

State Transportation Innovation Council (STIC)

STIC Business Meeting

MEETING DATE: Wednesday, July 21, 2021
TIME: 9:30 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 the STIC Co-Chairs, Executive Deputy Secretary Melissa J. Batula, P.E., and Federal Highway Administration (FHWA) Division Administrator, Alicia Nolan.

Ms. Batula welcomed everyone to the July STIC Business Meeting and stated that we have all endured a challenging year, but we are succeeding. PennDOT Central Office staff are returning to the offices this week. In early August, District Office staff will be returning. Ms. Batula said that she feels very good to be back in familiar surroundings and see everyone face to face. Ms. Batula thanked outgoing STIC members Keith Johnson from the University of Pittsburgh and Doug McLearn from the Pennsylvania Historical and Museum Commission (PHMC). She thanked them for their outstanding service to help move innovation forward in Pennsylvania. Ms. Batula welcomed Joseph Szczur to the STIC as the new representative from the University of Pittsburgh. Mr. Szczur is the former District Executive from District 12. The STIC appreciates having him back in this new role. Ms. Batula stated that the STIC looks forward to having a new representative from PHMC once that person is identified. She reviewed the meeting agenda and requested that attendees look within their organizations and search for innovations they would like to present at future STIC Business Meetings. She asked to please email the [STIC Resource Account](#) with the innovation information. Ms. Batula then introduced Ms. Nolan from FHWA and invited her to provide opening remarks.

Ms. Nolan thanked Ms. Batula and stated that the STIC is award-winning because all its members embrace the concept of how we can do things better. Ms. Nolan thanked STIC members for their participation and said she is looking forward to a great conversation. She stated that she hopes the next meeting will be in person.

Ms. Walker thanked Ms. Batula and Ms. Nolan for their opening remarks. Ms. Walker then introduced Clint Beck, P.E., from FHWA.

FHWA Update

Clint Beck, P.E., FHWA, provided FHWA and Every Day Counts Round6 (EDC-6) updates. Mr. Beck thanked PennDOT for the six-month report updates and stated that things are progressing now with the Digital As-Builts, e-Ticketing, Targeted Overlay Pavement Solutions (TOPS), and Ultra-High Performance Concrete (UHPC) for Bridge Preservation and Repair. Mr. Beck extended his congratulations to the STIC Incentive Program Funding Project recipients, whom Ms. Walker will announce later in this meeting. Prior winners of the incentive funding have included the Stormwater Management Training and Field Guidebook, Unmanned Aerial Systems (UAS), and Augmented Reality in Transportation innovations.

The funds are being expended, and PennDOT is making good progress in sharing information in the field. Mr. Beck discussed two initiatives related to UAS; an overall strategic plan and having drones for the Pennsylvania State Police to perform crash reconstruction, both of which received incentive funding in prior years.

Mr. Beck stated that the FHWA fiscal year 2021 Accelerated Innovation Deployment (AID) Demonstration Program funds are now available. This includes \$10 million in grants across the country. The Notice of Intent deadline is Aug. 3, 2021. The application deadline is Sept. 28, 2021. Mr. Beck stated that if someone has a good idea for AID Demonstration Funding, they should reach out to Ms. Walker in BOI.

EDC-5 Innovation Spotlight – Unmanned Aerial Systems (UAS)

Ms. Walker introduced Kelly M. Barber, P.E., Section Chief of PennDOT's Bureau of Project Delivery.

Ms. Barber presented the high-level recommendations for the UAS Steering Committee. Ms. Barber highlighted:

- Background of the Steering Committee, including seven key focus areas:
 - Survey
 - Bridge Inspection
 - Incident Management
 - Miscellaneous (Construction, Traffic, Training)
 - Human Resources
 - Information Technology (IT)
 - Communications
- Department Use Cases
 - Bridge Inspection
 - Survey
 - Quantification of Materials at Stockpiles
 - Construction Inspection – Progress of Projects, Earthwork
 - Incident Management – Slides in Districts 3 and 11
- Recommendations
- Current Initiatives
- Next Steps
 - Finalize current initiatives
 - Assist districts with getting started
 - Continued knowledge sharing/outreach
- The UAS Workshop scheduled for July 27-29, 2021

Ms. Walker reminded participants to ask questions using the chat box or by emailing penndotstic@pa.gov.

STIC Incentive Program Funding Project Recipients

Ms. Walker announced the 2021 STIC Incentive Program Funding Project, recipients. Ms. Walker said recipients were selected after a thorough review of all the submissions and the feedback received through the survey distributed to the STIC members earlier this year. Both selected projects are STIC innovations that are moving through the STIC's Innovation Development Process. Ms. Walker announced that the two selected projects include Bridge Deck Link Slabs and the

Automated Traffic Signal Performance Measures (ATSPMs) Pilot. The Bridge Deck Link Slabs innovation will be funded with \$40,000 in STIC Incentive Program funding. Bridge deck joints have been one of the leading causes of premature bridge deterioration. Use of Bridge Deck Link Slabs is an economical way to eliminate deck joints by connecting adjacent deck sections with a specially designed slab composed of traditional or UHPC. The funding will be used to support the development of design procedures and design tools. The ATSPMs Pilot will be funded with \$60,000 in STIC Incentive Program funding. Both projects will be required to provide a 20 percent state match. ATSPMs are an innovative way to use data to analyze and optimize the performance of traffic signals. Poorly timed traffic signals are a significant contributor to roadway congestion. The funding will be used to procure vendor software that can flag anomalies in various performance measures.

Innovations for Advancement

Ms. Walker stated that the next portion of the meeting includes several presentations on current STIC innovations.

Sequential Dynamic Lighting Curve Warning Systems

Ms. Walker introduced Sequential Dynamic Lighting Curve Warning Systems co-Innovation Owners from the Safety and Traffic Operations Technical Advisory Group (TAG), Brian M. Smith, P.E., District 1 Traffic Engineer, and William Lesterick, District 11 Safety Manager. This innovation is being presented for advancement, which is the next phase in the STIC Innovation Development Process.

Mr. Smith introduced himself and the Interstate 86 Curve Warning Project in Erie County. I-86 runs across the entire border of New York. Mr. Smith stated at its interchange with westbound I-90, a dangerous curve has caused many problems over his 25 plus years at PennDOT. PennDOT has tried to address the crash problem, some have had good results, but the team has never been able to reduce crashes at this location. Mr. Smith provided a Google image of the curve. The curve is gentle for cars but very difficult for trucks to maneuver. The Average Daily Traffic Count is 10,000, which is modest for Interstate travel with 16 percent trucks. Crash history of 27 crashes in 20 years indicates that the majority included trucks going through the guiderail and dropping 30 feet below the roadway.

Mr. Smith said that the team added the Sequential Dynamic Lighting Curve Warning System, a 24-hour, solar-powered dynamic curve warning system. PennDOT implemented a configuration that consisted of seven units of 24-inch by 30-inch chevrons. The overall cost for the entire installation was \$37,000. Mr. Smith presented a short video showing the sequential flashing of each chevron and a benefit/cost analysis of the innovation over a 5-year crash history of 23:1. Lessons learned include that the chevrons alone may not influence the speed, and more advanced warning signs or messages may be needed. Other factors may influence these crashes, including a shift in the load inside the truck. Mr. Smith stated that since the installation of the chevrons two years ago, there was one truck crash. The truck driver was driving at a fairly reasonable speed, and there was a shift in his load. Mr. Smith added that the team is now adding signs alerting truck drivers about the possibility of load shifting, which will be electrified and equipped with a wig-wag flashing light system.

Mr. Lesterick discussed three locations where District 11 implemented the Sequential Dynamic Lighting Curve Warning System. The first is on Interstate 79 (I-79) on notorious s-bends with truck roll-over issues. The second location is in downtown Pittsburgh, coming off the Veterans Bridge ramps to and from State Route 28 (SR 28), and the last location is on SR 28 at the edge of the county. The three areas totaled over 150 run-off-the-road type crashes. Each location showed a positive benefit/cost ratio based on Benefit-Cost Analysis (BCA) conducted.

Mr. Lesterick stated that I-79 is an electrically powered installation and covers three different curves as the driver enters Neville Island Bridge. Trucks commonly enter the curve too fast. A lighted sign reminds cars and trucks to slow down as they

approach the S-curves. Adding chevrons is an additional reminder to vehicles to slow down. District 11 installed 74 signs on both sides of the curves going north and south. The signs on the I-579 ramps on the Veterans Bridge coming to and from SR 28 are electrically powered. Motorcycles coming across the bridge lose control and jump the barrier. The chevrons are radar-activated and set to 30 miles an hour. The chevrons activate when the motorist goes over the speed limit. The SR 28 curve chevrons are solar-powered. Mr. Lesterick stated that there was an option to install electrically powered signs, but with solar-powered chevrons, junction boxes and the conduit are not needed. Lighted signage along with chevrons reinforce winter conditions and substandard curves. Mr. Lesterick stated that the total contract cost just over \$1 million of Highway Safety Improvement Program (HSIP) funds. Electrically powered installation totaled \$682,090, and the solar-powered installation for 18 signs totaled \$66,395.

Lessons learned from **electrically powered installations** include:

- It is not just the signs (conduit, wire, junction boxes)
- Consider junction boxes at each location to make for more straightforward repairs and installations
- Be aware of where your power is coming from
- If crossing railroads, ensure you have proper coordination
- Allow lead time in the contract to obtain signs
- Post selection: signs could have been single post but PennDOT used a two post-installation. This required modification of brackets on the back of the signs.

Lessons learned from **solar-powered installations** include:

- Ensure you have adequate sunlight – may need a solar study
- Coordinate with the supplier if using proprietary items to ensure the system can adequately power the signs for usage
- Consider potential electrical supply to the location
- Lead time
- Post selection

Innovation Updates

Stormwater Management Training and Field Guidebook

Rich Heineman, PennDOT Bureau of Maintenance and Operations (BOMO) Section Manager and Innovation Owner, provided an update on Stormwater Management Training and Field Guidebook. Mr. Heineman reviewed the problem statements. There is a lot of roadside maintenance training but a lack of training specific to Stormwater Control Measures (SCMs). PennDOT owns and maintains 2,800 SCMs. Not all SCMs are created equal. There are a lot of different types with specific requirements. The Innovation Development Team is utilizing an innovative training approach for complex and less-understood assets. Mr. Heineman stated that the training goals include providing a foundation of knowledge for maintenance forces, enhancing information retention using an innovative blend of learning tools, and consistent application of proper SCMs maintenance. The Innovation Development Team realized it is not just training that someone takes once or twice, but an opportunity for an innovative learning approach.

The approach includes:

- Virtual classrooms that include polling, breakout groups, and discussions are a better way to interact with attendees and help them retain the information. In the virtual classroom, the training focused on PennDOT's system of tracking SCMs, identifying SCM types, recognizing various types of vegetation in SCMs, equipment

needed for each activity, and SCM type and common routine/preventative, corrective maintenance activities.

- How-to videos included maintenance demonstrations, proper execution of tasks, addressing issues
- Field guides include instructions, best practices, equipment, Low Ground Pressure (LGP) equipment, and minimal compaction techniques.
- Collaboration site is a central location for guidance, used via MS SharePoint, accessible to maintenance forces

Mr. Heineman stated that the Innovation Development Team developed all the content. In May, the team completed a virtual pilot training with 31 attendees. The team also obtained constructive feedback from those attendees and has incorporated the feedback to further adapt training for in-person delivery. The next offering will be in District 8 on Sept. 15-16, 2021. The team has completed 13 field guides, one how-to-video, "Mowing SCM Surfaces," and the SharePoint site is in progress.

Certified Concrete Finishers Course

Ms. Walker introduced Jim Casilio, P.E., Director of Technical Services, Pennsylvania Aggregates and Concrete Association (PACA) and Innovation Owner. Mr. Casilio presented information about the Certified Concrete Finishers Course. Mr. Casilio stated that he and Harold Hill, PennDOT 4 are the Co-Innovation Owners, with Steve Fantechi and Kevin Keefe leading the Construction and Materials TAG.

Mr. Casilio stated that the Clearance Transmittal Process is complete. It went through steps 1 and 2, as well as the FHWA review. The Section 704 specification will be included in Publication 408 and will be effective for projects let after April 2022. Sixty percent of the finishers must be certified. Mr. Casilio stated that the construction training module was presented at additional winter school training. Districts 11 and 12 are the only districts left that need the training. Mr. Casilio stated that they are looking forward to getting onto their agendas this winter. At that point, all the districts will have obtained the training.

Mr. Casilio said that after the first half of 2021, over 160 finishers were trained, with 360 finishers holding the required certification. Seven classes are scheduled for the second half of 2021. The goal is two classes a month. Mr. Casilio thanked PACA member companies that hosted the finisher certification classes. Contractors that also hosted classes for their finishers to get them certified included Pennsy Supply, Road-Con, Inc., Hempt Brothers, and Golden Triangle Construction.

Karl Singleton, Pennsylvania Diversity Coalition, asked if there have been targeted attempts to ensure diverse companies are afforded this opportunity to be competitive by taking the Certified Concrete Finishers Course. Mr. Singleton offered to provide the Pennsylvania Diversity Coalition as a resource to Mr. Casilio. Mr. Casilio responded that we would want to partner with the Pennsylvania Diversity Coalition to find any businesses willing to host the course. Mr. Casilio stated that a minimum of 10 participants is required to hold the training.

Lane Reservation System

Ms. Walker introduced Doug Tomlinson, P.E., PennDOT BOMO Division Chief and Safety and Traffic Operations Assistant TAG Leader. Ms. Walker stated that the Lane Reservation System had been put on hold but was recently awarded a federal grant. Mr. Tomlinson presented the Lane Reservation System and said that the idea has been around for a couple of years. Mr. Tomlinson provided information about how the Lane Reservation System works. He said that the concept is similar to how you would make a reservation at one of your favorite restaurants. It allows the user to understand when there is availability. The team is looking for something similar from a work zone perspective. There are times when work zones are not appropriate. The Lane Reservation System would help move work zones to when and where it is a more appropriate time and provide traffic management systems with better information.

The concept was first developed when PennDOT and the Pennsylvania Turnpike Commission (PTC) discussed with the STIC in September 2016. At the time, funding was not available. Mr. Tomlinson stated that the TAG presented it to the Smart Belt Coalition, a coalition of agencies from a few states focused on automated vehicle technology and submitted for the Advanced Transportation and Congestion Management Technologies Deployment grant in 2017. The team was not successful in 2017. Mr. Tomlinson stated that the team resubmitted in 2018 with a smaller group, including the Turnpike Commissions from Pennsylvania and Ohio, and they were successful. Due to funding constraints caused by the COVID-19 pandemic, the PTC and Ohio Turnpike Commission are no longer pursuing the project and PennDOT worked with FHWA to reduce the scope in order to move forward.

Lane Reservation System objectives include:

- Accurate, reliable, and timely work zone information
- Limit work zone conflicts
- System for planning and real-time management of work zones
- Field verification at the beginning, end, and in between
- Data feed for use by various applications and industry partners
- FREEVAL-PA to identify appropriate lane restriction time periods
- Adoption of the Work Zone Data Exchange
- Use for connected and automated vehicle applications

Next steps:

- Using Advanced Traffic Management System vendor
- Finalizing IT approval processes
- Anticipate September start date with expected completion by 2022
- Policy and legislation may be needed.

Innovation in Motion

Mobile Quality Assurance Application and Database

James Griffin, PennDOT Operations and Performance Office (OPO) presented the Quality Assurance (QA) Evaluations App.

Mr. Griffin discussed background information including QA reviews completed by OPO QA staff on identified department-force core maintenance operations outside of winter services. All 67 counties are reviewed a minimum of three times per calendar year. Twenty-six different operations are reviewed on 10 different forms. Work Zone Traffic Control evaluations are completed in conjunction with the operational reviews. Processes and policies are in place for communication and follow-up.

Problem Areas

- QA Program Analysis – More than 500 QAs completed annually with no method to analyze data other than manual entries into spreadsheets; cumbersome processes.
- Training – No method existed to capture data for analysis in identifying opportunities for improvement to focus on.
- Downloading of videos and pictures was prolonged due to system latency.

- PennDOT's BOMO leadership acknowledged the need to streamline processing QA reviews and capturing data utilizing a web-based database application.

Timeline

- QA Evaluations App development started in 2017-2018.
- System testing began in 2019.
- System placed into full production in spring 2020.
- Evaluators enter information in the field using tablets devices.
- Photos and videos downloaded using the PAVideo App on cell phones with a URL embedded in the QA report
- Allows for electronic signatures and reports to be sent to the Regional Maintenance Advisor in real time.

Realized Benefits/Efficiency Gains

- Drastic reduction in resources utilized for processing
 - Frees up evaluator time to complete other tasks (training, road & equipment reviews, mentoring tasks, etc.).
 - Eliminates need for the Administration Assistant to process emails and do logging.
- Information is distributed to county, district and central office management within one to two days in most cases.
- All processes – appeals, after-action-reviews – are self-contained within the QA report for easy reference rather than in shared folders
- Database updates in real time allowing for real-time reporting and analysis.

Communications Update

Ms. Walker provided communications updates. PennDOT will host Virtual Innovation Days this year during the first week of November (Nov. 2-4, 2021). More information will be sent in the coming months. The UAS Workshop information was posted in the chat box by Mr. Beck. Ms. Walker will also send the information for the AID Demonstration Funding Program, as Mr. Beck mentioned earlier, along with registration information for the UAS Workshop.

The next STIC Business Meeting will be held on Nov. 17, 2021.

The meeting adjourned at 11:03 a.m.

Attendance List

Members in Attendance:

- Executive Deputy Secretary Melissa Batula, P.E., PennDOT
- Division Administrator Alicia Nolan, FHWA
- Susan Armstrong, PACA
- Emily Bernzott Emm, P.E., WTS
- Nicholas Burdette, P.E., ACEC
- Stan Caldwell, CMU
- Stacey Cleary, PAAMA
- Eric Donnell, Ph.D., PSU
- Joseph Gerdes III, PSATS
- John-Thomas Graupensperger, PAEP
- Brad Heigel, P.E., PTC
- Aaron Hoover, APC
- Richard Jucha, P.E., ACPA
- Domenic Rocco, P.E., PA DEP
- Ronald Seybert, Jr., P.E., APWA
- Joseph Szczur, P.E., University of Pittsburgh
- Mahmood Shehata, P.E., MASITE
- Karl Singleton, PA Diversity Coalition
- Steven Thomas, AICP, Franklin County
- Edward Troxell, PSAB
- Alfred Uzokwe, DCNR

PennDOT Leadership:

- Larry Shifflet, Deputy Secretary for Planning
- Michelle Jennings, Acting Deputy Secretary for Administration
- Michael Keiser, P.E., Acting Deputy Secretary for Highway Administration
- Sandra Tosca, P.E., District Executive, District 3
- Michael Rebert, P.E., Acting District Executive, District 6
- Tom Prestash, P.E., District Executive, District 9
- Cheryl Moon-Sirianni, P.E., District Executive, District 11
- Bill Kovach, P.E., District Executive, District 12

FHWA Leadership:

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

Absent Members:

- Rodney Bender, P.E., PUC
- C. Kim Bracey, DCED
- Brandon Carson, SAPDC
- Mark Compton, PTC
- Melissa Gates, CCAP
- John Gibble, U.S. Army Corps of Engineers
- John Kibblehouse, Jr., PAPA
- Amy Sturges, PML

Follow-Up Tasks

	Item	Lead	Due Date	Status
1.	FHWA AID Demonstration Funding applications due	HA Program Areas/BOI	Sept. 28, 2021	In Progress
2.	SCM Training – District 8	Maintenance TAG	Sept. 15-16, 2021	In Progress
3.	Contact Pennsylvania Diversity Coalition to advertise Certified Concrete Finishers Course to diverse businesses	J. Casilio	Aug. 27, 2021	In Progress