Hancock Public Works Replaces Antrim Road Bridge
Submitted by Kurtis J. Grassett, Director of Public Works, Town of Hancock

The Hancock Department of Public Works began the process of replacing Antrim Road Bridge, over Moose Brook during the summer of 2009. The old “bridge” was a set of 60 inch twin culverts that were installed around the 1940s.

Work began during the last week of June 2009 and challenges arose quickly. First, there was a lot of large stone rubble due to an old railroad crossing next to the site. Worker’s discovered that one of the old bridge’s stone abutments had been used to fill in the gully to raise the road. Since the site needed to be fully de-watered, the crew removed all the boulder rubble and diverted the water in a system as watertight as possible. At one point the crew calculated over 700 GPM of water running back through the boulders! After the site was dewatered, they began the excavation for the footings.

A second challenge was a very high groundwater table for July. The pumps worked overtime, but the crew was able to get the footings poured and cured before any serious issues arose.

Third, this project involved full reconstruction of about 900 feet of roadway, and the installation of a closed drainage system. This work took the crew between three and four weeks, and was finished just as the bridge structure arrived.

In early September, the new structure was in place and crews were rebuilding the rest of the roadway over the new bridge. By mid-September all that remained to do was install the bridge and approach rail and finish paving.

The entire project was completed by October 1, 2009. Traffic was closed for 13 weeks and the job was completed in 15 weeks. (“Hancock” is continued on p.3)
Master Roads Scholars

Master Roads Scholar—Scott Johnston

Scott Johnston has been working for the Town of Enfield for nine years. He has worked as a heavy equipment operator and assistant to the road agent. He will continue to take classes with the UNH T^2 Center because he says, “you can always learn something new.” His favorite part of the T^2 Roads Scholar Program is talking with people who work in other municipalities and learning different ways to do the same job. Scott likes that his job tasks are different every day. His advice to new public works employees is to “realize that you can always learn from others.”

Master Roads Scholar—Carl Knapp

Carl Knapp is the Public Works Director for the Town of Weare. He has worked there for 18 years. Carl began his involvement in public works in 1991 as a truck driver and equipment operator. In six months, he became a general highway foreman. Carl will continue to take classes in the T^2 Roads Scholar Program to continue to gain knowledge. His favorite part of the T^2 Program is the interaction with the instructors and other public works professionals and having the opportunity to broaden his knowledge.

The Town of Weare recently completed a bridge project in which town employees completed most of the work. He enjoys his job and interaction with employees, selectmen, and the general public.

His advice for new public works employees is to “keep yourself educated, learn and use good safety practices, and stay upbeat no matter what circumstances come up.”

Carl has been married to his wife Vicky for the past 20 years. He has two daughters: Holly, 15 years old, and Brittany, 18 years old. In his free time, Carl enjoys building custom trucks, hiking, camping, motorcycling, and cross-country skiing.

Master Roads Scholar—Steve Rougeau

Steve Rougeau has been a Lead Highway employee for the Town of Milford DPW since April 1993. He began his involvement with public works, working for the NHDOT in 1974 as a highway maintainer. He worked his way up to assistant foreman before working in the private sector in 1988.

Steve will continue to take courses with the UNH T^2 Center. He says they are very informative and there is always a need for more information to help in understanding and improving daily tasks and projects. He reports that due to the UNH T^2 Cracksealing workshop, Milford is now implementing a crack sealing program as a priority for road repairs. They have acquired a drag box and complete their own shimming. His favorite part of the Roads Scholar Program has been being able to share all the information and experience he has with others that he met in the program.

Steve likes being responsible for completing projects and making the roads safer and up-to-date. He advises new public works employees to acquire as much knowledge as possible, because it is helpful both on and off the job.

Steve is married to his wife Kathie and has
seven children. Three of his children are currently enrolled in college, two live in Virginia, and two live at home with himself and his wife. In addition, Steve has four grandchildren. Steve enjoys gardening, running, bicycling, taking trips to college sporting events, and riding motorcycles.

Master Roads Scholar is the fourth and final achievement level in the UNH T² Center Roads Scholar Training Program. It requires completing 100 contact hours plus the requirements for Roads Scholar Two: 5 hours in basic road construction, 5 hours in supervision or personal development, 5 hours in environmental, 5 hours in tort liability or safety, and 20 hours in other technical areas.

UNH T² Roads Scholar Program: www.t2.unh.edu/training/rdscllr.html
UNH T² Training Calendar: www.t2.unh.edu/training

New Public Works Supervisor Mentor Program

- Are you a new Road Agent or Public Works Director? Do you have field-related questions, and could you benefit from the expertise of a seasoned public works supervisor?
- If yes, your neighboring communities want to help you in your transition!
- If interested in being a mentor or mentee, please call the UNH T² Center at 800-423-0060 or email t2.center@unh.edu.

(“Hancock” continued from p.1)

Like other communities, Hancock prefers to maintain their bridges using their own personnel and equipment. Grasset reports they have found this to be beneficial financially and also in terms of employee morale. However, for some projects Hancock does rely on local contractors to assist with needs outside of their resources. On this particular job, Hancock had assistance from Portadam Inc., Mathewson Companies, Don Hardwick and Sons, Wilson Foundations, Able Crane, Contech Construction products, M&W Soils, CWS Fence, Holden Engineering, and Central Concrete.

The cost of this project, including design, was $377,186. The Town of Hancock put about $51,000 in labor and equipment into this project. Those funds were used as matching funds toward the Town share of the 20% match required by NHDOT’s Bridge Program. The remaining cost to the town was $24,437, with NH Bridge aid picking up 80% of the total cost.

Footing pour for a precast arch, Antrim Road over Moose Brook, Hancock NH.
Processed Glass Aggregate

Submitted by Justin Pelletier -- UNH T² Project Assistant & Civil Engineering Student

Recycling facilities often reject large quantities of glass due to glass recycling regulations. The rejected glass is usually landfilled or stockpiled. However, most of this rejected glass is suitable for use as Processed Glass Aggregate (PGA). PGA is glass that has been recycled and processed into a useable product. PGA is suitable for use in the construction industry, to replace sand and gravel aggregates. By using PGA, a significant volume of waste can be kept out of landfills and used in a sustainable way.

“PGA requires no color separation – saving space and labor. It provides a new use for unmarketable or contaminated glass, eliminates the capital expense of storage containers, and can remove as much as 50% more material from the waste stream by including ceramics and other household glass not normally part of a traditional glass recycling program” says the Northeast Resource Recovery Association (NRRA). Suitable sources of PGA are glass or ceramic bottles, glass jars, ceramic tableware and cookware, vases, ceramic flowerpots, plate glass, mirror glass, and residential incandescent light bulbs.

Glass can be stockpiled indefinitely for future use since it is not a chemical and will not leak contaminants into drinking water or breakdown in the environment. Richard Lee, Director of Public Works in New London, states, “In my experience, there are no downfalls to using PGA in place of gravel as long as it is used properly and in the right applications.”

In order to use glass as aggregate material, it must first be pulverized, or crushed, in a way that will grind down all sharp edges. There are various pieces of equipment commercially available that are designed solely for this purpose, or there are some facilities that will process the glass for the purchaser. The town of New London manages such a facility with help from the NRRA, which provides cooperative purchasing programs to its members.

Towns can send their glass to New London to be crushed and stockpiled for later use in public works projects. The NRRA hires private contractors to crush the glass, which is then stockpiled in New London. The Town of New London distributes the glass to other towns at a much lower price than gravel. PGA prices are determined by the Town of New London based on who is purchasing it. For instance, a municipality that contributes glass to be processed will pay less for PGA than a town that does not. “On average, we process around 800-900 tons of glass per year” says Lee.

Unsuitable sources of PGA are larger ceramic items such as tubs, sinks, toilets, large fixtures (unless large crushing facilities are available), lab or medical waste glass, TV tubes, computer monitors, automotive glass, tempered glass, hazardous product containers, and fluorescent light bulbs.

For more information, or if you are looking to use PGA in your project, contact: Richard Lee, Public Works Director, Town of New London, (603)526-6337, nlbd@tds.net

References

An asphalt paving technique called the safety edge is gaining momentum across the country as transportation officials strive to protect motorists from run-off-the-road crashes. The safety edge calls for the interface between the roadway pavement or paved shoulder and the graded shoulder to be paved at an optimal angle, to minimize vertical drop-off and provide a safer roadway edge. This means the edge of the pavement tapers down into the shoulder instead of dropping off vertically. The recommended angle of the taper is about 30 to 35 degrees from horizontal.

The Federal Highway Administration (FHWA) recommends that states use the safety edge technique particularly on two-lane roads with unpaved shoulders.

Benefits of the Safety Edge

The safety edge is not an extra procedure. Instead it requires a slight change in paving equipment and has little impact on project costs. In addition, the safety edge improves the consolidation of the pavement near the edge, enhances pavement durability, and mitigates pavement drop-off until the worker can pull the graded shoulder up over the tapered edge.

The safety edge is the newest Highways for LIFE Vanguard Technology. This initiative uses dedicated teams, marketing techniques and designated funding to deploy high-payoff innovations quickly and broadly. The safety edge team is developing a marketing plan with goals, implementation tactics and communication tools to move the technology into mainstream use across the country. Other Vanguard Technologies are road safety audits, prefabricated bridge elements and systems, precast concrete pavement systems, and techniques for making work zones safer.

Fewer Fatalities

Crash data show that roadway departures account for 53 percent of fatal crashes. When a tire drops off a paved surface, sometimes just inches from the travel lane, a driver can have difficulty reentering the roadway if the pavement edge is nearly vertical, especially if the height difference is significantly more than 2 inches. When the driver drifts off the pavement and tries to steer back on, the nearly vertical edge can cause “tire scrubbing,” a condition that may result in oversteering. The driver can then lose control of the vehicle and crash into oncoming traffic, rollover or hit a fixed object.

“We believe the safety edge is a focused solution that will reduce fatalities on rural two-lane roads where run-off-the-road crashes are most prevalent,” said Chris Wagner, pavement and materials engineer at the FHWA Resource Center. “The safety edge also shows great promise in increasing the durability of the outside pavement edge, thereby increasing the service life of the pavement.”

Wagner estimates that the safety edge has been used by about 15 state departments of transportation, including those in Alabama, California, Georgia, Indiana, Iowa, Missouri, New York, Texas, and Utah. “We recently completed a demonstration project in Iowa, and they now want to use it on two more projects,” said Wagner. “And the Georgia DOT uses it on all their overlay projects.”
New LTAP Directors Orientation

By Kathryn A. Myers -- UNH T² Program Manager & Road Business Editor

On December 9 and 10, 2009, our friends from ARTBA, FHWA, and the CT LTAP Center came to NH to meet with us. They provided a New Directors Orientation (NDO) for me as the new LTAP Manager at the T² Program in NH. The meeting was very informative, productive, and provided us at NH LTAP with information on support tools and services for LTAP centers.

Every LTAP in America is connected by our National Local Technical Assistance Program Assoc. (NLTAPA). NLTAPA provides legislative advocacy and other support to all LTAPs. NLTAPA also contracts with ARTBA to provide free services, including publications and resources to all LTAPs. In addition, our NH LTAP Center hosts an email listserv for the national program.

Safety Edge Evolution

The safety edge concept was developed in 2003 through discussions between Wagner and Frank Julian of the FHWA Resource Center’s Safety and Design team. Previous research by a Texas Transportation Institute team, led by Dr. Don Ivey, indicated that a tapered transition between the paved roadway and the unpaved shoulder would help errant vehicles maintain control as they reenter the travel lane.

Wagner and Julian began formulating ideas on how to create such a tapered edge at the pavement-graded shoulder interface. Wagner had experience at the National Center for Asphalt Technology with using a tapered wedge concept to create longitudinal joints in asphalt pavements along the lane line joint. That experience provided a starting point for developing the safety edge. At that point, Wagner and Julian began partnering with the Georgia DOT Office of Maintenance. Office staff such as Director Bryant Poole and Project Manager Lynn Bean were involved in the design and planning of a project to study the constructability of a safety edge on a resurfacing project.

Poole was instrumental in planning and coordinating the project, and Bean was a key player in building the project and developing the hardware the Georgia DOT used to form the safety edge. Industry was also a partner in the concept, and two companies now produce and sell a shoe that attaches to the paver and forms the safety edge.


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Photo courtesy of Gary Antonelli, President, Advant-Edge Paving, www.advantedgepaving.com
Pothole Prevention & Repair

By Ashley Benson, UNH T² Project Assistant & UNH Masters in Literature Student

Potholes are formed when water is trapped beneath the surface of the pavement. Water can enter the road base through surface cracks or from the side of the pavement. During winter, the water freezes and thaws in reaction to temperature changes. This freeze-thaw cycle often produces frost heaves, which allows more water in the pavement, perpetuating the frost heave creation cycle.

New Hampshire roads are most heavily affected by potholes in the spring, during the final thawing of the season. As the ice melts, water is trapped beneath the pavement surface. As vehicles drive over the pavement, the weakened pavement surface layer collapses, resulting in small holes and cracks, which expand as traffic continues to move over them.

In the summer, highway departments can take preventative measures such as crack sealing and improving drainage. This minimizes the number of potholes formed by keeping water out of the base material. Due to cold temperatures, however, the only option for maintenance in the winter and spring is pothole patching. To ensure a longer-lasting pothole patch, crews must apply the right material using the right procedure.

Materials

There are two options for materials used in pothole repair: hot-mix and cold-mix patches. Hot-mix asphalt patches generally last longer than cold-mixes, but the hot asphalt must be mixed at extremely high temperatures. Also when using hot-mix, repair, compaction, and paving must be completed before the asphalt has cooled. The temperature of the roads’ surfaces for the majority of the year is far too cold for hot-mix asphalt to be used effectively. Due to this, cold-mix asphalt patches are generally used on New Hampshire state roads. Not only is cold-mix more practical in terms of weather, it can be stockpiled throughout the year, and is less expensive and easier to use than hot-mix.

Three types of cold mix can be used: local cold mix, agency-specified cold mix, and proprietary cold mix. Local cold mix is a blend of local aggregates and liquid asphalts, either cutbacks or emulsions. Agency-specified cold mixes, requested by state highway departments, are created by asphalt plants, who produce the material according to these
specifications using high-quality aggregates and modified liquid asphalts. Proprietary cold mixes are commercially produced blends of carefully matched aggregates, liquid asphalts, and additives. By applying cold-mix using the following techniques, highway departments can make repairs that will last for many months.

Repair Techniques

Using cold-mix asphalt patches, repairs can be performed during varied weather conditions, ranging from clear spring days to harsh winter storms, with temperatures from 0 degrees to 100 degrees F. Under harsher conditions, pothole repairs are generally only performed in emergency situations. Otherwise, repairs are scheduled as routine maintenance during warmer and drier seasons. Highway departments have successfully used four methods for pothole patching: throw-and-roll, edge-seal, semi-permanent, and spray injection. The method of choice depends on the amount of money an agency can spend, the equipment available, and time available for repairs.

Semi-permanent

Semi-permanent patching is the most widely recommended method of pothole repair. It includes the following steps:

• Remove water and debris from the pothole, using a broom, shovel, compressed air or other comparable equipment.
• Straighten pothole edges, creating a rectangular rather than jagged edge. This can be done using a jackhammer, pavement saw, milling machine, etc.
• Place the mix using a shovel and rake. Placement should be made in no more than 3” lifts, compacting between each lift.
• Compact patch from the center towards the edges of the hole. This will provide better compaction at the edges and corners. Hand devices, such as a vibratory plate compactor or single-drum vibratory rollers, are recommended for this method of pothole repair.

This repair requires more equipment and workers than the throw-and-roll or spray injection methods. However, the semi-permanent method results in a very tightly compacted patch, which is why it is the most widely recommended of the procedures given here.

Throw-and-Roll

Throw-and-roll is possibly the simplest and quickest method. The throw-and-roll method consists of the following steps:

• Place mixture into the pothole. The hole does not need to be cleared of water or debris before repairs. Any type of hand tool, such as a shovel or pitchfork, may be used to fill the hole. Fill the hole so that there is a crown in the center.
• Compact the material, by rolling over it 6 to 8 times with truck tires. Some crews have found it useful to cover the patch with sand before rolling over the patch, to prevent material from sticking to tires.
• After compacting, check the level of the patch to make sure the center of the patch is ¼” to ½” above the pavement surface.
• If the patch is low add more cold mix and repeat the patching steps again.

This method is similar to the standard “throw-and-go”, “dump-and-run” or the “pitch-and-pat” methods. In this method, however, truck tires compact the patches, which provides a tighter patch.

Traffic is able to drive over the patched pothole without creating depressions in the patch, and it also provides for better water runoff. While the throw-and-roll method does require a little more time to complete than the standard “throw-and-go” or “dump-and-run” methods, the extra 1 to 2 minutes to compact the patches will produce a significantly better patch.

**Edge Seal**

The edge seal method is essentially the throw-and-roll method with an additional step added. Follow all the same procedures for the throw-and-roll method, and then seal the edges of the patch, using asphalt tack and sand on the road surface.

**Spray Injection**

Spray injection is the most rarely used method, but does provide a long-lasting patch. The spray-injection procedure consists of the following steps:

- Blow the hole clean and dry of water and debris.
- Spray a tack coat of binder on the sides and bottom of the pothole.
- Spray asphalt and aggregate into the pothole. The compaction is provided by the velocity of the aggregate sprayed into the hole, thus no further compaction is required.
- Cover the patch with a layer of aggregate.

The spray-injection method is quick, provides a long-lasting patch, and uses low cost materials. However, a skilled operator is usually required to effectively patch using the spray injection method. Also, spraying machines are required for this method so the cost of equipment is much higher than the other pothole repair methods discussed.

**Winter Patching**

Best results for pothole repair are obtained by scheduling repair work during dry, warm weather. Unfortunately, potholes usually form during wet and cold weather, during the winter and early spring months. In such cases, careful selection of materials and procedures is important to obtain a long-lasting patch, particularly because conditions for repairs are not ideal.

Choose high-quality, crushed aggregates for winter patching. The selected binder should be made from emulsified asphalts, with an anti-strip additive. The mixture should be workable at low temperatures, to allow both easier handling and compaction. This also ensures that winter patching can be completed before low air and surface temperatures cool the mixture. The most important issue to consider for winter patching is that the binder-aggregate-additive mixture be compatible. Since winter patching seldom allows the time required for the semi-permanent procedure, use the throw-and-roll method with a high quality or highway department-specified mix to provide a longer-lasting patch.

**Spring Patching**

Patches placed in the spring have a longer life than those in the winter because of more favorable weather conditions, and the end of the freeze-thaw cycle in particular. Spring patching can be done by any of the procedures discussed above: the throw-and-roll, edge seal, semi-permanent, or spray injection. Cost and the availability of equipment and workers should be considered when choosing which method to use in pothole repair.

Managers should make sure that any material stockpiled over the winter is workable in a range of temperatures. Materials workable at very low temperatures tend to be very sticky and hard to use at higher temperatures, while materials workable at very high temperatures are also difficult to use at low temperatures. Therefore, material that’s useable in a range of temperatures is best because of varying weather conditions in the spring. High-quality crushed aggregate and emulsified asphalt should be used for spring patching. Antistripping additives are recommended to keep asphalt from stripping away.
from aggregates.

The SHRP Asphalt Pavement Repair Manual of Practice provides illustrations of the methods discussed above. Readers can obtain the book from the UNH T² Center.

References
- Crack Sealing Why Crack Seal?, Asphalt & Concrete Repair, City of Fort Wayne Indiana Division of Public Works, www.ci.ft-wayne.in.us/street_dept/crack_sealing.htm, 2000. “Fix It and Forget It: A Training Course in Pothole Patching” (L036) which is available from the Local Technical Assistance Program (American Public Works Association, 1301 Pennsylvania Avenue NW, Suite 301, Washington DC 20004; phone (202) 347-7267, fax (202) 737-9153; E-mail liap@patriot.net)
- Spring Has Sprung—and So Have the Potholes, The Link, Kentucky Transportation Center, Vol 17 No 1 Spring 2001.

Proper Budgeting

Highway department budgets are often drained at the end of winter due to snow removal costs. Unfortunately, the costs of road upkeep do not end when the snows melt. To ensure that money is available for spring pothole repair, agencies should have separate budgets for snow removal and for road maintenance. Money allotted for road maintenance can be used for preventative maintenance such as crack sealing and debris removal, as well as for spring pothole repair.

Using a Management System

Along with a maintenance budget it is important to have a plan of action when potholes do occur, and also ways to prevent potholes. A pothole control program is an essential part of a productive and efficient pavement management system. By sticking to regularly scheduled maintenance tasks relating to drainage, agencies can decrease the accumulation of water in the road base. Make sure to regularly schedule drainage-related maintenance, including clearing debris and foliage from storm drains, ditches, and culverts. Because potholes are formed when water drainage is poor, the elimination of water reduces pothole formation. Additionally, an active crack sealing program is very cost effective, and extends the life of the pavement. Water can enter the roadway through unsealed cracks, which can cause potholes to develop rapidly. Sealing these cracks can effectively stop potholes before they form.

A pavement management system, such as Road Surface Management System (RSMS), can help detect early signs of roadway failure. Early detection enables agencies to implement maintenance strategies before potholes develop. A comprehensive inventory of all city or town roads by pavement type, thickness, and condition of roadway allows the department to coordinate and prioritize maintenance efforts, which is more effective in terms of time and money. Agencies can train crews or hire an expert to recognize problem areas before potholes develop. Well-trained employees help the problem areas to be repaired and strengthened immediately.
Linsey’s Administrative Tips: Setting Goals at Work
By Linsey Shaw, UNH T² Program Support Assistant

Goal setting is very important in the workplace. Goals give employees something to focus energy on and they help ensure productivity.

Goal setting can be difficult for some people. Use SMART to help set goals. SMART is an acronym and each letter stands for a characteristic that will help with goal setting. Here is what each letter means:

- **S** is for specific. A specific goal has a better chance of being attained and provides the employees with more information about the goal.
- **M** is for measurable. Being able to measure the progress of your goal will keep you on track and make the goal more attainable.
- **A** is for attainable. Most goals are attainable as long as you set up steps and establish a time frame that allows you to reach the end result of your goal.
- **R** is for realistic. A goal must be a job or task for which you are willing and able to work toward it to be realistic.
- **T** is for timely. Every goal should have a time frame because then you have a way to measure progress and know when the goal should be achieved.

References:

UNH T² Offers Backhoe Operation & Safety Training
Submitted By Butch Leel, UNH T² Technical Support Asst. and Backhoe Operator Training Instructor

UNH T²’s backhoe operation and safety training is designed for operators with limited or no experience, although all operators are welcome.

Topics emphasized during training are the pre-trip inspection, the operator manual, permitting, loading and unloading a backhoe from a trailer and the proper tie down points, setting up a workzone in accordance with the MUTCD, trench safety, and soil types and the impact they have on trench stability and safety.

Safety is emphasized throughout the training, including proper digging and loading techniques with the front bucket, leveling and back dragging with the front bucket, the components of the rear digging bucket and how they work, how to shoot a grade and why it is important, and how to dig a straight trench.

Before the end of the first day each participant gets in a backhoe to familiarize themselves with the controls, in preparation for the second day, which is the hands-on portion.

On the second day participants have an opportunity to run a backhoe to accomplish these tasks, use the front bucket to dig material from a pile, level and back drag material, dig a straight trench, shoot a grade to determine the depth of trench, lay in a piece of pipe using proper craning techniques, shoot another grade to determine the pitch on the pipe, remove the pipe again using proper craning techniques, and fill in the trench using the backhoe bucket.

To date, UNH T² has trained 28 people during six sessions of backhoe operation and safety. UNH T² would like to thank Mark Avery and Dennis Ford for co-instructing this workshop with Butch and the NHDOT District 2 for the use of a backhoe and facility.
NH LTAP Services

Your NH LTAP Center (UNH T²) offers the following services to NH municipal highway departments:

1. **Training Opportunities.** Over 100 workshops are offered annually throughout NH. Most are one-day and 5 Roads Scholar credits. Examples are: A Hard Road to Travel: Municipal Law; Basics of a Good Road; Flagger Certification; Road Drainage and Culverts; Grader Operation & Safety; Winter Operations; and Workzone Traffic Control. [http://www.t2.unh.edu/training/index.html](http://www.t2.unh.edu/training/index.html)

2. **NH Roads Scholar Program.** Includes four recognition levels, with specific subject area coverage. At each level, awards and certificates are presented; names are published in an annual Roads Scholar Directory and newsletter, with an article and portrait for Master Roads Scholars; official letters are mailed to Selectmen and Supervisors; and press releases are sent to local newspapers. [www.t2.unh.edu/training/rdscllr.html](http://www.t2.unh.edu/training/rdscllr.html)

3. **Newsletter.** Road Business is published quarterly and features technical and safety articles, publications, and names of participants in our training program. [www.t2.unh.edu/newsletter.html](http://www.t2.unh.edu/newsletter.html)

4. **Mutual Aid.** A network of municipalities that can assist one another during public works emergencies. There are over 115 communities in the program currently. [www.t2.unh.edu/ma](http://www.t2.unh.edu/ma)

5. **Listservs.** A listserv is an electronic mailing list. Subscribers can provide information and ask questions via email. Replies can be sent to an individual or to everyone. [www.t2.unh.edu/lists](http://www.t2.unh.edu/lists)

6. **Technical Assistance.** Personalized technical assistance is available through phone, fax, email, or special site visits. To request technical assistance, call 603-862-2826.

7. **Publications and Videos.** Hundreds of publications and videos may be added to your library or borrowed for three weeks at no charge. [www.t2.unh.edu/video_pub/publist.html](http://www.t2.unh.edu/video_pub/publist.html) & [www.t2.unh.edu/video_pub/vidlist.html](http://www.t2.unh.edu/video_pub/vidlist.html)

8. **Website.** Contains information on the NH Roads Scholar Program, current training, NH public works mutual aid, Road Business newsletter, and transportation links. Whenever possible, publications and videos are available for download and streaming. [www.t2.unh.edu](http://www.t2.unh.edu)

9. **Mailing Lists.** To receive workshop flyers and/or Road Business free of charge, call 603-862-2826.

NH Public Works Mutual Aid Program

If your community is NOT one of the 115 members of NH Public Works Mutual Aid (NHPWMA) Program and you would like someone from the NHPWMA Board of Directors to talk to your select-board about the benefits of joining, please contact Kathryn Myers, k.myers@unh.edu or 603-862-1362.

NHPWMA website & list of participating communities: [www.t2.unh.edu/ma/index.html](http://www.t2.unh.edu/ma/index.html)
Crossword Puzzle

Be the first to successfully complete this crossword and fax it to 603-862-0620, to win a FREE T² workshop!

Name: ___________________________________ Title: _______________________
Affiliation: ____________________________________________________________________
Address: _______________________________________________________________________
Phone: __________________________ Email: ________________________________

ACROSS
1 The second day of backhoe operation and training is the _____ portion.
4 Glass must first be ________ in order for it to be used as an aggregate material.
6 The Antrim Road Bridge was ________ in 15 weeks.
8 Spray-injection requires a skilled ________ in order to achieve a quality patch.
10 Workplace goals should be specific and ________.
12 One challenge to the Antrim Road Bridge replacement was a high ________ table for July.
13 Backhoe operation and safety training emphasizes ________ safety.
16 Crash data show that roadway departures account for 53% of roadway ________.
17 The freeze-thaw cycles of February and March often cause ________ on the NH roads.
18 The old Antrim Road Bridge was a set of sixty inch twin ________.
19 Goal-setting ensures ________ in the workplace

DOWN
2 Glass rejected by recycling facilities is suitable for use as Processed Glass ________.
3 Wagner and Julian partnered with the ________ DOT to develop a safety edge for roadways.
5 The ________ method of pothole repair is the simplest and quickest method.
6 High-quality ________ aggregates should be used for winter and spring pothole patching.
7 PGA keeps a significant volume of waste out of ________.
9 Backhoe operation and safety training gives participants the opportunity to practice proper craneing ________ on the second day of training.
11 In the safety edge technique for road paving, the edge of the road tapers, rather than ________ off ________.
14 Over a ________ workshops are offered annually by the NH-LTAP center.
15 The town of Hanover uses their own personnel to maintain bridges because it increases employee ________.
Milestones

- Barrington Highway joined NH Public Works mutual aid.
- Courtney Heath is new Road Agent in Goshen.
- Jackson Highway joined NH Public Works mutual aid.
- Timothy Keenan is new Road Agent in Sharon.
- Troy Water & Sewer joined NH Public Works mutual aid.

Publications & CDs

- AASHTO 2002 Roadside Design Guide—CD (2 disks). These disks contain a PowerPoint presentation and supplemental video. USDOT, NHI & Local Technical Assistance Program.
- APWA Clipart—CD. 38 graphic images of various public works scenarios, including pothole patching, snow blowing, striping, surveying, and sweeping. APWA.
- Inspecting Ground Anchors—CD (2 disks). This 2 disk set provides field inspectors with background knowledge of the construction of ground anchors and instructions for inspection of ground anchors during construction. Disk 1 focuses on preconstruction and disk 2 focuses on construction. US DOT & FHWA.
- The Endangered Species Act: BuildSmart—CD. These 2 CDs are designed to acquaint the construction inspector personnel with the Endangered Species Act (ESA) and to help them direct their contractor to Build Smart. This is for the experiences and inexperienced construction inspector. Portland State University, 2004.
- LTAP/TTAP 25 Years of Service. This publication explains the history and success story of the LTAP and TTAP centers since their institution by the FHWA starting in 1982. FHWA.
- Ten Essentials of a Good Road. Here are 10 basic tips to help maintain and keep your roads in good condition. NACE.

Videos

- The Best Defense is a Good Road, PA-1—DVD. How can municipalities reduce their liability by building safer roads. Cornell Local Roads.
- Construction Career Days: A Step into Your Future, PA-2,—DVD. Explains the purpose of construction career days and the benefit to the construction industry of recruiting people to enter the construction workforce. UT Construction Career Days.
- Defensive Flagging: A Survivor’s Guide, ST-9—DVD. Video discusses the importance of following the MUTCD correctly. Video has English or Spanish versions. TX DOT, FHWA, TEEX.
- Grader Safety, Maintenance, and Operation, M-4, DVD. Video includes 3 parts: 1) pre-start walk-around and daily service on machine 2) operator station with controls and safety systems 3) safety tips when operating the machine. John Deere, 2004.
- Gravel Road Maintenance: Meeting the Challenge, M-2, 38 min.—DVD. Instruction on proper gravel road maintenance techniques. Includes 6 parts: Introduction, Correct Roadway Shape, Shaping the Roadway, Good Surface Gravel, Dust Control & Additional Resources. MN LTAP.
- Incident Command System, ST-7,—DVD. Discusses how large emergencies are responded to by many people and agencies in an effective and efficient manner.
- Rumble Strips: A Sound Investment, ST-4—DVD. This video on shoulder and centerline rumble strips and rumble stripes is intended to introduce you to a cost-effective treatment that has been proven to provide results by saving lives. USDOT & FHWA.
- Workzone Safety, ST-8—DVD. Discusses 1) traffic control devices 2) elements of a workzone 3) typical applications 4) good flagging procedures and 5) liability. Cornell Local Roads Program.
PW.Net Listserv

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UNH T² staff meet with the advisory board quarterly to discuss training, center initiatives and special projects.

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- Nancy Mayville-Municipal Highways Engineer, NHDOT Planning & Community

FHWA Representative
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- Martha Drukker-Associate Engineer, Concord
- Richard Lee-Director of Public Works, New London

NH Public Works Standards & Training Council
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About UNH T²

Congress established the Local Technical Assistance Program (LTAP) in 1982 to provide services to US municipalities. There is an LTAP Center in every US state and Puerto Rico, and there are Regional Centers serving Tribal Governments.

NH LTAP (UNH T²) was established in 1986. We continue the LTAP mission by providing services to NH municipalities, the NH Department of Transportation, and private road-related organizations.

T² Program Supporters
- Federal Highway Administration
- NH Department of Transportation
- University of New Hampshire
- National LTAP & TTAP Program

T² Center Staff
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- Ashley Benson, Project Assistant & UNH Masters in Literature Student

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