



# moving FORWARD

SPRING 2008

A quarterly review of news and information about Pennsylvania local roads.

## LTAP Training Helps Workers Respond to Trench Collapse in Lancaster



When a hole collapsed and trapped a Lancaster City Water Transmission and Distribution employee in December last year, his fellow workers knew just what to do, thanks to LTAP training that they had received just four months prior to the incident.

Tom Slocum, the city's labor supervisor on duty at the time of the

incident, says he and the other workers could see that, while the trapped man was in pain, he was not in imminent danger. "The one thing we learned at the training," he says, "was, if it is not a life-threatening situation, to leave the man in the hole and to call 911."

Within an hour, the worker, whose leg was trapped in the mudslide that occurred when water seeped into the three-foot-deep hole, was rescued by a Manheim Township fire and rescue unit and taken to the hospital for treatment of injuries to his leg and foot.

"The city workers responded 100 percent the way they should have," says Rick Kane, fire chief and emergency management director for Manheim Township. "The number one thing to do in this situation is to not go into the hole and to activate

the 911 emergency response system. That's exactly what they did."

Donna Jessup, operations supervisor for the Streets, Motor Vehicles, and Traffic Bureau for the City of Lancaster's Department of Public Works, says, "I can't ever remember in my 28 years with the city that a trench collapse has happened to city employees."

Yet the employees knew what to do in this situation because in August 2007 they had received safety training from LTAP that touched on trench safety and what steps to take if an emergency occurs.

"The training obviously paid off," says Jessup, who regularly schedules training for Lancaster's public works employees. "The workers did what they were taught. They called 911, secured the site, and didn't immediately jump into the trench to dig the trapped man out."

### Training Pays Off

The trench safety discussion was part of LTAP's training course on Equipment and Worker Safety, says Sam Gregory, an LTAP instructor. "In all our courses, we stress that if an emergency occurs where someone gets hurt, then the employees should stabilize the situation, providing only limited first aid while being careful not to put themselves in danger, and notify the proper authorities to get the people with the necessary first aid training to the scene to help."

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# Pavement Preservation: 'Maintenance First' to Ensure Safer, Smoother Roads

"The right treatment on the right pavement at the right time." These words have become something of a mantra in the past few years for anyone with road and street maintenance responsibilities. Yet, making sure all your roadways are maintained properly in a timely manner can be a challenge at times. "Pavement Preservation" is the term that has been adopted to capture the ideas and practices of applying the right materials on the right streets at the right time so that your residents are guaranteed safer, smoother travel.

Pavement Preservation is a cost-effective set of practices designed to extend pavement life, improve safety, increase motorist satisfaction, and save public tax dollars. Just as your car needs regular maintenance, from scheduled tune-ups to oil changes, to keep it running smoothly, pavement requires timely maintenance, too.

Even the best surfaces are subject to wear and tear. By incorporating Pavement Preservation techniques, municipal road and street managers and their crews can determine what treatment is best for a given road at a specific time. This timely and qualified "maintenance first" approach helps to enrich travel and safeguard against costly road reconstruction. The results are durability and dependability of municipal roads and streets.

Some of the benefits of Pavement Preservation are . . .

- **Lower Costs Over Time**—For every additional dollar spent on preventative maintenance treatments, a municipality can save as much as \$10 in future road rehabilitation or construction costs.
- **Predictable Budgets, Stretching Dollars**—By scheduling pavement treatments and incorporating planned pavement maintenance on a regular basis, municipalities can predict future costs and budget accordingly. And, because liquid fuels allotments to municipalities usually don't provide adequate funding to cover major road reconstruction costs, regularly scheduled treatments will help to stretch precious dollars by making the best use of available resources.
- **Reduced Premature Pavement Failures**—When pavement damage, such as water seeping into cracks and freezing, goes untreated, premature pavement failures can result. Pavement Preservation strives to prevent this damage from occurring in the first place.
- **Better Streets**—Regular pavement monitoring and scheduled maintenance keep roadways in better overall condition than if a municipality practices random or insufficient maintenance of roads.
- **Reduced Traffic Delays, Less Cost to Drivers, Happier Taxpayers**—Well-maintained roadways result in fewer traffic delays and less vehicle upkeep costs to drivers. Extensively damaged pavement requires more indepth construction that may result in longer, inconvenient delays at work zones. In addition, pavements that are in bad condition take their toll on a vehicle's wear and tear. Well-maintained roads, on the other hand, mean that residents and other motorists are better able to reach their destinations safely and on time.

To get started in Pavement Preservation, consider attending an LTAP training course, such as the LTAP Road Surface Management and the Spring Road Maintenance classes. In addition to these courses, PennDOT's District 1-0 Municipal Services Unit staff has been promoting a "Pavement Preservation tool" that can be used anywhere in Pennsylvania. The Pavement Preservation tool is a set of Excel spreadsheets that may be accessed using a personal computer with the Microsoft applications package.

"Municipal officials in our district have used this tool with great success," says Mike Dutko, District 1-0's Municipal Services supervisor. "We're in the northwest where the most extreme weather in Pennsylvania usually occurs, and this tool provides us with a quick, efficient, and accurate means to compare multiple pavement surface treatment options."

Jim Cooper, who developed the tool worksheet and works in the field with municipal officials every day, says, "This broad-based tool can be applied to multiple applications. From chip seals to thin hot-mix asphalt to ultra-thin concrete overlays and even to gravel calculations, the tool can give borough managers, public works directors, contractors, and anyone else the comparative information they need to make the best decisions about pavement surface treatments."

To learn more about the Pavement Preservation tool, call your district Municipal Services representative and arrange for a demonstration of the tool's use in your municipality. The tool is also available on PennDOT's Web site ([www.dot.state.pa.us](http://www.dot.state.pa.us)) under the Bureau of Municipal Services tab. Before using the tool's spreadsheets, you will need to know the dimensions of your streets and will have had to conduct a basic daily traffic count on those streets.

You may also obtain Pavement Preservation information from the National Center for Pavement Preservation located in Michigan. Visit [www.pavementpreservation.org](http://www.pavementpreservation.org) or call (517) 432-8220. Staff at the center can send you the Pavement Preservation Checklist Series booklets. These pocket-sized booklets were created to help state and local highway and street maintenance and inspection staff in the use of innovative pavement preventive maintenance processes.

This simple chart shows how using Pavement Preservation techniques can restore a municipality's roads and streets to nearly new condition.◆

# Retroreflectivity: Can Everyone Read the Signs in Your Municipality?

About one-fourth of road trips are made at nighttime, when, according to recent statistics, about half of traffic fatalities occur. The causes of nighttime crashes are widespread, but research indicates that signs that cannot be easily read or understood are a significant contributor. To help address this problem, new traffic sign retroreflectivity requirements have been included in Section 2A.09 of the latest update to the Manual of Uniform Traffic Control Devices (MUTCD).

Retroreflectivity is a property of a surface that allows a large portion of the light coming from a point source to be returned directly back to a point near its origin. This property is critical to the nighttime visibility of road signs and pavement markings. A wide number of factors, including age, type, orientation, and location of signs, sign sheeting, drivers' age and needs, and headlamp performance, influence the actual retroreflective performance and condition of the signs in your municipality. Therefore, purchasing and maintaining the correct signs and pavement markings are critical to improving nighttime safety on your roadways.

"Your signs and pavement markings must be part of your municipality's maintenance program," says Mark Hood of Pennoni Associates. He also recommends being prudent in the length of time that you plan for a typical sign to last. An agency must take into account the type of retroreflective sheeting chosen, sun exposure, sign orientation, and past performance of signs under similar conditions when making these decisions.

To comply with the new MUTCD requirements, municipalities have until January 2012 to implement and continue to use a management or assessment method to maintain traffic sign retroreflectivity at or above specified minimum levels. Municipalities will have until January 2015 to replace any regulatory, warning, or post-mounted (except street name) guide signs, and until January 2018 to replace street name signs and overhead guide signs that fail to satisfy the minimum retroreflectivity levels.

Provided that a management or assessment method is in place by January 2012, your municipality would comply with the requirements of the new MUTCD provisions even if some individual signs do not meet the minimum retroreflectivity levels at a particular point in time. However, with a seven- to ten-year compliance period for replacing signs that have insufficient retroreflectivity, municipalities should be able to implement improved sign inspection and management procedures.

If a management method is chosen and implemented, municipalities can begin to replace signs in a time frame that is consistent with their typical sign replacement cycle and their budget. Any increased costs from complying with the new retroreflectivity sign requirements should be offset by the long-term savings expected to result from the longer life of the higher performance sheeting products and other upgraded materials.

Hood suggests combining the management and assessment methods by implementing a scheduled maintenance program to supplement the sign life management method. The inspection program should include inspecting signs during both day and night and cleaning and replacing signs as needed. "Encourage your employees, police officers, and others whose duties require that they travel on your roadways to report any damaged, deteriorated, or obscured signs at the first opportunity," he says. "Steps should be taken to ensure that weeds, trees, and shrubbery are cut back and that construction, maintenance, and utility materials and equipment do not obscure the face of any sign."

LTAP's Traffic Signs class discusses the do's and don'ts of sign maintenance programs. Participants will learn how to develop a management system that works with the unique characteristics of their municipality. For more information about this course, visit LTAP's Web site at [www.ltap.state.pa.us](http://www.ltap.state.pa.us). ♦

**NEW MUTCD SIGN** U.S. Department of Transportation  
Federal Highway Administration

**RETROREFLECTIVITY REQUIREMENTS**

Maintaining Traffic Sign Retroreflectivity

FHWA-SA-07-020

**T**raffic signs provide important information to drivers at all times, both day and night. To be effective, their visibility must be maintained. The 2003 *Manual on Uniform Traffic Control Devices* (MUTCD) addresses sign visibility in several places, including Sections 1A.03, 1A.04, 1A.05, 2A.06, 2A.08, and 2A.22. These sections address factors such as uniformity, design, placement, operation, and maintenance. Previously, the MUTCD did not specify minimum retroreflectivity levels.

The second revision of the 2003 MUTCD introduces new language establishing minimum retroreflectivity levels that must be maintained for traffic signs.

**Agencies have until January 2012, to establish and implement a sign assessment or management method to maintain minimum levels of sign retroreflectivity.**

The compliance date for regulatory, warning, and ground-mounted guide signs is January 2015. For overhead guide signs and street name signs, the compliance date is January 2018. The new MUTCD language is shown on page 2 and 3 of this document.

The new standard in Section 2A.09 requires that agencies maintain traffic signs to a minimum level of retroreflectivity outlined in Table 2A-3 of the MUTCD. The Federal Highway Administration (FHWA) believes that this proposed change will promote safety while providing sufficient flexibility for agencies to choose a maintenance method that best matches their specific conditions.

Including Table 2A-3 in the MUTCD does not imply that an agency must measure the retroreflectivity of every sign. Rather, the new MUTCD language describes five methods that agencies can use to maintain traffic sign retroreflectivity at or above the minimum levels. Agencies can choose from these methods or combine them. Agencies are allowed to develop other appropriate methods based on engineering studies. However, agencies should adopt a consistent method that produces results that correspond to the values in Table 2A-3.

The new MUTCD language recognizes that there may be some individual signs that do not meet the minimum retroreflectivity levels at a particular point in time. As long as the agency with jurisdiction is maintaining signs in accordance with Section 2A.09 of the MUTCD, the agency will be considered to be in compliance. This document describes methods that can be used to maintain sign retroreflectivity at or above the MUTCD's minimum maintained retroreflectivity levels.

**RETROREFLECTIVITY MAINTENANCE**

The MUTCD describes two basic types of methods that agencies can use to maintain sign retroreflectivity at or above the MUTCD minimum maintained retroreflectivity levels—assessment methods and management methods. The FHWA has identified and listed assessment and management methods for maintaining sign retroreflectivity in accordance with Section 2A.09. These methods are described on page four. A full report on these methods can be found at [www.fhwa.dot.gov/retro](http://www.fhwa.dot.gov/retro).

## Publication #535 Helps to Manage Local PennDOT Projects

If your municipality is interested in applying for project dollars from PennDOT or if you are looking for a single source of information on how to effectively manage local project funds, then PennDOT Publication #535 may be just the resource that you're looking for.

*Overview of PennDOT Local Project Processes: A Guide to Getting Started on a Local Project with PennDOT* was developed to give municipalities and other local project sponsors a general understanding of the procedures for developing a state-funded transportation project. Local projects that are funded through the Local Bridge Program, the Congestion Mitigation and Air Quality Improvement Program, the Transportation Enhancements Program, the Hometown Streets Program, the Safe Routes to School Program, and the Scenic Byways Program are described in this publication.

Developed by experienced program managers, the guide provides funding application and management procedures for each program as well as step-by-step explanations to get you started on your project. PennDOT Publication #535 is available from your PennDOT Municipal Services representative and may be downloaded from the PennDOT Web site. ◆

### Overview of PennDOT Local Project Processes:

A Guide to Getting Started on a Local Project with PennDOT



October 2007

PUBLICATION 535

PUB 535 (10-07)

## Driving Surface Aggregates: Where Technology and Dirt Roads Meet

When Gov. Gifford Pinchot made a commitment to "get the farmer out of the mud" in the 1930s, the state responded by converting thousands of miles of dirt roads into classic high-crowned paved roadways. Over the years, many dirt roads were "macadamized" to become the "hard top" highways, roads, and streets that we drive on every day.

However, did you know that Pennsylvania contains more than 20,000 miles of dirt and gravel roads today? And these roadways are not just found in the rural parts of the state. The city of Philadelphia, for example, owns and maintains over six miles of these roads, and the commonwealth itself is responsible for more than 500 miles of dirt and gravel roadways. Still, the bulk of Pennsylvania's dirt and gravel roads—more than 17,000 miles—are owned and maintained by municipalities.

Although the "Pinchot road" design has served Pennsylvania well over the decades, the commonwealth is always seeking improvements to paved and unpaved roads that it can share with municipalities. Driving surface aggregates, or DSA, is an example of a type of improvement for unpaved roads. Developed by Penn State's Center for Dirt and Gravel Road Studies, DSA is a mixture of crushed stone that was developed specifically as a surface wearing course for dirt and gravel roads. The material is also helpful in controlling dust and roadway drainage.

"This is particularly important," says Kevin Abbey formerly of Penn State's Center for Dirt and Gravel Road Studies, "because many miles of dirt and gravel roads are near high water quality streams, which can be quickly degraded from drainage runoff during storms."

Driving surface aggregates are now approved for use by municipalities, according to Rich Stirling, manager of PennDOT's New Product Evaluation Program for Lower Volume Local Roads. "We worked closely with the experts at Penn State to develop a specification that should result in an easy-to-build, low-maintenance, cost-effective driving surface for locally owned dirt and gravel roads," he says.

So what would Gov. Pinchot have thought about this tweaking of his time-tested road design? Undoubtedly, he would have approved. A progressive conservative politician who served as the first director of what is today the U.S. Forestry Service, he would have likely endorsed a product that saves time and money and helps to protect our environment at the same time.

Information on DSA is taught during LTAP's Unpaved and Gravel Roads—Common Maintenance Problems course and during the Spring Road Maintenance training series, sponsored by LTAP and PSATS, as part of an exploration into issues of environmentally sensitive roads. Information on these classes may be obtained by visiting the LTAP Web site at [www.ltap.state.pa.us](http://www.ltap.state.pa.us) or by calling 1-800-FOR-LTAP (367-5827). ◆

## Trench Collapse in Lancaster

*continued from page 1*

In accordance with OSHA regulations, municipal officials and employees also are taught to shore up any hole that is at least five feet deep and to place a ladder in the hole to provide an escape route, says Gregory. Because the hole in which the Lancaster workers were repairing the water main break was only three feet deep, the city workers did not have to reinforce it.

Employees were digging in the three-foot-deep hole to repair a broken water main in Manheim Township when the south wall of the trench collapsed without warning. One worker was able to jump out of the trench, but the other worker became mired in the mud.

When the 911 call was placed, Lancaster County dispatched its specially trained trench rescue team to the emergency, says Manheim Township's Fire Chief Rick Kane. This specialized crew brings along the proper equipment to shore up a trench and a vacuum to suck out any mud or dirt from the hole. However, once the emergency responders arrived and saw that the man was trapped in a shallow hole rather than a trench, the services of the specialized team were not needed, and the fire company rescuers set to work.

To extract the worker, whose leg was trapped in mud, rescue workers from Manheim Township Fire and Rescue laid a ladder across the trench, lowered a short ladder into the hole, and entered the hole to immobilize the worker and place him on a long board. The man was then hoisted up out of the hole.

Kane was quite impressed with how the city's water bureau workers did the right thing by not sending anyone into the hole and calling 911 right away.

"Their response is not something we see too often," he says. "Usually people want to jump in the hole and try to save their buddy. When we asked them why they responded the way they did, they seemed surprised and said it was what they were trained to do."

"I found out later that the training came from LTAP," he continues. "I was really impressed. These workers implemented their training and absolutely did what they were taught to do in that situation."

## Make Training a Priority

Municipalities should make regular training of their public works employees a priority, says Donna Jessup, operations supervisor for the Streets, Motor Vehicles, and Traffic Bureau for the City of Lancaster's Department of Public Works.

"You just never know when you're going to need that training," she says. She credits the LTAP safety training that the city's public works employees received last year with the workers' proper response to a recent trench collapse.

The cave-in, which took place in December 2007 while Water Transmission and Distribution Bureau workers were digging in a three-foot-deep hole to repair a water main leak, occurred just four months after the employees had received mandatory training provided by LTAP that touched on trench safety. (See main article for details about the incident.) The workers responded correctly by staying out of the hole and calling 911 to notify emergency responders who were able to rescue the man whose leg was trapped in the muddy cave-in.

Jessup, who is a member of the LTAP Advisory Committee, can't say enough good things about LTAP's training. As chairman of Lancaster's Public Works Safety Committee, she is responsible for scheduling two to three mandatory training sessions for employees each year.

"I usually use LTAP to provide the training," she says, "which covers anything from lawnmower safety to equipment and worker safety to work zone traffic control."

In fact, she credits LTAP with helping to fast-track her career. After working for years as a clerk for the city of Lancaster, she took the LTAP Roads Scholar courses and over the next few years made the transition to foreman to street supervisor to operations supervisor for the city's three bureaus within the Department of Public Works.

"A lot of what I know I learned from LTAP," she says. "It is a big part of who I am and what our department is about."

As an advocate of ongoing employee training, she offers the following advice to municipalities:

- **Make time for training.** "A lot of times what I hear from other municipal officials is that we don't have the time," she says. "Safety should be your number one concern, so you really must find the time for training." "You just never know when you'll need to employ what you learned," she says. "What happened to us with the trench collapse could have happened to anyone. 'We don't have the time' is a poor excuse. You need to find the time. The grass can keep growing, and the mowing can wait."
- **Train all your employees.** Jessup says that because some municipalities only send their supervisors to training, critical information doesn't end up reaching the right people. "The workers who are out in the battlefield, out in the trenches, should be trained, too," she says. "They are the ones who will benefit the most from what they learned."
- **Remember that LTAP will bring training to you.** When municipalities complain that employee training is not convenient or close enough, Jessup replies that that is no excuse. "LTAP will come to you," she says. "You only need 10 to 12 people to hold a class. Invite surrounding municipalities, and you will be able to quickly make up that number."
- **Stay up-to-date on training.** "Don't think that just because you took the course once that you are covered," says Jessup. "Times change, employees change, the workforce changes, the laws change, and procedures change." For those reasons, she says, training should be ongoing.
- **Make training mandatory.** "I am fortunate that Charlotte Katzenmoyer, our public works director, is supportive of training and allows me to use the word 'mandatory' to make sure that all our employees go to the training I schedule," says Jessup. "Nothing is more important. I don't care what else you have to do; you better be there. Training is that important."

For more information about LTAP training or setting up a course in your area, contact LTAP at 400 North Street, 6th floor, Harrisburg, PA 17120; 1-800-FOR-LTAP (367-5827); [www.ltap.state.pa.us](http://www.ltap.state.pa.us); [LTAP@state.pa.us](mailto:LTAP@state.pa.us). ♦



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