On the Road in New Hampshire

Eastern Snow Expo

The 8th Annual Eastern Winter Road Maintenance Symposium & Equipment Expo was held on September 4, 2003 at the Center of New Hampshire in Manchester. The event is in a different state each year. In 2001, it was in Massachusetts. In 2005 it will be in Connecticut. The 2003 show was co-sponsored by Federal Highway (FHWA), the New Hampshire Department of Transportation (NHDOT), and the UNH T² Center.

The purpose of the expo was to improve agency’s response to winter weather. The latest equipment and techniques were available to assist with snow and ice control, fleet maintenance, materials storage, and environmental issues.

The co-sponsors coordinated three interesting and informative educational tracks. The Environmental Track featured sessions called Environmental Impacts of Abrasives, Salt Storage, Fueling and Vehicle Washing, and Environmental Concerns Related to Winter Maintenance Operations.

The Safety Track featured sessions entitled: Motor Carrier Regulations and Their Effect on Winter Road Maintenance, Use of Warning Lights, LEDs, and Fiber Optic Lights, Spring Weight Restrictions.


All three tracks were well-attended.

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Three roundtables completed the day. They were entitled: Shopping for Diesel Engines, Winter Maintenance Effects of roadway Delineation, and Winter Maintenance—Liability and Insurance. Even though the roundtables began at 2:45, fifty-nine people attended.

Over 1000 people registered for the event. They came from 36 states and provinces. There were 73 vendors, whose products ranged from anti-icing chemicals to plow blades from insurance to safety clothing.
This New Hampshire rural collector carries more than 3000 vehicles per day. It should have both center and edge lines. Engineering judgment would probably conclude that the centerline should define no passing zones.

Pavement markings guide road users along travel paths and inform them of regulations. This article describes the MUTCD rules for two of them: centerlines and edge lines. They are especially important at night and for motorists new to the road. They are often required or recommended on local roads.

The box on page 3 contains definitions of key terms. Readers should also note the use of particular verbs. “Shall,” “must,” and “required” denote MUTCD Standards, or mandatory rules. “Should” and “recommend” denote Guidelines, or recommendations. “May” denotes Options, or allowable actions. For illustrations of the rules, readers should refer to Figures in MUTCD Section 3B.

Centerline Markings

Centerline stripes inform motorists that others will travel in opposite directions on a roadway. Solid or broken lines define passing rules. The MUTCD requires centerline markings:

♦ On urban arterials and collectors with a 20 foot or more travel way width, and an ADT of 6,000 vehicles per day or greater.
♦ On two-way roads with three or more traffic lanes.

continued on page 3
It recommends centerline markings

♦ On urban arterials and collectors with a 20 foot or more travel way width, and an ADT of 4,000 vehicles per day or greater.
♦ On rural arterials and collectors with an 18 foot or more travel way width, and an ADT of 3,000 vehicles or greater.
♦ On other travel ways where an engineering study indicates a need.

The MUTCD allows engineering estimates of ADTs if traffic counts are not available. Cities and towns may place centerline stripes at specific locations. Examples include around curves, over hills, and before bridges.

Centerline stripes must be yellow, and 4 to 6 inches wide. On two-lane, two-way roadways they must be one of the following:

♦ A broken yellow line where crossing the centerline for passing is permitted for traffic traveling in either direction.
♦ A broken yellow line and a solid yellow line where crossing the centerline for passing is permitted for the traffic traveling adjacent to the broken line, but is prohibited for traffic traveling adjacent to the solid line.
♦ Two solid yellow lines where crossing the centerline markings for passing is prohibited for both directions.

On undivided two-way roadways with four or more traffic lanes, centerline stripes shall be two solid yellow lines. On two-way roadways with three traffic lanes, one- or two-direction no-passing zone markings should designate two lanes for traffic in one direction.

**Edge Line Markings**

Edge line stripes inform motorists of roadway edges. They are especially important during adverse weather and visibility. The MUTCD requires them on rural arterials with a 20 foot or more travel way, and an ADT of 6,000 vehicles per day or greater. It recommends edge line markings:

♦ On rural arterials and collectors with a 20 foot or more travel way, and an ADT of 3,000 vehicles per day or greater.
♦ On urban arterials and collectors with a 20 foot or more travel way width, and an ADT of 4,000 vehicles per day or greater.
♦ On rural arterials and collectors with an 18 foot or more travel way width, and an ADT of 3,000 vehicles or greater.
♦ On other travel ways where an engineering study indicates a need.

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**Terms and Definitions**

**MUTCD.** The Manual of Uniform Traffic Control Devices, which provides the rules for pavement marking installation and maintenance.

**Urban areas** have high-density land development, usually with populations of 5,000 or more.

**Urban roads** are highways and streets in urban areas. Their primary uses are for commuting and shopping.

**Rural roads** are outside of cities. They serve as links between population centers.

**Arterial roads** serve travel between cities, large towns, and other transportation generators. Traffic volumes and speeds are usually very high. Collector roads collect traffic from local urban streets and rural roads, and convey it to arterial roads.

**ADT.** Average Daily Traffic. The average of 24 hour traffic counts, usually expressed in vehicles per day (VPD).

**Engineering judgment.** The MUTCD recommends that engineering judgment be the basis for all traffic device decisions. It also recommends that agencies without staff engineers seek engineering assistance from others.
Changes for Many Dig Safe Callers
New System More Efficient, With the Proper Information

Dig Safe Notification

The NH Dig Safe rules cover nearly every kind of public excavation. An "excavator" is any person performing an excavation. Highway departments are frequent “excavators.” Therefore, they must notify Dig Safe System, Inc. (DSS) 3 days before digging. (This excludes Saturdays, Sundays and holidays.)

DSS notifies member companies of proposed excavation projects. Then members identify the location of underground facilities. DSS gives callers a permit number as confirmation. That “ticket” is good for 30 days. Any digging after that requires another permit.

DSS recently upgraded its computer system. Some callers have seen no change. They have routinely provided information that fits the new system. Others, however, must now give different information. This article is for those people, and for those who will begin requesting Dig Safe permits. Understanding the system should help everyone efficiently acquire permits.

Background for System Changes

Using a computer system DSS determines which utility companies to notify. In the past, DSS relied on a database of street names. Utilities supplied a list of streets where they had buried facilities. The database could only search for streets in their entirety but not for street segments. When DSS staff punched in a street name, all the companies listed received the excavation notice.

However, a utility might have buried lines on only a street section. When it still received an excavation notice, it had to investigate it. This was inefficient for both the member utilities and the callers seeking permits.

DSS now uses more efficient GIS/GPS technology. It can now identify precisely the utilities in the excavation area. That is, it can if it has the needed information.

The Needed Information

DSS can notify the affected companies if callers provide one of these information types:
1. Address; e.g., 25 Main St.
2. Address Range; e.g., 5-25 Main St.
3. Intersection; e.g., Main St. at Green St.
4. Latitude and Longitude Coordinates (LLC); e.g., Latitude 42.4795875° North and Longitude 71.1192741° West.

This information is usually sufficient to identify location. However, more information can speed buried line location. The following will help utility locators define the exact project area and mark buried facilities.
• pole, post, pedestal, transformer, or manhole numbers
• lot numbers
• new streets and developments
• place names, such as McDonalds or the Public Library
• mile markers and exit numbers of highways
• locations that begin at an intersection and then proceed down either street

At times, callers cannot give an address, address range, intersection, or LLC. DSS staff must still locate the proposed excavation area on their maps. Therefore, the caller must provide other information. Most important are distance and direction from existing streets. Distance should be in feet. The staff member then draws a polygon to define the excavation area. Staff will often add information as comments. The computer system will notify the affected utilities.
When DSS Staff Must Draw on Maps

The following are examples of when DSS staff will need additional information.

**Example 1: For pole, post, pedestal, transformer, or manhole numbers; place names; lot numbers.** The caller plans to replace a speed limit sign post. An address, an intersection, or LLC are not available.

The caller must give distance and direction information. An example is “Replacing the 35 mph speed limit sign on the north side of Montvale Avenue 250 feet east of Main Street.”

**Example 2: For New Streets.** The city/town plans to repair ditches along a road that might not appear on recent maps.

DSS staff needs distance and direction information from mapped streets to define the excavation area. For example, “Grading the ditches for 850 feet on both sides of Springdale Road. It goes north from Main Street, starting 600 feet west of Elm Street.”

**Example 3: Excavation at a location without an address.** Highway crews will install new guardrail for a steep slope on Rural Road. An address, an intersection, or LLC are not available.

DSS staff needs the intersecting street names, and distances and directions. For example, “Installing a guardrail on the south side of Rural Road between Main Street and Elm Street. It begins 350 feet from Main Street for a length of 110 feet.”

**Summary**

Municipal highway departments must notify Dig Safe before any excavation. If they provide the necessary information, they will receive a permit number. The best information is an address, address range, intersection, or LLC. If not, they must provide distance and direction information.

Municipal officials can notify DSS by phone at 1-888-dig-safe. They can apply online at www.digsafe.com (click on “Online Options.”) The website also has information and forms under “Services.”

In addition, excavators must “premark” excavation areas. They must define the point or perimeter with white paint, stakes, or other white markings.

Thanks to Lisa Faso, Dig Safe System, Inc. Public Relations Representative, who provided basic information and reviewed this article.

Sources:
For the complete Dig Safe rules, see http://www.digsafe.com/documents/uhindex.pdf.
For more on DSS procedures, see http://www.digsafe.com/services/downloadableforms.htm

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**NHPWME Fall Meeting**

The New Hampshire Public Works Municipal Engineers will hold its Fall Meeting again this year at the New Hampshire Municipal Association’s Annual Conference. The session will be from 9:30-12:00 and 1:30 -2:45 on November 13, 2003 at the Center of New Hampshire, Manchester.

Kevin Nyland from the NHDOT will explain the new Wetlands Notice of Intent procedure. Municipalities will find this process easier for routine maintenance and more timely than the previous procedure.

Deb Loiselle and Jim Colburn will share their experience working with EPA and NPDES II regarding construction Activities. This topic will be of interest to all municipalities.

Eric Williams from NHDES will discuss grant opportunities for municipalities when working with Nonpoint Source Pollution.

Tom Ballestero, UNH Civil Engineering Department, will discuss Retention vs. Detention Ponds. This is an on-going topic of discussion for engineers and maintenance people.

To register for the event, contact NHMA at 800-852-3358. Looking forward to seeing you there!
Training to Improve Performance
Planning for Needed Knowledge and Skills

Improving Performance

Organizations measure performance by the goods produced or services provided. It is the employees that produce the goods and provide the services. Therefore, performance depends on the application of the employees' knowledge and skills. This is true for all organizations, including highway agencies.

A highway department can improve its performance in two ways:
1. Enable greater application of existing knowledge and skills.
2. Improve the knowledge and skills of its people.

Recognizing good performance is an effective, yet inexpensive, way to get greater application. Necessary, but more expensive, is providing the materials and equipment necessary for efficient and effective application.

A municipality can improve the knowledge and skills of its people. This includes crew members, and also managers and others who make decisions about highway maintenance and repair. Highway maintenance is complex. New people have a lot to learn. Experienced people have to keep abreast of new technologies. Lifelong learning and training are the only paths to improve knowledge and skills.

To improve performance, municipalities must have a program to ensure its people are on the learning and training path. The following are steps to develop a learning program. It refers to learning approaches, which are described in the next article.

Developing a Learning Program

To improve its people's knowledge and skills, a highway department should have an education and training program. It can develop such a program with these steps:
1. Determine the results the department wants to achieve. The department's planned work will usually define these results.
2. Determine what knowledge and skills people will need to achieve the results.
3. Design a training plan that enables individuals to acquire the needed knowledge and skills. Managers should consider the learning approaches in the next article. They can then decide whether to use workshops of training providers, and internal training.
4. Arrange or deliver the training.
5. Design the follow-up and ways to reinforce the training.
6. Measure the impact and calculate return on your investment.

With a thorough training plan, a highway department will have people with the necessary knowledge and skills to achieve its results. In other words, the employees can produce more, and improve the performance of the department.

After any training, municipal management should reinforce the learning. Learners must apply it, or they will soon forget. Assigning learners with appropriate tasks is not only reinforcement, but also recognition of their self-improvement.

Recognition reinforces learning, especially public recognition. Examples include:
♦ Public announcements of training activity completion, such as at department and public meetings, in newspapers, and in town reports.
♦ Prominent display of certificates and awards
♦ Official letters of recognition.

Public individual recognition also increases the prestige of the department and the municipality.

Source:
Learning Approaches

Educators have many approaches to help people learn. Some are more effective than others. Effectiveness varies by individuals; people differ in how they learn. As recommended below, learners gain the most knowledge and skills from a combination of the following approaches.

Instructor-led training: Generally, people learn more in classrooms. Instructor-led field exercises are also very effective. Trainers must know their material and how to teach adults. They must prepare clear and organized presentations. They should have handouts so learners can follow the presentation. Handouts are useful for reference in the workplace. Instructors are most effective when they engage learners through discussion and exercises.

Although effective, instructor-led training can be costly in terms of both time and money. Therefore, municipalities should be sure they invest in high quality training. The International Association of Education and Training (IACET) has criteria for effective adult learning. The UNH T² Center, among others, apply the IACET criteria to their training activities.

Book learning: Some people learn effectively from written materials. Books and periodicals provide new ideas and information. They also enable readers to refresh and clarify prior learning.

Book learning is relatively inexpensive and easy to administer. However, reading alone seldom develops new skills or results in changed behavior. For the best return on investment, many individuals should read the book, and then participate in group or departmental discussions.

Video learning: Videos add a visual component that helps many people learn. Otherwise, it has the advantages and disadvantages of books. Studies have shown that video learning is especially effective if groups view and discuss the video.

E-learning: Many new web-based learning programs are becoming available. They vary in purpose as well as effectiveness. Some only provide information, often with pictures and at times with videos. Some programs are essentially courses on computers. Learners read materials, and then answer questions or take exams.

Effectiveness depends largely on the learning style of the learner. Computer operation skills can also be a factor. In general, learners develop few new job-related skills, and retain the information for only a short time. Advantages include lower travel costs and greater personal convenience.

Action learning: Nearly everyone learns by doing. The process is real-time, work-related problem solving. A group of employees solves work problems or improves processes. For individuals, it can result in self-discovery and increased confidence. For the group, it can build confidence in each other, and shows what they can accomplish together.

The advantage is its relevance to the workplace. The disadvantage is that it tends to be reactive; "When there is a problem, we fix it."

On-the-job training: This approach includes mentoring, tutoring, or coaching. It is especially effective for skills training. The mentor, tutor or coach must have personal relations skills as well as be skilled in the subject. The advantage is that learning is personalized, both to the individual and the situation. On the other hand, it is usually time consuming and limited to special situations.

Combining Approaches

Combining the above approaches expands as well as reinforces learning. For example, after instructor-led training, managers can set up action learning and on-the-job training situations. They can similarly combine book or video learning with action and on-the-job learning.

Some e-learning programs incorporate instructor-led training. Via email, learners discuss material with the instructor and other learners. Taken by a group of employees, they could combine e-learning with action or on-the-job training.

Source:
Getting the Most from Training
Here Are Some Suggestions

Attendees listen to an Incident Command Systems workshop given by Barry Wante

Most people attend training for new knowledge and skills. Sometimes they want to expand on what they know, or to refresh themselves on a topic. Training also provides an opportunity to network with others in the same or related fields. Whatever the purpose, they expect to be able to do their job better, and to advance in their careers.

What people learn depends on the quality of the training. Perhaps even more important, it also depends on the learners’ preparation, participation, and application. This article suggests ways to get the most out of training.

Selecting Training

Above all else, people should define training topics based on their need for knowledge. For many topics, there are often a number of training options. For some, options are limited, and for a few topics training must be developed. Managers must often search for the options. The search is easier if they get on training providers’ mailing lists. Web searches might reveal possible training possibilities.

After finding a training provider, managers should ensure the training will fulfill their need. If necessary, they should contact the provider and ask specifically what will be covered. People often contact the UNH T2 Center with specific questions about courses. They can also ask others who have attended a course.

Have a Training Purpose

Before attending a session, learners should have a clear purpose. It should be based on the training need defined above, and in terms of “learning outcomes.” That is, learners should know what they want to learn, and how they might apply it in their job. The clearer they are about learning outcomes, the more likely they will learn what they want. In other words, knowing learning outcomes creates more active, and satisfied, learners.

If a boss requests a learner to attend training, he or she should understand the boss’s expectations. The learner can ask, “How do you expect me to use what I have earned?”

Involving the Boss

Many municipal officials require approval for training. Before requesting approval, learners should list the training benefits for the department. After the training, learners should meet with superiors to discuss what was taught. Such discussions also reinforce learning.

While You Are There

It is the instructor’s responsibility to clearly present material. Learners should hold instructors to that responsibility. They should help by asking questions. Moreover, questions help learners fulfill their learning purpose.

Some learners hesitate to ask questions. They should remember that, if they do not understand something, others probably do not either. Asking questions can generate discussion and benefit other learners. Of course, learners can speak with the trainer during breaks.

Learners should take notes during the workshop. No one can remember everything that is said. Notes are useful for later reference. They are also another way to learn the material. Notes are especially important for ideas about application of the material.

During breaks, learners should organize the handouts and their notes. They also try to discuss the material with other learners.

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Publications
University of New Hampshire Technology Transfer Center

Copies of the following books and pamphlets, and our complete list of publications, are available from the UNH T² Center. The website has the most up-to-date list of publications. When requesting an item with a charge, please include the check with your form. If ordering by mail, follow the instructions below. To request by telephone, call 603-862-2826, or in NH, 800-423-0060. You can also request by fax to 603-862-2364, online at www.t2.unh.edu, or by e-mail to t2.center@unh.edu

The following materials are available free of charge.

____Another Sleepless Night? From PRIMEX³, this publication gives guidelines to more productive “all-nighters” during winter operations.

____Calcium Chloride Package. A set of articles and pamphlets explaining the benefits of deicing with calcium chloride.

____Call Dig Safe Before You Dig. An information pamphlet with regulations and helpful laws regarding digging.

____Flowable Fill Packet. This packet discusses different types of fills, covering specifications, materials and construction recommendations.

____Instructions for Use of the Notification of Routine Roadway and Railway Maintenance Activities. Provides notification form and process for use by public or private entities that are proposing to conduct certain routine roadway and railway maintenance in wetlands, surface waters and other protected areas.

____Maintenance of Small Traffic Signs. A guide for maintaining small traffic signs geared toward maintenance personnel.

____Manual of Practice for Anti-icing of Local Roads. Manual of Practice—Appendix B. A rewrite of Manual of Practice for an Effective Anti-icing Program published by the FHWA. This UNH T² Center workshop notebook describes the difference between deicing and anti-icing, and how to set up a good anti-icing program.

____NACE Action Guide—Tort Liability. Explains liability and insurance for individuals, public agencies, and employees who are concerned with local roads, road care, and maintenance. Also goes through the elements of a lawsuit.

____Road Salt and Water Quality. Environmental Fact Sheet discusses road salt management, alternatives to road salt, and the DOT Reduced Salt Pilot Program.

____The Salt Storage Handbook. A practical guide for handling deicing salt. Published by the Salt Institute.

____Snow Disposal Guidelines. Environmental Fact Sheet; flyer gives recommended guidelines for snow disposal.

____Things to Know Before You Buy a New Plow. Reprinted from a previous edition of Road Business, this article points out recommended specifications for trucks that will have snow plows, and spreaders.

To Request Material by Mail

Check the items you would like to receive. Fill out this form and include a check in the envelope, if necessary. Cut out this page and mail to the UNH T² Center.

Name: _____________________________________________________________________________________
Position: ___________________________________________________________________________________
Organization: _______________________________________________________________________________
Address: ___________________________________________________________________________________
Town: ________________________________________________ State: _____________ Zip: _______________
The following videos are available from the UNH T³ Center Video Library. You can have five videos for a two-week period with no charge. To request by mail, check the videos you would like to borrow (up to 5), fill out the mail request form, staple closed, affix stamp, and mail. To request by telephone, call (603) 862-2826 or in NH, (800) 423-0060. Visit our complete publication and video catalog on our website at http://www.t2.unh.edu or email us at t2.center@unh.edu

___DC-225, Traffic Barriers, 46 min. Consists of an overview of traffic barriers, how they work, why they’re used, what factors cause them to fail, and installation of different systems: the cable barrier system, the box beam barrier system, W-beamwood and steel signpost systems, concrete barrier systems, and traffic barrier terminals.

___DC-243, Plows of the Future, 8 min. Improvement of snow plows and how SHRP is researching them. Snow Scoop is featured.

___M-243, Plow Power, 15 min. Modern techniques for efficient and effective plowing, focusing on plowing in towns and cities. Techniques include main streets, intersections, cul de sacs; wing blade, tandem blade, and reversible blade usage, and one-way streets.

___M-247, Planning and Organizing Winter Operations, 12 min. Preparations for winter operations including ordering parts and materials, stock piles, checking drainage areas, rental agreements, snow plowing map, crew and staff meetings.

___M-248, White Gold, 26 min. Emphasizes the proper selection of snow equipment. Discusses the advantages and limitations of various types of equipment, plows, and blades.

___PA-217, Safety Restoration Snow Removal Guidelines, 25 min. Presents snow and ice removal safety hazards, and methods for correcting them. Also discusses the importance of snow and ice removal management plans and how they can be implemented.

___ST-207, Safety Features for Local Roads and Streets, 2 tapes. These tapes show typical highway safety conditions and roadside obstacles. It presents the ways to eliminate or minimize accident severity. It looks at ditch slopes, culvert ends, driveways, cross roads, cable and concrete barriers, bridge railings, sign posts and mailboxes.

___ST-223, Snow Plowing and Sanding Techniques, 20 min. This video discusses techniques for plowing and standing, as well as preparation and safety.

___Video Catalog.
Milestones:

*Boscawen* has joined Mutual Aid.

Alex Cote is the new Road Agent in Deerfield.

*Martha Drukker*, City of Concord, has joined the UNH T2 Advisory Committee as a representative of the New Hampshire Public Works Municipal Engineers Association.

Richard Petell, Highway Superintendent in Gilford died after a brief illness on July 6, 2003

Websites:

UNH T2 Center: http://www.t2.unh.edu

Construction Work.com field manual provides practical tools http://www.constructionwork.com/


NH Municipal Websites http://webster.state.nh.us/municipal/index.html#h

NH General Court, see what bills are being reviewed. http://www.gencourt.state.nh.us/ie/

PSNH Contractor information http://www.psnh.com/Business/Contractor/building.asp

Short-cut keys for Microsoft http://www.assistu.com/archive/view/20000215

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After The Session

The following will help learners retain what is taught.

- As soon as possible after the workshop, go over handouts and notes. Make additional notes to help organize ideas.
- Discuss what was taught with superiors and co-workers. This review reinforces learning, and benefits the department.
- Apply what is learned as soon as possible.
- Periodically review the course materials and notes.

These suggestions will help learners get more out of workshops. They will benefit learners, others, and the municipality. It also helps ensure approval of future training requests.

Adapted from Bacal, Robert, “Going to Training? Here’s Some Hints”, *T’S Quarterly*, South Carolina Transportation Technology Transfer Service, 1-2. Summer 2003
# Calendar

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<td>All About Asphalt, Keene</td>
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<td>PR for PWD, Manchester</td>
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<td>Basic First Aid, Franklin *</td>
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<td>Basic First Aid, Concord *</td>
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*Mutual Aid Course*