



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

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Sustainability in Transportation

By Lisa Harris & Nora Fairchild

Sustainability is not just about the environment. It's about saving resources and enhancing livability — now and for the future.

Sustainability is at the forefront of the public works profession these days. Yet many people do not know what sustainability means, let alone how it applies to their community. This article will describe the basic concept of sustainability, why it's caught the attention of public works professionals, and some tools for adopting sustainable practices.

What is sustainability?

Every public works department has adopted resource-saving strategies and ways of doing more with less, and this is certainly one aspect of sustainability. However, sustainability goes beyond project or departmental goals to consider broader issues at a community level, from how the built environment is designed (sprawled vs. compact) to how the systems operate that sustain the community and



Roads and bridges and other public works infrastructure are significant elements in a community's livability and economic success.

region. Transportation is one of those systems, and it affects the environment in how transportation infrastructure is built, maintained and used.

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Asphalt Recycling on the Rise

By Lisa Harris & Matthew Barnett

One of the biggest investments a community makes is in the material used to build and maintain its roads. When asphalt roads need resurfacing, a way to get the most out of that investment is to mill the existing material—creating reclaimed asphalt pavement, or RAP—amend it with binder and aggregate, and re-place it back on the road. This article will describe benefits of using RAP and its use in Kansas.

When asphalt pavement is milled and reused in a new asphalt mix, the

old asphalt cement is rejuvenated so that it becomes an active part of the adhesive process that holds the pavement together, just like the old aggregate becomes part of the aggregate content of the new mix. The same material can be recycled again and again. As Mike Crow, of the Kansas Asphalt Paving Association says, "It's like money in the bank, sitting on your roads."

This article will discuss considerations for using RAP on local roads and will

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Sustainability in transportation *Continued from page 1*

The impetus in the national move toward sustainability comes from acknowledgement that America cannot continue to afford to build low-density communities and infrastructure. It is operationally inefficient and financially unsustainable, especially considering the decreasing availability and rising cost of materials and fuel needed to build, maintain and use such facilities. The American Association of State Highway and Transportation Officials (AASHTO) has acknowledged these challenges in their report on sustainability titled *Transportation: Invest in Our Future*.

According to the AASHTO report, "America's transportation system has served us well, but now faces the challenges of congestion, energy supply, environmental impacts, climate change, and sprawl that threaten to undermine the economic, social, and environmental future of the nation. With 140 million more people expected over the next 50 years, past practices and current trends are not sustainable."

The report also discusses the importance of meeting transportation needs while passing on "a better world to our children and grandchildren." To achieve both, it is necessary to expand the transportation network's capacity while simultaneously reducing the environmental footprint of the system, the report said.

Thinking differently about the bottom line

AASHTO urges transportation decision makers to adopt a "triple bottom line" approach to sustainability by evaluating performance based on **economic**, **social**, and **environmental** impacts and giving equal consideration to these driving forces. This general approach is also endorsed by other proponents of sustainable engineering, including the American Society of Civil Engineers (ASCE) and the American Public Works Association (APWA).

In the October 2011 issue of the *APWA Reporter*, the author, Wilfred Nixon, who is a member of APWA's Winter Maintenance Subcommittee, discusses how considering all three types of impacts creates a systems approach when developing agency activities, whether individual projects or broader areas of operation. Some impacts may have more weight than others in a given situation. He gave an example of planning snow and ice control in an environmentally sensitive watershed. Using a systems approach, he said, one would "...consider the environmental needs (not to damage the watershed), in conjunction with the societal needs (for a safe and mobile transportation system even in the winter months) and the economic needs (non-chlorine deicers are a lot more expensive than chloride deicing chemicals, like salt)."

It's up to the agency to decide how to weigh these impacts and devise a strategy for the area. Nixon said in some areas, societal needs may be deemed more important than economic ones, so non-chloride deicers would be used in that watershed. Others might just plow the area and post signs that roads will be snow and ice covered there. Or an agency could adopt a low-salt policy for that area.

Coming to Kansas: EDC Live Webinars

FHWA's **Every Day Counts** (EDC) promotes specific technologies that help transportation agencies improve sustainability and reduce project time. Kansas LTAP will be assisting FHWA's Kansas Division to engage local agencies across the country in dialogue and education about these technologies, using live "dynamic webinars." Participants will have an opportunity to interact with the presenter and contribute to discussion. Our next newsletter issue will contain dates and topics for these webinars, and information on where they will be held in Kansas.

Nixon said that setting overall community priorities has to be done with other stakeholders, and he urged public works agencies to take the lead.

Transportation sustainability in Kansas

Sustainability is making strides in Kansas. Here are just a few examples.

- In our Fall 2008 newsletter issue, we highlighted the achievements of Riley County Public Works in building a campus for maintenance, administration and training designed towards having a zero carbon footprint. The structures use a combination of natural light, energy-efficient fixtures, geothermal heating, radiant heat, a central control system, wind and solar power, and more to create energy efficiency. Riley County's sustainability projects in public works are part of a larger community commitment to energy efficiency in County buildings. The County has been recognized nationally for its sustainability achievements. To read the article, download our newsletter at <http://www.ksltap.org> at the Newsletters link. Riley County gives tours of its public works campus. Call Rod Meredith at (785) 539-2981 to schedule a tour.

- The Kansas Department of Transportation has funded a K-TRAN study to examine energy and fuel use in their buildings, vehicles and equipment. The research will include recommendations for ways to increase energy efficiency. KDOT is also piloting wind energy generation at two of their subarea shops (see page 7).

- The Mid-America Regional Council, a regional planning authority in the Kansas City area, is addressing sustainability in several ways, from the broader level of sustainable urban planning to providing information and tools for creating multi-modal transportation systems. Read about some of their programs on page 12.

- Kansas Take Charge! Challenge. Sixteen cities in four different regions in Kansas participated in a friendly competition to become more sustainable at home and in the workplace. The challenge focused on energy conservation.



Selected Resources for Adopting Sustainable Practices in Transportation

Note: Web pages for these resources can be found in the Sources section, below.

- In 2008 the **American Public Works Association** created the APWA Center for Sustainability to support decision-making and practices for sustainability. This page includes several related links, including:
 - An interactive decision making tool for adopting sustainable practices called the “APWA Framework for Sustainable Communities.” This tool helps the user consider whether to adopt a technology across a matrix of considerations including ecology, economy, empowerment, efficiency, and health.
 - Web page on APWA’s annual conference on sustainability in public works.
 - Web page on livable communities.
- **EDC website.** The Federal Highway Administration (FHWA) launched an initiative called “Every Day Counts” (EDC) to protect the environment as well as shorten project delivery and enhance roadway safety. Five specific technologies are being promoted to reach those goals. Kansas LTAP has been helping FHWA with promotion of EDC technologies to local agencies, including education about the safety edge technology for pavements and warm mix asphalt. See page 2 for information on upcoming webinars on these and other EDC technologies.
- **AASHTO’s Center for Environmental Excellence.** This is a helpful resource for information on sustainability specific to transportation. It is designed with DOTs in mind, but is also applicable to local agencies.
- **The American Society of Civil Engineers (ASCE)** offers an online “Fundamentals of Sustainable Engineering” course that covers practical considerations in adopting sustainable practices as well as big-picture discussions of policy and social and economic trends. \$695 for ASCE members and \$795 for nonmembers. <http://www.asce.org/sustainability/>
- **Sustainable communities: When we decide to make them, sustainable communities will come in all sizes, forms, and locations.** This article describes how the City of Greensburg, Kansas, is adopting sustainable practices as it rebuilds after much of the city was destroyed by a tornado in 2007.
- **Environmentally Sensitive Maintenance for Dirt and Gravel Roads, 2007.** This manual was developed by Penn State’s Center for Dirt and Gravel Studies and several partners. It describes maintenance practices that reduce nonpoint pollution and helps keep road materials from eroding.

Winners will be announced later this year. Each region’s winner will receive an award, valued at \$100,000, of a renewable energy or energy efficiency project for their city.

Conclusion

Creating more sustainable communities is an ongoing process, and your agency is a key player in that process.

It includes everything from conserving fuel and energy to adopting planning practices and plans that promote efficiency in community design and delivery of community services. For more information on sustainability specific to transportation, consult the resources listed above. ■



Sources:

- Harris, Lisa. Riley County’s new “green” public works facilities are saving the county \$\$. KUTC Newsletter, Fall 2008.
- Nixon, Wilfred. Take a walk on the sustainable side... APWA Reporter, October 2011.
- APWA Center for Sustainability. http://www.apwa.net/get_connected/sustainability
- APWA Framework for Sustainable Communities. http://www2.apwa.net/documents/sust/framework_designINTERACTIVE.pdf
- APWA Resource Center: Livable Communities. <http://www2.apwa.net/ResourceCenter/index.asp?Section=livable&SectionName=Livable+Communities#74>
- APWA Annual Conference on Sustainability. <http://www.apwa.net/sustainability>
- Every Day Counts. FHWA. <http://www.fhwa.dot.gov/everydaycounts/>
- AASHTO Center for Environmental Excellence. http://environment.transportation.org/environmental_issues/sustainability/
- Sustainable communities: When we decide to make them, sustainable communities will come in all sizes, forms, and locations. <http://www.prairiefirenewspaper.com/2008/10/sustainable-communities>
- Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Penn State Center for Dirt and Gravel Studies. <http://www.epa.gov/owow/NPS/sensitive/sensitive.html>. 2006.



Asphalt recycling

Continued from page 1

describe use of RAP by KDOT and a few locals agencies in Kansas.

Benefits of using RAP

Why use RAP? Because it can save money. Less virgin material is needed for the mix if RAP is used—less aggregate and less oil. There are environmental benefits, too. According to the National Asphalt Pavement Association (NAPA), if RAP use increases to 25 percent of the average mix in the United States, total lifecycle greenhouse gas emissions will be reduced by 10 percent, which equates to 2 million tons offset annually—equivalent to taking 350,000 cars off the road.

NAPA reports that there is ample evidence that the quality of asphalt pavements that contain RAP is equal to or better than pavements using all virgin materials. However, that assumes that RAP is tested and the mixes are designed based on the characteristics of the RAP. Unfortunately, materials testing is often beyond the financial means of local agencies, but performance can be controlled by purchasing high quality RAP or being conservative in the amount of RAP used in the mix.

KDOT's use of RAP

The Kansas Department of Transportation has been using and testing RAP in mixes for decades. Kansas was one of the lead states in the U.S. in testing a higher percentage of RAP in a pavement mix. Now KDOT uses 25-40 percent RAP in its mixes, all of which are Superpave. Greg Schieber, materials field engineer at KDOT, said that KDOT has developed



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The quality of reclaimed asphalt pavement (RAP) is dependent on the age and quality of the asphalt from which it is derived. RAP can be amended to improve its performance.



a RAP blending spreadsheet that allows for RAP up to 50 percent of a mix depending on the binder grading of the RAP. KDOT's target is -23 degrees Celsius for the blended virgin and RAP binder, so the Contractor can use any percent of RAP in the mix as long as the blended virgin and RAP binder is -23 degrees Celsius or lower.

Increased interest in RAP

The Federal Highway Administration formed a Recycling Asphalt Pavement Expert Task Group in 2007 with stakeholders from government, industry, and academia to investigate obstacles to increasing RAP use. The Group was charged with achieving increases in RAP use through technology transfer, accelerated deployment strategies, and eliminating artificial and arbitrary barriers to increased recycling and instead using performance-based pavement criteria.

Part of the national challenge of increasing the use of RAP in pavement mixtures is related to supply. It is

scarce in some rural areas. The Group encourages rural agencies to allow milling on their pavements prior to the placement of asphalt overlays to provide more material for asphalt plants in areas where RAP is scarce.

Crow said that RAP is in more demand in Kansas than it used to be. "Before it was a nuisance by-product; now it's in demand," Crow said. Cost has gone up with demand, too, Crow said, from about \$6 per ton to about \$20-30 per ton today.

Where to get RAP in Kansas

Asphalt contractors in Kansas each have their own piles of RAP, said Crow. RAP in those piles typically come from a variety of sources, all mixed together. However, it is possible to purchase RAP from a contractor off a specific job if you arrange for it in advance, as Butler County did (see sidebar, next page). RAP from state and interstate highways is generally high quality, due to the standards for asphalt mixes on these highways.



Sources:

- National Asphalt Pavement Association (NAPA). Asphalt pavements are America's most recycled product. <http://asphaltroads.org/why-asphalt/recycling-and-energy.html>
- NAPA. How to Increase RAP Usage and Ensure Pavement Performance. Brochure. <http://store.asphaltpavement.org/index.php?productID=697>
- NAPA. Black and Green: Sustainable asphalt now and tomorrow. <http://asphaltroads.org/images/documents/Sustainability%20Report%202009.pdf>
- Recycling Asphalt Expert Task Group home page. <http://www.morerap.us/>
- Phone interviews with Mike Crow, Mark Thiel, Justin Mader, Darryl Lutz, and Greg Schieber, KDOT, October 2011.



Another source of RAP is your own roads. Asphalt can be removed by milling or by chunking out the pavement (if from a full reconstruction project). Over time, a stockpile of millings will begin to harden and will need to be crushed again before adding it to virgin material. If your recycled asphalt comes from a full roadway reconstruction, a more economical approach may be to have the asphalt chunked out and stockpiled. Then every year you could crush only the amount of material you need for that year, eliminating the possibility of having to process the RAP twice.

What percentage is best?

Schieber said that 15 percent RAP, regardless of its quality, should not have an effect on the thermal cracking performance of the virgin material in the mix. KDOT allows 15 percent of RAP in a mix to come from an off-site source. If above 15 percent, the RAP on a KDOT project must be from millings created onsite. This policy gives KDOT some measure of quality control because KDOT knows the quality of their own pavements.

Crow said local agencies typically use a 15 percent mix, although there is a range. Three local agencies using RAP are profiled in the sidebar at right.

In sum

Using RAP in an asphalt mix can save your agency money and provide environmental benefits. It may take some trial and error to get the right mix of RAP and virgin material for your conditions.

For more information, read NAPA's brochure titled *How to Increase RAP Usage and Ensure Pavement Performance*. It provides answers to common questions associated with RAP performance. See the sources for this article for a link to this brochure and to other resources about RAP.

You can also request help from KDOT. For assistance with mix design, contact Greg Schieber at (785) 296-1198 or gregs@ksdot.org. For assistance with testing, contact your nearest KDOT area office. ■

Examples of Local Agencies in Kansas using RAP

- **The City of Lawrence** uses 15 percent RAP in its asphalt mixes, and it generally performs well, says Mark Thiel, assistant public works director (phone 785-832-3134). However, Thiel said the City recently cut back to 15 percent on the allowable percentage of RAP in their Superpave mixes because they were experiencing premature cracking on some of their newer pavements. While it is difficult to know whether the cracking is due to factors such as the underlying base conditions or the amount of traffic, the suspected cause was brittle RAP.

"RAP in the stockpiles [of our asphalt suppliers] is inconsistent in quality—it could come from a road that is 15 years old or a parking lot that is 40 years old," Thiel said. The City does not have the resources or the money to do the testing necessary to determine the characteristics of the RAP they are getting and what they might need to do to improve its performance. Thiel said the City was asked by a supplier to try a paving project where one lane would have a higher percentage of RAP than the other lane, to see if the additional RAP affected performance under similar conditions. The City is interested, but that project is not yet planned.

- **McPherson County** plans to overlay 15-20 miles of roadway with asphalt containing RAP in the next year. Justin Mader, project engineer, (phone 620-241-0466) said the county has acquired about 10,000 tons of millings and about 30,000 tons of chunked asphalt from a nearby KDOT project on K-61, so they have material to work with for many years. The County will be adding a RAP addition onto their asphalt plant this winter, so they can start using RAP. They are in the process of determining the design of their mixes. Mader hopes for some help from KDOT with that. He expects the County will use a higher percentage of RAP in the base layers and a lower percentage in the surface layers.

Mader says that adding RAP to an asphalt mix will make the pavement more stiff and more susceptible to cracking. Therefore, a softer asphalt oil is recommended with a RAP mix. McPherson already uses a soft oil (PG64 22) in virgin mixes, so they will not have to change oil type.

McPherson County is also experimenting with warm mix asphalt. They have been told that using warm mix asphalt will allow for a higher percentage of RAP in those mixes.

- **Butler County** uses a high percentage of RAP in its mixes (50 percent in both hot and cold mixes) and reports good success. Darryl Lutz, public works director (phone 316-322-4101), said they address quality control on the front end. The County purchases high quality RAP from projects from KDOT or the Kansas Turnpike. To obtain RAP, Lutz finds out where KDOT and the Turnpike will be doing mill and overlay projects in his area and gets the word out to prospective bidders that he is interested in buying RAP, followed by a proposal.

The County processes millings for use in cold mix asphalts to pass a 7/8" sieve opening. Lutz said they do not process the RAP they run through a hot mix plant, but they do pass the millings over a 2" bar screen to remove large chunks.

Lutz said mixes with 50 percent RAP are a little stiffer than those with virgin materials, and more open at the top. He said they typically seal pavements with RAP sooner to account for that.

Lutz is pleased with the performance of their RAP mixes based on visual inspection. His agency has significantly reduced the amount of oil they use, and he thinks the pavements with RAP are good for the County in many ways.



New Resource on Green Infrastructure

By Lisa Harris

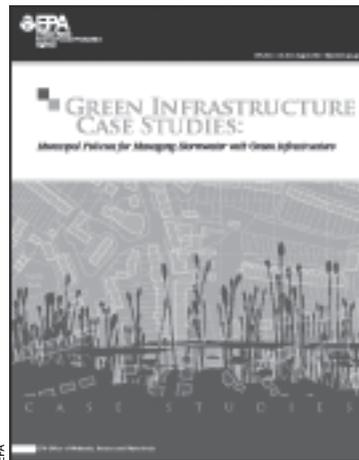
An excellent new resource on green infrastructure is available for free download at our website. If you are not familiar with the term green infrastructure, it refers to methods of designing infrastructure systems in ways that are harmonious with natural systems. When stormwater is managed with green infrastructure, water is retained near to where it falls on the ground rather than conveyed off site by curbs and sewers to bodies of water.

This report, published by the US Environmental Protection Agency (EPA) and titled *Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure*, is especially helpful because it contains 12 case studies from cities across the country that have already installed green infrastructure projects.

Green street practices include bioswales, rain gardens and infiltration practices, street trees and porous paving materials, many of which add value to the public space as well as providing better environmental performance.

Green infrastructure is considered the wave of the future in stormwater management for a number of reasons, including:

- **Flood control.** Costs and concerns associated with more frequent flood events have driven many communities to adopt green infrastructure as a way to mitigate future flooding and better manage runoff.
- **Quality of life.** Green stormwater facilities are more attractive than conventional curbs and gutters and larger areas can double as recreation facilities. Keeping nonpoint sources of pollution from accumulating in water bodies is healthier for a community's citizens and wildlife.



The guide contains a wealth of information on the topic—from technical descriptions of green infrastructure facilities to how to incorporate green infrastructure regulations and incentives in local policies. The 12 case studies describe in detail how and why those communities built green infrastructure projects.



• **Lower costs for installation and maintenance.** Surface transportation systems, including roads, streets, sidewalks and alleys, can be the greatest contributor to total imperviousness in a community. Local transportation agencies dedicate significant funds to repairs, maintenance and improvements to these systems. Eight of the 12 municipalities in this study have realized the value of leveraging these funding sources by incorporating green infrastructure practices into standard transportation projects. Sometimes a green infrastructure project can serve two or more community goals at the same time and draw upon multiple funding streams to accomplish its construction. For example, a large detention area could be co-designed as a park.

The increased investment necessary to include green infrastructure, especially in larger projects, is typically a very small percentage of the total project costs. Costs and ease of designing or redesigning streets depends on whether the street is already built, what maintenance or improvements are already planned and whether retrofits are being made to streets, sidewalks or other types of infrastructure or utilities.

Green Infrastructure Case Studies is especially useful for communities interested in learning

more about green stormwater technologies, their benefits, and also the thornier aspects of codifying green infrastructure in local policies, and garnering support from the public and elected officials in adopting a stormwater system that looks and functions in a nontraditional way.

Green infrastructure makes sense for many communities. Download this report at <http://www.ksltap.org> and learn more about the topic. Does it make sense for you? ■

Source: *Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure*. Environmental Protection Agency, 2010.

One of the 12 cities profiled in the report is Lenexa, KS. Lenexa compared three alternative stormwater management approaches and found that on-site detention with green infrastructure costs about 25 percent less than the old approach of retrofitting and reactive solutions. (More on Lenexa's cost-savings at: <http://www.ci.lenexa.ks.us/Stormwater/lessexpensive.html>. More on Lenexa's storm water programs and plans at <http://raintorecreation.org>).

Lenexa was hard hit by major floods in 1998 and again in 2004. The City uses green infrastructure approaches, such as rain gardens, street swales and other retention methods to provide additional flood protection during peak events. Lenexa had public support for these newer natural systems because of the inability of traditional systems to provide adequate flood protection.

Lenexa has a comprehensive plan for protecting and creating large-scale green infrastructure within the City's jurisdiction. The City directs development away from sensitive natural lands and then purchases land in priority areas to provide flood mitigation, stream protection, water quality improvements and recreational amenities. The guide contains a map of the many functional green spaces in Lenexa that also serve as public parks and trails for recreation and education.



KDOT Korner

What is KDOT doing to save energy and fuel? *By Lisa Harris*

A look at a few projects under way.

Highway departments consume a fair amount of energy either in their buildings or in their vehicles. KDOT has implemented energy-saving measures in their buildings for many years, such as double-glazed windows and condensing furnaces, to name a few. Now KDOT is working toward making even more changes to save energy and save money.

Carbon footprint research

KDOT has commissioned a K-TRAN project to document current energy use in KDOT buildings and vehicles and develop recommendations for ways to reduce KDOT's carbon footprint through improved energy efficiency. Leif Holliday, traffic/field operations engineer for KDOT's Bureau of Transportation Planning, is the project coordinator.

Holliday said the project is unique in that it taps into energy-efficiency expertise at both The University of Kansas and Kansas State University. "It's a cooperative effort," he said. For KU's project, Phase 1 has been led by Dr. Oswald Chong and Phase 2 will be led by Dr. Edward Peltier. KSU's project is being led by Dr. Kyle Riding.

"KDOT owns hundreds of facilities, including our district, area and subarea offices and also vehicle storage facilities around the state," said Holliday. The research team is gathering data on energy use at each facility. Holliday said data-gathering has been complicated by the fact that several utilities provide electricity to KDOT across the state, and those utilities vary in ease of providing access to usage data on their systems.

The research team is also gathering data on fuel use by KDOT's vehicle fleet. KDOT keeps records of the types of fuels they use; however, analysis of that data requires the extra step of breaking down



This wind turbine at the Osborne, Ks., subarea facility provides about 1/3 of the electricity used at the facility.

the codes in the records to identify the vehicle types and fuel types.

So far, the research team has found that energy use in KDOT buildings is better than the national average (even though several buildings are much worse than the national average), while KDOT vehicle fleets perform on par with the national average.

Wind turbines at maintenance shops

Wind turbines are being tested at two of KDOT's subarea maintenance shops and have been in place for a few years. Peter Carttar, assistant bureau chief for KDOT's Bureau of Construction and Maintenance, said the turbines were

installed at the Grainfield and Osborne subarea facilities to take the edge off their electricity bills. Each wind turbine powers about a third of the facility's needs.

The turbines have been maintenance-free so far. Carttar attributes that to the turbines' relatively small size and simple design. Both turbines are 1.8 kilowatt Skystream wind generators and they each sit on a 33 foot tall galvanized steel monopole.

Carttar said it was important to KDOT that the towers be installed and maintained without any participation required of subarea staff. "We did not want to get in the way of the people who need to get on our highways," he said. KDOT hired a contractor to install the turbines.

One unexpected aspect of wind generation in Kansas is that winds are so strong at times that the generators automatically stop turning to save wear and tear. A wind tower that is not turning looks out of service, which does not give the best public impression—however, the tower may just be at rest before it starts turning again, Carttar said.

Carttar is coordinator of a new K-TRAN project that will assess the performance of their wind turbines compared with what was predicted by a model developed by K-State. The project will help KDOT and K-State learn more about wind generation and help KDOT decide whether to add wind generators at other subarea facilities.

For more information on these KDOT sustainability projects, contact Leif Holliday at (785) 296-2906 or leifh@ksdot.org or Peter Carttar at (785) 296-3576 or carttar@ksdot.org. ■

Sources:

- Leif Holliday phone interview, September 26, 2011.
- Peter Carttar phone interview, September 26, 2011.
- Oswald Chong email interview, October 5, 2011.





Air Pollution 101

By Nate Vander Broek

You don't need to be an air quality expert to make informed decisions. Here's a primer for public works agencies, especially in or near urban areas.

It's a hot, calm, sunny summer day in Kansas, and you notice that your eyes and nose burn when you are outside. This may be your body's natural reaction to poor air quality, possibly caused by high levels of either ground-level ozone or particulate matter. This article will discuss these two types of air pollutants, where they come from, how they're measured, and why it's important to keep them in check. (Health concerns are just one reason.) We'll also cover what you can do to reduce these pollutants in your agency's daily operations.

The Big Two: Ground-level ozone and particulate matter

Ozone. You may be wondering how ozone, found high in the atmosphere and known for protecting us from the sun's ultraviolet radiation, is causing these symptoms. It's not. The concern is with *ground-level* ozone, the pollutant that is created on hot, sunny days when volatile organic compounds (VOCs), coming from cars, lawn equipment, chemical plants, asphalts, oil-based paints, auto body shops and cleaning products are mixed with nitrogen oxides (NOx), emitted by cars, power plants and industrial plants. Ground-level ozone can irritate lungs, cause pain and wheezing when breathing, cause permanent lung damage with repeated exposure, aggravate asthma and increase susceptibility to respiratory illnesses like pneumonia and bronchitis.

Besides causing health problems, ground-level ozone can negatively affect the local economy. It can decrease agricultural yields by interfering with some plants' ability to produce and store food and makes them more susceptible to certain diseases, insects, other pollutants, and harsh weather. Some businesses may not be interested in locating in an area known to have poor air quality.



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Ground-level ozone and particulate matter can irritate the eyes and nose.



Particulate matter. Particulate matter is another major contributor to air pollution, including in rural Kansas. Particulate matter is a mixture of solid particles and liquid droplets found in the air. Examples of particles include dust, dirt, soot and smoke. These particles may also form as a chemical reaction from sulfur dioxides and nitrogen oxides. These chemicals come from power plants, vehicles and industrial plants.

Not all particles are readily visible. Some particles can be seen with the naked eye and others require a microscope. Particles are emitted from construction sites, unpaved roads, fields, smokestacks and fires. Like ground-level ozone, particulate matter also causes health issues including coughing, wheezing, and decreased lung function. It may be inhaled, accumulate and react deep in the lungs.

Particulate matter can travel long distances. According to Amanda Graor, air quality program manager at the Mid America Regional Council in Kansas City (MARC), smoke from pasture burns in the Kansas Flint Hills has reached all the way to New Jersey!

Unlike ground-level ozone, particulate matter occurs year round, not just during the hot, sunny summer

months. In fact, a condition known as temperature inversion can make matters worse in winter when warm air above traps cold air below and the wind is too calm to mix up the air layers, keeping particles close to where we breathe.

The EPA and the Clean Air Act

To protect public health, Congress created the Environmental Protection Agency (EPA) in 1970 and gave it the role of carrying out the Clean Air Act (CAA). The CAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) that set limits to the amount of pollutants in the air.

The CAA also gives the EPA the ability to limit emissions from sources such as chemical plants, utilities and steel mills.

Each state must develop a State Implementation Plan (SIP) that outlines how it will control air pollution under the CAA. The Kansas SIP is available to view at <http://www.epa.gov/region7/air/rules/kansas/toc.htm>. The EPA must approve state, tribe and local agency plans for reducing air pollution. If the plan does not meet the necessary requirements, the EPA can issue sanctions against the state and take over enforcing the CAA in that area.

Kansas air quality monitoring

To be in attainment, air quality must be measured and pollutants must not exceed a determined level per each pollutant type. In Kansas, air quality is monitored from 24 sites throughout the state by the Kansas Air Quality Program. It tracks five criteria pollutants: carbon monoxide, ground-level ozone, oxides of nitrogen, particulate matter and sulfur oxides. Within each criterion, there are primary and secondary standards. Primary standards are designed to protect public health and secondary standards are designed to protect public welfare, such as damage to crops,



vegetation, animals and buildings. The data is analyzed to determine compliance with federal standards and to evaluate air quality trends. Real-time air quality data from the 24 monitoring stations is available to view at the Kansas Bureau of Air and Radiation website, <http://www.dhe.state.ks.us/aq>.

In 2008, the EPA set the current attainment level for ground-level ozone to 75 parts per billion (ppb). This is measured from April 1 to October 31. Levels are recorded every hour and averaged over eight hours. If the rolling eight-hour average exceeds 75 ppb, then the average has exceeded the standard for that day.

Determining a violation is not a one-time event; it is a three year process. The fourth-highest reading from each monitor from every year is averaged over three years. If this average exceeds 75 ppb, that monitor is in violation. For regions with multiple monitors, it only takes one monitor to be in violation for the whole region to be considered in violation.

Check your air quality online

In the Kansas City metropolitan area, to check for Ozone Alert days when the ozone level is dangerously high go to the **SkyCast** page on MARC's website: <http://www.marc.org/environment/airq/skycast.asp>. This online tool monitors conditions like temperature, cloud cover, wind speed and direction, and ceiling height to forecast air quality conditions in a range from good to unhealthy. It also provides

helpful Ozone Alert actions designed to protect your health and reduce pollution depending on the conditions, described later in this article.

For a look at current and forecasted air quality conditions at a national level, as well as detailed information for a number of Kansas counties, several Kansas monitoring stations, and two cities in Kansas (Topeka and Wichita), check out AIRNow's website, <http://airnow.gov>. **AIRNow** provides a geographical view of the Air Quality Index displayed over a map of the United States. Air quality is categorized as either good, moderate, unhealthy for sensitive groups (USG), unhealthy, very unhealthy, or hazardous. The Air Quality Index is calculated for the five major air pollutants: ground-level ozone, particle matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide.

This website includes other tools, such as AirCompare, which allows you to compare your air quality with other areas throughout the nation. You can compare counties (including 15 counties in Kansas), states, and monthly averages based on health related criteria, such as asthma or outdoor activity. Another tool on AIRNow's website, Air Quality Monitor Maps, provides current ozone and particulate matter levels, as well as yesterday's peak ozone and particulate matter levels, at many monitoring stations throughout the country, including many Kansas locations. You

can even view past air quality maps dating back to October 2009.

What your agency can do to help the environment (and your agency)

Now that you have a background on ground-level ozone and particulate matter, what can your public works agency do to help keep your area in attainment if at risk? Here are some suggestions adapted from a list compiled by MARC to help reduce air pollutants. These measures can also help your agency save money and help protect the health of your workers.

- **Refuel at the end of the day.** Putting gas in your vehicle later in the day allows fumes to dissipate overnight, making it less likely that they will contribute to high ozone the following day.
- **Stop at the click.** Stop refueling when the pump automatically shuts off. Overfilling the tank increases the likelihood of spills and can ruin your car's vapor recovery system.
- **Keep tires inflated.** Keep tires properly inflated and aligned.
- **Don't mow on Ozone Alert days.** Mowers and other gas-powered landscape equipment don't have emissions controls. They create more air pollution per gallon of fuel burned than cars do. Mow when it's cool outside and don't mow at all on Ozone Alert days.
- **Landscape with native plants.** Landscaping reduces the area you have to mow. Native plants require less water,

Continued on page 11



Sources:

- Air Quality, Mid-America Regional Council (MARC): <http://www.marc.org/environment/airQ/>
- SkyCast, Mid-America Regional Council (MARC): <http://www.marc.org/environment/airq/skycast.asp>
- Today's Air Quality Forecast, AIRNow: <http://www.airnow.gov>
- Kansas Air Quality Report, Kansas Department of Health and Environment: http://www.kdheks.gov/bar/download/06-07_Air_Quality_Report.pdf
- Kansas Air Quality Monitoring System, Kansas Department of Health and Environment: <http://www.dhe.state.ks.us/aq/>
- Region 7, Environmental Protection Agency: <http://www.epa.gov/aboutepa/region7.html>
- The Plain English Guide to the Clean Air Act, Cleaning Up Commonly Found Air Pollutants, Environmental Protection Agency: <http://www.epa.gov/air/caa/peg/cleanup.html>
- Air Quality and Health, World Health Organization: <http://www.who.int/mediacentre/factsheets/fs313/en/index.html>
- Kansas Clean Diesel Program Grant Application Guidance 2011 Grant Competition, Kansas Department of Health and Environment: http://www.kdheks.gov/bar/air-monitor/dieselgrant/Round_3_Application_Guidance.pdf
- Managing Kansas' Roadsides: Wildflowers and Native Grasses, Kansas Department of Transportation: <http://www.ksdot.org/burconsmain/Connections/roadside/flowers.asp>
- Kansas Flint Hills Smoke Management: <http://www.ksfire.org/>
- Broder, John. Obama Administration Abandons Stricter Air-Quality Rules. New York Times, September 2, 2011.



A Leg Up

Kansas MPOs Promote Walking and Bicycling

By Nate Vander Broek

Part One of a two part series.

Communities that are sustainable have ample options for safe walking, bicycling and transit. Nationally, Kansas ranks close to the middle for its pedestrian and bicycle safety initiatives and programs. Here are some figures to back that up:

- In 2011, the League of American Bicyclists (LAB) rated Kansas 23rd in the country for safety initiatives and programs.
- LAB gave Kansas a D grade based on a cumulative score including categories such as policies and programs, education and encouragement, evaluation and planning, and enforcement (League of American Bicyclists);
- Kansas's Pedestrian Danger Index was ranked 35th in the country by LAB. While this may not sound too bad, it could and should be improved. In real numbers, 222 people died while walking in Kansas between 2000 and 2009 (Transportation for America).

But there is hope. Throughout Kansas, a number of metropolitan planning organizations (MPO) and cities are establishing programs and updating plans to create a safer environment for pedestrians and bicyclists. This article will provide some examples of these programs and hopefully inspire you to



Courtesy Mid-America Regional Council's Flickr stream

Children learn the basics of bicycling safely at bike rodeos sponsored by MARC's Safety Ambassadors.



start your own pedestrian and bicycle safety programs.

Mid-America Regional Council

The Mid-America Regional Council (MARC) has worked on a number of programs aimed at increasing the 4 Es (education, enforcement, engineering and encouragement) for pedestrians and bicyclists in the Kansas City metropolitan region. One of its educational programs, **Safety Ambassadors**, trains volunteers who are already engaged in pedestrian safety, such as law enforcement officers and teachers, to work with schools and



Sources:

- League of American Bicyclists, http://www.bikeleague.org/programs/bicyclefriendlyamerica/bicyclefriendlystate/pdfs/2011_rankings_and_grades.pdf
- Dangerous by Design 2011, Transportation for America, <http://t4america.org/docs/dbd2011/ks-dangerous-by-design.pdf>
- Mid-America Regional Council:
 - Explore KC, <http://www.marc.org/bikeped/explorekc.htm>
 - Safe Routes to School, <http://www.marc.org/bikeped/sr2s.htm>
 - Safety Ambassadors, <http://www.marc.org/bikeped/safetyambassadors.asp>
 - Bicycle Rodeo Images, <http://www.flickr.com/photos/marckc/sets/>
 - Destination Safe Coalition, <http://www.marc.org/transportation/safety/destinationsafe.htm>

communities to educate children to be responsible and safe pedestrians and bicyclists. Safety ambassadors participate in “bicycle rodeos” for children that offer courses in safety, helmet fittings and basic bicycle repair demonstrations and tune-ups. Since the Safety Ambassadors program began in 2007, over 90 ambassadors have been trained and over 1,000 children have been educated about pedestrian and bicycle safety.

“Bike More, Walk More” is the motto for **Explore KC**, a program that encourages people of all ages to explore Kansas City by foot or bicycle for both commuting and recreational purposes. The campaign also aims to improve air quality and reduce traffic congestion. This program has increased the safety of bicyclists by handing out red blinking LED lights that attach to bicycles and reflective arm bands for cyclists.

Destination: Safe Coalition is a program that focuses on bicycle and pedestrian safety, engineering and enforcement issues. It is a partnership between local agencies that have a stake in improving bicycle and pedestrian safety, such as law enforcement, traffic engineers, emergency service providers, transit coordinators and local officials. The program provides a way for these agencies to get together and discuss transportation safety issues. Destination: Safe Coalition has helped establish the region's safety priorities, coordinate the region's safety planning, and implement coordinated efforts that improve transportation system safety.

The **Safe Routes to School** program helps create a safe and welcoming environment for children to walk or bicycle to school. Recent interest in



the program comes from a number of factors, such as an increase in child obesity rates and diabetes, a reduction in the budget for bus transportation, and an increase in fuel costs. The program looks at all of the 4 Es described above, by:

- Encouraging students to try walking or bicycling to school.
- Educating children about the health and environmental benefits of walking or bicycling.
- Making engineering changes to the walking and biking environment to reduce speeds and create safe crossings and facilities, and
- Enforcing laws that ensure the safety

of children.

Getting started is easy

Creating a safer environment for pedestrians and bicyclists in your community doesn't have to be a difficult or expensive task. Aaron Bartlett, Bicycle Coordinator at MARC, suggests the 3 Ps for getting started: **program, project and policy**. Start by adopting a policy in favor of bicycling and pedestrian activities. Then encourage the enforcement of the policy. Next, create an inventory of current conditions in order to identify needed projects, such as intersections without crosswalks, or sidewalks without

ADA ramps. Inventory all these items to find major accessibility or safety gaps in the system. Next, prioritize the gaps and develop a list of projects for both short-term and long-term plans.

In sum

Metropolitan Planning Organizations in Kansas, like MARC, have begun working on a number of programs and policies that will increase the safety of pedestrian and bicyclists. Look for information on pedestrian-related programs of other MPOs in Kansas in our next issue. ■

Air pollution 101 *Continued from page 9*

less mowing and fewer chemicals. Planting native plants on rights-of-way to reduce mowing needed.

- **Don't idle your vehicle.** Vehicle emissions are a major contributor to air pollution. Studies have linked various types of vehicle emissions to asthma symptoms, cardiopulmonary disease, and lung cancer.
- **Keep vehicles and motorized equipment efficiently.** Regular maintenance and oil changes can reduce emissions by 50 percent.
- **Update diesel engines to reduce emissions and reduce engine idling.** Retrofit older diesel vehicles with pollution control devices in the exhaust system. Reduce idling with auxiliary power units, cab heaters and block heaters. Replace older engines with newer, cleaner engines that are certified to a more stringent set of engine emissions standards. For more information on what you can do update diesel engines and the typical cost associated with these upgrades, go to EPA's National Clean Diesel Campaign website at <http://www.epa.gov/otaq/diesel/index.htm>.
- **Make work adjustments.** On Ozone Alert days, have your employees perform any strenuous outdoor activities early in the morning to help avoid conditions that may cause health concerns, especially for those employees with

asthma or other existing health issues.

In summary, while the air quality in Kansas is generally good, it's important to take steps to keep it this way. Use the available web resources, such as MARC's SkyCast page or the tools on AIRNow's website, to find out when air conditions are poor or when it's an Ozone Alert Day.

On days when the ozone or particulate matter levels are high, take reasonable precautions to reduce your contributions to air pollution and to safeguard the health of your employees who work outside. It's good for your agency and it's good for Kansas. ■

Changes to Air Quality Regulations?

Until just recently the EPA has been considering a stricter standard for ground-level ozone attainment. According to Amanda Graor at MARC, if the level is lowered from 75ppb to 60 or 70 ppb, while much of Kansas would probably still stay in attainment, areas near Kansas City and Wichita might not.

What are the ramifications? If an area is considered to be in nonattainment, the State Implementation Plan may require expensive clean-up and stricter controls for industrial sources like manufacturing and power plants — as well as traffic flow management for motor vehicles. Also, extra controls could be required for smaller and more numerous pollution sources, such as gasoline stations. Vapor recovery sleeves might be required on the pump handles, and the stations might be restricted to selling only higher-grade and more expensive fuel. The EPA could require a nonattainment area to develop a new regulatory plan for reducing emissions.

Graor said the EPA has received a lot of pressure from senators and industry groups to delay the update to the ground-level ozone until 2013, the date of the next scheduled review. And indeed, these potential changes are off the table for now. President Obama requested that EPA Administrator Jackson withdraw the draft Ozone National Ambient Air Quality Standards, saying that it would impose too severe a burden on industry and local governments at a time of economic distress.



Save Electricity with LED Streetlights

By Nora Fairchild

If you are trying to make sustainable changes in your community, one simple solution is to install or replace existing street lights with LED light fixtures. This article will explain how LEDs work, the costs and benefits of making the switch and how LED lighting contributes to sustainability.

How LED lights work differently than incandescent bulbs

Light-emitting diode (LED) light bulbs are becoming fairly common in household use. Due to their energy efficiency and long-term cost-effectiveness, communities are bringing the bulbs to a larger scale for use in street light fixtures.

The fixtures include many individual LED bulbs in one unit. The light from LED bulbs is clear blue or white rather than yellowish like incandescent street lamps. This change helps colors being illuminated to look more “true,” and may help some people see better while driving.

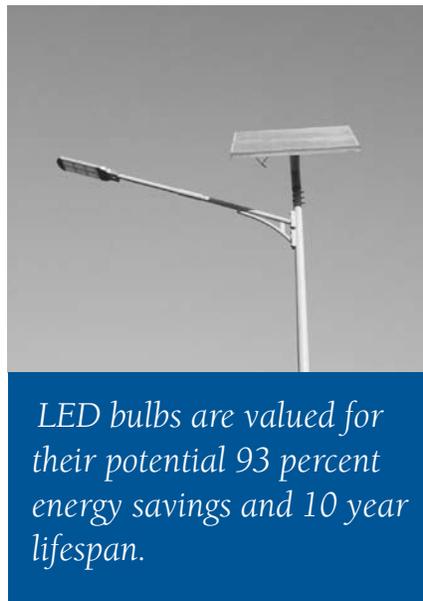
Efficient and effective

Several characteristics of LED fixtures help communities save money:

Energy efficiency. LED fixtures use significantly less power to operate than incandescent fixtures. According to a study by the Missouri Center for Transportation Infrastructure and Safety at the Missouri University of Science and Technology (Missouri S&T), LEDs can provide a 93 percent energy savings.

Bulb longevity. LEDs contain no mercury and produce less heat than other bulbs so that the unit can work efficiently without premature bulb burnout. LED bulbs transfer heat over the area of the lamp evenly, and the unit lasts longer as a result. Missouri S&T estimates the lifespan of an LED bulb at 10 years.

Maintenance advantages. While traditional bulbs need to be replaced as soon as the bulb goes out, LED fixtures contain many small individual bulbs that create a uniform glow so it is hardly noticeable when a few of the small bulbs



go out. Maintenance can be scheduled at regular intervals rather than in response to instances of street lights burning out.

A good fit with solar power. LED light fixtures come in different types, including solar-powered. Using solar power is especially feasible for these fixtures because the energy draw from LED bulbs is much lower than for incandescent bulbs.

Can be retrofitted. A new LED unit can replace an incandescent unit on an existing pole. Swapping the units takes only about 30 minutes per fixture, per the Missouri S&T.

Cost

Upfront, LED street light units are significantly more expensive than traditional ones. According to an article in USA Today, LED units cost about \$1000 per unit compared to conventional units that are around \$250 each. Bulbs are more expensive too; LED street light bulbs themselves go for about \$40, while conventional high pressure sodium lamp bulbs are about \$20. However, LEDs are much more energy efficient, and that’s the primary way long-term cost savings are achieved. While communities would have to pay

more for the fixture to start, they would save maintenance costs and energy costs over the long run, helping to make up the difference.

Communities using LEDs

Many communities across the United States, large and small, are using or piloting LED street light fixtures in their jurisdictions. Here are just a few:

City of Los Angeles, California. uses LED street lights, and their Bureau of Street Lighting states that LEDs are a no-cost sustainable alternative because they are highly efficient.

City of Lawrence, Kansas. A newspaper article about Lawrence, Kansas’ switch to LED bulb units in the vintage-looking streetlights downtown reported that it will take about 40 years for the lights to pay for themselves in energy savings. Even with the long payback, staying with traditional bulbs may soon not be an option for many communities. Assistant city public works director Mark Thiel said Lawrence’s switch to LED lights would be inevitable because of decreasing production and decreasing popularity of metal halide and high pressure sodium light bulbs.

Riley County, Kansas. Riley County Public Works has installed five different types of LED street lights in their parking lot to test their effectiveness. All are solar powered.

Solar panels come in two types—monocrystalline and thin film. Rod Meredith, the County’s assistant public works director, says the thin film system is a better alternative for use with LEDs because it includes batteries in the base of the pole that enable more storage capacity for power. The streetlight also remains dim until a car approaches, preserving power until it is needed. LEDs do not take as long as traditional lights to illuminate to full brightness. These units cost about \$7,000.

Meredith says solar technology coupled with LED fixtures really saves money if the fixtures are being placed in a new area that would otherwise not need electrical lines installed.



According to Pacific Gas and Electric Company there are many benefits of replacing traditional street light bulbs with LED bulbs:

- Improved night visibility for pedestrians, bicyclists and drivers due to higher color rendering, higher color temperature (more prevalence of yellowish white, orange and red colors) and increased illuminance uniformity
- Significantly longer lifespan
- Lower energy consumption
- Reduced maintenance costs
- Instant-on with no run-up or re-strike delays
- No mercury, lead or other known disposable hazards
- Lower environmental footprint
- An opportunity to implement programmable controls (e.g. bi-level lighting)

Riley County plans to install three more types of LED street lights in their parking lot this year to consider the best options for future use in parks and possibly on county roads. Meredith says that the LED street lights they are testing are self sufficient and work well.

For more information about Riley County's test of solar powered LED units, contact Rod Meredith at (785) 539-2981.

Potential downsides to using LED technology

Technology is new and changing. Meredith said the only thing to watch out for is the rapidly changing LED industry. Because the products are so new, variations of LEDs fixtures come out often that you may not be able to depend on using the same replacement equipment and bulbs and procedures again and again.

Very bright light. According to the Missouri S&T, there have been complaints that LED street lights are too bright and at times distracting for drivers. In residential areas, LED street lights can be bothersome at night when they are in close proximity to bedroom windows. However, Meredith

says that the complaints he received in Riley County were that the solar lights installed in their parking lot were not bright enough. He plans to install one of the brightest LED fixtures soon to compare it to the relatively dimmer models he currently has in place.

On the plus side, LEDs' capacity for brightness could allow bicyclists to ride at night with greater safety.

Are LED units worth the extra cost?

The initial cost of LEDs can be intimidating and could deter a community from making the switch. However, LED street light fixtures are energy-efficient and can be cost-effective in certain situations. They have more potential to be cost effective for new installations rather than retrofits on existing fixtures that already have an incandescent fixture in place and you could just continue replacing the bulb when it burns out. Still, retrofits allow for significant energy savings and more predictable maintenance—a plus for any community, and something to consider as electricity prices continue to rise in Kansas and the availability of incandescent bulbs declines over time. ■

Sources:

- Grassman, Scott E. et al. "Alternative Energy Sources for MoDOT." Missouri S&T. February 2011. http://ntl.bts.gov/lib/36000/36000/36022/R260_CR.pdf
- Metz, Christine. "Downtown Street Lights Switched to LED." Sunflower Horizons. May 31, 2011. <http://sunflowerhorizons.com/groups/making-good-choices/2011/may/31/downtown-street-lights-switched-to-led/>
- Lunar Accents Design. "LED Thermal Management" 2008. <http://www.lunaraccents.com/educational-LED-thermal-management.html>
- Email and phone interviews with Rod Meredith and Mark Thiel, 2011.

Environmental Benefits of Warm Mix Asphalt *By Lisa Harris*

One way to reduce energy use and air pollutants in your paving projects is to use warm mix asphalt instead of hot mix.

- Environmental benefits include:
- Reduced fossil fuel consumption in producing the mix.
 - Reduced fuel consumption when transporting and placing the mix.
 - Reduced emissions.
 - Increased potential for using more recycled asphalt in the mix.

To learn more, about the sustainability characteristics of asphalt, go to the Asphalt Pavement Alliance website at <http://www.asphaltroads.org> and download their publication *Carbon footprint: How does asphalt stack up?*

Source: Black and Green: Sustainable asphalt, now and tomorrow. National Asphalt Pavement Association (NAPA). 2010. ■

Do you need an engineering license to do this?



Do you need an engineering license to determine the size of a culvert that runs under a driveway? Answer below. ■

ANSWER: Yes. An engineer must size the culvert or officially sign off on your determination. Source: Road & Bridge Tasks in Kansas, 2005.



WHAT'S NEW

By Lisa Harris

See download / ordering information on next page.

Here are three new resources specifically written for local road owners:

Road Safety Information Analysis: A Manual for Local Rural Road Owners

This document was designed to acquaint local agency practitioners, regardless of background or experience level, with the sources, calculations, tools and methods to make data-supported decisions about local road safety. FHWA, 2011.

Roadway Departure Safety: A Manual for Local Rural Road Owners

A majority of fatal crashes in rural areas involve a roadway departure. This document identifies a variety of common causes of roadway departure crashes and how to address them. This is a good overview of the topic, and it is well illustrated. FHWA, 2011.

Intersection Safety: A Manual for Local Rural Road Owners

This document identifies a variety of common causes of roadway departure crashes and how to address them. FHWA, 2011.

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."

■ TRAINING:

2011

Traffic Signal Design – NEW COURSE

November 2 – Wichita
November 3 – Lawrence

Bridge Maintenance

November 9 – Salina
November 10 – Lawrence

Alternatives to Paving Half-Day Class

November 30 – Lawrence

Legal Permitting & Regulatory Process

▲L3-r
December 7 – Manhattan

2012

Risk & Liability Issues ▲L1

January 18, 2012 – Salina
January 25, 2012 – Lawrence

MUTCD for Technicians ▲L1

January 12, 2012 – Topeka
March 20, 2012 – Hutchinson
May 22, 2012 – Hays

■ HOSTS WANTED!

Save travel time and expense for your employees by hosting an LTAP training workshop at your agency. Contact Kristin Kelly at (785) 864-2594 or kbkelly@ku.edu

■ MEETINGS:

KDOT-KAPA Fall Asphalt Forum

November 2-3 in Topeka
(local agencies are welcome)
<http://www.ksasphalt.com>

14th Annual Concrete Streets and Local Roads Seminar

November 8 – Overland Park
Contact Cindy Allen at 913-381-2251
(cindy@moksacpa.com) or visit <http://www.moksacpa.com> for more information.

Kansas County Highway Association Fall Meeting

November 14 – Topeka
<http://www.kansascountyhighway.org>

55th Annual Asphalt Paving Conference

December 1 – Lawrence
<http://www.continuinged.ku.edu/programs/asphalt/index.php>

Kansas County Highway Association & American Public Works Association Kansas Chapter Joint Meeting

May 9-11, 2012 – Newton

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.



South Dakota LTAP

ALTERNATIVES TO PAVING

Ken Skorseth, a national expert on low volume roads and the author of the popular "Gravel Roads Maintenance & Design Manual," is coming to Kansas to teach a half-day workshop on criteria for considering alternatives to paving, including taking an asphalt road back to gravel. The workshop will provide insights and case studies for assessing roadway surfacing options and stabilization methods. It will also cover safety and public relations issues when changing the type of pavement. See details above for this November 30 class.



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.

Road Safety Information Analysis:

A Manual for Local Rural Road Owners

FHWA, 2011. See description on page 14.

Download at http://safety.fhwa.dot.gov/local_rural/training/fhwasaxx1210/

or request hard copy

Roadway Departure Safety:

A Manual for Local Rural Road Owners

FHWA, 2011. See description on page 14.

Download at http://safety.fhwa.dot.gov/local_rural/training/fhwasal109/

or request hard copy

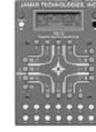
Intersection Safety:

A Manual for Local Rural Road Owners

FHWA, 2011. See description on page 14.

Download at http://safety.fhwa.dot.gov/local_rural/training/fhwasal108/

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.

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 LTAP Newsletter mail list
- send Road Scholar Program brochure
- add to KS LTAP email discussion list

Name _____ Phone number _____

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*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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Is your mailing information correct?

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



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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