



# State Transportation Innovation Councils

## *Partnering for Continuous Innovation*

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Innovations like ultra-high-performance concrete and precast deck panels allowed construction crews to remove and replace an entire bridge deck in Hennepin County, Minnesota, in 17 weeks.

This is an era of rapid change, and the transportation community is looking to capitalize on innovative technologies and practices that can enhance highway safety, expedite project delivery, decrease traffic congestion, and improve environmental sustainability. State Transportation Innovation Councils (STICs) are instrumental in this nationwide effort.

A STIC is a group of public and private transportation stakeholders that evaluates innovations and spearheads deployment statewide. The councils consist of representatives from federal, state, and local agencies, as well as from industry, academia, and other partners. Through each STIC, these stakeholders come together from a state's transportation

community to consider all sources of innovation comprehensively and strategically and to advance the technologies and processes that promise the greatest impact.

### **Culture of Innovation**

National initiatives such as Every Day Counts, the Implementation Assistance Program of the second Strategic Highway Research Program (SHRP 2), and the Innovation Initiative of the American Association of State Highway and Transportation Officials (AASHTO) are promoting innovations and supporting the transportation community in putting innovations into practice. Working through the STICs, state



Photo: Priya Saini/ALU, Flickr

departments of transportation (DOTs) can consider the innovations recommended by these sources and others.

The Federal Highway Administration (FHWA) launched Every Day Counts in 2009 in cooperation with AASHTO. Under the program, FHWA places a request every two years in the *Federal Register* calling on transportation stakeholders to nominate innovative technologies and processes that have proved effective and that are market ready although underutilized—in other words, innovations that have a capacity for success in widespread use.

FHWA selects approximately one dozen innovations for deployment. The agency highlights these at regional stakeholder summits, and state DOTs choose the innovations that will work best for them and their customers.

The concept of a nationwide network of STICs grew out of the Every Day Counts program as a way to reach a range of stakeholders with transportation responsibilities at all levels. By April 2016, STICs were at work in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and the jurisdictions associated with the Office of Federal Lands Highway. This widespread, continuous effort to foster innovation has had a positive effect on the adoption of new technologies and processes.



PHOTO: NEW YORK STATE THRUWAY AUTHORITY

## Gaining Traction

For example, the Massachusetts STIC, formed in 2011, has implemented 32 of the Every Day Counts innovations. For each of these, the STIC assembles a deployment team that develops an implementation plan and reports on progress at quarterly STIC meetings. The STIC's innovation success stories include projects involving design-build contracting,

Seven innovations from the Every Day Counts program and three products from the second Strategic Highway Research Program were included in the Tappan Zee Bridge replacement design-build project.

### INNOVATION

## Traffic Incident Management

**E**very Day Counts and SHRP 2 are promoting training in traffic incident management (TIM). The multidisciplinary program focuses on response efforts that protect motorists and responders while minimizing the impacts on traffic flow. In 2013 to 2014, during the second round of Every Day Counts, more than 80,700 responders received training in the best practices for clearing crashes, and by August 2016, the number had reached 200,000. In the fourth round of Every Day Counts, FHWA is encouraging adoption of three national performance measures that agencies can focus on when collecting and reporting TIM data:



PHOTO: FHWA

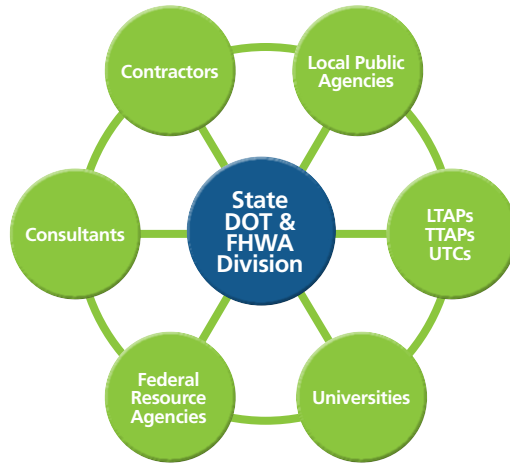
*Traffic Incident Management is a unique, multidisciplinary training program aimed at protecting motorists and responders while minimizing the impacts on traffic flow. Every Day Counts is supporting improvements in TIM data collection (above) and reporting.*

- ◆ Time of lane closure,
- ◆ Time that responders are on the scene, and
- ◆ Number of secondary accidents.

With STIC Incentive funding, Missouri DOT is accelerating TIM data collection by integrating the data feeds with regional integrated transportation information systems. Missouri DOT is hosting a TIM summit to inform all partners about effective TIM practices and to gather input for specific strategies.



**FIGURE 1** Through the STICs, state DOTs can engage with additional stakeholders, learn their priorities, and collaborate in selecting and deploying innovations from Every Day Counts or other sources. (Graphic: FHWA)



e-construction technologies, smarter work zones, and ultrahigh-performance concrete connections for prefabricated bridge components.

In New York State, the STIC’s action plan for Every Day Counts innovations includes a dashboard that highlights the implementation status and accomplishments of each initiative. The dashboard keeps management up to date and informs new employees.

The New York STIC also emphasizes the combination of multiple innovations on a project or program. In replacing the Tappan Zee Bridge, for example, the state used seven Every Day Counts innovations, including design–build project delivery, 3-D modeling, and e-construction, as well as three SHRP 2 products, including complex project management strategies.

These two examples show how the national STIC network and Every Day Counts are gaining positive traction. As of May 2017, each state has used 14 or more of the 43 innovations promoted through Every Day Counts, and some states have adopted more than 30. Many of these innovations have become mainstream practices across the country.

### Partnering for Impact

Each STIC represents a partnership between federal, state, and local governments, as well as the private sector and the academic community (see Figure 1, above, left); the dynamics are unique to each state. In striving to advance innovations, each STIC forms a link between the research community, proven technologies, and statewide implementation.

## INNOVATION Accelerated Bridge Construction

**M**ethods of accelerated bridge construction (ABC) include slide-in bridges, prefabricated bridge elements and systems, and the geosynthetic-reinforced, soil-integrated bridge system—all championed in more than one round of Every Day Counts. ABC enables highway agencies to replace bridges in hours, to reduce planning and construction efforts by years, to decrease traffic delays, and potentially to increase safety and to lower project costs.

In collaboration with the Kentucky Transportation Cabinet, Indiana DOT used ABC and design–build project delivery on the Milton–Madison Bridge, a \$103 million project. The innovations allowed the old bridge to stay open to traffic while the new one was built. The procedure slid the 2,428-foot-long structure from temporary piers 55 feet laterally onto the refurbished original piers; the Milton–Madison Bridge is the longest bridge to be slid laterally into place in North America.

The new steel truss bridge over the Ohio River weighs 30 million pounds and is 40 feet wide—twice as wide as



PHOTO: MILTON–MADISON BRIDGE PROJECT

*The Milton–Madison Bridge over the Ohio River is the longest in North America to be moved into place by sliding laterally, an ABC technique. The joint Indiana–Kentucky DOT effort also used design–build project delivery.*

the 1929 structure it replaced—and accommodates two 12-foot lanes and 8-foot shoulders. With the bridge slide approach, the river crossing was closed for only 41 days, in contrast to the 1 year that conventional construction would have required.

Maine DOT used STIC Incentive funds on an ABC project that called for prefabricated concrete deck panels with ultrahigh-performance concrete connections. With innovative materials and technologies, the project team replaced the deck of the Western Avenue Bridge in 52 days—78 days faster than traditional methods would have required—and is developing standards from the lessons learned.

STIC Incentive funds helped Mississippi DOT write guidelines for ABC technologies. The guidelines provide a step-by-step process for determining the suitability of projects for ABC and to outline lessons learned from ABC projects.

For more information about ABC, visit <https://www.fhwa.dot.gov/innovation/everydaycounts/edc-2/abc.cfm>.



Kentucky's Utilities and Rail Coordination Program and its STIC conduct research to improve railroad coordination.

Although the makeup and operation of the STICs may vary somewhat, each state's FHWA division office and the state DOT typically cochair the STIC, which may include representatives from the Local Technical Assistance Program, the Tribal Technical Assistance Program, and university transportation centers.

Local agency representatives often include county engineers and representatives from metropolitan planning organizations, local transit and tollway authorities, and city public works departments. Industry representatives may come from trade associations, as well as from private construction and consulting firms. Many councils also have representatives from federal agencies such as the Federal Transit Administration, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers.

Through established partnerships, the Kentucky STIC is working to accelerate deployment of an unmanned aircraft systems program, to implement e-construction, and to improve railroad coordination. The Kentucky STIC's ability to deploy innovative ideas statewide quickly and effectively is a result of involving all partners and has improved services to state citizens.

## STIC Incentive Program

FHWA administers a STIC Incentive program that offers up to \$100,000 per state in each federal fiscal year to support or offset the costs of standardizing innovative practices in a state transportation agency or other public-sector stakeholder. The funds provide a federal share of 80 percent on a project, and project sponsors or other allowable funding sources supply the 20 percent nonfederal match. The STIC Incentive funds have helped states to mainstream innovations and to expedite project delivery.

The Idaho Transportation Department applied

incentive funds in developing design standards for geosynthetic-reinforced, soil-integrated bridge system construction, an innovation promoted by Every Day Counts. The department also hosted a workshop to demonstrate the technique to approximately 100 local agency representatives.

Maine DOT applied STIC Incentive funds for an accelerated bridge construction project with prefabricated concrete deck panels and ultrahigh-performance concrete connections. By using the innovative materials and technologies, the project team replaced the deck in 52 days—an estimated 78 days faster than with traditional methods. Maine DOT is applying the lessons learned to develop standards, specifications, and design guidance for projects.

## INNOVATION e-Construction

**E**-construction uses readily available technologies to improve document management for construction projects. E-construction saves money by decreasing the costs of paper use, printing, and document storage and saves time by reducing communication delays and by speeding transmittal. Supported by Every Day Counts, the method improves communication by allowing faster approvals, increased accuracy, and better document tracking. AASHTO has designated e-construction as an Innovation Initiative focus technology.

Florida DOT has used an e-construction documentation process for all construction contracts since July 2016, when the state institutionalized paperless processes. STIC Incentive funds enabled Florida DOT to complete efforts to provide field staff with mobile devices for e-construction. Florida DOT reports that e-construction

benefits include instantaneous data collection and the ability to troubleshoot and resolve issues in the field. After spending \$1.1 million to implement e-construction, the agency estimates a savings of approximately 1 hour per day per field user, or \$22 million a year.

Michigan DOT has implemented a successful e-construction program that is estimated to save \$12 million, to have eliminated six million pieces of paper per year, and to have slashed construction modification times from 30 days to three. The agency claims to be 99 percent paperless.



PHOTO: MICHIGAN DOT

*Highway projects require a significant amount of documentation. State DOTs using e-construction—the paperless management of construction documents—report savings in time and money.*



## Excellence Awards Recognize STICs

**A**SHTO and FHWA recognized STICs in Kentucky, Massachusetts, and Vermont in 2016 with the inaugural STIC Excellence Awards for success in fostering a culture of innovation.

◆ The Kentucky Transportation Cabinet created a senior management position to spearhead the integration and standardization of innovative processes throughout the state. High-friction surface treatments and Safety Edge contributed to an 85 percent drop in roadway crashes. Kentucky's policy of accelerated bridge construction has encouraged continuous innovation on bridge projects.

◆ Massachusetts DOT formed a committee named READi—for review, evaluate, accelerate, and deploy innovation—to identify innovations for deployment. The agency holds an annual Innovation and Tech Transfer Exchange to share the newest ideas in transportation technology. Massachusetts DOT used accelerated bridge construction to replace 14 bridges on I-93 over 10 weekends.

◆ The Vermont STIC Executive Council meets monthly to discuss new ideas, technology advances, and the applications to today's challenges. The Vermont STIC holds an annual meeting at which participants from industry, municipalities, and associations brainstorm innovative ideas. The Vermont Agency of Transportation has established a Performance, Innovation, and Excellence Section to lead innovation efforts.

STIC Incentive funds have helped Ohio DOT develop guidance for improving the quality and for streamlining the production of feasibility studies and alternative evaluation reports. The project was part of an ongoing effort by the state DOT to improve the quality of the project documents required under the National Environmental Policy Act.

In addition to the STIC Incentive program, FHWA offers other resources to help states and their transportation partners deploy innovations. Several funding options are available for states that are incorporating innovations into projects—for example, the Accelerated Innovation Deployment Demon-

stration program and the Increased Federal Share for Project-Level Innovation. FHWA also provides training, technical assistance, workshops, and peer exchanges to assist states in incorporating Every Day Counts innovations into standard practices.

## Strengthening the Network

As all of the STICs work toward the goal of strategically deploying innovation, the number of projects implementing advanced technologies and practices has increased significantly nationwide. The new task is to nurture the network to ensure that the focus on innovation becomes a permanent part of transportation practice.

Leadership is essential. Leadership support, even when an innovation proves unsuccessful, creates an environment in which people are willing to take the risks of doing something differently from the way it always has been done. FHWA's senior leader in each state, the division administrator, is part of the STIC, and in many cases, the state DOT's chief engineer or executive officer is actively engaged.

Although leadership support is a necessity, engagement from all stakeholders makes a STIC thrive. In addition to their role in Every Day Counts initiatives, these dynamic partnerships encourage collaboration, so that stakeholder representatives from throughout the state can brainstorm, learn from each other, and generate new ideas and tools that also benefit their organizations.

## Next Steps

Now that a STIC network is in place, what can maximize the potential for innovation deployment? At the Transportation Research Board (TRB) 96th Annual Meeting in January 2017, transportation professionals shared their perspectives on this question during a workshop on the elements of effective STICs. Sponsored by the TRB Standing Committees on Technology Transfer and on the Conduct of Research,

Lawyers Road in Herndon, Virginia, before and after the incorporation of bike and turn lanes. An Every Day Counts study on road diets, or roadway reconfiguring, shows increased mobility, access, and safety.



PHOTOS: VIRGINIA DOT



Victor Mendez (center), U.S. Department of Transportation, speaks at a meeting of the Pennsylvania State Transportation Innovation Council.

the workshop presented key strategies for innovation deployment gleaned from transportation leaders. Several strategies centered on outreach and communication, including developing resources for training transportation practitioners and for educating a range of other audiences.

FHWA assists in training by assembling deployment teams that provide technical assistance and support to the transportation community for each Every Day Counts innovation. The teams are adding an education component this year by creating content for high school and college curriculums, ensuring that the innovations are discussed with future transportation leaders. The goal is to foster an interest in the transportation industry among high school and college students and to expose the college audience to the innovations and practices they will encounter as they begin their careers in transportation.

One way to inform stakeholders and help them relate to the innovation deployment is to tell a compelling story about STIC activities. Whether the result is shortened project delivery, improved safety or environmental sustainability, or reduced congestion or costs, presenting the data that quantify the successes can make the results more meaningful for internal and external audiences.

Pennsylvania DOT, for example, enlists its communications department to spread news stories about the STIC's successes, including the quantifiable benefits from the innovations. This involves outreach and communication to provide updates on STIC efforts that relate to the traveling public and other stakeholders.

Pennsylvania DOT uses a variety of communication tools, such as the agency's web page, newsletter, social media, and informational videos to increase awareness of the innovations. The agency also has held a local government innovation day for elected officials to learn firsthand about the STIC and its role in improving the transportation services and

facilities of municipalities and communities. These are only a few of the strategies that STICs can employ to support innovation deployment and to make innovation part of everyday operations.

## Connections and Solutions

Each STIC and the national STIC network are providing the connections for government, industry, and academia to work together to identify, advance, and deploy the best project delivery solutions. With continued support from the transportation community, the STICs can establish a permanent, nationwide culture of innovation to deliver, build, maintain, and manage transportation improvements at all levels in a better, smarter, and faster way.

*FHWA welcomes ideas and comments on this topic at [innovation@dot.gov](mailto:innovation@dot.gov).*

### Related Websites

- ◆ FHWA Center for Accelerating Innovation  
<https://www.fhwa.dot.gov/innovation/>
- ◆ Power of the STIC (video)  
[https://www.youtube.com/playlist?list=PL5\\_sm9g9d4T20L20Dh1U4cf\\_Ke8oIS5Tn](https://www.youtube.com/playlist?list=PL5_sm9g9d4T20L20Dh1U4cf_Ke8oIS5Tn)
- ◆ Presentations from the National STIC Meeting  
[https://www.fhwa.dot.gov/innovation/stic/national\\_stic\\_meeting\\_recordings.cfm](https://www.fhwa.dot.gov/innovation/stic/national_stic_meeting_recordings.cfm)
- ◆ Presentations from the TRB STIC Workshop  
[https://www.fhwa.dot.gov/innovation/stic/best\\_practices.cfm](https://www.fhwa.dot.gov/innovation/stic/best_practices.cfm)
- ◆ Tapping Innovation Councils to Lead Change  
March–April *Innovators* magazine  
<https://www.fhwa.dot.gov/innovation/innovator/issue59/issue59.cfm>