Providing FREE training, technical support, and resources to municipalities for almost 40 years.

movingforward

FALL 2023

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

A New-Look LTAP Website

Easily Access Your Classes and Technical Assistance

Streamlined and enhanced to better serve users, the new and improved LTAP website allows for easier navigation to commonlyrequested items directly from the homepage. and resources regular users are accustomed to

Visitors to the homepage will immediately notice the new look and an easy-to-use dashboard. Next, users will want to sign in. Once signed in, one click is all you need to

> monitor your training schedule, technical assistance requests, user data and Roads Scholar status, training registrations, or resources and technical information.

Not a registered user? No problem. Simply go

And, you may still access the extensive services

through the menus at the top if you prefer.

pennsylvania



to Sign In in the top header and click the Sign-Up button to create an account.

Some other features of the website:

Wish you had a PDF of your class certificates? Simply select the **My Training Schedule** green box on the homepage and download your

certificates. Please note it may take up to 30 days for in-person class certificates to be available.

My Training



Misplaced your Roads Scholar Certificate(s)? Simply click on the My User Data and Roads **Scholar Status** green button on the homepage.

My User Data and Roads Scholar Status

From there scroll down to the bottom of the page.



The LTAP website is full of transportation resources. To help find the ones you are looking for they are categorized

Resources and

under Resources and Technical Information.

See the Website Brochure under "News" on the website for more information on the website.



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TECHNOLOGY

Use of Drones in Public Works

by Jeff MacKay, P.E., NTM Engineering

Drones, also known as unmanned aerial vehicles (UAVs), are multi-rotor, remote-controlled flying devices that offer live first-person viewing and can capture high-resolution images and videos from the air. Over the past decade, state departments of transportation (DOTs) have increasingly employed the utility of drone technology in all phases of project development, including planning, design, construction, and maintenance. Drones enable access to areas that would be difficult or impossible to reach on foot, such as steep and rugged terrain, densely forested areas, and bodies of water. The ability to access hard-to-reach locations, cover large areas quickly, collect data efficiently and accurately, and keep people away from dangerous locations has made drones an attractive tool for DOTs. In addition, drones can be used to conduct structural inspections on critical infrastructure (e.g., bridges, dams, and buildings) as well as monitor dangerous environmental conditions such as erosion and flooding.



A DJI Mini 2 Drone being deployed. Photo: NTM Engineering



A drone image from above a truss bridge. Photo: NTM Engineering

How are Municipalities Currently Using Drones?

In recent years, municipalities across Pennsylvania have found a wide range of uses for drones in public works. In a variety of areas, drones provide a safer, more efficient, and cost-effective way to gather information compared to traditional methods.

In early 2023, PennDOT conducted a survey of local government agencies to identify if and how they are currently using drones and whether they would like to use drones for maintenance, operation, and safety of local transportation infrastructure. Of the 162 survey respondents, 92 of them (57%) indicated that they are using drones. The most cited applications (selected from a list) among those using drones were general mapping/photogrammetry/aerial photography (71%), and emergency response/incident management (67%).



A drone photograph of Newport Borough in Perry County. Photo: NTM Engineering

Other applications selected from a list by respondents included:

- Construction Inspection (35%),
- Surveying (30%),
- Detail Base Mapping for Design or Maintenance (25%),
- Other Infrastructure Inspection (non-bridge) (24%),
- Bridge Inspection (20%), and
- Measuring Quantities (stockpiles, slope failures, etc.) (18%).



A drone photo of Summit Township's public works buildings in Crawford County. Photo: PennDOT LTAP

A drone photo of a Summitt Township truck and plow in Crawford County. Photo: PennDOT LTAP



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STIC Spotlight How To Reduce Lane Departure Crashes: A FoRRWD Thinking Approach

By PennDOT Bureau of Innovations

Pennsylvania sustains more traffic fatalities and serious injuries each year due to vehicles departing from their travel lane compared to any other crash type, according to the Pennsylvania Crash Information Tool (PCIT).

Two-thirds of all fatal and serious injury lane departures

include a collision with a fixed object, most commonly trees, utility poles, embankments, and guiderail.

More than half of all fatal and serious injury lane departures occur on rural roads. Given Pennsylvania's large rural network, this issue must be addressed through systemic and spot-specific infrastructure improvements, according to Pennsylvania's 2022 Strategic Highway Safety Plan.

Implementing the Federal Highway Administration's (FHWA) Focus on Reducing Rural Roadway Departures (FoRRRwD) approach is a key initiative to reduce rural roadway departures. FoRRRwD uses a logical approach with innovative tools and techniques to reduce deaths and serious injuries in rural roadway departure crashes. It is an FHWA Every Day Counts Round 5 (EDC-5) innovation that Pennsylvania championed.



Annual Crash Facts and Statistics reports can be found at <u>www.</u> <u>penndot.pa.gov/safety.</u>

Installation of curve warning signs on rural

the roadway safely. Photo: PennDOT STIC

roads alerts drivers and helps them navigate

What are the benefits of FoRRRwD?

- Proactive approach. Systemic analysis enables professionals to mitigate high-risk locations, sometimes before crashes even happen.
- Targeted investments. Projects are based on data and risk, so investments can be made with more confidence.
 Flexibility. There is a wide range of analysis and countermeasure selection tools to fit any level of data and expertise.
- Safer roads. The combination of proven countermeasures installed at targeted, high-risk locations is the key to reducing rural roadway departures.

Pennsylvania's 2022 Strategic Highway Safety Plan outlines other strategies, such as modifying roadside clear zone in the vicinity of

hazardous fixed objects, reevaluating passing zones, and utilizing the highway safety manual to identify and evaluate proposed improvements. Behavioral safety efforts that deal with seat belt use, distracted driving, and impairment are equally important to improving this emphasis area.

The strategies to combat lane departure crashes are aimed at keeping vehicles on the roadway and within the proper lanes of travel. This includes installing systemic infrastructure improvements such as centerline and shoulder rumble strips, high friction surface treatments (HFST), cable median barrier, guiderail end treatments, retroreflective signing, roadway delineation, and pavement markings.



Centerline rumble strips are a proven safety countermeasure intended to alert drivers when they leave the roadway through the generation of noise and vibration. Photo:

PennDOT STIC

For example, <u>HFSTs</u> improve the traction of vehicles by increasing the pavement surface's skid resistance to combat lane departure crashes around curves and at intersections.

On State Route 611 in Northampton County where HSFT was applied, for example, the frequency of crashes was reduced by 100%. Additionally, fatalities at this location went from eight to zero and injury crashes went from 190 to 71, a 63% decrease. When PennDOT evaluated the cost-benefit ratio of HFST, it found that it saves roughly one life each year for every 15 locations it was applied. In addition, the research found that HFST reduced wet road crashes on horizontal curves by 75% and run-off-road crashes by over 50%.

Local municipalities can also implement safety measures for curves and along their roadsides to reduce the potential for crashes. PennDOT's Local Technical Assistance Program (LTAP) offers several courses to assist municipalities with roadside safety, including:

- Curves on Local Roads: Issues and Safety Tools, reviews
 curve safety issues and how to study a curve to determine
 the appropriate countermeasures, such as signs, pavement
 markings, and other techniques.
- Roadside Safety Features, reviews roadway departure
 Continued on page 5



State Transportation Innovation Council (STIC)

(717) 772-4664

RA-pdPennDOTSTIC@pa.gov www.penndot.pa.gov/about-us/PennDOT2020

Municipality PA One Call Responsibilities

Facility Owner Responsibilities Under the Underground Utility Line Protection Law in Pennsylvania

The Pennsylvania "Underground Utility Line Protection (UULP) Law" (PA Act 287 of 1974), as amended by Act 50 of 2017, became effective April 28, 2018.

Owners and operators of underground facilities in Pennsylvania are required to be members of Pennsylvania One Call System. The definition of a facility owner is any public utility or agency, political subdivision, municipality, authority, rural electric cooperative, or other person or entity who or which owns or operates a line and the underground line serves one or more customers or consumers in Pennsylvania. *This includes a municipality if they maintain underground power/communication to traffic signals, traffic loops, stormwater, sanitary sewer, water, or any other underground line providing service.* The PA One Call Facility Owners https://www.palcall.org/pocs/6ffc5c7e-750d-45a4-aee6-8a40d0b09920/Facility-Owners site contains a link to apply for membership.

Below are highlights of facility owner responsibilities. More detailed information is provided at Underground Utility Line Protection Law | Pennsylvania One Call System (pa1call.org). It shall be the duty of each facility owner:

- 1) To be a member of and give written notice to the One Call System including:
 - a) the legal name of the facility owner, mailing address, telephone number, and fax number, if available, to which inquiries may be directed.
 - b) the county, municipality, and street identification boundaries in which its lines are located.
 - c) To provide the One Call System, within five business days, with any revised information.
- 2) Respond within 10 working days of receipt of request from designer to identify the site of excavation or demolition work for which they are preparing a drawing in,
 - a) as to the position and type of the facility owner's lines at such work site based on the information currently in the facility owner's possession or,
 - b) to mark the plans which have been provided to it by the designer.
 - c) The facility owner shall so advise the person making the request of the facility owner's status at the work site through the One Call System.
- 3) Respond within two (2) working days after receipt of a timely request from a contractor or operator who identifies the site of excavation or demolition work:
 - a) To mark, stake, locate or otherwise provide the position of the facility owner's underground lines at the work site within 18 inches horizontally from the outside wall of such line.
 - b) Facility owners shall make reasonable efforts to locate or

- notify excavators of the existence and type of abandoned lines.
- c) To identify the location of a known facility's point of connection to its facilities as a helpful guide to the excavator or owner.
- d) Follow the Common Ground Alliance Best Practices for Temporary Marking set forth in ANSI standard Z535.1. See the chart listed below.
- e) To respond to emergency notifications as soon as practicable following receipt of notification of such emergency.
- f) To participate in preconstruction meetings for a complex project or as described in section 5(3).
- 4) If a facility owner fails to become a member of the One Call System and a line or lines of such nonmember facility owner are damaged by an excavator such facility owner shall have no right of recovery from the excavator of any costs associated with the damage to its lines.
- 5) To submit an Alleged Violation Report (AVR) to the commission through the One Call System not more than 30 business days after receipt of notice that the facility owner's lines have been damaged by excavation or demolition work or if the facility owner believes a violation of this act has been committed in association with excavation or demolition work. The report of alleged violation shall be in a form and manner as required by the commission. No report may be required where the cost to repair the damage to the facility owner's lines is less than \$2,500, unless the same person damaged the facility owner's lines two or more times within a sixmonth period.
- 6) To comply with all requests for information by the commission relating to the commission's enforcement authority under this act within 30 days of the receipt of the request.
- 7) To participate in the One Call System's Member Mapping Solutions.
- 8) To maintain existing records of main lines abandoned on or

after April 28, 2018, and to mark, locate or identify the main lines, if possible, based upon the existing records.

WHITE	Proposed excavation
PINK	Temporary survey markings
RED	Electrical power lines, cable, conduit, and lighting cables
YELLOW	Gas, oil, steam, petroleum, or gaseous materials
ORANGE	Communication, alarm or signal lines, cables or conduit and traffic loops
BLUE	Potable water
PURPLE	Reclaimed water, irrigation, and slurry lines
GREEN	Sewers and drain lines

In accordance with ANSI Z535.1 standard

Drones in Public Works continued from page 2

Act 50 of 2017 now authorizes the Pennsylvania Public Utility Commission (PUC) to enforce provisions of the Law under their Bureau of Investigation & Enforcement (I&E).

The PUC may issue a warning and order requiring compliance with this Act and may levy an administrative penalty of not more than \$2,500; or if the violation results in injury, death, or property damage of \$25,000 or more, an administrative penalty of not more than \$50,000 for a violation of the Act.

The PA One Call website provides a vast amount of information to support facility owners. A <u>Users Guide for Act 287 as Amended https://www.pa1call.org/resourcelibrary/resource/download?id=217</u> is available. Member Services Representatives are available to answer questions and provide technical support at 1-800-248-1786 ext. 7168.

STIC continued from page 3

crashes and countermeasures, including guiderail applications.

- Road Safety Audit, is an FHWA Proven Safety
 Countermeasure to improve safety for specific roadways, intersections, and other roadway elements.
- Local Road Safety Plan, is another FHWA Proven
 Safety Countermeasure to improve safety throughout a community

In addition to the courses, LTAP provides newsletters, articles, technical bulletins, and drop-ins on safety topics. Furthermore, LTAP offers direct technical support to municipalities to assist with safety concerns. This assistance can be a straightforward phone call about a sign installation question, or a field review of a curve/roadway to develop a safety strategy.

West Lampeter Township in Lancaster County recently worked with LTAP to conduct a curve study on Morningside Drive.

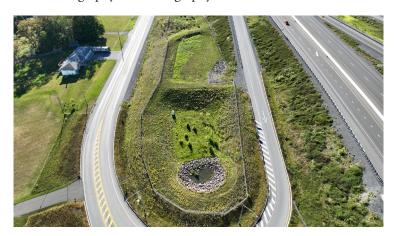
"The road has several S-turns and we continued to have problems with run-off-the-road crashes," said Sean Alexander, roadmaster for West Lampeter Township, Lancaster County. "The LTAP staff was a tremendous help in conducting multiple tests and establishing the criteria for the recommended safety countermeasures."

As a result, the township is implementing several safety countermeasures, including markings ahead of the curves that read "slow", large arrow signs in addition to the already established chevrons, upgraded signage prior to the curve, and a new eight-inch shoulder line.

"We will evaluate the additional safety measures once they are in place and hopefully, they will help address the issue," Alexander said. "LTAP is a great resource and we've taken advantage of their classes. They provide a wealth of knowledge." For more information on available courses, visit LTAP's website.

Specific applications of drones that were noted by respondents included:

- MS4 outfall and stormwater management facility inspections,
- Accident reconstruction,
- Code enforcement,
- Pre- and post-inspections for roadway bonding,
- Utility locations for GIS,
- Examination of tops of public buildings,
- Locations of beaver dams,
- Before and after flyovers of stream restoration projects,
- Aerial photography during flood events for FEMA map comparisons, and
- Photography and videography for website and social media.



Drone imagery for a stormwater basin inspection. Photo: NTM Engineering

More Information on Drones

LTAP offered a drop-in titled Introduction to the use of Drones on September 7. The recording can be accessed from the LTAP website: https://gis.penndot.gov/LTAP/Public/WebinarAndDropIns GenInfo.aspx.

LTAP is developing a course and more resources to assist municipalities with using drones in their operations. The new class and resources will be available in 2024. Course topics will include drone applications, types of data collected, governing regulations and licensure, and drone equipment and costs. Note that it is not a drone pilot certification course.

Some useful links on drones are noted below.

- Federal Highway Administration: https://www.fhwa.dot.gov/uas/.
- PA Drone Association: https://padrone.org/.
- PennDOT's UAS/Drones Page: https://www.penndot.pa.gov/Doing-Business/Aviation/Licensing%20and%20
 Safety/Pages/Unmanned-Aircraft-Systems-(Drone)-Information.aspx

To RAP or Not to RAP? That is the Question

By: Charles Goodhart, Executive Director and Mary Robbins, Ph.D., P.E., Director of Technical Services, PA Asphalt Pavement Association

To RAP or not to RAP, that is the question. Yes, this is a good question for municipalities to ask. Should you allow Reclaimed Asphalt Pavement (RAP) in your asphalt mixes? Many local agencies across the state require PennDOT-approved mixes, and if Liquid Fuels funds are utilized for a construction or maintenance project, municipalities are required to utilize PennDOT Approved Materials (contact your PennDOT Municipal Services Representative https://www.penndot.pa.gov/Doing-Business/ LocalGovernment/MunicipalServicesRepresentatives/Pages/ default.aspx for more information). Approximately 90% of PennDOT approved asphalt mixtures include RAP, yet, we



A RAP stockpile in Eastern Pennsylvania. Photo: PA Asphalt Pavement Association

are not seeing widespread material failures across the state, which is a good indicator that PennDOT's specifications utilize this valuable resource responsibly.

But what about municipalities that do not allow RAP in their mixes? Why don't they include this valuable and sustainable resource in their mixes? Let's

explore the reasons why RAP should be permitted in your asphalt mixes.

First and foremost, let's get an unsubstantiated myth out of the way. Asphalt mixes with RAP perform as well as or better than asphalt mixes without RAP. Overwhelmingly the research and studies from around the country, including the following FHWA (Federal Highway Administration) Tech Briefs, show asphalt mixes with RAP, when properly designed, tested, and constructed, perform well. They are durable, smooth, and recyclable.

- High Reclaimed Asphalt Pavement Use (FHWA-HRT-11-057), 2011 https://www.fhwa.dot.gov/publications/ research/infrastructure/pavements/11057/11057.pdf
- State of Knowledge for the Use of Asphalt Mixtures with
 - Reclaimed Binder Content (FHWA-HIF-18-059), 2018 https://www.fhwa.dot.gov/ pavement/pubs/hif18059.pdf
- Resource Responsible Use of Reclaimed Asphalt Pavement in Asphalt Mixtures (FHWA-H<u>IF-22-003</u>), 2021 https:// www.fhwa.dot.gov/pavement/ asphalt/pubs/hif22003.pdf

While PennDOT does not place an upper limit on the amount of RAP



A RAP stockpile in Southwestern Pennsylvania. Photo: PA Asphalt Pavement Association

allowed, the statewide average RAP content of PennDOT mixes is only 19%, which is relatively low compared to other RAP being processed. Photo: PA Asphalt states that routinely use higher RAP contents. As noted in



Pavement Association

the most recent FHWA Tech Brief (HIF-22-003), some states are successfully using high percentages of RAP (as much as 50% RAP) without compromising performance.

Second, RAP is a valuable resource and can reduce the cost of an asphalt mix. An asphalt mix with 21.1% RAP can save an average of \$7.80 per ton of mix. Shouldn't you take advantage of these cost savings for your taxpayers?

Third, RAP is the most recycled material in the United States and 100% of the RAP removed can be reused in new asphalt pavements. Therefore, RAP is not just an economical choice, it is also a sustainable choice. There is a finite amount of quality aggregate in Pennsylvania, yet the aggregate in RAP has already met material specifications. By using RAP to replace a percentage of virgin aggregate and virgin binder in the mix, the strain on these finite resources is reduced. Furthermore, the greenhouse gas emissions (GHG) associated with extracting and transporting these materials to the asphalt plant as well as the carbon footprint

of the mix is reduced.

Fourth, as good stewards of the environment, reducing our carbon footprint and slowing the earth's global warming potential is something to which we should aspire. Doing so can save you money and will get you ready to deal with soon-to-be-enacted green procurement practices on the state and federal level. Sooner



A contractor manages a RAP stockpile. Photo: PA Asphalt Pavement Association

or later, the practice of requiring green construction materials will reach the local level. PennDOT is currently developing a green construction material policy that will involve the requirement of a material supplier providing an Environmental Product Declaration (EPD) (EDC-7: EPDs for Sustainable Project Delivery | Federal Highway Administration (dot.gov) https://www.fhwa.dot.gov/ innovation/everydaycounts/edc 7/sustainable epds.cfm for each construction material (steel, glass, concrete and asphalt mix) that is procured for a construction project. They are mandated to facilitate this via the Inflation Reduction Act. So, one of the ways asphalt mix producers can and are reducing their carbon footprint is by putting RAP in most if not all of their mixes. Doing so via proper design and performance testing of the mix will allow for higher RAP mixes that will perform as well or better than virgin mixes and permit the reuse of this valuable resource - RAP - and at the same time reduce GHG emissions, and save money.

2024 Build a Better Mousetrap Innovation Challenge

Recognizing Innovative Inventions and Improvements

PennDOT Local Technical Assistance Program



Do you ...?

Have a new idea for addressing a common problem?

Have a unique reuse or repurposing of older equipment?

Want to show off a unique process that saves time or money?

Show Us Today!

Just send the following to LTAP:

- Municipality, County
- Contact Name, Phone, and Email
- Name for Innovation
- Brief Description
- A Photo or Video More are welcome!

Email: ltap@psats.org **Fax:** 717-763-9732

Mail: PennDOT LTAP c/o PSATS Attention: Karen Atkinson 4855 Woodland Drive Enola, PA 17025

Deadline: January 3, 2024

Questions?

Karen Atkinson can help! Call: 717-763-0930, ext. 156 Email: katkinson@psats.org.

Application on the website November 1, 2023 Submissions due March 1, 2024.

LTAP website: https://gis.penndot.gov/ltap



Phone: 1-800-FOR-LTAP
Email: LTAP@pa.gov

PA LTAP is looking for innovations that municipal employees or road crews designed, built, or adapted through use of technology. It can be anything from the development of tools and equipment to modifications to processes that increase safety, reduce costs, or improve efficiency or the quality of transportation. Technological innovations and unique use of new tools such as drones, apps, computers, smartphones, tablets, etc., are welcome.

Upcoming LTAP Training

Archived Training: Catch up online!

Recorded sessions and handouts from previously held drop-ins and webinars are available on the LTAP website, **gis. penndot.gov/ltap**. Sessions cover a variety of topics from asset management to truck restrictions. Check out the full list online and take advantage of this free training from the comfort of your home or office.

Classes are being held in person and virtually. Check the website, **gis.penndot.gov/ltap**, for the latest listing. If you would like to receive email alerts about upcoming training, send a request to ltap@pa.gov. Here is a sampling of upcoming scheduled classes. *All classes are free!*

Course Handouts Are Now Online

Did you misplace a workbook or handout from a course? Do you wish you had the handouts in an electronic format? All the handouts from LTAP courses are now online and available for download. Go to **gis.penndot.gov/ltap** and under the Course Descriptions tab, click on the course and then scroll to the bottom of the course information to see a list of course handouts.

New Courses

If the handout for a class is six slides to a page, there is a full PowerPoint workbook you can download on the website. These have the PowerPoint slides with the workbook content below the slide. They are designed to make it easy to follow the virtual classes and provide all the notes for the in-person classes.

Check the website for new courses or reach out to your Planning Partner or LTAP to schedule a class at your facility.

Active Transportation Plans

November 8 - York County

Asset Management

November 2 – Schuylkill County

Bridge and Culvert Inspection for Municipalities

November 2 – Warren County November 9 – Mercer County

Drainage: The Key to Roads that Last

November 1 – Lancaster County

Introduction to Traffic Studies

November 2 – York County

Municipal Stormwater Facilities Program

December 6 - Virtual

Pedestrians and Crosswalks

November 1 – York County

Speed Limits and Speed Management

November 14 – Virtual

Stormwater Control Measures O&M

January 17, 2024 - Virtual

Unpaved and Gravel Roads Common Maintenance Practice

November 14 - Clarion County

Winter Maintenance

November 15 – Lancaster County

Winter Maintenance Planning

November 1 – Schuylkill County

Congratulations to the following Roads Scholars!

The following scholars were certified between June 1 and August 31, 2023

Roads Scholar I:

- Justin Gathercole, East Fallowfield Twp., Chester County
- John S. Tallon Jr., West Goshen Twp., Chester County
- Eric Bemesderfer, Upper Allen Twp., Cumberland County
- Nicholas R. Boyd-Chisholm Sr., Upper Allen Twp., Cumberland County
- Mark A. Sostar, Penbrook Borough, Dauphin County
- Brandon J. Pecora, Mount Joy Borough, Lancaster County
- Cody Ashlock, City of Philadelphia, Philadelphia County
- Michael Geoghan, City of Philadelphia, Philadelphia County
- Richard Kelly II, City of Philadelphia, Philadelphia County

Roads Scholar II:

• Anthony J. Lombardo, East Hempfield Twp., Lancaster County

Roads Scholar Administrative:

- Joseph Kauer, Borough of Bridgeville, Allegheny County
- Matthew J. Decker, New Hope Borough, Bucks County
- Mark A. Sostar, Penbrook Borough, Dauphin County

Roads Scholar Police:

• Michael Jenkins, Montgomery Twp., Montgomery County

Roads Scholars, Share the News! LTAP has a press release you can modify and use to announce your accomplishment to your local media. To obtain a copy of the release, go to **gis.penndot.gov/ltap** and look for the release under "Roads Scholar Program."



LTAP Contact Information:

400 North Street, 6th Floor, Harrisburg, PA 17120 1-800-FOR-LTAP (367-5827) Fax: (717) 783-9152 Email: Itap@pa.gov Web: gis.penndot.gov/ltap

All LTAP services are free to municipalities.