

Pennsylvania State Transportation Innovation Council

# ACCOMPLISHMENTS 2014

*Innovation through Collaboration*



## **MESSAGE FROM THE STIC CO-CHAIRS**

*Over the past year, the State Transportation Innovation Council (STIC) made strides in promoting new ideas and supporting the deployment of innovations through outreach and education. We are proud to present you with the 2014 Annual Report which details the progress we achieved over the past year.*

*Since its inception, the STIC has been recognized as a national leader in innovation; and, this year was no different. In 2014, the STIC trained over 400 PennDOT employees, approved over 15 new initiatives, and promoted the deployment of a number of other innovations through presentations at more than 20 conferences and events across the state such as APC/PennDOT Fall Seminar, the PSATS Annual Conference and many more.*

*The success of the STIC is due to an enthusiastic and energetic staff and a dedicated group of volunteers committed to excellence. Their hard work and creativity received both state and national attention in 2014. We commend the STIC on its accomplishments in the past year and challenge the members and staff to continue to lead through innovation.*



**Barry J. Schoch, P.E.**

Secretary of Transportation

A handwritten signature in black ink that reads "Barry J. Schoch".



**Renee Sigel**

FHWA Division Administrator

A handwritten signature in black ink that reads "Renee Sigel".

## 2015 STIC MEMBERS

### Co-Chairs

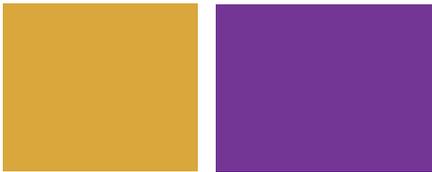
**Barry J. Schoch** | Pennsylvania Department of Transportation  
**Renee Sigel** | Federal Highway Administration

### Members

**John Becker** | American Concrete Pavement Association  
**Rodney Bender** | Pennsylvania Public Utility Commission  
**Stan Caldwell** | Carnegie Mellon University  
**Will Clark** | York County Planning Commission  
**Mark Compton** | Pennsylvania Turnpike Commission  
**Crystalann Deardorff** | Women in Transportation Seminar  
**Nathan Flood** | Pennsylvania Department of Conservation and Natural Resources  
**Douglas George** | American Society of Highway Engineers  
**Kelly Heffner** | Pennsylvania Department of Environmental Protection  
**Brad Heigel** | Pennsylvania Turnpike Commission  
**Elam Herr** | Pennsylvania State Association of Township Supervisors  
**Gary Hoffman** | Pennsylvania Asphalt Pavement Association  
**Steve Howsare** | Southern Alleghenies Planning and Development Commission  
**Bob Latham** | Associated Pennsylvania Contractors  
**Mark Magalotti** | University of Pittsburgh  
**Doug McLearn** | Pennsylvania Historical and Museum Commission  
**Scott Sternberger** | American Council of Engineering Companies  
**Darlene Stringos-Walker** | Pennsylvania Association of Environmental Professionals  
**Martin Pietrucha** | Pennsylvania State University  
**Jim Runk** | Pennsylvania Motor Truck Association  
**Richard Sause** | Lehigh University  
**David Spotts** | Pennsylvania Fish and Boat Commission  
**Peter Vlahos** | Pennsylvania Aggregates and Concrete Association  
**Sherri Zimmerman** | American Public Works Association  
**Member to be Appointed** | Pennsylvania Chamber of Business and Industry



Warm Mix Asphalt



Adaptive Signal Control Technology

### Table of Contents

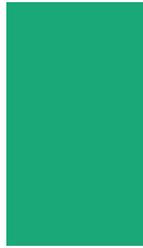
STIC Members	3
From an Idea to Innovation	5
Innovations Update	6
Safety Symposium	8
District Spotlight: An Interview with District 12 Executive Joe Szczur, P.E.	9
Mapping Our Progress on the STIC Webviewer	10
Putting Innovation into Practice	11
Innovation Spotlight: High Friction Surface Treatment	12
Education through Innovation Day Workshops	13
Pennsylvania STIC Awarded Innovation of the Year	14
Looking Ahead to 2015	15



Safety Edge



The STIC includes professionals from industry, academia, and resources agencies.



*“Working with our state, federal, and industry partners we’re identifying proven practices to pilot and implement in Pennsylvania, and we are continuously striving to deliver a safer, more efficient transportation system.”*

*– PennDOT Secretary Barry J. Schoch*



District 11 used prefabricated elements to accelerate the replacement of the SR 288 Main St. Bridge in Lawrence County.



Technical Advisory Group members play an important role in innovation deployment.

## THE STATE TRANSPORTATION INNOVATION COUNCIL: MOVING INNOVATION FORWARD

The State Transportation Innovation Council (STIC) is composed of a multi-stakeholder leadership team co-chaired by the Pennsylvania Department of Transportation (PennDOT) and the Federal Highway Administration (FHWA). The STIC brings together a diverse team of transportation stakeholders to forge an environment of innovation, imagination, and ingenuity to pursue specific initiatives and their rapid implementation to deliver a modern, high quality transportation system to the citizens of Pennsylvania. The STIC identifies new strategies to respond to challenges that impact Pennsylvania’s transportation infrastructure and promotes innovations to enhance safety, efficiency, and sustainability.

## FROM AN IDEA TO INNOVATION

Technical Advisory Groups (TAGs) were created to assist the STIC in evaluation of initiatives for promotion and implementation. The TAGs develop white papers and submit the ideas to the STIC for approval. The table below highlights the many ideas TAGs have presented to the STIC to date. After an idea is approved by the STIC, the subject-area TAG collaborates with PennDOT to develop a deployment plan to track progress and promote the innovation. In the past year, the TAGs have presented over 15 initiatives to the STIC, and have supported the deployment of a number of other innovations. If you are interested in joining a TAG, please contact the STIC at [ra-pdpenndotstic@pa.gov](mailto:ra-pdpenndotstic@pa.gov).

## MAKING AN IMPACT

**500+ PROFESSIONALS TRAINED**

**37 WHITE PAPERS CONSIDERED**

**35 INNOVATIONS PROMOTED**

**20+ PRESENTATIONS DELIVERED**

**26 AGENCIES AND ORGANIZATIONS REPRESENTED ON THE STIC**



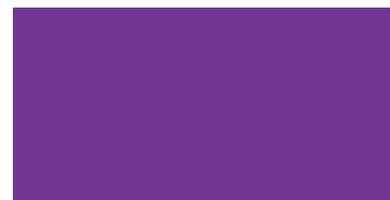
The STIC meets quarterly to discuss new innovations.



District 1 Innovation Day Workshop.



Geofoam is a STIC innovation.



TAG PROGRESS	White Papers Presented to date
Construction TAG	1
Design TAG	3
Environmental TAG	5
Intelligent Transportation Systems (ITS) TAG	8
Maintenance TAG	4
Materials TAG	4
Project Delivery TAG	6
Safety TAG	5
Technology TAG	1
<b>TOTAL IMPACT</b>	<b>37</b>

## INNOVATIONS UPDATE



### Congestion Reduction

New technologies like **Adaptive Signal Control Technology** respond to real time traffic conditions optimizing timing and improving the flow of traffic. This reduces delays, congestion and decreases hazardous emissions. Adaptive traffic signals are being installed on important travel corridors throughout the state including U.S. Route 22 and the Carlisle Pike in District 8.



### Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS)

PennDOT encourages the use of GRS-IBS bridge technology in **Publication 447, New Products for Low Volume Roads**. Ten GRS-IBS bridges have been constructed in Pennsylvania.



### High Friction Surface Treatment (HFST)

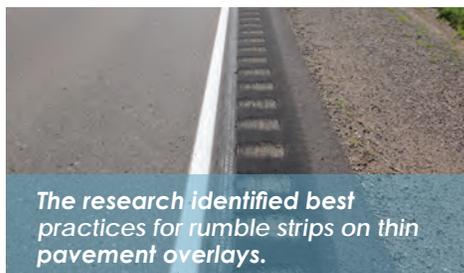
PennDOT is currently evaluating the construction and performance of **HFST at over 75 high crash sites** using five different binder resin materials. The evaluations will be completed in 2015.

Adaptive traffic signals planned to ease congestion on Capital Region roadways

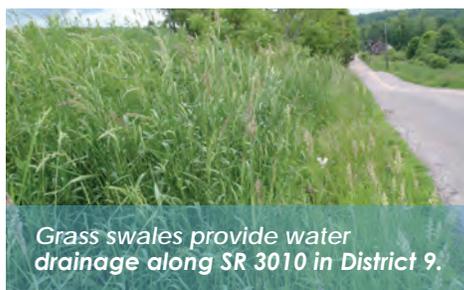




The Divergent Diamond Interchange will reduce conflict points and move traffic more efficiently.



The research identified best practices for rumble strips on thin pavement overlays.



Grass swales provide water drainage along SR 3010 in District 9.

### Intersection & Interchange Geometrics

Innovative intersection and interchange geometric designs are being deployed throughout the commonwealth with the first **Divergent Diamond Interchange** planned for construction at the intersection of Interstate 70 and U.S. Route 19 in PennDOT District 12.

### Rumble Strip Installation on Thin Pavement Overlays

The STIC partnered with Penn State University to complete a synthesis of best practices to help determine how to address the process and **procedures for the installation** of centerline and edgeline **rumble strips on thin pavement overlay** projects.

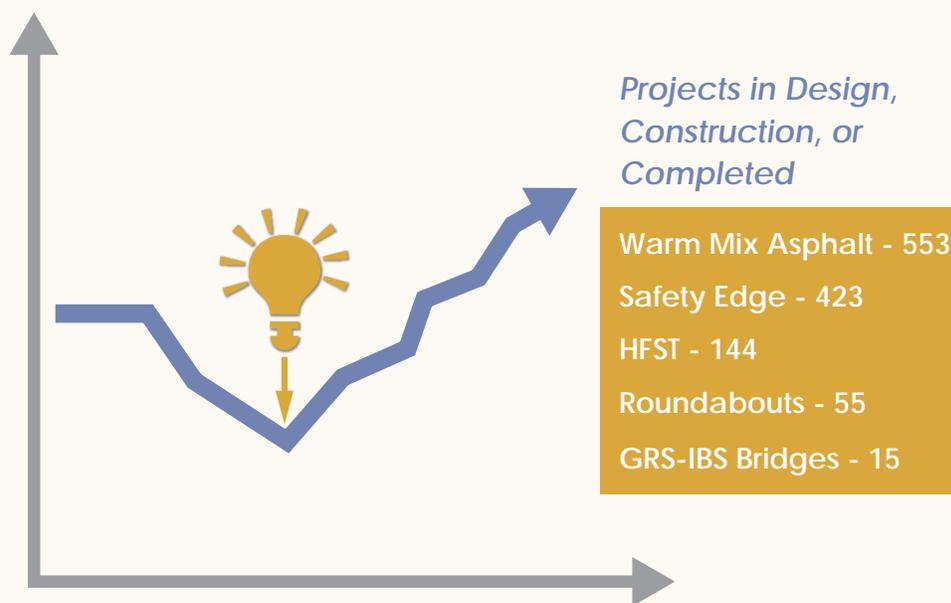
### Sustainable Stormwater

The STIC is partnering with the Pennsylvania State Association of Township Supervisors (PSATS) to offer **13 educational training sessions** to local governments on sustainable stormwater strategies including grass swales; and, to provide tools on how to navigate the Highway Occupancy Permit (HOP) process.

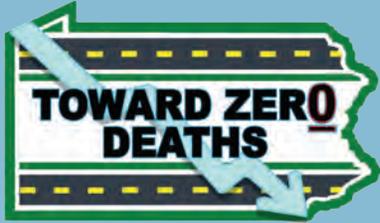
*“In July, I saw firsthand the benefits of Pennsylvania’s focus on highway innovation when I traveled to the Keystone State to see how state transportation officials are building a culture of innovation into their work. I left from my visit impressed at what the State Transportation Innovation Council (STIC) has achieved.”*

- Gregory G. Nadeau,  
Acting Administrator, Federal Highway Administration

### The Impact of Innovation on Projects



## SAFETY SYMPOSIUM BY THE NUMBERS



26 EXPERT  
PRESENTATIONS

175 ATTENDEES



Students participated in the Safety Symposium.  
Photo courtesy of DVRPC.

19 PARTNER  
EXHIBITS

24 SAFETY  
RECOMMENDATIONS



LEGISLATIVE AWARENESS RAISED

## STIC SAFETY SYMPOSIUM BRINGS TOGETHER

### *Transportation Professionals and Lawmakers*

On June 10, 2014, the STIC hosted the Pennsylvania Safety Symposium at the State Museum of Pennsylvania. The concept for the Safety Symposium was submitted as an innovative idea to the STIC by the Delaware Valley Regional Planning Commission (DVRPC). The Symposium attracted 175 attendees including transportation safety experts, legislators, and planners from Pennsylvania and neighboring states. The event featured concurrent panel presentations by experts who shared information on pressing safety issues and innovations followed by audience question and answer discussions. Presentations addressed strategies to reduce roadway fatalities related to four focus areas:

- *Unbelted Occupants*
- *Impaired Driving*
- *Work Zone Safety*
- *Young Driver Safety*

PennDOT Secretary Barry Schoch delivered a Keynote presentation sharing his support of efforts to improve safety on Pennsylvania roadways. The successful Symposium ended with closing remarks delivered by Governor Tom Corbett.

*The Safety Symposium is continued on  
page 10.*



The modernization of I-70 is underway.



Contractor innovation during construction.



Dual roundabouts planned for intersection of SR 519/SR1055.

## DISTRICT SPOTLIGHT: AN INTERVIEW WITH DISTRICT 12 EXECUTIVE JOE SZCZUR, P.E.

Innovation is making a big impact in PennDOT Engineering Districts across Pennsylvania. In District 12, much of this success can be attributed to the leadership of PennDOT District Executive Joe Szczur, P.E., and his dedicated staff. We asked Joe to share his motivations behind pushing for innovation in District 12.

### What prompted you to invite the STIC to host the inaugural Innovation Day Workshop in District 12?

Our portfolio of capital improvement projects over the next decade includes the currently underway modernization of I-70 between New Stanton (Westmoreland County) and Washington, Pa. When completed over the next two decades, we will improve 42 miles of interstate and more than 20 interchanges. We felt it was a great opportunity to take all of the innovations that the STIC had in its portfolio and consider if and how they can be incorporated into any of our projects currently under design, and any of our other Transportation Improvement Program (TIP) projects underway. We also wanted to put to practice what the STIC is all about and use the forum as an opportunity to educate our designers, project managers, consultants, and contractors.

### How have you institutionalized innovation?

We look at how different innovations can be incorporated into every project. We track these projects and innovations at our In-depth Project Review Meetings. We also talk about new innovations at our Project Delivery Meetings, but we are not limiting ourselves to innovation in Design either. A contractor asked to change the type of structure that was proposed on one of our interstate projects. The plan called for two dual lane structures utilizing crossovers. They proposed building a box culvert under the I-70 spans and not utilizing crossovers for the work zone traffic control. It saved money for future planned projects and greatly enhanced the safety concerns of using crossovers on the congested section of interstate as was originally designed.

### How has innovation impacted your work?

I think it has allowed our staff to realize how important it is to advance quality and innovation in our industry. Just think, if every Engineering District advanced one innovation each year, how much PennDOT will help shape the future of transportation in Pennsylvania, and nationwide.

We have been able to significantly reduce the construction time in several of our projects by using innovations like A+Bx bidding, pre-fabricated bridge elements, and GRS-IBS bridges, all of which originated through the STIC and in support of FHWA's Every Day Counts initiative.

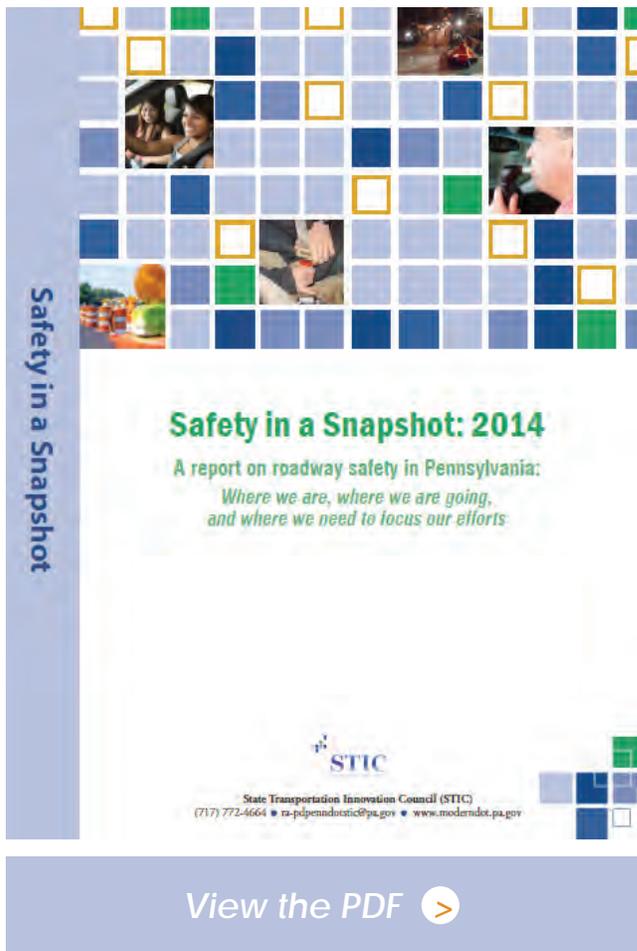
We also feel that safety goes hand in hand with quality and innovations. Examples in our district include the use of roundabouts, the continuous flow intersection, as well as intelligent compaction and high friction surface technologies.

### What advice can you share with others?

Being satisfied with the status quo is not an option. We have a responsibility to taxpayers, who invest in our industry, to inherently advance our industry to provide safe, efficient, and modern transportation. Since the inception, and under the direction of Barry Schoch and Renee Sigel, the STIC is just another way to establish PennDOT as a national leader.



District Executive  
Joe Szczur, P.E.



## SAFETY IN A SNAPSHOT: 2014

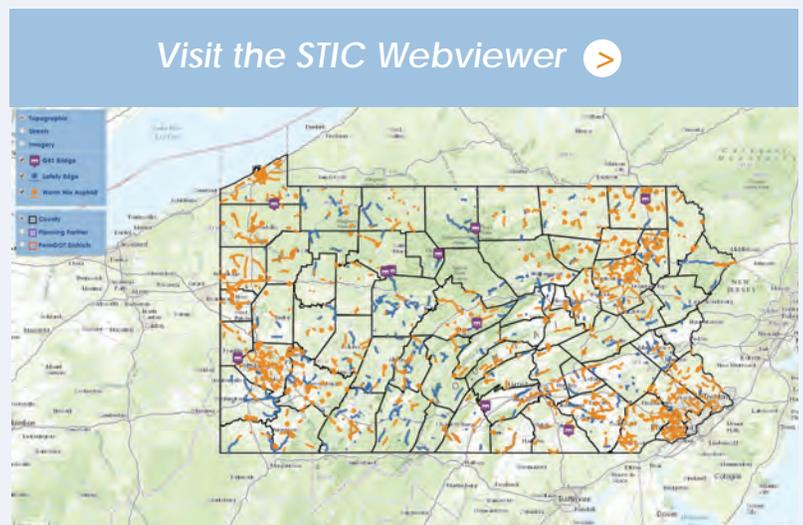
Following the Safety Symposium, the STIC published *Safety in a Snapshot: 2014*, a report on roadway safety in Pennsylvania which details current trends and captures findings from the Safety Symposium to set an agenda for focusing future efforts and investment. The report provides a detailed analysis of four major traffic safety concerns in Pennsylvania: unbelted occupants, impaired driving, teen driving, and speeding dangers in work zones. Using compelling data, the report compares Pennsylvania's policies and performance to progress in other states; and, shares strategies to move towards the goal of zero fatalities on Pennsylvania roadways. For more information on the *Safety Snapshot*, please visit the STIC website [www.ModernDOT.pa.gov](http://www.ModernDOT.pa.gov).

## MAPPING OUR PROGRESS ON THE STIC WEBVIEWER

To showcase the deployment of innovations across the state, the STIC launched an interactive webviewer map. The online tool allows visitors to search for innovations by county, PennDOT District, and Planning Partner and then map projects that have utilized the innovations:

- *Geosynthetic Reinforced Soil Integrated Bridge Systems (GRS-IBS)*
- *Safety Edge*
- *Warm Mix Asphalt*

Visitors can select the individual project for more information, see the project with Videolog, and get information on the techniques with a STIC fact sheet or watch an educational video. This webviewer can be accessed on the STIC web page, by clicking on the *Explore STIC Innovations graphic*.



# INNOVATION THROUGH COLLABORATION

## PUTTING INNOVATION INTO PRACTICE

The most effective tool for deploying innovation is putting products and tools into the hands of practitioners. In 2014 alone, the STIC hosted four Innovation Day Workshops, presented at over 20 events, and exhibited at several industry conferences including the PSATS Annual Conference, the Annual APC/PennDOT Fall Seminar, and the Transportation Engineering and Safety Conference. To put innovation into practice, the STIC developed several educational tools including the STIC Innovations Catalog, the STIC WebViewer, a High Friction Surface Treatment Model, and a number of other outreach initiatives.

### *A Comprehensive Catalog on STIC Innovations*

The *STIC Innovations Catalog* provides readers with the step-by-step process to advance an idea to an innovation. The catalog provides detailed information about each innovation including the description, benefits, and the deployment status. To ensure that the most up-to-date information is shared, the STIC has revised and reprinted the catalog three times over the past year and plans to continue frequent updates. For more information on the catalog, please visit the STIC website [www.ModernDOT.pa.gov](http://www.ModernDOT.pa.gov).

## 2014 APC/PENNDOT FALL SEMINAR



The STIC and FHWA partnered to exhibit at the APC/PennDOT Fall Seminar.



View the PDF 

## INNOVATION SPOTLIGHT: HIGH FRICTION SURFACE TREATMENT



*"I have been doing low-cost safety improvements for over ten years and I have never seen such an immediate positive response to a safety treatment. In our use of HSFT on curves, we've seen a day and night difference in accident reduction and even elimination. Quite simply, it stops crashes from occurring."*

*- Stephan Pohowsky, PennDOT- Safety Program Specialist*

### Feel the Friction

The STIC developed an educational poster and interactive model to communicate the benefits and application guidelines of this innovation. In partnership with the PennDOT Materials Testing Lab and Kwik Bond Polymer, the STIC constructed a model which allows participants to feel the friction by sliding a tire across an asphalt sample treated with a durable resin binder and wear-resistant aggregate. With this tool, the STIC is educating practitioners to maximize the impact of this safety innovation.

High Friction Surface Treatment (HFST) is a low-cost safety improvement proven to reduce crashes on wet pavements and curves and save lives.

In 2007, PennDOT District 5 installed the first HFST in Pennsylvania at an intersection in Northampton County. This site was selected because of its history of crashes. In fact, 22 crashes occurred at the intersection over a ten year period. After HFST was installed, crashes dropped to zero over the last five years. **The impact of the treatment was exceptional, reducing crash frequency by 100%.**

This safety improvement has been installed at **42 sites** and is planned for application at **103 more** locations across the state. The rapid deployment of this innovation is helping PennDOT to meet the goal **Toward Zero Deaths** on Pennsylvania roadways.



## EDUCATION THROUGH INNOVATION DAY WORKSHOPS

Over the past year, the STIC has partnered with three PennDOT District Offices and the Pennsylvania Turnpike Commission to host educational workshops training over 400 professionals on innovative products and techniques in transportation. The workshops were held in Districts 12, 1, 9 and central office in Harrisburg in collaboration with the Pennsylvania Turnpike Commission.

Each Innovation Day Workshop was customized to fit the district's training goals. Facilitators Michael Bonini and Karyn Vandervoort challenged attendees to consider how innovation could be implemented in projects. Technical experts and PennDOT peers provided in-depth training on specific STIC and FHWA Every Day Counts innovations hand-picked by district leadership. At each workshop, PennDOT Secretary Barry Schoch provided a Keynote presentation and encouraged discussion and questions.

Audience participation is a key component to the success of Innovation Days. The interactive format facilitated participation through competitive activities like **Name that Innovation** and small breakout groups to explore how innovations could be applied to the district's priority projects. Attendee evaluations showed an overwhelming positive response to the leadership from PennDOT management, presentations from peers, and the exciting interactive format of the workshop.



*District 9 Innovation Day project breakout group.*

The STIC team is planning upcoming workshops in partnership with Districts 3, 4, and a regional event in Western Pennsylvania that will combine training for Districts 12, 11, and 10. Through collaboration with the American Society of Highway Engineers (ASHE) and the American Council of Engineering Companies (ACEC), the STIC is engaging consultants and contractors to provide training to private industry partners. If you are interested in bringing an Innovation Day Workshop to your organization, please contact the STIC at [ra-pdpenndotstic@pa.gov](mailto:ra-pdpenndotstic@pa.gov).

*“One of the best parts about today’s workshop was seeing actual innovations being used in projects through peer discussion.”*

*– District 12 Innovation Day Workshop participant*



*Tony Mento, FHWA shares information at the District 9 Innovation Day Workshop.*





DISTRICT 9  
EXECUTIVE  
THOMAS  
PRESTASH  
PLAYS  
NAME THAT  
INNOVATION

### Name that Innovation

The STIC management team created the fun and exciting **Name that Innovation** game to engage workshop attendees in applying the information they learned into practice. Using a blank Innovation Town Map, participants formed small teams to brainstorm where and how they would apply innovations to improve the transportation system in 'Innovation Town.' As the time expired, the teams with the most innovations placed correctly on the map were awarded fun prizes, including **unexpected Payday candies**.

*"The Innovation Map exercise got us out of our chairs and had us actually think about what we learned. Not an ordinary seminar!"*

*- District 9 Innovation Day Workshop participant*

### PENNSYLVANIA STIC RECEIVES HIGHEST HONOR AT GOVERNOR'S INNOVATION EXPO

On July 23, 2014, the Governor's Innovation Office hosted the **2014 Innovation Expo** to highlight innovation in state government. Each state agency competed in the Expo through an exhibit and formal presentation to showcase initiatives to improve efficiency and service delivery. Awards were given to recognize outstanding efforts in several categories including human services, customer service, e-Government, cross agency collaboration, and Innovation of the Year.

The STIC was awarded the Innovation of the Year for the presentation of Innovation Town, displaying transportation innovations through cross agency collaboration. The award was presented by Secretary Kelly Powell Logan of the Governor's Office of Administration.



Attendees discuss techniques at District 12 Innovation Day.



The STIC accepts the Governor's Innovation of the Year award.

## LOOKING AHEAD TO 2015

The STIC has set an ambitious agenda for 2015 to promote innovations that improve pavement performance and reduce congestion on Pennsylvania roadways. This includes an enhanced focus on paving techniques, design and construction, safety, and traffic operations through: **Intelligent Compaction**, **3D Modeling for Construction and Steel Structures**, **Adaptive Signal Control Technology**, and **Smarter Work Zones**. In addition to these innovations, PennDOT is partnering with FHWA to promote Every Day Counts initiatives.

In 2015, the STIC will announce the creation of the Pennsylvania Consortium of Transportation Universities (PaCTU) which will advise the STIC on current and future research capabilities at universities and how they can assist to drive innovations into practice. The STIC is working with representatives from Penn State University, Carnegie Mellon University, and the University of Pittsburgh to plan an inaugural Consortium to be held in the spring of 2015. The Consortium will bring together researchers from universities, technical experts, and transportation professionals from PennDOT, the Pennsylvania Turnpike Commission and industry partners to promote a discussion on new research and best practices. The Consortium is another example of the value and power of the STIC to bring people together to enhance communication to support the common goals of the transportation industry.

Through the STIC, PennDOT and FHWA have collaborated to deploy innovative products to improve transportation system performance. This partnership includes funding opportunities for demonstration projects. FHWA has provided \$100,000 in **STIC Incentive Funds** to support research on rumble strips on thin pavement overlays and High Friction Surface Treatment material evaluations. PennDOT has submitted an application to FHWA for an additional \$700,000 of **Accelerating Innovation Deployment (AID) Funding** to support infrastructure improvements, ITS technologies, and

*"There is nothing more important and inspirational than being on the forefront of innovation for the transportation industry. The FHWA with its EDC program, along with their strong partnership with PennDOT and their STIC, are driving innovation into the nation's highways for a safer and more efficient tomorrow."*  
 – Renee Sigel, FHWA Division Administrator

travel demand management strategies including the installation of adaptive traffic signals on McKnight Road in Pittsburgh, PA, and promotion of connected and autonomous vehicles. The decision on this application is expected to be announced in 2015. For more information on Every Day Counts and incentive funding opportunities, please contact Karyn Vandervoort at [karyn.vandervoort@dot.gov](mailto:karyn.vandervoort@dot.gov).



*Innovation Day attendees listen to peer presentations.*

## DATES TO REMEMBER | STIC Business Meetings

March 11	Pennsylvania State Association of Township Supervisors, Enola, Pennsylvania
June 17	Location To Be Determined
September 23	Location To Be Determined
December 9	Location To Be Determined

## Thank You to Our STIC Members

In 2015, the STIC will say farewell to five members as their terms come to a close.

*Thank you:* Thomas R. Clark, American Public Works Association  
Barry G. Hoffman, American Society of Highway Engineers  
David M. Sanko, Pennsylvania State Association of Township Supervisors  
John Ward, Delaware Valley Regional Planning Commission  
Angela Watson, Women in Transportation Seminar

***The STIC co-chairs, Secretary Barry Schoch and Division Administrator Renee Sigel, wish to express their sincere gratitude for the dedication and outstanding service performed to the Commonwealth of Pennsylvania as a member of the State Transportation Innovation Council from 2011 to 2014.***

For More Information



State Transportation Innovation Council (STIC)

[ra-pdpenndotstic@pa.gov](mailto:ra-pdpenndotstic@pa.gov)

[www.ModernDOT.pa.gov](http://www.ModernDOT.pa.gov)