



KANSAS LTAP Newsletter

Summer 2013

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

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Alternatives to Curb and Gutter on Streets: Benefits and Challenges

By Lisa Harris



Seattle Public Utilities

Alternatives can be used instead of curbs, or in combination with them. This project in Seattle combines curbs with rain gardens.



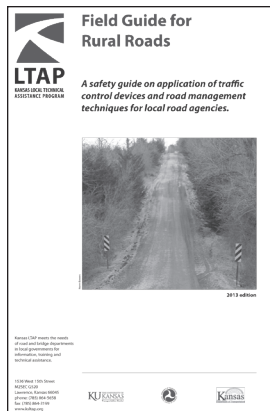
For several communities in Kansas in or near urban areas, Environmental Protection Agency regulations require that water quality best management practices (BMPs) be installed for new developments and re-developments one acre or more in size. Concentrated development in urbanized areas substantially increases impervious areas, such

as city streets, driveways, parking lots, and sidewalks, on which pollutants settle and remain until a storm event washes them into storm drains that discharge to surface waters. Common pollutants include pesticides, fertilizers, oils, salt, trash, debris, and sediment.

BMPs are designed to keep stormwater closer to where it falls, and to prevent pollutants from getting into water bodies.

The EPA's stormwater program, known as NPDES (National Pollutant Discharge Elimination System), has two phases: Phase I for cities with municipal separate storm sewer systems (MS4s) serving a population of 100,000 or more and Phase II. The Phase II, or "small MS4" general permit program, regulates MS4s that generally serve populations less than 100,000 in urbanized areas. Some MS4s

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Get Your Updated Field Guide

Revised guide is 2009 MUTCD compliant and has new a look.

Kansas LTAP's popular rural field guide has been updated. Applicable to all rural roads, paved and unpaved, it now complies with the 2009 MUTCD. The guide has a new cover (at left) and will fit in a glovebox. You can view the publication at <http://www2.ku.edu/~kutc/pdffiles/FieldGuide2013-Final.pdf>. Hard copies are available at Kansas LTAP for \$4.00 each. For Kansas public works and road & bridge agencies, the first copy is free. Turn to page 15 to order.



Alternatives to curb and gutter *Continued from page 1*

located outside urbanized areas may also fall under Phase II if they have, or may have, the potential to negatively impact surface water quality as a result of their discharges.

There are many kinds of BMPs. Some are designed to receive and treat runoff from streets, providing an alternative to traditional curb and gutter.

This article is aimed at local government officials who review site plans for development, whether or not their jurisdiction is an EPA-regulated MS4. Developers may come to you with plans for BMPs, including alternatives to curb and gutter. This article provides some information and perspective from stormwater managers who have seen such projects in their own communities, and things to think about as you consider alternative approaches.

Communities in the Kansas City metro area have been requiring BMPs in developments for many years, to comply with the communities' Phase II permits. (Lenexa was the first city in Johnson County to hold a NPDES permit.) Some of the BMPs built have been alternatives to curb and gutter.

We spoke with Rob Beilfuss, water quality specialist, City of Olathe, about the use of curb and gutter alternatives in the Kansas City area, their benefits and challenges, and the future of storm water management in urban and suburban areas. Beilfuss was storm water manager in Lenexa for many years and now holds that position in Olathe. We also spoke with Scott Lindebak, stormwater program manager in Wichita, about some experiences in their city with green roadside infrastructure.

What are some common stormwater BMPs?

Stormwater BMPs include **swales, detention basins, permeable pavement and pavers, stormwater planters, and catchment systems**, to name a few common types.

Curb and gutter and BMPs can be used on the same project. Olathe has a policy that allows curb to be removed for impervious areas that drain directly to BMPs.

Advantages and challenges for using curb and gutter alternatives

Advantages

- Help meet EPA regulations for controlling solids in storm water
- Help mitigate flooding by spreading out storm flow
- Can be attractive green spaces if well designed
- Some designs are less expensive to install than curb and gutter

Challenges

- Maintenance time and costs—short term and long term
- Public acceptance
- Lack of control of how property owners maintain the BMPs

Why consider streetside BMPs?

First, a principal reason for a city to consider streetside BMPs in site plans is that they help meet the water quality goals of the NPDES, Beilfuss said.

Other advantages of green alternatives to curb and gutter are:

—*Convenience.* Areas along roadways are convenient places to put BMPs. The city owns the right-of-way, and work crews can get to them.

—*Flood control.* BMPs can help mitigate downstream flooding by spreading out storm flow.

—*Aesthetics.* BMPs can be attractive green spaces if well designed.

—*Costs.* Beilfuss said BMPs can be more cost effective in the long run than ditches for flood control. He said ditches tend to erode and compromise the roadbed. Some green designs may be less expensive to install than curb and gutter.

Not all streetside BMPs are green

In an urban area where developable space is limited, using a nonvegetated “proprietary” BMP may make sense, such as CDS® Unit. A proprietary BMP is designed so that storm water runs into an underground chamber that is cleaned out periodically. Proprietary systems are effective at removing trash, oil and grease, and total suspended solids, which are common roadway pollutants. They can be placed under the ROW, so they don't take up a lot of space. Green BMPs, such as swales and bio-retention cells work well too, but they can be more labor-intensive to maintain.

Maintenance issues

Any drainage system, including curb and gutter, is dependent on routine maintenance for effective operation. For water quality BMPs, both Beilfuss and Lindebak advise cities to understand the maintenance considerations before approving these structures.

Primary maintenance considerations include:

Trash. Trash removal is a consideration for any roadside BMP. Proprietary systems collect trash in an underground chamber, which can easily be removed with a vac truck every few months, depending on the pollutant load. Trash also collects in green BMPs. Trash scattered among native plantings can be unsightly and depending on the public view, the BMPs may need to be maintained frequently.

Establishing native plants. This is a short-term but intensive maintenance



Proprietary systems with catch basins are excellent at collecting and trapping trash and debris.





Good resources on stormwater quality management

National Menu of Stormwater Best Management Practices. This EPA website provides links to recommended practices in the NPDES-related areas of public education, public involvement, pollution identification and control, and construction BMPs. The page also contains links to guidance for complying with EPA regulations and a host of stormwater case studies from different cities. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Manual of Best Management Practices for Stormwater Quality, 2012 Edition, by the MidAmerica Regional Council (MARC) and APWA. This manual is the Kansas City area's local design manual. It takes into account the area's clay soils and other local conditions. The manual includes design standards for developing post-construction BMPs. Most cities in the Kansas City area have adopted the MARC-APWA manual by reference in their code. Olathe has adopted the manual as guidance, to allow more flexibility. http://marc.org/environment/Water/bmp_manual.htm. MARC has an excellent general website on stormwater as well, at <http://www.marc.org/Environment/Water/index.htm>

Kansas Department of Health and Environment. Beilfuss recommends carefully reading the Kansas stormwater permit that applies to your jurisdiction, if any. <http://www.kdheks.gov/muni/ms4.htm>. Rance Walker at KDHE is a good contact for stormwater questions -- (785) 296-5537.

Websites from other cities. Public outreach and education is a requirement in Kansas stormwater permits, and most Phase I and II cities have extensive stormwater webpages. These are excellent resources for communities that are being pulled into the program as their populations meet the Phase II criteria. (Gardner, KS, is one recent example.) Such communities need to adopt development codes that require stormwater BMPs, and some are learning from scratch.

Richard Basore. Basore is a KCHA watershed field coordinator. He maintains a list of interested stakeholders and sends regular email messages to them as he hears about new and interesting developments in stormwater issues. To be added to list, email Basore at rbasore@kdheks.gov.

Sources of training and mentoring

National conferences and expos. There are a lot of stormwater conferences out there with workshops, training sessions, and vendors with latest BMP technologies. You can find some by searching on the internet for "national storm water conference."

Certifications. Resources for certification are the National Certification for Stormwater, an AWWA training track on stormwater, and Enviro-cert International.

Peer groups. There are a few informal groups in Kansas that get together to share storm water information. In Kansas, a group called the "Clean 13" meets regularly to talk about BMP issues. Some of the member cities are Hutchinson, Wichita and Topeka. Call Rance Walker at (785) 296-5537 for more information about this group.

Johnson County's Stormwater Program meets on a regular basis. The county coordinates with the cities on BMP-related issues. Lee Kellenberger, Johnson County's stormwater program coordinator, is the contact for this.

MARC's water quality public education committee meets regularly. Anyone is welcome. Learn more at <http://www.marc.org/Environment/Water/index.htm>.

issue. There is no "instant native grass." It takes several years to establish deep roots. The plants must be nurtured until they reach full stand. They need regular watering, and a cover crop is usually recommended (like winter wheat) to protect the native plants that will be

barely visible above the ground in the first year while they are establishing their root systems.

Weeding is also needed, and it takes a trained person to tell the difference between a weed and a native plant. Beilfuss said there has been a shortage of

expertise in establishing native plants in Kansas, but that is changing.

Maintaining established plants.

Control of weeds and cedar trees can be accomplished with controlled burns. Lenexa crews are trained in prescribed burning and they burn native areas as needed (usually every 2 to 3 years).

Native grasses are green and growing in the heat of summer, but the biomass browns up and the plant is dormant in the cool seasons. The brown/dry biomass can be a fire hazard if located too close to buildings. Many cities mow native plants in the fall to show the public that the area is being maintained; this also reduces fire hazard.

Sediment removal. As drainage basins collect solids over time, they will need to be dredged and cleaned.

Responsibility for maintenance.

After a BMP or drainage ditch is installed, it is often the responsibility an individual property owner or homeowner's association (HOA) to maintain it.

An HOA typically does not know how to maintain ditches and BMPs. The HOA may not set aside funding for maintenance and overhauls of the BMPs that are needed over time.

Most BMP standards say that maintenance of the BMP is the responsibility of the property owner, but an enforcement mechanism is needed. Olathe inspects BMPs every two years and sends out a notice of violation if a property owner is not doing proper maintenance.

Public buy-in. A significant factor in successful long-term maintenance of green infrastructure, and one that might not come immediately to mind, is public acceptance. Green infrastructure is more likely to be maintained when the people see it as an amenity who live by it or have BMPs on their properties.

One issue with buy-in is public acceptance of native plants. Sometimes the public may perceive a stand of native plants as an "un-maintained" area or "weed patch." It's important to educate the public on the use and value of native plants, Beilfuss said.

Olathe works with development consultants and their landscape architects to ensure that aesthetics are considered in

Continued on next page



Alternatives to curb and gutter *Continued from page 3*

their designs. The city promotes planting natives in groupings, with staggered heights, to show the public that the area has been “landscaped” with natives.

Another issue with public acceptance is mowing. In the Kansas City and Wichita areas, residents want to mow their fescue right down to the edge of the street. Roadside ditches can't be mowed when they are wet. Sometimes residents want to fill in the ditches in front of their homes. (See Wichita's experience with

this in the sidebar on page 9.)

Building buy-in

Providing public input and public education are requirements of a city's NPDES permit. The EPA has some good resources on its website for both of these activities. (See the first resources in the sidebar on page 3).

Specific populations can be identified for targeted educational activities. For example, cities in Johnson County give

presentations to school kids so that they will understand what a watershed is and how a property impacts someone downstream. Cities in the Kansas City area also proactively reach out to HOAs and routinely respond to questions from homeowners and HOAs about how to maintain BMPs.

Future of stormwater management

National water quality standards
Continued on page 9

Railroad Crossing Maintenance: Who's Responsible for What?

By Matthew Barnett and Norm Bowers

Local governments maintain roads, railroad companies maintain railbeds, but who maintains the crossings in the railroad's right-of-way? The railroad and local government agency usually each have some responsibility for that. It depends on what type of maintenance needs to be done and any agreement your agency has made with the railroad. This article contains information you need to know to avoid safety and liability problems for your city, county or township.

Types of maintenance and who is responsible

Paving/surfacing. When rails cross a local road in Kansas, the railroad is responsible for surfacing the roadway within 24 inches of the outside rail, according to Kansas Statute K.S.A. 66-227. If the railroad crosses a paved road, the railroad must pave their portion of the crossing as well.

The law is silent, however, on who is responsible for the approach-road surface from the railroad right of way (ROW) line to 2 ft from the rail. Railroads have generally taken the position that the surface of the road is the responsibility of the local agency that maintains the road. By tradition, local road authorities usually do maintain the roadway surface approaching the tracks even though the road is located on railroad right-of-way.

Drainage. K.S.A. 66-227 states that the railroad is responsible for grading, bridges, ditches and culverts within their ROW that may be necessary to make a safe crossing.

Vegetation management. Mitch Sothers, coordinating engineer with KDOT's Bureau of Design, says sight obstructions within the railroad's ROW are the railroad's responsibility. For example, if vegetation



New Federal Rule: Regulatory Sign on the Crossbuck

The 2009 MUTCD has a new rule that requires a YIELD or STOP sign to be added to the crossbuck on all public crossings without active warning signals. The MUTCD established a target compliance date of December 31, 2019 or when adjustments are made to the individual grade crossing and/or corridor, whichever occurs first, for implementing the new rule.

The YIELD sign is the default sign. A STOP sign should only be used where an engineering study indicates it is warranted based on such conditions as poor site distance, approach roadway grades and speed of the trains.

The MUTCD does not state whether the railroad or public agency is responsible for installation and maintenance of the YIELD or STOP sign on a crossbuck. Norm Bowers, Local Road Engineer with the Kansas Association of Counties (KAC), says that most counties consider these signs as part of the crossbuck assembly and believes it is the railroad's responsibility to install and maintain these YIELD or STOP signs.

<http://www.shutterstock.com>



in the railroad ROW is blocking a crossbuck sign, the railroad would be responsible for controlling that vegetation.

Clearing debris and snow. If something falls on the roadway at the rail crossing, Sothers said there is a mutual responsibility to clear the tracks while taking care not to foul or damage the track. “Think about snow removal,” he said. “The road authority doesn’t just clear the snow up to the railroad right-of-way.”

Signing and signals. State law (K.S.A. 66-2,121) and the federal MUTCD (*Manual on Uniform Traffic Control Devices*) require the railroad to install and maintain, at minimum, a crossbuck. Active warning signals are also property of the railroad and are maintained by the railroad.

A new federal regulation requires a YIELD or STOP sign to be installed onto a crossbuck. See the sidebar on page 4.

At active signals, most railroads have an emergency notification sign, which is their responsibility to install and maintain. The sign has the emergency phone number as well as the crossing number. This emergency number can be used when the signals are malfunctioning or there is some other type of emergency.

Advance pavement markings and signing are almost always the responsibility of the local road agency. Usually the signing consists of an railroad advance warning sign (W10 series), and pavement markings on paved roads. When a YIELD or STOP sign is installed on the crossbuck, a YIELD AHEAD or STOP AHEAD sign may be needed if there is poor sight distance approaching the crossing. Details about advance warning signs and pavement markings are in Part 8 of the MUTCD: Section 8B.27 for signs and Section 8B.06 for pavement markings.

The local roadway authority should contact the railroad before doing any approach work on railroad property.

A few more thoughts

Federal Railroad Administration (FRA) Regulations:

FRA regulations require safety training for workers that work within 25 feet of a live track. That is a safety regulation that is enforced by federal regulators on railroad companies, and may not apply to road workers. To comply with FRA regulations, the railroad will normally want to provide a trained flagger when road work is within 25 ft of a track.

Trespass: There is a state railroad trespass law (K.S.A. 21-5809) that applies to railroad property. The law exempts public and private crossings, but could apply to work done by a local agency away from the crossing, i.e. trimming trees along the tracks.

Coordination With the Railroads

Coordination with the railroad does not have to be burdensome, said KDOT’s Mitch Sothers. “Both parties are going to have to be willing to communicate, coordinate and compromise,” he said.

These partnerships are part of providing good service to your community. Sothers said he’s seen situations where the personalities of individuals can either promote effective partnerships or cause them to falter. “It is going to take working together on successful projects and acknowledging each other’s contributions,” Sothers said. He recommends taking time to meet in person with rail company representatives periodically to establish and maintain good working relationships.

KAC’s Norm Bowers said that sometimes it is difficult to find the right person at the railroad to notify about maintenance work. To assist with this, he has posted contact names for the Union Pacific and the Burlington Northern on the Kansas County Highway Association website at <http://www.kansascountyhighway.org/DocumentCenterii.aspx>.

Notice prior to doing maintenance: The local roadway authority should contact the railroad before doing any approach work on railroad property. While it may not be a violation of laws or regulations when working on the approach, the railroad is rightfully concerned about any work on their right-of-way. With or without flagging, it is a good policy to move workers and equipment off the railroad right-of-way when a train approaches. Ultimately, it is in everyone’s interest to cooperate while working on railroad property. An injury, fatality, or causing a train to stop is something that no one wants.

Short tracks. Most railways are owned and maintained by a railroad company, but some municipalities own short tracks, in which case those municipalities are responsible for every crossing along the short track, and its components.

In sum

It’s important that counties, cities and townships work with the railroad companies to keep all crossings well maintained throughout the year. Well maintained crossings and railways help limit the possibility of crashes and liability. See the sidebar on this page for advice on working together with railroad companies.

For more information, contact Mitch Sothers at KDOT at (785) 296-3529 and visit the KCHA webpage mentioned in the sidebar above. ■

Sources:

- “Workin’ on the Railroad.” Maine Department of Transportation. www.maine.gov/mdot/community-programs/csd/railroad.php
- Mitch Sothers. Interview. March 8, 2010.
- Manual on Uniform Traffic Control Devices (MUTCD) with Revisions 1 and 2. 2009 edition. http://mutcd.fhwa.dot.gov/kno_2009r1r2.htm.
- Kansas Statutes Annotated 66-227. http://www.kslegislature.org/li/b2013_14/statute/





The Economics of Closing a Low-Volume Bridge

By Lisa Harris

[Earlier this year, a K-TRAN research report was published on the economics of closing a structurally deficient low volume rural bridge. This article will describe the main points of the article and provide some responses to the report from around the state. Much of this article is excerpted from the report.]

As Kansas bridges age on low-volume roadways, the cost of repairing or replacing a structurally deficient bridge can be a serious hardship for any local government. A KDOT-sponsored research project has produced some numbers that may be useful in deciding whether to close a bridge. The project investigated the economics of closing a structurally deficient low volume bridge by quantifying driver detour length and vehicle operating costs if a bridge were closed, and comparing those with the cost of replacing the bridge.

Locations of structurally deficient bridges on rural low-volume roads were provided by KDOT, and their respective detour lengths were determined. It was found that 648 of the 992 structurally deficient bridges studied would have a detour length of two miles or less if closed.

Many assumptions were made by the research team and KDOT, including vehicle operation costs and bridge replacement cost, with known data limitations. For this project it was assumed the structurally deficient bridge is located on a two-wheel path secondary roadway where the ADT is 25 vehicles or less. Conservative values for vehicle operating costs for a passenger car and a large-truck were determined to be \$0.60 and \$1.00 per mile, respectively. It was also assumed that an 80/20 split between passenger cars and large trucks existed for each bridge's ADT. The research team assumed the 80/20 split would account for seasonal changes when planting and harvest occurred.

Bridge replacement cost (including

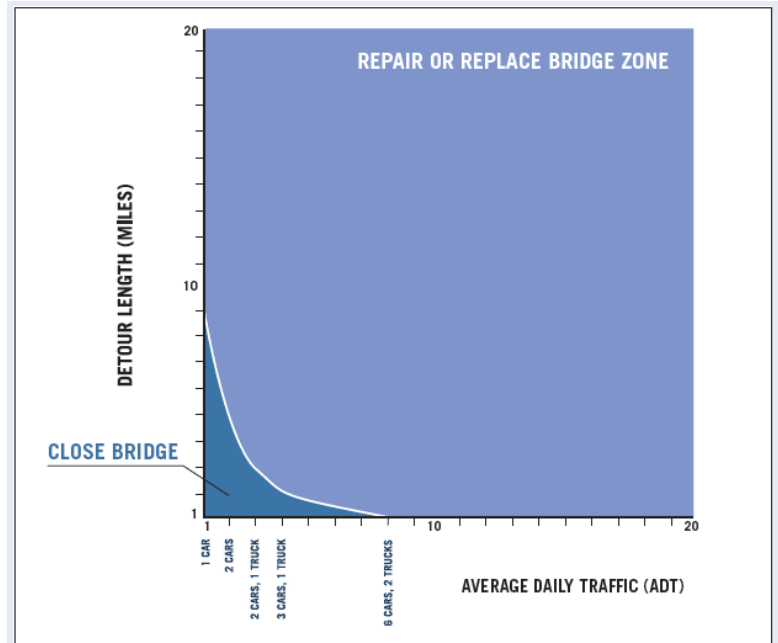


FIGURE 3. DETERMINING BRIDGE CLOSURE / REPAIR / REPLACE BASED ON ADT AND DETOUR LENGTH

K-TRAN report

a bridge's annual maintenance and periodic inspections) was estimated at \$150,000 with a 75 year life-span. Most of the bridges in the study were steel.

The researchers developed a graph (see the research report's Figure 3, above) that shows when a bridge might be closed or repaired, based on ADT, vehicle types, and detour length. The researchers expected to see a large number of bridges in the "close bridge" category, but the result was just the opposite. The study stated instead, that "in order to justify closing a bridge, the number of vehicles traveling daily on such a bridge needs to be very low with a short expected driver detour."

One of report's authors, Tom Mulinazzi, explained that the costs of a detour add up fast: "If you multiply the number of miles of the detour by the operating costs for the vehicles expected to travel on those detours, and you multiply that out over a number of years, that all adds up pretty quickly."

Analysis and driver detour length determination

With an assumption that a vehicle could safely detour around any of the identified structurally deficient bridges, the research team investigated the length of the shortest driver detour around each of them. To determine the shortest driver detour length, the structurally deficient bridge was identified on Google Earth, adjacent private properties were investigated to ensure farmsteads would not be landlocked if the bridge were to be closed, and the researchers determined that there was a safe detour route on a two/three wheel-path gravel road or paved road.

The driver detour length was assumed to be the length a vehicle had to travel out of its way to get to the nearest intersection after the closed bridge. For example, if a closed bridge was located on one side of a one-mile grid, a driver detour length of two miles was recorded since the vehicle would have to travel one mile anyway to get to that intersection if

Sources:

- Mulinazzi, Thomas, Schrock, Steven, Fitzsimmons, Eric. The Economics of Closing Low Volume Rural Bridges. Kansas Department of Transportation. K-TRAN report. February 2013. http://www.ksdot.org/PDF_files/KS-13-1_Final.pdf
- Interviews: T. Mulinazzi 6-10-13; N. Bowers 6-19-13; P. Evans 6-20-13; P. Nusser 6-28-13; N. Cable 6-28-13.



the bridge stayed open.

Six of the bridges had a driver detour length of over 11 miles. The researchers stated that, based on the driver detour length alone, these bridges would be excellent structures to be considered for repair or replacement.

Knowing the price of replacing the bridge, the driver detour length, and vehicle operational costs, the researchers developed Figure 3 (shown on previous page). A relationship was developed between driver detour length and ADT on the road on which the structurally deficient bridge was located. The vehicle operating cost and detour length were then computed and compared to the bridge replacement cost.

The researchers concluded that the cost of operating a vehicle around a

detour due to a bridge closure is much higher than the cost of replacing a bridge—however, if there is very low ADT and a detour less than 9 miles, justification could be made to close the bridge based on vehicle operating costs.

How to use the report

The researchers suggested that local highway agencies work with their elected officials to determine an economical plan to close or repair a rural bridge while considering the safety of drivers. They consider this report as “one tool in the toolbox” for these discussions, Mulinazzi said.

Another tool mentioned in the report is a companion study titled, “The Economics of Potential Reduction of the Rural Road System in Kansas,” that

provides considerations for discussion between commissioners and engineers in determining if a rural county network of roads and bridges could obtain a cost benefit from being reduced.

This K-TRAN bridge closure study has understandably generated some discussion among Kansas local road officials. The report’s Figure 3 is especially controversial as it suggests that detour-caused vehicle operating costs should be directly compared against the cost to the government in tax dollars for repairing or replacing a bridge. This assumption points to many more bridges being in the “repair or replace bridge zone” than there are funds to repair or replace them. The comments below will address this point and others.

Read the research report for yourself at the link shown under the Sources on page 6. ■

The Kansas DOT defines a bridge as structurally deficient if an inspector determines the bridge deck, superstructure, substructure, culverts and retaining walls are not able to support today’s federal legal loads.

Responses to the Bridge Closing Report

Norm Bowers, Kansas Association of Counties. From his bi-weekly email report: I think it is useful to know that rural residents incur a significant cost to detour around a closed bridge, but there is a bigger issue to consider. The issue we have at the county level is that the entire county pays for the bridge, not just the rural residents that use a bridge. The city residents are taxed for county road and bridge maintenance and construction, and get very little direct benefit. Most rural counties depend on agriculture, which uses the rural roads. The commissioners have to decide the fair funding level for bridge replacements and the county road system in general.

Our current bridge replacement rate in Kansas is about half of what is required to maintain the 20,000 county bridges, so in the long term, if we don’t increase funding we will have to close half the bridges. Fewer bridges will result in longer trips and more cost for rural residents; the other option is higher taxes for everyone. I am glad I am not a commissioner making those hard decisions.

Penny Evans, Sedgwick County Bridge Engineer. I would consider this report in the decision-making process to close a bridge, but would probably not give it much weight. There are so many items to consider in the decision to close a bridge. Most bridges I have “closed without replacement” had alternate access. Some of the reasons I have considered in not replacing a bridge are: 1) Alternate access is available from both sides of the bridge; 2) The farmer/rancher has created a low water crossing next to the bridge because the bridge has limited load capacity; 3) No residences have sole access via this bridge; 4) The bridge is not capable of carrying agricultural loads (very narrow or low load posting) and is not currently being used for agricultural purposes; 5) The road on the other side is minimum maintenance / impassable during wet weather, but accessible from other routes during dry weather; 6) Four residences take access over the bridge (LWC), but the replacement will cost \$600,000, and the bridge has been there longer than the houses; 7) Commissioners have prioritized replacing the bridge above other projects—find the money!

Phillip Nusser, Stafford County Road Supervisor. I would think that you would have to consider a lot more factors than just vehicle counts in keeping a bridge open. These small traffic numbers can be skewed very easily with a farming operation that generates much of their own traffic but yet only serves one constituent. Even a larger number, say 20 ADT, is not a very good ratio when it comes to getting the biggest bang for buck in these times when everyone has been asked to do more with less. Shouldn’t the numbers be closer to what we use when we consider paving a road or keeping it gravel?

As for using the report, it would be something to consider, but in the long run I don’t really feel it would carry much weight.

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Responses to the bridge closing report *Continued from page 7*

Neil Cable, Saline County Engineer. The research team that undertook the study of the topic of the economic impact of closing low-volume rural bridges is to be commended for their efforts on this important topic. While the many assumptions upon which the report is based can be debated, nonetheless the study provides good information and is thought provoking. I do believe sensitivity studies of the study assumptions would be beneficial and make the study more robust.

There are other important factors in making the decision to close, repair, or replace a given bridge which are not explicitly addressed in the report, some of which will be touched on in my comments:

- Important findings in the study are relatively consistent with our experience in Saline County. More than three dozen bridges have been closed over the last several years in Saline County with no plans (or financial resources) to reopen them.

- The study indicates that in almost 2/3 of the cases studied (648 of 992), driver detours are two miles or less as the result of a closed bridge. This is true for Saline County in virtually all cases.

- The report's Figure 3 illustrates the relationship between average daily traffic and detour length and the decision to close or repair/replace a bridge. The average daily traffic on the bridges closed in Saline County was low, generally on the order of 10 to 15 vehicles per day. These vehicles were theoretically all cars, since the bridges were all load-posted and not legally usable by trucks. (In reality, trucks continued to use these bridges and that is another motivating factor in closing bridges having low load capacities.) This number of vehicles is at or just above the curve in Figure 3, hence the importance of sensitivity studies of the variables.

I do have one criticism regarding Figure 3. Extending the horizontal and vertical axes of Figure 3 beyond 10 in each direction unnecessarily dramatizes the "Repair or Replace Bridge Zone" of the figure and makes it appear that most low-volume bridges should be kept open. Why did the research team stop at 20 on each axis? Think how much more dramatic it would be if they had extended these axes out to 1,000! Dramatic but meaningless just as it is to extend the axes beyond 10. Most crucial decisions are in the low traffic volume, low detour length arena. It did not require a study, and goes virtually without saying, that long detours are not practical nor are they politically acceptable.

- One very important factor not explicitly addressed in the report is who pays the respective costs. Well over 99 percent of the cost to repair or replace a bridge in Saline County is borne by taxpayers who will never use the bridge. The dollars taken from these people are precious to them and to us who are entrusted to use those dollars wisely and get the most good for the most people from every cent. As stewards of those dollars we know we cannot satisfy all wants, so we do our best to satisfy all needs.

"Wants" versus "needs" is an important distinction. People elect to live in remote areas. Arguably, not even farmers in this day and age need to live where they farm. In Saline County, as is the case elsewhere, many farmers work ground many miles from where they live. While we are obligated to enable people living in remote areas to be able to get home, society simply cannot afford to get them home as the crow flies. Driving a mile or two out of the shortest route possible is simply the price one must pay for living in a relatively remote area. Most people accept that cost.

The acceptance by the general public of what we had to do here in Saline County—closing bridges we could not afford to replace—is testimony to the fact that people are willing to do their share to keep taxes under control. We are in a much healthier position financially here in Saline County because of the decisions we made and are well along with replacing bridges and box culverts on essential routes that crisscross the county. ■



"One very important factor not explicitly addressed in the report is who pays the respective costs. ... The acceptance by the general public [for closing bridges in Saline county] is testimony to the fact that people are willing to do their share to keep taxes under control." —Neil Cable





Alternatives to curb and gutter *Continued from page 4*

appear here to stay (in fact, they are likely strengthen). NPDES Phase II requirements mandated general water quality protection measures for municipalities. In the future, stormwater programs will likely target their activities to priority watersheds (TMDL water bodies), Beilfuss said. TMDLs, or total maximum daily loads, are the maximum amount of a specific pollutant that can be assimilated by a water body without degrading the quality of the water such that it does not meet current water quality standards. Communities will need to develop a plan to restore and protect waterways that have high TMDLs.

New EPA regulations may also be on the horizon. Currently the EPA targets new developments and redevelopments. Beilfuss said the EPA has discussed modifying the stormwater rule to include retrofitting built-out areas with BMPs. Retrofitting BMPs can be costly in built-out areas due to lack of available space. It may be necessary to remove an existing impervious area or building in order to build a BMP.

Due to the cost burden on development, this proposed requirement may not ever come to fruition, Beilfuss said. If it does, municipalities will have to work closely with existing developments to identify cost-effective BMP retrofits. One example of a cost-effective solution would be installing little BMPs tucked along a curb and gutter street rather than a whole new system. An example of this is in Kansas City, MO, where the city has retrofit some bump-outs along a street to route stormwater into green infrastructure along the roadside.

Work with your developers

Traditionally, stormwater systems were designed for flood control. Water quality considerations are relatively new. Sometimes developers use consultants who don't understand the value of using treatment trains (a series of complementary BMPs), Beilfuss said. Consultants may pick the most expensive and maintenance intensive BMP, when there are other more cost effective options out there. The ability of the future

Wichita's experience with green infrastructure

Wichita's street standard is curb and gutter. Scott Lindebak, the city's stormwater division manager, says that the city promotes using alternatives to curb and gutter, but the message is not getting traction. He said that's probably because two Wichita developments that tried alternatives have received complaints from residents.

Both were built over a decade ago and have ditches on residential lots that drain to a detention basin. In each case, some residents have filled in their ditches, either to allow for easier mowing or to provide off-street parking adjacent to the road. Some residents installed pipe for drainage, but there was no consistency in pipe size from house to house. That makes it difficult to maintain those pipes.

Lindebak said that the projects were not intended to address water quality; they were something new, something different, and were likely proposed by the developer for cost savings. In the end, the HOAs did not maintain control of the drainage process and also did not maintain the drainage basin effectively.

"Many homeowners end up filling in the ditches and the city loses control of managing the drainage," Lindebak said.

To create an aesthetically pleasing detention basin in the Wichita area, Lindebak said it needs to be 10 ft deep or so, receiving drainage from 10-20 acres. During dry spells, water may need to be added to it from a well.

Lindebak said that developers, HOAs and home buyers need to completely embrace the concept and the maintenance costs involved for streetside BMPs to be successful.

Lindebak thinks that Wichita will continue to have an urban standard of curb and gutter and will use other kinds of BMPs in developments to meet EPA requirements for water quality.

property owner to maintain needs to be considered as well.

When reviewing site plans, it's important to understand how the methodology works for choosing a BMP, so that possible alternatives can be considered, if needed.

Once the site plan is complete and construction is under way, construction of the drainage structures should be monitored. Olathe requires a stormwater permit and performance bonds for any development installing BMPs. Through the permitting process, the city establishes an inspection schedule to ensure proper installation.

Conclusion

We hope this article has shed some light on the advantages and challenges of BMPs, especially those that are alternatives to curb and gutter and—and will help you get started if your community reviews plans that include them. As seen here, different communities can have different experiences and perspectives, and it's important to carefully think through these kinds of projects.

Check out the stormwater resources in the sidebar on page 3. Those are just a few examples of helpful resources available to you. ■



Sources:

- Interviews: Rob Beilfuss on 8-1-13; Scott Lindebak on 7-15-13.
- KDHE Municipal Stormwater Program website: <http://www.kdheks.gov/muni/ms4.htm>
- Eliminating Curbs and Gutters. EPA NPDES fact sheet. Accessed 8-5-13. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=88&minmeasure=5>



KDOT Korner

Research Examines Safety Benefits of Shoulder Improvements

Study on two-lane roads on the state system is applicable to local roads as well.

By Lisa Harris

A recent research project sponsored by KDOT examined the safety effectiveness of shoulder improvements for two lane highways on the state system. This article will describe the research findings for fatal and injury crashes. We'll also provide more information on the tools used in the study to calculate safety effectiveness, called "crash modification factors" or CMFs.

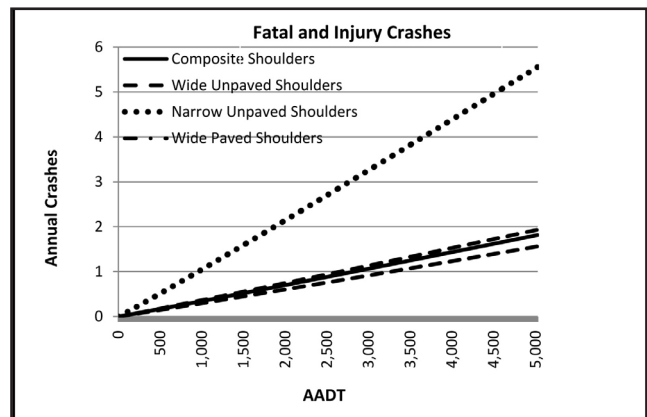
The research

In this study, University of Kansas researchers focused on shoulder width and surface type in looking at the safety benefits of three types of improvements to narrow (less than 5 ft) unpaved shoulders. The three improvement types are:

- composite shoulders, which have more than one surface type—usually a 3ft wide section of paved shoulder adjacent to a turf or gravel outside section
- wide unpaved shoulders
- wide paved shoulders

CMFs, or crash modification factors (see sidebar below) were developed and used to calculate the expected number of crashes after a narrow unpaved shoulder would be upgraded to each of the three treatments.

The figure at right shows the results of the CMF calculations for expected fatal and injury crashes. The dotted line, depicting narrow unpaved shoulders, shows a greater likelihood of serious crashes. The three treatments each show a clear reduction in the likelihood of serious crashes. For example, upgrading to composite shoulders (the solid line in the figure) can reduce



This figure from the research report shows expected annual fatal and injury crashes versus annual average daily traffic for narrow unpaved shoulders and three types of shoulder improvements. Narrow unpaved shoulders show the highest potential for crashes. The three types of improvements show similar crash reduction benefits.



fatal and injury crashes by 31 percent. Paved wide shoulders showed slightly more safety benefit than that, and wide unpaved shoulders showed slightly less safety benefit than that. But overall, the results are very similar for the three improvement options, especially for low AADTs.

Regarding paving shoulders, the researchers noted that the safety benefits of incremental increases in paved shoulder widths have been studied and are discussed in the *Highway Safety Manual*. While any increase in paved shoulder width is beneficial, studies suggest that safety gains appear to be higher

*See our previous article on the Highway Safety Manual in our Winter 2011 issue, page 6. <http://www2.ku.edu/~kutc/pdf/files/2011LTAP-Winter.pdf>

More on Crash Modification Factors

An important aspect of this research was to apply AASHTO's *Highway Safety Manual* (HSM) to crash analysis on the Kansas highway system. The HSM can help transportation agencies better understand the trade-offs of safety and cost when making safety improvements. The HSM contains tools and methodologies for consideration of safety across all phases of project development, from planning through operations and maintenance, and includes using crash modification factors.

A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given treatment at a specific site. Results of CMF calculations for different treatments can be compared to identify those with the greatest expected safety benefit. The HSM contains CMFs for a variety of shoulder treatments. However, not all shoulder treatment types are listed in the HSM, including the type of composite shoulders typically built by KDOT. The researchers had to create customized CMFs for those.

CMFs are one tool for choosing a shoulder treatment. Other things to consider are prevalent vehicle types, the presence of bicyclists, long-term sustainability, construction cost, and expected operations and maintenance. For more information on using CMFs, visit FHWA's Crash Modification Factor Clearinghouse at <http://www.cmfclearinghouse.org/>.



The researchers concluded that an agency may obtain greater system-wide safety benefits from paving longer segments with a narrower shoulder strip as part of a composite shoulder, rather than paving shorter segments with a wide shoulder.

for the initial increases in width. The researchers concluded that an agency may obtain greater system-wide safety benefits from paving longer roadway segments with a narrower shoulder strip as part of a composite shoulder, rather than paving shorter roadway segments with fully paved wide shoulders.

An interesting side note from the research: If your unpaved shoulders are already wide (more than 5 ft), improving the shoulder to a composite shoulder is not predicted to improve safety and may even increase the likelihood of crashes. The researchers believe more study is needed on this finding.

Suggestions for future studies

The research focused on the variables the researchers believed to be most essential for safety at shoulders, that is, surface type and width. However, they acknowledged that many other factors could impact crash risk, including the existence of an edge line, whether the pavement has a tapered edge treatment, lighting, time of day, heavy vehicle percentage, the existence of rumble strips, and roadside hazard rating. The researchers stated that the

analysis would be improved if more variables would be included in future research, and if the sample size were increased.

In sum

When it comes to shoulder safety, in general, paved is best, and wider is better. But when it comes to affordability, wide paved shoulders may not be an option. Two almost-as-effective and more affordable options for improving narrow, unpaved shoulders are 1) widening the shoulders and keeping them unpaved, or 2) widening them and paving a 3-ft strip of the shoulder to create a composite shoulder. The composite shoulder option is just slightly better in terms of safety.

The researchers stated that more study is needed on improving unpaved shoulders. That seems especially important if you also need to consider bicycle safety, an aspect the researchers did not specifically address in this study. AASHTO's *Guide for the Development of Bicycle Facilities* (2012) states that paved shoulder widths should increase with higher levels of bicycle usage, vehicle speeds above 50 mph, or a higher percentage of bus or truck traffic.

The researchers stated their methodology improves upon the methodology in the HSM in that it provides more realistic crash modification factor (CMF) values for local agencies. They recommend that local agencies apply these values to the crash prediction models in the *Highway Safety Manual* to develop more accurate safety estimations for their own rural two-lane roads.

To read the complete study, see the link at the Source below. ■

Source:

- Zeng, Huanghui, Schrock, Steven, Mulinazzi, Thomas. (2013) Evaluation of Safety Effectiveness of Composite Shoulders, Wide Unpaved Shoulders, and Wide Paved Shoulders in Kansas. Kansas Department of Transportation K-TRAN report KU-11-1. This K-TRAN report can be accessed at http://www.ksdot.org/PDF_files/KU-11-1_Final.pdf.

Sign Retroreflectivity Assessment Highlight #3

By Lisa Harris

[This is our third highlight on methods local road agencies are using to measure and document the retroreflectivity of their regulatory signs before the federal deadline of June 13, 2014. We highlighted Miami County in Spring 2010 and the City of Burlington in Winter 2013. Here we highlight Lyon County's method that combines the use of a retroreflectometer and simple software.]

Lyon County, Kansas, has been measuring sign retroreflectivity with a retroreflectometer the past 10 years or so, but they more recently upgraded to a TAPCO GR3 model. TAPCO configured the instrument to make it compatible with Simple Signs software, and the result is an efficient way to get information into

the county's sign database.

Eldon Jones, sign foreman, said the retroreflectometer has the ability to determine the GPS coordinates of a sign as well as measure its retroreflectivity.

"It nails down the GPS and it goes right into the database," he said.

The database includes basic information the county needs for each sign, such as sign ID, type of sign, type of sheeting, blank and post, date last maintained, date retroreflectivity was recorded, and condition of the sign. The database also includes a photograph for each sign taken with a



digital camera.

Jones has a crew of one (himself) for recording all the county's signs, and two additional crew members for sign maintenance. So far he's up to 6,600 of the 10,000 or so signs in the county. He fits in the retroreflectivity work when he can, around his other foreman duties.

"Sometimes it might go a week or so before I can get back to it," he said. "But it's going along OK."

Jones said their system is working very well for Lyon County, and it is "truly simple." For questions, call Jones at (620) 343-5477. ■



Considerations for Restoring Historic Bridges

By Aliza Chudnow

A historic bridge paints a picture of what life was like in the past. Many older bridges in Kansas are listed on national, state or local historic registers, deemed especially worthy of preservation. This article describes criteria and considerations for restoration, financial assistance available for restoration, and highlights a bridge restoration project in Wichita.

Types of listings. A historic bridge can be nominated for national or state listing as a historic property. Some communities have a local listing process, too, like the cities of Wichita and Lawrence, and that's a third possibility. You can nominate a bridge for any or all of these listings. Instructions for nominating a property for federal or state listing are available at <http://www.kshs.org/p/nomination-process/14654>.

National listing makes it possible for you to apply for federal financial assistance for the listed property. Federal restoration standards must be followed. (See the federal standards sidebar on the next page.)

State listing provides an extra measure of protection for a property, along with also requiring that federal restoration standards be followed. Patrick Zollner, Director of the Cultural Resources Division at the Kansas State Historical Society, said the Kansas preservation statute, K.S.A. 75-2724, requires that state the historic preservation officer be given notice and an opportunity to investigate and comment upon any proposed project the state (and any political subdivision of the state) undertakes that will "damage or destroy" federal- or state-listed historic property.

Local listing establishes a property as being important to the community and can help establish local preservation funding priorities. The community sets its own restoration standards. This is the most flexible option, but with fewer options for funding assistance.

Financial assistance for bridge restoration. The Kansas Historical Society manages one of the two primary financial assistance programs—the *Heritage Trust Fund*. For this program, 80/20 matching grants up to \$90,000 are available for federal- or state-listed bridges. Another avenue for bridge preservation funds, and one that does not require a federal or state listing, is a *Transportation Alternatives Grant*, administered by the Kansas DOT. A bridge may be awarded either a Heritage Trust Fund or a Transportation Alternatives Grant, or both. Zollner said both grant programs are competitive. If selected, the bridge owners work closely with the State Historical Society to make sure the bridge is restored according to the federal Standards for the Treatment of Historic Properties.

KDOT *Federal Funds Exchange* dollars can be used for bridge restoration using local standards, or as a match for one of the above grants.

Restoration considerations. Listing a property does not guarantee that it will be restored. For example, the Austin Bridge in Neosho County

It's easy to learn which bridges in your jurisdiction are located on the national and Kansas registers of historic places:

- Go to <http://www.kshs.org/p/register-database/14638> to access the database menu.
- To find all the listed bridges for your jurisdiction, type the word "bridge" under "Property/District Name" and add the name of your jurisdiction where indicated. Press "Search" and you will see your listed bridges along with their descriptions and photographs.



Preservation Profile: Minisa Bridge. Built in 1932 in Wichita, the Minisa Bridge was listed on the Wichita Register of Historic Places in 1979 and was restored in 2007. The restoration project received a Transportation Enhancement grant through KDOT. \$2 million of the City of Wichita's general funds were spent in addition to the grant.

Restoring the Minisa Bridge was no easy feat. Originally the city was only going to repair the deck and the rails, said Wichita's senior planner, Kathy Morgan. But during preliminary inspections, the structural components of the bridge were found to be compromised. The abutments, deck and pilings had to be replaced.

Also needing restoration were concrete sculptures at the bridge heads (see photo above) and Carthalite railings and some of the colored Carthalite sculptures. A product unique to Wichita, Carthalite is cast stone with colored glass in the mix.

"A historic masonry consultant was hired and then he trained the contractor [to restore the Carthalite]," Morgan said. "We did mortar and concrete testing to determine the chemical make-up of the original material and then duplicated that material."

The city launched a campaign to involve the community to participate in the restoration process. The city conducted a press conference and advertised in the local paper and on TV to ask for donations of 1930's- era colored glass that the contractor needed to reconstruct the Carthalite. A donation booth was set up near the bridge site. Even though the bridge was closed for six months and caused traffic hardships, the public was invested in helping the project succeed.

"Restoring the Minisa Bridge was a huge success in engaging the community," Morgan said. "Over 200 people attended the re-opening."

The Minisa Bridge, along with many others, remains an important physical reminder of Wichita's history, and will continue to stand strong for many more years to come.



has been listed on the National Register of Historic Places for almost 40 years, still unrestored. Zollner said there is no established process for restoring listed property. “Listed properties are routinely demolished through neglect or re-development,” he said.

Before deciding to restore a historic bridge, do your homework. Even if you are fortunate enough to be awarded outside financial assistance, local funds will be needed too. It could be an expensive project. See the sidebar below for some thoughts from Clark Rusco of Barton County about what could drive up costs for restoring stone bridges.

Restoring a historic bridge needs strong community support to gain political support. Often citizens have emotional ties to historic bridges that can help this process. Wichita built community support for restoring its Minisa Bridge—see sidebar at left. And that support has now turned into community pride.

More information. For (much) more information about restoring historic bridges than we have space for here, visit <http://www.kshs.org>. If you have a specific question about restoring a bridge, contact Patrick Zollner at pzollner@kshs.org.

Another helpful resource is the Historic Bridge Foundation (<http://historicbridgefoundation.com>), a clearinghouse of information on how to restore a historic bridge, including a list of contractors with experience in bridge restoration.

Also, an Iowa-based grass roots organization called Workin’ Bridges has spearheaded bridge restorations in Iowa and has recently been involved in efforts to preserve several historic Kansas bridges. Learn more at <http://www.skunkriverbridge.org/the-project.html> or contact Julie Bowers at jbowerz1@gmail.com or at (641) 260-1262. ■

US Secretary of the Interior’s Standards for the Treatment of Historic Properties

These standards, codified as 36 CFR Part 68, are regulatory for Historic Trust Fund and Transportation Alternatives grants. The Standards are neither technical nor prescriptive, but are intended to promote responsible preservation practices. For example, they cannot, in and of themselves, be used to make essential decisions about which features of the historic structure should be saved and which can be changed. But once a treatment is selected, the Standards provide philosophical consistency to the work.

The four treatment approaches, in hierarchical order, are Preservation, Rehabilitation, Restoration, and Reconstruction.

Preservation places a high premium on the retention of all historic fabric through conservation, maintenance and repair. It reflects a structure’s continuum over time.

Rehabilitation emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it is assumed the property is more deteriorated prior to work. (Both Preservation and Rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.)

Restoration focuses on the retention of materials from the most significant time in a property’s history, while permitting the removal of materials from other periods.

Reconstruction establishes limited opportunities to re-create a non-surviving site, landscape, building, structure, or object in all new materials.

Choosing the most appropriate treatment for a building requires careful decision-making about a building’s historical significance, as well taking into account a number of other considerations, including:

- Relative importance in history
- Physical condition
- Proposed use
- Mandated code requirements

Source: http://www.nps.gov/hps/tps/standguide/overview/using_standguide.htm

To list or not to list? Barton County has six historic stone bridges in need of repair, built in the 1940s by the Works Progress Administration (WPA). The bridges are on the National Historic Register. Clark Rusco, Barton County engineer, sees value in listing historic bridges, because a listed property is eligible for Heritage Trust funding. However, he cautions local governments to think about whether they will realistically be able to meet the standards in restoring listed structures (see information on the standards above).

At the 2012 MINK local roads conference, Rusco said, in his opinion, stone bridges probably should *not* be nominated for historic designation if damaged stones are low in the structure, near the natural waterline, and need to be replaced, if stones are missing from the structure, or if “all of the stone masons in the area are on Medicare.” Those situations could create a costly project. He said a stone structure *should* be nominated for historic designation if the structure is in good shape, grout is the major repair item, you can preserve work of previous craftsmen, and if contractors are in your area to do the work. Rusco also advised that extra paperwork is part of the territory when working with a listed property, and to be prepared for that.

Sources:

- Interviews. Clark Rusco on June 1, 2012; Kathy Morgan on June 4, 2012; Patrick Zollner on June 10, 2012.
- Kansas Historical Society website. <http://www.kshs.org>
- Kansas Statute K.S.A. 75-2724. <http://www.kshs.org/p/state-historic-preservation-statute/15577>
- Hamada, Abdul. “Something Old, Something New: Wichita restores historic bridge.” Government Engineering. March-April 2009.
- Rusco, Clark. Is it better to be a stone arch bridge or an *historic* stone arch bridge? Presentation at 2012 MINK conference, St. Joseph, MO.



MORE

By Lisa Harris

See download / ordering information on next page.

Minnesota Snow and Ice Control: Field Handbook for Snowplow Operators

This field handbook helps promote the understanding of tools, best practices and limitations for snow and ice control. It also encourages progressive changes in snow and ice control practices to help reduce salt/sand use and environmental impacts while meeting the safety and mobility needs of roadway users. Minnesota LTAP. Revised 2012.

Alkali-Silica Reactivity Field Identification Handbook

Alkali-silica reaction (ASR) can result in expansion and cracking of concrete, leading to a reduction in the service life of concrete structures. This handbook serves as an illustrated guide to assist users in detecting and distinguishing ASR from other types of damages in the field. FHWA. 2012.

Applying the ADA in Work Zones: A Practitioner Guide

This document provides guidance and examples of common solutions to make work zones accessible to all pedestrians. The guideline highlights the practices of several State DOTs as well as sample scenarios in the 2009 *Manual on Uniform Traffic Control Devices*. (A 13-minute introduction video to the guide is available for viewing at <http://www.youtube.com/watch?v=HVK-IVqHY78>.) ATSSA. Fall 2012.



CALENDAR

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

■ TRAINING:

2013....

Basics in Budgeting, Finance & Reporting – ▲L3

September 10 in Wichita

HSMLite

September 10 in Hays

Asset Mgmt & Cost Accounting – ▲L3-r

September 19 in Salina

Road Safety Assessment – ▲L3-e

September 24 in Dodge City

EDC Exchange: Locally-Administered Federal Aid Projects

September 24 in Topeka and Hays

Concrete Street Maintenance – ▲L1-r

October 22 in McPherson

October 23 in Topeka

Low Cost Safety Improvements

October 29 in Ottawa

Snow and Ice Control – ▲L1-r

November 4 in Oakley

November 5 in Salina

November 6 in Emporia

November 7 in Pittsburg

November 8 in Leavenworth

Risk & Liability– ▲L1-r

November 13 in Emporia

Project Planning & Mgmt – ▲L3-r

November 15 in Wichita

■ UPCOMING MEETINGS:

APWA-KS Roundtable

September 12 in Salina

<http://kansas.apwa.net/>

MINK Local Roads Regional Meeting

September 25-26, 2013 in St. Joseph, MO

Contact Lisa Harris at (785) 864-2590 or

LHarris@ku.edu

APWA-KS Fall Meeting

October 15 in Overland Park

<http://kansas.apwa.net/>

Kansas Association of Counties Annual Conference and Exhibition

October 29-31 in Wichita

<http://www.kansascounties.org/index.aspx?NID=10>

KCHA Membership Meeting

October 30 in Wichita

Contact Penny Evans at (316) 660-1777

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.

▲L1 = KS Road Scholar Program Level 1 — Technical skills required course.

▲L2 = 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."

▲L3-r = KS Road Scholar Program Level 3 — Master Road Scholar required course.

▲L3-e = KS Road Scholar Program Level 3 — Master Road Scholar elective course.

COMING IN SEPTEMBER: Asset Management and Cost Accounting

This is a Level III Road Scholar required course. Those participating in this course will improve their skills in developing project budgetary and tracking expenditures. Participants also will learn essential components to asset management systems and observe demos of a sampling of management systems used by counties and cities in Kansas. This training will be offered this fall and is only offered every other year. Check the training calendar above for additional details.



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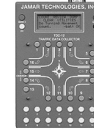
See description on page 14. 44 pages. Minnesotal LTAP. Free download at <http://www.mnltap.umn.edu/publications/handbooks/documents/snowice.pdf>

Alkali-Silica Reactivity Field Identification Handbook

See description on page 14. 80 pages. Federal Highway Administration. Free download at <http://www.fhwa.dot.gov/pavement/concrete/asr/pubs/hif12022.pdf>

Applying the American With Disabilities Act (ADA) in Work Zones: A Practitioner Guide

See description on page 14. 36 pages. ATSSA. Fall 2012. Free download at http://www.workzonesafety.org/files/documents/training/fhwa_wz_grant/ada_guide.pdf
or request hard copy



EQUIPMENT LOANS

We offer the following items for loan to local highway agencies. Contact mgivechi@ku.edu for counter boards and weaver@ku.edu for the Safety Edge shoe. There could be a waiting list for these items.

Safety Edge Paving Shoe. This Advant-Edge shoe attaches to a paver with a universal bracket, provided with the shoe. To borrow, email Pat Weaver at weaver@ku.edu.

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



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