On the Road in NH: Success with Beaver Deceivers in Andover

By Kathryn Myers, UNH T² Training Program Manager & Road Business Editor

Thanks to Victoria Mishcon--Selectboard member in Andover, for providing this information.

Beavers can cause major damage to municipal and other infrastructure by building dams, which can create floods. The solution is to prevent beavers from doing any harm. Wildlife biologist, Skip Lisle, offers his “beaver deceivers” as a humane solution. Beaver deceivers prevent beavers from successfully blocking streams and culverts.

Skip Lisle’s devices have been installed throughout the United States, including one on Elbow Pond Road in Andover NH, and many claim the deceivers are very successful. Victoria Mischon, selectboard members in Andover, says “Skip installed two devices for us in October, and after a month of heavy beaver activity, with lots of trees knocked down, the culverts remain completely unblocked.”

One way to deceive beavers is to build a fence outward from a culvert. The fence can be made with cedar or pressure-treated wood posts and steel sheet fencing. The fence prevents beavers from entering the space from the top, sides, or bottom. This forces beavers to build so far away from the outlet that the animal will usually decide the effort to dam the stream is not worth it.

This fence does not plug the culvert and the fence panels are large enough to allow fish and other aquatic animals through.

Lisle has found that trapezoid-shaped fences are the most effective. However, beaver deceivers can take almost any form needed to fit in the space available.

If road managers need to lower the level of water that a beaver dam is holding, they can use a pipe system to deceive beavers. Place the inlet end of the pipe in the beaver-made pond at the desired water level, and the discharge end of the pipe on the other side of the dam. Surround the inlet end of the pipe with a Lisle-designed “round fence.” This will prevent the animal from blocking the drain. Then create a notch in the dam at the water level desired. Beavers may build where the notch was made, but once they are committed to maintaining an established dam they do not typically search downstream for leaks.

Beavers are important to our ecosystem and should never be harmed. Beaver activities create and sustain wetlands, help filter toxins out of watersheds, and provide habitat for both plants and animals.

For more information, Skip can be reached at Beaver Deceiver International, (802) 843-1017.

UNH Technology Transfer Center Mission: To provide technical and management information about roads and bridges to municipal officials and road-related organizations.

UNH T² Center, Road Business, Spring 2009, Vol. 24, No. 1
Master Roads Scholars

Master Roads Scholar—Bruce Brown

Bruce Brown is the Assistant Road Agent in Northfield. He is in his fifth year with the town. Bruce likes everything about his job, particularly the people he works with.

Bruce recommends that new public works employees listen to their supervisors since they are there to help you acquire new skills, and you can learn a lot from their experience.

Bruce’s favorite part of the UNH T² Roads Scholar Program has been the workshops. He has found that he applies something he has learned in the program every day on the job. There are several more classes that Bruce wants to take with UNH T².

Master Roads Scholar—Bob Seawards

Bob Seawards has been a heavy equipment operator for Dover for eight years. He enjoys the hands on aspect of his job. Bob likes using different equipment and meeting new challenges that arise every day.

Bob plans to attend new UNH T² workshops and also wants to enroll in the Public Works Academy program.

Bob recommends that new public works employees establish goals for themselves and stick with what they are doing to achieve those goals. He says there is always room for advancement for those working in public works. He says that “it is dirty work, but it is rewarding.”

Master Roads Scholar is the fourth and final achievement level in the UNH T² Roads Scholar Program. It requires the completion of 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. The next 50 hours to reach Master Roads Scholar are at the learner’s discretion. Most UNH T² workshops yield five contact hours. Therefore an individual must typically attend twenty one-day workshops to earn Master Roads Scholar.

UNH T² Roads Scholar Program Information: www.t2.unh.edu/training/rdsclr.html

Roads Scholar Training Program: Did You Know?

- **INSTRUCTING**: You may send 3 employees to your workshop session for free if you instruct for us as a volunteer (un-paid).

- **TRAINING FACILITIES**: Employees can receive training at a reduced rate if a free adequate training facility can be used by UNH T² for the training. We would need to make a site visit to ensure it was adequate for our customer’s training needs.

- **ROAD BUSINESS ARTICLES**: You may earn one Roads Scholar credit if you submit a one page article and it is accepted to be published in Road Business (if you have not already used your 10 “outside” hours).

- **MANUALS/GUIDES**: You may earn up to 10 hours in our Roads Scholar Program if you create a manual, field guide, reference sheet, or other material, that can be distributed to all NH municipalities (if you have not already used your 10 “outside” hours).

Contact Kathryn Myers: k.myers@unh.edu or 603-862-1362, if you are interested.
New Sign Retroreflectivity Requirements

By Kathryn Myers, UNH T² Training Program Mgr. & Road Business Editor

The Manual on Uniform Traffic Control Devices (MUTCD) specifies requirements on sign visibility. Federal Highway Administration (FHWA) has recently adopted new minimum requirements for sign retroreflectivity as mandated by Congress. The new provisions can be found in Section 2A.09 and Table 2A-3 of the MUTCD. Previously, the MUTCD did not specify requirements for sign retroreflectivity.

Time-Frame

Municipalities have until January 2012 to establish a sign assessment method designed to maintain minimum levels of sign retroreflectivity.

Municipalities have until January 2015 to replace regulatory, warning, and ground-mounted guide (except street name) that do not meet the minimum levels of retroreflectivity.

Methods

Municipalities have until January 2018 to replace overhead guide signs and street name signs that do not meet the minimum levels of retroreflectivity.

The multiple year compliance period was chosen so municipalities are able to replace signs in a period that is consistent with the typical sign replacement cycle.

Municipalities do not have to measure the retroreflectivity of every sign. However, agencies must use one or more of the five assessment methods outlined in the MUTCD or develop other appropriate methods based on engineering studies. Any method must meet the requirements outlined in Table 2A-3.

Municipalities will be considered to be in compliance if they are following Section 2A.09, and even if some signs do not meet the minimum retroreflectivity levels at some point in time.

Sheeting Types

Sheeting types (as defined in ASTM 04956) that can be used according to the new requirements are as follows:

- All prismatic sheeting materials may be used for any sign.
- High Intensity Beaded (Type III) and Super Engineer Grade (Type II) may be used for any sign except for the white legend on overhead guide signs.
- Engineer Grade (Type I) may be used for all signs except for:
  1. the white legend on guide signs,
  2. the white legend on street name signs, and
  3. all yellow and orange warning signs.

Even though a particular type of sheeting might initially meet the minimum retroreflectivity levels when new, it could quickly degrade to below the minimum retroreflectivity levels.

For more information: www.fhwa.dot.gov/retro.

*UNH T² is hosting a Sign Retroreflectivity workshop on May 5, 2009 in Concord.*

References

<table>
<thead>
<tr>
<th>Countermeasure</th>
<th>Description</th>
<th>Cost Range</th>
<th>Data, Benefits, and Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Road Safety Audits</td>
<td>Road Safety Audit (RSA) is a safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team.</td>
<td>Very low cost: Costs are in the form of time and team coordination.</td>
<td>Crash reduction percentages from 20-80% have been recorded on past projects where a RSA was done. Lifecycle costs are reduced since safer designs often carry lower maintenance costs. Societal costs of collisions are reduced by safer roads and fewer severe crashes. More information at: <a href="http://safety.fhwa.dot.gov/rsa/">http://safety.fhwa.dot.gov/rsa/</a>.</td>
</tr>
<tr>
<td>#2 Rumble Strips and Rumble Stripes</td>
<td>Rumble strips are ground into the pavement and are outside of the travel lane. Rumble stripes are ground into the pavement and painted over with the appropriate striping.</td>
<td>Low cost: Cost will vary based on the application. Prices range between $0.20 and $3.00 per linear foot</td>
<td>Over 50% of California’s fatal crashes are a result of road departure. This application provides an audible warning and physical vibration to alert drivers they are leaving the roadway. The application of rumble stripes or strips has shown good results in reducing run off the road (ROR) crashes. More information at: <a href="http://safety.fhwa.dot.gov/roadway_dept/rumble/index.html">http://safety.fhwa.dot.gov/roadway_dept/rumble/index.html</a>.</td>
</tr>
<tr>
<td>#3 Median Barriers</td>
<td>Median Barriers separate opposing traffic on a divided highway and are used to redirect vehicles striking either side of the barrier.</td>
<td>Medium to high cost: Cost will vary depending on the material used. Cable barrier systems can be installed on average for $76,500 per mile.</td>
<td>Cross-median crashes can be some of the most severe and most result in a serious injury or death. Median Barriers can significantly reduce the occurrence of cross-median crashes and the overall severity of median-related crashes. More information at: <a href="http://safety.fhwa.dot.gov/tools/median_barrier.htm">http://safety.fhwa.dot.gov/tools/median_barrier.htm</a>.</td>
</tr>
<tr>
<td>#4 Safety Edge</td>
<td>Safety Edge is a paving technique where the interface between the roadway and graded shoulder is paved at an angle to eliminate vertical drop-off.</td>
<td>Very low cost: The technique requires a slight change in the paving equipment (approximately $1,200).</td>
<td>Research between 2002-2004 shows that pavement edges may have been a contributing factor in as many as 15-20% of ROR crashes. When a driver drifts off the roadway and tries to steer back onto the pavement the action may result in over-steering. Safety Edge minimizes that occurrence by reducing the vertical angle between the shoulder and pavement. More information at: <a href="http://safety.fhwa.dot.gov/roadway_dept/docs/sa07023/">http://safety.fhwa.dot.gov/roadway_dept/docs/sa07023/</a>.</td>
</tr>
<tr>
<td>#5</td>
<td>Roundabouts</td>
<td>High cost: Installations may require additional R.O.W. A reduction in serious crashes may justify the costs.</td>
<td>Roundabouts offer substantial safety advantages and can reduce the occurrence of right angle crashes and have the potential to reduce fatal and injury crashes from 80–87%. Geometric features provide a reduced speed environment and excellent operational performance.</td>
</tr>
<tr>
<td>#6</td>
<td>Left- and Right-Turn Lanes</td>
<td>Medium to high costs: Some installations may require additional R.O.W.</td>
<td>Rear-end crashes are the most frequent type of collisions at intersections. Adding turn lanes provides separation between turning and through traffic and reduces these types of conflicts. It is desirable to offset opposing left turn lanes to increase visibility of approaching vehicles.</td>
</tr>
<tr>
<td>#7</td>
<td>Yellow Change Intervals</td>
<td>Very low cost: Time and interagency coordination are required.</td>
<td>Yellow Change Intervals that are not consistent with normal operating speeds create a dilemma zone in which drivers can neither stop safely nor reach the intersection before the signal turns red. Increasing yellow time to meet the needs of traffic can dramatically reduce red light running.</td>
</tr>
<tr>
<td>#8</td>
<td>Median and Pedestrian Refuge Areas</td>
<td>Low cost: Retrofit improvement, even lower costs for new roadway projects.</td>
<td>Pedestrian fatalities account for approximately 700 deaths or 17% of all fatalities in California. Providing raised medians or pedestrian refuge areas has demonstrated a 46% reduction in pedestrian crashes. Raised medians or refuge areas are especially important at multi-lane intersections with high volumes of traffic.</td>
</tr>
<tr>
<td>#9</td>
<td>Walkways</td>
<td>Medium to high cost: Based on the amount and type of application.</td>
<td>“Walking along road” pedestrian crashes are approximately 7.5% of all pedestrian crashes. The presence of a path, sidewalk or paved shoulder can provide a significant reduction in “walking along road” pedestrian crashes.</td>
</tr>
</tbody>
</table>
Economic Recovery & NH Municipalities

By Julia Faller, UNH T² Project Assistant & UNH Business Student & Bob Strobel, UNH T² Project Manager

The American Recovery and Reinvestment Act (ARRA) was signed by President Barack Obama on February 17, 2009. The federal government awarded $111 billion to be divided (not necessarily equally) to all fifty states for development of infrastructure and science. Of this $111 billion, New Hampshire is allotted $129 million for roads and bridges, $4-5 million for airports, and $13 million for public transit.

How was the Money Secured?

Of the $129 million, the NHDOT State Bridge Aid and Highway Aid programs secured $11 million; while the Transportation Enhancement Program (TEP) secured $3.8 million for sidewalks, bike paths and lanes, historic transportation structures, landscaping, and mitigation for highway runoff and wildlife protection. As of February 25, 2009, NHDOT has advertised $40 million of highway and bridge projects.

Stipulations on Funding

To qualify for stimulus funds, projects must be:

1. A bridge with length more than 20 feet and on a public highway
2. Have recommended bridge postings in compliance
3. A functional classification highway not including urban and local roads and rural minor collectors
4. Be “Shovel-Ready”—able to start construction within 90 days
5. In NH’s 10-year Plan (TYP) or in a program in the TYP and in the Statewide Transportation Improvement Plan (STIP).

Funds are allocated on a first-come, first-served basis for qualified projects, and more projects have been identified than funds available for them.

Project Timeline:

1. 50% of Highway and Bridge funds must be under contract before June 17, 2009
2. All funds must be placed under contract before June 17, 2010
3. Projects must be completed by February 17, 2012.

*Funds not awarded by deadlines will be redistributed to other states.

NH Governor John Lynch recently stated that road resurfacing programs will use a substantial part of the federal stimulus funding. The NHDOT is planning to pave 760 miles of road, compared to only 250 miles it would have been able to pave without the stimulus. NHDOT Commissioner George Campbell stated, “this much-needed 760 miles of paving work will touch all parts of the state, putting people to work, helping to preserve our highway system and making a noticeable difference in the quality of the ride for motorists.”

Also scheduled is a $9.5 million pavement rehabilitation project on NH Route 101 in Epping. The project extends 9.5 miles from the east side of the Lamprey River Bridge in Epping to east of Exit 9 in Exeter.

NH Economic Stimulus Office

The Governor’s Office of Economic Stimulus was created with an Executive Order by NH Governor John Lynch on January 27, 2009. Governor Lynch appointed state Deputy Attorney General Orville “Bud” Fitch as office director. Bud will assist the Governor and state agencies in the management of federal stimulus funds.

The office was created to “…ensure that New Hampshire and its citizens receive maximum benefits from any federal economic stimulus package, and that those funds are used to create jobs and protect essential services here in New Hampshire.” The President’s website monitoring the ARRA projects that the stimulus funds should create and/or save 16,000 jobs in New Hampshire.

For more information: www.nh.gov/recovery/programs/transportation.htm or www.nh.gov/recovery/aboutus/index.htm

References:

Nearly all pavement damage can be attributed to water. Water infiltrates pavement through pavement cracks. This creates the freeze-thaw cycle of water, which damages the road subbase. Crack sealing is a cost-effective technique to prevent this damage to pavement.

When to Crack Seal

Crack sealing is a preventive maintenance procedure. It must be done before the road is severely damaged. Perform crack sealing routinely as part of the road maintenance plan. Inspect roads at least biannually and keep good records on road condition to determine how best to maintain it. Consider crack density and road edge deterioration when deciding on an appropriate action to take for cracks (see Table 1). Crack density is a general measure of the number of cracks in an area. Crack density can be low, medium, or high.

Longitudinal, transverse, and block cracks are typical occurrences on the roadway. Longitudinal cracks run parallel to the length of the roadway while transverse cracks run perpendicular to the length of the roadway. Block cracks divide the pavement surface into rectangular pieces, typically 1 square foot or more in size. Use crack sealing on longitudinal, transverse, and distantly spaced block cracks.

Crack sealing strategies include partial depth patching, spot patching, microsurfacing and fog sealing. Use partial depth patching for repairs within the upper one-third of the pavement depth. Use spot patching to correct localized problems, such as potholes. Use microsurfacing and fog sealing to treat the entire road surface. Microsurfacing is a mixture of asphalt emulsion, aggregate, water, and other additives. It is properly proportioned, mixed, then spread on a paved surface. A fog seal is a light application of diluted asphalt without any aggregate applied to the pavement surface.

Follow these steps for a crack treatment program:
1. Review construction and maintenance records, including pavement age, design, and prior maintenance, including any recent work.
2. Inspect the pavement and record distresses.
3. Determine the appropriate type of maintenance for the pavement (see Table 1 above).
4. Determine whether cracks should be sealed or routed (see Table 2 on next page).
5. Select materials and procedures for the crack treatment operation based on climate, traffic, crack characteristics, available equipment and

Table 1: Corrective Action Guidelines.—Adapted from SHRP H-106
6. Acquire material and equipment.
7. Conduct and inspect the crack treatment operation.

When NOT to Crack Seal

Crack sealing will not be effective on a road with significant damage. It will be difficult to fully seal the road and water infiltration is then likely. Also crack sealing is sometimes aesthetically displeasing (see Figure 1).

High density cracks, such as alligator and block cracking, are not good candidates for crack sealing (see Table 1). Alligator cracking is a grouping of cracks that form a pattern which resembles an alligator’s back, and is usually a higher density than block cracks.

Do not use crack sealing to fill potholes. Instead, consider a complete surface treatment, rehabilitation, or reconstruction of the road.

Crack Sealing Materials

The three primary sealant materials used for crack sealing are cold-applied, hot-applied, and chemically-cured thermosetting materials. Variations of each material can be created. The most common variations are:

<table>
<thead>
<tr>
<th>Crack Characteristics</th>
<th>Crack Treatment Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width, inches</td>
<td>Crack Sealing</td>
</tr>
<tr>
<td></td>
<td>1/5 (0.2) to 3/4 (0.75)</td>
</tr>
<tr>
<td>Edge Deterioration</td>
<td>Routing</td>
</tr>
<tr>
<td>(i.e., spalls, secondary cracks)</td>
<td>Minimal to None (&lt; 25 percent of crack length)</td>
</tr>
<tr>
<td>Annual Horizontal</td>
<td>Transverse Thermal Cracks</td>
</tr>
<tr>
<td>Movement, inches</td>
<td>Transverse Reflective Cracks</td>
</tr>
<tr>
<td></td>
<td>Longitudinal Reflective Cracks</td>
</tr>
<tr>
<td>Type of Crack</td>
<td>Transverse Cold-Joint Cracks</td>
</tr>
<tr>
<td></td>
<td>Longitudinal Cold-Joint Cracks</td>
</tr>
<tr>
<td></td>
<td>Distantly Spaced Block Cracks</td>
</tr>
</tbody>
</table>


- Manpower, cost, and performance.
- Acquire material and equipment.
- Conduct and inspect the crack treatment operation.
- Periodically evaluate treatment performance.

When NOT to Crack Seal

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The three primary sealant materials used for crack sealing are cold-applied, hot-applied, and chemically-cured thermosetting materials. Variations of each material can be created. The most common variations are:

1. Cold-applied thermoplastic bituminous materials:
   a. Liquid asphalt (emulsion)
   b. Polymer-modified liquid asphalt
2. Hot-applied thermoplastic bituminous materials:
   a. Asphalt cement
   b. Fiberized asphalt
   c. Asphalt rubber
   d. Rubberized asphalt
   e. Low-modulus rubberized asphalt
3. Chemically cured thermosetting materials:
   a. Self-leveling silicone

The most commonly used materials for crack sealing are hot applied sealants. Hot applied sealants are usually asphalt cements (sometimes modified

Figure 1: Crack sealing performed on alligator cracking. An alternate solution should have been used on this road.
with rubber), which are heated to around 350 to 375 degrees F. When the sealant is applied, the material cools and the thermoplastics harden. Hot applied sealants typically last three to five years.

Cold applied sealants are also commonly used. Cold applied sealants are usually emulsified asphalt. When the sealant is applied, water evaporates from the material causing the emulsifying agent to harden. Cold applied sealants typically last one to two years.

Two advantages to using cold applied sealants are:
1. They do not require heating for application. This makes application easier and safer.
2. They may be applied in times of high humidity.

Consider performance, characteristics, and cost when choosing material. Select a sealant with high durability and flexibility for roads with high traffic volumes. Use a highly elastic material for roads with wide cracks.

Specify hot-applied sealants that meet ASTM D5078 (Crack Filler, Hot-Applied, for Asphalt Concrete and Portland Cement Concrete Pavements), ASTM D6690 (Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements), Federal Specification SS-S-1401, or specifications required by the NHDOT.

Specify sealants to meet ASTM D5893 (silicone-based sealants), or ASTM D7116 (jet fuel resistant sealants) for concrete pavements when appropriate. Visit the ASTM website for more information: www.ASTM.org.

Asphalt cutback materials and mineral-filled asphalts are not typically used. Asphalt cutbacks are harmful to the environment and are banned in many areas and mineral fillers (stone, lime, fly ash) are expensive.

**Crack Sealing Procedure**

Seal cracks in moderately cool temperatures to minimize movement in the sealant material. Thermal expansion of asphalt causes cracks to be tightest in hot temperatures and widest in cold temperatures. Spring and fall are usually ideal times to crackseal with temperatures between 45 and 65 degrees F.

Seal cracks in three steps:
1. Clean and dry the crack using a hot-air lance or a high pressure air hose. Ensure the crack surface is free of dirt and water or the sealant will not stick to the surface. Be careful not to burn the pavement when using a hot-air lance.
2. Fill cracks immediately with sealant after they are clean and dry to stop condensation or debris from entering the crack. Follow the manufacturer’s and agency’s guidelines on sealant installation.
3. Use a squeegee to remove excess sealant and to create an overband around the crack. An overband is a strip of sealant material centered over the surface of a crack. This protects the pavement surrounding the crack from damage. Do not form a wide overband, especially on longitudinal cracks. Sealant overbands form a surface that is much more slick than pavement and it creates a slipping hazard, especially to motorcycles.
4. Reroute traffic around the treated area until the sealant is completely dry. Protect the material with a light cover of sand, toilet paper, or sawdust if traffic must be allowed to pass over the treated area.

**Crack Routing**

Crack routing is an effective way to improve the quality of crack seals. Routing is cutting a rectangular section at the crack surface to provide a reservoir to place the sealant in.

To rout a crack, cut a block into the pavement centered over the crack using a pavement saw or router. Use a sharp blade to minimize spalling (cracking, breaking, chipping, or fraying of the pavement surface within 2 feet of a joint or crack). Fill the reservoir and crack with sealant by following the same procedure as regular crack sealing.

Routing will protect the crackseal since the reservoir is below the paved surface and not easily
damaged by traffic or plows. Routing also helps the sealant adhere to the pavement. The Strategic Highway Research Program (SHRP) identified standard routing as one of the most effective crack sealing methods.

**Safety When Crack Sealing**

Crack sealing poses a safety hazard to workers and drivers/riders. Follow all safety precautions for material handling and equipment operation provided by the manufacturer. Hot applied sealants are used at 350 degrees F or higher and require strict safety precautions.

Ensure that workers wear proper safety apparel including long sleeved shirts, long pants, safety glasses, gloves, steel-toed boots, and hard hats.

Do not allow pedestrians or vehicles near the crack sealing operation if possible.

**Benefits to Crack Sealing**

The major benefit of crack sealing is limiting water infiltration. Preventing water infiltration will reduce freeze-thaw damage and protect the roads’ subbase. Studies by the Ministry of Transportation in Ontario support that a properly performed crack sealing treatment can extend asphalt pavement life by at least two years. The useful life of asphalt pavement is typically around eight to twelve years. Therefore, crack sealing can extend the road life by over 20%.

Figure 2 shows the difference in pavement life of a road with no maintenance versus a road that is periodically crack sealed. The road life is increased and the pavement condition improves each time the road is crack sealed. However, the road does continue to deteriorate even with crack treatment. Road deterioration is inevitable, but it can be delayed with proper maintenance.

Crack sealing also:
- prevents cracks from worsening,
- stops sand and debris from getting into cracks and damaging surrounding pavement,
- prevents potholes from forming,
- reduces tire and suspension wear for drivers, and
- assures residents that their road is considered in the municipal road maintenance plan.

Crack sealing is inexpensive compared to most other repair procedures, including road rehabilitation. Cracksealing is a valuable maintenance operation since the benefit-cost ratio is high. However, eventually crack sealing will no longer be effective and other alternatives must be used.

**References**


Transportation Research Board.


![Figure 2: Pavement Deterioration With and Without Crack Sealing](image)
Employees in many industries are now expected to produce more in less time. This unrealistic expectation could relate to why studies support that employees are currently less satisfied with their jobs than employees were a decade ago.

Many baby boomers will be replaced by younger workers as they leave the current work force. Some younger workers have different attitudes and expectations about the role of work in their lives than their older counterparts. This presents a new challenge for many employers and could be impacting employer’s ability to get managers and field crews to reach their full potential.

The answer to the problem for many agencies is to provide more training to their employees. Studies support that if your field personnel get below eight hours of training per year, it will not lead to any changes in productivity. Many organizations offer more training for employers (management) than employees. It is equally important to train those doing the work, not just those making the decisions. Quality, service and productivity also happens out in the field and not just in the office.

Most public agencies don’t have formal training programs in place, and making time to train employees can be challenging. However, leaving people to learn by doing is much more costly. Managers should set a goal to conduct training that will help employees excel. A good training goal should be to provide 40 hours of training per year per employee. The total cost of this training probably won’t be more than two percent of overall payroll cost but the return will be much higher in productivity and safety.

First, hold a meeting with management to select and prioritize training topics. Make it a habit to cover the same topics annually while adding new ones. There are always new employees and refresher classes reinforce correct performance.

Second, schedule training time each week, such as 30 minutes every Tuesday morning. Third, make the training interactive. Use the common method of training:

1. tell them what you are going to tell them,
2. tell them,
3. show them,
4. let them do it, and
5. tell them again.

Coach participants through exercises until they get it right and recognize those who do a good job. Share training duties among employees based on experience and skill. Give everyone a chance to instruct.

There are times when you should use outside people to teach on new and technical tasks. Bringing in a specialist to train or sending employees offsite to workshops can be worth the investment. Ensure the information they were provided is reinforced after they get back on the job so they can implement their new skills and to show management support of their training.

Employees do not want to struggle with tasks or take longer to master new skills. Employees want to make a meaningful contribution to their job, and they want to be recognized for their efforts. Training can accomplish this. Training also fosters team morale and more enthusiasm for work.

Address safety concerns and save money by training employees. Use training to build productivity, quality of work, motivation and company loyalty. Too busy to train? Think again.

Linda Hanson, CMC, is a certified management consultant and author of 10 Steps to Marketing Success. She writes, speaks and consults on marketing, management, and customer service issues and can be contacted at www.llhenterprises.com. Sign up for her free newsletter, The Superior Performance Report.

Reference:
The following articles were published in Road Business during the last 4 years.
To access articles: www.t2.unh.edu/rdbus_index or contact the UNH T² Center.

**Bridges.** Bridge Maintenance Practices, *Summer 2006.*


Dates

- NHPWA Annual Mtg., May 27, LGC—Concord.
- Mt. of Demonstrations, May 28, 8am-1pm, Gilford-Gunstock Ski Area.

Milestones

- Scott D. Kinmond—New Road agent in Moultonborough (former Police Chief)
These publications and videos are available from UNH T² FREE of charge. To request material, fax this completed form to 603-862-0620.

**Publications**

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**BMPs for Resolving Human-Beaver Conflicts in Vermont.** Beaver management in Vermont, biology and behavior of beavers, defining the problem and best management practices for handling human-beaver conflicts. *Vermont Fish & Wildlife Department.*

**Crack Seal Application.** A pavement preservation checklist in the use of innovative pavement preventive maintenance processes. *USDOT & FHWA.*


**Field Guide for Inspecting Signalized Intersections to Reduce Red-Light Running.** Suggests a procedure for conducting an investigation of a specific intersection that has been identified as a red-light running problem site. *FHWA.*

**Incident Sign Installation Guide.** Information on how, when, and where to install incident related signs. *USDA Forest Service.*

**Minimum Impact BMPs for Maintenance of Large Woody Material in Streams and Rivers.** Info. sheet on large woody material, and when and why to remove it or not from rivers and streams. *NHDES.*

**Protecting Historical & Cultural Resources from Adverse Effects: Regulatory & Other Resources.** Features NH DHR Project Review Links & Info., historic preservation review & compliance, regulatory overview for highway-related projects in NH, and more. *NH Division of Historical Resources.*

**Standard Specifications for Road and Bridge Construction**-CD Provides information on road and bridge construction, including general provisions, earthwork, pavements, and incidental construction. *NHDOT.*

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**Videos**

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**Dangerous Travelers – Controlling Invasive Plants along America’s Roadways, M-3, 26 min.—DVD.** This is the first video of a series on invasive species prevention best management practices. It targets road maintenance personnel and equipment operators. *USDA Forest Service, 2006.*

**Flagging in the Workzone, ST-233, 10 min.—DVD.** Discusses proper flagging practices and techniques that help make workzones safer for flaggers, workers, and roadway users. *OR DOT and T² Center.*

**Gravel Road Maintenance: Meeting the Challenge, M-2, 38 min.—DVD.** Provides instruction on proper gravel road maintenance techniques. The video is broken down into 6 parts: Introduction, Correct Roadway Shape, Shaping the Roadway, Good Surface Gravel, Dust Control, & Additional Resources—Requires Flash Player. *MN LTAP.*

**Lifelines – Your National Forest Roads DC-3, 32 min.—DVD.** Explores the relationship between people and the land (past, present and future). It also celebrates the partnership between the USDA Forest Service, Federal Lands Highway Administration, and state and local communities in providing continued stewardship and access to national forests. *USDA Forest Service, 2006.*

**The Muddy Roads Project, M-235, 20 min.—DVD.** A study in VT on BMP’s for maintaining gravel roads during mud season.

**Road Safety Audits - A New Way of Doing Business, ST-3, 14 min.—DVD.** RSA Overview. *FHWA.*

**Work Zone Safety for Rural Local Agencies, ST-234, 102 min.—DVD.** Touching on traffic control devices, zones, applications, and flagging techniques. Information also discussed about legal liability. *UNC ITRE/FHWA.*

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**Customer Information**

Name: _____________________________

Title: _____________________________

Affiliation: _______________________

Mailing address: ___________________

Town/City: ________________________

State: __________________ Zip: ______

Phone: __________________ Fax: ______

Email: ____________________________
Listservs

A listserv is a free way to use email to exchange information. To subscribe send an email to k.myers@unh.edu and include: your name (first and last), your email, your affiliation, and the list name you want to subscribe to.

- **PW.NET**: Want to know what is happening in other towns? Or, learn the latest regulations? Need a place to ask questions of other public works officials? Want to be the first to receive notifications of UNH T² Center trainings and other special projects? Sign up for pw.net.
- **OFFICE.ADMIN**: Do you work in an office? Do you spend a lot of time working on a computer? Do you supervise others? Do you conduct interviews? Sign up for office.admin.
- **NE.PAVEMENT**: Do you work in the New England region and manage a pavement program? Are you interested in learning about the latest products or solutions for pavement management? Sign up for ne.pavement.

T² Center Advisory Board

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

**NH DOT Representatives**
- **Steve Dubois**: Civil Engineer, NH DOT Systems Planning
- **Nancy Mayville**: Municipal Highways Engineer, NH DOT Planning & Community

**FHWA Representative**
- **Christopher Tilley**: Area Engineer

**Municipal Representatives**
- **Alex Cote**: Director of Public Works, Town of Deerfield
- **Martha Drukker**: Associate Engineer, City of Concord
- **Richard Lee**: Director of Public Works, Town of New London

**NH Public Works Standards & Training Council**
- **Dave Danielson**: President, Forcee Advocacy LLC

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.

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**
- **Christopher Bourque**, Project Asst.--UNH Civil Engineering Student
- **Julia Faller**, Project Asst.--UNH Business Student
- **Charles Goodspeed**, T² Center Director
- **Butch Leel**, Technical Support Assistant
- **Kathryn Myers**, Training Program Mgr. & Road Business Editor
- **Linsey Shaw**, Program Assistant
- **Bob Strobel**, Software Project Manager

About Road Business

Road Business is a quarterly publication of the University of New Hampshire Technology Transfer Center. Any opinions, findings, conclusions, or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of our sponsors. Any product mentioned is for information only and is not a product endorsement.
### Spring/Summer 2009 Training Calendar

**www.t2.unh.edu/training**

<table>
<thead>
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<th>Event Description</th>
<th>Participants</th>
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