

State Transportation Innovation Council (STIC)

STIC Business Meeting

MEETING DATE: Wednesday, March 23, 2022

TIME: 9 a.m. – 11 a.m.

LOCATION: Microsoft Teams Call

ATTENDANCE: Refer to Attendance List

Welcome and Introductory Remarks

Anja Walker, PennDOT Bureau of Innovations (BOI), welcomed all attendees and called the meeting to order. Ms. Walker reviewed the ground rules for this Microsoft (MS) Teams meeting and the process for questions and comments. She provided an overview of the agenda and contents of the meeting booklet. Ms. Walker introduced PennDOT Acting Executive Deputy Secretary Melissa Batula, P.E., sitting in for STIC Co-Chair PennDOT Secretary Yassmin Gramian, P.E., along with STIC Co-Chair Federal Highway Administration (FHWA) Pennsylvania Division Administrator Alicia Nolan.

Ms. Batula welcomed everyone to the March STIC Business Meeting. Ms. Batula stated that we face challenging times; however, there is a reason for optimism with the new bipartisan infrastructure funding and opportunities for collaboration. State solutions will help stop the infrastructure funding gap. Earlier this month, PennDOT joined the Pennsylvania State Association of Township Supervisors (PSATS) for a news conference to review the importance of the new bipartisan infrastructure law for local governments and their road and bridge needs. Ms. Batula stated that she is excited to see the progress of selected Every Day Counts (EDC) 6 initiatives, the STIC Incentive Program funding and cited a few examples. As part of the e-Ticketing and Digital As-Built innovation, PennDOT piloted the e-Ticketing and Mobile Construction application in each of PennDOT's 11 districts in the 2021 construction season. The e-Ticketing innovation provides consistency in the data captured on projects all over the state and limits interactions with the material delivery drivers. It also provides a safer work environment for construction inspection staff. More e-Ticketing pilots will be conducted this year, and we will continue to update the application as we learn more. As part of the EDC innovation, John Myler, PennDOT District 11, has been asked to travel to Puerto Rico to share information regarding e-Ticketing with our peers there. PennDOT is looking at 2024 for full implementation of e-Ticketing.

In 2019, PennDOT used STIC Incentive Program funding to improve unmanned aerial systems (UAS) or drones. PennDOT is looking at a multitude of uses for UAS. As of 2022, PennDOT has more than 20 licensed UAS pilots operating more than 15 drones. The Pennsylvania Turnpike Commission (PTC) utilized \$50,000 in FHWA STIC Incentive Program funding to assist in purchasing four UAS vehicles that were transferred to the Pennsylvania State Police (PSP) for crash reconstruction.

Another innovation that PennDOT has been exploring is Augmented Reality in Transportation. This is another STIC Incentive Program funding project. In 2021, District 11 piloted virtual asphalt acceptance testing, which used high-definition cameras within the plant with a remote person overseeing the test. The pilot was very well received, and now PennDOT is combining those two initiatives. District 11 will be testing the augmented reality goggles in the plant instead of the cameras, so they will get a hands-on feel for what the tester is doing.

Ms. Batula thanked the champions of this new technology and provided an overview of the agenda. Ms. Batula thanked outgoing STIC members for their participation and welcomed new STIC members. Ms. Batula turned the meeting over to

Ms. Nolan. Ms. Nolan echoed that the STIC is very impressive in Pennsylvania due to all participation and partnership throughout the state. Pennsylvania embraces innovation and takes risks to try something new. The Pennsylvania STIC is a national leader because of the people on this call.

Ms. Walker then announced the following outgoing and incoming STIC members:

Returning STIC Members

John-Thomas Graupensperger, PWS – Pennsylvania Association of Environmental Professionals (PAEP)
John Kibblehouse, Sr. – Pennsylvania Asphalt Pavement Association (PAPA)
Ronald A. Seybert Jr., P.E. – American Public Works Association (APWA)
Nicolas Burdette, P.E. – American Council of Engineering Companies (ACEC/PA)

Outgoing STIC Members

Steven Thomas, AICP – Franklin County Planning Commission
Mahmood Shehata, P.E. – Mid-Atlantic Section of ITE (MASITE)
Joseph Gerdes III – Pennsylvania State Association of Township Supervisors (PSATS)
Daniel Cessna, P.E. – American Society of Highway Engineers (ASHE)
Richard J. Jucha, P.E. – American Concrete Pavement Association (ACPA)
Brandon Carson – Southern Alleghenies Planning & Development Commission
Emily Bernzott Emm, P.E. – Women in Transportation Seminar (WTS)
Stacey Cleary – Pennsylvania Association of Asphalt Materials Applicators

Incoming STIC Members

John Becker, P.E. – American Concrete Pavement Association (ACPA)
Bert Lahrman – North Central Regional Planning Commission
Carrie Fischer, MEng, P.E. – Women in Transportation Seminar
John R. Shutsa – Pennsylvania Association of Asphalt Materials Applicators
Michael Boyer – Delaware Valley Regional Planning Commission (DVRPC)
Mike Davidson, P.E., PTOE – Mid-Atlantic Section of ITE (MASITE)
Katie Lizza – Pennsylvania State Association of Township Supervisors (PSATS)
John Caparella – American Society of Highway Engineers (ASHE)

Bipartisan Infrastructure Law (BIL)

Ms. Nolan stated that she has made this presentation to various groups in the recent past and that members of her staff have also presented segments of the information. The BIL is also known as the *Infrastructure Investment and Jobs Act*. Ms. Nolan covered the highway provisions of the BIL but noted that there are so many other infrastructure aspects of the BIL. She stated that BIL continues all highway programs of the previous federal highway authorization (FAST Act) for five more years (FY 22-26) and includes more than a dozen new programs. FHWA has fact sheets on the various programs and is working on detailed program guidance for many of these programs. BIL includes a \$90 billion transfer of funds from the General Fund to the Highway Trust Fund (HTF) to keep the HTF solvent for the duration of BIL. States just received the full appropriations of funds last week for the first year of BIL. Ms. Nolan covered the various funding opportunities and

programs for highways under BIL. Ms. Nolan's slides are included as a PDF file attached with this meeting summary. For more information, please visit FHWA's [BIL website](#).

FHWA Update

Clint Beck, P.E., FHWA, stated that Yathi Yatheepan, P.E., FHWA Innovation and Research Coordinator, had a conflict but will return for the next meeting. A lot of the current FHWA efforts center around BIL. EDC is in Round 6, and FHWA is looking for ideas to gather for [EDC Round 7](#), which begins in 2023.

STIC Incentive Funding Program Nominations

Ms. Walker provided an overview of the 2022 STIC Incentive Program funding submissions. All the submissions are listed in the meeting booklet as well.

Ms. Walker presented the following 10 submissions:

1. **Recycled Asphalt Shingles in Asphalt Paving**

Requested Amount: \$125,000

Description: The goal of this project is to use recycled asphalt shingles on a pilot project in District 6. The recycled asphalt shingle material will be incorporated into asphalt paving mixtures, utilizing some of the asphalt and aggregate in the shingles and ultimately reducing landfill material.

2. **Recycled Plastic in Asphalt Paving**

Requested Amount: \$125,000

Description: The goal of this project is to incorporate recycled plastic in asphalt paving mixtures. This way the recycled materials are reused instead of being sent to a landfill. Early indications show that recycled asphalt performs very well in rutting resistance and is acceptable in cracking resistance.

3. **3D Digital As-Builts**

Requested Amount: \$36,000 OpenBrIM Platform Annual Subscription Fee

Description: The OpenBrIM Platform is a PennDOT-approved software for Refined Analysis Load Factor Rating (LFR) and Load and Resistance Factor Design (LRFD) within the Commonwealth. In addition to an analysis engine, it is also a digital delivery solution for bridges where parametric 3D modeling, load rating, health monitoring, inspection reports and asset management among other things, are combined in one tool. The same model used for design and construction can be utilized for asset management, inspection management, health monitoring, load rating, and more. Overall, the OpenBrIM Platform can address all the digital delivery requirements and processes for bridges through a pilot project including libraries, workflows, training, documentation, and other necessities.

4. **Unbonded Concrete Overlay with Geotextile Interlayer**

Requested Amount: \$125,000

Description: This project will overlay a concrete pavement with a concrete overlay in District 6. The interlayer debonds the two layers to eliminate reflective cracking. The geotextile interlayer would be faster and cheaper to install than an asphalt layer. This project would be part of the EDC Round 6 Targeted Overlay Pavement Solutions (TOPS) innovation.

5. **Jarraf All Terrain 4WD Tree Trimmer**

Requested Amount: \$100,000

Description: The Jarraff style trimmer is a 75-foot telescopic boom capped with a 180-degree rotating saw blade. The benefits are increased safety, extended pavement life expectancy, increased level of service during summer/winter operations and increased fiscal efficiency. The equipment would be shared by PennDOT Districts 2, 10 and 11.

6. **TPM2100 RAM Marker Applicator**

Requested Amount: \$24,000

Description: The TPM2100 RAM Marker Applicator was created to reduce the risk of injury to employees and highway travelers by automating the process of placing flexible chip seal markers and temporary hard markers on the roadway. The benefits include aiding in faster and more accurate job completion, maintaining application speeds of 1-5 MPH, and improving employee safety.

7. **Variable Speed Limit (VSL)**

Requested Amount: \$100,000

Description: The goal of this project is to utilize 20 SP-710-DSL (Trailer Mounted Work Zone Dynamic Speed Limit Signs) for a pilot Variable Speed Limit (VSL) project on I-80 in Clearfield County, District 2. District 2 is piloting VSL during the winter season along a stretch of I-80 from Mile Marker 97 to Mile Marker 120 in Clearfield County both Eastbound and Westbound. This is in conjunction with PSP Troop C (Dubois and Woodland barracks) efforts to minimize speeds prior to and during weather events to ensure motorist safety. These efforts will be monitored by the Regional Traffic Management Center. Sign activation, crashes and PSP warnings/citations will be used to provide metrics for this pilot.

8. **RFID Tags Test Usage**

Requested Amount: \$30,000

Description: The goal of this project is to investigate the potential use of RFID Tags for various PennDOT assets. By scanning an RFID Tag one can gain access to limitless data about the product to which it is attached. For example, a precast concrete tag could display the manufacturer, date cast, test results and material certification. Onsite material samples could be tagged and sent for testing where the tag is scanned to receive details about the sample. Once completed, the data could be deleted, and the tag sent back out for use. Tags could also be used by maintenance forces when permanent items are tagged like signs, structures, guiderail etc. There are various devices in the market from simple stickers that require a powered scanner to cellphone sized blocks that are self-powered. There is currently a National Cooperative Highway Research Program (NCHRP) research team working on RFID tag uses in construction (NCHRP 03-140) and various other states have been testing and using RFID Tags for several years.

9. **Brushing Loader**

Requested Amount: \$100,000

Description: A brushing loader attachment is available to install on PENNDOT front end loaders to do roadside vegetation management. It would save time from crews doing manual removal with chainsaws and make it safer for employees. More brush removal could be accomplished in a quicker time. This is related to the current Brushing Loader and Vegetation Management Equipment Catalog STIC innovation.

10. **Snow Plow GPS Routing System**

Requested Amount: \$60,000

Description: This project aims to place a GPS turn-by-turn routing system into PennDOT plow trucks to allow plow drivers to follow an assigned route. There are many temporary and new plow drivers every season, and learning

new routes is often difficult, resulting in sections of routes being missed during a storm. With the recent shortage of operators, rental trucks and contractors have taken on routes, and it would be beneficial to have a GPS turn-by-turn snow route system to guide them through their snow routes. It would also benefit department staff when they must cover routes for which they are not familiar.

Ms. Walker provided an opportunity to comment in the MS Teams chat box. Ms. Batula indicated that some requests are for equipment purchases. She asked if the funding was to promote widespread adoption or provide funding for single units. Ms. Walker responded that the overall goal of STIC Incentive Program funding is to offset the cost of standardizing innovative practices in the state to promote and implement innovative practices statewide. Mr. Beck agreed with Ms. Walker and stated that the funding goal is for future implementation and kickstarting the process. FHWA would like to see the equipment purchase paired with showing others how to implement it, thereby spreading the technology around and developing new policies and procedures.

Doug Tomlinson stated the District 2 VSL effort would be a continuation of a pilot that took place toward the end of this winter. No funding is currently identified for next year. There were six uses, resulting in only a minor lane closure at a ramp. This is a service as opposed to purchase of equipment.

John Becker stated that he would like to work with PennDOT to submit a proposal for implementing Performance Engineered Mixtures. This program is a high-priority FHWA effort, and Mr. Becker asked if funds are available for the purchase of innovative testing devices as part of this process. Ms. Walker stated that the funding is to offset the cost of standardizing practices, so if it's a new testing device, we must identify how we would ultimately implement it statewide. Ms. Walker will follow up with John Becker to see if they could work with the Construction and Materials TAG.

- Nicholas Burdette said the first two submissions are similar: recycling shingles or plastic in asphalt. Do we know if one is more economically viable at this time given material availability and percentage of recycled content? Ms. Walker stated that she will follow up with Lydia Peddicord for the answers to these questions and the following response was provided: Neither Post-Consumer Shingles, or Recycled Plastics for use in asphalt pavements have a highly developed supply infrastructure in Pennsylvania at this time. This is because of the lack of market demand. The Department has not historically allowed these types of recycled products in Pennsylvania because of a tendency for both of these materials to contribute to a decreased resistance to cracking (less flexible asphalt) in asphalt pavements. That said, the Department is diligently exploring ways to incorporate the use of these recycled products in order to potentially increase the market demand and lessen the carbon footprint of our paving materials. This effort aims to potentially reduce the cost of asphalt materials without effecting quality in a meaningful way.

Michael Clinger stated that research projects related to asphalt shingles and plastics in asphalt are either in progress or recently completed and should be taken into consideration when evaluating the STIC Incentive Program funding submissions. Nicholas Burdette said that is good to know and agreed with Mr. Clinger. Mr. Burdette stated that they are two great ideas, but details and economics would be essential to understand. Mr. Clinger said that all goals, performance and longevity have been identified in the scope of implementing pilot projects related to this research.

Ms. Walker will send out a feedback survey regarding all the submissions to gather additional feedback.

EDC-6 Innovation Spotlight – e-Ticketing

Kelly Barber, P.E., PennDOT Major Bridge P3 Office, provided an update on PennDOT's e-Ticketing efforts. She provided a

high-level overview of the program, identified who is involved, discussed how it works, and gave a timeframe for implementation. The innovation eliminates paper documentation, improves efficiency, helps ensure reliable payments, and improves safety of workers who do not have to walk around materials trucks at the worksite to receive paper tickets.

The steering committee consists of American Council of Engineering Companies of PA (ACEC/PA), American Concrete Pavement Association (ACPA), Associated Pennsylvania Constructors (APC), PACA, Pennsylvania Asphalt Pavement Association (PAPA), Pennsylvania Turnpike Commission (PTC), PennDOT, FHWA, and Pennsylvania Motor Truck Association (PMTA). There are four sub teams: Specifications, IT Solutioning, Haulers, and Maintenance.

A pilot specification was quickly developed by the team in less than three months. It was used on a few projects last construction season and applies to aggregate, asphalt and concrete. Some changes were identified for the new specification based on the pilot projects last year. Additional pilot projects will be chosen in 2022 – up to 15 projects per district with multiple materials on each project. PennDOT anticipates full implementation by 2024.

Maintenance projects are on hold at this time until system enhancements are completed. The mobile application went live last July for construction inspection staff. Materials information is sent to the mobile devices through an application programming interface (API). Ms. Barber shared screen shots of the mobile application and said that PennDOT has also made enhancements to the program and identified future enhancements. Ms. Barber thanked all the team members who worked diligently to implement this program.

Ron Seybert asked through the chat box if e-Ticketing will be available for local municipal business partners to use, or is the system for PennDOT only? Ms. Barber responded that the system was developed specifically for PennDOT ECMS projects only. If the local project is an ECMS project through PennDOT, then yes it would be available. If not, municipal partners can work with their suppliers to determine if e-Tickets can be used.

Innovations for Advancement

Ms. Walker announced two innovations for advancement, the Brushing Loader Attachment and Vegetation Management Equipment Catalog, and the Environmentally Sensitive Area Signage. Ms. Walker asked that as the participants viewed the presentations if they could please think of any roadblocks, concerns, and questions to advancing these innovations.

Brushing Loader Attachment and Vegetation Management Equipment Catalog

Dean Poleti, P.E., Maintenance TAG Leader, stated that he is presenting on behalf of Mike Martin, Innovation Owner. Mr. Poleti said that the Brushing Loader Attachment is a STIC Innovation because it was used by other state DOTs. The Brushing Loader is a regular front-end loader with a brushing attachment that you can attach to its front to conduct vegetation management. It attaches to 25,000 pound and larger loaders. Most of PennDOT's loaders fit this category. There are many different size booms available, but the 23-foot and 25-foot booms are most frequently used, having pretty good reach. The Brushing Loader comes standard with an actuator and proportional joystick, so they are easy to maneuver. The visibility is excellent because the operator is elevated on a platform. The Brushing Loader has unmatched vertical reach, with the boom/loader reach combined offering excellent vertical capability.

There is a renewed focus on the standard of care. PennDOT does a lot of daylighting, brushing, and canopy removal. It does not entirely relieve tree trimming, but the tool is excellent for dealing with debris clean-up. This equipment is used in Maryland. The equipment is not proprietary equipment. There are various manufacturers with similar products. When looking to bid this out, it is straightforward to bid and receive the lowest bid. Mr. Poleti also presented a video from a local municipality in Harrisburg that owns this equipment, demonstrating the equipment in operation.

Mr. Poleti presented the second part of this innovation, the Vegetation Management Equipment Catalog. The catalog is going through the publication process. The TAG went through and looked at all the equipment that PennDOT currently has in their inventory and broke it down by county and piece of equipment. PennDOT County Maintenance Managers and the Assistant Highway Maintenance Managers might want to know what equipment is in their area, from tractors to mowers. They can borrow the equipment instead of buying it or see how it works before buying it. The catalog includes observations about the equipment during demonstrations. Mr. Poleti said that he expects the publication will be available in one to two months.

Ms. Walker asked Mr. Poleti if the catalog includes a contact page for district and county offices. Mr. Poleti responded yes, they do have a contact page for district equipment managers and their contact email and phone numbers. Ms. Walker asked if the catalog would be available to local governments. Mr. Poleti replied yes. Because the catalog is an actual publication, they will be able to go to the forms and publications section of PennDOT's website, click on the appropriate link and download the catalog.

Brandon Dean, PennDOT District 8, asked if there were slope limitations on the brushing loader. Mr. Dean also stated that he can see how this equipment could be helpful for stormwater maintenance. Mr. Poleti responded that this would be limited to the capability of the front-end loader itself. He said you will not be able to take the Brushing Loader on steep slopes. The Brushing Loader is only useful on flat surfaces. There are other equipment options for steep slopes. A remote-control mower or mower max is a good option for a steep slope.

Ms. Batula asked how safety is covered – especially with boom arms that could conflict with utility lines. Mr. Poleti responded that they added a safety section to the catalog. This boom arm would not be available to use close to any type of utility line for vertical tree removal.

Environmental Sensitive Area (ESA) Signage

Brandon Dean, Innovation Owner, introduced ESA Signage, bright orange caution signs placed every 50 feet along sensitive areas to avoid, such as wetlands. They are easy to deploy, easy to maintain, they avoid catching debris like flexible orange fencing, and can be used with standard fencing.

A pilot project, SR 0083-074 in York County, PennDOT District 8, successfully deployed ESA signage and saved 1,000 feet of orange protective fencing. Due to permit commitments, small pocket areas to avoid within stream relocation areas still utilized standard fencing. ESA is cheaper than orange fencing and can be used with construction fencing or bog turtle avoidance fencing. It was proven to be effective on the pilot project, which was a high-profile job near a Pennsylvania Welcome Center. The next stage for the innovation is to deploy it.

Bert Lahrman asked how the signs keep people out, are they enforceable, and are the signs reusable. Mr. Dean said that the sign could be reused and that the signs are plastic. Mr. Dean said that this is an example of "less is more." The sign includes a wooden stake a couple of feet tall. As far as enforcing the signs, the sign does not say "No Trespassing" or "Keep Out." However, it was a highway Right-of-Way area that the team worked in and was relatively inaccessible to the public. Mr. Dean said one of the main objectives is to prevent workers getting into the area with equipment. The sign refers to the Environmental Monitor on the project to help workers understand why they are being asked to stay clear of that area with their equipment.

Innovation in Motion – Recycled Plastic Modified Asphalt - Ridley Creek State Park Pilot Project

Crystal May and David Sledziewski, P.E., of RK&K presented this project. Ms. May stated this project is part of the Strategic Recycling Program (SRP). This helps recycle large quantities of hard to recycle plastics. The first part of this project was to evaluate materials and processes for their advantages and disadvantages, reusability, and quantity of recycled material use.

The team also researched product types and manufacturers, specifications, and environmental implications, such as microplastic releases. Ms. May conducted outreach to other state DOTs, trade associations, laboratories and research institutions. RK&K studied existing performance and environmental testing and the proper use of the materials regarding storage, introduction process and permitting. The project was supported by additional state agencies such as DCNR, DEP, and DGS through the Governor's GreenGOV Council. The project location was chosen to be in the southeastern portion of the state to minimize cracking potential. A project that involved a full-depth pavement was preferred. Sandy Flash Drive in Ridley Creek State Park was the chosen project. Reconstruction involved a full-depth reclamation with a wearing course that included 30 percent recycled asphalt pavement (RAP) for one mile and recycled plastic and 30 percent RAP for one-half mile. Environmental and performance testing was performed on the completed pavement. PennDOT will monitor this project for the next five years, and Penn State will develop performance standards to test these materials. Mr. Sledziewski stated that he hopes this work will result in a Publication 408 standard specification for recycled plastic material in pavement in the future.

Communications Update

Ms. Walker reminded everyone that the STIC is celebrating its 10th anniversary this year and will mark that by including special edition newsletters, podcasts, and innovation events (either in-person or virtually).

Additionally, Ms. Walker stated that instead of creating the typical STIC Year End Report for 2021, STIC innovations are featured as part of PennDOT's [Focus on Innovations](#) report, which was published in March 2022. In addition to STIC innovations, the publication also highlights other grassroots innovations that PennDOT worked on throughout the year.

The next STIC Business Meeting will be held on July 27, 2022. More information to come regarding location.

The meeting adjourned at 11 a.m.

Attendance List

Members in Attendance:

- Acting Executive Deputy Secretary Melissa Batula, P.E., PennDOT
- Division Administrator Alicia Nolan, FHWA
- Susan Armstrong, PACA
- John Becker, P.E., ACPA/PA
- Rodney Bender, P.E., PUC
- Michael Boyer, DVRPC
- Nicholas Burdette, P.E., ACEC
- John Caperilla, American Society of Highway Engineers (ASHE)
- Mike Davidson, P.E, PTOE, MASITE
- Eric Donnell, Ph.D., PSU
- Carrie Fischer, MEng, P.E., WTS
- Melissa Gates, CCAP
- John-Thomas Graupensperger, PAEP
- Brad Heigel, P.E., PTC
- John Kibblehouse, Jr., PAPA
- Bert Lahrman, North Central Regional Planning Commission
- Katie Lizza, PSATS
- Ronald Seybert, Jr., P.E., APWA
- John R. Shutsa, PAAMA
- Joseph Szczur, P.E., University of Pittsburgh
- Edward Troxell, PSAB

PennDOT Leadership:

- Larry Shifflet, Deputy Secretary for Planning
- Michelle Jennings, Acting Deputy Secretary for Administration
- Chris Kufro, P.E., Acting District Executive, District 8
- Tom Prestash, P.E., District Executive, District 9

FHWA Leadership:

- Keith Lynch, Assistant Division Administrator
- Clint Beck, P.E., Director of Programs and Performance Management

Absent Members:

- C. Kim Bracey, DCED
- Mark Compton, PTC
- John Gible, U.S. Army Corps of Engineers
- Amy Sturges, PML
- Stan Caldwell, CMU
- Aaron Hoover, APC
- Domenic Rocco, P.E., DEP
- Karl Singleton, PA Diversity Coalition
- Alfred Uzokwe, DCNR

Follow-Up Tasks

	Item	Lead	Due Date	Status
1.	Follow up with John Becker, ACPA regarding performance engineered mixtures	Anja Walker	ASAP	Completed
2.	Ask Lydia Peddicord for her opinion about the viability of recycled asphalt shingles versus recycled plastics in pavement.	Anja Walker	ASAP	Completed
3.	Survey all members for more input on STIC Incentive Program fFunding submissions	Anja Walker	ASAP	Completed