On the Road in New Hampshire

Public Works Mutual Aid Program Assists with October Flooding

October 8-9, 2005 brought devastating rains and flooding to the southwestern part of the state. Although, the amount of rain received is still under debate, many miles of roads were compromised requiring state and local agencies to work long hours to ensure safe roads. Three municipalities activated New Hampshire Public Works Mutual Aid.

The town of Walpole closed seven roads. According to Jim Terrell, we “had a lot of damage and needed help from a lot of towns.” Jim mostly needed ten-wheelers to haul materials and he had plenty of offers to help. Towns assisted for a three-four days at a time. Overall the help extended 15-18 days. The towns that assisted were: Derry, Enfield, Goffstown, Peterborough, Merrimack, Washington and Westmoreland.

Ed Thayer, road agent in Washington, received a call from Chum Cleverly, Bow public works director and founder of the Mutual Aid system. Chum offered to help and sent his deputy director, Tim Sweeney along with two additional trucks. Tim assessed the situation and returned with five trucks over the next two days. When the flooding first occurred, Ed didn’t think of Mutual Aid, he said that he “forgot about the resource.” Ed was “very happy and that the paperwork was minimal.”

When Kurt Blomquist, Keene director of public works sent a request on the Mutual Aid pager and an email for help on pw.net, Ken Daniels, public works director in Enfield answered the call.

continued on page 2

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Ken found two vaccon trucks for Keene by searching the Mutual Aid files on-line. Peterborough and Goffstown each sent a truck. The primary clarifier at Keene’s wastewater treatment plant was overwhelmed with grit and grease. Kürt said, “the request was a unique requirement and it was nice to have someone secure the equipment while I worked on other details of the emergency.”

The towns that sent crews to help were pleased. In Bow, the crew that went to Walpole liked being able to help out. Chum said that it was important to him to send capable employees. Derry found that sending people was a morale booster for those who went. Peterborough was happy to go and even stayed on a third day. And, Enfield said the whole thing went off “without a hitch.”

The New Hampshire Department of Transportation (NHDOT) assisted local municipalities as well. The Bridge Division installed two Bailey Bridges, one in Hancock and the other in Unity. The requests for the bridges were made through Planning and Community Assistance (formally known as Municipal Highways).

To learn more about New Hampshire Public Works Mutual Aid Program contact Kathy DesRoches at the UNH T² Center (www.t2.unh.edu/ma).

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**Blogging: Who is Protected?**

Blogs, a personal diary or journal, are an on-line craze. Once posted blogs can be read by anyone and can be misused by employees.

Companies use blogging policies to educate employees about their rights and responsibilities and to avoid potential conflicts. Include employees in the policy making decisions about blogging to create cooperation and a sense of involvement. Company policies should advise employees that any blog:

1. Should include a disclaimer that the opinions in the blog belong to the author alone;
2. May not be used to disclose confidential information belonging to the company or others;
3. May not include content that negatively reflects on the company, its customers or its employees, or anything sexually explicit, harassing, discriminatory or embarrassing; and
4. May not use the company's logo, trademark, trade name, slogan, or graphics.

Bloggers have few protections. A terminated blogger can allege discrimination if his/her blog discloses religious or ethnic background, or homosexuality, etc. In addition, the National Labor Relations Act can protect a blogger if the blog was used to discuss wages, benefits, other terms and conditions of employment, or to try to unionize their workplace.

Source:
Snow Drift Control

Snow Fences

By Chris Robert

Snow fences reduce snow drifts by slowing the wind speed as it passes through the fence. A reduction in wind speed causes snow particles carried by the wind to settle out into a drift creating snow accumulation on the downwind side of the fence.

The desired effectiveness of a fence dictates how tall it will be. The storage capacity of the fence is controlled by its height. Leave a gap between the ground and the bottom of the fence. The gap forces wind under the fence and keeps the fence from being buried.

Proper installation ensures snow fence effectiveness. The following points are critical:

- Locate the fence 35 times its height from the edge of the road
- Snow fence material should be 50% porous
- Leave a gap of 6 - 12 inches under the fence.
- Avoid large openings in a fence. Overlap to prevent loss of effectiveness.
- Extend fence at least 50 feet beyond the protected area to account for the loss of effectiveness at the ends of the fence
- Choose appropriate snow fence material for application based upon local conditions
- Install fence posts before the ground freezes. Fencing may be installed at a later date.
- Use personal experience to determine appropriate drift protection areas

Dense vegetation can act as a living snow fence along roadways. Locate living snow fences 150 - 300 feet upwind of the roadway to prevent drifting. Although primarily located on privately owned land, living snow fences are a public benefit. Living snow fences require voluntary cooperation and participation from the landowner.

A Hard Road to Travel (2004 Edition)

New Hampshire Law of Local Highways, Streets, and Trails

A Hard Road to Travel is a valuable resource for local officials and others interested in New Hampshire roads. Topics covered include: creation and classification of highways; discontinuance; liability, regulation and maintenance; Class VI highways; bridges; trails; drainage; funding; utility lines; and sidewalks, parking and streetlights. To order contact the Local Government Center: 603-224-7447
Master Roads Scholars

Sharon Lucey—City of Dover

Sharon began working in the City of Dover as a laborer. A year and a half later she became a Working Foreman in the Utility Division. Sharon leads a team of four. Its responsibilities include; running the meter division; performing inventory control functions for water, sewer, and drainage maintenance supplies; running the backflow prevention program; and assisting in winter operations.

Sharon loves the variety in her job. Training is on-going in her department to keep water and sewer certifications current. She likes UNH T² classes because the workshops always apply directly to her job. She says that achieving Master Roads Scholar was been her goal and feels satisfied and proud.

Steve Lucier—Road Agent, Bradford

Steve Lucier is the road agent in Bradford. He’s been in Bradford for three years. Achieving Master Roads Scholar is a goal that he is proud to reach. Steve believes that classroom knowledge helps tremendously “on the job.” Steve plans to continue taking classes and learning new ideas and skills to perform his job better. The Town of Bradford is very supportive of the Roads Scholar Program. The majority of his co-workers take classes and many have achieved Roads Scholar I.

As a Master Roads Scholar, Steve is ready to put his knowledge and skills to work. As he plans for the months ahead he says, “Let’s hope for a nice warm winter and not too much snow.”

Hard Hats

There is always someone who objects to hearing a hard hat. Hard hats are an important piece personal protection equipment. To get the most protection, secure hard hats and adjust the webbing so the wearer can bend over without the hat falling off. Use chinstraps head injuries often occur after hard hats are knocked off.

Periodically, check the shell for cracks and the suspension system for cracking, tearing, or fraying. Never paint, drill holes, or use solvents on a hard hat as they weaken the shell. As a general rule, replace the entire hat every two years.

Complaints and Advice

My hard hat is too hot in the summer.

Tests indicate that temperatures inside a hard hat are 12 degrees cooler than a baseball cap. The air between the shell and the suspension create ventilation and the hat’s surface reflects the heat.

My hard hat is too cold in winter.

Liners that cover the ears are available for use on cold days. Do not wear hard hats on top of hats or parkas and do not remove the suspension.

My hard hat is too heavy and strains my neck.

The weight of a hat is properly worn and maintained should go unnoticed. The average hat weighs 13 ounces and a head weighs about 13 pounds.

Check for the official rules about safety and protective clothing. Wear a hard hat when working:
• On or adjacent to the traveled portion of the roadway.
• In contractor’s hard hat zones.
• While operating heavy equipment.
• Where there is danger of head injury from impact, and/or falling or flying objects.
• Where there is danger of contact with a high voltage electric source.

Source:
KS LTAP Workplace and Equipment Safety Fact Sheet
New Hampshire Roads Scholars

We are pleased to recognize individuals who, during the Fall of 2005, have achieved the following levels in the UNH T² Center Roads Scholar Program.

**Master Roads Scholar.** Participated in UNH T² Center training activities which totaled 100 contact hours and covering the range of topics required for Roads Scholar II.

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Bruce Adler</td>
<td>Chesterfield</td>
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<tr>
<td>Bart Bevis</td>
<td>Chesterfield</td>
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<tr>
<td>Ed Chase</td>
<td>Merrimack</td>
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<td>Earl Labonte</td>
<td>Lebanon</td>
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<td>George Leel</td>
<td>NHDOT</td>
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<td>Sharon Lucey</td>
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<td>Steve Lucier</td>
<td>Bradford</td>
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<tr>
<td>Jim Plante</td>
<td>Chesterfield</td>
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<tr>
<td>Jeff Strong</td>
<td>Merrimack</td>
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**Senior Roads Scholar.** Participated in UNH T² Center training activities which totaled 70 contact hours and covering the range of topics required for Roads Scholar II.

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<thead>
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<tr>
<td>Tony Albert</td>
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<td>Joe Benjamin</td>
<td>Walpole</td>
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<td>Doug Bullen</td>
<td>Durham</td>
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<td>Bob Burley</td>
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<td>Kelly Butler</td>
<td>Enfield</td>
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<td>Sam Clough</td>
<td>Haverhill</td>
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<td>Steve Curtis</td>
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<td>Richard Fairweather</td>
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<td>Samuel Fortune</td>
<td>Bradford</td>
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<td>Rod Forward</td>
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<td>James Gove</td>
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<td>Rob Greene</td>
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<td>Ken Hamilton</td>
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<td>Mike Hammond</td>
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<td>Jim Holmes</td>
<td>Portsmouth</td>
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<td>Matthew Ingham</td>
<td>New Durham</td>
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<td>Calvin Johnson</td>
<td>Madison</td>
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<td>Emile Lacerte</td>
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<td>Michael Laclair</td>
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<td>John Larochelle</td>
<td>Rochester</td>
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<td>Jared Rumford</td>
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<td>Bob Seawards</td>
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<td>Andy Smith</td>
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<td>Tom Spaulding</td>
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<td>Dean Stearns</td>
<td>Merrimack</td>
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**Roads Scholar II.** Participated in UNH T² Center training activities which totaled 50 contact hours and covered a set of minimum subject areas including road design and construction basics, other technical, tort liability and safety, and supervision or personal development.

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<td>Dean Stearns</td>
<td>Merrimack</td>
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<tr>
<td>Steve Yeaton</td>
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Building a Successful Road

By Doug MacGuire, Project Assistant

Municipalities must be prepared to play an active role in the layout, design, and inspection of the new roads proposed and built by developers. It is in the municipality’s best interest to accept well-built roads as future maintenance will be the municipality’s responsibility. Consider the following suggestions when creating minimum local road construction standards.

Road Components

A well built paved road consists of two gravel layers and two pavement layers (see figure 1). NHDOT recommends 11 foot travel lanes (22 feet pavement width) for a road with an average daily traffic of 750-1500 cars. Many communities have found that the pavement section described below provides a roadway that will require minimal maintenance for many years.

1. BankRun Gravel – 12 inches (NHDOT Spec. 304.2)
2. Crushed Gravel – 6 inches (NHDOT Spec. 304.3)
3. Base Course Pavement – 2.5-3 inches
4. Top Course Pavement – 1.5-2 inches

Subgrade

Construction begins at subgrade (the foundation of the road). Stake the road to the correct elevations. Typical spacing of centerline stakes is every 50 feet. Each stake contains the following information (see figure 2):

- Station number corresponding to the design plan. It represents a distance, (e.g. 3+50=350ft from project start).
- Elevation at subgrade,
- Plus 12” bankrun,
- Plus 6” crushed,
- Plus 2.5” base course, and
- 1.5” top course.

Place two offset stakes for every centerline stake, one on each side of the road 3-4 feet off the proposed edge of pavement. Subgrade elevations must match the engineering plan.

In excavated areas, watch for groundwater entering the excavation. Consider adding underdrain when groundwater is present.

Road Crown

Road crown should begin at subgrade and be carried through both gravel layers. A typical road crown is 2%. Less than 2% will prevent water from sheeting away, making the road prone to frost heaving. After placing bankrun and crushed gravel, fine grade to perfect the road crown.

Compaction

Use a geotechnical company to perform the compaction testing on each gravel layer and on subgrade sections where more than a foot of fill is required. Test at least every 100 feet. The recommended compaction is 95%.
Check multiple areas at each station

To achieve compaction, use a large vibratory roller. A large single roller may not fully compact around stakes. As construction vehicles travel over the subgrade watch for signs of instability. If the subgrade material appears soft or spongy, the materials may be saturated or unstable. Aerate saturated areas. Excavate and replace unstable materials.

**Stringing Gravel Layers**

A string line and ruler provide a reasonably accurate method to ensure uniform placement of gravels. Figure 3 shows an example of utilizing this method to check a placed bank run gravel layer.

The following steps explain how to check for any low or high areas across the span of road.
1. Span a station of the road with a string.
2. Wrap the string around all three stakes (centerline and 2 offsets) at the mark above the one being checked.
3. Measure down from the string, to the layer below. (The measurement should be equal to the next layer.)
4. Check several spots across the span. (Typical tolerance is within one inch.)
5. Repeat procedure at several stations.

**Before Paving**

Check the crown using a four foot level. The paver will follow existing ground assuming no error by the paver operation.

Before paving, survey centerline elevations because a stake may have shifted resulting in a rise or drop in grade.

**Paving**

Do not pave in the winter or when the ground is frozen. The air temperature must be 45°F and rising. Do not allow paving during steady rain as rain will saturate the gravels.

The temperature of pavement off the truck must be between 260°F and 350°F. Verify pavement thickness and that the paver follows the 2% grade.

Once paved, back up edges of pavement with gravel to protect the pavement edge from cracking and to allow cars to smoothly pull off the road.

Remember, verifying proper building procedure through inspection is essential to make sure the road is built correctly. A road built correctly will last and require minimum maintenance saving a town time and money.

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Special thank you to Dave Lent for your assistance with this article!
Pavement Edge Drop-Offs

Edge Drop-Offs are Hazardous!

Each year, an estimated 11,000 drivers are injured and 160 die in the US in crashes related to pavement edges. Tort liability claims resulting from pavement edge drop-offs cost highway agencies millions each year.

What are Edge Drop-Offs? How do they Develop?

A drop-off occurs when there is a difference in height between a roadway's paved surface and the adjacent shoulder or ground. The pavement edge is unsafe when the angle is nearly a 90-degrees and the drop-off is more than 2 to 5 inches. Drop-offs occur due to

- aging of the road,
- changing subgrade conditions,
- traffic volume,
- poor drainage,
- lack of maintenance, and,
- recent construction or resurfacing projects.

When tires slip off a paved surface onto an unimproved or deteriorated shoulder, drivers will attempt to steer back onto the roadway and may lose control of their vehicle. The pavement edge "scrubs" the tires so drivers over-steer. Over-steering results in drivers re-entering the roadway at a sharp angle and losing control of their vehicle. Their right rear tire may catch the pavement edge and swing the car around or sideways causing the car to veer into the adjacent lane. This may result in a collision with oncoming cars or running off the road and striking a fixed object.

The solutions to repair severe edge drop-offs are simple:

- Perform routine maintenance of shoulders.
- Resurface or rebuild the shoulders when reconstructing or resurfacing of pavement.
- Add a safety edge as part of a contract specification. The edge descends from the new pavement edge at a 30 to 35-degree angle to the adjacent shoulder. (Note: this is a temporary, but important, solution until shoulders are backed up).

What's A Safety Edge?

A safety edge is installed at the edge of the road in reconstruction and resurfacing projects. It is a simple and cost-effective way to create a safer road edge. The edge creates a small "ramp" from the shoulder to the new pavement allowing errant vehicles to "climb" back onto the pavement in a controlled way. Asphalt pavement contractors use a special edging device to install a safety edge while resurfacing.

The safety edge also creates a strong tie between roadway and shoulder by locking the old shoulder into the resurfaced road. If time and money prevent immediate resurfacing or rebuilding of shoulders, crews can restore the shoulders at a later time when the edge is used. If plans exist to rebuild the shoulders immediately the safety edge is still a good idea. If the rebuilt shoulder washes out, the safety edge will remain to assist errant vehicles back to the pavement.

Kistic, Joseph, Remedy of Pavement Edge Drop-Offs from Resurfacing Projects, The Pennsylvania Local Roads Program, LTAP Technical Information Sheet #123, Fall 2005

Upgrading NH Public Works Software

A new initiative of the UNH Technology Transfer center is to create and distribute a Geographical Information System (GIS) to assist municipalities with asset management and GASB34.

The GIS tool will be used to collect infrastructure data. The data will be collected and managed using an internet-based Web server. This will allow for quick and efficient use of the data.

The system will update and integrate the Road Surface Management System (RSMS), Sign Inventory Management System (SIMS), and Drainage Inventory Management System (DIMS) into a GIS platform to create an improved New Hampshire Public Works Software Management package. The data will include infrastructure inventory information and condition.

The UNH T² Center is working with the New Hampshire Department of Transportation (NHDOT), New Hampshire Geographically Referenced Analysis Information Transfer (GRANIT), and other partners to develop a seamless state wide parcel map.

The NHDOT is incorporating its fly-overs with their straight-line diagrams for integration with municipal parcel maps for distribution via a Web server. Local agencies will be able to use this map as well as enter data and upload their information to it.

<table>
<thead>
<tr>
<th>Distance from Edge of Travel Lane</th>
<th>2 inches</th>
<th>&gt; 2 inches to ≤ 4 inches</th>
<th>&gt; 4 inches to ≤ 2 feet</th>
<th>&gt; 2 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 4 feet</td>
<td>No channelizing devices required.</td>
<td>Install 1:1 or flatter safety edge. (1)(2)(3)</td>
<td>• Place suitable material to grade and compact to non-movement. • Install a 1:3 (3:1) slope with suitable material and compact to non-movement. (1)(2)(3) • Install temporary barrier.</td>
<td>• Install temporary barrier. • Place suitable material to grade and compact to non-movement. • Install a 1:3 (3:1) slope with suitable material and compact to non-movement. (1)(2)(3)</td>
</tr>
<tr>
<td>&gt; 4 feet to ≤ 12 feet</td>
<td>No channelizing devices required.</td>
<td>Install 1:1 or flatter safety edge. (2).</td>
<td>• Place suitable material to grade and compact to non-movement. • Install a 1:3 (3:1) slope with suitable material and compact to non-movement. (2)(3)</td>
<td>• Install temporary barrier. • Place suitable material to grade and compact to non-movement. • Install a 1:3 (3:1) slope with suitable material and compact to non-movement. (2)(3)</td>
</tr>
<tr>
<td>&gt; 12 feet to ≤ 15 feet</td>
<td>No channelizing devices required.</td>
<td>Use channelizing devices throughout dropoff condition. (3)</td>
<td>Use channelizing devices throughout dropoff condition. (3)</td>
<td>Use channelizing devices throughout dropoff condition. (3)</td>
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Footnotes:
(1) Install low shoulder signs at intervals not to exceed ½ mile throughout the dropoff condition.
(2) Use channelizing devices throughout dropoff condition.
(3) No channelizing devices are needed if the dropoff is:
• outside the right-of-way: OR
• behind the guiderail, barrier, or curb: OR
• greater than 15 feet from the edge of roadway.
These publications are available from the UNH T² Center. See www.t2.unh.edu/video_pub/publist.html for a complete list and to access some publications online. To request publications, complete form and mail or fax to 603-862-2364.

- **Another Sleepless Night?** This packet provides information for individuals who snow plow to stay alert during their shift. *Primex*
- **Deicing, Anti-icing, and Chemical Alternatives.** An informational sheet on emerging technologies to consider for particular snow or ice control situations. *UNH T³ Center Road Business, Fall 1996.*
- **Things to Know Before Buying a New Plow.** This handout includes information to consider when buying a new snow plow, including information on the engine, frame, cab, front axle, and other considerations. *UNH T³ Center Road Business, Spring 1996.*
- **Administrative Rules for Safety and Health.** This provides information on the safety and health of employees, including confined space, toxic substances, abrasive blasting, fire protection, and other important rules. *State of NH Department of Labor.*
- **Nonpoint Source Pollution.** This BMP’s of nonpoint source pollution includes information on the water cycle and pollution, BMP’s for developing land and for land use, citizen involvement and watershed planning, and funding. *NHDES 1992.*
- **Road and Street Load Limits.** This is a summarized report on House Bill 613, which declares the maximum weight limits on class IV, V, and VI roads.
- **Road Business CD.** This CD contains Road Business issues from spring 2000 to fall 2005. *UNH T³ Center.*
- **Snow Disposal Guidelines.** This fact sheet introduces concerns of citizens during winter operations and it describes guidelines for minimizing complaints and environmental hazards. *NHDES 1992.*
- **Stormwater Management and Drainage: NACE Action Guide.** This manual provides information for local engineers and administrators to cope with legal, technical, and environmental problems associated with stormwater. *NACE 2000.*
- **Suggested Minimum Design Standards for Rural Subdivision Streets.** These are minimum standards to be met or exceeded whenever possible, by town and city local authorities. *NHDOT 2003.*
- **The Snowfighter’s Handbook.** This guide has information on snow and ice control, including training, equipment, planning, types of snow, calibration, salt application, spreading and plowing problems, and safety. *Salt Institute.*

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**Material Request Form**

Name: ____________________________
Affiliation: ____________________________
Town/City: ____________________________
Phone: ___________ Fax: ___________
Title: ____________________________
Mailing address: ____________________________
State: _______________ Zip: ___________
Email: ____________________________

UNH T² Center, Road Business, Winter 2005, Vol. 20, No. 4
Milestones:

Doug Bernard, Master Roads Scholar, has retired from Concord.

Mike Burledge, of the NHDOT is retiring this year.

Dave Cedarholm, has is the new town engineer in Durham, replacing Bob Levesque.

Ryan Haynes, of New London passed away.

Larry Jackson, director of public works in Littleton, Master Roads Scholar, and president of the Road Agents Association had retired.

Pete Lavoie, community services director in Dover, has retired. Pete was chair of the Public Works Mutual Aid Committee.

Web sites:

Chip Seal Best Practices NCHRP Report 35-02  

Highway Watch: http://www.highwaywatch.com/

Management Quotes http://www.adviceonmanagement.com

On-line Dictionary http://www.onelook.com/

Road Safety Audits  

Listservs

A listserv is a free way to use email to exchange information. To subscribe send an email to ListProc@lists.unh.edu. Leave the subject line blank, in the body of your message type:

Subscribe listname your name

For instance:

Subscribe pw.net John Doe

PW.NET

Want to know what is happening in other towns? Or, learn the very latest in regulations? Need a place to ask questions of other public works officials? Want to be the first to receive notifications of UNH T2 Center workshops? Sign up for pw.net

RunOff.Talk

Want to discuss NPDES II issues and concerns? This list enables a dialog to clarify federal permits, and determine the best technical management for compliance. Use it to announce meetings and conferences.
Cal endar
Planned UNH T² Center workshops
Spring of 2006
For additional information or registrations, call the UNH T² Center or check the website

- Drainage, Drainage, Drainage
  2 Locations
- Erosion Control
  2 Locations
- Geotextiles
  2 Locations
- Hard Road to Travel
  2 Locations
- Inspection and Testing
  2 Locations
- MUTCD
  1 Location
- Municipal Permits
  1 Location
- Municipal Road Standards
  1 Location
- Performance Evaluations
  2 Locations
- Project Planning
  1 Location
- Repair Treatments
  1 Location
- Work Zone Traffic Control
  2 Locations

Flooding in Walpole—October 2005