

# ***Managing Stormwater: Best Management Practices to Minimize Mosquito Breeding***

*Marianne Walch, Ph.D., Environmental Scientist, DeIDOT NP DES Program*

## **THE PROBLEM**

Management of stormwater runoff is an important component of roadway design and maintenance. In recent years, stormwater management strategies have fallen under increasingly stringent federal and state water quality regulations, requiring implementation of numerous structural stormwater controls, or best management practices (BMPs). These BMPs include retention and detention ponds, bioretention cells, biofiltration swales, infiltration basins, sand filters, underground storage vaults and a variety of proprietary treatment devices.

Regulations governing stormwater discharges – including the Federal Clean Water Act’s National Pollutant Discharge Elimination System (NPDES) permits and Total Maximum Daily Load (TMDL) requirements – have challenged DOTs (Department Of Transportation) and local agencies across the nation to improve runoff quality through the construction of ever increasing numbers of BMPs. DeIDOT currently has more than 500 stormwater BMPs in its inventory, and hundreds more are anticipated to be added soon as part of new roadway construction projects or as retrofits into areas that currently are inadequately protected.



*Overgrowth of emergent vegetation promotes mosquito breeding in stormwater ponds.*

One issue associated with modern stormwater management programs that has recently received a lot of attention is the potential of stormwater treatment BMPs to provide abundant habitat for the propagation of mosquitoes if they are not properly designed and maintained.

Approximately 60 species of mosquitoes are found in Delaware, and of these about 19 species can be aggressive biters of humans. Not only is their biting activity a nuisance, but some mosquitoes also are potential vectors of human and animal diseases. All require standing water to complete their life cycles. The recent threat of West Nile virus has compounded concerns about the potential of stormwater ponds, infiltration basins and other BMPs to provide habitats that are particularly favorable for mosquito breeding.

## **PROJECT DESCRIPTION**

DeIDOT’s NPDES Program provided funding to Dr. Jack Gingrich, of the University’s Department of Entomology and Wildlife Ecology, to conduct a study of the potential for DeIDOT-owned stormwater retention ponds and sand filters to produce nuisance mosquitoes and West Nile Virus vectors.

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## LHTAC COUNCIL MEMBERS

On June 17, 2011 the quarterly meeting of LHTAC was convened and the following members were elected to their respective offices to become effective July 1, 2011:  
 Lan Smith-Chairman, Mac Pooler-Vice Chairman, Dan Schaeffer-Secretary/Treasurer



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- Stuart Davis**, Executive Director  
Idaho Association of Highway Districts
- Tony Poinelli**, Deputy Director  
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Association of Idaho Cities



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The people listed below help guide and direct the policies and activities of the Idaho T2 Center. You are invited to contact any of them to comment, make suggestions, or ask questions about the T2 Program.

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208-387-6323

**Dan Copeland**  
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Bannock County Road & Bridge Department  
208-233-9591

**Don Barr**  
Street Superintendent  
City of Nampa Street Division  
208-468-5831

**Associate Member**  
Ned Parrish  
ITD Research Program Manager  
208-334-8296

**Kelly Brownsberger**  
Road Supervisor  
Post Falls Highway District  
208-765-3717

**Rob Simon**  
Supervisor  
Clearwater County Road & Bridge Department  
208-476-4813

**Stuart Davis**  
Executive Director  
Idaho Association of Highway Districts  
208-345-5176

**Ex-Officio Members**  
Lance Holmstrom  
LHTAC Administrator  
800-259-6841

**John Zamora**  
Director  
Buhl Highway District  
208-543-4298

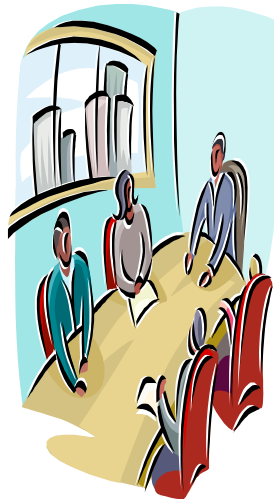
**Brian Christiansen**  
Street Superintendent  
City of Ketchum Street Department  
208-726-7831

**Steve Hyndman**  
Training Specialist  
Idaho Transportation Department  
208-799-4242

**Lori Porreca, PhD**  
Community Planner  
FHWA-Idaho Division  
208-334-1843 Ext. 132

## LHTAC STAFF

- Lance Holmstrom, MUP, Administrator
- Jeff Miles, PE, Deputy Administrator (effective 7/1/11)
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- Cindy Stewart, Publication/Council Manager
- Nancy Ziebarth, Secretary/Receptionist
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- Jessica Barnes, Construction Records Inspector
- Byron Walker, Construction Engineering Intern
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- Matthew Syphus, GIS Specialist
- Bruce Drewes, T2 Manager
- Lorie Cover, T2 Training Coordinator
- Denise Shields, T2 Event Coordinator



## LHTAC Staff News

**Congratulations!** Dan Shirilla (former Deputy Administrator) has accepted a new assignment as Federal-aid Financial Manager effective May 17, 2011.

Scott Ellsworth, PE, PLS has joined the LHTAC Federal-aid Team as Federal-aid Area Manager effective June 8, 2011.

Jeff Miles, PE will join the LHTAC staff as the new Deputy Administrator to become effective July 1, 2011.



**Local Highway Technical Assistance Council (LHTAC)**  
**Idaho Technology Transfer Center (T2) - LTAP**  
 3330 Grace Street, Boise, ID 83703  
 Phone: (208) 344-0565 (800) 259-6841  
 Fax: (208) 344-0789  
 LHTAC webpage, [www.lhtac.org](http://www.lhtac.org)  
 Idaho T2 Center webpage, [www.idahot2.org](http://www.idahot2.org)

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The study focused on determining factors that are predictive for BMPs that are high producers of mosquitoes versus those that are low producers.

Mosquito vector production and larval abundance was monitored in a number of different ponds, mitigation wetlands and sand filters over several years. BMP characteristics examined included steepness or shallowness of pond slopes, shade, presence of invertebrate predators, and a variety of water quality factors.

Detention ponds (or “dry” ponds) were found to produce more larval mosquitoes than all other pond types, particularly if they do not drain properly. Some sand filters that drain slowly or hold water in sediment traps also produced large numbers of larvae. The data also suggested that mosquito breeding in ponds is highly correlated with overgrowth of vegetation such as cattails and Phragmites on shallow benches, and with high levels of nutrients such as phosphates. Shallow ponds with heavily vegetated edges often supported high numbers of mosquito larvae. Mosquitoes are basically filter feeders that feed on a variety of phytoplankton, zooplankton, and fine organic debris. Thus, stagnant, eutrophic conditions in ponds tend to favor mosquito production. Heavy growths of invasive vegetation may also protect larvae from predators.

### THE PAYOFF FOR DELDOT

Mosquitoes need a minimum of four to six consecutive days of stagnant water for larvae to hatch to adulthood. Although many modern “green technology” stormwater treatment BMPs, such as bioretention areas and bioswales, detain water temporarily provide water quality improvements, nearly all are designed to drain completely within 72 hours. So if they are functioning properly, the likelihood that mosquito larvae will survive and emerge as adults is low. As these structures slowly clog due to age and lack of maintenance, however, they can retain water long enough to allow floodwater mosquito pupae and larvae to reach maturity.

Thus proper design, construction and maintenance of BMPs are critical to reducing the suitability of BMPs for producing mosquitoes. The results of Dr. Gingrich’s study have assisted DeIDOT’s NPDES Group in developing and improving its routine BMP inspection and maintenance protocols.

### VEGETATION MANAGEMENT

Overgrowth of emergent vegetation, such as cattails and Phragmites, provides mosquito larvae with refuge from predators, protection from surface disturbances, and increased or-



ganic debris and nutrients. These weeds can also impair the functioning of the pond. DeIDOT has developed a proactive strategy to remove undesirable vegetation from stormwater BMPs that includes annual inspections, herbicide treatments when needed, excavation of accumulated sediments that promote plant growth, and follow-up monitoring. Although shallow safety benches are required by law around pond perimeters, we try to limit the growth of emergent plants on the benches.

### BMP DESIGN AND MAINTENANCE

All of DeIDOT’s detention and infiltration BMPs are designed to drain completely within 72 hours following a storm event and remain dry. Annual BMP inspections alert us when these structures are beginning to clog due to accumulations of sediment or other structural defects. Maintenance work orders are then submitted to correct the problems. Occasionally BMPs fail to function as designed. These are either completely renovated or replaced with a more appropriate BMP design. DeIDOT no longer accepts designs that include dry ponds. In addition to promoting mosquito breeding, they have been found to provide only limited water quality treatment.

### CONTROL OF NUTRIENT ENRICHMENT

Dr. Gingrich’s research demonstrated that high levels of nutrients such as phosphorus may contribute to algal and bacterial blooms, providing abundant food sources for mosquito larvae. In a follow-up component of his group’s research, different methods of reducing phosphate concentrations in stormwater ponds were evaluated for their effectiveness in controlling mosquito larval abundance. Of these, treatment with aluminum sulfate (alum) showed some preliminary promise. This has provided us with another tool to supplement other BMP maintenance methods.

Long-term management and maintenance of stormwater treatment practices is an increasingly expensive and challenging task for DeIDOT. Minimizing their mosquito production potential is only one of these challenges, but an important one. Research provided through the Delaware Center for Transportation has provided the Department with additional tools to maintain our assets in an efficient and environmentally sensitive way.

**For information in Idaho, please contact:**  
**Johanna Sandow, Water Quality Standards Analyst**  
**Water Quality Division**  
**DEQ State Office**  
**1410 N. Hilton**  
**Boise, Idaho 83706**  
**Email: [johanna.sandow@deq.idaho.gov](mailto:johanna.sandow@deq.idaho.gov)**  
**Phone: (208) 373-0163**

Reference: TranSearch, Delaware Center For Transportation, Summer 2010, Vol. 10, No. 2

# Road Safety Audits: A New Safety Tool for the Toolbox

On a daily basis highway agencies are working to address highway issues on their facilities. One tool that is proving valuable is the Road Safety Audit (RSA) process. Following a RSA training course, the Idaho Transportation Department (ITD) formed a RSA Team to review the intersection of SH-44 and Linder Road. The intersection is under the jurisdiction of the Idaho Transportation Department (SH-44) and the Ada County Highway District (Linder Road). The location was selected by ITD, District 3, due to the number of crashes and a planned maintenance project at this intersection.

Following the national model, as illustrated below, the RSA was conducted by an independent, multidisciplinary team to identify potential road

safety issues and opportunities to improve safety for all road users.

Team members were selected from the Idaho Transportation Department, the Ada County Highway District, the City of Eagle, and the Federal Highway Administration. Law enforcement officers from Ada County also participated in the RSA. Representatives brought



years of experience in highway design, operations, safety and enforcement to the Team.

The Team spent two days observing traffic and reviewing the highway safety, development and operational data for this area. With this information in hand, the Team was able to identify the primary safety issues and recommend potential solutions. The Team also noted several things that were working well at the intersection. This information was presented to ITD and others in a closeout meeting. A final report was prepared by the Team documenting their recommendations. To give ITD an estimate of the potential safety benefits associated with the Team's recommendations, where available, crash modification factors are included for each of the strategies.

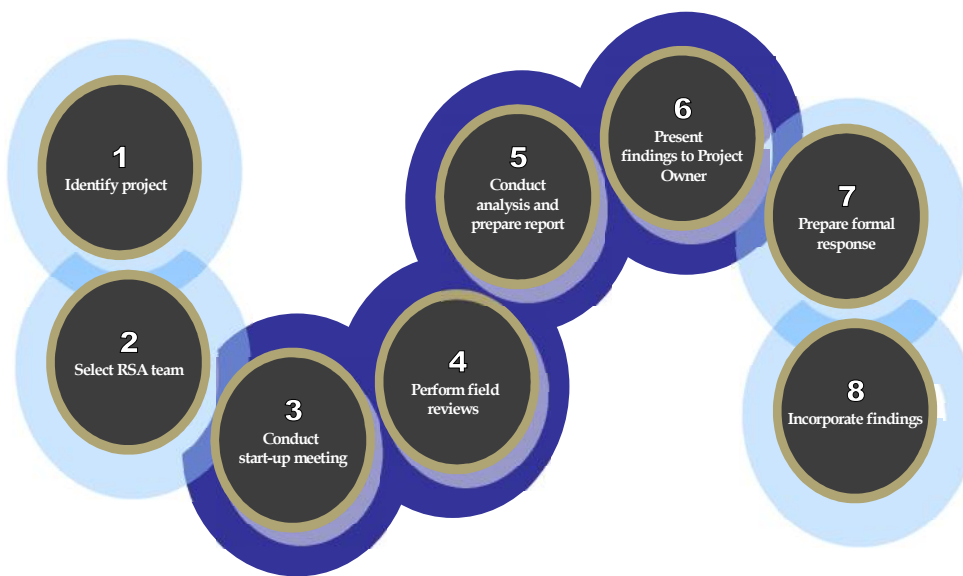
The source for this information was the Crash Modification Factors Clearinghouse (<http://www.cmfclearinghouse.org>) and the AASHTO Highway Safety Manual (<http://www.highwaysafetymanual.org>). The Team anticipates that the recommendations will be considered and implemented based on available resources.

Due to the success of this RSA and others nationwide, other agencies are encouraged to try this new tool. For more information on the RSA process see <http://safety.fhwa.dot.gov/rsa>. Also, if you or your organization has a need for a RSA course, please contact Bruce Drewes, T2 Center Manager or Lorie Cover, T2 Center Training Coordinator at 1-800-259-6841.

*Reference: Lance Johnson, Safety & Traffic/ITS Engineer, FHWA Idaho Division Office*

## Responsibilities

-  RSA Team
-  Design Team/Project Owner



# Great Resource for Improving Pedestrian Safety

*The RSA model works well for identifying pedestrian hazards and making improvements.*

The document titled *Pedestrian Road Safety Audit Guidelines and Prompt Lists*, published by the Federal Highway Administration, provides transportation agencies and teams conducting a roadway safety audit (RSA) with a better understanding of the needs of pedestrians of all abilities.

The Guide has two primary sections:

- 1) The *Knowledge Base Section* discusses the basic concepts behind a Pedestrian RSA, such as
  - Understanding the characteristics of all pedestrians,
  - Analyzing pedestrian crash data, and
  - Pedestrian considerations in the 8-step RSA process.
- 2) The *Field Manual Section* includes the guidelines and prompt lists. The guidelines provide detailed descriptions of potential pedestrian safety issues while the prompt lists provide an abbreviated version of the same information.

## What is considered in a Pedestrian RSA?

There are six universal considerations for the entire RSA site:

- *Needs of pedestrians:* Do pedestrian facilities address the needs of all pedestrians?
- *Connectivity and convenience of pedestrian facilities:* Are safe, continuous, and convenient paths provided along pedestrian routes throughout the study area?
- *Traffic:* Are design, posted, and operating traffic speeds compatible with pedestrian safety?
- *Behavior:* Do pedestrians or motorists regularly misuse or ignore pedestrian facilities?
- *Construction:* Have the effects of construction on all pedestrians been addressed adequately?

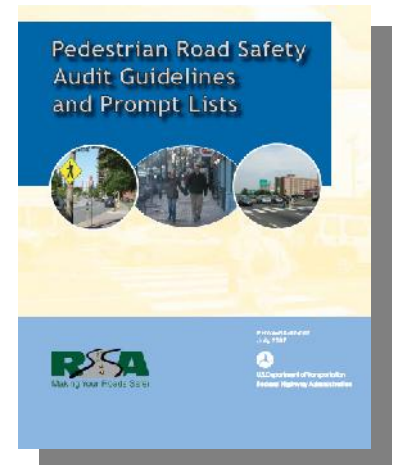
- *School presence:* Is the safety of children in school zones adequately considered?

RSA teams have special considerations beyond those of a typical RSA and should include safety experts with experience in developing the various aspects of a roadway and pedestrian facility. For example, at least one person on the team should be familiar with the Americans with Disabilities Act (ADA) requirements so as to understand how these affect design options, and how safety concerns for all road users can be addressed while meeting the ADA requirements.

It is critical that RSA team members have a working knowledge of pedestrian design requirements as well as an understanding of the relative safety of various design features. The RSA team should be familiar with national and State guidelines and standards for pedestrian safety covered in:

- **AASHTO's A Policy on Geometric Design of Highways and Streets (Green Book).**  
[https://bookstore.transportation.org/item\\_details.aspx?ID=110](https://bookstore.transportation.org/item_details.aspx?ID=110)
- **ADA Accessibility Guidelines (ADAAG).**  
<http://www.access-board.gov/adaag/html/adaag.htm>
- **Manual on Uniform Traffic Control Devices.**  
<http://mutcd.fhwa.dot.gov/servers/pubs.htm>

**Applicable State-specific documentation**, such as State statutes and laws governing pedestrian and motorist responsibilities. In Kansas, these can be found at the Kansas Department of Transportation's Bicycling and Pedestrian Web site: <http://www.ksdot.org/burRail/bike/>  
**Idaho:** [http://itd.idaho.gov/bike\\_ped/regulations.htm](http://itd.idaho.gov/bike_ped/regulations.htm)



## Anticipated challenges in conducting pedestrian oriented RSAs

While the number of agencies implementing RSA programs in general is increasing, FHWA points out that organizations face numerous challenges in using RSAs to address pedestrian safety. The following are some of the key challenges:

**Identifying the projects that are prime candidates to be audited.** In many cases, the issue of pedestrian safety is not given a high priority—for example, construction projects that close sidewalks. Procedures need to be established that ensure that pedestrian issues are addressed in all projects. Using an RSA for those projects that are identified as having a significant impact on pedestrian flows can potentially have major benefits. Section 3.4 of the FHWA Guidelines provides additional information on the types of projects for which pedestrian RSAs should be considered.

**Convincing agencies of the need for an independent, experienced auditor on pedestrian-focused projects.**

Many communities have been conducting RSAs or similar environmental assessments with untrained or informal auditors such as community members.

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## 4 Inch Wide Rumble Stripe - The Iowa Experience

### BACKGROUND

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was enacted by Congress in 2005. One of the provisions of this legislation required states to identify the roadway segments with the highest incidence of crashes. Iowa addressed this requirement by locating the road sections with the highest 5% of crashes for various crash causes, which for rural roads are single vehicle run-off-road incidents. In addition to identifying these high crash locations, Iowa also developed mitigation options for application in these areas in an effort to reduce this crash type. For higher volume state-owned roadways, this mitigation often involved the addition of paved shoulders and rumble stripes, both proven highly effective in reducing run-off-road crashes. However for high crash locations on local rural roads, paved shoulders are not a viable option due to cost, narrow shoulders, and right-of-way restrictions. For these local roads, an alternative process was devised involving milling of narrow width rumble strips directly along the existing pavement edge and placement of standard edge line pavement markings over the milled areas, resulting in rumble stripes. A research project was funded by the Federal Highway Administration, Iowa Highway Research Board, and Iowa Department of Transportation for the installation and evaluation of effectiveness of this process.

Following an explanation of the proposed process, six county engineers in Iowa agreed to participate in the research project. A contract was let through the Iowa DOT to install nominal 4 inch wide, approximate 5/8 inch deep, rumble stripes in selected locations, mostly horizontal curve areas, in seven separate locations. Most installations were along the outside edge of pavement, although two locations in one county were placed in paved shoulders. To widen the scope of analysis, rumble stripes were installed in both Portland Cement Concrete and Hot Mix Asphalt pavements. One additional county elected to place rumble stripes with an independent rehabilitation project and yet another county is considering similar action for a future project. Both of these counties will be included in an analysis of effectiveness.

### CONSTRUCTION

The project was let to contract by the Iowa DOT in January of 2008 but due to a late and very wet (soft shoulders) spring, work did not commence until late June. Although most of the construction work was completed in early July,



*A four-inch edge line rumble stripe placed on a rural highway in Iowa*

areas around the low side of super elevated curves were initially omitted due to the instability of the top heavy milling machine. Since those locations were quite critical for evaluation of the process, the contract was suspended to allow the contractor time to develop another prototype milling machine to complete these areas. The re-designed machine performed adequately and the contract work was completed in November of 2008.

### ANALYSIS

Retro reflectivity testing was performed twice at most of the sites, initially soon after initial construction and again in late autumn, following several months of service. Readings will again be taken in the spring and may show the effects of snow and ice removal by county maintenance forces on the edge line pavement markings. It is anticipated that the residual markings remaining in the milled rumble stripes will still be quite effective.

Some of the researchers' observations on construction/performance:

Problems noted:

- Horizontal consistency with distance from edge - Guidance system needs refinement.
- Inadequate removal of millings (added compressor to installation process).
- Instability around low side of horizontal curves – had to omit those areas initially.
- Break up of edges on Portland Cement Concrete pavement.
- Difficult to achieve desired 5/8" milling depth in PCC pavement (most measured approximately 1/2" in depth).
- Milling operation had to omit areas around close proximity mailboxes.

Comments from participating counties were solicited after initial construction and again in March 2009 included the following.

- Stripes do make noise when vehicles cross; though not as much as 16" wide rumbles used by Iowa DOT.
- Problem with alignment close to edge has caused some damage there – will this affect pavement performance?
- No complaints or negative comments received.

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**Rumble stripe with caked material and debris in the bottom**



**Milling machine tipping on low side of elevated horizontal curve**



**Similar wear for edge line in rumble stripe and flat section**

- Compliments on increased safety and visibility of edge have been received.
- Traffic seems to respond to the audible warning.
- One crash reported in area w/ stripes – Car swerved for deer. Otherwise, working well.
- Received many positive comments; retro-reflectivity seems good to the eye this early spring.
- Will pooling water during thawing and refreeze cause deterioration?

- Positive comments from all, even Amish community using horse-drawn buggies.

Results and reactions from the installation of these narrow width rumble stripes has been mostly positive. Final evaluation of effectiveness will be concluded in 2011 with an analysis of crash history for run-off-road crashes, before and after installation of the rumble stripes. The final report will be listed on the In-Trans web site at [www.ctre.iastate.edu](http://www.ctre.iastate.edu)

*Reference: John Perry, Field Operations Engineer, FHWA Idaho Division Office*

## Safety Summit Focuses on Rural Highways

The chance of being seriously injured or dying in a motor vehicle crash on a rural highway is significantly greater than on an urban highway.

More than 200 law enforcement officers and highway safety professionals learned why during a presentation delivered at a recent Highway Safety Summit by Prof. Nicholas Ward, with Montana State University's Western Transportation Institute.

Ward told summit participants in Pocatello that rural driving behavior often involves more speeding and alcohol use and less use of seat belts.

He told the group that changing rural highway fatality and injury statistics would require promoting a culture of rural highway traffic safety. Most of Idaho's highways are classified as rural.

Attendees also participated in a Commercial Drivers License (CDL) review that concentrated on identifying motor vehicles that would require an operator to hold some form of a CDL.

Other topics covered during the summit included a law enforcement perspective on crash reduction, changes to Administrative License Suspension (ALS) rules, conducting a road safety audit and a look at the science behind retroreflec-

tivity that helps drivers see signs and roadway markers better.

Sgt. Ted Piche, Lewiston Police Department, made a Line of Duty presentation to Officer Dennis Clark, Jerome Police Department during the safety summit. Clark was shot earlier this year following a high-speed chase.

This year's summit was dedicated to Clark.

**Photos:** Sgt. Ted Piche presents a Line of Duty Award to Officer Dennis Clark (above right). Clark was blinded in one eye after being shot earlier this year following a high-speed chase. Mary Hunter, who retires this week as manager of the Office of Highway Safety, receives a purse made from seat belt strap material (right).

*Reference: Idaho Transportation Department, The Transporter 5-13-2011*



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While local community members who often use the facilities being audited have a strong awareness of many problems observed on those facilities, they may not have the background knowledge necessary to identify relationships to the built environment and potential solutions.

Another problem with local community members using the RSA is that they may be used to certain situations and not perceive them as threatening and potentially risky as an outside trained auditor might; “fresh eyes” may be needed to take into consideration a variety of safety concerns and provide innovative recommendations to mitigate issues.

Although outside RSA team members may not have an institutional memory of the facilities being audited, they may 1) carry less bias in terms of considering safety issues, 2) be better trained to comprehensively assess the environment and identify relationships between safety, behavior, and the physical and social environment, and 3) be in a better position to coordinate findings with the responsible parties to promote change and implement improvements.

**Ensuring the needs of all roadway users are considered.** Whereas the focus of this guide and materials is on pedestrians, it is important that the needs of all road users are considered when conducting an RSA. This includes not only understanding design principles, but also the laws that affect all users. Failure to consider all users appropriately may result in potential safety issues going unnoticed by the RSA team or inappropriate suggestions being made for all road users. For example, installation of a sign or signal for one type of user may create sight distance issues for another type. The intent of this guide is to assist RSA teams in considering potential pedestrian issues, not to lead teams to place any lower priority on other road users.

### Pedestrian RSA Zones

Areas to be considered in pedestrian safety take into account the different areas people will be on foot:

- A. Streets
- B. Street Crossings
- C. Parking areas/adjacent developments

#### *Understanding the different relationships between agencies and the public in pedestrian-oriented RSAs.*

Pedestrian-oriented RSAs may involve local pedestrian and community groups either as part of the RSA team, or as advocates for specific issues or concerns. Members of these groups may be able to add more details on the pedestrian’s perspective of facilities, thus further ensuring the needs of users are met. Sometimes an RSA may even be initiated at the request of such a group. It is important for the RSA team to consider the role these organizations may play in the improvement process when planning an RSA and suggesting mitigation strategies.

#### **Using Pedestrian RSAs in school areas**

Schools pose unique pedestrian safety problems because of the age of pedestrians and the mix of pedestrian, bicycle, and vehicular traffic. Potential issues are exacerbated with the increasing number of students driven to school, thereby increasing the number of drop-off and pick-up points. Because of the uniqueness and complexity of a school’s problems, a review by an independent RSA team could help assure that a balanced approach is taken to address safety. School officials and parents are closely involved with the problems and are acutely aware of day-to-day operation of the school facility and have strong opinions regarding problems and their solutions. The

value of the RSA team’s findings is in the independent perspective of the task and the need to consider a variety of stakeholder viewpoints and perceptions in the process.

#### **Pedestrian RSAs in Kansas**

To our knowledge, no one in Kansas has yet performed a pedestrian RSA. Becky Pepper, bicycling and pedestrian coordinator for the Kansas DOT, said “I don’t know of any KDOT efforts in regard to a Pedestrian RSA.” She mentioned that MARC [the Kansas City area MPO] hosted an FHWA training session for RSAs in urban areas and is looking closer at developing RSA procedures for the region. Aaron Bartlett of MARC reported that they have not done an official Pedestrian RSA, but they got a taste of some of the issues in a safety training that examined a location that had a new shopping/restaurant area across a busy street from a large retirement community.

Kansas LTAP has been conducting roadway safety assessments in rural locations, and has not conducted a Pedestrian RSA to date.

#### **Funding available for Pedestrian RSAs?**

When asked if there is any funding available to locals for conducting RSAs, Pepper said “I’m not quite sure what state funds may be available, if any, after all the cuts, but Safe Routes to School (SRTS) funds could be used for preliminary engineering (PE) to determine appropriate countermeasures. Federal HSIP funds could also be used [for this].” She noted that PE funds are being used in a SRTS project in FL District 7 to determine appropriate countermeasures.

Wherever there are pedestrian safety problems, a Pedestrian RSA is a comprehensive analysis tool that can help solve those problems. To download FHWA’s July 2007 *Pedestrian Road Safety Audit Guidelines and Prompt Lists*, go to: <http://drusilla.hsra.unc.edu/cms/downloads/PedRSA.reduced.pdf>.

Reference: Kansas LTAP, Winter 2010

## Safety While Working with Silica

Submitted by Ashley Benson, UNH T<sub>2</sub> Project Assistant & UNH Masters in Literature Student

Over 1.7 million workers in the United States are exposed to respirable crystalline silica, mostly from construction sites working with concrete, according to the Center for Disease Control. Concrete is composed of these crystalline silica particles, which, when breathed in, can cause a non-treatable and often fatal lung disease called silicosis. Symptoms of silicosis include shortness of breath, chest pain, fatigue, weight loss, and respiratory failure.

Although silicosis is irreversible, it can be easily prevented through instituting the following simple safety regulations when employees are handling concrete.

First, ensure employees are working in well-ventilated areas and minimizing dust exposure by applying water sprays, wetting silica dust while in the air, or using saw blades or drills that add water directly to the concrete being cut.

Second, managers need to ensure employees are wearing the appropriate Personal Protective Equipment (PPE). Respirators should always be worn when working in areas



with silica exposure. See industry standards for what type of respirator to use, as the makes and models will vary between jobs. Also, disposable or washable work clothes and gloves should be worn when working in areas where crystalline silica particles are in the air.

Third, employees should vacuum the dust from work clothes, shower as soon as possible after exposure to silica particles, and change into clean clothes.

Fourth, managers should ban eating, drinking, and smoking in areas where silica dust is in the air. In addition, employees should wash their hands before doing any of these activities after exposure to silica dust.

Fifth, and most importantly, managers should be knowledgeable about what tasks in public works expose workers to crystalline silica dust, and ensure that necessary safety precautions are taken before the task begins. Silicosis is a serious illness that is irreversible, but it is 100% preventable when the proper safety measures are taken.

Reference: UNH T<sub>2</sub> Center, *Road Business*, Summer 2010, Vol. 25, No. 2

## How to Preserve Concrete Pavements

By Daniel Brown, Contributing Editor, *Better Roads*

**Slab stabilization:** This technique restores support to concrete slabs by filling small voids that develop underneath the concrete slab at joints, cracks, or the pavement edge.

**Full-depth repairs (FDRs):** This is a way to fix cracked slabs and joint deterioration by removing at least a portion of the existing slab and replacing it with new concrete.

**Partial-depth repairs (PDRs):** These correct surface distress and joint-crack deterioration in the upper third of the concrete slab. Placing a PDR involves removing the deteriorated concrete, cleaning the patch area, placing new concrete, and reforming the joint system.

**Dowel bar retrofits (DBRs):** This method consists of cutting slots in the pavement across the joint or crack, cleaning the slots, placing the dowel bars, and backfilling the slots with new concrete. Dowel bar retrofits link slabs together at transverse cracks and joints so that the load is evenly distributed across the crack or joint.

**Cross-stitching longitudinal cracks or longitudinal joints:** Cross-stitching repairs cracks that are in low-severity condition. The method adds reinforcing steel to hold the crack together tightly.

**Diamond grinding:** By removing faulting, slab warping, studied tire wear and unevenness resulting from patches, diamond grinding creates a smooth, uniform pavement profile.

**Joint and crack resealing:** This technique minimizes the infiltration of surface water and incompressible material into the joint system. Minimizing water entering the joint reduces subgrade softening; slows pumping and erosion of the subgrade or sub-base fines; and may limit dowel bar corrosion caused by deicing chemicals.

For more information, you can contact the American Concrete Pavement Association (ACPA) headquarters at 847-966-2272. ACPA maintains chapter offices throughout the country that stand ready to help with your concrete pavement questions. See also [www.pavement.com](http://www.pavement.com).

Reference: *Matters*, Montana LTAP, Spring 2010



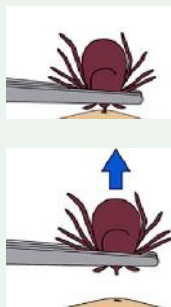
## Tick Removal

If you find a tick attached to your skin, there's no need to panic. There are several tick removal devices on the market, but a plain set of fine-tipped tweezers will remove a tick quite effectively.



### How to remove a tick

- Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
- Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
- After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.



### Follow-up

If you develop a rash or fever within several weeks of removing a tick, see your doctor. Be sure to tell the doctor about your recent tick bite, when the bite occurred, and where you most likely acquired the tick.

Avoid folklore remedies such as "painting" the tick with nail polish or petroleum jelly, or using heat to make the tick detach from the skin. Your goal is to remove the tick as quickly as possible--not waiting for it to detach.

Reference: Centers for Disease Control and Prevention, [http://www.cdc.gov/ticks/removing\\_a\\_tick.html](http://www.cdc.gov/ticks/removing_a_tick.html)



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*Thank you!*

## Pocatello Safety Fest of the Great Northwest—April 2011 Update Hosted by the Idaho T2 Center

The Idaho T2 Center hosted its 2nd Annual Safety Fest of the Great Northwest on April 26<sup>th</sup> through 28<sup>th</sup>, in Pocatello, Idaho. We are pleased to report that this event was a huge success, with its 847 participants who received **free** safety training through the 47 classes offered. Included in the 47 classes offered were OSHA's 10 hour Construction and General Industry classes, *all available at no charge*.

We had many gracious vendors and sponsors who helped us offer break refreshments, as well as lunch, to all the attendees each day. We also had 43 qualified instructors who *volunteered* their time to make this event possible.

We look forward to the future Idaho Safety Fest events and anticipate an increase in attendance at all of them. The T2 Center and LHTAC want to thank everyone involved for their commitment to the safety and training of Idaho's workforce. *...Thank you!*

Reference: Bruce W. Drewes, T2 Manager and Denise D. Shields, T2 Event Coordinator



**\*FREE TRAINING\***

## Safety Fest of the Great Northwest Lewiston—October 25-28, 2011

The Idaho T2 Center is proud to announce that we will be sponsoring our 2nd Safety Fest of the Great Northwest 4 day conference in Lewiston this October. This **free** safety training is available to the construction and general industry community to provide safety and health training to help reduce fatalities, injuries and illnesses on the job. The Lewiston conference will be held Tuesday, October 25<sup>st</sup> through Friday, October 28<sup>th</sup>, 2011 at Lewis & Clark State College.

Registration at <http://www.safetyfest-lewiston.org> will be open **some time in July 2011 – (date to be determined)**. Please watch our website at [www.idahot2.org](http://www.idahot2.org) for more information and registration details, or contact T2 Event Coordinator, Denise Shields at: [dshields@lhtac.org](mailto:dshields@lhtac.org), 1-800-259-6841 or 1-208-344-0565. *We hope to see you there!*

Reference: Denise D. Shields, T2 Event Coordinator



# Motorcyclist Fatalities Are Increasing Dramatically

The number and rate of motorcyclist deaths on U.S. roads are rising dramatically. Motorcycle rider fatalities rose 115 percent between 1997 and 2005. During the same time, fatality numbers and rates for passenger car crashes dropped (Figure 1).

In just one year—2005—motorcycle crash-related fatalities increased by 13 percent (to 4,553), making motorcycle rider fatalities a leading contributor, along with pedestrian fatalities, to the slight overall increase that year in the national highway fatality rate.

Trends accompanying the rising motorcyclist death toll include a dramatic increase in motorcycle ownership, particularly by riders over 40, along with changes in other factors such as motorcycle size and rider experience. The rate of increase in fatalities has outpaced the rate of increase in motorcycle registrations, and the death and injury rates among middle-aged motorcycle riders have increased most rapidly.

## Roadway Factors for Safer Riding

Road design and maintenance factors can, and do, affect motorcycle crashes, injuries and fatalities. Design, construction, maintenance, and roadway practitioners can reduce hazards to motorcyclists and other road users by considering motorcyclist safety.

## Pavement Surface

- Patch potholes promptly. Potholes pose a greater hazard to the operation of motorcycles than to larger vehicles.
- Specify pavement surfaces with adequate pavement friction. Examine the friction characteristics of asphalt sealants and of intersection markings. The use of thermoplastics, particularly for broad, horizontal intersection lines, can create slippery surfaces for motorcycles that stop at the intersections. Metal road surface components — either temporary or permanent— offer limited traction in many cases, and, when wet, are difficult to see.
- Reduce uneven road surfaces. Milled surfaces, parallel paving lane joints, parallel grids on bridges, steel plates, and other uneven roadway surfaces can be especially hazardous for motorcycles.
- Require tidy crack repairs. A motorcycle's traction can be seriously compromised by "tar snakes"— excess asphalt or other sealants used for crack repair.

- Remove debris and fluid spills quickly and thoroughly. Roadway debris and fluid spills pose greater hazards to the operation of motorcycles than to larger vehicles. Debris can deflect a motorcycle's wheel or hit the motorcyclist. Fluid spills can easily cause loss of traction.

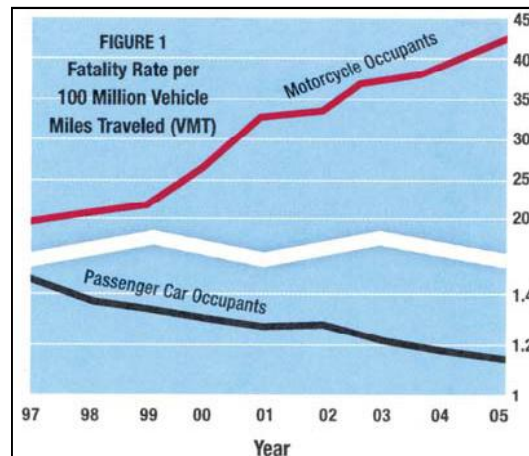


Figure 1 shows fatality rate trends for motorcycle occupants versus passenger car occupants. Between 1997 and 2005, fatality rates for motorcycle occupants rose 115 percent, to 42 fatalities per 100 million motorcycle VMT. During the same period, fatality rates for car occupants dropped steadily, to less than 1.2 fatalities per 100 million passenger car VMT.

## Roadside Safety

- Install safety edges. Untapered vertical shoulder drop-offs are even more dangerous for motorcycles than for other vehicles. Adopting a standard contract specification requiring a 30-35° angle asphalt wedge along each side of the roadway in all construction and resurfacing projects is a simple and cost effective way to assure pavement edge safety.
- Consider motorcyclist safety when designing roadsides. The potential impact on motorcycle riders should be considered in design and placement of roadside safety hardware, clear zones and side slopes, and other roadside safety strategies.

## Visibility and Warning

- Consider motorcyclist hazard warning signs. Signage targeted toward motorcyclists can warn of conditions that are especially hazardous for them. These might include uneven pavement surfaces, rumblestrips or crosswinds.
- Ensure visibility of signs and roadway markings. Keep in mind that many motorcycles have only a single headlamp for illumination.

## The Integrated Safety Solution—Safe Drivers, Safe Vehicles, Safe Roads

Safer roadways are just a small part of the solution to reducing the alarming trend toward increased motorcyclist injuries and fatalities. Motorcyclists should equip themselves with helmets and other protective clothing and equipment, get professional training, maximize their conspicuity through lighting and apparel, obtain the proper motorcycle license, and **absolutely never drink and ride**. Motorcycles should be properly maintained and operated. All road users, including drivers, motorcycle riders, and pedestrians need to obey the rules of the road and respect the rights of all. Only by addressing the problem from all angles can we achieve the desired result of safer roadways for all users.

For more information contact: Dr. Morris Oliver, FHWA, Office of Safety (HSA), 202.366.2288.

<http://safety.fhwa.dot.gov/mac>, FHWA-SA-07-012

Reference: MATTERS, Montana LTAP, Summer 2010, Vol. 27, No. 3



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JUNE 2011

## CALENDAR OF EVENTS

|                       |  |                           |
|-----------------------|--|---------------------------|
| July 15-19, 2011      | National Association of Counties (NACo) Annual Conference & Exposition   | Portland, OR              |
| July 25, 26, 2011     | How to Supervise People ( <a href="http://www.pryor.com">www.pryor.com</a> )   | Pocatello, Twin Falls, ID |
| September 9, 2011     | Local Highway Technical Assistance Council Meeting   | Boise, ID                 |
| September 19-23, 2011 | Idaho Association of Counties Annual Conference 2011   | Moscow, ID                |
| October _____, 2011   | LHTAC Application Workshops ( <b>dates &amp; locations soon to be announced-<a href="http://www.lhtac.org">www.lhtac.org</a></b> ) | _____, ID                 |
| October 25-28, 2011   | Lewiston Safety Fest of the Great Northwest (Sponsored by the Idaho T2 Center)   | Lewiston, ID              |
| November 8-9, 2011    | Idaho Association of County Engineers and Road Supervisors Annual Conference   | Boise, ID                 |
| November 9-11, 2011   | Idaho Association of Highway Districts 83rd Annual Conference  | Boise, ID                 |
| November 9-12, 2011   | 2011 Road & Street Conference  | Yakima, WA                |
| December 9, 2011      | Idaho Technology Transfer (T2) Center Semi-Annual Board Meeting  | Boise, ID                 |

*If you are interested in additional information regarding any of the above referenced meetings and/or training sessions, please contact LHTAC at 1-800-259-6841 or [lhtac@lhtac.org](mailto:lhtac@lhtac.org).*