



moving FORWARD

SUMMER 2024

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

Upper Providence Township, Delaware County Detour Change Success Story

by Marvin Ta, P.E.

LTAP worked with Mareile Watson, Upper Providence Township manager, and Dave Montella, chief of police, to help with a traffic problem on S. Ridley Creek Road (T348). Due

to a county bridge reconstruction project on Manchester Road, Delaware County established a detour on S. Ridley Creek Road as seen in Figure 1. Due to the detour, the township expressed safety concerns related to speed and volume on S. Ridley Creek Road (see Figure 2), which is a township residential road posted at 25

miles per hour (mph) with an estimated volume of 300 vehicles per day (vpd) per PennDOT's Traffic Information Repository. To determine whether there are traffic calming concerns on S. Ridley Creek Road due to the detour (see Figure 3), LTAP worked with the township to install a radar traffic counter collecting both speed and volume data. The data showed that S. Ridley Creek Road now has a volume of 4,085 vpd and an 85th percentile speed of 35 mph, significant increases due to the detour. Per PennDOT's Pennsylvania's Traffic Calming Handbook, Publication 383, when speeding is the primary concern, the 85th

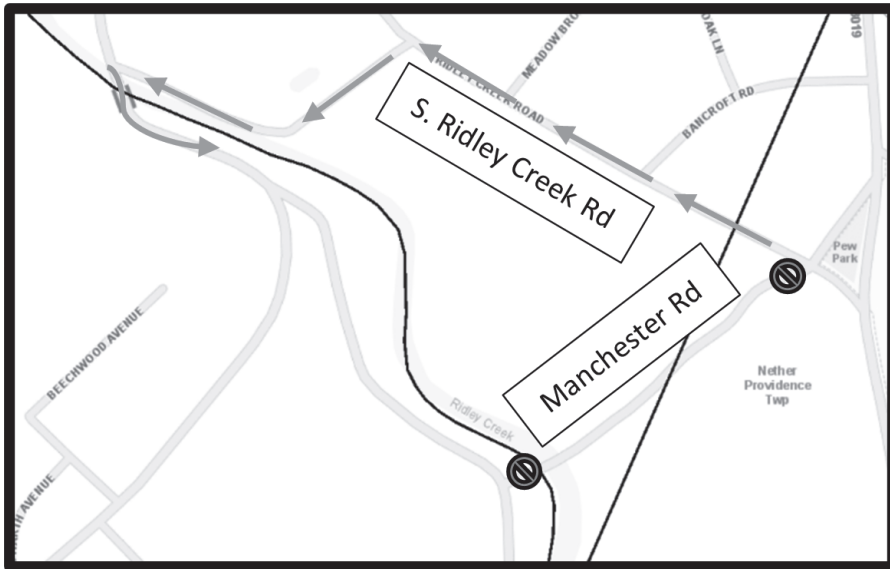


Figure 1 is an aerial view of the study area. Graphic: PennDOT LTAP



Figure 2 shows S. Ridley Creek Road, a narrow rural residential road. Photo: PennDOT LTAP

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Why Use GIS: Leveraging a Powerful Tool for Effective Municipal Transportation and Infrastructure Asset Management

by Jerry Jameson, Cedarville Engineering Group

Integrating Geographic Information Systems (GIS) into the realm of public works can be a game changer for Pennsylvania municipalities. GIS technology offers local governments a powerful toolset for managing infrastructure assets. Particularly in the multifaceted domain of transportation asset management, GIS stands out as an indispensable tool that can help maintain institutional knowledge, improve efficiency and responsiveness, and help inform important decision-making.

The benefits of using GIS to manage your transportation assets are manifold and far-reaching. At the forefront is the ability to streamline roadway maintenance operations. Through GIS, municipalities can meticulously catalog road and infrastructure conditions, track maintenance activities, and prioritize repairs and work based on real-time data. This proactive approach minimizes disruptions, enhances safety, and can prolong the lifespan of infrastructure assets.

It can also be a valuable tool in simply cataloging what the municipality owns. Sign maintenance, a vital aspect of municipal public works, gets a significant boost from GIS integration. GIS facilitates the systematic inventorying of signage assets, including their location, condition, and compliance status. By centralizing this information within a GIS platform, municipalities can ensure regulatory compliance, expedite maintenance tasks, enhance overall roadway safety, and document those pesky signs that always seem to need to be reset.

Addressing localized flood concerns and stormwater management is another critical area where GIS shines. By integrating hydrological data into GIS platforms, municipalities can model flood scenarios, identify vulnerable areas, and implement targeted mitigation measures. From green infrastructure projects to stormwater retention ponds, GIS enables municipalities to design resilient infrastructure solutions that mitigate flood risks and enhance community resilience.

Culverts, which are an essential component of the drainage infrastructure needed to keep roads safe and passable during storm events, are subject to wear and degradation over time. GIS enables municipalities to monitor the condition of culverts, identify maintenance or capacity enhancement needs, and prioritize rehabilitation efforts. By proactively managing culvert assets using GIS, municipalities can mitigate flood risks, prevent costly infrastructure failures, and safeguard travelers against the adverse impacts of stormwater runoff.

GIS is indispensable for keeping roads free from hazards, particularly during inclement weather. Snow plowing operations, for instance, benefit immensely from GIS-based route

A Geographic Information System (GIS) is a system that creates, manages, analyzes, and maps all types of data. GIS connects data to a map, integrating location data (where things are) with all types of descriptive information (what kind of things are at that location). This provides a foundation for mapping and analysis that can help municipalities keep track of assets, understand patterns, and give geographic context to municipal challenges and opportunities. The benefits include improved communication and efficiency as well as better management and decision making.

optimization and real-time tracking capabilities. By harnessing GIS technology, municipalities can deploy snow removal resources more effectively, minimize downtime, and ensure uninterrupted access to essential services during winter storms.

Ensuring the safety of all travelers is paramount for Pennsylvania municipalities. GIS plays a crucial role in this regard by facilitating the analysis of crash data, identifying high-risk areas, and implementing targeted interventions to improve road safety. From traffic calming measures to enhanced signage placement, GIS empowers

municipalities to implement evidence-based strategies for accident reduction and injury prevention.

GIS excels at planning a comprehensive and efficient transportation network. Municipalities can utilize GIS to analyze traffic patterns, identify congestion hotspots, and optimize transportation routes for maximum efficiency. GIS can also be used to help identify gaps in the multimodal transportation network and help plan for pedestrian and bicyclist facilities like sidewalks, bike lanes, and trails. This data-driven approach not only enhances mobility but also reduces environmental impact and enhances the quality of life for residents.

Perhaps one of the most compelling reasons for municipal adoption of GIS is the remarkable ease of use that modern GIS platforms offer. Gone are the days of complex, hard-to-use GIS systems accessible only to highly trained technicians. Today's GIS solutions are user-friendly, intuitive, and designed to empower non-technical users. Municipal staff can effortlessly navigate GIS interfaces, use data collection tools, access critical data layers, and perform complex analyses with just a few clicks. This accessibility,

LTAP 2024 New Classes

In early 2024, LTAP completed four new half-day courses. All the courses are available virtually and may be requested for onsite delivery. On the home page of the LTAP website, look under “Upcoming Training” on the right side of the page for classes being held in your area or offered online. If you are not finding the class, reach out to LTAP at ltap@pa.gov or 1-800-FOR-LTAP or your planning partner to schedule a class.

School Transportation Management, eligible for Roads Scholar II, Roads Scholar Administrative, Roads Scholar Police

This course provides municipalities with a basic understanding of transportation management issues in and around schools. The course will identify key issues and outline tools and techniques available to mitigate them. At the end of this course, attendees will be able to:

- Understand the common transportation issues around schools.
- Understand the purpose of official school zones in Pennsylvania and how they are properly established.
- Apply solutions to manage congestion and safety concerns during school pickup and drop times.

Trucks on Local Roads: Issues and Solutions, eligible for Roads Scholar II, Roads Scholar Administrative, Roads Scholar Police

Truck traffic on local roads is a difficult balancing act for many municipalities in Pennsylvania. While trucks need access to pick-up and deliver the goods that are necessary for everyday life and the economy, many local roads are not suitable for truck travel. Furthermore, recent changes to State Law in Act 31 of 2018 add more complications.

This class will:

- Review current state laws and regulations on truck access and restrictions.
- Discuss the traffic study requirements and options for restricting truck traffic.
- Examine real local truck traffic issues, problems, and solutions.
- Explore planning approaches for trucks, including land use, the roadway network, and ordinances.

Drones: Municipal Transportation Uses, eligible for Roads Scholar I, Roads Scholar Administrative, Roads Scholar Police

This course introduces attendees to the basics of unmanned aerial vehicles (UAVs) with a focus on municipal program uses. Also known as unmanned aerial systems, these device are most often called drones. Participants will learn the variety of types and pertinent uses of the drones such as bridge/building inspections, roadway pavement visual condition assessments, and more. The course will introduce the governing regulations for use. Equipment data collection capabilities and costs will be reviewed. Note, this course is not intended to teach actual operation techniques of drones; its focus is basic drones understanding toward municipal utilization and program development planning.

Geographic Information System (GIS) Basics, eligible for Roads Scholar I, Administrative

This course is for municipalities interested in learning about Geographic Information Systems (GIS) and how technology may be able to assist them in increasing efficiency and reducing costs for asset management and transportation planning. Common goals and objectives of municipalities often include improving

communication and transparency between staff, elected officials, and the public, effectively transferring institutional knowledge as staff changes, recording maintenance history, and automating inspection processes. This LTAP training provides the attendees with the opportunity to see how to interact with different types of interactive GIS web map applications. Additionally, the class provides an introduction of how applications are created and how data is collected and maintained.



Patrick Wright teaching a class in Lancaster County. Photo PennDOT LTAP

Impact of environmental factors on personnel safety Q&A

What safety factors should we discuss as we transition into summer maintenance activities?

Occupational factors include both the work environment and the work you are doing. The temperature, humidity, and direct sunlight are all factors to pay attention to in the work environment. In addition, the physical exertion required for your job can contribute to your risk for heat-related issues as you transition into working in the hotter temperatures.

What are some specific safety issues we should be aware of?

The most obvious is sunburn but you also need to be aware of heat exhaustion which could lead to heat stroke if untreated.

What are the symptoms of heat exhaustion?

Symptoms of heat exhaustion include heavy sweating, paleness,

muscle cramps, tiredness, weakness, dizziness, headache, nausea or vomiting, and fainting.

What do you recommend if you suspect someone is suffering from heat exhaustion?

Basic treatment is to help the victim to cool off by taking them to a shaded area and having them slowly hydrate themselves with water as they rest. Always document this and seek medical attention if symptoms worsen or last longer than one hour.

What effect does humidity have when working on a hot day?

When the air is humid, it contains a higher amount of moisture, which affects how efficiently our body can cool down through sweating. This makes you more prone to heat exhaustion and heatstroke.



Take breaks and hydrate when working in the heat.

Where can we find more information on working outside when the temperatures get hotter?

The Occupational Safety and Health Administration (OSHA) has a heat safety tool to calculate the heat index indicating the risk factors for various temperature and humidity. The app allows workers and supervisors to calculate the **heat index** for their worksite, and, based on the heat index, displays a **risk level** to outdoor workers as well as other information. For more information reference: [Heat Safety Tool | Occupational Safety and Health Administration \(osha.gov\)](https://www.osha-slc.gov/heat-safety-tool).

Why Use GIS *continued from page 2*

along with the abundance of free open-source data, democratizes GIS, enabling personnel across departments to leverage its capabilities for informed decision-making.

GIS is a powerful tool for Pennsylvania municipalities tasked with managing transportation assets and infrastructure. Its ease of use, coupled with its many benefits ranging from streamlined maintenance operations to enhanced safety and resilience, makes GIS indispensable in the modern public works landscape. By embracing GIS, municipalities can unlock new levels of

efficiency, effectiveness, and sustainability in managing their transportation and infrastructure assets.

Interested in getting started with GIS or enhancing your current program? LTAP can assist with tapping into this valuable resource. Email LTAP at ltap@pa.gov, call 1-800-FOR-LTAP, or put in a tech assist through the LTAP at website <https://gis.penndot.pa.gov/ltap/>.

2024 Build a Better Mousetrap Innovation Challenge

FIRST PLACE

Saw Mounted on Loader “Fire Chicken”

North Codorus Township
York County

Contact Person: Travis J. Shearer, Roadmaster
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What was the challenge? The township was tasked with daylighting (removing the tree canopy) within the right-of-way of township roads. This process keeps the roads dryer to extend the pavement life and reduces potential icy spots in the winter. To do this task, a bucket truck was used to elevate an employee off the ground. This puts the employee in a dangerous situation with the risk of falling and injury due to using a hand-held saw in an elevated position and the potential for falling debris hitting the person. The operation was slow as a person was raised in the bucket into a position so they could cut the limb, the limb had to be secured, and then lowered after being cut. The entire process was time-consuming and potentially hazardous.

How did you develop and implement your solution? The township’s road department staff discussed the issue and determined that a ground-based equipment-mounted solution would be the safest and most efficient approach. This would reduce or eliminate the potential of falling, injuries from the saw, and being hit by falling debris. It could also increase the speed at which the task could be completed. Their invention was named the “fire chicken”.

What labor, equipment, plans, or material did it take to make the solution work? The design was thought out using a few sketches, ingenuity, scrap and surplus materials, and a trip to the government surplus to purchase saw blades. The steel which became the arms of the “fire chicken” was salvaged from the township yard. The hydraulic pump was from an old salt spreader and the saw blades are government surplus. With the purchase of some hydraulic lines and fittings the road crew fabricated the ground-based limb cutter.

It was designed to fit on a loader. The arm is angled so the operator can see where they are going and keep clear of any falling debris. The blade spins at about 400-500 rpm unlike a conventional saw which spins at approximately 3,000 rpm. The initial design had a full blade guard, like a weed wacker. This guard severely obstructed the operators view of the blade, so the design was modified into a cage-type guard which contains the blade in the event of a connection point failure.



The blade used on the “fire chicken” spins at about 400-500 rpm. Photo: North Codorus Township, York County



The “fire chicken” was designed to be mounted on a loader. Photo: North Codorus Township, York County

What was the cost of implementation? Altogether, the cost was about \$200 for new parts in addition to the salvage materials. A total of about 40 hours went into the design, gathering of materials, and fabrication.

What was the positive impact/result/outcome of your efforts? To complete the daylighting task the person running the saw is now inside a cab and not in a bucket holding a saw. This environment reduces the risks of accidents and injury. The “fire chicken” also increased the crew’s efficiency so they can daylight more road miles in the same amount of time. The task efficiency and increased pavement life stretch the township’s road dollars. The community benefits by having dryer, safer roads that last longer.

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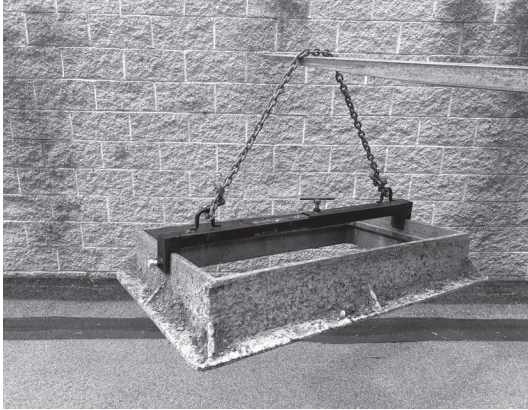
Build A Better Mousetrap *continued from page 5*

RUNNERUP

Storm Basin Frame Lifter

Peters Township
Washington County

Contact Person: Jared A. Scott
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The township designed a tool to safely and conveniently lift storm basins for maintenance. Photo: Peters Township, Washington County

What was the challenge? The challenge facing the road department was safely lifting the frames to make repairs to the storm water basins. Staff used clamps to lift and remove the frames and on occasion the clamps would slide and the frame would become unbalanced. The result was to set it back down and completely adjust the clamps and lifting points. The township needed something that was safer and more consistent to do the job more efficiently.

How did you develop and implement your solution? The township welding shop needed a major overhaul and was looking for things to fabricate to use existing material. Staff knew the materials would be on hand so the only cost associated with the frame lifter would be labor. The fabricators designed the lifter to be adjustable and so it can be used to lift a lot of things other than the basin frames. The lifter can be used with any equipment, including the crane on the utility trucks to make projects easier.

What labor, equipment, plans, or material did it take to make the solution work? The labor hours involved in the fabricating of the project totaled approximately 16 hours. It was completed in one-and-a-half days and painted during the afternoon of the second day. Materials used include square tubing, square bar, angle, ¾-inch bolts and nuts, and black and red paint.

What was the cost of implementation? There was zero costs of materials to fabricate the frame lifter as all the materials used were on hand. The labor costs were approximately \$480.

What was the positive impact/result/outcome of your efforts? The main benefit of the frame lifter is safety and convenience. The tool makes the overall project of reconstructing storm basins a lot easier and definitely safer for our crews. Something that seemed so simple was an ongoing issue and this “tool” has benefited our department in a great way.

RUNNER UP

The Un-Reeler - Coiled Pipe Un-Reeler & Back Saver

Lewis Township
Lycoming County

Contact Person: Charles E. O’Brien, Jr.
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The Un-Reeler assists with the transport and installation of both 100 feet long reels of 6 inch diameter underdrain and 60 feet long reels of 8 inch diameter underdrain. Photo: Lewis Township, Lycoming County

What was the challenge? The township staff faced challenges overcoming friction when uncoiling underdrain piping for installation on tar-and-chipped roads. The underdrain is installed to improve subsurface drainage, protect the roadway, and extend the pavement life.

Back injuries are a problem for employers across the county; the township is no different. Due to limited staff and an aging workforce (50s through 70s), a tool that would make the task of unrolling large coils of perforated piping easier and reduce the risk of back injury was needed.

How did you develop and implement your solution? The township developed and implemented the solution by harnessing our mechanical aptitude. Both typical sizes of coils were measured so the tool could be used with both six- and eight-inch underdrain pipe. After the initial plan, staff checked the shop for scrap materials and developed a sketch and went to work building the Un-Reeler.

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Detour Change *continued from page 1*

percentile speed should exceed 10 mph over the posted speed limit before traffic calming is considered. Another minimum requirement is if the volume exceeds 1,000 vpd.

As a result of this data collection, the township was able to work with the county to revise the existing detour off S. Ridley Creek Road due to the impacts of traffic, maintenance, and quality of life. Therefore, traffic calming was not necessary.

Need help with temporary traffic control or traffic calming in your municipality? Call 1-800-FOR-LTAP or email us at LTAP@pa.gov. For more information, check out the Temporary Traffic Control Course and Traffic Calming Course.



Figure 3 shows where the road closure was and the detour onto S. Ridley Creek Road.

Photo: PennDOT LTAP

Registration is Open Roadway Management Conference -2024



The RMC is relevant to practitioners who manage, design, construct, and maintain state, county, and municipal roads and streets.

RMC2024.org

October 23-25, 2024

**Atlantic Sands Hotel & Conference Center
Rehoboth Beach, Delaware**



Build A Better Mousetrap *continued from page 6*

What labor, equipment, plans, or material did it take to make the solution work? The design was fairly simple and utilized welded two-by-two inch steel tubing as the frame, adding three-inch diameter Schedule 40 PVC pipe over the top to reduce friction, the main stem has a piece of 1/8-inch plate steel (four-inch diameter) added as a cap to keep the coil from slipping off.

The Un-Reeler fits over any excavation bucket and allows for easy transport and installation of both 100-foot-long reels of six-inch diameter underdrain and 60 feet long reels of eight-inch diameter underdrain.

All the equipment was available in the township's shop, including a portable band saw, welder, PVC saw, and power drill. All the materials were scrap, readily available in the shop. Ten feet of two-by-two inch square steel tubing, seven feet of three-inch schedule 40 PVC pipe, one piece of 1/8-inch plate steel, one 1/2-inch bolt and nut was used.

What was the cost of implementation? The township has no material cost invested into the project as everything was salvaged material from the shop. A total of two hours was invested into the fabrication.

What was the positive impact/result/outcome of your efforts? This invention reduces installation time by increasing the efficiency of uncoiling the spools in a minute and reduces the potential of back injuries. Due to the task being easier, staff are able to do more work in a day to lay the pipe.

Resources:

- PennDOT's Traffic Information Repository (TIRe) <https://www.arcgis.com/home/item.html?id=c4131f4e2205424aadc337ad989d80c9/1000>
- PennDOT's *Pennsylvania's Traffic Calming Handbook*, Publication 383 <https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20383.pdf>
- Tech Sheet 205 Temporary Traffic Control Guidelines Update PennDOT Publication 213 https://gis.penndot.gov/BPR_PDF_FILES/Documents/LTAP/TechSheets/TS_205_Update_Temporary_Traffic_Control_Guidelines.pdf

Upcoming LTAP Training

Classes are being held in person and virtually. Check the website, gis.penndot.pa.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!**

Bridge and Culvert Inspections for Municipalities

August 20, 2024 – Blair County

Geographic Information System (GIS) Basics

October 24, 2024 – Pike County

Posting and Bonding on Local Roads v.II

September 10, 2024 – Cambria County

Public Works Safety

November 6, 2024 – Potter County

Road Surface Management v.II

September 17, 2024 – Lycoming County

Speed Limits and Speed Management

September 13, 2024 – Huntingdon County

Traffic Calming

October 29, 2024 – Lycoming County

Traffic Signs Basics

September 18, 2024 – Lancaster County
October 17, 2024 – Somerset County

Winter Maintenance

October 8, 2024 – Berks County

November 12, 2024 – Lycoming County

Winter Maintenance Planning

October 9, 2024 – York County

October 11, 2024 – Erie County

October 16, 2024 – Crawford County

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

Archived Training: Catch up online!

Recorded sessions and handouts from previously held drop-ins and webinars are available on the LTAP website, gis.penndot.pa.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.

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.pa.gov/LTAP and under the Training Descriptions tab, click on the course and then scroll to the bottom of the course information to see a list of course handouts.

Congratulations to the following Roads Scholars!

The following scholars were certified between January 1 - April 30, 2024.

Roads Scholar I:

- Seth Pulver – McKees Rocks Borough, Allegheny County
- Meghan L. Simoneaux – Pittsburgh City, Allegheny County
- Lane T. Brown – Ferguson Township, Centre County
- Derrick J. Resse – Half Moon Township, Centre County
- Timothy Matthew Steele – Ferguson Township, Centre County
- Chris B. Nalepa – West Goshen Township, Chester County
- Nathan D. Yarnall – West Whiteland Township, Chester County
- Wade Greene – Monroe Township, Cumberland County
- Aaron Pasetti – Haverford Township, Delaware County
- Gary Pasetti – Haverford Township, Delaware County
- Stan Cupp - Lower Macungie Township, Lehigh County
- Dan Hollingsworth – Lewis Township, Lycoming County
- Emily Mrochko – Montoursville Borough, Lycoming County
- Calvin Kern – Dover Township, York County

Roads Scholar II:

- Meghan L. Simoneaux – Pittsburgh City, Allegheny County
- Mike Huges – London Grove Township, Chester County
- John S. Tallon Jr. – West Goshen Township, Chester County
- Nathan D. Yarnall – West Whiteland Township, Chester County
- Patrick J. McVeigh – Silver Spring Township, Cumberland County
- Evan Zeiders – PennDOT, Dauphin County
- Aaron Pasetti – Haverford Township, Delaware County

- Gary Pasetti – Haverford Township, Delaware County
- Anthony J. Fuga Jr. – Jermyn Borough, Lackawanna County
- Tyler J. Clinton – Mount Joy Borough, Lancaster County
- John P. Stine – Mount Joy Borough, Lancaster County
- Stan Cupp – Lower Macungie Township, Lehigh County
- Suzanne K. Dobel – Lower Macungie Township, Lehigh County
- Colby M. Ambrose – Dover Township, York County
- Calvin Kern – Dover Township, York County

Roads Scholar Administrative:

- David Fromm – Pittsburgh City, Allegheny County
- Greg Watts – Derry Township, Dauphin County
- Gary Van Deutsch – Dallas Township, Luzerne County
- Richard Bailo – Delaware Township, Pike County

Roads Scholar Administrative:

- Scott A. Firestone – South Londonderry Township, Lebanon County
- Chad E. Martin – Hanover Borough, York 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.pa.gov/LTAP and look for the release under "Roads Scholar Program."

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All LTAP services are free to municipalities.