LOCAL & COUNTY

ROADS SAFETY NEWSLETTER



VOLUME 3 | FALL 2016 | WORK ZONE SAFETY



The Delaware Valley Regional Planning Commission (DVRPC) is the metropolitan planning organization for the Philadelphia metropolitan region. Some of DVRPC's relevant safety work includes:

- Regional Safety Task Force: multidisciplinary group that meets quarterly to improve safety;
- ➤ Transportation Safety Action Plan: identifies key emphasis areas and strategies to reduce crash fatalities in the region;
- Highway Safety Improvement Program: assists county partners with advancing safety projects; and
- Municipal Implementation Tool brochures: "how to" guides on a variety of planning topics for municipal governments.

See www.dvrpc.org for more information and free downloads of all publications.

DELAWARE VALLEY REGION



his newsletter is for you, the municipal official, to provide some useful information to help you make your work zones safer.

Work zones create unexpected conditions for motorists and dangerous situations for workers, even on straight, flat, dry roads. Introducing new traffic patterns and new entry and exit points along a roadway increases the likelihood for crashes, injuries, and fatalities.

In these days of heightened awareness of liability, safety in work zones is now more important to municipal officials than ever. According to Pennsylvania's Local Technical Assistance Program (LTAP) Center, more than half of the publications of work zone requirements (Publication Number 203) were sold to attorneys. The website *Lawyers Weekly* offers books, such as *Killer Roads: From Crash to Verdict*; and the American Bar Association also offers specific training, such as *Transportation Facility Negligence*.

Safety in work zones is also important to state departments of transportation (DOTs) and the Federal Highway Administration (FHWA). Not only are state and federal safety regulations tightening, but creating a safe environment is part of how DOTs are doing business going forward.

"Enhancing Safety in Work Zones" is a focus area in the Pennsylvania Department of Transportation's (PennDOT) current Strategic Highway Safety Plan (SHSP). According to Les Toaso, former PennDOT District 6 District Executive, "An overarching goal of both the statewide and District 6 Strategic Business Plans is to continuously foster a 'safety first' culture. One of the objectives used to measure PennDOT's success rate is to reduce the number of work zone intrusions. Safety is everyone's concern." The state of New Jersey's 2015 SHSP also identifies work zone safety as a priority emphasis area. Improvement strategies include work zone training for law enforcement and public awareness initiatives.

WHERE DOES YOUR COUNTY RANK: WORK ZONE CRASHES BY COUNTY AND STATE

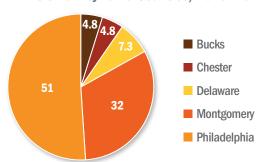
Change in crash frequency is used to measure the relative safety of work zones, and that process begins with data on reportable crashes. Both Pennsylvania and New Jersey consider work zone incursions to be any instance where a vehicle in the normal stream of traffic enters the demarcated work zone, and work zone crashes are any crash that happens within a work zone.

WORK ZONE CRASHES ON LOCALLY OWNED ROADS

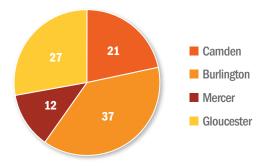
Work zone crashes on locally owned roads could involve municipal employees. For the five years between 2010 and 2014 in the five Pennsylvania DVRPC counties, 82 of the 502 average work zone crashes (16 percent) occurred on locally owned roads. In the four DVRPC New Jersey counties for the period between 2009 and 2013, 676 of the 1,581 average work zone crashes (43 percent) were on local roads. Locally owned roads account for 93 percent of road miles in DVRPC's four New Jersey counties, and 75 percent of road miles in DVRPC's five Pennsylvania counties.

PERCENTAGE OF WORK ZONE CRASHES ON LOCAL ROADS

DVRPC's Pennsylvania Counties, 2010–2014



DVRPC's New Jersey Counties, 2009–2013



WORK ZONE CRASHES IN THE DVRPC REGION

DVRPC'S PENNSYLVANIA COUNTIES

The table below shows work zone crashes and five-year averages for all five counties in southeastern Pennsylvania over the five-year period from 2010 to 2014, the latest year for which Pennsylvania crash data was available when this was prepared. Work zone-related crashes increased by 59 percent during this time period, with 247 more crashes in 2014 than in 2010. During the same time period, total crashes in DVRPC's Pennsylvania counties decreased by 400 (1.2 percent). (Source: PennDOT)

Work Zone-Related Crashes in DVRPC's Pennsylvania Counties, 2010–2014: All Roads

	2010	2011	2012	2013	2014	5-YR AVG	'10-'14 CHG	'10-'14 % CHG
Bucks	35	45	54	112	113	72	+78	+31%
Chester	31	84	89	131	112	89	+81	+27%
Delaware	26	45	23	19	23	27	-3	-13%
Montgomery	148	197	146	208	186	179	+48	+24%
Philadelphia	125	65	93	221	178	136	+53	+70%
All of Pennsylvania Region	365	436	405	691	612	502	+247	+59%

Source: PennDOT

DVRPC'S NEW JERSEY COUNTIES

The next table shows work zone crashes and five-year averages for the four New Jersey counties in the DVRPC region. Data is shown for the five-year period from 2009 to 2013, the latest year for which New Jersey crash data was available. During this time period, work zone crashes decreased by 12 percent, with 159 fewer crashes in 2013 than in 2009. During the same time period, total crashes in the four New Jersey DVRPC counties decreased by 10.9 percent. (Source: New Jersey Department of Transportation [NJ DOT])

Work Zone-Related Crashes in DVRPC's New Jersey Counties, 2009–2013: All Roads

	2009	2010	2011	2012	2013	5-YR AVG	'09-'13 CHG	'09-'13 % CHG
Burlington	315	801	524	398	404	488	+89	+28%
Camden	712	903	630	240	369	571	-343	-52%
Gloucester	178	197	97	64	72	122	-106	-40%
Mercer	276	190	459	599	477	400	+201	+73%
All of New Jersey Region	1,481	2,091	1,710	1,301	1,322	1,581	-159	-12%

Source: New Jersey Department of Transportation (NJ DOT)

LTAP OFFERS WORK ZONE TRAINING FOR MANAGERS AND LABORERS IN PENNSYLVANIA AND NEW JERSEY

LTAP is the FHWA technology transfer program that provides technical assistance and best-practices training to local highway departments as a way to transfer innovative transportation technology to local communities throughout the United States and Puerto Rico.



PA LTAP offers "Work Zone Temporary Traffic Control," a day-long session addressing safety principles,

regulations, and practical applications. This class, like all PA LTAP offerings, is free for municipal employees. Public Works Directors may also receive in-person telephone consultations for issues pertaining to specific work zones. For more information: 1-800-FOR-LTAP (1-800-367-5827) or www.ltap.state.pa.us. If a needed class is not already scheduled locally, it may be scheduled upon request.

In Pennsylvania, the LTAP Center is managed by PennDOT's Program Center, with assistance from the Pennsylvania State Association of Township Supervisors (PSATS). DVRPC is the planning partner for the five counties in southeastern Pennsylvania.



NJ LTAP offers "Work Zone Safety Awareness Workshop," a half-day overview addressing work zone safety compliance with national Manual on Uniform Traffic Control Devices

as well as legal responsibilities. There is a fee for this class, and continuing education credits are awarded at class completion, as they are for a variety of programs. For more information: http://cait.rutgers.edu. In New Jersey, the LTAP Center is directed and run by Rutgers University's Center for Advanced Infrastructure and Transportation (CAIT).

standards. Roles of workers and enforcement personnel are covered.

FHWA PROMOTES WORK ZONE AWARENESS

Every April, the Federal Highway Administration hosts National Work Zone Awareness Week (NWZAW). Programs are held all around the United States to bring national attention to motorist and worker safety, and mobility issues in work zones. Since 1999, FHWA has worked with the American Association of State Highway and Transportation Officials (AASHTO) and the American Traffic Safety Services Association to coordinate and sponsor events that week. A number of other transportation partners also support NWZAW. For information about upcoming events, visit: www.atssa.com/Events/

www.atssa.com/ Events/

national work zone awareness week. as px.

FHWA'S EVERY DAY COUNTS INITIATIVE PROMOTES SMARTER WORK ZONE APPROACHES

FHWA is promoting two work zone initiatives: road project coordination to minimize the impact of work zones, and technology applications to reduce crashes and delays. Project coordination is where neighboring municipalities work together to combine projects along the same corridor, which saves time and costs for project elements such as right-of-way acquisition and utility work. Technology applications include using queue and speed management to manage work zone traffic. Examples include new ways to alert drivers so they can slow down and proceed safely through the work zone. For more information visit: www.fhwa.dot.gov/everydaycounts.

NJ LTAP SPONSORS ANNUAL WORK ZONE SAFETY CONFERENCE

New Jersey's LTAP Center at Rutgers CAIT hosts an annual conference for municipalities to discuss innovations in work zone safety coinciding with FHWA's National Work Zone Awareness Week held each April. Bethany Allinder, Program Coordinator and Registrar at the NJ LTAP Center said, "In addition to municipal officials, we also involve law enforcement personnel as they play such an important part in keeping work zones safe." For proceedings from the 2016 program, visit: https://cait.rutgers.edu/cait/16th-annual-work-zone-safety-conference. For more information on future NWZAW events in New Jersey, contact Ms. Allinder at 848-445-3112 or bethall@rci.rutgers.edu.



Attendees at the 2015 New Jersey Work Zone Safety Conference (Courtesy of New Jersey LTAP)



PENNSYLVANIA STATEWIDE WORK ZONE **CRASH FACTS**

In 2014, work zone crashes were 1.5 percent (1,845) of Pennsylvania's 121,317 total crashes. Of the work zone crashes, 47 percent involved fatalities or injuries.

On average, statewide work zone crashes resulted in injury or fatality 49 percent of the time between 2010 and 2014. For reference, almost 67 percent of all crashes statewide during the same time period resulted in injuries or fatalities. On average, 6 percent of work zone crashes were on local roads. The table below shows historical data for statewide work zone crashes.

PENNSYLVANIA STATEWIDE WORK ZONE CRASH **STATISTICS, 2010-2014**

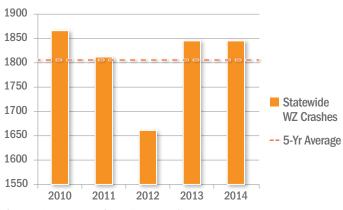
YEAR	TOTAL WORK ZONE CRASHES	% WITH INJURY OR FATALITY	# INJURED	# OF Fatalities	# OF WORKERS KILLED STATEWIDE	% ON LOCALLY OWNED ROADS
2010	1,866	51%	1,425	23	4	6%
2011	1,812	48%	1,315	21	1	6%
2012	1,661	50%	1,124	21	3	7%
2013	1,845	48%	1,262	16	0	6%
2014	1,845	47%	1,241	24	3	6%
5-yr Avg	1,806	49%	1,273	21	2	6%

Source: Pennsylvania Crash Facts and Statistics,

www.penndot.gov/TravelInPA/Safety/Pages/Crash-Facts-and-Statistics.aspx

Statewide, the average number of injuries and fatalities from work zone crashes has remained relatively stable over the five years examined. Although the number of injuries has decreased by about 13 percent since 2010, the number of fatalities increased slightly from 2010, and by 67 percent between 2013 and 2014.

PENNSYLVANIA STATEWIDE TRENDS IN WORK **ZONE CRASHES**



Source: Pennsylvania Crash Facts and Statistics

REGIONAL WORK ZONE CRASH FACTS FOR THE FIVE DVRPC PENNSYLVANIA COUNTIES

According to PennDOT crash records, an average of 502 work zone-related crashes occurred per year between 2010 and 2014 in southeastern Pennsylvania. This is approximately 28 percent of the statewide average occurring in just five of Pennsylvania's 67 counties.

WORK ZONE CRASH STATISTICS FOR THE FIVE DVRPC PENNSYLVANIA COUNTIES, 2010-2014

YEAR	TOTAL WORK Zone Crashes	# INJURED	# OF FATALITIES	% WITH INJURY OR FATALITY	% ON LOCALLY OWNED ROADS
2010	365	306	3	57%	23%
2011	436	322	6	50%	14%
2012	405	281	6	50%	25%
2013	691	487	5	48%	12%
2014	614	422	6	49%	14%
5-yr Avg	502	364	5	50%	16%

Source: Pennsylvania Crash Facts and Statistics

There were a variety of causes recorded for the work zone crashes during this period, but bad weather was not one of them. Most of the work zone crashes—88 percent—happened on dry road conditions and under clear skies. Only 1 percent were related to drivers' failure to respond to temporary traffic control devices in the work zone, as derived from the crash database.

Construction or work zone vehicles accounted for less than 1 percent of vehicles involved in work zone crashes.

Seventy-six percent of vehicles involved were passenger vehicles unrelated to the work zone.

Collision type trends in work zones differ from typical nonwork zone crashes. Data indicates that the most commonly reported work zone collision type in southeastern Pennsylvania is "rear end," and the next most common is "hit fixed object." For all crashes, the most common collision type reported in the DVRPC's five Pennsylvania counties for the 2010–2014 time period was "angle," and "rear-end" crashes were next most common. (Source: DVRPC)

NEW JERSEY STATEWIDE WORK ZONE CRASH FACTS

In 2013, work zone crashes were 2.4 percent (5,844) of New Jersey's 241,532 total crashes. Of these work zone crashes, over 23 percent involved fatalities or injuries. On average, work zone crashes resulted in injury or fatality 27 percent of the time between 2009 and 2013 statewide. The table below shows historical data for work zone crashes in New Jersey. On average, 43 percent of work zone crashes ocurred on local roads.

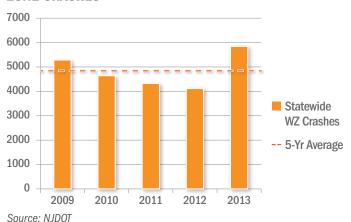
NEW JERSEY STATEWIDE WORK ZONE CRASH STATISTICS, 2009-2013

YEAR	TOTAL WORK Zone Crashes	% WITH INJURY OR FATALITY	# INJURED	# OF FATALITIES	% ON LOCALLY OWNED ROADS
2009	5,285	24%	1,240	12	41%
2010	4,637	30%	1,356	15	47%
2011	4,326	31%	1,325	10	50%
2012	4,112	28%	1,207	17	51%
2013	5,844	23%	1,377	8	31%
5-yr Avg	4,841	27%	1,301	12	43%

Note: NJ has a high percentage of locally owned roads. Source: NJDOT

In 2013, 25 percent of all crashes statewide resulted in injury or fatality, slightly higher than work zone injuries and fatalities (23 percent). Statewide, work zone crashes declined steadily four years in a row between 2009 and 2012. In 2013, even though crashes increased 42 percent from 2012, there was a more than 50 percent decline in the number of work zone crash fatalities between 2009 and 2012.

NEW JERSEY STATEWIDE TRENDS IN WORK ZONE CRASHES



A typical work zone set-up in southeastern Pennsylvania

REGIONAL WORK ZONE CRASH FACTS FOR THE FOUR DVRPC NEW JERSEY COUNTIES

Only four of New Jersey's 21 counties are in the DVRPC region, yet, on average, from 2009 to 2013 approximately 33 percent (1,581) of the statewide work zone crashes occurred here. During that same time period an average of four fatalities ocurred each year in work zones, though no work zone fatalities were reported in 2013.

WORK ZONE CRASH STATISTICS FOR THE FOUR DVRPC JERSEY COUNTIES, 2009–2013

YEAR	TOTAL WORK ZONE CRASHES	% WITH INJURY OR FATALITY	# INJURED	# OF Fatalities	% ON LOCALLY OWNED ROADS
2009	1,481	34%	358	4	55%
2010	2,091	32%	491	4	34%
2011	1,710	35%	424	5	43%
2012	1,301	35%	298	8	44%
2013	1,322	23%	310	0	41%
5-yr Avg	1,581	24%	376	4	43%

Source: NJDOT

The most common work zone collision type in the four **New Jersey DVRPC counties was "rear end,"** averaging 37 percent of crashes for the five years between 2009 and 2013. During the same time period, "rear-end" crashes represented 29 percent of all crashes. For both total crashes and work zone crashes, the second most common collision type was "hit fixed object."

NJDOT's Traffic Mitigation Plan for the I-295/I-76/Route 42 Direct Connection construction project is an example of promoting safe traffic flow through the project area while minimizing delay. For more information: www.state.nj.us/ transportation/commuter/roads/rt295/tmp.shtm.

FLAGGER TRAINING STANDARDS BY STATE

Pennsylvania and New Jersey both require it, but not in the same way

Training flaggers for construction sites on all types of roads, whether done by public employees or contractors, is now required both in Pennsylvania and in New Jersey, and standards differ between the states. Here is a rundown of the major points.



Specifications require that, as mandated in Publication Number 213 (Pub 213), any flagger in any work zone must successfully complete flagger training every three years and must carry an up-todate certification card.

In Pennsylvania, flagger training is offered by PSATS. Industry associations and private-sector training companies offer similar classes. A per-student or permunicipality fee is usually charged for these classes. (Source: workzonesafety.org)



NJDOT's Standard Specifications for Road and Bridge Construction require that all flaggers be formally trained, and that they demonstrate competence. Several industry

association and private-sector providers offer feebased training, which is certified for NJDOT standards. In addition to flaggers, traffic control technicians and traffic control supervisors must also take formal training, with refreshers every two years. Training is available through CAIT. (Source: workzonesafety.org)



Example of proper flagging technique (Courtesy of PennDOT LTAP)

FEDERAL AGENCIES COLLABORATE ON WORK ZONE SAFETY



The second Strategic Highway Research Program (SHRP2) is an effort among FHWA, the Transportation Research Board, and AASHTO to create real-world solutions to today's transportation challenges.

For work zone safety, SHRP2 offers a tool for planning work zones earlier to better manage highway reliability and safety across corridors and networks. Called WISE: Work Zone Impacts and Strategies Estimator Software (R11), this tool is a decision support system for planners and engineers for evaluating traffic impacts of work zones to better schedule projects. WISE promotes well-planned work zones within a transportation improvement program across a corridor or region to minimize negative impacts to mobility, safety, and the economy.

By integrating WISE into practice as an improvement program development tool, agencies can evolve their culture toward transportation systems management and operations.

Integrating the SHRP2 WISE Program can yield many benefits:



WISE SAVES LIVES

Better coordinated work zone scheduling can reduce the number of work zone-related crashes by providing alternate routes that allow motorists to avoid work zones altogether.



WISE SAVES MONEY

An optimized renewal programming schedule can reduce the agency's expenditures on mitigation strategies.



WISE SAVES TIME

Careful planning and scheduling of work zones can mitigate or avoid some work zone delays.

(Source: Federal Highway Administration)

You can learn more at www.fhwa.dot.gov/GoSHRP2.

THE NATIONAL WORK ZONE SAFETY **INFORMATION CLEARINGHOUSE** is dedicated to

providing the transportation construction industry and the public with comprehensive information to improve motorist, worker, and pedestrian safety in work zones. Managed in part by AASHTO, and the Texas Transportation Institute, the Clearinghouse has the world's largest online library of free information, including many resources for local road owners, on: crash data, technologies and equipment, best practices, safety expert contact information, laws and regulations, safety standards, training videos, public education campaigns, and materials in multiple languages. For details: www.workzonesafety.org

REGIONAL EFFORTS

Pennsylvania Turnpike Enforcement Program "Operation Orange Squeeze"



In cooperation with the Pennsylvania State Police Troop T, the unit in charge of turnpike patrols, the Pennsylvania Turnpike Commission launched a major work zone safety campaign in May 2015.

Between when the turnpike opened in 1945 and today, more than 30 turnpike workers have been killed. In 2014 alone there were 150 crashes in work zones resulting in two deaths.

(Source: PA Turnpike Commission)

The turnpike's safety campaign came about after two of its workers were killed within a year by speeding motorists entering their work zones: one was struck by a truck that entered a closed lane, and one was killed when a vehicle left the roadway and struck a truck, which in turn struck the worker. Both of the workers were assigned to construction units based in southeastern Pennsylvania.

"The Commission is determined to do whatever we can to get motorists to slow down in work zones. We're committed to raising awareness of the harsh consequences," said Pennsylvania Turnpike CEO Mark Compton. "There's no greater priority than the safety of our workers."

Beginning in 2014, state troopers began conducting speed enforcement from orange-colored turnpike-owned construction vehicles in work zones in an enforcement program known as "Operation Orange Squeeze."

In selected enforcement area(s)—so drivers don't know the locations troopers are stationed inside Turnpike Commission-owned vehicles within work zones running radar while another trooper waits outside the



PennDOT Traveling Workers Memorial (Courtesy of PennDOT)



Example of service plaza poster (Courtesy of Pennsylvania Turnpike Commission)

work zone to pull over and cite offenders. Motorists cited for travelling 11 mph or more over the speed limit could face a \$200 fine and five points, which triggers an automatic 15-day suspension of their license.

In 2015 the Public Relations and Marketing department of the Turnpike Commission formed a partnership with the Pennsylvania State Police. Together they developed a media campaign that was being implemented in conjunction with Operation Orange Squeeze. The campaign includes billboards, printed materials, service plaza and toll booth posters, and social media outreach to raise awareness of both the issue of work zone safety and the enforcement program.

During the enforcement-only phase of Operation Orange Squeeze in 2014, on average 416 citations were issued per month by state troopers in Pennsylvania Turnpike work zones. In 2015, before the information campaign began, on average 443 Operation Orange Squeeze citations were issued in work zones per month. After the information campaign was in place, citations dropped to an average of 365 per month.

(Source: Pennsylvania State Police Troop T)

For more information, visit www.OperationOrangeSqueeze.com

NATIONAL EFFORTS TO HELP MAKE WORK ZONES SAFER

Occupational Safety and Health Administration's (OSHA) Directives:Be Aware of Federal Requirements

OSHA standardized procedures and conditions for those inspecting work zones for the first time with Directive CPL 02-01-054. Effective since 2012, it provides "guidance for the safe inspections of work sites where employees are engaged in construction work on and near roadways or highways."

The OSHA regulations used in the requirements are now codified in the 2014 updates to Pub 213. Both the OSHA documents and Pub 213 are available online at the website address listed in the Resources section of this page.

ADDITIONAL RESOURCES

- PennDOT Publication 213, Temporary Traffic Control Guidelines, June 2014, Commonwealth of Pennsylvania Department of Transportation. Download for free at: www.dot.state.pa.us/public/PubsForms/Publications/PUB%20213.pdf
- PennDOT Publication 212, Official Traffic Control Devices (Vehicle Code, 75 Pa.C.S), March 2006. Commonwealth of Pennsylvania Department of Transportation. Download for free at: www.dot.state. pa.us/public/PubsForms/Publications/PUB%20212.pdf
- Analysis of Crashes in the Delaware Valley. Delaware Valley Regional Planning Commission. Download for free at: www.dvrpc.org/ Products/14028/
- ▶ OSHA Directive Number CPL 02-01-054, "Inspection and Citation Guidance for Roadway and Highway Construction Work Zones," October 16, 2012, U.S. Department of Labor. Download for free at: www.osha.gov/OshDoc/Directive_pdf/CPL_02-01-054.pdf

SHSPs serve as a blueprint to reduce fatalities and serious injuries on all roadways. Each state's SHSP is a data-driven, comprehensive, and multidisciplinary plan designed to guide safety programs and investments.

- Pennsylvania SHSP: www.penndot.gov/TravelInPA/Safety/Pages/Strategic-Highway-Safety-Plan.aspx
- New Jersey SHSP: www.state.nj.us/transportation/about/safety/sshsp.shtm



Publication Number: NL12037 **Abstract:** This newsletter provides safety ideas, information, and resources for municipal and county staff who are

involved in supervising, setting up, or working within roadway work zones.



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The Delaware Valley Regional Planning Commission is

dedicated to uniting the region's elected officials, planning professionals and the public with the common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region – leading the way to a better future.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. DVRPC documents and publications can be translated into alternate formats or languages, if requested. For more information, visit the DVRPC website at www.dvrpc.org or call 215.592.1800.