Lawrence’s standard procedure to evaluate any request for traffic control. It is a long

process. After receiving the request, traffic data is obtained when time permits; a staff report is prepared for the Traffic Safety Commission that meets once a month; the Traffic Safety Commission makes a recommendation to the City Commission; if approved by the City Commission, an ordinance is prepared and must receive two readings and be published, then the signs can be installed. When asked what changes, if any, he would make to the process he stated “this process has worked well for us for at least the past 18 years.”

In summary, if you plan to add or remove traffic control devices in your city or county, be sure to seek the help of a traffic engineer for all major decisions. [See page 15 to obtain a reference card that outlines which traffic-related tasks do and don’t need an engineering license.] If you do not have an engineer on staff, KDOT may help you in finding and funding an engineer. Make sure you follow the necessary requirements of the Kansas-adopted version of the MUTCD and consult the Kansas handbooks on traffic control devices for advice tailored for small cities and low volume rural roads. ■

Traffic Counters and How They Compare

By Nora Fairchild

A traffic counter or monitor is a useful tool for conducting traffic studies and determining when traffic control devices are needed. Counters record the number and type of vehicles traveling over or near them. Traffic counters come in many different types. It’s good to have choices, but sometimes it can be difficult to know which one suits a given situation. Three common types—tube, magnetic and laser counters—vary in cost, safety, efficiency and durability. This article will map out these differences and discuss some considerations related to local roads.

Traditional counters

Pneumatic (tube) traffic counters. The Federal Highway Administration’s *Traffic Monitoring: A Guidebook* says that tube counters are one of the cheapest methods of traffic counting, costing up to \$100 per counter. Tube counters are considered temporary traffic counters because the tubes tend to wear out under traffic after multiple studies, especially on rough surfaces like chip seals. They don’t work well

in poor weather conditions, and they require high speeds to work well. The guidebook says that they are best for moderate volume traffic.

Inductive loop (magnetic) traffic counters. “Credit card” traffic counters are traffic counters that use magnetic imaging to count the number, speed and length of vehicles during a given period of time. According to HiStar, their NC-47 and NC-97 magnetic counters are 99 percent accurate when tracking free flow traffic statistics.

Card counters can be embedded under gravel or placed on top of asphalt. They can come with a protective cover that increases durability. Like the name suggests, card counters are very small and are only about the size of a credit card. They cost about \$200-300 each.

Credit card counters are not accurate for vehicle-type classification because they have a tendency to miscount cars that have trailers and have trouble distinguishing between trucks and buses. According to an Indiana Department of Transportation study, they can also be negatively affected by

extreme weather, and cannot detect vehicles that are not in motion.

Newer technology

Active infrared (laser) traffic counters. Laser counters can be found in store entrances, unobtrusively tracking the flow of people in and out of a given business. Another take on this technology is the laser traffic counter, which sends a beam from one side of the road to count and record each vehicle’s length and speed as it passes through. The laser counter then stores this information electronically, which can be easily transferred from counter to computer. Similar to magnetic counters, laser counters also have trouble interpreting large vehicles such as trucks and buses and may over-count.

Laser traffic counters, also called infrared axle sensors or traffic monitoring systems, have not yet been implemented in Kansas to our knowledge, but they serve as a good alternative to traditional style traffic counters in certain situations. Karen Carroll from the Iowa DOT reports



Detector Type Example Products	Detection Accuracy			Installation		Maintenance Needs	Costs *	
	COUNT	WEIGHT	CLASSIFICATION	SETUP	CALIBRATION		INSTALLATION	MAINTENANCE
Inductive Loop Detectors (ILDs)	EXCELLENT	NA	FAIR	MODERATE	EASY	HIGH	HIGH	MEDIUM
	Not affected by weather performs well under high and low volume traffic			Must block traffic for installation high rate of installation errors		Weakens pavement	\$1447 per lane to install	
Video Image Detectors (VIDS)	FAIR	NA	POOR	DIFFICULT	MODERATE	MEDIUM	HIGH	MEDIUM
Peek Video Track 500 Autoscope 2004 Elop Traffic EVA 2000	Occlusion and light conditions reduce accuracy weather related problems poor performance in high density locations			Requires a pole for mounting			\$1178 per lane to install	
Active Infrared Detectors	EXCELLENT	NA	FAIR	EASY	MODERATE	LOW	HIGH	HIGH
Schwartz Autosense I	Weather related problems poor performance in high density locations			Requires a pole for mounting			\$1658 per lane to install	
Microwave Detectors	EXCELLENT	NA	NA	EASY	MODERATE	MEDIUM	MEDIUM	LOW
Remote Traffic Microwave Sensor (RTMS) Peek PODO Whelen TDN-30	Not affected by weather			Requires a pole for mounting can be mounted overhead or on side of road (sidefire)			\$1086 per lane to install	
Passive Acoustic Detectors	FAIR	NA	POOR	EASY	EASY	LOW	MEDIUM	LOW
Smartsonic TSS-1 SmarTek SAS-1	Poor performance in echo-filled environment			Requires a pole for mounting can be mounted overhead or on side of road (sidefire)			\$913 per lane to install	
Passive Magnet Detectors	EXCELLENT	NA	FAIR	EASY	EASY	LOW	LOW	LOW
3M Canoga Vehicle Detection System 702	Not affected by weather performs well under high and low volume traffic			Can be installed under pavement by horizontal drilling or installed under overpass			\$755 per lane to install	
Piezoelectric Detectors	EXCELLENT	EXCELLENT	EXCELLENT	DIFFICULT	DIFFICULT	HIGH	HIGH	HIGH
	Accurate data to within ± 15% GVW			Must block traffic for installation stringent site requirements			\$ 1894 (AVC) per lane to install \$3360 (WIM) per lane to install	
Bending Plate for WIM	EXCELLENT	EXCELLENT	EXCELLENT	DIFFICULT	DIFFICULT	HIGH	HIGH	HIGH
	Accurate data to within ± 10% GVW			Must block traffic for installation stringent site requirements		Frequent recalibration	\$3360 (WIM) per lane to install	
Pneumatic Detector	FAIR	NA	FAIR	EASY	EASY	MEDIUM	LOW	LOW
Road Tube	Weather related problems poor performance under low speeds performs well under moderate volume traffic			Cannot be used in rutted pavement locations		Road tubing replacement	up to \$100 per locations to setup and retrieve	
Manual Data Collection	EXCELLENT	NA	EXCELLENT	NA	NA	NA	MEDIUM	LOW
Personal Labor and Equipment	Not affected by weather performs well under high and low volume traffic for short periods of time						Varies due to cost of personnel and type of count performed	

FHWA

This table from FHWA's **Traffic Monitoring: A Guidebook** shows the wide range of traffic monitoring equipment available and how they compare. The information can help you make informed choices about the kinds of equipment to use for your conditions.



that the AxleLight system serves as a good permanently-installed alternative to temporary tube and card counters. Carroll said that the DOT uses the laser counters to obtain classification traffic data in metropolitan areas.

AxleLight is one of the leading distributors of laser traffic counters. AxleLight representative Glenn Harter says that laser traffic counters are more durable and reliable than tubes, which need to be replaced often due to wear and tear. Laser counters are also user-friendly. They require little setup and can be easily used by a non-specialist.

One advantage of laser traffic counters is that they do not require worker-intensive installation methods and are therefore a safer alternative to installing tube or card counters in areas with high traffic. With the traditional tube counter, workers must nail down

one part of the tube and either shut down or cross the road to attach the other side. Laser counters are instead placed on one side of the road, either permanently or temporarily and eliminate the need for workers to be out in traffic.

While laser counters offer some clear advantages, they also have some disadvantages related to price and weather. The price of AxleLight counter starter kits begin at \$15,000 to \$20,000. The kits include everything you need to get started, but the price is still high compared to that of tube counters.

It's hard to forget our unpredictable Kansas weather. Laser traffic counters, like many other types of counters, require clear conditions to work at their full potential, so an unexpected weather change could cause problems such as incorrect or erratic statistics. However,

Carroll noted that a radiant heat system has been used successfully to keep Iowa roads that are being counted by the AxleLight systems clear of snow and ice.

To contact AxleLight, visit <http://www.ustraffc.net/ptaxlelight.htm>.

More information

Above is a table from FHWA's *Traffic Monitoring: A Guidebook* that compares the three types of traffic counters discussed in this article—along with other types of traffic monitors—on a variety of factors, from cost to reliability to ease of installation.

To access the guidebook for more information, visit: <http://www.wfl.fhwa.dot.gov/programs/td/publications/documents/traffic-monitoring.pdf>. ■

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The Science of Highway Safety

By John Ryyanen

Highway Safety Manual is a valuable tool for local agencies

As a civil engineer (or one who works closely with civil engineers) you know that when you're designing an intersection and you have a question about sight distance, you can look for an answer in the "Green Book," also known as the American Association of State Highway Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*. Similarly, when you have a question about signs, pavement markings and signals for the same intersection, you know you will find all the answers in your copy of the *Manual on Uniform Traffic Control Devices*, or MUTCD.



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Nothing about the Highway Safety Manual (HSM) constitutes a legal standard, nor does it mandate responsibilities. It is simply a great tool for making informed decisions about how to allocate resources to address safety issues most effectively.

But where do you look when you have a question about traffic safety? For example, what is the safest method for handling left turn movements at a four-way signalized intersection? Until recently, you would have had to sift through multiple sources of information (including, probably, the Green Book, the MUTCD, and published research reports) to find an answer to such a question. But there was no guarantee that you would find a definitive answer.

The question about left turn movements exposes a dilemma that safety professionals have grappled with for years: What constitutes safety on a road? Must a road simply adhere to established design standards to be considered safe, or does it require something more?

Standards not enough

Dr. Ezra Hauer, Professor Emeritus in the Department of Civil Engineering at the University of Toronto and internationally-recognized highway safety expert, said that the problem with defining safety as a function of compliance with standards is that "limit standards do not tell the designer what the safest design is. Rather, they specify

the limit of what is permissible." (Hauer 1999b).

Today a new publication called the *Highway Safety Manual* (HSM), available through AASHTO, is the definitive source of substantive answers to roadway safety questions. The manual was developed and refined by a diverse team of roadway safety stakeholders over the past 10 years to provide a single source for safety information and tools in a form that facilitates decision-making based on data.

Valuable resource, but not a standard

Priscilla Tobias, Bureau Chief of Safety Engineering for the Illinois Department of Transportation (IDOT) serves as Chair of the task force that oversees the maintenance and ongoing development of the HSM. She is extremely pleased that such a powerful tool is available for road-owning agencies.

"This manual represents the best safety-related science of our day," she said. "And it has been thoroughly vetted by safety experts and representatives from all groups involved with roadway safety to make sure it's accurate and

relevant for all stakeholders. This is the first time we have had such a resource."

Tobias is careful to stress that the HSM is not a standard, like the MUTCD.

"The manual is intended as a guide; nothing about it constitutes a legal standard, nor does it mandate responsibilities," she said. "It's simply a great tool for making informed decisions about how to allocate resources to address safety issues most effectively."

How the HSM is different

The key to the manual's usefulness lies in its thorough, scientific approach to identifying, analyzing and solving safety problems.

First, many methods of site selection in the HSM help road agencies zero in on the most relevant sites by eliminating from consideration sites that are at a randomly high or low fluctuation in crashes.

Then, after a site is identified, the HSM provides a means for analyzing the safety impact of decisions at all stages of the project development process, which enables practitioners to quantify the effectiveness of safety improvements along with other transportation performance measures.

Finally, the HSM includes an extensive catalog of proven crash modification factors (CMFs) for a variety of geometric and operational treatment types. Using CMFs, practitioners can predict the safety impact that a potential treatment or design may have on their road system.

Early adopters lead the way

At three volumes and nearly one thousand pages, the HSM contains a formidable amount of information, especially for those who are not experienced in the practice of analyzing



and improving roadway safety.

To help disseminate new information in the manual and to encourage road-owning agencies to use it, a national effort is under way to showcase different states' experiences with the HSM. The effort, officially titled the "Lead States Initiative for Implementing the Highway Safety Manual," involves state and local transportation officials in 13 states. (Missouri and Illinois are the closest lead states to Kansas.)

One product of the Lead States Initiative will be an HSM user guide to assist other state and local road agencies in implementing the HSM.

Thirty DOTs initially expressed interest in the Initiative. The director of the Lead States effort, Charles Niessner, of the National Cooperative Highway Research Program (NCHRP), thinks the willingness to get involved is thanks to the requirement in the national transportation bill of 2005 (SAFETEA-LU), that required each state DOT to establish a strategic highway safety plan.

"Requiring strategic highway safety plans really elevated the importance of roadway safety and helped everyone move more purposefully in that direction. I think the response to our invitation shows that our State DOTs see the HSM as another great tool to help refine our collective approach to improving the safety of our roads."

Michigan, a lead state, sees boon for local safety

Tracie Leix, supervising engineer for the Michigan DOT's Safety Programs Unit, is managing MDOT's participation in the Lead States Initiative. Leix is especially excited about the HSM because she expects it to enhance her group's already healthy relationships with local road agencies.

Leix and her team have seen first-hand how engaging with local partners on safety projects can produce great results. In 2004, the MDOT established Michigan's Local Safety Initiative to help local road agencies in Michigan implement safety improvements. The initiative provides crash analysis, field reviews, safety training and safety software improvements (using RoadSoft's

safety module).

"Through the local safety initiative, we stress the importance of measuring safety and quantifying the effectiveness of improvements," Leix explained. "The HSM will be a great tool to support these efforts as we continue to work together with our local partners to improve the safety of Michigan roads."

To help local agencies understand and use the HSM in Michigan, a Local Agency HSM Implementation Team is working with Michigan's LTAP to produce training materials for various groups of stakeholders at the local level that are involved in making roadway safety decisions.

"Among our local agency partners, we have metro, urban, and rural agencies. And within each agency we have people dedicated to design, development, safety, and other focus areas," Leix said. "No matter where someone fits in the process of improving roadway safety, certain aspects of the manual apply to them. We're working to make sure the training is relevant to each groups' needs."

Not just for state DOTs

Tony Giancola, Executive Director of the National Association of County Engineers (NACE) is also excited about the availability and relevance of the HSM for road-owning agencies across the country. "This is a very useful tool," he said. "It will be a big help for road agencies at state and local levels as they evaluate, design, plan for and implement safety improvements in their respective communities."

Everyone familiar with the HSM agrees that it will be a great tool for improving roadway safety, but some are expecting more—especially those who have experience with implementing safety improvements at the local level.

Wayne Schoonover, P.E., County Highway Engineer for Ionia County Road Commission in Michigan, says the HSM could help local road agencies pay for road projects. He has been an enthusiastic participant in the Michigan DOT's Local Safety Initiative program since it was created in 2004.

"The success we've had in securing federal safety funding for Ionia County road improvements is a great example of the value of a data-driven approach to safety," Schoonover said. "If not for the quantifiable solutions [MDOT] helped us define, we would not have qualified. The Highway Safety Manual can help any agency define quantifiable solutions to their safety problems, which could help them secure similar funding."

Kansas and the HSM

Kansas is currently updating its strategic highway safety plan, and the HSM is mentioned in the revision. One of the goals (or safety outcomes) of the Kansas SHSP is to improve the ability to analyze data statistically to better inform decision-makers. One of the strategies mentioned for achieving that goal is to educate transportation professionals about the Highway Safety Manual. Look for training and/or information about the HSM in the future.

For more information about the Highway Safety Manual, including how to order it, visit <http://www.highwaysafetymanual.org>.

This article was adapted from the March 2011 issue of *The Bridge*, a newsletter of the Michigan Local Technical Assistance Program (LTAP).

John Rynnanen is an editor at the Center for Technology and Training at the Michigan Tech Transportation Institute. ■



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Finding A Sign Management Tool To Fit Your Needs

By Nate Vander Broek



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By January 2012, federal law is requiring local agencies to have some kind of sign management system in place. This could be a simple paper inventory or spreadsheet that tracks sign location, condition and/or maintenance, but some agencies are seeking software specifically designed to manage these tasks. We surveyed sign management software vendors regarding their products and received 13 responses. Topics in the survey questions ranged from the features of the tool, such as mapping and custom reports, to financial issues such as initial cost and annual maintenance fees. This article will go through each of the survey questions and provide a summary of the results. Information on where to obtain the complete results of the survey is at the end of this article.

Is the software available as a stand-alone product?

Almost all of the software tools work as a stand-alone product. This means that you don't have to buy another software package to use this tool. Some of the tools cover the licensing fees for database or other software tools used in the system. For instance, RoadSoft provides licenses for TATUK GIS and Microsoft SQL Express. CitiTech Management Software cautions that without resources, work orders, work reporting and inspections, their sign management tool is incomplete.

Is your product a module of an asset management system or cost accounting program? About half of the companies surveyed said that their software is a module of either an asset management system or cost accounting

program. A few companies, such as GBA Sign Master, iWorQ Systems Sign Management and Sign Master, use only the asset management system. A few other companies, such as STAR Road and SignIT and Datalink, indicated that it is part of both the asset management system and cost accounting program. No companies indicated that it is only part of the cost accounting program. The remaining companies said their software uses neither system.

Type of database used in the software? A majority of the systems use either Microsoft Access or Microsoft SQL Server for their database. CitiTech Management Software and GBA Sign Master work with Oracle, as well as Microsoft products. LTAP PA Sign Inventory and Management System works with Excel and SignMaster uses Fox Pro. Microsoft SQL Server and Oracle are more robust databases and

work better with large amounts of data. There may be more expensive licensing fees if using Microsoft SQL Server or Oracle than with Access or Excel. If the software is online-based, such as the 3M Sign Management System or iWorQ Systems Sign Management, then you will not have to install or manage your own database.

Does the software come preloaded with standard posts and sign descriptions? Almost all of the software tools come preloaded with standard posts and sign descriptions. Some tools, such as Baker Sign Systems and RoadSoft, provide users with the ability to add or edit the data. CitiTech Management Software does not preload the data, but allows users to add their own post and sign descriptions. SignIT and Datalink preloaded the FHWA Sign Library, but did not preload descriptions nor did they preload posts or mounting hardware.

What is the number of customizable fields? Answers to this question varied from zero (SignIT and Datalink) to 2000 (CitiTech Management Software). Most software systems provide some level of customization for fields.

Does the system support single or multiple users? All the systems except one support multiple users. The only exception is Tams Sign Management Program. It only supports a single user. SimpleSigns said it supports single users but can accommodate multiple users.

What are the field data entry options? Some systems recommend using their own tool for collecting data. For instance, RoadSoft recommends the LDC (Laptop Data Collector). The LDC is a GIS-based, mobile data collection



These are the sign software management vendors that responded to our survey. Costs and features range considerably.

3M(TM) Sign Management System

Dave Meslow — dkmeslow1@mmm.com
651-733-5201 Cost: \$7,500

Baker Sign System

Scott J Baker — sbakerks@hotmail.com
620-212-3768 Cost: \$1,500

CitiTech Management Software (CMS)

Brian McKiernan — corporate@cititech.com
605-348-5069 Cost: \$15,000 and up

GBA Sign Master

Joel Knight — jknight@gbams.com
913-488-3984 Cost: \$3,000

iWorQ Systems Sign Management

gperrett@iworq.com
888-655-1259 Cost: \$1200-\$5000

LTAP PA Sign Inventory and Management System

Patrick Wright — pwright@pennoni.com
717-265-6143 Cost: Free, through LTAP Centers

RoadSoft

Tim Colling — tcollin@mtu.edu
906-487-2102 Cost: \$5,995

SignIT and Datalink (Tapco)

Joanne Conrad / Mike Haley — joanne@tapconet.com
877-827-2652 Cost: \$1200

SignMaster - by MasterMind Systems, Inc.

Dan Sandwisch — dan@mastermindsystems.com
419-862-3888 Cost: \$1500 to 10,000

Signs Inventory by Geographical Navigation

Stephen Steiner — ssteiner@ovellollc.com
815-354-4047 Cost: \$3000 - \$5000

SimpleSigns

Mike Rowekamp — mrowekamp@rowekamp.com
952-882-4776 Cost: \$1,500

STAR Road

Jeanne Jelinek — jeanne@starprogramming.com
620-962-5482 Cost: \$4,000 to 5,000

TAMS Sign Management Program

Nick Jones — nick.jones@usu.edu
435-797-2933 Cost: \$500

utility designed specifically for entering data into RoadSoft. 3M suggests using their Field Asset Status Tracker—or FAST tool—to keep the inventory database up-to-date. It enables data collection and recording of maintenance activity directly into the sign inventory database, with minimum effort, during regular assessment and maintenance activities. Most of the other software tools allow laptop, pocket PC, handhelds or tablets, and even paper. STAR Road also works with Ricoh cameras.

What is the mapping capability? While these answers vary considerably, most systems have some sort of mapping feature. 3M's tool comes with GIS mapping software. Baker Sign Systems, iWorQ Systems Sign Management and Signs Inventory by Geographical Navigation use Google Earth/Maps. CitiTech, GBA Sign Master, and SimpleSigns integrate with ESRI GIS. With SignIT and Datalink, assets can be plotted to a map via MS Mappoint with location and information regarding the number and types of signs at a given location. The only system that doesn't support mapping capabilities is the LTAP PA Sign Inventory and Management System.

Are standard reports provided? All of the software tools except one include standard reports. The only exception is the LTAP PA Sign Inventory and Management System which uses Excel and allows users to create customized reports. Most standard reports include information on signs by type, condition and location, work orders and activity reports. CitiTech Management Software has over 350 pre-defined reports to track and manage operations. SignIT and Datalink includes in-house and field inventory, employee rosters and work assignments, work order status, sign history, retroreflectivity inspection history, purchase history and requisitions.

Can you create custom reports? Most of the systems either have their own built-in tool that allows users to create custom tools by selecting fields from tables, or uses Crystal Reports to help users create custom reports. Additionally, most systems allow reports to be exported as a CSV or Excel file for additional editing or formatting. SignIT and Datalink does not provide custom reports at this time but is working on adding that as a new feature in for later editions. A few companies, such as SimpleSigns and STAR Road, will create customized reports for you upon request.

Does it automatically upload coordinates from a GPS device? Almost all of the systems automatically upload coordinates from a GPS device. CitiTech Management Software has a sophisticated "location" capability that includes GIS, GPS, Addressing and LRS (linear referencing). It requires a GPS-enabled device. SignIT and Datalink will accept GPS information directly from the GR3 retroreflectometer and transfer it to SignIT. SimpleSigns requires two clicks of the mouse to record a GPS coordinate of a sign. LTAP PA Sign Inventory and Management System does not automatically upload coordinates from a GPS device, but provides fields for manually adding GPS coordinates.

What is the initial cost? Costs range from nothing for the LTAP PA Sign Inventory and Management System to

Continued on page 12



Recent Driving Laws in Kansas Target Safety

By Nate Vander Broek



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Imagine your neighbor's teen-aged son riding his bicycle down the street and he stops to let a pedestrian cross at a mid-block crosswalk. Now imagine that a distracted driver who is texting on his phone does not notice the young bicyclist stopped in front of him, and crashes into him. Now imagine a different scenario where you pass the scene of a crash and notice a large hole in the windshield. The driver was thrown through it because she wasn't wearing a seat belt. Does it make you feel a little sick?

While both of these stories are frightening, both stories may be less common in the future. In 2010, Kansas signed into law two new statutes designed to increase safety for motorists and pedestrians. The first statute, signed in May of 2010, makes the failure to wear a seatbelt a primary traffic offense. The second, known as the distracted driving or texting law, and also signed into law in May of 2010, prohibits drivers from writing, sending or reading text messages while driving.

This article will describe the two laws in greater detail and examine enforcement considerations, projected safety impacts, funding Kansas will receive by enacting the primary seat belt

law, and the fine drivers and passengers will receive by not obeying these laws.

Distracted driving bill

The new law. The U.S. Department of Transportation categorizes distracted driving into three categories: 1) visual (taking your eyes off the road); 2) manual (taking your hands off the wheel) and; 3) cognitive (taking your mind off what you're doing). The Kansas law seeks to reduce one of the most hazardous distractions, texting, because it involves all three types of distractions.

The law, K.S.A. 8-15,111, prohibits a person who is operating a motor vehicle on a public road or highway from "texting," using a wireless communications device to write, send, or read a written communication. The statute defines a "wireless communications device" to include any type of device that sends or receives messages but to exclude voice-operated devices. Law enforcement officers or emergency service personnel who are working are exempted from the ban. Texting is also allowed when the vehicle is stopped off the regular traveled portion of the roadway. Other conditions involving emergencies are allowed.

Distracted driving statistics. In 2008, 26 percent of crashes in Kansas were due to motorists failing to give full time and attention to driving, costing an estimated 853 million dollars. Crashes in Kansas due to cell-phone use have increased steadily from 198 in 2003 to 394 in 2008. According to the Kansas DOT, cell phone-related accidents killed seven people and injured 161 people in Kansas in 2007.

Researchers believe the texting law could save annually as many as 29 lives and avoid as many as 4,100 injury crashes in Kansas per year. Nationally, the issue is equally frightening. The National Highway Traffic Safety

Administration (NHTSA) reports that almost 20 percent of all crashes involved distractions in 2008. This translates to nearly 6000 fatalities and half a million injuries. Nationally, the proportion of drivers distracted during fatal crashes increased from 8 percent in 2004 to 11 percent in 2008.

Funding. Kansas does not receive any funding directly related to the passage of the distracted driving law.

Enforcement. We've heard enforcement of the texting law can be difficult. Sgt. Matt Sarna of the Lawrence Police Department was recently interviewed by the *Lawrence Journal World* regarding enforcement of the texting law. Sarna said it can be difficult to tell if a person is texting or dialing a cell phone.

The same article cited City of Lawrence prosecutor Jerry Little as saying that because officers have to show that a driver was texting and not answering the phone or dialing a number, he could see how the law would be difficult to enforce. In Douglas County, only two tickets were issued in the first month since the statute was enacted. Both tickets were in the rural part of the county. However, Douglas County Sheriff Sgt. Steve Lewis said that catching people texting in the county can be difficult because there isn't the stop-and-go traffic that cities have. No tickets were issued in the City of Lawrence.

Mark Engholm, a Kansas State Trooper, said the state does not keep track of the number of tickets issued for breaking the texting law because it is not a moving violation. He had no comment regarding the enforcement of the texting law.

Fines. The fine for unlawful texting is \$60. Court costs may increase this fine. For instance, in Douglas County, court fines are an additional \$93.50.



Failure to wear a seat belt now a “primary offense”

The other law passed in 2010 sets the failure to wear a seat belt as a primary traffic offense. This gives law enforcement officers the right to stop and ticket the driver or front seat passenger who is not wearing a seat belt. Also, anyone under the age of 18 can be ticketed for not wearing a seat belt. While seat belt use was already required, officers were not able to issue tickets unless the driver was stopped for a separate infraction.

There are a few exceptions to this law. Mail carriers are exempted from this law, as well as anyone with a written statement from a physician stating that the person is unable to wear a seat belt.

Seat belts use is also required for adults sitting in the back seat, but remains a secondary offense.

Kansas became the 31st state to enact a primary seat belt law.

Seat belt usage statistics.

Lawmakers hope the enforcement of the seat belt as a primary offense will encourage more drivers and passengers to buckle up. In 2010, KDOT observed

seat belt usage in 20 random counties throughout Kansas shortly after the seat belt law as a primary offence law became enacted. The survey showed that seat belt usage increased from 77 to 82 percent from 2009 to 2010. In 2008, 87.3 percent of people involved in a crash in Kansas were wearing seat belts. In 1998, this number was only 75.8 percent.

While seat belt use has been increasing, the new law is designed to be an incentive for further seat belt use. A report by then-Governor Parkinson in August 2010 noted that Kansas is expected to increase its belt use by approximately nine percentage points, cut annual fatalities in passenger cars and light trucks by eight percent and reduce serious injuries throughout the state.

According to a study by the Automotive Coalition for Traffic Safety, states with primary seat belt laws averaged 5.8 percent higher seat belt usage when fines were \$30 or more. In Kansas, the state fine for not wearing a seat belt is only \$5, the lowest seat belt fine in the country. After July 1st, 2011, the fine increases to \$10. These rates include court fees. Nationally, the

average seat belt fine is \$25.

Controversy on fines. Some cities and counties were charging extra fines on top of the state fine for seat belt infractions. For example, Lenexa set their fine to \$60 with an additional \$30 in court costs. Olathe and Leawood increased their fines to \$30. Wichita created a system of fines based on age, with tickets for adults not wearing seat belts at \$30, children 14-17 at \$60 and children 8-13 at \$121 tickets. (Children who are 13 years of age and younger receive their tickets under a separate law, the Child Passenger Safety Act.)

Some lawmakers said that they believed cities were using the new law as a revenue generator. They sought to set limits on the amount of the ticket, and they succeeded. House Bill 2192 was recently signed by Kansas Governor Brownback. The bill contained several provisions, including limiting the fine for primary seat belt law infractions to \$10.

Many cities claim the existing primary seat belt fine is too low to encourage seat belt use and that the low fee does not even cover the cost of

Continued on next page



Sources:

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- Kansas DOT. Kansas Adult Observational Safety Belt Usage Rates. <http://www.ksdot.org/burTrafficSaf/safblt/safbltusag.asp>.
- Scott Rothschild. Lawrence Journal World. Speed limit increase OK'd. April 16, 2011.



New driving laws *Continued from page 11*

writing the ticket. According to a recent federal study, states with fines averaging \$81 had seat belt use rates of 84 percent. Compare that to states that only charged on average \$25 and had seat belt usage rates of 72 percent.

Enforcement. Since the initial law passed, the number of seat belt tickets has increased significantly in some cities. Overland Park issued almost 1500 more tickets than in the previous year. Olathe increased tickets by 1,100 and Leawood increased tickets by almost 900.

Funding. By passing this law,

Kansas will receive approximately \$11 million dollars in federal transportation funding that was unavailable to Kansas until the new seat belt law was enacted. Kansas must use \$1 million of the \$11 million towards behavioral traffic safety activities. The remainder can be spent on highway improvement projects.

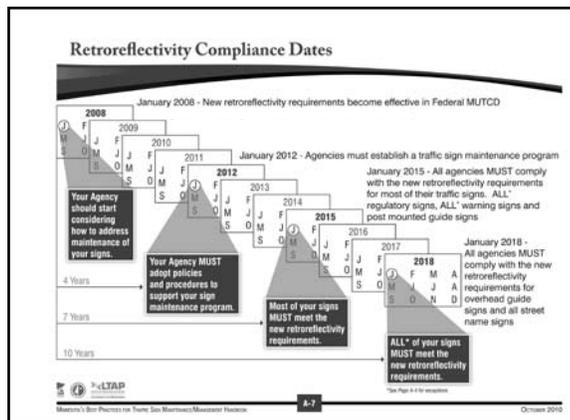
In sum

While it may be too early to tell if these safety laws have already changed Kansas driver's habits concerning seat belt use and texting while driving,

national statistics show that charging fines for these activities will reduce the number of offenders—and that will save lives. Kansas will continue to improve safety measures with the additional \$1 million in federal funding set aside to safety issues, and can use the remaining \$10 million for improving highways and public transportation. These laws are good for Kansas. ■

Nate Vander Broek is a graduate student in urban planning at the University of Kansas.

New Sign Deadlines are Closer, Closer, Closer



New federal regulations for sign management and maintenance start to come into effect next year. The first requirement is to have a sign management system in place by January 2012, and by January 2015 to comply with new retroreflectivity requirements for most of their traffic signs.

The Minnesota LTAP has designed a one-page reminder of upcoming deadlines for these regulations (at left). It is published in the *Minnesota's Best Practices for Traffic Sign Maintenance/Management Handbook*. You can obtain a full-sized version by downloading the handbook or by going to <http://www.ksltap.org> and clicking on "Sign Retroreflectivity Compliance Dates" under "What's New." ■

Sign management tools *Continued from page 9*

a hefty \$15,000 and up for CitiTech Management Software. You should be able to find a system that will provide the basic features for a price between \$3000 and \$6000. The more expensive ones, such as 3M's Sign Management System, provide more features and may provide support and training. Baker Sign System, GBA Sign Master, Sign IT and Datalink, Simple Signs and Tams Sign Management Program offer products for \$3000 or less.

Is there an annual maintenance fee? Over half of the companies

Want more details on these software tools? Go to <http://www.ksltap.org> and click on "Sign Management Software Survey Results" under "What's New." Full answers to the survey questions, by vendor, are listed there.

charge a yearly maintenance fee. Some, like the CitiTech Management System, determine the rate based on a percentage of the license fees. Others charge a flat fee every year, which may

include additional training or support. Of those who charge a flat rate, the price varies from \$250 for Baker Sign System to \$2000 for Signs Inventory by Geographical Navigation. Four companies do not charge a yearly maintenance fee. These companies include 3M, LTAP PA Sign Inventory and Management System, SignIT and Datalink, SimpleSigns, Tams Sign Management Program.

See sidebar at left for information on where to find the complete survey results, by vendor. ■



A Leg Up

Need Design Ideas for Pedestrian Safety? Check Out These Archived Webinars—Anytime

In 2010, the Federal Highway Administration Safety Office and the Pedestrian and Bicycle Information Center (PBIC) held a Webinar series intended to help communities address pedestrian safety issues through design and engineering solutions. Modeled after an in-person training course, “Designing for Pedestrian Safety,” the Webinars cover topics ranging from sidewalk design to road diets.

These Webinars were recorded and are now archived online, free to watch by clicking at the links below.

Part 1: Introduction to Pedestrian Safety Design and Planning Principles

Presented by Craig Allred, FHWA, Resource Center Technical Specialist, and Michael Ronkin, Designing Streets for Pedestrians and Bicyclists, LLC.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 2: Sidewalk Design

Presented by Peter Eun, FHWA RC Safety Engineer.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 3: Treatments at Unsignalized Pedestrian Crossings

Presented by Charlie Zegeer, PBIC Director.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 4: Intersection Geometry

Presented by John LaPlante, Director of Traffic Engineering, T.Y. Lin International, Inc., and Keith Sinclair, Acting Assistant Division Administrator, FHWA Connecticut Division.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm



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This Webinar series is meant for engineers, planners, traffic safety and enforcement professionals, health professionals, and elected officials who are seeking ideas and solutions for making changes to the physical environment that improve safety for pedestrians.

Part 5: Signalized Intersections

Presented by Michael Moule, President, Livable Streets, Inc., and Fred Ranck, FHWA Resource Center Safety Design Engineer.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 6: Interchanges and Roundabouts

Presented by Fred Ranck, FHWA Resource Center Safety Design Engineer, and Hillary Isebrands, FHWA Resource Center Safety Specialist.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 7: Road Diets

Presented by Peter Lagerwey, Senior Planner, Toole Design Group.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

Part 8: Pedestrians and Transit

Presented by Dan Nabors, Senior Transportation Engineer, VHB.

Go to: http://www.walkinginfo.org/training/pbic/dps_webinars.cfm

To find out about future pedestrian-related Webinar dates as they are released, visit <http://www.walkinginfo.org/webinars>. ■

Since its inception in 1999, PBIC's mission has been to improve the quality of life in communities through the increase of safe walking and bicycling as a viable means of transportation and physical activity. The Pedestrian and Bicycle Information Center is maintained by the University of North Carolina Highway Safety Research Center with funding from the U.S. Department of Transportation Federal Highway Administration.



Source:

• Designing for Pedestrian Safety Webinars. http://www.walkinginfo.org/training/pbic/dps_webinars.cfm.



WHAT'S NEW

By Lisa Harris

See download / ordering information on next page.

W-Beam Guardrail Repair: A Guide for Local Street and Highway Maintenance Personnel

The purpose of this guide is to provide highway and maintenance personnel with up-to-date information on how to repair damaged W-Beam guardrail. Appendices provide information on the resources (equipment, tools, crew, and time) that will be needed and forms for inspection and maintenance. This guide is an update to a 1990 document of the same name. 54 pages. FHWA 2008.

Maintenance of Drainage Features for Safety: A Guide for Local Street and Highway Maintenance Personnel

This guide was prepared to help local road agency maintenance workers understand the importance of maintaining and upgrading drainage features on their road system. Storm water that stands or ponds on the road surface and shoulders can contribute to crashes. It can cause hydroplaning under water conditions and skidding under icing conditions. Water run-off can deteriorate the shoulder, sideslopes, and reduce the effectiveness of safety hardware (guardrails, sign posts, etc.) This guide identifies typical drainage problems and suggests corrective measures to improve safety. 38 pages. FHWA, 2009.

CALENDAR

Visit our Web site for even more training calendar listings and to register for workshops. Go to <http://www.ksltap.org> and click on "View the LTAP Calendar."

2011 TRAINING:

NEW ROAD SUPERVISOR TRAINING

May 9 – Hays
(This will be a pre-conference workshop before the Kansas County Highway Association's Spring meeting.)

TRAFFIC IMPACT STUDIES ▲M-e

May 11th – Topeka

MUTCD FOR TECHNICIANS (Updated course) ▲T

May 24th – Garden City

ROAD SAFETY ASSESSMENT ▲M-e

September 21 - Pittsburg

TRAFFIC IMPACT STUDIES ▲M-e

September 27 - Wichita

ASSET MANAGEMENT AND COST ACCOUNTING ▲M

September 28 - Wichita

September 29 - Topeka

CONCRETE ROAD MAINTENANCE ▲T

October 11 - Salina

October 13 - Leavenworth

SNOW AND ICE CONTROL ▲T

October 26 - Hays

October 27 - Hutchinson

October 28 - Manhattan

TRAFFIC SIGNAL DESIGN *New Course*

November 2 - Wichita

November 3 - Lawrence

BRIDGE MAINTENANCE

November 9 - Salina

November 10 - Lawrence

LEGAL PERMITTING AND REGULATORY PROCESSES ▲M

2 locations

RISK AND LIABILITY ISSUES ▲T

2 locations

UPCOMING CONFERENCES:

KCHA Spring Meeting

May 9-11 – Hays

APWA Mid-Am Regional Conference

May 18-20 – Overland Park

MINK Regional Local Roads Meeting

Sept. 21-22 – St. Joseph, MO

Become a Kansas Road Scholar!
<http://www.ksroadscholar.org>
Learn • Grow • Excel

For information on calendar items 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 courses are provided by the Kansas Association of Counties. Go to <http://www.kansascounties.org> and click on "Education Program."

▲M-r = KS Road Scholar Program Level 3 — Master Road Scholar required course.

▲M-e = KS Road Scholar Program Level 3 — Master Road Scholar elective course.



LEGAL PERMITTING AND LIABILITY WORKSHOPS COMING

For a public works official, staying out of legal trouble is easier if you do things right and avoid doing things wrong. Two LTAP workshops planned for this fall will focus on these topics. A workshop on legal permitting and regulations will detail federal, state and local requirements related to your profession. The workshop on liability will discuss how to keep your city or county from getting sued and what to do if it happens. Look for more information later this year.



FREE ROAD & BRIDGE RESOURCES

Check off your selections, fill in the bottom portion, and return this form to:
Kansas LTAP Materials Request, 1530 W. 15th St., Room 2160, Lawrence, Kansas 66045 or fax to 785/864-3199



TRAINING GUIDES & REPORTS

You are free to keep these unless otherwise noted.
Or you can download at the links provided.

Kansas Local Road Management Handbook

Described on page 1 of this newsletter.

Sign Retroreflectivity Compliance Dates

See page 12 of this newsletter.

Sign Management Software Survey Results

See article on page 8.

Traffic Monitoring: A Guidebook

See article on page 4.

W-Beam Guardrail Repair

See description on page 14.

Maintenance of Drainage Features for Safety

See description on page 14.

The above resources can be downloaded at: <http://www.ksltap.org> under "What's New" or "Resources to Download."

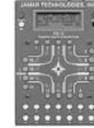
Road and Bridge Tasks in Kansas Laminated Card

Shows which road and bridge related tasks require professional engineering and which do not. April 2007.

request a hard copy

MN Best Practices for Traffic Sign Maintenance/Management

Described on page 3 of this newsletter. Download at <http://www.lrrb.org/PDF/2010RIC10.pdf>.



EQUIPMENT

We offer turning movement counter boards for loan to local highway agencies. Email mgivechi@ku.edu to arrange a loan. There could be a waiting list for these counters.

Turning Movement Counter Board DB-400, Jamar Technologies, Inc.

A basic model for recording turning movements at intersections. The board 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.

Our resource catalog of free reports and training videos is searchable online. Visit <http://www.ksltap.org>. Click on the "Lending Library" to search the catalog.



REQUEST FORM

- send materials indicated address correction add to newsletter mail list send Road Scholar Program brochure
- send 2009 Kansas LTAP Resource Catalog of free training videos and publications add to LTAP email discussion list

Name _____ Phone number _____

Position _____ E-mail address _____

Agency _____

Street Address _____

City _____ State _____ Zip+4 _____

*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.

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Please fax changes to (785) 864-3199 or email Lisa Harris at LHarris@ku.edu.

 **KANSAS LTAP**

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

Kansas LTAP, 1530 W. 15th St. #2160, Lawrence, KS, 66045. Call 785/864-5658 (fax 785/864-3199) <http://www.ksltap.org>

The Kansas Local Technical Assistance Program (LTAP) is an educational, technology transfer and service program of the Kansas University Transportation Center (KUTC), under the umbrella of the KU Transportation Research Institute. Its purpose is to provide information to local government highway departments and their personnel and contractors by translating into understandable terms the latest technologies in the areas of roads, highways and bridges.

The *Kansas LTAP Newsletter* is published quarterly and is free to counties, cities, townships, tribal governments, road districts and others with transportation responsibilities. Editorial decisions are made by Kansas LTAP. 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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