

KUTC Newsletter

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An issue dedicated to the environment and health

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Local projects with federal aid must address environmental justice

[Two issues ago we focused on communicating with the public. This article builds on that theme, with an environmental twist. We'll explain the federal requirement for inclusive public involvement the EPA has coined "environmental justice." —Ed.]

... by Dr. Femi Adesanya

Transportation systems changes can have significant effects on communities and their residents. These may include changes in aesthetics, value of the surrounding property, nature of the neighborhood, accessibility, safety, noise, community cohesion and business productivity. And these effects can be long term or short term. For example, widening an arterial can have short-term economic development effects that produce long-term ramifications for property values in the area. Property value (and tax) increases are rarely welcome by any resident but can be a major



burden for community residents with low or fixed incomes.

Environmental justice analysis considers the fact that, when it comes to the effects of road projects, one size does not fit all. Minority and low-income populations tend to be affected in different

ways than the rest of the population. A transportation project that reduces the mobility of low-income residents, for example—many of whom already have limited transportation options—has a considerably greater effect than does a reduction in mobility in the general population.

Environmental analysis allows the effects
continued on page 2 ➤

Environmental Justice is defined by the US Environmental Protection Agency as:

“The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or execution of federal, state, local and tribal programs and policies.”

Environmental justice,
continued from page 1

of proposed transportation projects to be translated into costs and benefits to the various communities affected by the project. To receive federal approval and certification, transportation agencies must be able to demonstrate the equity of their activities.


The critical question in environ-

An example of environmental justice from Kansas: KDOT recently re-worked a major road improvement project near Cheyenne Bottoms to take into account the need for access for wheat farmers who needed to harvest their crops at a critical time in the project. To deny farmers access would have posed a significant economic hardship for farmers already hard-hit by last year's drought.

mental justice analysis is: Who is likely to feel the project's effects (whether positive or negative)? Environmental justice analysis uses a two-stage planning process to answer this question. The first stage is a preliminary screening that can be as brief or detailed as the situation warrants. This is when neighborhood concerns and characteristics are documented.

A community profile creates a picture of existing conditions and community values. It provides a baseline against which the effects of the proposed transportation project can be adequately evaluated.

- A typical community profile will include all or some of the following:
- employment information
- mobility characteristics
- accessibility characteristics
- quality of transit service
- environmental & social stress factors
- neighborhood resources
- level of public infrastructure



Here's a simple environmental justice tool: When people sign in at a meeting, ask them to put a push-pin on an aerial or plat map to show where their business or residence is located. Before the meeting begins, you will know who is present and where they work and live. You will see quickly where you need to extend your outreach.

This map can be useful when you present your plan/project at a public hearing, to show the locations where you have met with community groups. A visual reference reassures public officials that you have been in touch with their constituents.

The second stage of the analysis occurs after the project's effects have been determined. One looks at how these effects are distributed among the populations affected. Community profile information is used at this stage to tailor the project effects and mitigation to the community.

The only way to know a community's needs for certain is to ask its members. In addition, unbiased site observations and information collected from the affected communities are essential to understanding a commu-

nity's values and practices. Biased, flawed, and incomplete information collection will impede the analysis and will result in an inadequate environmental justice analysis.

About the author: Dr. Adesanya manages the NPDES and Stormwater Monitoring and Environmental Justice Division for J.B. Trimble Inc., in Birmingham, Ala. He will be the instructor for two Environmental Justice seminars to be held in Kansas in early October. See page 14. ■

Phasing in Phase Two

... by Ira Allen

Over the past three years, you've been hearing a lot from us about Phase Two permits and regulations, the second stage of the National Pollution Discharge Elimination System (NPDES). Well, the due dates for compliance with Phase Two regulations have come and gone. In this article, we will provide a quick overview of the three different programs of Phase Two, and will talk with staff at the Kansas Department of Health and Environment (KDHE) about how things are working out.

1) Industrial runoff

According to Alan Brooks, coordinator of both the construction and industrial runoff permits for KDHE, it's a little

hard to keep track of who has submitted applications for industrial permits and who hasn't. "We don't have any [tracking system] for these applications. But there are many communities from whom we have not seen any submissions," said Brooks.

All municipalities in Kansas by now should have filed an industrial activity Notice of Intent (NOI) form. This form may be easily completed. [We have a sample on our web site at www.ksltap.kutc.ku.edu]. Brooks said Phase Two hasn't had as large an impact on industrial activities as on construction or stormwater system activities.

2) Construction runoff

All communities in Kansas must comply with the Phase Two construction

permit program if they have eligible projects. Of those that haven't yet submitted construction permit applications, Brooks said some probably didn't because they don't have any projects large enough to be subject to construction runoff regulations. Municipalities with construction projects, for example, only need to apply for a permit if those projects are larger than one acre.

Most communities that have submitted construction permit applications have hired consultants to prepare them. Brooks noted that the applications have varied in how they were completed. "In general, counties with smaller demographics submit applications with more of a homemade feel, which is not necessarily a sign of poor quality," he said. "The main thing is to submit the application."

When asked for a subjective impression of how counties feel about the new regulations, Brooks said he'd heard "a little grumbling about unfunded mandates," but that everybody who's submitted seems to be complying as best they can. He also remarked, "Most of the county engineers I hear from seem very interested in complying. Of course, that's a self-selected group."

Brooks's final comment? "This isn't rocket science. You can apply for a permit with a brain and a pencil." And from the sounds of it, most municipalities are doing just that, one way or another.

3) Stormwater systems

The third program of Phase Two, regulating stormwater systems, doesn't yet involve extremely small systems, unless they're in urbanized areas, but it does represent the next small step in a large process.

Most of the changes municipalities make based on Phase Two MS4 requirements will not make our waterways pristine. For instance, the elevated fecal coliform bacteria levels in Sand Creek won't be entirely eliminated simply because Newton complies with

So, what is Phase Two again? It's a group of three permit programs related to municipal road departments: stormwater system discharge, industrial runoff, and construction runoff.

These programs aim to bring water quality protections to communities and entities smaller than those protected under Phase One of the NPDES. KDHE administers Phase Two regulations for the Environmental Protection Agency (EPA).

For more information on each of these programs, consult the Summer 2000, Spring 2002, and Summer 2002 issues of the *KUTC Newsletter*, which may be obtained by calling Lisa Harris at (785) 864-2590, or as PDFs from our web site at www.ksltap.kutc.ku.edu.

For further information on construction or industrial runoff permits, contact Alan Brooks at (785) 296-5549, and for information on municipal separate stormwater sewer system permits (MS4s), call Rance Walker at (785) 296-5537 or visit KDHE's web site at www.kdhe.state.ks.us/stormwater/#muni.

Phase Two. Newton is, after all, only one of several communities along Sand Creek. But over time, and as these requirements extend further to smaller cities all over the state and country, the effects will accumulate. At this point, however, said Rance Walker, it's a matter of everybody "doing their fair share," shouldering their part of the collective environmental responsibility.

The beauty of Phase Two, Walker said, is that it "focuses effort on solving problems, while still allowing leeway for municipalities to set their own priorities." He remarked, "We try to really encourage municipalities to look and see what their own local problems are, not just what's required by the permit"—in other words, what their citizens care about and want changed.

Walker noted that although the majority of communities that would need to apply for Phase Two stormwater permits have applied, they have not actually issued any permits yet.

"I don't want to make excuses, but we simply haven't had the time and resources," Walker said. Because of this, those that have applied are "though I hate to say it, sort of in limbo," he said. Of course, once the permits are issued, they'll be required to meet the obligations of the permit, but for now, most municipalities have done all that's required of them.

KDHE has gone through the first

couple of versions of the stormwater permit, and is currently redrafting it. Then it will be placed on public notice for at least 30 days, and EPA will also review it for comment. Depending on the comments received, the draft will either be considered final or modified again—and cycled through the comment process again. Walker said, "I certainly hope we can get that done by the end of this year—it may be at least two to four months."

Once stormwater permits are issued, compliance would be tracked by annual reports, as it now stands in the latest draft.

"The point is, [communities are] supposed to identify what they're committing to do under the permit, and their annual reports should document that," said Walker. "It ends up being a self-reporting compliance process. That's the way the system works under other NPDES permits," he explained.

Just a phase?

The Phase Two permitting process looks like it's here to stay, and most communities have already taken steps to fulfill their obligations under new regulations. As mentioned above, Phase Two is "just a phase," in one sense. That is, it's simply one step in the larger project of holding ourselves accountable in the EPA's long-term focus on water resource protection. ■

Safety, health, and the Hispanic worker

... by Brad Sant



Did you know that more than 270 Hispanic construction workers were killed on the job in 2000? Those numbers surprised me, too. Hispanic workers are a growing and important part of the roadway construction industry, but their

injury and death rates have reached record high levels. It is time for the industry to quickly address this problem through better training and improved communications.

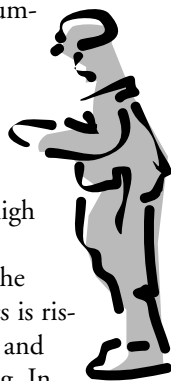
A look inside the numbers

The statistics are compelling. Hispanic workers make up nearly a third of the roadway construction workforce (see Table 1). During 2000, the rate of occupational fatalities for all Hispanic workers increased 24 percent from the previous year, to 815 deaths. That increase was nearly 100 percent attributable to construction deaths. In 2001, the number of Hispanic deaths climbed to 891.

Construction was not the only reason for the jump in 2001, but it was part of the high number of fatalities.

At the same time the death rate for Hispanics is rising, the rates for white and black workers are falling. In 2001 the Bureau of Labor Statistics (BLS) reported the fatality rate for white workers fell for the sixth year in a row and the rate for black workers fell for the second year in a row.

Yet for the construction industry, with its high number of Hispanic



| Occupation | Total | Percentage of Total | | |
|--|-----------|---------------------|-------|-----------------|
| | | Women | Black | Hispanic Origin |
| Grader, dozer and scraper operators | 60,000 | 1.8 | 5.0 | 8.6 |
| Industrial truck and tractor operators | 542,000 | 6.3 | 20.8 | 20.8 |
| Construction laborers | 1,024,000 | 3.6 | 10.1 | 29.3 |

Table 1
A weighted average of the percentage of the workforce of Hispanic origin for these occupations yields an estimated 25.7 percent. Data source: BLS 1997. When contrasted with data from the U.S. Census Bureau, ARTBA estimates the percentage of Hispanic workers at approximately 28 percent.

workers, 2001 (the latest year for which we have statistics) closed with fatalities reaching their highest level since the Fatality Census was first conducted in 1992—with 267 deaths in the heavy and highway trades alone.¹

Why is the rate so high?

Hispanic workers are filling construction jobs—with traditionally high injury and fatality rates—in increas-

ing numbers. Some projections show Hispanic workers holding 47 percent of all construction jobs by 2010. The willingness of Hispanic workers to fill hazardous construction jobs is certainly one of the reasons for the high rates, but not the only one. A large portion of this workforce is immigrant and for many, English is a second language. Many industry professionals believe that Hispanic workers are not receiving the necessary safety and health training for their jobs, and in many circumstances where training is provided, they do not understand well enough what is being taught.

Another possible reason is many

Many Hispanic workers do not read or write well in their native language—and not all Spanish is the same. There are literally hundreds of different Spanish dialects... A long-term approach to language barriers may be to develop a type of “English as a Second Language” (ESL) program in the workplace.

workers prize their employment and are reluctant to complain about dangerous working conditions for fear of dismissal—real or perceived. The illegal immigration status of some workers

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compounds their fear of complaining.

A large portion of Hispanic workers continues to support immediate and extended family that remains in their native countries. Recent reports have documented that one of the largest sources of U.S. currency into many Latin American economies is derived from family members working in the U.S. and sending earnings home to their families.

The incentives are not always aligned properly to ensure safe working conditions for Hispanic workers. Yet, many contractors report that without their Hispanic workers they would not be competitive in the “low-bid” roadway construction industry.

Protecting the health and lives of Hispanic workers

No matter how one looks at the future of roadway construction, Hispanic workers will figure prominently in the work force. Employers must begin now to address the problematic injury and death rates for this valuable work force or they will suffer the emotional, financial, and demoralizing setbacks that inevitably come with a workplace fatality.

Training

The American Road & Transportation Builders Association (ARTBA) has been tracking this problem for some time and is developing safety and health training programs in English and Spanish to help employees address communication challenges with Spanish-speaking workers.

These tools, available in both English and Spanish, include a videotape to help teach workers how to avoid collisions in roadway construction zones; an OSHA approved 10-hour training program developed with the National Safety Council; and a safety orientation program for new hires, developed with the Laborers’ Union, the National Asphalt Pavement Association and the Operating Engineers Union.

Other challenges

Spanish training materials are just the beginning, however. Many employers will face challenges with worker literacy and varying dialects. Many Hispanic workers do not read or write well in their native language—and not all Spanish is the same. There are literally hundreds of different Spanish dialects emerging from over 30 Spanish speaking countries.

A long-term approach to language barriers may be to develop a type of “English as a Second Language” (ESL) program in the workplace. This follows the centuries-old process of creating value in workers by increasing their skills. Employers may also want to create an incentive program for workers to improve their language skills, such as assistance in obtaining a valid drivers’ license.

A long-term investment

If employers will invest in their Hispanic workforce, they will be

rewarded with hard-working, loyal employees who are able to complete their tasks safely. In the meantime, as the workers progress, the employers have developed a cadre of bilingual managers who will help communicate with the next round of employees who will be eager to learn English and work safely.

¹*National Census of Fatal Occupational Injuries in 2001*, Bureau of Labor Statistics News Release, USDL 02-541, September 25, 2002.

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Partnership Produces Best Practices

... by Ira Allen

Lately we’ve been hearing more about partnering initiatives between environmental agencies and highway agencies. Here’s an example from New Hampshire.

A new publication by the New Hampshire DOT and the NH Department of Environmental Services confirms the value of teamwork. *Best Management Practices for Routine Roadway Maintenance Activities in New Hampshire* covers culvert extension to embankment stabilization to road maintenance near designated prime wetlands—and emphasizes ways to accomplish these tasks with minimal disturbance to nearby water bodies.

The impetus for this collaboration was the fact that much of the

maintenance done along roadways involves drainage control, and runoff from roadways and work zones affects nearby water bodies. The manual’s intent is “to provide a menu of best management practices from which all roadway maintenance personnel may select practices appropriate to specific sites and conditions.”

In other words, it is not a one-size-fits-all guide to roadway maintenance. Rather, it is a collection of the experiences of the people who know best how to manage these activities: those of you in the field.

Thirteen best practices are described and illustrated. If this strikes your interest, check the manual out at the New Hampshire DOT’s web site (www.nhdot.com), where you can download it for free. ■

Antifreeze recycling: Good for the environment and your bottom line



... by Geneva Jacobs

In the course of normal vehicle operations, antifreeze picks up toxic metals from a vehicle's engine and must be disposed of with special care, or recycled. Many communities in Kansas are implementing antifreeze recycling programs. Recycling antifreeze reduces waste, saves money, and helps to reduce dependence on limited natural resources.

How does antifreeze become toxic?

Unfortunately, both EG and PG antifreeze pick up heavy metal contamination from the vehicle's engine when the vehicle is driven. This contamination, which can contain lead, makes any used antifreeze toxic.

Regardless of whether you're using a PG- or EG-based antifreeze, if you are planning to dispose of it and buy new antifreeze (instead of recycling), the Kansas Department of Health and Environment (KDHE) requires you to test how hazardous

your used antifreeze is. Hazardous material is tested using the Toxicity Characteristic Leaching Procedure (TCLP). To find out more about TCLP, check out the Environmental Protection Agency's web site at <http://www.epa.gov/oamcinc1/0112125/1311.pdf>.

Why recycle?

Because used antifreeze is contaminated with heavy metals, it must be disposed properly. Antifreeze should never be dumped on land or in water, or put into any kind of drain, inside or outside. This practice is a violation of the Clean Water Act and can harm people, pets and wildlife.

Antifreeze can't be diluted with water to make it nontoxic. Therefore, no type of antifreeze is safe for disposal in the environment.

Properly disposing of antifreeze as a hazardous waste is expensive, especially when you consider you then have to also buy new antifreeze.

Another argument for recycling is saving nonrenewable resources—in this case, ethylene glycol or propylene glycol, derived from coal or petroleum. Recycling antifreeze keeps these resources in use and out of the environment.

Good as new?

Recycled antifreeze is less expensive than new antifreeze, but is it as good? Extensive research indicates that, when properly formulated, recycled coolants meet nationally recognized performance specifications, and many even exceed them. So quality of product is not a concern with recycling.

Costs

For a closer breakdown of price differentials, see the sidebar accompanying

What is antifreeze?

Antifreeze serves three main functions in a vehicle: heat transfer, corrosion protection and protection from both freezing and boiling in the engine. Glycol is the main ingredient in all antifreezes, in one of two forms: ethylene glycol (EG) or propylene glycol (PG). In addition to the glycol base, most antifreeze also contains corrosion inhibitors and foam controllers.

this article; note how much cheaper it is to recycle than to dispose of used antifreeze and buy new coolant.

If that weren't enough incentive, a fine of up to \$25,000 per day and possible jail time may ensue for those who use improper disposal methods for used antifreeze.

Specs and regs

The American Society of Testing and Materials (ASTM) International provides antifreeze standards that are accepted and used in research and development, product testing, quality systems, and commercial transactions around the globe. ASTM International's antifreeze standards concern antifreeze-grade ethylene glycol and the general, physical, chemical and performance requirements for supplemental coolant additives (SCAs).

Federal procurement guidelines recommend federal fleet managers establish programs for antifreeze recycling that consist of reclaiming spent antifreeze on-site or establishing a service contract for recycling it off-site.

In addition, several state DOTs, including the Kansas Department of Transportation (KDOT), have set product specifications for used antifreeze. Per KDOT regulations, the antifreeze must comply with all chemical, performance and physical requirements of the latest revisions of both ASTM D 3306 and ASTM D 4985.

Comparisons of four antifreeze recycling methods

| | 1) On-site, closed loop | 2) On-site batch | 3) Mobile service | 4) Off-site service |
|--|--|----------------------------|-------------------------------|---------------------|
| process type | filtration or ion exchange | filtration or distillation | filtration or reverse osmosis | distillation |
| capacity (gal./hr.) | 4-5 | 4-100 | 55-210 | 375-500 |
| facility worker training required | yes | yes | no | no |
| service disposes of recycled wastes | yes | yes | some do | no |
| capital cost range | \$2500-13,800 | 3,700-18,000 | none | none |
| cost range per gallon to recycle antifreeze* | filtration \$3.00-4.50 ion exchange \$4.45-7.20 | \$0.74-4.50 | \$1.75-3.00 | \$3.20-3.70 |
| average labor time | 30-60 min. | 25-35 min. | 20-30 min. | 20-30 min. |

*Cost ranges are after unit capital cost payback and do not include labor costs. From "Antifreeze Recycling," *Best Environmental Practices for Auto Repair and Fleet Maintenance*, US EPA, November 1999.

For more information, visit the ASTM web site at www.astm.org.

Only select an antifreeze recycling method after directly discussing quality specifications and vehicle warranty concerns with potential recycling machine or service vendors. If possible, find a vendor who will guarantee the quality of their recycled antifreeze or who can provide certification letters from vehicle manufacturers or customers. You should definitely find a vendor who can meet KDOT specifications for used antifreeze.

KDHE encourages antifreeze recycling because it is safer and better for the environment. The agency does not require tests for contaminants in antifreeze destined for recycling. However, testing will continue to be required of those who generate used antifreeze slated for disposal (rather than recycling).

Recycling options

Due to special restrictions that apply to waste antifreeze, precautions must be taken to ensure its proper handling. Some shops purchase their own recycling equipment or use an

antifreeze recycling service. Each of these practices solves the problem of antifreeze waste disposal and also provides reformulated antifreeze, thereby eliminating the need to purchase new antifreeze. Waste antifreeze can be recycled via one of the following three methods:

1) *Recycling on-site:* Waste antifreeze is recycled in a machine located on-site that is owned by the facility and operated by its employees.

2) *Using a mobile recycling service:* A vehicle equipped with a recycling unit, owned by a recycling company or other operator, visits the facility to recycle the waste antifreeze on-site.

3) *Recycling off-site:* Waste antifreeze is picked up by a recycling company that re-supplies the facility with recycled antifreeze.

Each of these recycling methods involves the same two steps: removing contaminants and then restoring antifreeze properties with additives. Although it depends on the amount of antifreeze destined for recycle, it is typically cheaper for an agency to use a mobile recycling service—or to use their own equipment—to recycle

waste antifreeze than to purchase new antifreeze and hire a separate service to dispose of the used antifreeze.

Another cost-effective option is to send used antifreeze to an off-site recycling service while buying back reformulated antifreeze from the same company. Disposal of used antifreeze while buying new antifreeze is the most expensive choice.

Which method is best for you?

The following possibilities should be considered when evaluating which method is best for your shop:

- purchasing new antifreeze versus recycled or extended-life (which comes with a five year/150,000 mile warranty);
- shipping used antifreeze off-site for recycling;
- buying or leasing on-site recycling equipment and replacement filters;
- contracting with a service to recycle used antifreeze on-site and reformulate the recycled product;
- paying to use and maintain on-site recycling equipment; and
- paying to dispose of hazardous waste.

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Chlorides and other dust suppressants help keep dust on the road and out of the air

... by Phil Collins

One car traveling one mile of unpaved road daily for a year causes one ton of gravel (a natural resource) to be lost. Multiply that by the number of vehicles that travel daily on the network of unpaved roads in our counties across Kansas and you can quickly see what an impact this can have on the depletion of our natural resources and our built environment.

Fugitive dust kicked up by traffic on an unpaved road is a sign that the stability of the road surface has been weakened. Dust, or “fines,” acts as a glue to hold the surface of unpaved roads together. An unstable surface is a driving hazard. Another hazard is the dust itself—it limits visibility.

Dust creates a health hazard for residents who live on or nearby unpaved roads. There are also hazards to consider for sensitive crops, roadside vegetation and animals.

In addition to environmental and health effects, road dust affects the bottom line. When fines are lost, gravel loss and maintenance costs increase dramatically.

One way to reduce the amount of dust that becomes airborne from passing vehicles is to use dust suppressants on an unpaved road. A dust suppressant can reduce the amount of fines that can be removed by vehicles or wind because they hold or bind the surface particles together and increase the density of the road surface.

Dust control products

There are many types of dust control products. Chlorides, lignins, asphalts and oils are some of the most common varieties available in this area of the country.

Chlorides. These are the most common and cost-effective products used for dust control. Liquid calcium chloride and liquid magnesium chloride are water-based, odorless, colorless, nontoxic, nonflammable and “environmentally friendly” when applied properly. [See application tips on page 9.] Chlorides mix with the dust to form a glue that binds together the road particles.

Most road materials are negatively charged. Calcium chloride and magnesium chloride are positively charged so they are attracted to and bond with the road materials being treated. This bond ensures that these products will not leach out of the road surface.

Calcium chloride and magnesium chloride are hygroscopic and deliquescent. These properties give a road the ability to hold moisture and draw moisture from the air to keep the road surface damp over an extended period of time.

A chloride-treated road can be graded without losing its dust control. Check with your chloride distributor on the correct method of maintaining a chloride treated road.

Lignins. A by-product of the paper pulp industry, these products are often referred to as “tree sap.” Lignins have to be diluted for dust control use. The preferred application method for lignins is to blade them into the road materials. This is because lignins do not penetrate well on their own.

Lignins have a strong tendency to leach out with rainfall. Lignins also have a strong odor.

Lignins can have limited availability—which can affect pricing. Lignin treated roads cannot be maintained without destroying the dust control.

Asphalts. Cut-back liquid asphalts and emulsified asphalts are readily available but are not as widely used as they once were. These products form a “crust” over the surface of the road, covering up the dusty surface, and they do not bind well to the dry surface below. The use of these products increases the maintenance of unpaved roads for road agencies. Asphalt-treated surfaces tend to increase the potential for potholes, making the driving surface of the road less stable. Citizen complaints are sometimes a problem if vehicles pick up these products when traveling over a freshly treated surface.

Asphalt treated roads are difficult to maintain because the road surface cannot be bladed without losing the dust control; agencies are also reluctant to spend maintenance dollars patching potholes on rural roads.

Oils. One of the most common in this category is soybean oil soapstock. Like lignins, this is a by-product of refining plant material—in this case, soybeans. The preferred application method for soybean oil soapstock is to blade it into the road materials. This product does not penetrate well into road materials and has a strong tendency to leach out with rainfall. It also has a strong odor. The availability will depend upon the proximity to soybean processing plants which will affect freight costs and pricing.

Soybean oil soapstock-treated roads are difficult to maintain without losing the dust control.

The benefits of dust control

The environment—natural and man-made—can be significantly improved by controlling fugitive dust on unpaved roads. Dust on crops and roadside vegetation can be drastically

Citizens Share Cost of Dust Control

Recently, some Eudora, Ks, residents [in Douglas County] have found their neighborhoods way too dusty. In response to clouds of dust created by a growing amount of traffic in the region, homeowners near the Hesper Heights subdivision have collected \$51,000 to pay for paving the gravel roads in the area. Those funds will pay for part of the cost, and they want the County to cough up the rest of the money.

While Douglas County—which does not currently have a formalized dust control program—ponders this idea, some counties in Kansas have found ways that work for them for dealing with controlling dust on rural roads. Here's an example:

Up until 2000, Johnson County offered a no-cost dust control program to its residents, providing 300 feet of surface treatment to anyone living within 300 ft of the road in question. However, due to budget cuts, this service has been changed to a citizen-paid program. Now, Johnson County residents can have MC-30 asphalt put down in front of their homes for \$400 for the first 300 feet, plus \$1 for each additional foot.

Johnson County typically receives about \$11,500 per year from citizens wanting to take advantage of the program, said Johnson County engineer Norman Bowers. This translates into about 11,000 feet of dust control per year. Bowers said that residents typically band together to split the cost; the money they raise covers the price of materials, but may not cover preparation costs such as adding rock to stabilize the road. Any funds not provided by the residents come from the County's normal operating budget.

Residents that pay for surface treatment are also encouraged to repair small potholes that may appear in the treated area. Pothole patching material is available at home improvement stores and lumber stores.

Johnson County has prepared a pamphlet for residents about their program. You can download their dust control pamphlet at our web site: www.kslap.kutc.ku.edu. For more information, contact the Johnson County Road Maintenance office at (913) 715-8354.

Sources: *Lawrence Journal-World*, 8/21/2003; *Dust Control on Low Volume Roads*, FHWA, May 2001; <http://www.jocoks.com/pubwrks/Projects/dustcontrol.htm>
—by Courtney Hansen

reduced. Air quality can be significantly improved for residents that live on or nearby unpaved roads. Much less dust will migrate into homes, businesses and vehicles.

For the agencies that have a dust control program, there are added benefits: reduced maintenance costs, reduced aggregate replacement costs (thereby conserving a natural resource), and reduced complaints from the motoring public.

Phil Collins is a regional sales manager for Scotwood Industries, Inc.—a distributor of chemicals for dust control and deicing. He can be reached at (913) 851-3500 or at pcollins@scotwoodindustries.com ■

Phil's preparation & application tips for chlorides

The road surface should contain sufficient amounts of a good mixture (gradation) of road material with a maximum size of 3/4 inch down to a fine dust. If there is not a sufficient amount of material with the proper gradation, new material of the proper gradation should be added and blended-in.

The road surface should be watered to help conserve the fine dust, which is the required binder. The surface should then be "wet" bladed sufficiently to break up the crusted surface, potholes and washboarding, and to form a smooth surface with a modified "A" crown (four percent crown) for proper drainage. Dry blading is not recommended; it will segregate the materials and the fines will blow away.

Blading is important especially if the surface contains hard, crusty or tire-polished areas or if other dust control products have previously been used. The freshly-bladed surface should be pre-wetted to an optimum moisture content of seven percent (to form a mud ball) just prior to the dust control application.

Chlorides should be applied with a calibrated, ground-speed-controlled unit specifically designed for road work. Your chloride sales rep will best be able to recommend the correct application rate for your needs. For best results, traffic should not be allowed on a treated surface for a couple of hours, until it has started to cure. If traffic must use the treated surface, vehicles and speed should be kept to a minimum.

Rolling the surface with a pneumatic (rubber tire) roller is recommended, but not mandatory. Rolling will compact the surface and seal in the moisture created by the combination of the water and the chlorides. Watch to see that the rolling does not cause the road surface to "pick up" or stick to the tires. If this happens, stop rolling and allow more time for the surface to cure.

Oh Deer!

A new look at preventing deer/car collisions

... by Ira Allen

Collisions with deer and other large animals are the third most common type of motor vehicle accident in the United States. In Kansas in 2002 alone, 9000 animal-vehicle collisions caused one death and 337 injuries. That's 13 percent of all accidents in Kansas for that year. And those are just *reported* accidents. KU Researcher Eric Meyer mentioned a Minnesota study that found a whopping one-half of deer-vehicle accidents go unreported up there. So the actual numbers in Kansas, too, are probably even more alarming.



helpful in determining how, where, and when to take precautions to prevent collisions (like installing deer crossing signs). Unfortunately, as the industry saying runs, deer can't read signs. Perhaps what we need, joked Meyer, are literacy programs for the deer. KU doctoral candidate Ishtiaque Ahmed wrote in his dissertation, "Traditionally in Kansas, accident records have been used to identify locations where deer collisions occur most frequently, and warning signs or other mitigation measures have been installed as appropriate. However, the sites are not generally reassessed at a later date to determine if the signs are still needed or if the countermeasures were effective." Deer movement patterns shift, and human countermeasures do not always shift to meet those changing patterns. Furthermore, Ahmed noted, past efforts have not often focused on determining where new high-risk areas will spring up.

Ahmed's dissertation suggests a new, more proactive approach for

reducing deer-vehicle crashes. He sets forth two similar models for predicting segments of highway that are high-risk with respect to deer-vehicle crashes. These models could allow planners to deal with problem areas before they become a problem.

Meyer explained the thinking behind these models: "The idea is to figure out which highway segments should be given the highest priority [when installing accident prevention measures]." Traditionally, DOTs have decided this using formulae based on the number of accidents per year for a given number of years. One problem with this, as Meyer mentioned, is that high-accident segments may change from year to year. Where deer go for food and water changes every year, and even if a segment of the highway is very high-risk, it may happen that there are dozens of near-misses in that area, but only one or two accidents over a number of years. This would result in that area not being given priority in preventing animal-vehicle collisions. "So the crash history may not be the best predictor," Meyer said.

Ahmed takes a comprehensive approach in determining where the State DOT and local agencies should concentrate their resources, including in his models a number of factors considered by other researchers as well as a couple of his own, such as "clear width" and "median type" of the roadway.

Looking for a sign

This may well be the only article you'll read this year comparing deer to hurricanes, but the two have some similarity in terms of how we predict and prepare for their impact. In past years, the response to hurricanes was to hope they wouldn't hit us, and then clean up the wreckage afterwards. In areas that experienced frequent hurricanes, some extra measures were taken—like evacuations—but their effectiveness was limited because they were overused. Because

continued on page 13 ►

Here are some statistics for you to munch on. Deer-vehicle accidents cost us all a lot more than you might imagine:

- In 2002, 9000 deer-vehicle accidents were reported in Kansas (13 percent of total accidents in the state);
- 12 years earlier, in 1990, only 60 accidents were reported;
- About \$8 million are spent collecting deer carcasses in the US every year;
- Injuries and fatalities from deer-vehicle accidents cost about \$200 million per year in the US;
- Each deer-vehicle collision costs an average of \$2000 in repairs to the vehicle.

KDOT Korner

Public Involvement, KDOT Style

... by Courtney Hansen

Historically, most DOTs have only significantly included public opinion in large-scale projects, leaving public involvement on smaller projects to district engineers, who often don't have the time or training to effectively seek formal public involvement. At KDOT, most of the agency's public involvement centered on specific issues on large-scale projects that were hot buttons for the public.

To improve public involvement on a broader scale and make it a standard way of doing business, KDOT decided to implement one of the first DOT-wide public involvement programs in the nation. In planning this program, KDOT realized that its district-office employees, who are familiar with local attitudes and conditions, were an untapped resource for community involvement.

KDOT started by conducting a series of interviews—both internal and external to Kansas. The external interviews were conducted with 22 other DOTs, and focused on learning more about their public involvement practices. In states with decentralized DOTs, with coordinators in each district of the state, public involvement was more effective than that in states with very centralized DOTs. Local coordinators prove valuable in these states because they live and work in their districts and have direct experience with local issues, which generates greater public trust and familiarity.

In states with more centralized DOTs, public involvement was improved with the addition of personnel hired specifically for communicating with the public.

KDOT also conducted interviews with their own staff and with the Kansas public. The interview results indicated that KDOT staff were generally effective with their interactions with the public, but the timing of public information could be improved. The results also indicated that communication with the public should be done more at the local level and less from one central office.

Based on these findings, KDOT created a list of recommendations for improving their public involvement program. The list includes:

- Expand the organizational culture and structure, so the public's communications needs are more fully met.
- Revise the project planning and development process, allowing the public to participate in decision-making in a more timely and meaningful way.
- Provide staff training to increase awareness about the public involvement process and to provide KDOT employees with the tools necessary to successfully complete their jobs.
- Improve internal communication between functions so that the public's concerns and issues are addressed throughout the transportation process.

KDOT's first step in implementing these recommendations was to add a "discovery phase" to project planning and development. In the discovery phase, KDOT examines the physical characteristics of the road section, reviews the environmental status of the area, and determines the level of public involvement required for the project. The discovery phase also allows

KDOT district engineers and planners to suggest revisions early, based on public comments obtained in a variety

of manners, from one-on-one discussion to public hearings.

To help staff inform the public in a timely manner, KDOT developed a set of worksheets called *Step-by-Step: Public Involvement for the Life of Your Project*. [Download the PDF from our web site: www.ksltap.kutc.ku.edu.]

KDOT also instituted project delivery groups to ensure that each project is delivered on time and within budget, and to improve internal and external communications.

To improve employees' roles in public involvement, all KDOT employees have been trained to be ambassadors for the agency, so they can effectively communicate with the public in a manner that has a positive effect on the public's perception of the agency. Additionally, a public involvement professional position was created for each district, along with two similar positions within the Division of Public Affairs in Topeka. Key members of each Project Development Group are responsible for tracking public opinion and informing landowners of projects.

KDOT has also enhanced public involvement through the use of several resources, including a toll-free telephone number: (877) 550-KDOT, information cards, *Tools, Techniques, and Timing: A KDOT Handbook*, and KDOT's web page.

KDOT's public involvement plan was officially adopted on September 8, 1997. Since then, KDOT has encountered only a few surmountable challenges, and has taken great steps toward improving public involvement. For more information, call Ron Kaufman, Public Involvement Administrator (785) 296-3769. Ron has extra copies of *Tools, Techniques, and Timing: A KDOT Handbook* for interested readers.

Source: "KDOT's Innovative Public Involvement Program," Julie L. Lorenz and Rosemary Ingram, 1998. ■

Recycling antifreeze, *continued from page 7*

Starting an antifreeze recycling program

Currently, only 12 percent of generated waste antifreeze is recycled each year. If you do not have an antifreeze-recycling program in your area, now is the time to start. Research has shown that a recycling program can greatly reduce purchasing, handling, storing and antifreeze disposal costs. Since KDHE does not require testing used antifreeze destined for recycling, time and money can be saved by not having to test for contaminants.

Parsons, KS, uses a Solar brand machine to recycle their antifreeze. While they have not seen the major cost savings indicated by research, they are pleased with their program.

“We have to dispose of very little antifreeze each year—maybe 10 gallons. The rest stays in good shape,” said Phil Kepley, Parson’s maintenance supervisor. Kepley said that the cost of the machine, labor, chemicals, filters and testing strips makes their recycling program a financial wash. “But we are helping the environment and we save the cost of disposing a lot of antifreeze,” he said.

Extended-life antifreeze

Another way to save on antifreeze disposal costs is by purchasing extended-life antifreeze, which is designed to last five years (150,000 miles) or longer. Shops that switch their fleets to extended-life antifreeze reduce the need to either purchase new or manage used antifreeze. Although the initial cost of extended-life antifreeze is higher than that of conventional antifreeze, this loses significance when you consider that the long-lasting extended-life antifreeze will rarely require changing. In fact, many newer vehicles, including cars, light trucks, and heavy-duty diesel trucks, are factory-filled with extended-life antifreeze. Finally, extended-life

When talking with a recycling vendor, consider asking the following questions:

- What types of additives are added to the recycled antifreeze?
- What is the availability, length, and coverage of the warranty on the recycling unit or recycled antifreeze?
- Do any vehicle manufacturers certify the unit or recycled antifreeze?
- Do you have performance data on antifreeze recycled by this equipment?
- What recycling wastes are generated (filters, sludge, resin, still bottoms)?
- Who will dispose of the wastes?
- What is the waste generation rate?
- What is the cost per gallon to recycle the antifreeze? What does this cost include?
- Are there contaminants that prevent your unit or service from recycling antifreeze?
- Do you have references from anyone in the area who is using your unit or service?
- Does the technology recycle OAT coolants and propylene glycol?
- Are additive packages provided for OAT coolants?
- If so, how much do they cost and how are they obtained?
- Will you train our mechanics to properly use the unit?
- Is a unit available for a short demonstration or trial period?
- What is supplied for the demonstration?
- Where is the nearest technical sales representative?
- How much does the unit cost?
- Are there any other initial costs for accessories or special additives?
- Do you offer a lease option? If so, what is the monthly lease cost?

antifreeze saves labor costs associated with draining and then refilling the cooling system with typical product. Using extended-life antifreeze, however, does not necessarily solve the environmental problems connected to the creation of ever-more hazardous waste. So, before you buy another gallon of antifreeze, explore your options. And remember to be friendly—environmentally-friendly, that is.

Sources

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- www.energy.wsu.edu/buildings/files/IAQ/childcare/handouts/hazard_prod.pdf;
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- www.astm.org;
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- “Antifreeze Recycling,” *Best Environmental Practices for Auto Repair and Fleet Maintenance*, Environmental Protection Agency, November 1999. ■

Deer study,

continued from page 10

people were evacuated in situations where the storm then turned and went in another direction, residents lost faith in the evacuation process, and ignored the warnings. Hurricane prediction has become much more sophisticated over the years, to the point where false alarm evacuations are a rarity, not the norm, and Ahmed is looking to push deer collision area prediction into a similar realm.

County engineers who have placed “deer crossing” signs at particular places on their roadways may be familiar with a scenario like that described above. Motorists see so many of these signs that they tend to discount them, especially since most motorists will not see any deer most or all of the times they drive by these signs. Of course, there was a significant correlation between deer crossings and sign placement at one time, or the signs wouldn't be there, but if motorists do not see it themselves, the signs lose meaning and effectiveness.

Meyer said, “These signs are one of the reasons KDOT asked us to look at [the issues addressed in Ahmed's dissertation]. Once you put those signs up, you can't take them down, because it becomes a liability issue. The problem is, people learn to ignore them.” Part of the issue here is that these signs are needed most during a very specific part of the year—the rut, or mating season—and during specific times of day—the twilight hours—in that part of the year.

Another problem with signing is that it only responds to problems that have already developed. Ahmed's research into ways of identifying possible high-risk segments gives transportation engineers the opportunity to allocate their scarce resources for measures that not only should prove more effective than signing, but also can be set in place before people start getting injured or killed.

An ounce of prevention?

Given that you know which segments of highway are high-risk, the next question is of course what to do about it. Although there's little research definitively proving that signing doesn't work, consensus in the industry is that it's not all that worthwhile. Ahmed had several suggestions,

Another drawback of signing is that it only responds to problems with deer that have already developed.

including: New route planning should be performed with an eye to avoiding bisecting wooded corridors, and more emphasis should be given to road segments where the highway intersects rivers or creeks. At these areas, appropriate measures should be taken to prevent deer from entering the right of way.

One such measure is fencing. “Given the vast amount of highway in Kansas, we can't build 12-foot fences around all roads,” Meyer said, “but Ahmed's model should help in identifying which segments of highway might most benefit from fencing.” Flashing lights for deer signs during pre- and post-twilight hours during the right season—November through January—was another possibility Meyer mentioned.

Yet another way to keep deer off the road may be found by looking to Europe. Vegetated wildlife overpasses, or “green bridges,” are coming into favor in a variety of countries throughout Europe, led by Germany, France and Switzerland. A good deal of research has been done on the effectiveness of these wildlife overpasses, which vary between 28 and 2,625 feet wide, and span a number of the highways in those countries.

According to an FHWA Scan Team's report, “The overpasses are very effective for a wide variety of animals... The conclusions included the observation that structures at least 197 feet wide were more effective than overpasses narrower than 164 feet, especially for larger mammals. It was noted that animal behavior on the overpasses is more normal on wider structures.”

Although certainly more expensive than some of the alternatives, these green bridges reflect a stronger emphasis in Europe on avoidance of animal-vehicle collisions. The American Scan Team stated a need for greater attention to avoidance in the United States. “This can result from a stronger consideration of avoidance alternatives in transportation planning and implementation,” the Team said, such as building green bridges in high-risk areas, as determined by Ahmed's procedures for identifying these segments of highway.

If green bridges strike you as a little bit too much, you may want to consider using Ahmed's model to determine high-risk areas on your beat, and install flashing lights or fencing as appropriate. Whatever prevention methods you choose, improved identification of high-risk highway should allow you a proactive role in preventing accidents, saving both money and lives over the long run.

Sources

Wildlife Habitats Connectivity Across European Highways” (www.international.fhwa.dot.gov/wildlife.htm);

“Germany: Where Roads and Wildlife Coexist” *Greener Roadsides* (www.fhwa.dot.gov/environment/greenerroadsides/sum02p3.htm);

Improved Modeling of Deer-Vehicle Crash Likelihood on Highway Segments Using Roadway Characteristics in Kansas, Ishtiaque Ahmed (unpublished dissertation draft). ■

Reviews

... by Courtney Hansen

Common Roadside Invasives: A Roadside Field Guide to Showy Herbaceous Weeds

24 pages, produced by FHWA, 2002. This laminated, folding guide identifies roadside plants which can invade both agricultural land and natural areas. All of the plants listed are on various State noxious weed lists. The detailed illustrations are sorted by color, and the guide opens into a single sheet to make identification easy. The publication is slim, simple, and easy to use, and it serves its purpose well, aiding roadside vegetation managers and maintenance personnel in identifying and controlling these plants.

Dust Control on Low Volume Roads: A Review of Techniques And Chemicals Used

59 pages, produced by FHWA, May 2001. This reprint of an August 1998

report includes a historical review of road-building techniques and attempts at controlling dust, world statistics on non-paved roads, and a listing and evaluation of several dust control and surface maintenance methods used across the country. This latter inclusion adds the most value to this publication as a resource for engineers and planners; and appropriately, it makes up the bulk of the material presented. The booklet reports on past successes and failures with various techniques, as well as ideas for improvement for current practices, and suggestions for choosing between and implementing each of the procedures.

Scenic Byways: A Design Guide for Roadside Improvements

112 pages, produced by USDA Forest Service, July 2002. Beautiful photography and useful information come together in this full-color guide to planning, designing, and improving

scenic byways. The book includes information on developing scenic byways, and particularly visitor facilities along these roads, with visual appeal and visitor satisfaction in mind. Topics covered include accessibility, entry design, and recreational areas. This guide teaches the reader more through the many photographs than through the text on the page. Still, this book includes valuable information, and should be useful to planners, designers, and managers of scenic byways.

Public Roads Magazine, January/February 2003 issue

60 pages, produced by FHWA. The Kansas LTAP has acquired copies of this magazine to offer to local agencies. This particular issue focuses on safety and includes articles on making two-lane roads safer, reducing points of conflict, and more. ■

Calendar

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

... 2003

*Gravel Road Maintenance Workshop
Sept 30—Hoxie
Oct 1—Ness City
Oct 2—Lyons
Oct 8—Council Grove
Oct 14—Paola
Oct 15—Junction City

*Environmental Justice: Implementation and Application
October 1—Wichita
October 2—Lawrence

October 11-14
Kansas League of Municipalities (and APWA) Fall Meeting in Topeka, KS
call 785/354-9565

October 14-15
MINK 3 County Engineers Meeting in St. Joseph, MO
Call Gary Rosewicz at 785/562-5349

October 16
**Click Listen & Learn: Traffic Calming

*Snow & Ice Control
October 27—Chanute
October 28—Topeka
October 29—Norton
October 30—Hutchinson
October 31—Salina

November 13
APWA Roundtable Discussion in Dodge City
Call Tony DeCicco at 316/268-4087

November 13
Kansas Asphalt Conference in Lawrence, KS
Call 785/864-4790 or visit www.kuce.org

November 16
**Click Listen & Learn: Blueprints for Public Works Yards

November 23-25
Kansas County Association (and KCHA) Fall Meeting in Overland Park, KS
Call Rod Meredith at 785/539-2981

December 17
**Click Listen & Learn Work Zone Safety Beyond Barrels & Cones

... 2004

February 4
Environmental Engineering Conference in Lawrence, Ks.
Call 785/864-4790 or visit www.kuce.org

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

**To register for the APWA/LTAP "Click Listen and Learn" workshops, call Ashley Gann at (816) 472-6100 ext. 3511. Cost is \$150 per site.

You Can Help!

The LTAP Advisory Committee will have its annual meeting in early November. Each committee member brings "hot topics" to the meeting for us to consider for workshops or newsletter articles.

If you have a "hot topic" you would like to have this group consider, contact any member of the LTAP Advisory Committee (see page 16) or call Lisa Harris at the Kansas LTAP at (785) 864-2590.

Free Resources

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

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

Poster

Free to road departments in Kansas.

Be Safe, Be Bright, Wear Retroreflective Materials at Night

A safety poster for your crew or the general public.
Produced by FHWA, 2001.

Publications

You are free to keep these unless otherwise noted.

Common Roadside Invasives: A Roadside Field Guide to Showy Herbaceous Weeds

24 pages, published by FHWA, 2002.

Dust Control on Low Volume Roads: A Review of Techniques and Chemicals Used

50 pages, published by FHWA, 2001.

Scenic Byways: A Design Guide for Roadside Improvements

112 pages, published by USDA Forest Service, July 2002.

Public Roads Magazine, Jan/Feb 2003 issue

60 pages, published by FHWA. Special issue on safety.

Equipment

Available free—for loan to local highway agencies. Call us at (785) 864-5658 to arrange time period needed for loan. There could be a waiting list for these items.

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

A basic model for recording turning movements at intersections. The board is is lightweight and comes with its own case.

Jamar Technologies, Inc. (TDC-8) Turning Movement Counter Board

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

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