



moving FORWARD

SUMMER 2015

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

STIC Hosts Demonstration Day on High-Friction Surface Treatment

Municipal officials and road crew members joined representatives of PennDOT, the Federal Highway Administration (FHWA), the State Transportation Innovation Council (STIC), and North Cornwall Township, Lebanon County, in May for a regional demonstration day showing the application of an innovative, safety-enhancing pavement surface treatment on a road in North Cornwall Township.



Municipal, state, and federal officials attend a demonstration of HFST application in Lebanon County.

High friction surface treatment (HFST) uses high-quality, wear-resistant aggregates or stones to provide increased friction and grip on pavements. This helps to keep a vehicle in its lane on slippery pavement around curves and allows drivers to stop. The materials used to bond the stone to the pavement are designed to set quickly so there is minimal impact to the traveling public.

“PennDOT as a whole is incorporating this technique into our toolbox to address locations known for crashes due to wet pavement or reduced pavement friction,” says PennDOT Deputy Secretary Scott Christie. “We’re eager to work with our local government partners to assist them in adapting this innovative technique to enhance roadway safety in their communities.”

At the demonstration day, North Cornwall Township and industry representatives

demonstrated the application of HFST on an S-curve near Mill Road on Route 241 in Lebanon County. According to a safety study using PennDOT and North Cornwall Township data, this location’s sharp horizontal curves and narrow shoulders have contributed to approximately 11 crashes per year since 2008.

“I had the opportunity to attend classes on the high friction surface treatment process, and realized this application could be a solution to reduce crashes, increase motorist safety, and reduce the burden on the township’s police department and safety response units,” says North Cornwall Township Public Works Director Thomas J. Long. “I highly recommend any municipality experiencing similar dangerous roadway conditions to consider high friction surface treatment as a solution to reduce accidents on their state and local roads.”

During the last five years, Pennsylvania has averaged approximately 200 fatalities and 450 major injuries per year due to crashes on wet pavement. PennDOT tracks crash data and has identified high-priority crash locations where the greatest return on investment can be realized in reducing wet-pavement, curve-related crashes.

Through 2015, PennDOT has installed HFST to 63 locations around the state in an effort to prevent crashes and save lives. Moving forward, PennDOT continues to evaluate HFST and has identified 121 additional locations that would benefit from this innovative technique.

These treatments are durable, long-lasting pavement surfaces that improve pavement friction in both wet and dry conditions. When applied

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to locations that have a higher propensity for wet-pavement curve-related crashes, have steep downgrades, or approach an intersection, the treatment increases friction and assists in preventing vehicles from skidding, providing safer roadways to the traveling public.

The State Transportation Innovation Council, a cross-section of various stakeholders, state and federal agencies, local governments, and industry partners that will work together to forge an environment of innovation, has promoted the use of HFST in coordination with the Federal Highway Administration's Every Day Counts (EDC) initiative. The initiative is designed to improve the safety of motorists at high-priority crash locations throughout the state.

“When it comes to the business of delivering projects and improving safety, we want to make every day count,” says Deputy Federal Highway Administrator Gregory Nadeau. “Our goals are simple but ambitious – to find ways to save time, save money, and save lives. PennDOT should be applauded because its use of HFST accomplishes all three.”

To learn more about the innovations being incorporated into PennDOT operations and by local governments across the state, visit www.ModernDOT.pa.gov and select “State Transportation Innovation Council.”

Snapshots from the HFST Demonstration Day



PennDOT Deputy Secretary for Highway Administration Scott Christie (left) and Tony Mento of FHWA address attendees at the technology showcase hosted by North Cornwall Township.



One lane of traffic is shut down on the S-curve where the HFST will be applied.



Richard J. Baker (right) of DBi Services, the contractor on the project, shows a sample of the gravel to attendees.



A truck applies the adhesive to the clean and prepared road surface, and a worker uses a shovel to spread the gravel and fill in any spots missed in the gravel application.

Build a Better Mousetrap

Venango County Township Wins Contest with Innovative Design



Cranberry Township's portable spreader box pump.

Cranberry Township in Venango County received first-place honors in PennDOT LTAP's 2015 Build a Better Mousetrap Contest, and Rome Township in Bradford County and Manchester Borough in York County placed as runners-up.

LTAP awarded the top honor to Cranberry Township for a portable spreader box pump that the roadmaster and mechanic built for about \$100. The township has nine plow trucks and spreader boxes that require repair and maintenance both before and during the winter season. Any system

maintenance would put the trucks — and the spreader boxes — out of service.

The township needed some kind of portable hydraulic system to operate the spreader boxes independently of the trucks. Over a few days, roadmaster Ted Williams and mechanic Paul Vanslyke constructed a device from scrap parts lying around the shop.

The holding tank and hydraulic assembly were salvaged from a road paver; the electric motor came from an old air compressor; the relay and switch assembly were taken from an old oil pump station; and the wheels came from an old cart. The metal cage cover that allows access to the motor and hydraulic filter was also taken from the paver. The men added a long-corded handheld switch to allow one person to run the machine and examine the spreader boxes simultaneously.

"Besides the fact that it only cost the township \$100, the pump solves every issue we needed to address and operates flawlessly," according to the township. "This machine permits our trucks to be free for other important jobs in the fall and reduces the amount of labor needed to service each spreader box by more than half the time. In the winter, trucks can spend more time treating the ice and snow."

As the first-place winner, Cranberry Township's invention will be entered in a regional competition with winners from Delaware, Maryland, Virginia, and West Virginia, as well as in the national LTAP/TTAP competition.

Runners-up place with innovative designs

Rome Township in Bradford County placed as a runner-up in the Build a Better Mousetrap Contest for a "trip" plow wing that the road crew designed and built for about \$60 and with 40 man-hours.

The township wanted to add a wing to one of its plows to be able to push snow back from roadside ditches to allow water to drain efficiently. However, the cost was prohibitive, so the road crew devised a homemade solution.



Cranberry Township received its Build a Better Mousetrap award during the 93rd Annual Educational Conference of the Pennsylvania State Association of Township Supervisors (PSATS) held in Hershey in April.



Rome Township's "trip" plow wing.

By cutting a 4-foot piece from an old V-plow, the men created a wing extension for the township's 11-foot snow plow. To minimize the risk of damaging the plow, they designed the wing to trip when it hits something hard. Using the truck mounting brackets from the V-plow and another old plow to create a hinge, they welded it at a slight angle so that when the wing trips, it lifts and swings back. Two trip springs from an unused plow add tension,

which allows the wing to trip without affecting the 11-foot plow.

Manchester Borough in York County also placed as a runner-up with its design of an MS4 storm drain grate puller. The borough wanted to reduce the time and effort required to pull storm drain

grates using a backhoe. For about \$150, the borough built a tool that makes it easier and quicker to lift grates. The crane can be attached to any truck in the borough's fleet and can also be used for other tasks, such as lifting items into a truck or sign post pulling. 🛠️



Manchester Borough's MS4 storm drain grate puller.

LTAP sponsors the Build a Better Mousetrap competition each year to recognize municipalities that build innovative gadgets or develop improved ways of doing a transportation-related job. The winning entry is submitted in the national competition. Look for more details later this year in how you can enter the 2016 contest.

Does Your Municipality Have a Plan for Managing Traffic During an Emergency?

by James Wheeler, PSATS

The news reports are continuous, and the statistics are sobering: Nationwide, first responders are struck and killed at traffic incidents to the tune of five firefighters each year, one police officer each month, one tow truck operator each week, and numerous road crews and public works personnel each day.

To prevent becoming part of this statistic, your municipality should have a traffic incident management (TIM) program for safely managing traffic in an incident zone and quickly restoring normal conditions. An effective TIM program improves safety for motorists and emergency workers, reduces the incident's duration and the potential for secondary accidents caused by "rubbernecks," and improves the response time for emergency services by permitting unobstructed travel to the crash scene.

Municipal road crew and public works personnel play an important role in a TIM program

The municipal road crew and public works personnel play an important role in a TIM program since they may be called to do the following when a traffic accident occurs:

- Manage traffic;
- Protect the scene;
- Help motorists with their disabled vehicles;
- Provide materials and special equipment;
- Establish alternate routes; and
- Repair damaged infrastructure.

To ensure they understand their responsibilities, municipal employees should receive proper training in traffic incident management. In addition, road maintenance vehicles should be equipped with materials and devices for prompt deployment at a traffic incident.

Decades of research by transportation agencies and practitioners of the science and application of traffic control have established an accepted and expected standard that local governments and emergency responders should meet. Many of these standards are outlined in Chapter 6 of the MUTCD, which details the structure for managing response activities. It also classifies three levels of traffic incidents:

- 1) Major – Requires closing all or part of a road for more than two hours.
- 2) Intermediate – Affects travel for 30 minutes to two hours.
- 3) Minor – Lasts no more than 30 minutes.

Typically, when a major or intermediate accident occurs, road crews will need to implement temporary traffic-control measures in the TIM area, which extends from the first warning device, such as a sign, light, or cone, to the last or to the point where vehicles are clear of the incident.

Temporary traffic controls have several different functions, including moving motorists safely and expeditiously around the traffic incident and reducing the likelihood of secondary traffic crashes. When setting up temporary traffic control, municipalities should follow PennDOT's Publication 213, which takes precedence over the MUTCD.

Proper flagger training is also critical in ensuring that a municipality can safely and effectively implement its TIM program. In fact, the state mandates training for all individuals who perform flagging duties on public roads. 🚧

Helpful Resources & Training

Publication 213, *Temporary Traffic Control Devices*, published by PennDOT, provides standards, notes, and drawings for setting up temporary traffic control whenever any construction, maintenance, emergency, permit work, utility work, or any other type of work occurs on roadways. <ftp://ftp.dot.state.pa.us/public/PubsForms/Publications/PUB%20213.pdf>

Manual on Uniform Traffic Control Devices, published by the Federal Highway Administration (FHWA), defines the standards that road crews must follow to install and maintain traffic-control devices on all public streets, highways, bikeways, and private roads open to public travel. mutcd.fhwa.dot.gov

Traffic Incident Management Handbook, published by FHWA, outlines the latest advances in TIM tools, programs, and practices from across the United States. www.fhwa.dot.gov (go to "Programs," choose "Operations," click on "Programs" again, and select "Traffic Incident Management" under "Non-Recurring Congestion")

LTAP Work Zone (Temporary) Traffic Control Training identifies the work zone setup requirements, traffic control devices, and flagging procedures through a review of Pub 213 and the MUTCD. www.ltap.state.pa.us

PSATS Instructor-Led Flagger Training meets the requirements in Publication 408 and covers such topics as flagging procedures, work zone set-up requirements, and traffic control devices. Attendees who successfully pass an exam will receive a flagger training wallet card, which is valid for three years. www.psats.org (choose "Training" and click "PSATS Workshops and Webinars" and "Classroom Workshops")

National Traffic Incident Management Emergency Responder Training, developed by the FHWA, is a free course that focuses on TIM fundamentals and terminology, notification, scene assessment and safety, command responsibilities, and traffic management. To schedule this training, contact PSATS at (717) 763-0930 or www.psats.org.

Geotextile Paving Fabrics Used During Resurfacing Help to Stabilize Failing Pavements

by Robert M. Peda, P.E., Navarro & Wright Consulting Engineers, Inc.

Pennsylvania has a network of more than 118,000 miles of public roads, streets, and toll roads. Of this vast road system, township governments are responsible for maintaining as efficiently and effectively as possible more than 51,000 miles. This extensive mileage combined with Pennsylvania's harsh climate requires both state and local governments to stretch their roadway budgets by using preservation philosophies and innovative products. Geotextiles have been used for innovative transportation applications for many decades, but more recently specialized paving fabrics have been called upon to help stabilize failing pavements when resurfacing.

Some of the benefits of using paving fabrics include providing a moisture barrier for base and subgrade reinforcement protection, creating a stress-relieving membrane between the existing pavement and new asphalt overlay, retarding the propagation of existing cracks through reflective cracking in the new overlay, and extending the pavement life. When pavements become distressed, surface water can infiltrate into the base pavement and subgrade soils, resulting in a weakened subgrade. This loss of support from the bottom and upward will result in pavement failure.

The goal is to take preventative measures to resurface the roadway before the failure begins. If that can't happen and the pavement needs rehabilitation after the damage has occurred, the placement of a paving fabric product between pavement layers will reduce the potential for damage caused by surface water infiltration and reflective cracking. Paving fabrics are saturated with asphalt cement when placed between pavement layers. Studies have shown that a heavy-duty paving fabric placed as a waterproofing and stress-relieving membrane within the pavement structure will delay reflective cracking.

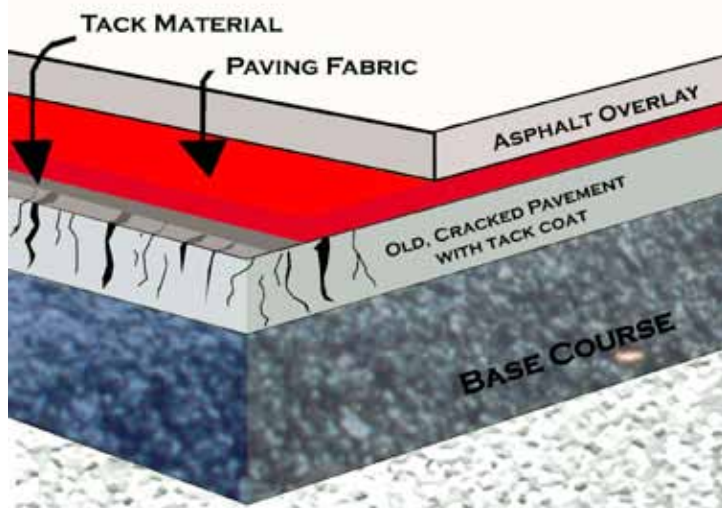


Photo courtesy of Asphalt Interlayer Association.

Federal and State Specifications

The American Association of State Highway and Transportation Officials (AASHTO) standardized geotextiles for transportation applications in "Standard Specifications for Geotextiles." AASHTO M288-06, the current standard, addresses geotextile applications for subsurface drainage, stabilization, separation, permanent erosion control, sediment control, and paving fabrics and sets forth a set of physical, mechanical, and endurance properties that must be met, or exceeded, by the manufacturer of the geotextiles. This standard specification is intended to more accurately identify the specific geotextile for the application.

Geotextiles have been used for innovative transportation applications for many decades, but more recently specialized paving fabrics have been called upon to help stabilize failing pavements when resurfacing.

Section 467, Heavy Duty Membranes, of PennDOT Publication 408 Specifications, *Highway Construction Specifications*, contains the applicable construction specification for paving fabrics. PennDOT has a standard special provision that covers the placement of the full-width paving fabric. PennDOT approves acceptable suppliers and paving fabric products under the Miscellaneous Section of Bulletin 15 for "Geotextile Paving Fabric (Bituminous)." The products are approved in accordance with the AASHTO M288 standard specification.

By following the Publication 408 specifications and using an approved product listed in Bulletin 15, the municipal government is eligible to use its liquid fuels fund allocation to purchase paving fabrics as a part of a resurfacing program.

The PennDOT specifications require the membrane to be placed in accordance with the manufacturer's recommendations, including temperature and equipment requirements. In addition, the contractor and/or manufacturer must provide a copy of Form CS-4171 with each shipment of product to the project. By completion of this form, the contractor certifies that the product meets specification requirements of Publication 408, Section 467, and AASHTO, M288-06.

Preparation and Placement

Preparation of the distressed pavement surface includes removing all dirt and debris from joints and cracks that will be under the paving

Geotextile Paving Fabrics *continued from page 5*

fabric. Potholes must be repaired, and all joints or cracks greater than one-quarter inch wide must be filled flush with the surface with PG 64-22 or PG 58-28. Before placing the paving fabric, be sure the pavement is sound and free of debris and loose materials and then follow the manufacturer's recommendations. Paving fabrics should not be placed on milled surfaces.

The sealant material must be the same paving grade asphalt as specified in the Superpave overlay. The asphalt distributor must be capable of spraying the asphalt sealant at the prescribed uniform application rate without streaking, skipping, or dripping. The equipment, whether mechanical or manual, used to lay down the fabric must ensure the paving fabric is smooth; a stiff bristle broom or squeegees is used to smooth the paving fabric.



The paving fabric distributor truck sprays PG 64-22 sealant followed by placement of the paving fabric by the spreader/broom tractor unit. Photo courtesy of ISMF LLC.

The paving fabric is placed over an acceptable prepared surface. The specified rate of asphalt sealant must be sufficient to satisfy the asphalt retention properties of the paving fabric. With the exception of emergency and construction vehicles, traffic should be kept off the paving fabric.



This paving fabric is placed over the Superpave leveling course, which was done the previous day to allow the roadway to cool prior to applying the sealant and paving fabric. Photo courtesy of ISMF LLC.

Finally, placement of the Superpave wearing course should closely follow the laying down of the paving fabric. If any asphalt bleeds through the paving fabric to cause construction problems before the overlay is placed, the affected areas may be blotted with sand. 🚧



9.5-mm hot-mix asphalt Superpave is placed over the paving fabric. Photo courtesy of ISMF LLC.

References

- PennDOT Publication 408, Specifications – <ftp://ftp.dot.state.pa.us/public/bureaus/design/pub408/pub%20408-2011.pdf>
- PennDOT Publication 35, Bulletin 15, Approved Construction Materials – ftp://ftp.dot.state.pa.us/public/pdf/BOCM_MTD_LAB/PUBLICATIONS/PUB_35/BULLETIN_15.pdf
- AASHTO M288-06 Specifications – [ftp://ftp.wfl.fhwa.dot.gov/geotech/Geotech%20FP-12/207,%20714%20-%20Geosynthetics/AASHTO%20M-288%20spec%20\(DAN\).pdf](ftp://ftp.wfl.fhwa.dot.gov/geotech/Geotech%20FP-12/207,%20714%20-%20Geosynthetics/AASHTO%20M-288%20spec%20(DAN).pdf)
- Asphalt Interlayer Association – www.aia-us.org/interlayer-specification-options/paving-fabric-interlayer/
- Propex Inc. – <http://geotextile.com/product/petromat.html>
- TenCate Geosynthetics Americas – www.tencate.com/amer/geosynthetics/products/pavement-solutions/tencate-mirafi-mpv/default.aspx

Upcoming 2015 Classes

To Register:
PHONE: 1-800-FOR-LTAP (367-5827)
WEBSITE: www.ltap.state.pa.us

This represents some of our scheduled courses. Look for updates on the website.

Asphalt Roads

September 15, Chester County

Bridge Maintenance & Inspection

July 15, Chester County

Drainage

August 3, Blair County

Equipment & Worker Safety

July 20, Huntingdon County

Intersections

August 5, Bedford County

Pavement Markings

December 4, Chester County

Polymer Modified Emulsion Asphalt

****New class****

July 14, Westmoreland County
August 27, Chester County
September 1, Blair County

Project Estimating Using Mathematical Principles

November 18, Chester County

Road Surface Management

September 10, Montgomery County

Roadside Safety Features

July 15, Blair County

Safe Driver

September 15, Montgomery County

Signs & Safety Features for Bridges/Culverts ****New class****

July 7, Bradford County
July 23, Luzerne County
October 1, Chester County
October 22, Cambria County

Stormwater Facility Operation & Maintenance

September 15, Chester County

Warm Mix Asphalt

July 27, Cambria County

Winter Maintenance

September 9, Montgomery County
December 9, Chester County

Work Zone (Temporary) Traffic Control

October 6, Chester County

This represents
some of LTAP's
scheduled courses.

Call 1-800-FOR-LTAP
for questions about
existing and future
courses.

Congratulations to the following Roads Scholar recipients:

- Dale Byers, Franklin Township, Adams County
- Devin Groff, Lancaster Township, Lancaster County
- Brad Holloway, North Coventry Township, Chester County
- Albert Ostrawski, Murrysville Borough, Westmoreland County
- Bill Paiano, Murrysville Borough, Westmoreland County
- Tim Pfaff, West Manheim Township, York County
- Kelly Shaw, Penn State University, Centre County
- Neal Slike, Murrysville Borough, Westmoreland County
- Frank Smeraglia, City of Sharon, Mercer County
- Jill Wawrzonek, PSATS, Cumberland County
- Brian Williams, East Bradford Township, Chester County

LTAP Introduces New Course on Signs and Safety Features for Bridges/Culverts

A new LTAP course, offered for the first time this summer, will demonstrate the importance of effective and consistent signing, marking, and delineating in advance of and at bridges and culverts. The course, LTAP Signs and Safety Features for Bridges and Culverts, will discuss the regulations governing signing, pavement markings, and other traffic control devices (TCDs) and will explain their application and placement. Students will learn about the different types of safety features, including guide rail and other barriers, and warrants for their use, placement criteria, and end treatments.

See schedule above for dates and locations for this new course.



Transportation News Briefs

Green Light-Go Funds Available This Fall

Municipalities looking for funding to improve traffic signals and help reduce congestion should consider applying for funding through Pennsylvania's "Green Light-Go" Traffic Signal Program. Watch for an announcement regarding applications this October.

Traffic signal projects on designated corridors with fewer than 10,000 vehicles per day are to be managed by the municipality, while projects on critical corridors with greater than 10,000 vehicles per day would be managed by PennDOT. Both types of projects require a 50 percent match from the municipality.

For more information, including frequently asked questions and other program guidance, please visit www.dot.state.pa.us and select the Green Light-Go icon in the left-hand navigation or go to <http://www.dot.state.pa.us/Portal%20Information/Traffic%20Signal%20Portal/FUNDGLG.html>. For additional information or questions regarding the Green Light-Go Program, email RA-PDSIGNALFUNDING@pa.gov.

Latest Policies and Products Approved by PennDOT

Temporary Signing for Oil and Chip: The policy requiring temporary signing and markings for seal coat/surface treatment (oil and chip) and skin-patching operations when existing pavement markings are covered has been revised, according to a strike-off letter released by PennDOT. The revisions are based on Publication 213, MUTCD, and tort liability costs.

Temporary "No Pavement Markings" and "Fresh Oil and Chips" signs must be installed before operations begin. Installation of temporary nonplowable raised pavement markers (chip seal markers) is optional. A new drawing showing the temporary signing and markings became effective March 1 and is part of the latest Publication 213, *Work Zone Traffic Control Guidelines*. For more information, contact Matthew Briggs, manager of PennDOT's Work Zones, Markings and Regulations Unit, at (717) 783-6268.

Products Approved: The following products have been approved, either as new or updated, for municipal use and are listed in Publication 447, *Approved Products for Lower Volume Local Roads*:

- MS-0420-0010 Small-Diameter Pipe
- MS-0450-0030 Trenchless Pipe Rehabilitation
- MS-0450-0001 Municipal Anti-Skid
- MS-0450-0004 Driving Surface Aggregate (DSA)
- MS-0460-0010/0011 Geosynthetic Reinforced Soils
- MS-0460-0020 Timber Slab Bridge

In addition, please note that two products were mistakenly removed from Publication 447 and the Pennsylvania Dirt and Gravel Roads-approved lists several years ago. EK 35 and EnviroKleen by Midwest Industrial Supply, Inc., are eligible to be purchased with liquid fuels funds. Be sure to obtain the normal bill and lading and certification forms for your file.

Approved Paving Fabrics: Research is currently under way on paving fabrics for use under bituminous (paving) overlays. Several brands and types of fabric have been approved in Bulletin 15 for use during paving projects. To make sure you are getting the correct fabric type for use on your roadways, consult your PennDOT District's Municipal Services Representative or contact Tom Welker of PennDOT at twelker@pa.gov or (717) 783-3721.

Did you find the information in this newsletter useful? Do you know others who will, too?

Please share this newsletter with others, including:

- Road supervisors
- Public Works Department
- Road crew
- Elected officials
- Managers and secretaries
- Engineers

You can also direct them to the electronic version available at www.ltap.state.pa.us.



pennsylvania

DEPARTMENT OF TRANSPORTATION

PennDOT Local Technical Assistance Program

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If you do not want to receive a copy of this newsletter, please send an email to katkinson@psats.org. The newsletter is available electronically on the LTAP website under Publications on the right-hand side of the page.

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