

# Technology Transfer



Vol. 23 No. 2

July 2007

## Inside This Issue...

<i>Chainsaw Safety</i>	Page 1
<i>Culvert Maintenance and Repair</i>	Page 3
<i>Winter Operations: Lessons Learned and New Ideas</i>	Page 4
<i>Join the T2 Listserv</i>	Page 5
<i>Sand and Salt Spreader DVD</i>	Page 5
<i>Road Safety Audit Guidelines</i>	Page 5
<i>ConnDOT's Safe Routes to School Program Recognized</i>	Page 6
<i>2006 Hot Mix Asphalt Paving Awards</i>	Page 6
<i>Connecticut T2 Center Hosts the LTAP Region One Annual Meeting</i>	Page 6
<i>Calendar</i>	Page 7
<i>Is It Zinke or Zenke?</i>	Page 7
<i>Test Your Flagger Knowledge</i>	Page 7

## Chainsaw Safety

*Reprinted with permission from the Arkansas LTAP Center  
Roads and Streets Newsletter*

When clearing debris after a storm, removing dead trees, or cutting wood, chainsaws save time. But as the American Red Cross points out, "it can be unforgiving and lethal, causing injury or death in the hands of an uninformed and unaware operator." In natural disasters, the American Red Cross offers this reminder: More injuries occur during the clean up after a storm than during the storm.

According to the U.S. Consumer Products Safety Commission (CPSC), there were more than 32,000 chainsaw injuries during 2005. Of those injured, 1,149 people were seriously injured, requiring hospitalization, or were killed. Chainsaw accidents comprise 11 percent of all injuries involving yard and garden equipment, according to the CPSC review for 2004.

According to George Maher, Agriculture Safety Specialist at North Dakota State University, fol-

lowing these safety guidelines can substantially decrease chainsaw injuries.

### General Safety Tips

- Use proper clothing and equipment. People employed as chainsaw operators are required to wear a helmet system consisting of head, face and hearing protection; cotton or leather gloves; chainsaw protective chaps or pants (UL Listed); and a pair of chainsaw protective work boots with steel toes. (OSHA Reg. 1910.266)
- Read the operator's manual. Become familiar with the recommended safe operating procedures.
- Use the chainsaw when in top physical and mental condition. Medications, alcohol and fatigue are factors that contribute to injuries.

*continued on page 2*

- Use the proper saw and get training from someone who is experienced with the type of chainsaw to be used. Light-weight saws (8 to 12 in. guide bar) are best for cutting small branches and felling very small trees up to 10" in diameter. Mid-weight saws (14 to 20 in. guide bars) should be used for frequent log cutting and felling trees up to 18" in diameter. Heavyweight saws (guide bars longer than 20") are for professional use.
- Perform regular maintenance on the saw. Sharp teeth ensure the saw will cut quickly, smoothly and more safely. Always wear gloves or cover the chain with a heavy rag when sharpening the saw teeth. Proper chain tension helps increase chain life and safe cutting. A chain that is too loose tends to derail and whip around. If a chain is too tight, it may bind and wear prematurely. Chains stretch with use and need to be readjusted frequently. Change air filters and spark plugs regularly, and lubricate the saw according to the manufacturer's instructions.
- Use both hands when starting and operating the chainsaw. Hold the saw with one hand, gripping the top handles firmly and pull the starter rope with the other.
- Don't stand on a log and saw between your feet.
- Always stand to one side of the limb you are to cut. Never straddle it.
- Always keep in mind where the chain will go if it breaks. Never position yourself or other people in line with the chain.
- Keep the chain out of dirt. Debris will fly, and the teeth will be dulled and chain life shortened considerably.
- Carry the chainsaw with the engine off.
- Fill a gas-powered chainsaw only when the engine is cool.



### Kickback Safety Tips

Kickback of a chainsaw occurs when the teeth on the chain catch on something as they rotate around the tip of the blade. The teeth may have enough force to cause the blade to kick back violently. Three situations cause this: When the nose of the blade strikes another object, starting a bore cut improperly, or when the blade nose or tip catches the

bottom or side of a saw cut during reinsertion.

The best defense against kickback is to keep the tip guard on the chainsaw. If this is not possible, keep a firm hold on the saw and use a saw that has a chain brake or kickback guard. Don't saw with the tip. Use a high chain speed when reinserting the blade in a cut or when removing it. Keep the saw teeth sharp. Always cut below shoulder height. This makes the saw easier to control, and keeps it away from the operator's face.

For a copy of the American Red Cross Chainsaw Safety Fact Sheet, please visit: <http://www.redcross.org/pubs/dspubs/chainsaw.pdf>

## Technology Transfer

Published by the:

**Connecticut Transportation Institute  
Technology Transfer Center**

Phone: 860-486-5400  
Fax: 860-486-2399  
Web: [www.t2center.uconn.edu](http://www.t2center.uconn.edu)

Supported through a cooperative effort of the Connecticut Department of Transportation and the Federal Highway Administration's Local Technical Assistance Program (LTAP) to provide information on the latest transportation technology to Connecticut's state and local government officials.

**Director/Editor**  
Donna Shea  
[shea@enr.uconn.edu](mailto:shea@enr.uconn.edu)

**Training Specialist**  
Mary McCarthy  
[mary@enr.uconn.edu](mailto:mary@enr.uconn.edu)

**Program Assistant**  
Shelly Desjardin  
[shelly@enr.uconn.edu](mailto:shelly@enr.uconn.edu)

**Technical Assistance Specialist**  
Scott Zinke  
[scott.zinke@enr.uconn.edu](mailto:scott.zinke@enr.uconn.edu)

### Additional Reminders

- Never make cuts with the saw between your legs.

# Culvert Maintenance and Repair

*Reprinted with permission from the Florida LTAP Center and the Vermont Local Roads Program*



During heavy rains, poorly working culverts can cause flooding that significantly damages roads and bridges. Even during normal wet weather, a crushed or plugged culvert will contribute to the deterioration of the road as it allows water to back up in roadside ditches. Standing water prevents further drainage from the road base and subgrade. A soft base or subgrade will give under

traffic, hastening break-up of the pavement. Inspect your culverts at least once a year. Afterward, prioritize the repair and maintenance they need, and then schedule and perform the work.

## Culvert Maintenance – troubleshooting

**What you observe....      What may be the reason...      How to fix it.....**

<b>Culvert Ends</b>		
Scouring/erosion at the inlet	<ul style="list-style-type: none"> <li>Ditch is too steeply graded</li> <li>Pipe is poorly located or aligned</li> <li>No headwalls</li> <li>Pipe is clogged</li> </ul>	<ul style="list-style-type: none"> <li>Line the inlet with stone</li> <li>Realign the pipe</li> <li>Install headwalls</li> <li>Clean and flush the pipe</li> </ul>
Scouring/erosion at the outlet	<ul style="list-style-type: none"> <li>Pipe is sloped too much</li> <li>No endwalls or aprons</li> <li>Pipe is too small</li> </ul>	<ul style="list-style-type: none"> <li>Build a stone splash pad</li> <li>Install endwalls or aprons</li> <li>Check size and replace with a larger pipe</li> </ul>
"Ponded" Water	<ul style="list-style-type: none"> <li>Inlet is too high</li> <li>Ditch grade is too flat</li> </ul>	<ul style="list-style-type: none"> <li>Reset the pipe; match the inlet</li> <li>Regrade the ditch to maintain correct flow</li> </ul>
Dented or crushed ends	<ul style="list-style-type: none"> <li>Vehicles or snowplows are hitting the ends</li> </ul>	<ul style="list-style-type: none"> <li>Fix, mark, and protect the pipe ends</li> </ul>
Heavy corrosion	<ul style="list-style-type: none"> <li>Water flowing through the pipe is acidic</li> </ul>	<ul style="list-style-type: none"> <li>Install a sleeve of PVC in the pipe, or replace the steel pipe with a PVC, aluminum or concrete pipe.</li> </ul>
"Piping" around the outlet	<ul style="list-style-type: none"> <li>Pipe is incorrectly installed, causing water to flow along the outside surface of pipe.</li> </ul>	<ul style="list-style-type: none"> <li>Reinstall the pipe on suitable, properly compacted bedding. Install a headwall</li> </ul>
<b>Inside Culvert</b>		
Sediment buildup	<ul style="list-style-type: none"> <li>Pipe isn't sloped enough</li> </ul>	<ul style="list-style-type: none"> <li>Reinstall the pipe at a slope of at least ¼ inch per foot</li> </ul>
Objects blocking the pipe	<ul style="list-style-type: none"> <li>Debris is traveling from the ditch to the culvert</li> </ul>	<ul style="list-style-type: none"> <li>Remove the blockage. Install check dams upstream of the culvert</li> </ul>
Sagging Bottom	<ul style="list-style-type: none"> <li>Foundation material has settled or has low bearing</li> </ul>	<ul style="list-style-type: none"> <li>Reinstall the pipe on suitable, properly compacted bedding</li> </ul>
Crushed Top	<ul style="list-style-type: none"> <li>Cover is inadequate</li> <li>Soil around pipe isn't compacted sufficiently</li> <li>Traffic load is too great</li> </ul>	<ul style="list-style-type: none"> <li>Add cover</li> <li>Reinstall the pipe more deeply, and use suitable, properly compacted bedding and backfill or install multiple small pipes or a pipe with a different shape.</li> <li>Replace pipe with a stronger one.</li> </ul>

## Routine Seasonal Culvert Maintenance

### Spring

- Inspect the inside as well as both ends of the pipe.
- Remove blockages (trash, brush, cornstalks, etc.).

### Summer

- Remove blockages.
- Clean and flush the length of the pipe.
- Repair, improve, or install headwalls, pipe ends, and splash pads.
- Trim and remove brush at pipe ends, and mow grass and weeds.
- Cut and remove trees and limbs that threaten to fall and block upstream ditches.
- Establish vegetation on bare slopes at pipe ends.
- Add fill to cover pipe more thoroughly.

### Fall

- Remove blockages.
- Mark headwalls or pipe ends for snowplow operators.

*Thanks to the Maine LTAP Center for the development of this troubleshooting guide.*

# Winter Operations: Lessons Learned and New Ideas

## A T2 Center – CRCOG Partnership

*By David Gofstein*

*Public Works Superintendent, Town of Bloomfield, CT  
On Special Assignment for the T2 Center*

The roundtable discussion on Winter Operations, held at Rensselaer in Hartford on May 24<sup>th</sup>, almost filled the room. Co-sponsored by T2 and CRCOG (Capitol Region Council of Governments), and adeptly moderated by Andy Tierney, Public Works Director for the Town of Hebron, the morning went fast. After presentations by a few vendors highlighting alternative chemicals, and their use in anti-icing and de-icing, representatives from agencies around the state asked questions, related experiences, and shared what

works and doesn't work in their city or town.

Attendees listened attentively to two presentations in particular. Bill Taylor, Public Works Director from East Hartford gave a presentation on his town's switch to an all salt program, targeting anti-icing as opposed to de-icing based on the FHWA guidelines. His implementation model shows his grasp of the many complexities involved, and has been the basis of quite a few other towns' adoption of East Hartford's plan.

Another direct and honest account of the good and the bad

holding the audiences' attention was Dick Baron and Jeff Wilson from CONNDOT. This past winter, CONNDOT switched its entire strategy from de-icing with the decades old 7-2 mix, to anti-icing with various strategies in various locations statewide. The good, the bad, and a few ugly tales and experiences on a big scale was extremely well received by all.



*Andy Tierney, Town of Hebron, with Donna Shea, T2 Center, (l) and Jennifer March-Wackers, CRCOG*

Ask a dozen people responsible for snow removal what it is, and you'll get a pretty standard answer. Ask the same dozen to explain how their organization does it, and the answers will start to diverge. It becomes clear that winter maintenance is a lot like a game of skill and chance. The task is simultaneously complex, dynamic, and changeable, yet the desired results remain inflexible. Many agencies are using technology to reduce the variables to a minimum, thus limiting their effect on the output.

### ***Experiences Shared by Roundtable Participants***

#### **Successes**

Getting in early—generally no later than the beginning of the storm.

Options include: additives, alternative deicers, various chemicals.

Pre-Treating is a viable option, up to several days for liquids. CONNDOT has good success with this.

Guidelines for temperature/actions are generally useful.

CONNDOT and many local agencies large and small continue to experiment.

#### **Challenges**

If you start with 2 inches of snow on the ground, it's too late to do anti-anything.

Many cities and towns use many different mixes.

It appears to work well with salt brine; other materials are not yet used here for this.

There are guidelines. Local conditions and variable play a huge role.

No one agency has the definitive answer.

***T2 looks forward to putting on more interactive roundtable discussions. For more information on Winter Operations, or if you would like to host a roundtable on a particular subject, contact us. Join the T2 Public Works Listserv to stay on top of training and technical information!***

## Connect to Connecticut's Public Works Community – Join the T2 Listserv



- Tell others of new ideas
- Ask questions about your issues
- Learn about new materials, methods and practices

To subscribe online, go to: <http://listserv.uconn.edu/ctpublicworks-l.html>

*This is one of the best tools we have ever had for Public Works. People answer at their convenience and they do not have to travel. This is like a web based roundtable discussion. I really appreciate and am thankful for all the feedback and help I get from my colleagues in other towns.*

~ **Scott Sullivan, Highway Superintendent , Town of Westport**

## A New Winter Operations Resource

### *Sand and Salt Spreader Calibration*

The T2 Center has a limited supply of this new DVD produced by the Massachusetts Baystate Local Road Program.

Paul Brown, Director of Snow and Ice Operations at the Massachusetts Highway Department guides highway employees through a successful spreader calibration and explains the proper techniques.

**Order your free copy today, supplies are limited!  
Call: 860-486-5400.**

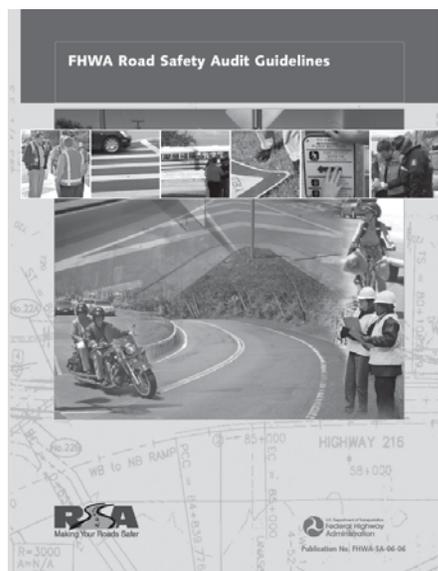
## Road Safety Audit Guidelines

A Road Safety Audit (RSA) is a formal safety performance of an existing or future road or intersection by an independent audit team. The RSA team considers the safety of all road users, qualitatively estimates and reports on road safety issues and opportunities for safety improvement.

A set of guidelines developed by the Federal Highway Administration Office of Safety provides a foundation for public agencies to draw upon when developing their own RSA policies and procedures to conduct RSA's within their community. They include:

- General RSA information
- How to implement an RSA program
- Overview of the RSA process
- Stages of an RSA
- Different types of audits (i.e., design, construction, pre-opening and existing roads)
- RSA tools (i.e., prompt lists)

The guidelines can be downloaded at: <http://safety.fhwa.dot.gov/rsarsguidelines/html/index.htm>



## ConnDOT's Safe Routes to School Program Recognized

At a ceremony on June 2<sup>nd</sup> at the DEP Marine Headquarters in Old Lyme, DEP Commissioner Gina McCarthy and Connecticut Greenways Council Chairwoman LaVerta Matthews presented Greenway Awards to nine individuals and organizations that have made significant contributions to the promotion, development and enhancement of linear open space in Connecticut. In the area of Transportation, the state Department of Transportation's Safe Routes to School program was honored for its hard work to protect Connecticut's natural resources and provide safe recreational opportunities for communities.

## 2006 Hot Mix Asphalt Paving Awards

At the 49<sup>th</sup> Annual Paving Conference hosted on April 18<sup>th</sup> by the CAAPA (Connecticut Asphalt & Aggregate Producer's Association) and the Connecticut Department of Transportation, the following awards were presented:

***To recognize a quality HMA pavement placed on a municipal roadway, the following team exemplified the highest standards of paving excellence.***

Location: **Carley Avenue, Town of Griswold**  
 Prime Contractor: American Industries, Inc.  
 Paving Contractor: American Industries, Inc.  
 Inspection Agency: Town of Griswold

***To recognize a quality HMA pavement placed on an unlimited-access roadway, the following team exemplified the highest standards of paving excellence.***

Location: **Route 214, Ledyard**  
 Prime Contractor: American Industries, Inc.  
 Paving Contractor: American Industries, Inc.  
 Grading Contractor: Rafferty Fine Grading  
 Inspection Agency: ConnDOT – District II, Maintenance

## T2 Center Hosts LTAP Region One Annual Meeting

On June 18-20, members of the LTAP (Local Technical Assistance Program) from Vermont, Massachusetts, New Hampshire, Rhode Island, New York, New Jersey and Maine joined us on UConn's campus for the Region One Annual Meeting. These meetings are a great opportunity to share successes and challenges and highlight new programs being developed to help support the public works communities throughout New England.



# Calendar

## AUGUST

- 1 **Older Driver Highway Design Workshop**  
*Road Scholar Elective, Hartford*
- 8 **Principles of Drainage**  
*Road Master Required, Storrs*
- 9 **Principles of Drainage**  
*Road Master Required, Westport*
- 10 **Principles of Drainage**  
*Road Master Required, Glastonbury*
- 14 **Supervisory Skills: Coaching Your Employees**  
*Road Scholar Required, Windsor*
- 16 **Supervisory Skills: Coaching Your Employees**  
*Road Scholar Required, East Lyme*
- 28 **Where and When to Use Signs, Signals and Markings**  
*Legal Traffic Authority Required, East Lyme*
- 29 **Where and When to Use Signs, Signals and Markings**  
*Legal Traffic Authority Required, New Britain*

## SEPTEMBER

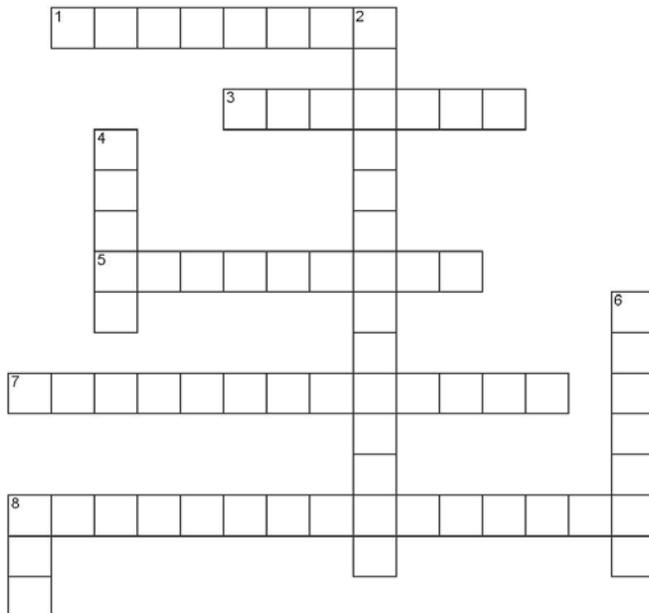
- 6 **Alternative Fuels: Use of Biodiesel in Connecticut**  
*Road Scholar Elective Roundtable Discussion, Hartford*
- 9-12 **APWA Public Works Congress & Exposition**  
*American Public Works Association, San Antonio, Texas*  
Go to: <http://www.apwa.net/Meetings/Congress/2007>
- 19 **Technology Transfer Center Expo**  
*University of Connecticut, Storrs*
- 27 **Technology Transfer Center Graduation Ceremony**  
*University of Connecticut, Storrs*

# Is it Zinke or Zenke?

Well actually it is both, Scott Zinke, the Research Engineer from UConn who is helping the T2 Center with Technical Assistance and is our Flagger Instructor and Scott Zenke, from the Town of Farmington, finally had a chance to meet at the Winter Operations Roundtable Discussion held in May.



# Test Your Flagger Knowledge



[www.CrosswordWester.com](http://www.CrosswordWester.com)

### ACROSS

- 1 It is not typical to use flaggers on these roads.
- 3 A factor influencing a driver's behavior
- 5 A distraction for a flagger
- 7 Not an approved option for communicating between flaggers
- 8 When Flagging at night, the flagger's clothing shall be this.

### DOWN

- 2 A sign with 8 sides.
- 4 The federal standards and guidelines for Flaggers.
- 6 Sign set up ahead of you when you are flagging.
- 8 Color of Flags used for Emergencies

**Think you've got all the answers? Be the first to fax a correctly completed puzzle to the T2 Center at 860-486-2399 and you'll win a surprise gift!**

# Technology Transfer Center Request Form

\_\_\_\_\_ Please change my address/contact information as indicated below.

\_\_\_\_\_ Please add this person to the mailing list. \_\_\_\_\_ Please remove this person from the mailing list.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Agency/Organization: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

I would like to see a future newsletter article on the topic of \_\_\_\_\_

I would like to submit a newsletter article; please call me at \_\_\_\_\_

I would like to request the following informational resource materials:

\_\_\_\_\_

\_\_\_\_\_

Please fax a copy of this form to 860-486-2399 or mail to:

University of Connecticut  
Technology Transfer Center  
Connecticut Transportation Institute  
179 Middle Turnpike Unit 5202  
Storrs, CT 06269-5202

CONNECTICUT TRANSPORTATION INSTITUTE

**Technology Transfer**

UNIVERSITY OF CONNECTICUT

179 MIDDLE TURNPIKE

UNIT 5202

STORRS, CT 06269-5202

NON-PROFIT ORG.  
U.S. POSTAGE  
PAID  
STORRS, CT  
PERMIT NO. 3