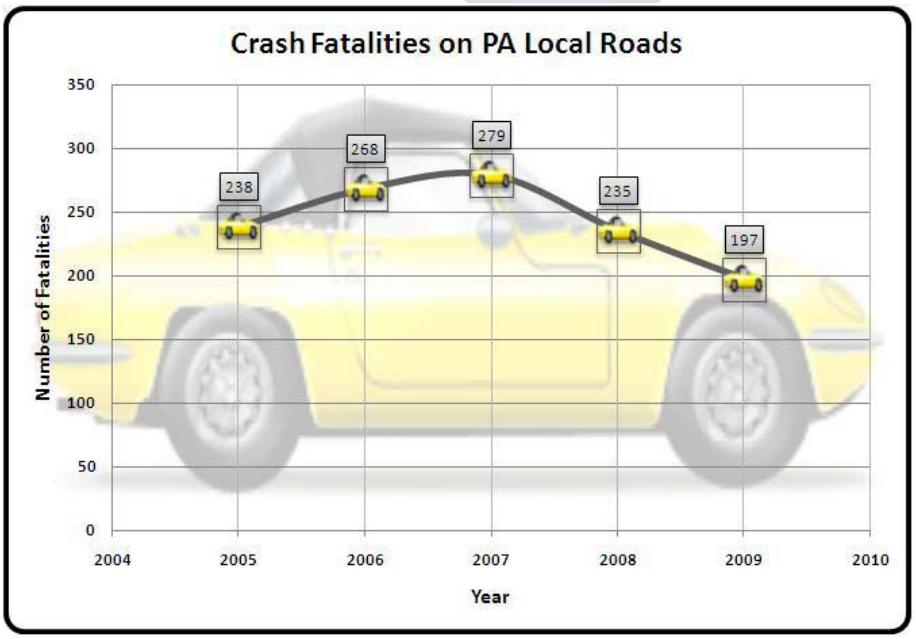
pennsylvania
DEPARTMENT OF TRANSPORTATION
PennDOT Local Technical Assistance Program

moving FORWARD

SUMMER 2010

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

Record Low Number of Deaths on State, Local Roads in 2009



Crash fatalities on local roads dropped in 2009 to the lowest level in five years. This drop could be attributed in part to increased safety programs and education.

The number of fatalities on Pennsylvania highways in 2009 dropped to 1,256, the lowest number since recordkeeping began in 1928. On local roads, the number also dropped in 2009 to 197, the lowest in the past five years.

Statewide, the previous low in highway fatalities was 1,328 in 1944. In 2008, there were 1,468 traffic deaths across the state. In looking at preliminary numbers for 2009, the Pennsylvania Department of Transportation (PennDOT) has noted that significant decreases in deaths have occurred in accidents involving or attributed to the following:

- those not wearing seatbelts—a drop from 567 in 2008 to 451 in 2009;
- alcohol-related—a decrease from 531 in 2008 to 442 last year;
- aggressive driving—a drop last year to 130, down from 141 in 2008.

Unfortunately, fatalities involving drivers aged 65 and older increased in the past year from 259 in 2008 to 276 in 2009.

On local roads, the number of crash fatalities in 2009 is an approximate 30 percent decrease since 2007. PennDOT reports the following number of fatalities on local roads over the past five years: 197 in 2009, 235 in 2008, 279 in 2007, 268 in 2006, and 238 in 2005.

More than 85 percent of crashes on Pennsylvania roads, whether state-owned or locally owned, are related to driver behavior, and PennDOT has made it a goal to save at least 100 lives each year through its safety programs and education. One such initiative, the Drive Safe PA, encourages motorists to avoid risky driving behavior, such as not buckling up, driving impaired, and driving aggressively.

Another way Pennsylvania strives to reduce traffic fatalities is through enforcement. In 2009, PennDOT distributed $11 million in federal funding to 396 police departments for aggressive-driving enforcement and to more than 600 police departments to conduct about 3,000 impaired-driving enforcement operations.

PennDOT also invests approximately $10 million each year to fund low-cost safety engineering improvements, such as installing

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ALSO IN THIS ISSUE

PennDOT-Approved Decorative Crosswalks

By Chris Zivkovich, E.I.T.

Crosswalks are an important aspect of transportation and pedestrian safety. Marked crosswalks clearly identify a roadway crossing for both pedestrians and motorists. The Pennsylvania Vehicle Code, Title 75, defines a crosswalk in two parts:

1. "That part of the roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway, …"
2. "Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface."

Both PennDOT and national guidelines regulate the application of crosswalk markings at intersections and at mid-block locations. According to the Manual on Uniform Traffic Control Devices (2003 MUTCD, Section 3B.17, page 3B-28), "Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from traffic signals or STOP signs."

A study should be performed before placing crosswalk markings on intersection approaches that are uncontrolled, (i.e., the approach does not have a stop sign or traffic signal controlling traffic). For mid-block crossing locations, PennDOT requires a study to be performed.

Once a study is completed and the decision is made to place crosswalk markings, there are specific criteria to follow for installation. According to PennDOT and MUTCD standards, marked crosswalks shall consist of solid white transverse lines no less than six inches in width, and there must be at least six feet between the lines (MUTCD Section 3B.17). The only exception to having the transverse lines is when the "longitudinal" style is used, which consists of parallel blocks and does not require the six-inch white lines (see Figure 1). If decorative crosswalks are installed, transverse white reflective edge lines are required as per PennDOT Publication 111M, TC-8600 Series Standard Drawings. (See Figure 1 for examples of approved crosswalk marking patterns.) More information on where to install crosswalk markings and signing requirements are in the MUTCD and PennDOT Publication 46, Traffic Engineering Manual.

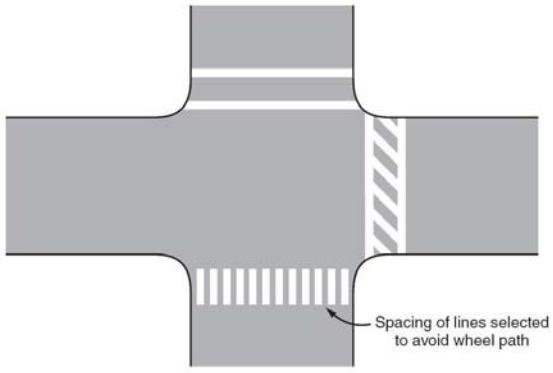

Figure 1 - Examples of crosswalk markings from MUTCD

Crosswalks on State-Owned Roadways

On state-owned roadways, municipalities are responsible for installing and maintaining crosswalk markings at intersections (PennDOT Publication 212, Section 212.5). PennDOT's TC-8600 Standards apply, and the products used must be listed in Bulletin 15.

Approved Decorative Crosswalks on Locally Owned Roadways

PennDOT's Bureau of Municipal Services has approved the use of decorative crosswalks under certain conditions. The decorative crosswalks (refer to PennDOT Publication 111M, TC-8600 for approved patterns and colors) are approved for use on low-volume local roads and are eligible to be installed using liquid fuels money. Hometown Streets, Safe Routes to School, and Transportation Enhancement projects that include improvements on state roads are also approved to use decorative crosswalks. There are two types of approved decorative crosswalks:

- Patterned thermoplastic crosswalks[1]
- Patterned/textured crosswalks

FHWA is concerned that some decorative crosswalks have elaborate designs and cater visually to the pedestrian rather than equally to the pedestrian and motorist. If motorists have difficulty identifying a marked crosswalk, safety issues may arise. The decorative crosswalk requirements defined by the FHWA are designed to help motorists better recognize a marked crosswalk. The approved decorative crosswalks should not have any reflective material between the transverse white reflective edge lines and should not be a color commonly used for traffic control, such as red, blue, green, yellow, or orange. The approved colors are limited to white, black, silver-gray, brown, and maroon. These basic requirements will help motorists better recognize marked crosswalks when a decorative finish is used.

There are three approved patterns for use in decorative crosswalks (see Figure 2):

- Courtyard (Type D)
- Herringbone (Type E)
- Offset brick (Type F)

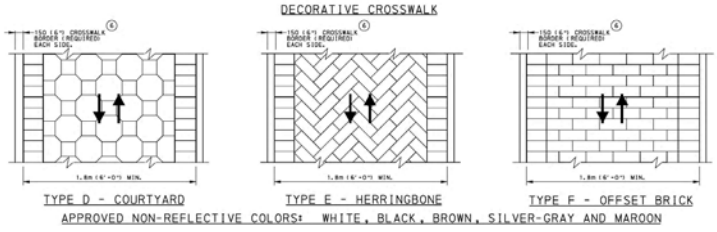

Figure 2 - Examples of decorative crosswalk patterns

[1] *Refer to PennDOT Publication 447, Approved Products for Lower Volume Local Roads, MS-0520-0022, for specifications.*

Patterned thermoplastic crosswalk

Patterned/textured crosswalk

As shown in Figure 2, transverse white reflective lines must be included on all decorative crosswalks.

Cost

As with many other aspects of construction, cost plays a major role in determining what type of crosswalk markings a municipality chooses to install. Although thermoplastic costs more, it tends to last longer than standard paint markings. This will save a municipality the money it would cost to repaint the lines with standard paint several times and limit the exposure of road crews on busier roads. (See Table 1 for a cost comparison among the different types of pavement markings.)

Table 1 - Cost Comparison

Type	Cost	Unit
6" White Waterborne Paint[1]	$0.20	LF
6" Thermoplastic[1]	$1.50	LF
24" White Waterborne Paint[1]	$5.00	LF
24" Thermoplastic[1]	$7.75	LF
Patterned Thermoplastic[2]	Varies $11 - $15	SF
Patterned/Textured[2]	Varies $18 - $27	SF

[1] Average statewide price from PennDOT ECMS Web site
[2] Approved vendor quoted price in fall 2009

The majority of the costs associated with the installation of decorative crosswalks are related to labor. Travel lanes can typically be reopened to traffic within two hours of closing when thermoplastic is installed and approximately four hours from the beginning of installation when a textured material is installed. The varying costs take into account the traffic control required, the pattern selected, and existing pavement conditions. ◆

Note: *All of the publications and standard drawings referenced in this article can be downloaded from PennDOT's Web site: www.dot.state.pa.us. Click on the forms and publications tab, and select the publication you want.*

Example from Emmaus, Pa. This style meets current standards, as long as the transverse white lines are reflective.

Example from Macungie, Pa. This pattern/style does not meet current standards and also lacks the transverse white reflective lines.

Trenchless Pipe Rehabilitation

Fairview Township finds HDPE liners are more expensive but less intrusive option for repairing stormwater culverts

When Fairview Township, York County, decided to repair two stormwater culverts running under township roads last year, it knew the traditional method of excavating into the corrugated metal pipe to replace it would not work in these cases. Both roads led to developments, one residential and the other commercial, and closing the roads to residents and motel guests and employees while the roads were excavated for stormwater pipe repairs was just not an option, says Michael H. Fleming, the township's superintendent of public works.

Instead, the township reviewed various pipe lining processes and decided to go with a high-density polyethylene (HDPE) lining that could be inserted into the existing metal pipes. As noted within Bulletin 15, Section 601.2.(a)6, PennDOT has approved only one vendor (SNAP-TITE, a division of ISCO Industries) for this process. PennDOT's District 9-0 has successfully used the HDPE lining to rehabilitate some corrugated metal pipes on I-99 in Bedford and Blair counties.

The process works by inserting an HDPE pipe inside the existing metal pipe and then filling the space between the new and old pipes with grout.

"The process is probably about three times more expensive than the traditional open cut-and-replace method," says Fleming, "but we felt it was the only viable solution to repair the pipes and still allow uninterrupted access to the affected residential and motel properties within the township."

The trenchless pipe rehabilitation process works by inserting the HDPE pipe inside the existing metal pipe and then filling the space between the new and old pipes with grout. This requires an

The depth of the stormwater culvert and its location beneath a road that could not be closed to traffic meant that the township had to consider other options than excavation and replacement of the existing corrugated metal pipe.

The township decided to use a high-density polyethylene (HDPE) lining that is snapped together and inserted into the existing metal pipe.

extra subcontractor, which adds to the expense of the project. Fairview Township, which bid the project using PennDOT Municipal Services forms (MS-944), used Liquid Fuels Funds to pay for the entire project.

In both scenarios in which Fairview Township employed the process, a perennial stream had to be temporarily bypassed while the new pipe and grout were installed. To do this, the contractor (E. K. Services, Inc., of New Cumberland) pumped the stream flow into sediment filter bags, flushed the existing culvert, inserted the liner and snapped it together, blocked off the opening between the existing metal pipe and the new liner, and filled that space between the two pipes with grout.

The trenchless pipe rehabilitation was the best option for repairing two stormwater culverts and still allowing uninterrupted use of the roadways above.

"Although it sounds simple, it was actually a long process, which if it goes as planned takes about three days to complete," says Fleming. PennDOT Publication 447, Section MS-450-0030, Trenchless Pipe Rehabilitation, defines the process, materials, and construction guidelines.

As part of the project, a local engineering firm (Century Engineering of New Cumberland) helped the township obtain waivers from DEP for the repair and maintenance of the existing pipes. The township also obtained temporary access easements from the adjacent property owners.

Following are more details about the two trenchless pipe rehabilitation projects:

Stone Row Lane (T805) had an existing 18-inch corrugated metal pipe that conveyed an unnamed perennial stream under the only entrance to a single-family housing development. The existing pipe was installed about 1960 during construction of nearby Interstate 83 overpasses and was located approximately 10 feet deep to the top of the pipe.

The HDPE liner is 74 feet long and 14 inches in diameter. Endwalls were placed on each end of the liner, and rock (R-4) was placed at the outlet end to reduce the velocity of the stormwater leaving the lined culvert.

Total cost for the project was $44,400, or $600 per linear foot, and included all materials, labor, and bypass pumping of the perennial stream.

Keystone Drive (T940) had an existing 48- to 54-inch corrugated metal pipe that conveyed an unnamed perennial stream under the only entrance to a residential home and two motels. The existing pipe, which also was installed about 1960 during construction of Interstate 83 overpasses, was located approximately 12 feet deep to the top of the pipe.

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The HDPE lining is inserted snugly inside the metal pipe . . .

and then "pea soup" gravel is pumped into the space between the new liner and the old pipe. Here, the grout is being dumped from the concrete mixer into the concrete pump.

Trenchless Pipe Rehabilitation

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The HDPE liner is 81 feet long and 42 inches in diameter. Endwalls were placed on each end of the liner and rock (R-4) was placed at the outlet end to reduce the velocity of the stormwater leaving the lined culvert. Unforeseen problems at this site, which included discovery of an existing 2-inch water service near the outlet of the original pipe and working with the pumps in colder weather, delayed completion of this project.

Total cost for the project was $71,382, or $881.25 per linear foot, and included all materials, labor, and bypass pumping of the perennial stream.

Note: *PennDOT Publication 447, Section MS-450-0030, Trenchless Pipe Rehabilitation, provides process, materials, and construction guidelines for this method. To access the information online, go to www.dot.state.pa.us and click on "Forms, Publications & Maps." From the list that appears, click once again on "Forms, Publications & Maps." Under Search Options on the lefthand side of page, click on "Search by Number" under the Publications heading. Go to page 9 and click on "PUB 447" - Approved Products for Lower Volume Local Roads. This will open a PDF of the document. Scroll down to page 67 where the criteria for MS-450-0030, Trenchless Pipe Rehabilitation, begins.*

The inlet end of the new culvert and endwall. A perennial stream, which had to be temporarily bypassed while the new pipe and grout were installed, is running through the stormwater pipe again.

Ferguson Township Road Crew Becomes Roads Scholars

Members of the Public Works Department at Ferguson Township, Centre County, celebrate becoming LTAP Roads Scholars. To become certified Roads Scholars, they had to take 10 LTAP maintenance and safety courses within a three-year period. To find out how you or your road crew can become Roads Scholars too, contact LTAP at 1-800-FOR-LTAP (367-5827) or www.ltap.state.pa.us.

Record Low Number of Deaths

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centerline rumble strips, improving traffic signals and signs, and relocating utility poles. Since 2000, nearly 12,000 low-cost improvements have been made statewide.

Studies show that this investment in roadway safety is paying off. For example, a study of the 1,167 miles of centerline rumble strips installed from 2000 to 2004 revealed a 35 to 50 percent reduction in centerline crashes. Likewise, shoulder rumble strips resulted in a 20 to 30 percent reduction in crashes along the side of the road.

In an effort to target mature drivers and reduce highway deaths in this age group, PennDOT has been offering information on approved Mature Driver Improvement courses held statewide and has promoted a brochure on talking with mature drivers.

Look for the 2009 edition of PennDOT's annual *Crash Facts and Statistics Book*, in which last year's numbers will be published, due out at the end of May. The book will contain these other details about safety on Pennsylvania's roadways.

For more information on PennDOT's safety efforts, including resources, tips, and program descriptions, visit the Drive Safe PA Web site, www.DriveSafePA.org.

Smart Transportation Links Land Use and Transportation Planning

Budget crises. Energy and infrastructure costs. Congestion. Public health. Economic development. Climate change. Quality of life. Pennsylvania's municipalities are grappling with these concerns and much more.

There are no easy answers to these issues, but the PennDOT is embarking on a new approach to thinking about transportation investments as part of the solution to the challenges that we all face. PennDOT calls this new approach **Smart Transportation**, and it needs your help to make it work.

What Does "Smart Transportation" Actually Mean For Your Municipality?

- **A closer link between land use and transportation decisions**. The most important aspect of Smart Transportation is linking local land use and PennDOT's transportation planning to ensure that all of our investments encourage and support the land development patterns that your community desires and that are affordable and long-lasting.
- **More collaboration**. PennDOT is collaborating with a number of entities, including local governments, other state agencies, transit providers, developers, and neighborhood residents, to arrive at community-oriented transportation solutions. "Collaboration" cannot simply be a buzzword—PennDOT is now coordinating its processes and decision-making to achieve a better approach to transportation.
- **Better use of existing resources**. Every project must be carefully evaluated to optimize its financial, environmental, and community benefits. Maintaining existing infrastructure is the best way to maximize our limited resources, which in turn means some new development must be steered toward places where infrastructure is already in place.
- **Safer places**. Smart Transportation encourages innovative measures that create a safe environment for everyone. Working together, local communities and PennDOT can identify creative, context-sensitive methods for improving our safety record in urban, suburban, and rural places.
- **More transportation choices**. Pennsylvania must invest in transportation solutions that encompass transportation choices for the future, including transit users, bicyclists, pedestrians, automobiles, and freight. PennDOT needs your help with investments in sidewalks, bike paths, transit, and the other elements that will help to achieve a more balanced transportation system.

How Can You Get Involved?

Smart Transportation cannot be successful without the active involvement of a variety of people in Pennsylvania, especially those in local government.

- **Learn more about Smart Transportation**. Visit www.smart-transportation.com. There are a number of resources, news articles, and links related to Smart Transportation. What questions do you still have? What resources would be most helpful to you and your community? We need your feedback and ideas. E-mail them to smarttransportation@state.pa.us.
- **Work with PennDOT on land use decisions**. PennDOT would be pleased to work with you as you consider new land use proposals and to help develop a transportation system that meets all of our needs. Please contact your PennDOT Municipal Services Representative or LTAP for further assistance.
- **Become a PennDOT Smart Transportation Ambassador.** Contact smarttransportation@state.pa.us if you are interested in helping to spread the word about Smart Transportation to community groups. We'll provide you with all the materials and training you'll need to get started.
- **Place Smart Transportation on your meeting agenda**. If you are looking for speakers for any community gatherings, meetings, or conferences, PennDOT would be happy to have an Ambassador come present to you. Contact smarttransportation@state.pa.us for more details.

Your active, positive involvement in transportation and land use issues will help lead to a more sustainable Pennsylvania. Together, we can ensure that our transportation system allows future generations to enjoy a vibrant economy, a healthy environment, and a great quality of life.

Smart Transportation starts with you. ◆

PennDOT is seeking municipalities' help with investments in sidewalks, bike paths, and transit to achieve a more balanced transportation system.

Upcoming Workshops

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

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

May 27, 2010
Union County
Roadway Safety Improvement Program
8:00 AM – 3:00 PM
SEDA-COG Office (Lewisburg)

May 27, 2010
Butler County
Equipment & Worker Safety
8:00 AM – 11:30 AM
Cranberry Township Public Works Operations

June 3, 2010
Lebanon County
Common Sense Solutions to Intersection Problems
8:00 AM - 3:00 PM
North Lebanon Township Building

June 10, 2010
Lycoming County
Bridge Maintenance & Inspection
8:00 AM – 2:00 PM
Woodward Township Fire Hall (Linden)

June 24, 2010
Lebanon County
Traffic Signs
8:00 AM - 3:00 PM
North Lebanon Township Building

July 6, 2010
Lebanon County
Risk Management/Tort Liability
8:00 AM – 2:00 PM
North Lebanon Township Building

July 7, 2010
Cumberland County
Traffic Signals
8:00 AM – 3:00 PM
PSATS Educational Center (Enola)

July 13, 2010
Lebanon County
Roadway Safety Improvement Program
8:00 AM – 3:00 PM
North Lebanon Township Building

Congratulations to the following Roads Scholar recipients:

- John Chambers, East Marlborough Township, Chester County
- Michael Fragale, Caln Township, Chester County
- Kevin Gebhart, Mount Joy Township, Adams County
- Mike Livelsberger, Mount Joy Township, Adams County
- Scott McMinn, Caln Township, Chester County
- Steve Poley, Upper Uwchlan Township, Chester County
- Kyle Ripka, Upper Uwchlan Township, Chester County
- Lance Weinsteiger, New Hanover Township, Montgomery County
- Lance Ziegler, Caln Township, Chester County

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DEPARTMENT OF TRANSPORTATION
PennDOT Local Technical Assistance Program

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