Control Potholes by Sealing Cracks, Joints in Advance

By Larry Galehouse, P.E., P.S

Every spring the news media embark on their pursuit of potholes and the damage they cause to vehicles.

In some locations it has been an annual ritual to embarrass road agencies for their lack of proper maintenance. In response, road managers often counter that a lack of sufficient road funding is responsible for poor pavement conditions and the resulting potholes.

Although both sides of the discussion have merit, because of potholes, road users must endure repair costs and inconvenience. Drivers experience damage to tires, wheels, and vehicle suspensions.

Sometimes serious road accidents occur as a direct result of potholes on high speed roadways. Motoring and related organizations estimate that potholes cause billions of dollars in damages to vehicles in the United States each year. But it doesn’t have to be that way, because simple practices exist can that effectively thwart the development of potholes.

In cold regions, cycles of freezing and thawing accelerate this process as water infiltrating within the structure freezes and exerts pressure on the pavement above. When the road and trapped water thaws, the resulting cavity collapses under traffic, forming a pothole. Sometimes water from the thawing of upper portions of the pavement structure cannot drain past still-frozen layers below. The saturated supporting pavement structure is weakened and the pothole forms.

Potholes in Warm, Cold Climates

Most people know that potholes are caused by the presence of water in the underlying pavement structure. Both warm and cold climate regions suffer potholes.

In warm climates, erosion by water present in the road’s structure undermines a road’s driving or friction course. Combined with the presence of traffic, the affected driving course begins to weaken, then suffers fatigue, and ultimately the poorly supported driving course is broken, creating a hole in the pavement surface. Now even more water can enter the pavement structure.

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Welcome to Autumn in New Hampshire!

I have to admit that this is one of my favorite times of year, with the leaves changing color, the temperature dropping and the touch of frost in the morning. It is a busy time of year, with the kids back in school, fall sports in full swing and everyone back to work after their summer vacations.

It is no different here at the LTAP, where we are in the midst of our fall session with many courses being offered around the state. If you didn't see a workshop that you wanted, or would like a specific one to come to your town, please email me. I would be happy to hear from you and to work with you to set something up. We always like hearing from you!

This Fall we’ve also been busy assisting with other events. As part of the NH Public Works Association, we helped at the 10th Annual Ken Ward Memorial Plow Rally on September 16, 2015, where the talented team from Merrimack took the grand prize. We also assisted at Construction Career Days on September 17 & 18, helping over 1,000 students learn about public works and the variety of things you can do as a career.

We have also hired Robert Goodrich to assist us as a Training Instructor and Researcher. Bob had been the President of W.S. Goodrich, Inc., a masonry yard that had been in his family for generations. The yard had closed, and although he had talked of retirement, we were able to convince Bob that his talents could be put to use and that we value his input and expertise. We look forward to working with him!

As Fall turns to Winter, we will all be bracing against the cold and wintry weather that’s bound to come, and we will start planning for our Sessions next year. Until then, have a great Autumn season!!

Amy Begnoche
LTAP Director
Technology Transfer Center
Potholes

How does water get into the underlying pavement structure and create a pothole in the first place? The simple answer is that almost always, the cracks and joints are left unmaintained and unsealed.

The time to solve the pothole problem is when the cracks begin to form on the pavement surface. Yet many road agencies forego easy and low-cost crack treatments in lieu of more costly pothole repair.

Pothole repair is full of risk for the driver, maintenance worker, and highway agency. Although some road agencies use sovereign immunity as a defense, there is no defense for a loss of life.

Moving pothole filling operations – the “throw, roll and go” method in which staff forces shovel asphalt mix into a pothole, the rear tires of the haul truck are backed over the hole, and the operation moves down the road – often are inadequately marked, with drivers suddenly coming on an operation with little warning.

But crack and joint sealing usually are performed in a proper work zone, reducing the risk for workers and drivers.

Do It Right The First Time

Maybe you have heard the saying, “there is never enough time and money to do it right the first time, but there is always enough time and money to do it over”.

In this instance, doing it right the first time means implementing a crack and joint sealing program in advance, while doing it over (and over) is the practice of pothole filling and patching, that is, waiting until the fix becomes dangerous and more expensive.

The following simple steps, done in advance, will prevent potholes from forming:

- Begin by sealing small cracks in flexible pavements early in the pavement life when it is in good condition, and continue sealing throughout the pavement life.

Transverse, longitudinal, reflective, block, and edge cracks should all be sealed. When the pavement is properly sealed, potholes and parallel crack development are very rare

- Seal the interface between the pavement and all castings, e.g., manholes, catch basins, water valves, etc., and

- Seal the joint between the pavement and the concrete (curb) gutter pan.

Keeping water out of your pavements by keeping cracks and joints filled or sealed during the summer will go a long way in avoiding potholes the next spring.

A video defining the problem is available at: http://youtu.be/j9lAgMT-teM

Technical information on crack and joint treatments may be found at: https://www.pavementpreservation.org/

Galehouse is executive director, National Center for Pavement Preservation at Michigan State University.

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In May, the NH DOT Districts and Divisions crowded an otherwise deserted fairground in Cheshire to participate in a long standing tradition of battling for the coveted title of Safety Plow Rally Champion! While several teams went head to head, one team came out on top. Brad Bartlett and Jim Callahan from District 6 were the winners of the day in the 38th Annual event!

In September, the 10th Annual Ken Ward Snow Plow Rally was held at the New Boston Fairgrounds. Jason Kimball and Dean Stearns from Merrimack won over 10 other municipalities. They then went head to head with Bartlett and Callahan, scoring identical points. The tie-breaking time comparison put the District 6 team on top with a time 30 seconds faster than Merrimack’s! Congratulations to District 6, the new NH State Plow Rally Champion!

Butch Says:
If you can’t hack it, get your jacket.

Tips To Protect Workers In Cold Environments

Prolonged exposure to freezing or cold temperatures may cause serious health problems such as trench foot, frostbite and hypothermia. In extreme cases, including cold water immersion, exposure can lead to death. Danger signs include uncontrolled shivering, slurred speech, clumsy movements, fatigue and confused behavior. If these signs are observed, call for emergency help.

OSHA’s Cold Stress Card provides a reference guide and recommendations to combat and prevent many illnesses and injuries. Available in English and Spanish, this laminated fold-up card is free to employers, workers and the public. Tips include:

How to Protect Workers
• Recognize the environmental and workplace conditions that may be dangerous.
• Learn the signs and symptoms of cold-induced illnesses and injuries and what to do to help workers.
• Train workers about cold-induced illnesses and injuries.
• Encourage workers to wear proper clothing for cold, wet and windy conditions, including layers that can be adjusted to changing conditions.
• Be sure workers in extreme conditions take a frequent short break in warm dry shelters to allow their bodies to warm up.
• Try to schedule work for the warmest part of the day.
• Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
• Use the buddy system - work in pairs so that one worker can recognize danger signs.
• Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) or alcohol.
• Eat warm, high-calorie foods such as hot pasta dishes.
• Remember, workers face increased risks when they take certain medications, are in poor physical condition or suffer from illnesses such as diabetes, hypertension or cardiovascular disease.

Information provided by: US Dept. of Labor, Occupational Safety & Health Administration, www.osha.gov
New Hampshire Roads Scholars

The first achievement level is Roads Scholar Level I. To achieve Level I, participants must complete 25 hours of training. Roads Scholar Level II requires 50 hours total, including 20 hours in technical training, 5 hours of supervisory training, 10 hours of tort/liability or safety, and 5 hours dedicated to environmental training while the final 10 hours electives. The third achievement level of the program is becoming a Senior Roads Scholar. Senior Roads Scholars have completed 75 hours of training including the requirements for Roads Scholar Level II. Master Roads Scholar is the fourth achieving level of the UNH T² Center Roads Scholar Training Program. To be a Master Roads Scholar, the participant must have completed 100 training hours, including the requirements for Roads Scholar Level II. Our fifth level is Master Roads Scholar II, which requires that 150 hours be earned including 20 in the safety category. Our highest level of achievement is the Advanced Master Roads Scholar. This person will have earned 200 hours of training and will have contributed to the Technology Transfer Center in some way, which is evaluated on a case by case basis. We congratulate all those who have reached new achievement levels and encourage further training in the future.

Roads Scholar I

25 training hours in the Roads Scholar Program
Steve Bagley, Sutton
Gregg Barron, Rochester
Gerald Barss, NHDOT-District 5
Damon Beaudreau, Hancock
Myron Beaulieu, Goffstown
Joshua Bessette, Milford
Robert Bethel, NHDOT-District 4
Dan Blanchette, Hopkinton
Brian Bordeau, Sanbornton
Michael Boylan, NHDOT-District 5
David Briand, Derry
Lee Brown, Tilton
John Burke, Hampton
Brian Cayer, Hopkinton
Jeffrey Chancey, Amherst
George Chase, Ashland
George Cheney, Thornton
Dalton Clark, Goffstown
Tim Collins, Thornton
Jason Darling, Enfield
David Desjardin, Rochester

Shane Dow, Northfield
Richard Dunton, Rochester
Neil Eldridge, Ossipee
Eric Elliott, Farmington
Wayne England, NHDOT-District 2
Tony Fligg, NHDOT-District 2
Robert Goddard, Village Dist. of Eidelwiess
Brian Grinavic, Meredith
Benjamin Hall, NHDOT-District 1
Joshua Hamel, Exeter
Clinton Havens, Derry
Bryan Hayes, NHDOT-District 6
Adam Hurst, Sutton
Brian Jackes, NHDOT-District 3
Pat Kelley, Jackson
Ryan Kenney, Goffstown
Steve Kenney, Weare
Justin Keyes, NHDOT-District 2
Mike Kos, Goffstown
John Lahey, Derry
Susan MacKenzie, Lyme
Christopher McGinnis, Hampton
Stuart McDanolds, Haverhill

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### Roads Scholar I

- Paul Michaud, Rochester
- Brock Mitchell, Gilmanton
- Marc Moore, Concord
- Charles Murray, Wakefield
- Stephen Poligni, Rochester
- Dana Rabito, Plaistow
- Richard Robbins, Claremont
- Kelly Robitaille, Village District of Eidelwiess
- Michael Roina, Bennington
- Ian Rollins, Bedford
- Daniel Rondeau, NHDOT-District 2
- Chris Rouleau, Conway
- Randy Rugar, NHDOT-District 2
- Joseph Sarno, Weare
- Paul Souza, NHDOT-District 2
- David Succi, NHDOT-District 6
- Alan Thoroughgood, NHDOT-District 2
- John Van Tassel, Northfield
- Tyler Vaughan, NHDOT-District 4
- Jared Wile-Marble, Rye

### Roads Scholar II

50 training hours and Roads Scholar II requirements
- Daniel Camire, Laconia
- Jeff Cantara, Alexandria
- Ron Clough, Hancock
- Brian Deschenes, Concord
- Carl Dombroski, Croydon
- Will Dourdounas, Keene
- Michael Fortier, Bedford
- S. Michael Gingras, Wakefield
- Timothy Guilmette, NHDOT-District 1
- Matt Hall, Milford
- Michael Kelly, Laconia
- Charles Murray, Wakefield
- Leigh Nichols, Wakefield
- Peter Nourse, Gilford
- William Prentice, Sandwich
- Michael Tatro, NHDOT-District 2
- Stephen Tolbert, NHDOT-District 2

### Senior Roads Scholar

75 training hours and Roads Scholar II requirements
- Scott Carey, Lebanon
- David Condon, Claremont
- James Doucette, Barnstead
- S. Michael Gingras, Wakefield

### Master Roads Scholar

100 training hours and Roads Scholar II requirements
- Duane Abbott, Sunapee
- Kevin Bartlett, Concord
- J. Scott Brown, Amherst
- Jason Brown, Seabrook
- Derek Corbin, Enfield
- David Condon, Claremont
- John Emery, Jr., Wentworth
- Joshua Hamel, Exeter
- Jean Mathieu, Bedford
- James M. Plourde, Antrim
- Gary Russell, Bennington
- Kenneth Salisbury, Amherst
- Richard Schofield, Derry
- Sumner Scott, Farmington
- Charles Seamans, Hampton
- Andrew Wolanek, Moultonborough
- Jeff Wright, Hancock

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Our nation’s rural transportation system is in need of repairs and modernization to support economic growth across the country. A new report released in May by TRIP, a national transportation research group, evaluated the safety and condition of the nation’s rural roads and bridges, and found a transportation system in critical need of improvement.

New Hampshire ranked among the top 20 states with the highest percentage of rural roads with pavement in poor condition. New Hampshire also ranked among the top 20 states for the number of rural bridges designated as “structurally deficient.”

The report also evaluated crash rates and fatalities, as well as connectivity and capacity. “The best way to stabilize and revitalize New Hampshire’s economy is to improve our transportation infrastructure,” said New Hampshire Senator Jeff Woodburn. “As a Senator representing the North Country, 20 percent of the state’s roads are in my district, and I know the important role well maintained roads play for a strong economy and a successful tourism industry.”

Rural roads and the economy

The report succinctly articulates how rural Americans are more reliant on the quality of their transportation system than their urban counterparts, and how the economic vitality of rural communities is directly affected by the quality of its roads and bridges.

America’s rural transportation system provides the first and last link in the supply chain from farm to market, while also supporting other important industries like tourism and energy transport.

“The rural transportation network plays a key role in the success and quality of life for farmers, ranchers, and numerous agricultural and food-related industries” said Bob Stallman, president of the American Farm Bureau Federation. “But deteriorated and deficient rural roads and bridges are hindering our nation’s agricultural goods from reaching markets at home and abroad, and slowing the pace of economic growth in rural America. Securing the appropriate resources at the local, state, and federal levels will allow for the improvements needed to provide a rural transportation system that will keep goods moving, improve quality of life, and quicken the pace of economic growth.”

Recommendations

The TRIP report recommends the following actions:

- Modernizing and enhancing key routes to accommodate personal and commercial travel
- Implementing critical roadway safety improvements
- Improving public transit access to rural areas
- And, most importantly, adequately funding the preservation and maintenance of existing rural transportation assets.

Inaction is not an option

The safety and quality of life in America’s smaller rural communities—and the health of the national economy—ride on our rural transportation system.

“Rural roads provide crucial links from farm to market, move manufactured and energy products, and provide access to countless tourism and recreational destinations,” said Will Wilkins, executive director of TRIP. “But, with long-term federal transportation legislation stuck in political gridlock in Washington, economic growth in America’s rural communities could be threatened,” Wilkins continue. “Funding the modernization of our rural transportation system will not only create jobs today, but also help to ensure ongoing economic development and quality of life in rural America.”

Read the full report at [www.tripnet.org](http://www.tripnet.org)
Roads Scholar  Continued from page 6

Master Roads Scholar II

150 training hours and Roads Scholar II requirements with Safety Champion Award
David Almon, NHDOT-District 6
Douglas Almon, NHDOT-District 6
Brian Barden, Dublin
Gavin Bell, Laconia
William Buxton, Derry
James Culpon, Laconia
Harold Denison, Laconia
Robert W. Donnelly, Jr., Enfield
Lee Dunham, Swanzey
Gordon Ellis, Epsom
Nathan Hadaway, Henniker
Mike Hillhouse, Goffstown
George Leel, Technology Transfer Center
Eric Poitras, Dover
Steve Smith, Laconia
Edward Stewart, Atkinson
John Starkey, Seabrook

Advanced Master Roads Scholar II

George Leel, Technology Transfer Center

The 2016 Snow Conference in Hartford will bring together more than 1,500 snowfighters from every corner of the winter maintenance community. Public, private, rural, metropolitan, domestic, international – they’re all sure to be there at the Show for Snow! The 2016 Conference features an exhibit floor packed with the newest equipment and products, quality education programs and technical tours, and opportunities to exchange ideas with manufacturers, distributors, consultants and other public works professionals. Its four days of winter training and networking you can’t afford to miss out on!

For attendees the 2016 Snow Conference has it all – from expert-led snow and ice education sessions to an exhibit floor full of excited vendors who can’t wait to show you the latest winter maintenance solutions your community’s been looking for. Make plans today to join your peers in Hartford for the Show for Snow in 2016.
Traffic signs are installed on our highways for many reasons. They may inform us of the need to stop, the speed limit, street names or which direction to go. Warning signs alert us to unexpected hazards on our roads. Signs help us obey the laws, find our destination, and keep us from running off the road. They help us to be safe whether we are a motorist, bicyclist or pedestrian.

Many agencies receive requests for “Slow Children”, “Children at Play”, or “Slow Children at Play” signs. At first glance it seems logical to install these signs. After all, children play in or near the road and shouldn’t there be some warning given to drivers? But do they really help? Are these signs ok to use?

The first place to look for advice is the Manual on Uniform Traffic Control Devices (MUTCD). This is a federal document that provides guidance on how to use traffic signs and which signs are appropriate. Kentucky law requires the use of this manual for traffic control.

Part 2 of the MUTCD discusses the function and purpose of acceptable signs on all types of roads. Communities are to only use standard signs that are found in the manual. “Children at Play” signs are not listed therefore are nonstandard and inappropriate to install.

There are several reasons why “Children at Play” signs are nonstandard and not to be used on roadways. Here are a few of them:

- The Traffic Control Devices Handbook from the Institute of Transportation Engineers (ITE) states, “Caution-Children at Play or Slow Children signs should not be used since they may encourage children to play in the street and may encourage parents to be less vigilant.” “Children at Play” signs give parents a false sense of security in letting their children play in the streets.
- Motorists should expect children to be at play in all residential areas, and the lack of signing on some streets may indicate otherwise.
- These signs have no legal basis for determining what a motorist should do. They are unenforceable and act as another roadside obstacle to pedestrians and errant motorists.
- Use of these nonstandard signs may imply that the involved jurisdiction approves of streets as playgrounds, which may result in the jurisdiction being vulnerable to tort liability.
- These signs do not provide guidance to motorists as to a safe speed.

“Children at Play” signs may be designed to look like warning signs, diamond shaped and yellow with a black legend. However, in many instances, this sign has a nonstandard shape and color. Warning signs provide information on the specific location of the hazard (pedestrian crossing, curve, etc.). “Children at Play” signs do not give a specific location. They merely tell the driver that kids may be in the road somewhere.

Studies have shown that “Children at Play” signs do not reduce traffic speeds or make drivers more observant.

By Todd Morrison, P.E. Technology Transfer Instructor, ©2015 University of Kentucky, Technology Transfer Program (T2)
Children  Continued from page 9

There are some alternatives that can work in many instances. The playground sign is an appropriate sign alongside parks or playgrounds. Also the pedestrian crossing sign should be used to warn motorists in those locations where children and others frequently cross the road.

Nearly 30 percent of tort cases filed against roadway agencies pertain to signs. When installing signs that do not follow the guidelines in the MUTCD, agencies are increasing their liability should a child be hit on these roadways.

It can be difficult to say no to residents when this sign is requested. Yet, by following the MUTCD and not installing “Children at Play” you may be improving safety for everyone in your community.

Sources: Manual on Uniform Traffic Control Devices, and Transportation Synthesis Report from Wisconsin Department of Transportation.

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33 Academic Way
Durham, NH 03824

Words can be circled either upward, downward, backward, or diagonally.
Good luck!
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