



moving FORWARD

WINTER 2024

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

Pennsylvania Hosts 2023 Roadway Management Conference

Last October, nearly 250 transportation practitioners from eight states who manage, design, construct, and maintain state, county, and municipal roads attended the Roadway Management Conference (RMC) at Seven Springs. Hosted by the five Mid-Atlantic Local Technical Assistance Program (LTAP) Centers, the RMC is an annual event designed to help attendees learn the skills, practices, and innovative methods to safely, efficiently, and effectively maintain local transportation assets.



Mastic was demonstrated to repair a larger crack. Photo: Mid-Atlantic RMC

Virginia Local Technical Assistance Program. The five centers make up the Mid-Atlantic LTAP Region.

The RMC hosted 18 workshops, eight keynote speakers, 16 vendors, and two afternoons of live outdoor demonstrations. Attendees heard from LTAP instructors, Department of Transportation technical experts, PennDOT leadership, and many industry experts during the three-day conference.

PennDOT Deputy Secretary for Planning Larry Shifflet welcomed the group with a message about taking the opportunity to network and exchange information, as the RMC is a unique opportunity to collaborate with nearly 250 peers from various states. PennDOT Executive Deputy Secretary Cheryl Moon-Sirianni provided a comprehensive overview

Save the Date Roadway Management Conference -2024



October 23-25, 2024
Atlantic Sands Hotel & Conference Center
Rehoboth Beach, Delaware



<https://roadwaymanagement.wixsite.com/home>

Pennsylvania hosted this year's conference, which rotates through the other Mid-Atlantic LTAP Centers, including the Delaware T2/LTAP Program, Maryland Transportation Technology Transfer Center, Virginia Local Technical Assistance Program, and West

ALSO IN THIS ISSUE

- Roundabouts..... 2
- Transportation News..... 3
- Midblock Crosswalks 4
- STIC..... 5
- Build A Better Mousetrap 7
- Upcoming Training..... 8
- Roads Scholars..... 8



Everyone has potholes. Participants learned about some easy-to-use materials. Photo: Mid-Atlantic RMC

Continued on page 3

Roundabouts

Increasing Traffic Safety and Efficiency

By Jason Stimmel, P.E.

'Ins and Outs' of Roundabouts

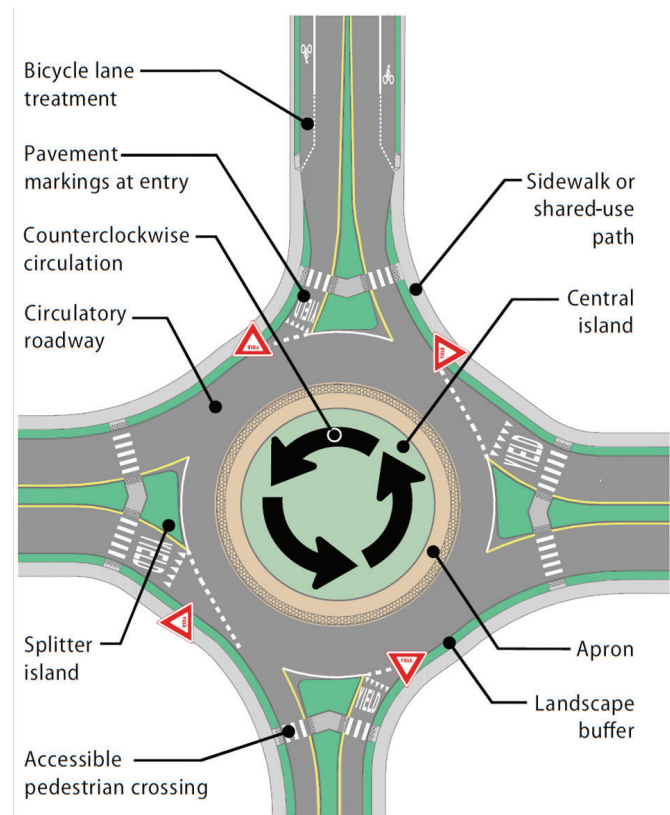
A roundabout is a type of circular intersection that does not require vehicles to stop before entering the intersection; entering traffic must instead yield to circulating traffic allowing for continuous traffic flow through the intersection. Do not confuse a roundabout with a traffic circle! Traffic circles are generally larger in size, entering traffic or circulating traffic is controlled with stop signs or traffic signals, internal circulation may be bi-directional, parking may be present, and pedestrians can be accommodated within the center. Whereas roundabouts all have the following essential characteristics:

- Traffic **ONLY** travels counterclockwise around a center island.
- Vehicles entering must slow down and yield to traffic already in the roundabout, which may require stopping.
- Circulating traffic has the right-of-way and does not stop.
- Pedestrian access is accommodated on the outside, with crossings accommodated behind the yield line on the approaches to the roundabout. The center island is not for pedestrians.
- Raised or painted "splitter islands" separate entering and exiting traffic and provide refuge areas for crossing pedestrians.
- A truck apron is provided around the central island for the rear tires of semi-trucks to track over.
- No parking is allowed within the roundabout or at the entries.

If any of the above listed roundabout characteristics are not met, the circular intersection is not considered a roundabout.

Roundabouts have been widely and successfully used

in other countries for decades, and since the mid-1990s roundabouts have become increasingly more prevalent in the United States. PennDOT built its first roundabout in 2005 and has been supporting the implementation of them since then. Municipalities across the state have started embracing roundabouts more recently. There are 78 roundabouts statewide in operation on state routes, with more currently either in design or under construction. In fact, PennDOT now requires roundabouts to be evaluated for all significant intersection projects during the planning phase as part of the department's Intersection Control Evaluation policy.



Elements of Roundabout Design (Image courtesy of FHWA) The image from the Federal Highway Administration details the elements of roundabout design.



Linglestown Roundabout / Linglestown Road (PA-39)

The image shows the roundabout at Linglestown Road (Route 39) in Lower Paxton Township, Dauphin County. Photo: PennDOT

Safety and Operational Benefits

Roundabouts are recognized as one of the safest types of intersections, improving safety in comparison to other at-grade intersection types due to fewer conflict points, slower speeds, and easier decision making. This is accomplished by the geometric design of roundabouts, which restricts all vehicle movements to right-turns only (eliminating conflict points – where vehicle movement paths cross that result in angle and head-on crashes) and reduces vehicle speeds to below 30 mph. It is these principal operational characteristics of roundabouts that result in reducing the severity of crashes, by virtually eliminating head-on and angle collisions (T-bone) and high-speed impacts that cause

Transportation News Briefs

LATEST INFORMATION FROM PENNDOT & OTHERS

What's New in New Products for Local and Low-Volume Roadways?

PennDOT Publication 447

Over the past few years, the inclusion of smaller aggregate (#9M or ¼ inch), fog seal on a chip seal or the use of paving fabrics under a double chip seal have helped municipalities across Pennsylvania improve their capabilities in maintaining roadways. PennDOT has researched these processes, found them to be beneficial, and approved them for use on low-volume local roads. Because of their approval, liquid fuels dollars can be used to pay for these treatments.

The staff responsible for the PennDOT "Pub 447, Approved Products for Lower Volume Local Roads," is beginning to study several — perhaps already known, but not approved — products and processes for potential inclusion in the Pub in the future.

For maintenance, the use of a scrub seal and a cape seal, which are variations of a conventional chip seal, are being studied and will be field tested during the 2024 calendar year. Once demonstration sites are established, the pilot areas will be evaluated for a few years to determine their capabilities and wear characteristics.

A scrub seal is an application similar to a chip seal treatment where asphalt emulsion and crushed rock are placed on an existing asphalt pavement surface. The only difference is that the asphalt emulsion is applied to the road surface and a series of brooms placed at different angles guide the asphalt emulsion into the pavement distresses (cracks) to ensure sealing of the road. This series of brooms, known as a "scrub broom," give the treatment its title, "scrub seal."

A cape seal is a combination treatment consisting of a chip seal covered with either a slurry seal or microsurfacing. Once the chip seal has been placed, the road should be reopened to traffic until a full cure has been obtained before placing the slurry seal or microsurfacing.

Slurry seals are established and proven treatments, but have never been approved for a combination use over a new chip seal. A slurry seal is the application of a mixture of water, asphalt emulsion, very fine aggregate, and additives to an existing asphalt pavement surface. A slurry seal is like a fog seal except the slurry seal has aggregates as part of the mixture.

PennDOT has partnered with PAAMA (Pennsylvania Association of Asphalt Material Applicators) to study the above processes.

On the paving side of road maintenance, the Pub 447 staff is working with the PAPA, (PA Asphalt Pavement Association) in updating a current standard special provision specification that PennDOT maintenance forces have used for several years with great success.

The material is a plant mix asphalt that uses a high quantity of RAP (Recycled Asphalt Pavement) and a 19-mm sized aggregate and is placed on the roadway at a minimum depth of 2.5 inches. It is a product that can be used to upgrade a roadway for heavier traffic loads or leveling out a rutted or bumpy rural road.

The use of RAP is suggested for roads with an Average Daily Traffic (ADT) of less than 5,000 vehicles a day because the SRL (Skid Resistance Level) may be unknown. A chip seal or microsurfacing layer is encouraged over the paved surface within one year with a material that will offer the SRL desired. The later application of the seal coat or microsurface will need to be factored in to estimate the full cost.

In the period from 2019 through 2023, more than 500,000 tons of RAP have been used in Pennsylvania by PennDOT and other sources and has proved to be effective.

The staff that maintains the Pub 447 is always looking for ideas that will help local governments with local road issues and solicits your input of a "new" material or process that will assist all local government agencies across Pennsylvania.

Contact Tom Welker at 717-783-3721 or twelker@pa.gov for additional information or suggestions. 📧

Roadway Management Conference *continued from page 1*

of the rebuilding of the Fern Hollow Bridge through a unique, streamlined, collaborative process after the bridged unexpectedly collapsed in January 2022.

PennDOT Secretary Mike Carroll closed the conference with a message of appreciation for all the thankless work that federal, state, and local road crews do without ever expecting praise or "spiking the football" over a job well done; the standard is getting

the job done correctly and professionally every single day.

To learn more about the topics presented at the 2023 RMC, go to <https://roadwaymanagementc.wixsite.com/home/2023-conference>, and click on "More Info" next to any agenda items to view a description of the presentation and access any handouts (including PowerPoint slides).

The 2024 RMC will be held from October 23-25 in Rehoboth Beach, Delaware. More information is available on the RMC website: <https://roadwaymanagementc.wixsite.com/home>.

PennDOT Midblock Crosswalk and Trail Crossing Policy Update

PennDOT has adopted a new policy in "Publication 46: Traffic Engineering Manual" to guide the location and design of midblock crosswalks and trail crossings. The new policy provides a consistent approach to installing traffic control devices at critical crossings of state and local roads in Pennsylvania to ensure the safety and comfort of all road users. The policy also provides clear procedures for requesting, installing, and maintaining midblock crosswalks and trail crossings. The new policy will replace Chapter 11, Section 9 of "Publication 46: Unsignalized Midblock Crosswalks."

The new policy provides guidance for midblock crosswalks and trail crossings on the following:

- Where to locate crossings,
- When it is necessary to install safety countermeasures at crossings,
- How to select the appropriate safety countermeasures at crossings, and
- General design guidance and best practices for crossings.



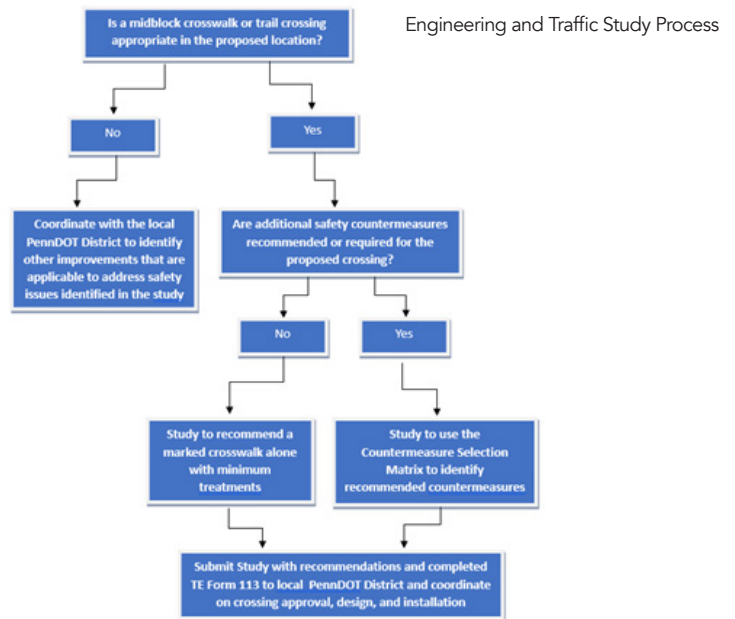
Midblock crosswalks are important for pedestrian access and safety (Canonsburg).
Photo: PennDOT LTAP

The new policy applies to all public roads in the commonwealth. PennDOT approval is required prior to the installation of any midblock crosswalk on a state highway, a local road with state or federal funding, or a federal aid roadway. PennDOT approval is also required if a traffic signal or flashing warning device permit is proposed for the crossing on a state highway or local road.

Engineering and Traffic Study

A critical component of the new policy is the requirement that an Engineering and Traffic Study be conducted for all proposed midblock crosswalks and trail crossings. The study will look at many different factors — posted speed, number of travel lanes, vehicle volumes, adjacent land uses, etc. — to determine if the proposed location is appropriate for a midblock crosswalk or trail crossing. The study shall demonstrate if key requirements (sight distance, distance to nearest marked crosswalk, and pedestrian volumes) are met for the proposed crossing location. Engineering judgement may be used to recommend a crossing if some key requirements are not met.

For crossing locations deemed appropriate for a midblock crosswalk or trail crossing, the study will use the new policy's Evaluation Matrix and Countermeasure Selection Matrix to determine if additional safety countermeasures are recommended or required and which safety countermeasures are appropriate. The completed study and associated [TE-113 form](https://www.dot.state.pa.us/public/PubsForms/Forms/TE-113.pdf) <https://www.dot.state.pa.us/public/PubsForms/Forms/TE-113.pdf> will be submitted to PennDOT for review and approval.



Minimum Crosswalk Treatments

The policy requires that the following treatments be installed at all mid-block and trail crossing locations:

- High Visibility Crosswalks,
- Warning Signs and Plaques, and
- Crosswalk Visibility Enhancements (as defined in [FHWA's STEP Guide](https://highways.dot.gov/safety/pedestrian-bicyclist/step/resources) <https://highways.dot.gov/safety/pedestrian-bicyclist/step/resources>).



Cumberland Valley Rail Trail crossing with minimum treatments. Photo: PennDOT LTAP

STIC Spotlight On the Road to Reducing Greenhouse Gas Emissions

STIC Looks to Pilot Cold Central Plant Recycle of Asphalt Flexible Pavements on Higher-Volume Roads

Pennsylvania's State Transportation Innovation Council (STIC) remains focused on moving forward innovations that increase the efficiency and resiliency of Pennsylvania's vast transportation system. Coupled with the goal of finding innovative ways to minimize the transportation industry's carbon footprint and decrease greenhouse gas (GHG) emissions, the STIC's Construction and Materials Technical Advisory Group (TAG) recently introduced Cold Central Plant Recycle (CCPR) of asphalt flexible pavements for higher-volume routes, which aims to do just that.

When it comes to asphalt pavements, there are two easy and effective ways to reduce carbon emissions. One is to increase the use of Reclaimed Asphalt Pavement (RAP) by putting more RAP into the asphalt mix; the second is to reduce the temperatures that are used to produce it.

CCPR of Asphalt Flexible Pavements does both. It uses 100% RAP, a material generated when asphalt pavements are removed for reconstruction, rehabilitation, or resurfacing and deemed of beneficial use by the Department of Environmental Protection, to create a new flexible asphalt base that provides almost the same structural capacity as a hot mix asphalt base while reducing carbon emissions. Additionally, as the name suggests, the material is mixed cold, meaning no heat is added during the process.

"CCPR is great for pavements that are in fair condition, where the pavement structure has moderate to severe distresses, but is not quite at the end of life, and the



A CCPR mix is being rolled; CCPR is placed and rolled just like traditional asphalt concrete. Photo: Mary Robbins

underlying materials are considered to still be in good condition," said Dr. Mary Robbins, director of technical services for the Pennsylvania Asphalt Pavement Association. "It is not meant to be a final wearing surface, so while it might be open to traffic during construction, it should be topped with an asphalt overlay or surface treatment."

CCPR takes RAP that is either milled from the project site and/or RAP that has been stockpiled previously, and it is mixed at a mobile cold recycling plant with a liquid, such as asphalt emulsion or foamed asphalt, and a small amount of cement, to create the new flexible asphalt base. It addresses some of the deeper distresses on roadways by focusing on the underlying materials, provides a longer life span than the typical mill and fill, and is more cost-effective.

To show that it is a cost-effective and sustainable solution for future use, the STIC Construction and Materials TAG is looking to pilot CCPR on higher-volume roads in PennDOT districts where most of the RAP is currently stockpiled. Projects using CCPR in Virginia on Interstates 64 and 81 saw significant cost savings and sections of those interstates completed in a much shorter timeframe.

The current PennDOT Pavement Policy Manual limits the use of CCPR to lower-volume routes, with less than 15,000 vehicles per day. However, the largest quantities of RAP in Pennsylvania are stockpiled in the urban areas, such as PennDOT's District 6, in the Philadelphia region, and PennDOT's District 8 in the Harrisburg region. By piloting this innovation on higher-volume roads, the Construction and Materials TAG is hoping to expand its use in the future. 🚧



This photo shows CCPR asphalt being mixed in a mobile cold recycling plant. Photo: Mary Robbins



**State Transportation
Innovation Council (STIC)**
(717) 772-4664

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

Roundabouts *continued from page 2*

the most severe injuries and fatalities. An added safety bonus is that roundabouts also translate into a safer environment for nonmotorized users such as pedestrians and bicyclists as well, due to the slower speeds at the approaches and the inclusion of median refuge areas which create two simple crossings of one-way traffic.

Both national and PennDOT studies on roundabouts have demonstrated reductions of 90% for fatal crashes, 75% for all injury crashes, 30 to 40% for pedestrian crashes, and 10% for bicycle crashes when compared to traditional signalized and/or stop-controlled intersections. In September 2023, PennDOT released data for 42 roundabouts on state routes at intersections that were previously stop or signal controlled. The 42 roundabouts reviewed all had at least three years of data available before and after the roundabout's installation. The review found that:

- Serious injury crashes were reduced by 24%,
- Non-serious injury crashes were reduced by 51%; and
- The total number of crashes dropped 3%.

Another benefit to roundabouts is they can manage about 30% more vehicles than a similarly sized signalized intersection during peak traffic flow conditions. During off-peak conditions, roundabouts cause almost no delay to drivers compared to traffic signals, which require drivers to stop and wait at a red light, resulting in delays to side-street and left-turning traffic from the major street no matter the time of day. The increase in capacity and efficiency (decreased delay) is due to the continuous flow operation of the roundabout.

Aesthetics and Environmental Benefits

While roundabouts serve a functional necessity as a form of intersection traffic control, aesthetically they also can have the added benefit of serving as a beautification element. Communities can install gardens, small trees, or landscaping in the center of the roundabout to serve as a gateway. However,

nothing should be placed in the central island that would attract pedestrians. Additionally, roundabouts provide environmental benefits from the reduction in vehicle delays and slower speeds, which results in improvements to air quality, lower fuel consumption, and less traffic-generated noise.

Life Cycle Costs

Roundabouts are not inexpensive – a ballpark cost estimate for a single lane roundabout is roughly \$1.5 to \$3 million to construct. However, they provide substantial cost savings over time; they have lower annual maintenance costs and eliminate traffic signal expenses. Think about this – if a storm knocks out power, a roundabout keeps functioning with no need to deploy police or emergency responders to direct traffic.

Roundabouts can still be controversial when first proposed, but several studies completed by the Insurance Institute for Highway Safety have shown that opposition generally falls over time as the public becomes more familiar with the systems and learns how to navigate the lanes. The biggest takeaway is the importance of establishing community engagement for projects where roundabouts are being planned and/or proposed. 🚧

Guidance Resources

- PennDOT Roundabouts Resource Webpage (<https://www.penndot.pa.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/Pages/Roundabouts.aspx>)
- Single-Lane Roundabouts Brochure (<https://www.dot.state.pa.us/public/PubsForms/Publications/PUB%20578.pdf>)
- NCHRP Report 1043 – Guide for Roundabouts (<https://www.trb.org/Publications/Blurbs/182939.aspx>)
- FHWA Roundabout Webpage (<https://highways.dot.gov/safety/intersection-safety/intersection-types/roundabouts>)



An example of aesthetic roundabout treatments can be seen in this image taken near Milton Hershey School. Photo: Pennoni and Milton Hershey School

Show Off Your Road Crew's Innovative Gadgets and Ideas by Entering the 2024 Build a Better Mousetrap Innovation Challenge

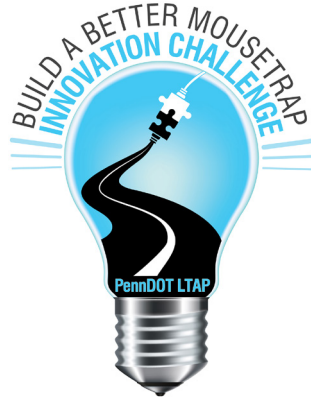
Has one of your employees recently built an innovative gadget or come up with a better way to do a job? If so, now is the time to show it off by entering the 2024 Build a Better Mousetrap Innovation Challenge.

Municipalities must use limited budgets and resources to serve the needs of residents and innovation can be the mission-critical factor that helps bridge that gap. Local road practitioners continually implement incremental changes in their processes, tools, and services to reflect changes in technologies and best practices. In their roles as innovators, municipal staff leverage their considerable creativity,

technical expertise, and diverse talent pool to suggest changes that are useful, valuable, and impactful to their local system. The Build a Better Mousetrap Innovation Challenge showcases the most clever and creative practices and tools from across the state. By sharing these innovations with one another, local road departments can adopt these new tools and practices, and deliver more efficient, cost-effective services to their communities.

LTAP is looking for innovations from municipal employees or road crews, such as 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, smart phones, tablets, etc., are welcome.

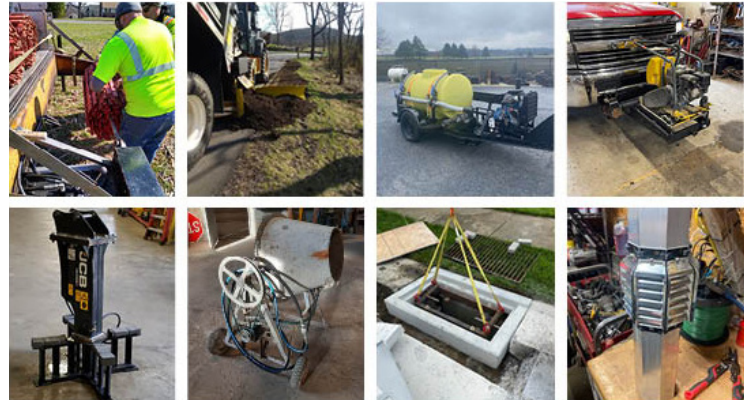
If you have an innovation to share with other municipalities,



submit your entry form by March 1, 2024. The LTAP Advisory Committee – a group made up of your peers – will judge the entry on recognized importance/impact, originality, applicability to others, cost effectiveness, time savings, agency or community benefit, and the overall quality of the application. The winners will be chosen in March and recognized at the annual conference of the winners' respective municipal association.

The top entries will be submitted to the national Build a Better Mousetrap recognition program. Winners of the national program will be announced at the annual LTAP national conference this summer.

To download entry forms for the 2024 Build a Better Mousetrap, go to gis.penndot.pa.gov/LTAP and click on "LTAP News/Events." under News. Complete the entry form and return it by March 3 to PennDOT-LTAP, c/o PSATS, 4855 Woodland Drive, Enola, PA 17025 or email it to katkinson@psats.org. For more information, call Karen Atkinson at (717) 763-0930, ext. 156. 📧



Midblock Crosswalk *continued from page 4*



The Capital Area Greenbelt trail crossing in Harrisburg showing a variety of treatments.

Photo: PennDOT LTAP

If you need assistance with a trail crossing or midblock crosswalk study or safety assessment, contact LTAP.

Safety Countermeasures

The policy provides a Countermeasure Selection Matrix to identify the appropriate safety countermeasures that may be installed in addition to minimum crosswalk treatments. The matrix includes the following safety countermeasures:

- Raised Crosswalk,
- Advance Yield Here to Pedestrians Sign/Yield Lane and Advance Warning Signage,
- Curb Extension,
- Pedestrian Refuge Island,
- Rectangular Rapid Flashing Beacon or Flashing Warning Device,
- Road Diet,
- Advance Warning Beacons,
- Grade Separation, and
- Traffic Signal. 📧

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!**

Americans with Disability Act (ADA)
February 21, 2024 – Virtual

Asset Management
March 5, 2024 – Schuylkill County

Drainage: The Key to Roads that Last
February 6, 2024 – Chester County

Geosynthetics
February 13, 2024 – Chester County

Temporary Traffic Control (Work Zones)
April 2, 2024 – Virtual

Temporary Traffic Control (Work Zones) Workshop
April 3, 2024 – Virtual

Traffic Calming
March 12, 2024 – Virtual

Traffic Calming Workshop
March 13 – Virtual

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.

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 Course 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 September 1 and October 1, 2023.

Roads Scholar I:

- Robert Deeds III – Hamburg Borough, Berks County
- Guy Bunteman Jr. – Lancaster Township, Lancaster County
- Tyler J. Clinton – Mount Joy Borough, Lancaster County

Roads Scholar II:

- Brian W. Rogers – Horsham Township, Montgomery County

Roads Scholar Administrative:

- Suzanne K. Dobel – Allentown City, Lehigh 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."



LTAP Contact Information:

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

All LTAP services are free to municipalities.

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

Please share this newsletter with others, including:

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

You can also direct them to the electronic version available at gis.penndot.pa.gov/LTAP.

