On the Road in New Hampshire

Reflective Street Signs Required, Increased Letter Size Recommended

Recent changes to the Manual on Uniform Traffic Control Devices (MUTCD) affect municipal street name signs. The compliance date is January 9, 2012 to allow state and local agencies to make the required and recommended changes.

The first change is to require retroreflective street name signs. The MUTCD had recommended reflectorized or illuminated signs. In other words, retroreflectivity for street signs has changed from an advisory to a mandatory condition.

The second change is a recommendation for an increase in letter size. On local roads with speed limits greater than 25 mph, signs should have 6 inch uppercase letters, 4 ½ inch lowercase letters, and 3 inch letters for street abbreviations or city sections (e.g., Avenue, Road, NW). For local roads with speed limits 25 mph or less, the existing MUTCD language is modified to provide an option for the continued use of a minimum 4 inch uppercase letter size with 2 inch lowercase letters for street abbreviations or city sections.

The Federal Highway Administration recognized that the change from 4 to 6 inch letter sizes would impose some additional costs on state and local jurisdictions. It therefore established January 9, 2012 as the compliance date for installing street name signs with these changes.

This long period gives New Hampshire municipalities time to decide how and when they will comply with these changes. One factor to consider is that reflectorized signs increase motorist safety. In addition, the larger lettered signs are more convenient for motorists and passengers. Several towns are already installing 6-inch lettered signs on major roads.

Cost, on the other hand, is a negative factor. A 6-inch lettered sign costs about twice that of 4-inch. Post and hardware costs also increase significantly. The added cost is due to the size of the signs. Signs with 4-inch letters are 6 inches high; signs with 6-inch letters are 9 inches high. Six-inch lettered signs are also longer, and require heavier posts and hardware.

Source:

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The Used Oil Grant Program

By Cassie Plourde,
Project Assistant

Some communities have taken advantage of the Department of Environmental Services’ (DES) Used Oil Grant Program. The on-going program provides grants to towns, cities, counties and solid waste districts. The grants don’t require a match and are given in amounts up to $2,500.00. A municipality can use the grant to establish an oil collection center or improve an existing one.

The program allows municipalities to meet the requirements of the Oil Remediation & Compliance Bureau (part of DES). It also enables municipalities to serve residents who change their own oil by providing them with a place to safely dispose of waste oil.

According to Thomas Plourde, Road Agent and Master Road Scholar, Mont Vernon had a collection tank used for motor oil that lacked a protective shed. The town applied for the grant, and used the money to build the shed they needed.

The Town of Bow has also used this program. According to Chum Cleverly, Public Works Director and Master Road Scholar, Bow applied for and received a grant for a new collection tank.

Local governments can also use the grant money for:
- Collection tanks and drums
- Spill containment
- Spill kits and sorbents
- Containment test kits
- Used oil fuel burners
- Filter crushers
- Transfer pumps
- Funnels, fill gauges, and other accessories
- Promotional and educational materials

To qualify for the grant, the municipality must promote storing and managing oil safely, recycle all collected oil, and serve local “do it yourself” oil changers. All awards must be used within one year. The municipality must submit an annual report to DES, including an accounting of the money used. In addition to the grant money offered, the municipality is eligible for:
- A $10,000 fund for the disposal of contaminated oil; (An example would be if brake fluid were to bleed into the oil in the collection tank. This would produce a hazardous waste material. The 10,000 fund would go towards the disposal of this material).
- Customer on-site assistance
- Annual training for solid waste operators

To obtain information and an application contact Wendy Waskin at DES, (888) Take-Oil. Wendy will also assist application preparation.
Public Works Employee of the Year Award

The New Hampshire Road Agents Association will present the Public Works Employee of the Year award at the Mountain of Demonstrations.

Sponsored by Howard P. Fairfield, Inc., the annual award honors one member of the public works community who has performed their job above and beyond the call of duty.

The nominee must be employed by a New Hampshire municipality, in Public Works, and must be nominated by a co-worker. Two Board Members of the New Hampshire Road Agents Association and a representative of Howard P. Fairfield will judge the entries.

To receive a nomination form and the guidelines, contact Heather Anderson at the New Hampshire Municipal Association (800-852-3358). Deadline for entry is April 15, 1999.

Incident Command System for Public Works

As part of its administrative role for the Mutual Aid for Public Works Program, the UNH Technology Transfer Center provides training to enrolled communities. Incident Command System (ICS) for Public Works is targeted to this group. Other communities are invited to attend these workshops.

In co-sponsorship with the NH Office of Emergency Management, the UNH T² Center has planned ICS workshops for the spring and fall of 1999. Barry Wante a Keene Police Captain is the instructor. Barry also instructs at the National Emergency Management Institute in Maryland.

ICS for Public Works is a two-day workshop. It covers basic ICS used by the fire service and police departments with emphasis on public works. It uses public works events and scenarios in practical exercises.

At a recent workshop one participant commented that he “really enjoyed the interaction and the group projects.” Another participant said, “the overall content was very informative and will help me and my town enormously in the future.” A third person said, “I feel very comfortable having to deal with any emergency...great workshop, would suggest all departments get involved.”

Like any UNH T² workshop, all departments are invited. We urge people interested in attending these workshops to get others to enroll. It is helpful to see what other departments are able to bring to the table during an emergency situation.

The UNH T² Center and New Hampshire Road Agents Association are conducting a set of half-day “Mutual Aid Orientation” workshops. The workshops are intended to inform municipalities about the Mutual Aid for Public Works Program. Municipal officials from cities and towns considering the program will benefit from attending. The workshops are scheduled for May 12, 13, and 18 in, respectively, Conway, Lancaster, and New London. For information and to register, contact the UNH T² Center or check our website.

Attend the 12th Annual Mountain of Demonstrations
New Hampshire Road Agents Association
June 11th 1999
Gunstock Recreation Area, Gilford NH
For more information contact: Heather Anderson
1-800-852-3358

PW.NET

Want to know what is happening in other towns? Need a place to ask questions of other Public Works Officials? Then, subscribe to PW.NET! It’s free. Send an email message to: kathy.desroches@unh.edu

In the body of the message type:
Add PW.NET your name

For Instance:
Add PW.NET John Doe

Road Business, Spring 1999, Vol. 14, No.1
Electrical Safety
By Stefanie R. Fishman,
Project Assistant

Work around electrical power is one of the greatest dangers facing highway crews. For their safety, they must know about electricity and how to work around it. This article will describe the effects of electrical shock, the electrical power system, safety around electrical distribution lines, and preventive measures.

Effects of Electrical Shock

Current is the killing factor in electrical shock. Voltage is important only in that it determines how much current will flow through the body's resistance. Current is measured in amperes or milliamperes (1/1000th of an ampere). Electric utilities classify effects of current if it breaks through the skin, since that risk can occur in emergencies. The following table summarizes effects of 60-hertz current on an average human body for that situation.

<table>
<thead>
<tr>
<th>Current Values through Body Trunk in Milliamperes (ma)</th>
<th>Effect on Average Human Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ma or less</td>
<td>No sensation</td>
</tr>
<tr>
<td>1-8 milliamperes</td>
<td>Sensation of shock. Person can let go.</td>
</tr>
<tr>
<td>8-15 milliamperes</td>
<td>Painful shock. Person can let go at will, if muscle control not lost.</td>
</tr>
<tr>
<td>15 to 20 milliamperes</td>
<td>Painful shock. Muscle control to adjacent muscles lost.</td>
</tr>
<tr>
<td>20-50 milliamperes</td>
<td>Painful. Severe muscular contractions. Breathing is difficult.</td>
</tr>
<tr>
<td>50-100 milliamperes</td>
<td>Probable Death</td>
</tr>
<tr>
<td>Greater than 100ma</td>
<td>Death</td>
</tr>
</tbody>
</table>

To put these values in perspective, the current necessary to operate a 120-watt light bulb is eight to ten times more current than would kill a person. A 12-watt bulb carries 90 milliamperes (ma), which can be fatal if it breaks through skin and the body's resistance. The current in other everyday objects such as Christmas tree lights (60 to 90ma), electric razors (100ma), and hair dryers (8000ma) could also be fatal. These common objects are fatal if the current actually breaks through the skin and body resistance.

Above ground wires, however, carry enough force to break through the body's resistance immediately upon contact. The force in these wires can be up to 35,000 volts. The current flow at the bodies resistance level and 120 volts is 240ma, over twice that which causes death. Thus, any contact with down lines means death instantaneously.

Electric Power Systems

As shown in the following diagram, a typical above ground electrical system includes generating stations, step-substations, transmission lines, step-down substations, distribution lines, and residential, commercial and industrial customer service installations.
The distribution lines along highways are 2,400 volts and higher, and very dangerous.

Public Works on the Scene

In emergencies, public works personnel might encounter fallen wires and cables. In such situations, workers can be more concerned about correcting the public works emergency than their own safety. The workers' safety should always be put first, especially around down wires. In all instances of down lines, workers should call the electric utility.

In routine, that is, non-emergency operations, each crew member should be fully aware of the hazards of operating equipment near power lines. They should know the proper safety practices to follow.

Before beginning operations in non-emergency situations always notify DigSafe so that underground utilities can be marked. Request the cooperation of the line owner to de-energize and ground the lines or to help provide insulated barriers.

The National Institute for Occupational Safety and Health (NIOSH) encourages employers to consider de-energization as the primary mean of preventing injury from contact between equipment and power lines.

The first step when starting an emergency or non-emergency project near power lines is to determine the best placement for machinery during operations and the size and type of machinery to be used. Find the locations and voltage of all overhead power lines at the job site.

Everyone around the site should be alert. Don't let the quiet, "harmless appearance lull you into a false sense of security." Although many overhead wires are covered, the covering is often designed to protect the wire from the weather or tree contact, not to protect you from the wire. Never consider a covered wire any safer than a bare wire.

Stay away from hanging or downed power lines and anything they are touching, including puddles of water, fences, trees, or people. Be aware that lightning or fallen wires could electrify wire or metal structures. Also remember that where there is one broken wire, there could be others.

Thus, in putting safety first one should remember:
- Don't expose personnel to unnecessary potential risks.
- Always treat conductors as energized.
- Stay at least 10 feet away from down wires. Workers should place barriers to keep others away.

Preventive Measures

Several preventive maintenance actions can decrease workers' chances of having to deal with down lines on a site.

When trees or limbs fall, they often fell electrical lines as well. Supervisors and workers should be on the look out for trees growing close to wires. When a tree branches are close to wires, they should notify the local power company to trim the tree limbs. Municipal crews should never work on trees that are touching power lines.

Workers can prevent accidents by watching out for power lines around machinery, such as dump bodies, backhoes, and crane booms.

Special thanks to:
Ernest A. Guimond, Safety & Health Administrator, Public Service of New Hampshire (603) 634-2621

Sources


Scholarships

The New Hampshire Road Agents Association is again offering two $300 scholarships for college education.

They scholarships are for graduating high school seniors in the top 25% of their class, or students currently enrolled in a post secondary institution. Applicants must be children of a NH Road Agents Association member, which includes entire municipalities and vendor companies.

The application deadline is April 30, 1999. For information and an application, contact Heather Anderson at the New Hampshire Municipal Association (800-852-3358).
Infrared Repair and Reclaiming
By Stefanie R. Fishman, Project Assistant

Pothole patches and utility cut repairs often leave small cracks between the new and old pavement. Traffic over road surface depressions and humps create small cracks also. Water can seep through the surface to the base through these very narrow cracks. Roads deteriorate much faster when water has penetrated their surface.

For conventional crack repair methods to be effective, cracks need to be wide enough to allow sealant to flow into the cracks. Infrared repair and reclaiming can be applied when cracks are very narrow, even when hardly visible to the human eye.

One source of infrared rays is the sun. In the last 25 years machine produced infrared rays have been used in road repairs. Many cities and towns are finding it an effective and cost-effective way to repair small cracks and to level the road surface. Municipalities can also use infrared on sidewalks, playgrounds, and tennis courts.

Infrared Rays vs. Heat

A dictionary definition of infrared reads, "Rays of light that are just beyond red in the spectrum. They cannot be seen but they produce heat deep inside an object.” In the same dictionary heat is defined as “a form of energy caused by a quickened movement of molecules”. In other words, infrared rays cause a rapid movement of asphalt and aggregate that create heat.

Heat applied to the road surface “cooks” the pavement from the outside in. Asphalt oils evaporate, and causes separation of the asphalt from the aggregate. Whether applied by a hand-held torch or large machine, heating pavement changes the inherent characteristics of the pavement. It frequently produces a burned or scaled surface, and a weaker pavement material.

Infrared rays avoid these damages by producing heat deep within the surface material. The rays penetrate the materials, softening it without significantly changing its characteristics. Infrared machines are of two types, one for repair and a second for reclaiming pavement material.

Repair with Infrared

An infrared panel softens the pavement material.

Repair is accomplished in six easy steps:

1. Sweep away any loose soil or standing water from the area to be repaired.
2. Position infrared panel over area to be repaired and allow heat to penetrate 5-9 minutes depending on depth, season, and aggregate.
3. Rake 6” inside heated material removing old joints, seams and rough areas.
4. Add material if necessary to bring patch to grade and lute to level.
5. Compact with vibratory roller or plate compactor.
6. Apply sealers if called for.

Infrared rays initially penetrate only to the next compacted layer. Several "heats" may be necessary to remove all layers for a full depth repair. The deeper penetration needed, the further away the infrared panel should be placed from the surface. This allows heat to penetrate deeper without burning the asphalt.
In infrared repair the temperature of a section of pavement should reach no more than 325°F. It is good practice to have a heat gun on site to register the pavement temperature.

**Reclaiming with Infrared**

An infrared reclaimer stores asphalt removed from a road for application with the infrared panel. Inside the reclaimer, infrared rays soften the asphalt material. Crews can spread this softened material like a cold- or hot-mix asphalt.

Reclaiming can produce high quality material to fill potholes and depressions. Reclaimed material from the same or similar road can provide a hot-mix material consistent with the original pavement.

Applying this hot-mix with an infrared panel creates a "hot to hot joint." The bonded materials eliminate cracks, and therefore the possibility of water seeping through the surface. In a "cold to hot joint" there is no bond so the surfaces expand and contract at different rates causing cracks. The "hot to hot joint" expands and contracts at the same rate, thus joints will not fail.

Reclaiming minimizes wasted material. When using a reclaimer to transport a hot-mix a two-day supply of asphalt can be bought to the site at one time. The material is kept at the optimum working temperature.

Many times after finishing a job there may be material leftover. Instead of throwing it away, this material could be stockpiled for use on a later job. This saves the costs of purchasing new asphalt. Chunks from utility cuts, for example, stockpiled, cleaned, and then reclaimed.

**Infrared Cost Savings**

Infrared is often more expensive than conventional repair methods, such as cutting out a piece of the asphalt to patch with cold mix. Infrared is also much faster than conventional methods taking only 5-9 minutes to heat the asphalt as opposed to an hour or more to cut and remove asphalt. The greatest cost benefit is in reducing road deterioration by keeping water out of the road base.

Infrared repair and reclaiming will be demonstrated at the Mountain of Demonstrations in Gilford on June 11. Call the UNH T² Center for directions or other information.

Special thanks to:

Dona Sears, Sales and Technical Representative, Artco Equipment Sales, Inc.
Wes VanVelsor, President, and David Krause, Product Development, Raytech Infrared Corp.

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**Excerpts from a DigSafe publication**

Q. What is a tolerance zone?
A. Often times it is difficult to pinpoint the exact location of an underground facility. The tolerance zone allows for this circumstance and establishes a 36” plus the width of the facility in which the facility should be found. Work performed in the zone should be done by other than mechanical means such that the facility will not be damaged.

Q. Is it my fault if I damage a facility that was installed at a shallow depth?
A. Yes! The depth of underground facilities varies due to changing soil conditions and other variables; therefore, excavators are cautioned that facilities may be shallower or depth than are located or than applicable codes require.

Therefore, excavators should be aware that estimates of facility depth given by locators, if given at all, are an indication of how deep the excavator can expect to dig, by hand, before encountering the facility.
Road Business Four Year Index

Call UNH T²Center for Articles You Can’t Find


Publications
from the
University of New Hampshire Technology Transfer Center

Copies of the following books and pamphlets, and our complete list of publications, are available through the UNH T² Center. 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 or by e-mail to cplourde@cisunix.unh.edu.

The following materials are available free of charge.

____ UNH T² Center Video Catalog

____ Highway Utility Guide. Useful to utility and highway professionals, educators, and government officials.

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

____ Revised! Nonpoint Source Pollution. This guide describes the causes of nonpoint source pollution, and suggests ways that NPS pollution can be prevented.

____ Flexibility in Highway Design. A guide written for highway engineers and project managers who want to learn more about the flexibility available to them when designing roads. It illustrates successful approaches used in other highway projects.

____ NACE Action Guide, Traffic Operations. A compilation of principles dealing with traffic engineering. Includes traffic studies with weight, accidents, speed, signs, markings, and signals. Has chapters geared toward construction and maintenance, school areas and residential areas.

____ Vegetation Control for Safety. A guide for street and highway maintenance personnel. Describes site clearance and safety operations for vegetation control.

____ Improving Highway Safety At Bridges On Local Roads and Streets. This guide discusses effective low cost methods of improving and enhancing bridge and bridge approach safety.

The following materials involve a minor charge. Please send a check with the form when requesting one of these materials.

____ Drainage, Drainage, Drainage. This manual features various drainage concepts. Problems with drainage and proper maintenance to ensure good drainage are also discussed. A UNH T² Center Workshop notebook. $15

____ Participant’s Manual for Preventive Maintenance Treatments Workshops. A UNH T² Center Publication. Describes the elements of a preventive maintenance program for local roads, the methods and materials for effective preventive maintenance treatments, and the road conditions that should receive them. Comes in a plastic binder. $15

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: ______

Check is enclosed payable to: University of New Hampshire $15 _______ $30 _______

Road Business, Spring 1999, Vol. 14, No. 1
Videos
from the
University of New Hampshire Technology Transfer Center
Road Business, Spring 1999, Vol. 14, No.1

The following videos are available from the UNH T²Center 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 at a time), fill out the mail request form, staple closed, affix stamp, and mail. To request by telephone, call (603) 862-2826 or (800)423-0060 (in NH). Visit our complete publication and video catalog on our website at http://www.t2.unh.edu.

M-205 Potholes: Causes, Cures, and Prevention. 11 min. Discusses how potholes develop, how they should be properly repaired, and how to develop a pothole repair program along with some preventive techniques.

M-215 Guidelines for Spring Highway Use Restrictions. 26 min. Shows where, how and when to post limits on roads in the spring. Discusses criteria for placing and removing restrictions, where to apply them, how much to restrict loads, and when to apply and remove restrictions. Washington DOT

M-236 Common Maintenance Problems and Causes. 21 min. Broad overview of the causes of problems on street and road systems. It discusses the source of failures in asphalt pavements, Portland cement concrete pavements, and surface treatment roads. It deals with gravel roads, paved and unpaved shoulders, drainage problems, and presents typical causes of these problems. International Road Federation

M-269 New Life for Old Roads. 7 min. Describes the Full Depth Reclamation process, noting precautions to take in order to ensure success. General Chemical

PA-211 Pavement Management Systems for Local Administrators. 17 min. Explains how a pavement management system works to determine where, when and what to repair. US DOT/FHWA

M-266 Maintaining a Safe Roadside. 21 min. Presents unsafe road sites in order to underscore the importance of maintaining safe roadsides. Colorado T²

DC-251 The Importance of Roadside Drainage. 19 min. The basis for this film is that if you do not plan the drainage of water the way you want nature will drain it for you. Describes surface and subsurface drainage, drainage systems, and procedures for their inspection and repair

M-238 Smoothing and Reshaping of Earth and Gravel Roads. 20 min. Shows the steps needed for maintaining and repairing earth or gravel roads. Smoothing and reshaping are covered separately, and equipment is discussed.

Video Catalog.
Milestones:

Rodney Bartlett is the new Public Works Director in Salem.

Paul Belanger has been promoted from Superintendent of Public Works in Bedford to Assistant Director of Public Works.

Richard Gonsalves has left the position of Director of Public Works in Plymouth and joined ConStrux, Inc. in Plymouth.

John Jackman is the new Director of Public Works in Somersworth.

Richard Malansky has been promoted to the Director of Public Works in Newmarket.

Wesley Staples has retired from Westmoreland.

PWMS Technical Support Available

The UNH T² Center is pleased to announce technical support specialist, Robert Strobel. Bob is available to answer questions about SIMS, RSMS, and MEMS. He is also the editor of the PWMS User’s Newsletter (Public Works Management Software) that provides news and tips from technical staff and users.

If you would like to receive a copy, please contact:

Robert Strobel
Technology Transfer Center
33 College Drive
Durham, NH 03824-3591

(603) 862-1362
(800) 316-9211 (for users who have completed training)
Fax: (603) 862-2364
email: rstrobel@cisunix.unh.edu

Websites:

More helpful websites for Public Works employees. Here are just a few. If you have others that your colleagues could benefit from, send the urls to kathy.desroches@unh.edu. We’ll publish the site and your name in Road Business. (No commercial sites please).

UNH T² Center: http://www.t2.unh.edu

These urls were provided by Wil van der Meulen from the North Carolina T² Center.
U Show Us—a site of “Best Practices” where Public Works personnel show their stuff.
http://www.fhwa.dot.gov/region8/ushowus/ushowus.htm
And MoDOT innovations ’97—another site of “Best Practices” from Missouri
http://www.modot.state.mo.us/gs/innov/inovat97.htm

The following urls are reprinted from the Northwest Technology Transfer Center bulletin—Winter 1999.

APWA American Public Works Association—a site containing various materials geared to meet the needs of public works departments.
http://www.pubworks.org

The U.S. State and local gateway—a site developed to give local government officials and employees easy access to federal information.
http://www.statelocal.gov

U.S Department of Transportation—the site has many links dealing with transportation related topics.
http://www.dot.gov
## Calendar

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<th>15 Bridge Maintenance—Keene</th>
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<td>20 Expecting Inspections—Concord, NHPWMEA</td>
<td>21 Bridge Maintenance—Epsom</td>
<td>22 Expecting Inspections—Littleton, NHPWMEA</td>
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<tr>
<td>26</td>
<td>27 Expecting Inspections—Exeter, NHPWMEA</td>
<td>28 Bridge Maintenance—Campton</td>
<td>29 Highway Dept. Safety—Portsmouth Expecting Inspections—Keene, NHPWMEA</td>
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<th>5</th>
<th>6 Work Zone Safety—Hillsborough Chain saw Operations—Lancaster; NHTOA</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>17 Project Planning—Manchester</td>
<td>18 Mutual Aid Orientation—New London</td>
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<td>27 Work Zone Safety—Lancaster</td>
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<th>2 RSMS—Durham</th>
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<td>11 Mountain of Demonstrations—Gilford</td>
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<td>14 ICS FOR PW—Portsmouth</td>
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</tbody>
</table>

- For NHPWMEA Events, contact Barbara at 225-8520
- For NHTOA Events, contact Pat at 224-9699

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