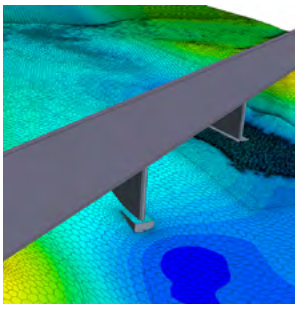
Every Day Counts:

An Innovation Partnership With States

EDC-4 Progress Report #1

January–June 2017



EDC
every day counts

U.S. Department of Transportation
Federal Highway Administration

"Every Day Counts provides the forum, it provides the tools, and it provides the expertise that we need to innovate in better ways."

Amy St. Peter, Maricopa Association of Governments Assistant Director

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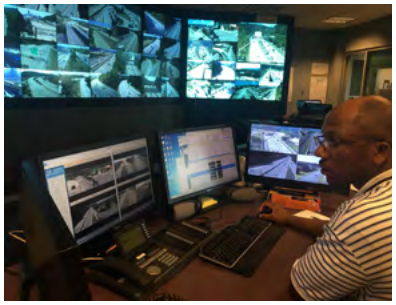
Foreword



Every Day Counts (EDC) is a Federal Highway Administration program to advance a culture of innovation in the transportation community in partnership with public and private stakeholders. Through this State-based effort, FHWA coordinates rapid deployment of proven strategies and technologies to shorten the project delivery process, enhance roadway safety, reduce congestion, and improve environmental outcomes.

This report summarizes the June 2017 status of innovation deployment for the 11 innovations in the fourth round of EDC. The report is intended to be a resource for transportation stakeholders as they implement their innovation deployment plans and to encourage ongoing innovation in managing highway project delivery to better serve the Nation.

"If we innovate, we can make the best use of our resources. We can achieve the best impact for the public."

Edwin Sniffen,
Hawaii Department of Transportation Highways Division Deputy Director

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ACRONYMS AND ABBREVIATIONS

AASHTO ..... American Association of State Highway and Transportation Officials
AID Demonstration ..... Accelerated Innovation Deployment Demonstration
ATSPMs ..... automated traffic signal performance measures
CHANGE ..... collaborative hydraulics: advancing to the next generation of engineering
DDSA ..... data-driven safety analysis
DOT ..... department of transportation
EDC ..... Every Day Counts
EDC-3 ..... Every Day Counts round three
EDC-4 ..... Every Day Counts round four
FAST Act ..... Fixing America's Surface Transportation Act
FHWA ..... Federal Highway Administration
FLH ..... Federal Lands Highway
NEPA ..... National Environmental Policy Act
STEP ..... safe transportation for every pedestrian
STIC ..... State Transportation Innovation Council
TIM ..... traffic incident management
UHPC ..... ultra-high performance concrete

Every Day Counts: An Innovation Partnership With States

Every Day Counts (EDC) is a Federal Highway Administration program that works in partnership with the **American Association of State Highway and Transportation Officials** and other transportation stakeholders to foster a culture of innovation. It focuses on accelerating project delivery and deploying proven innovations that facilitate greater efficiency at the State and local levels. Designed to complement other initiatives promoting innovative technologies and practices, EDC plays an important role in helping transportation agencies fulfill their obligation to the American people to deliver the greatest value for the tax dollars spent.

Every 2 years, FHWA works with State departments of transportation, local governments, tribes, private industry, and other stakeholders to identify a new set of innovative technologies and practices that merit widespread deployment through EDC. The selected innovations share common goals of shortening project delivery, enhancing the safety and durability of roads and bridges, cutting traffic congestion, and improving environmental sustainability. **EDC round four** (EDC-4), which promotes the adoption of 11 innovations in 2017 and 2018, builds on the success of previous deployment efforts.

After the process of selecting EDC innovations for each 2-year deployment cycle is completed, transportation leaders from across the country gather at regional summits to discuss the innovations and commit to finding opportunities to implement those that best fit the needs of their State transportation programs. After the summits, **State Transportation Innovation Councils** (STICs), which bring together public and private stakeholders, meet to evaluate innovations and spearhead their deployment. STICs are active in all 50 States, Washington, DC, Puerto Rico, the U.S. Virgin Islands, and Federal Lands Highway.

View the "Mission Possible" video for a quick look at the 11 EDC-4 innovations..

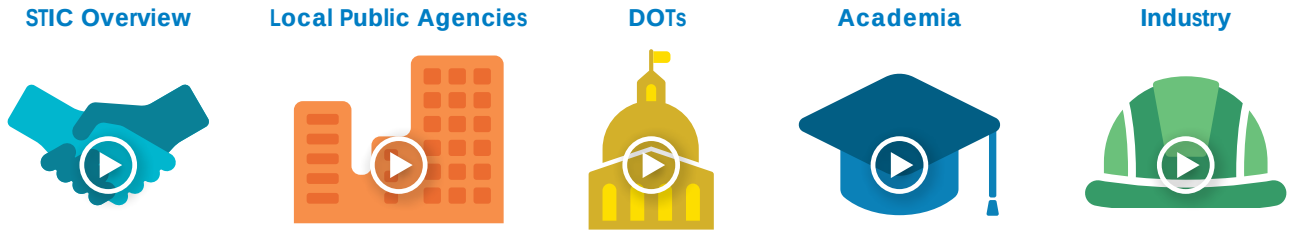
EDC's collaborative, State-based approach to deploying innovation enables States to determine which innovations will work best for them and their customers. Working through STICs, States can consider EDC innovations along with other recommendations from sources such as the AASHTO **Innovation Initiative** and the **second Strategic Highway Research Program** and adopt those that add value to their transportation programs.

FHWA's role in the EDC process is to provide national leadership in encouraging adoption of innovations that can improve the Nation's transportation system. The agency forms a multiagency deployment team for each EDC innovation to assist States in their implementation efforts. Using feedback from stakeholders obtained through communication opportunities such as the EDC summits, the teams offer technical assistance, training, and outreach to help the transportation community adopt innovations and make them standard practice.

> "The momentum has picked up through the series of Every Day Counts initiatives. More people are getting involved and seeing the advantage."
>
> *Malcolm Dougherty, California Department of Transportation Director*

FHWA also offers assistance through its **STIC Incentive** and **Accelerated Innovation Deployment (AID) Demonstration** programs to encourage and provide incentives for innovation deployment. The STIC Incentive program provides up to $100,000 a year per State to help STICs make innovations standard practice. The AID Demonstration program provides an incentive of up to $1 million to support the cost of deploying an innovation in any phase of a highway project. The program allocates up to $10 million a year in incentive funds.

The EDC program has had a significant positive impact on the transportation community's adoption of new technologies and processes. Every State has used 10 or more of the 32 innovations promoted during the first three rounds of the program, and some have adopted more than 20. Several of those innovations are now mainstream practices in many States. The 2015 **Fixing America's Surface Transportation Act** included EDC by name, directing FHWA to continue fostering a culture of innovation with stakeholders to deploy innovative practices and technologies.



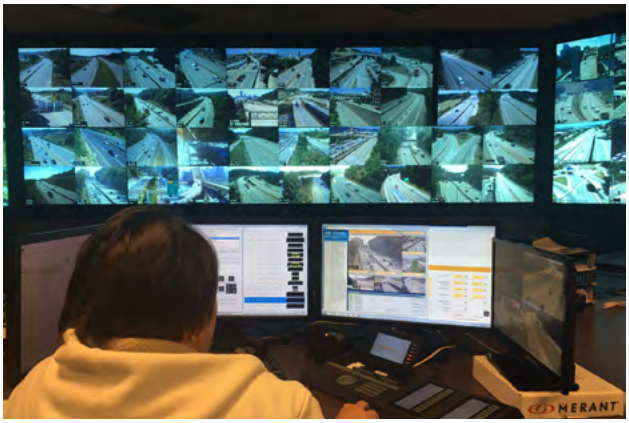
View the "Power of the STIC" video series to learn how the **national STIC network**, **local agencies**, **State transportation departments**, **academia**, *and* **industry** *collaborate to accelerate innovation deployment.*

> "Every Day Counts is a platform to accelerate the movement of innovations into the transportation community and how we do business."
>
> *Tony Furst, FHWA Chief Innovation Officer*

Innovation Highlights

Automated Traffic Signal Performance Measures

The **Alabama** DOT, the city of Tuscaloosa, FHWA, and the University of Alabama are partnering to deploy automated traffic signal performance measures (ATSPMs) across 85 intersections in the Tuscaloosa metropolitan area. Eighty-five dedicated short-range communication (DSRC) radios have been purchased for installation along SR69, SR215, US82, and US11. The goal is for the DSRC radios to enrich the data set for signal performance, satisfy the AASHTO Signal Phasing and Timing (SPaT) Challenge, mimic the Utah DOT ATSPMs, and establish a foundation for connected autonomous vehicle testing.



ATSPMs modernize traffic signal management by providing high-resolution data to actively manage performance and improve safety and customer service while cutting congestion and costs.

The **Florida** DOT (FDOT) is building organizational capability in tandem with ATSPMs to ensure the ability to sustain an active management posture over the long term. ATSPM deployments were launched in all districts to log high-density data. Upon successful testing, additional intersections will be configured. Once the data is validated, FDOT will identify locations with proper detector configurations to enable additional reports, such as turning movement counts and arrivals on red, and publish the data.

Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

After taking the National Highway Institute's 2D hydraulic modeling training, the **Georgia** DOT completed 2D modeling on several bridge projects. Georgia found that using 2D hydraulic modeling provided more accurate visualization of water surface elevations and distribution of flows through multiple openings.

The **Alaska** DOT developed a 2D hydraulic modeling review guidance document with the University of Alaska Fairbanks, and they developed a 2D model for the Chilkat River in support of a federally funded road project. The model was used to verify the proposed locations of bank protection and habitat enhancement features.

Community Connections

The lid over Interstate 90 on Mercer Island near Seattle, WA, enhances community connections with green space for a public park.

The **South Carolina** DOT (SCDOT) added a "Project Viewer" to the Department's Public Involvement Portal to provide a user-friendly and convenient way for the public to view the progress of highway and bridge projects. SCDOT's Public Involvement Coordinator conducted a series of training sessions for project managers and environmental personnel regarding new strategies for public involvement.

The **Connecticut** DOT (CTDOT) launched the Community Connectivity Grant Program (CCGP) to provide funding directly to municipalities to perform smaller-scale infrastructure improvements that make conditions safer and more accommodating for pedestrians and cyclists, thereby encouraging more people to use these healthy and environmentally sustainable modes of travel. CCGP funds are provided for targeted infrastructure improvements commonly identified through Road Safety Audits or other transportation planning initiatives.

Data-Driven Safety Analysis

The **Arizona** DOT (ADOT) is working on statewide implementation of Safety Analyst, predictive crash software produced by AASHTOWare, with the intent of moving away from funding projects based on past crash experiences to using data to fund projects based on predictive modeling. ADOT also held the first Safety Data User Group meetings with local and regional agencies to improve data quality and effectiveness throughout the State. Topics discussed included how to develop feedback capabilities between local agencies and ADOT when a crash report or Safety Data Mart (SDM) error is identified. ADOT is upgrading SDM from a proprietary software to one based on the commercially available Tableau program. This change will offer users of the raw crash data more tools to search, analyze, and, above all, tell the story of what the data is saying.

DDSA provides more reliable analysis than previous methods through the application of predictive and systemic tools for analyzing crash and roadway data.

The **Illinois** DOT developed State and local Five Percent lists that can be used to prioritize safety efforts at both levels. The State developed a guidance document to perform system-wide analysis on roadway segments, intersections, and curves. They also developed heat maps for the "emphasis areas" in the Illinois Strategic Highway Safety Plan and data trees to identify trends for all 102 counties and target systematic efforts.

e-Construction and Partnering: A Vision for the Future

The **Colorado** DOT (CDOT) created an e-Construction implementation team that includes representatives and "super users" from each region as well as an integrated implementation plan to help guide the team toward deployment. CDOT is piloting the use of mobile devices for construction administration needs on 12 highway projects, 12 local agency projects, and 7 bridge projects. These projects will test 36 apps supporting access to information, calculation tools, weather tools, etc. CDOT is modifying forms into fillable PDF format in preparation for using digital signatures. An AID Demonstration grant was awarded to pilot and test the integration of two CDOT systems as well as an electronic plan set into a unified portal to provide construction personnel with one location to manage both a design-bid-build project and a design-build project.

The **California** DOT (CalTrans) is using web-based surveys and mandatory, quarterly facilitated partnering meetings to improve communication assisted by e-Construction tools. Caltrans is expanding the claim submittal application process to include dispute review board (DRB) recommendations. This process improvement will provide better monitoring of the DRB program and improved access to DRB recommendations for lessons learned. Caltrans is also requiring project staff to meet with contractor staff after either party rejects a DRB recommendation to see if improving communication will reduce future disputes.

Integrating National Environmental Policy Act and Permitting

The **Virginia** DOT, FHWA, and U.S. Army Corps of Engineers developed a draft merged National Environmental Policy Act (NEPA) /404 process agreement. The agreement was shared with the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the U.S Fish and Wildlife Service for comment, and these agencies have been invited to be signatories.

The FHWA's **Federal Lands Highway** Division (FLH) developed a needs and recommendations document to help streamline the integration of NEPA and the permits process within FLH to deliver the program faster. An internal roles and responsibilities document provides direction to the discipline teams overseeing projects on coordination efforts with partners and internal team responsibilities. A flowchart allows the team to visualize the entire project and identify critical project area processes where contributions are needed. A template for Primavera P6 project management software incorporates the identified permitting requirements into the NEPA process.

The Dingmans Falls Road project team developed a process to identify a realistic timeline for project delivery that resulted in moving the permitting process up early in the project delivery timeline. This reduced Categorical Exclusion approval from 3 to 2 months and project cost by $1,463.00.

Pavement Preservation (When, Where, and How)

The **Pennsylvania** DOT developed standard specifications for thin asphalt overlays, and two projects will be completed this year using these standards. Pennsylvania regularly collects pavement condition and inventory data and has established policies related to pavement preservation and maintenance cycles. A pavement asset management system is being implemented with the central office and district personnel to better define needs, optimization of funds, and program recommendations.

The **West Virginia** DOT launched a "Just in Time" training program for district inspection staff to aid and refresh their preservation knowledge 2 weeks prior to specific preservation projects being completed in the field.

Road Weather Management—Weather-Savvy Roads

The **Oklahoma** DOT (ODOT) integrated 85 tablets into its snowplow fleet across the State and an additional 10 units are pending. ODOT is running tracking software on a web system to conduct real-time monitoring of winter weather operations in their Central Office and Field Division Offices. The system is able to capture a photo of the roadway every 10 minutes.

Integrating mobile observations and Pathfinder strategies can help agencies manage road systems and inform travelers ahead of, and during, adverse road weather conditions.

The **Colorado** DOT (CDOT) conducted 40 pre-storm conference calls for the 2016-2017 winter operational period. In advance of these calls, CDOT developed a chart for incident levels used by the CDOT Pathfinder Team to make an event determination (level 1 to 5) during pre-storm calls. This determination helps to plan for an appropriate response with available resources. Additionally, CDOT developed a public feedback survey to determine the impact of Pathfinder on traveler behavior and will use the data to make improvements as needed.

Innovation Highlights

Safe Transportation for Every Pedestrian (STEP)

Based on an assessment of statewide pedestrian crash data, the **Maine** DOT developed a "Strategic Plan to Address Pedestrian Crashes." One component of the plan is to identify potential STEP countermeasure sites, with an initial focus on 21 communities collectively encompassing 65 percent of pedestrian crashes, 35 percent of pedestrian fatalities, and 62 percent of incapacitating injuries.

The Maine DOT also held eight Crosswalk and Sidewalk Safety Workshops for local public agency engineers and planners through the Maine Local Roads Center. Engineering guidance on crosswalks and road diets has been updated to identify appropriate locations for STEP countermeasures, and agencies are being encouraged to deploy them through a Federal-aid funded Maine DOT Crosswalk Program.

Knowing how to determine good crossing locations and which countermeasures to use enables highway agencies and other organizations to increase pedestrian safety.

The **Tennessee** DOT developed a pedestrian safety program that will provide pedestrian safety improvements at the top 50 statewide intersections and corridors.

Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements

UHPC connection details make using prefabricated bridge elements simpler and more effective for accelerated bridge construction.

The **Iowa** DOT is the lead state on a pooled fund project on the structural design of ultra-high performance concrete (UHPC). They published newly developed standards for adjacent box girders, including material and construction specifications for UHPC materials. The Iowa DOT also hosted two UHPC workshops for local public agencies.

The **New Mexico** DOT constructed a UHPC girder bridge and is monitoring and analyzing the performance. They are designing two projects that will use UHPC for prefabricated bridge elements and conducting research on UHPC bridge overlays. STIC Incentive funds are being used to develop a locally sourced overlay material to integrate into the New Mexico specifications.

Using Data to Improve Traffic Incident Management

The **Maryland** DOT State Highway Administration (MDOT SHA) is collaborating with the Maryland State Police (MSP) on secondary crashes and tracking the data entered from law enforcement officers and troopers. The MDOT SHA will begin receiving secondary crash data with the next release of the MSP Accident Crash Reporting System.

The **Arkansas** DOT is developing dashboard tools to estimate the delay and costs associated with incidents. They completed the Traffic Incident Management Performance Measures Process for Progress Workbook and developed a baseline and draft implementation plan.

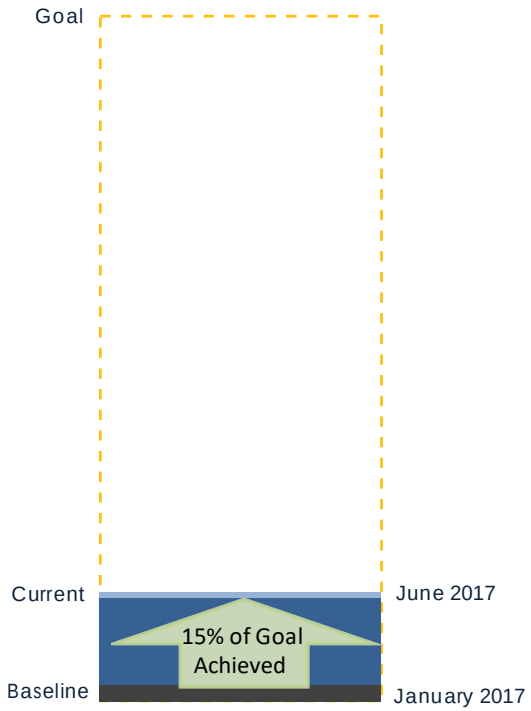
EDC-4 Innovation Implementation

Every 6 months, FHWA compiles a status report on the state of practice for the current round of EDC innovations. This section provides details on the 11 innovations in EDC-4 and includes maps and charts that show the progress made in advancing the technologies and practices by the end of June 2017.

The maps illustrate the innovation implementation stage in each State. The charts show the number of States that have demonstrated, assessed, or institutionalized the innovation. The charts also compare the June 2017 state of practice to the January 2017 baseline data and December 2018 goals set by States.

"State" is used as a general term that includes the State transportation department, metropolitan planning organizations, local governments, tribes, private industry, and other stakeholders in a State or territory. Information is provided for the 50 States, Washington, DC, Puerto Rico, the U.S. Virgin Islands, and Federal Lands Highway (FLH), a total of 54 entities.

The following table defines the innovation deployment stages displayed on the maps and charts.



Attainment of Demonstration, Assessment, or Institutionalized Implementation Across All Innovations and States
Progress Report #1

Innovation Implementation Stages

Not Implementing	The State is not using the innovation anywhere in the State and is not interested in pursuing the innovation.
Development Stage	The State is collecting guidance and best practices, building support with partners and stakeholders, and developing an implementation process.
Demonstration Stage	The State is testing and piloting the innovation.
Assessment Stage	The State is assessing the performance of and process for carrying out the innovation and making adjustments to prepare for full deployment.
Institutionalized	The State has adopted the innovation as a standard process or practice and uses it regularly on projects.

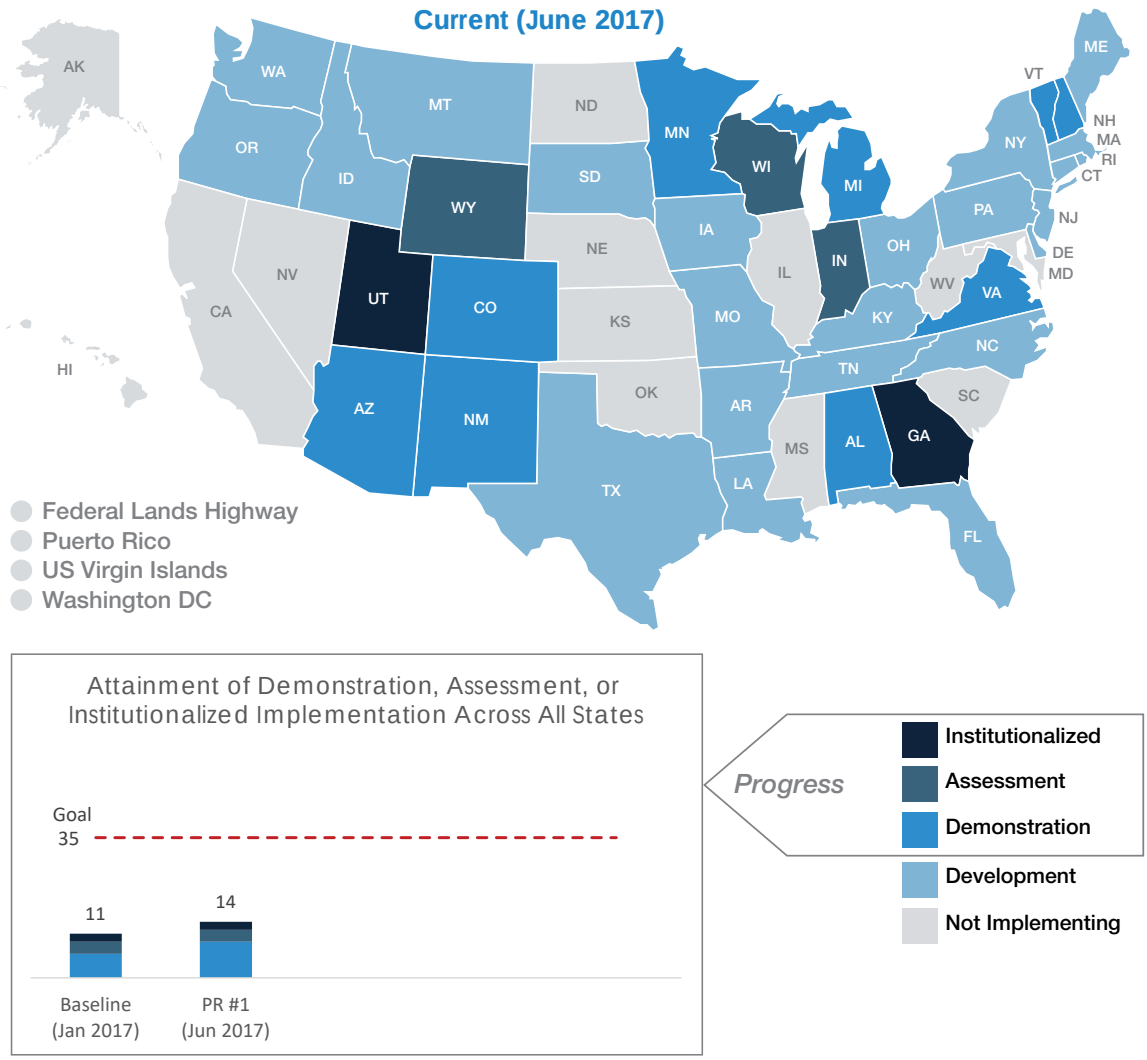
Automated Traffic Signal Performance Measures

Automated traffic signal performance measures (ATSPMs) enable transportation agencies to incorporate objectives and performance-based approaches in traffic signal operations, maintenance, design, and management. Using ATSPMs can improve safety and customer service while cutting congestion and costs.

More than 330,000 traffic signals operate in the United States. Typically, agencies retime signals on a 3- to 5-year cycle at a cost of about $4,500 per intersection. For most signals, citizen complaints are the primary performance measure. The need to use software modeling to simulate performance and manually collected traffic data drives up retiming costs.

ATSPMs consist of a high-resolution data-logging capability added to existing traffic signal infrastructure and data analysis techniques. This cost-effective technology provides the information needed to manage traffic signal maintenance and operations in support of an agency's safety and mobility goals.

Using ATSPMs to enhance safety and customer service is generating interest across the country. Twenty-three States are developing implementation plans and learning more about this innovation. Twelve States are demonstrating and assessing the technology. Two additional States have made ATSPMs a standard practice.



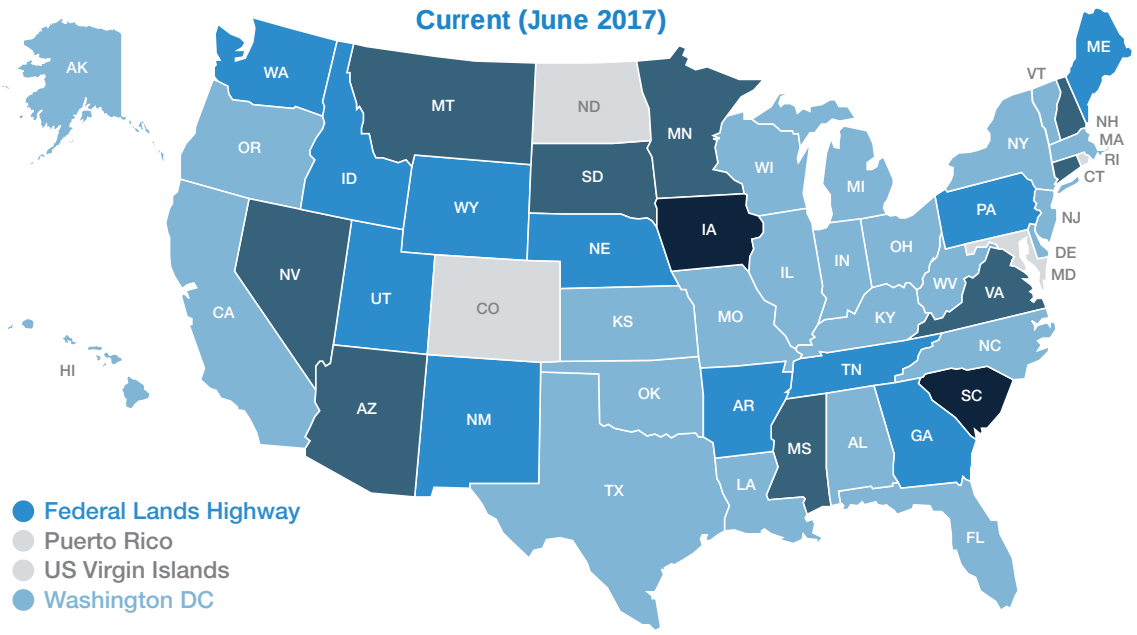
Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

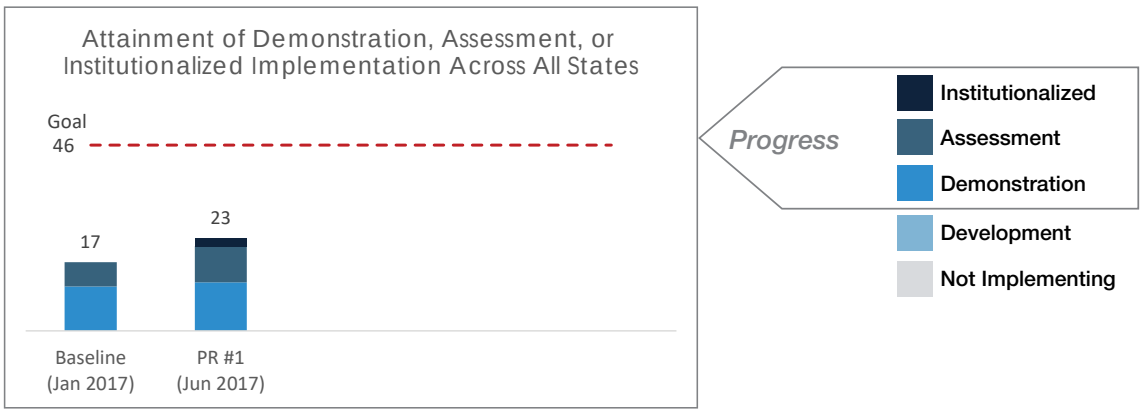
The effort on **collaborative hydraulics: advancing to the next generation of engineering** (CHANGE) uses hydraulic tools to improve understanding of complex interactions between river or coastal environments and transportation assets, enabling better design and more efficient project delivery.

The next generation of hydraulic engineering tools provides planners and designers with data they can use to improve project quality. The technology can be used to illustrate patterns of flow discharge, water surface elevations, depth, velocity, and shear stress. The results allow for more accuracy in estimating flow conditions and paths, evaluating hydraulic considerations, and assessing extreme weather event scenarios.

These new hydraulic modeling tools represent a significant evolution in hydraulic modeling theory and practice, with potential for streamlining environmental, regulatory, engineering, and other aspects of project delivery. The results can improve the ability of highway agencies to design safer, more cost-effective, and resilient structures on waterways.

CHANGE is generating widespread interest among States. Twenty-five States and Washington, DC, are developing implementation plans and learning more about this innovation. Twenty States and FLH are demonstrating and assessing hydraulic engineering tools. Another two States have institutionalized hydraulic tools.





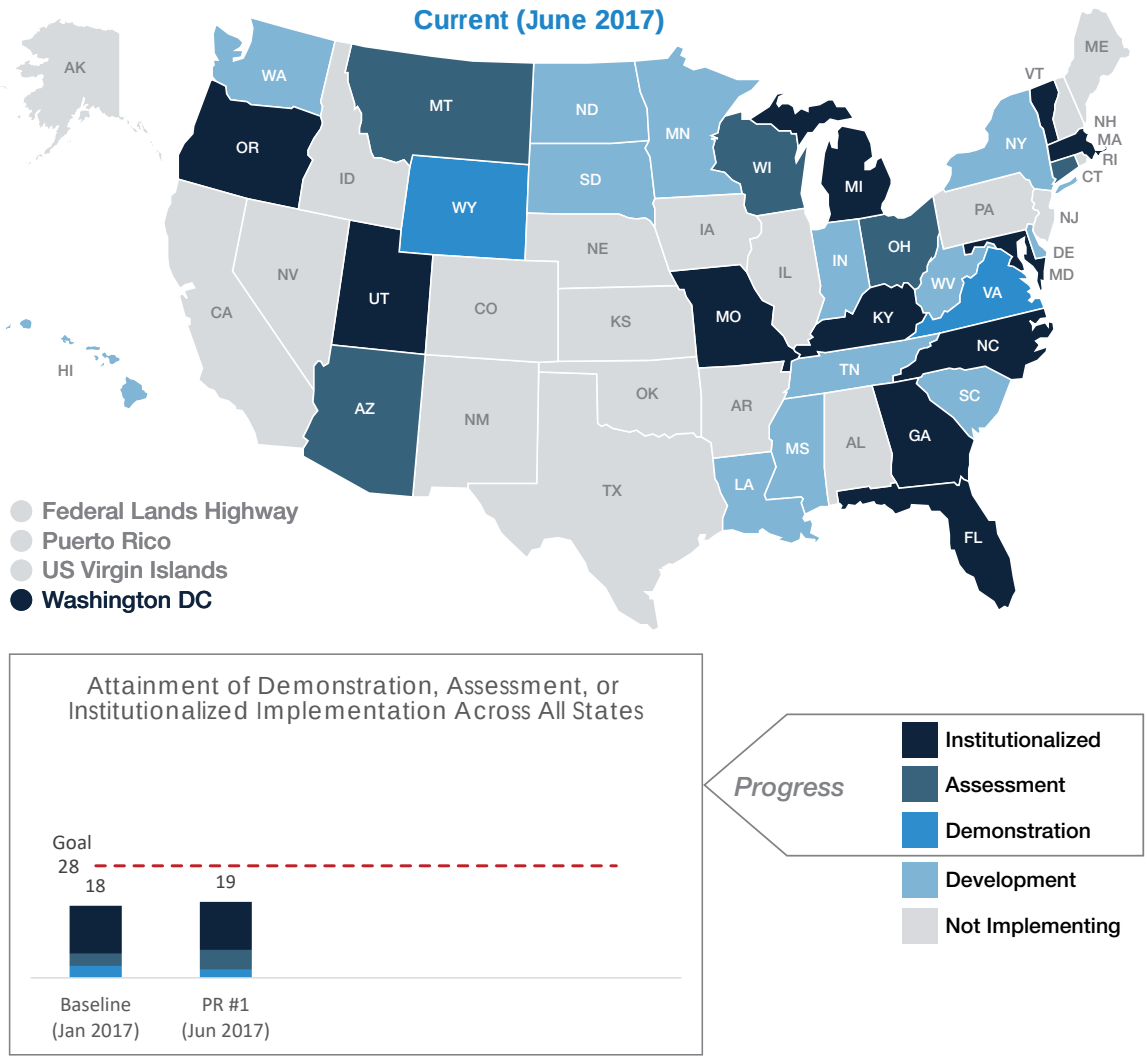
Community Connections

Community connections are performance management approaches for planning, designing, and building transportation projects that promote connectivity, revitalize communities, and improve public health and safety.

Transportation can play an important role in supporting community revitalization. Using performance-based management approaches can help transportation agencies develop highway retrofitting, rehabilitation, or removal options that turn aging infrastructure into opportunities for reestablishing community connections and cohesion.

Strategies planners and designers can use to connect communities and retrofit transportation infrastructure include visualization tools, scenario planning techniques, public involvement techniques, context-sensitive solutions, and design and construction processes. The community connections framework and tools can help agencies identify gaps and work to ensure that all users have access to safe, reliable, affordable, and multimodal transportation networks.

Fourteen States are developing implementation plans and learning more about community connections. Seven States are demonstrating and assessing community connections approaches to enhance their transportation networks. An additional 11 States and Washington, DC, have made community connections a standard practice.



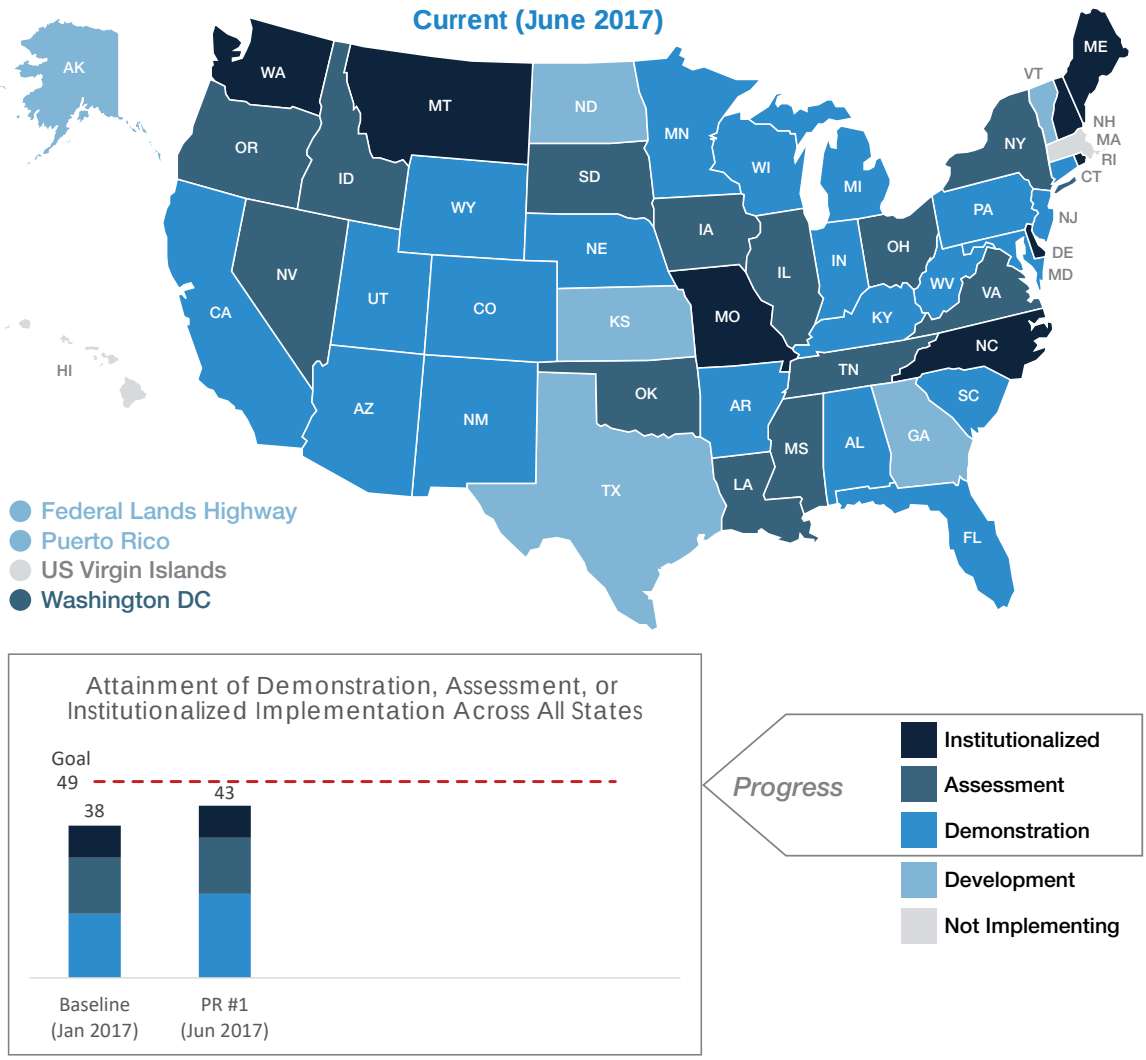
Data-Driven Safety Analysis

Data-driven safety analysis (DDSA) uses tools to analyze crash and roadway data to predict the safety impacts of highway projects, enabling agencies to target investments with more confidence and reduce severe crashes on roads.

Traditional crash and roadway analysis methods rely mostly on subjective or limited quantitative measures of safety performance. DDSA employs new, evidence-based models that provide agencies with the means to quantify safety impacts. In EDC-4, FHWA will continue to help States incorporate DDSA into processes and policies, but a new focus will be on assisting local agencies in gaining proficiency with DDSA tools.

DDSA includes two approaches that agencies can implement individually or in combination. Predictive analysis helps identify roadway sites with the greatest potential for improvement and quantify the expected safety performance of project alternatives. Systemic analysis uses crash and roadway data to identify roadway features that correlate with particular crash types.

Interest in using DDSA to enhance safety and reduce roadway crashes continues to grow. Six States, FLH, and Puerto Rico are developing implementation plans and learning more about this innovation. Thirty-four States and Washington, DC, are demonstrating and assessing DDSA tools to target safety investments. An additional eight States have made DDSA a standard practice.



e-Construction and Partnering: A Vision for the Future

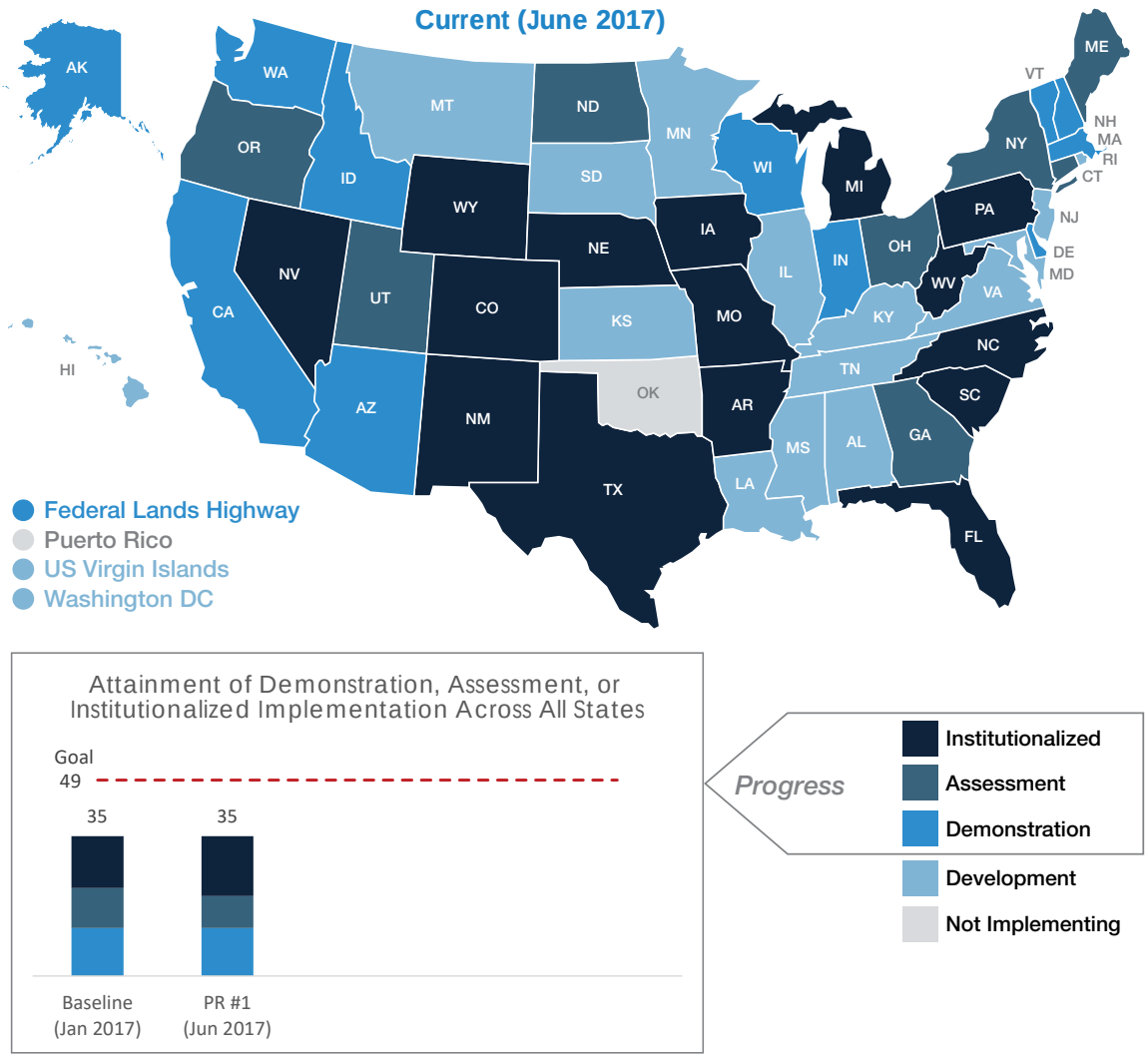
e-Construction and partnering: a vision for the future involves using paperless technologies to enhance partnering among stakeholders on construction projects, improving communication and workflows while streamlining project delivery.

e-Construction is the creation, review, approval, distribution, and storage of highway construction documents in a paperless environment. It uses readily available technologies to improve construction document management. It saves time by decreasing the delays inherent in paper-based project administration. It also saves paper, printing, and document storage and transmission costs.

Construction partnering is a project management practice in which transportation agencies, contractors, and other stakeholders create a team relationship of mutual trust and enhanced communication. Partnering builds connections among stakeholders to improve outcomes and complete quality projects that are focused on safety and built on time and within budget.

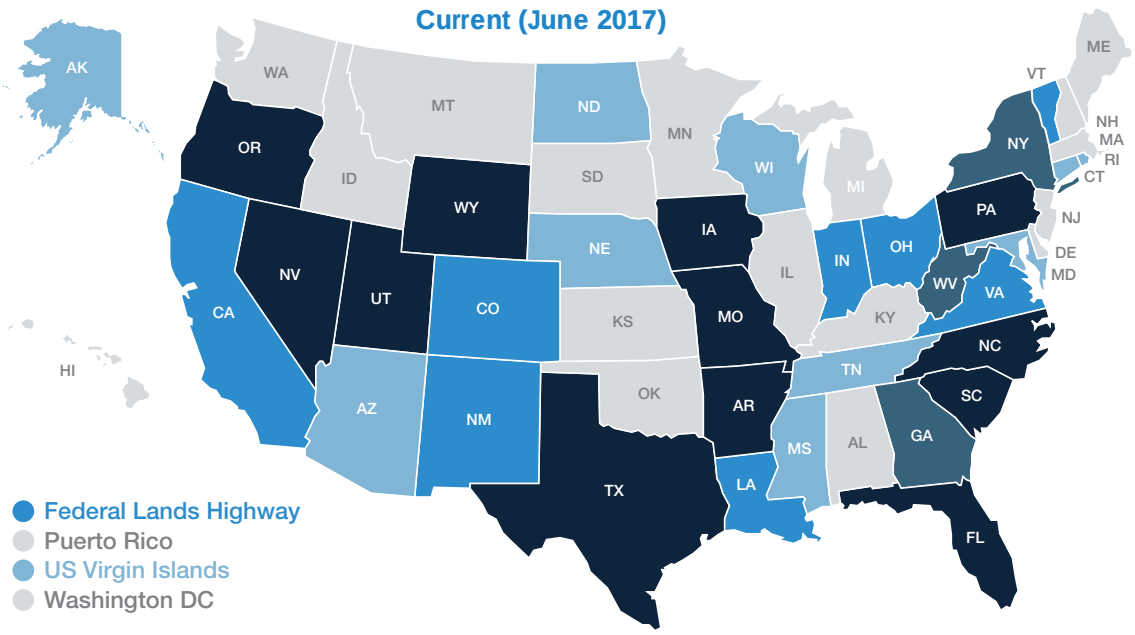
e-Construction

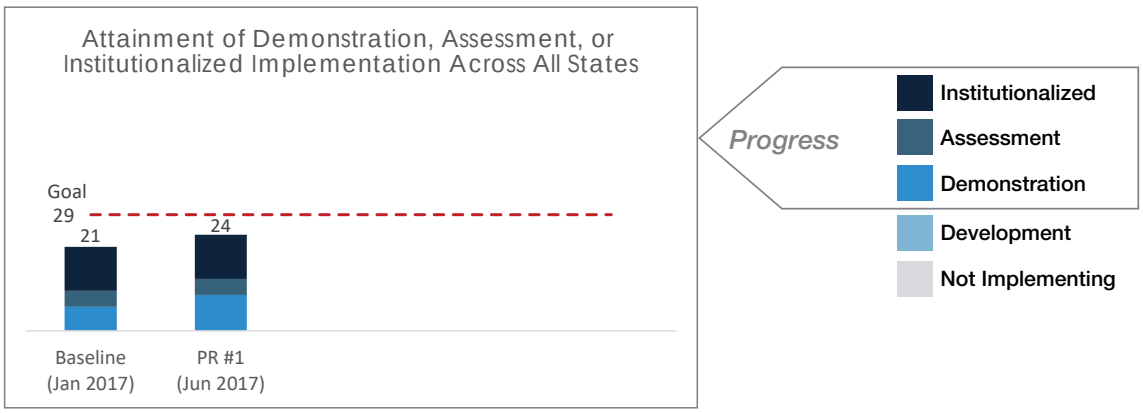
Applying a paperless approach to project document management continues to attract interest. Fifteen States, the U.S. Virgin Islands, and Washington, DC, are developing implementation plans and learning more about this innovation. Nineteen States and FLH are demonstrating and assessing e-Construction tools and processes. Fifteen additional States use e-Construction as a standard practice.



e-Construction and Partnering

Ten States and the U.S. Virgin Islands are developing implementation plans and learning more about e-Construction and partnering. Twelve States and FLH are demonstrating and assessing paperless technologies to improve partnering among stakeholders on construction projects. Another 11 States have made e-Construction and partnering a standard practice in project delivery.





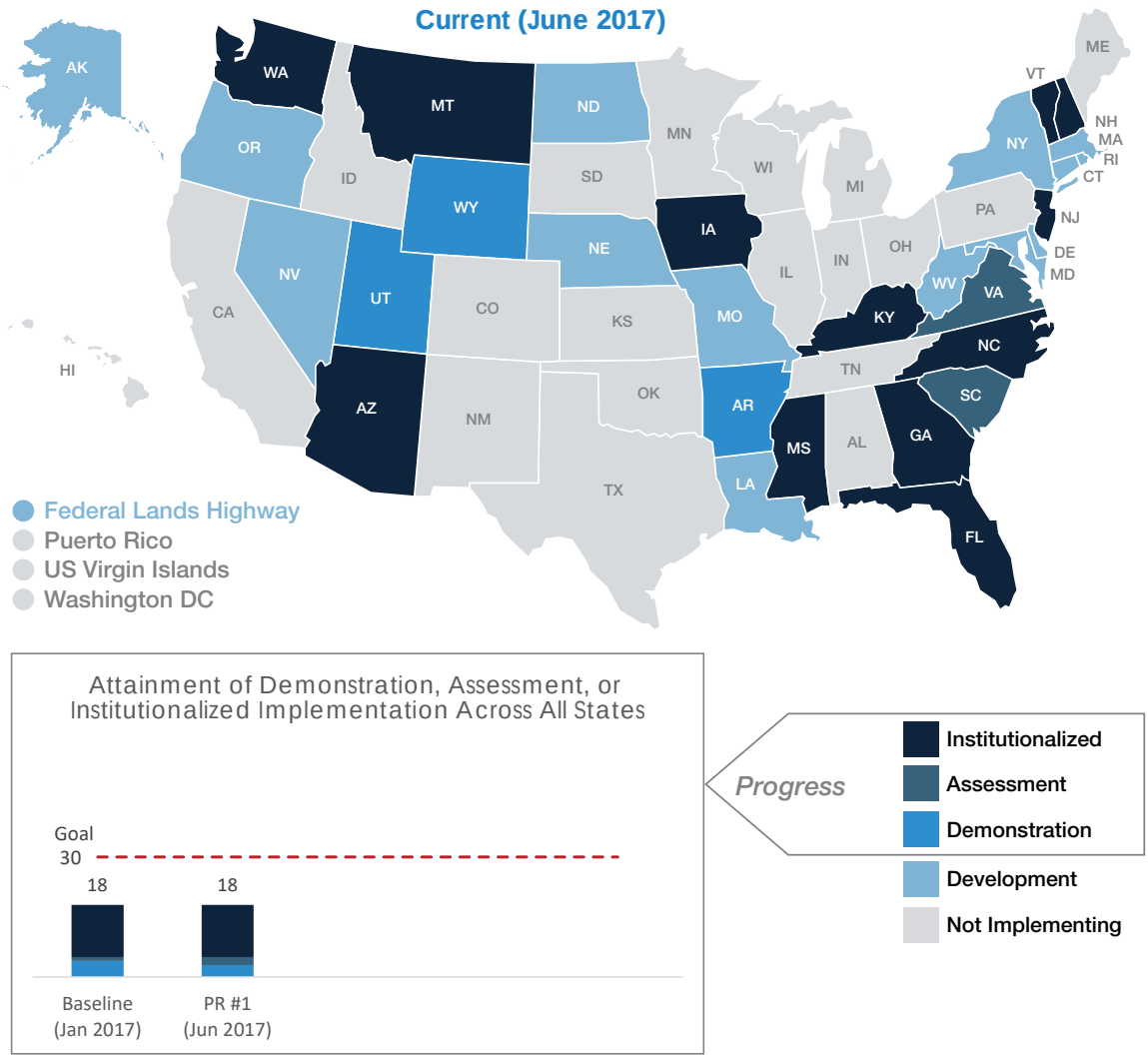
Integrating National Environmental Policy Act and Permitting

Integrating National Environmental Policy Act (NEPA) and permitting processes enables concurrent, synchronized environmental and permitting reviews that save time and reduce costs for the agencies involved.

Integrating NEPA and permitting processes allows the various environmental reviews and permitting procedures required for Federal-Aid Highway Program projects to be performed at the same time rather than sequentially. The resulting synchronization provides for more effective and efficient regulatory reviews, leading to projects with reduced impacts on the environment as well as time and money savings.

The EDC-4 effort focuses on outreach, training, and technical assistance to help transportation departments integrate NEPA and permitting processes. The effort features proven best practices, data management, and tools for navigating environmental assessments and environmental impact statements needed for transportation projects. It also offers assistance on using FHWA's online collaboration tool, eNEPA, to support timely and consistent coordination among agencies to complete necessary permitting processes.

Fourteen States and FLH are developing implementation plans and learning more about integrating NEPA and permitting. Five States are demonstrating and assessing tools to integrate NEPA and permitting processes in EDC-4. Another 13 States have made it a standard practice to integrate NEPA and permitting processes on projects.



Pavement Preservation (When, Where, and How)

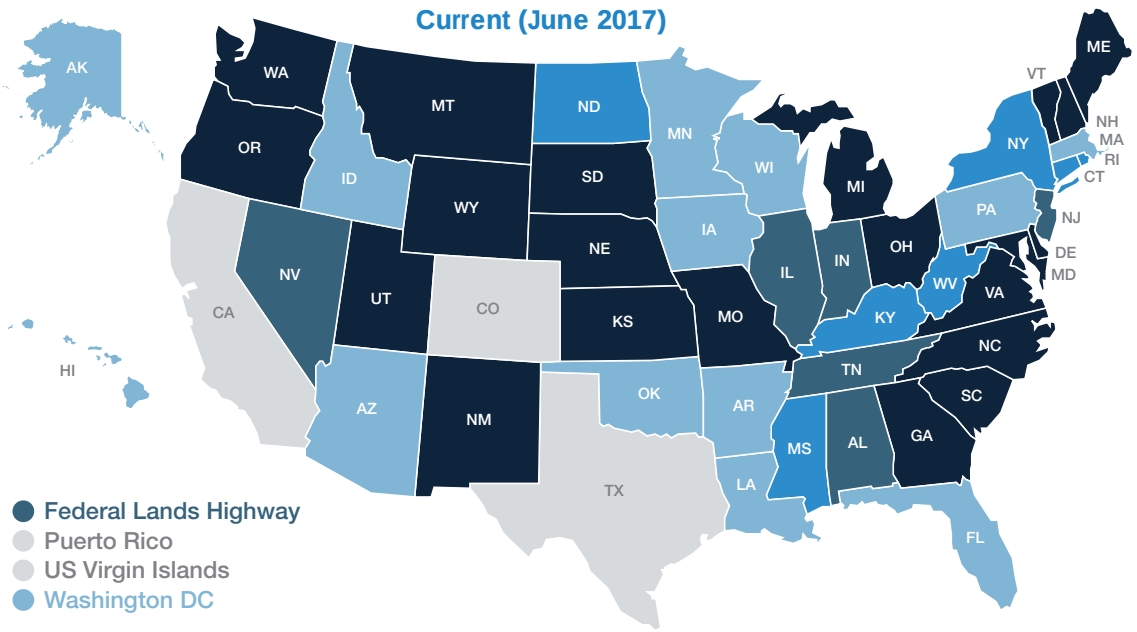
Pavement preservation (when, where, and how) involves applying a pavement preservation treatment at the right time on the right project with quality materials and construction, offering a critical investment strategy for optimizing infrastructure performance. Pavement preservation practices provide a cost-effective approach to extending the service life of pavements and achieving smoother, safer roads with fewer costly repairs.

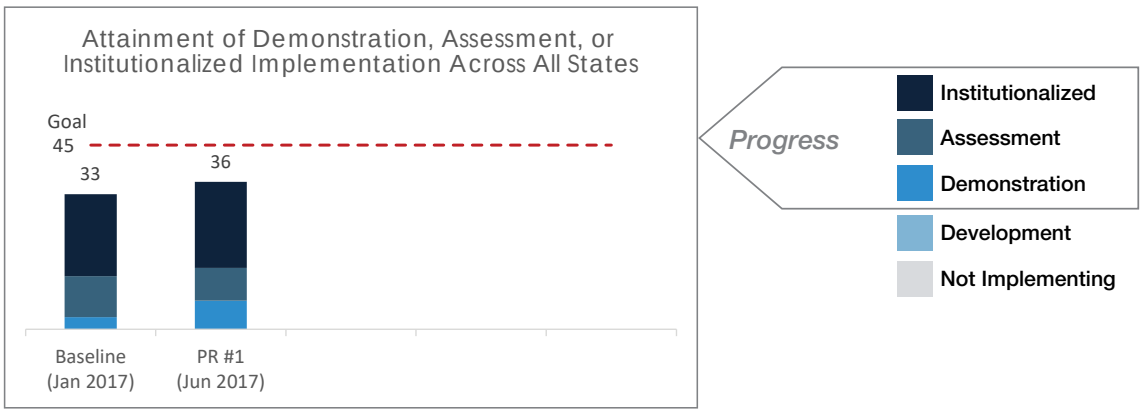
The "when and where" component of pavement preservation supports preservation of highway investments by managing pavements proactively. Whole-life planning defines expectations for the long term and provides more stability to the cost of operating and maintaining highway pavements. Identifying preservation strategies at the network level reduces the need for frequent or unplanned reconstruction.

The "how" component of pavement preservation promotes quality construction and materials practices, including treatment options that apply to flexible and rigid pavements. Successful construction practices contribute to improved pavement performance, providing smoother, safer roads and delaying the need for rehabilitation.

Pavement Preservation: When and Where

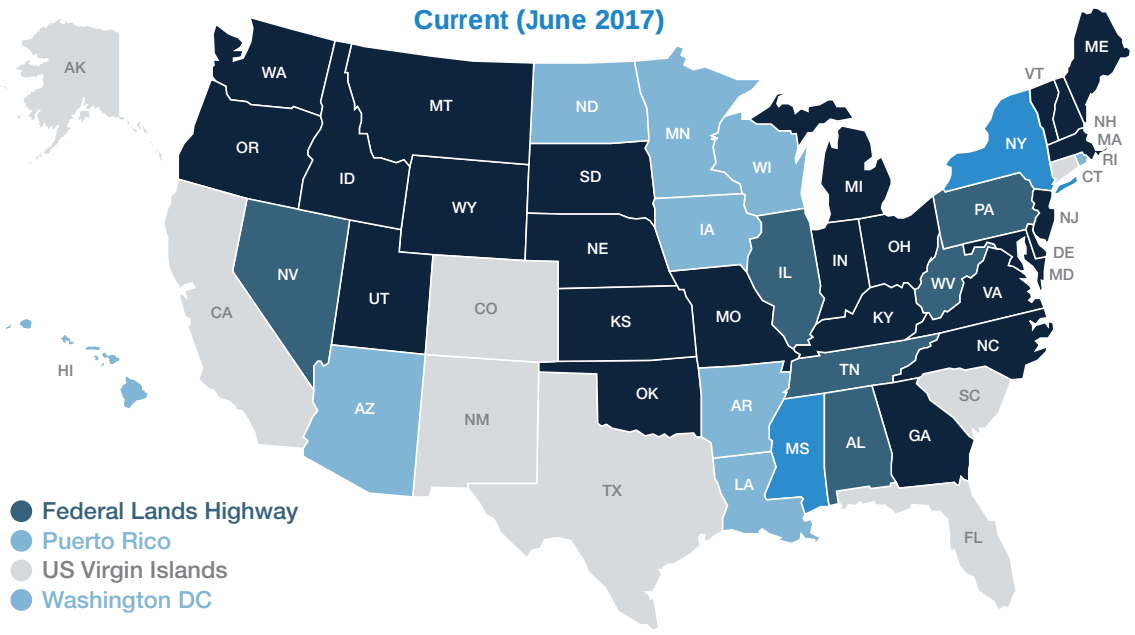
Thirteen States and Washington, DC, are developing implementation plans and learning more about when and where to apply pavement preservation treatments. Fourteen States and FLH are demonstrating and assessing the when and where component of pavement preservation. Another 21 States have made it a standard practice to manage pavements proactively to preserve highway investments.

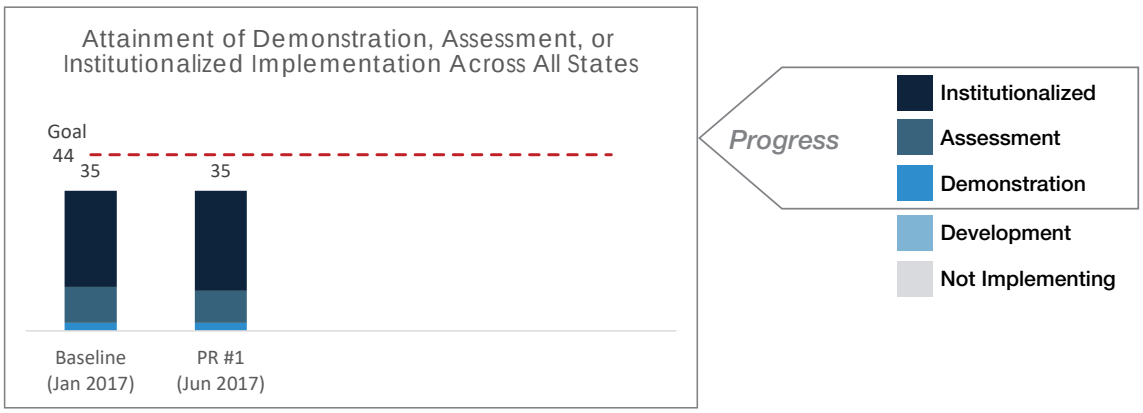




Pavement Preservation: How

Nine States, Puerto Rico, and Washington, DC, are developing implementation plans and learning more about how to apply pavement preservation treatments. Nine States and FLH are demonstrating and assessing the how component of pavement preservation. Another 25 States have institutionalized the use of quality construction and materials practices to preserve pavements.





Road Weather Management—Weather-Savvy Roads

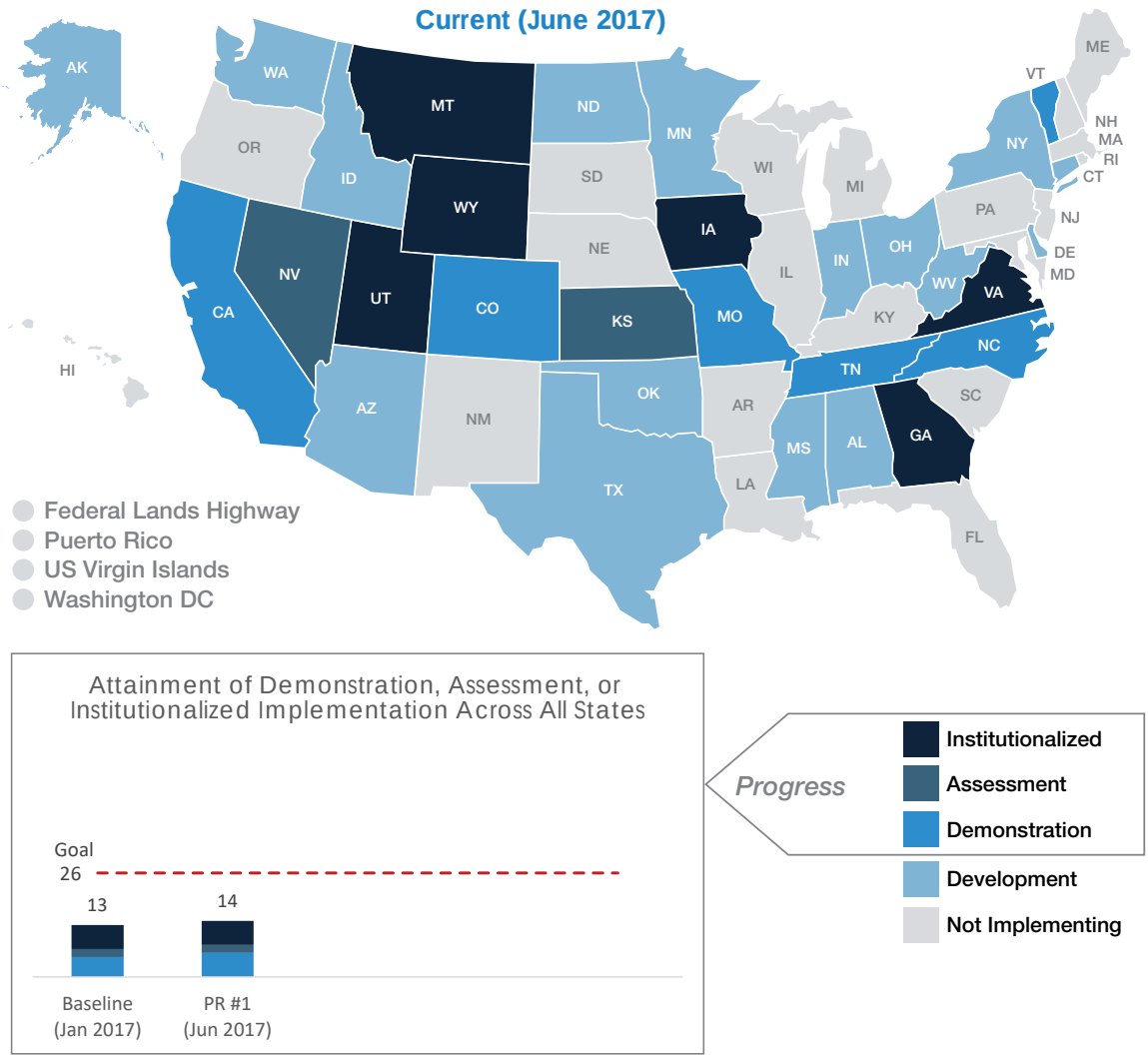
Road weather management—weather-savvy roads integrates mobile observations and Pathfinder strategies that can help agencies manage road systems and inform travelers ahead of and during adverse road weather conditions. Twenty-two percent of all vehicle crashes in the past decade were weather-related. On average, these crashes resulted in about 6,000 deaths a year. Adverse weather causes about 25 percent of nonrecurring traffic delays, and weather-related delays add about $3.4 billion a year to freight costs.

The Pathfinder process enables transportation departments, the National Weather Service, and private weather service providers to collaborate on clear, consistent road weather messaging. It provides the foundation for coordination across agencies to develop cohesive weather impact information that helps drivers make better travel decisions. Ultimately, it saves lives, protects property, and minimizes the impact of weather events.

Integrating mobile observations is a cost-effective way to gather information on weather and road conditions using existing fleet vehicles. Vehicle-based technologies provide agencies with data to manage transportation systems before the negative impacts of road weather occur. Maintaining a high level of service on roads can reduce crashes and keep traffic moving smoothly.

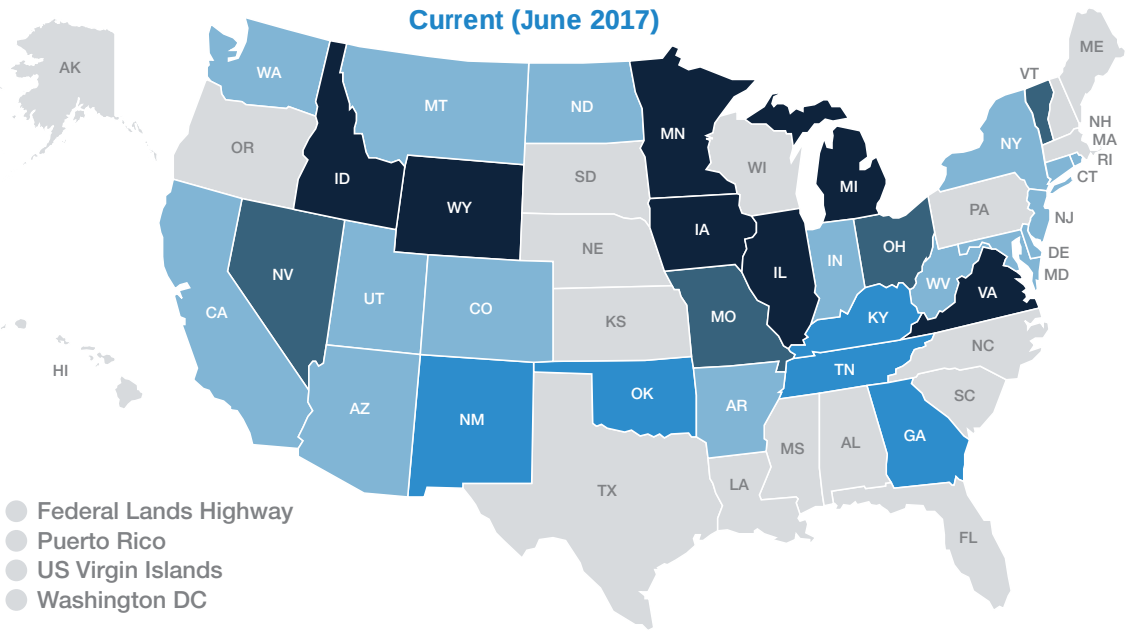
Road Weather Management: Pathfinder

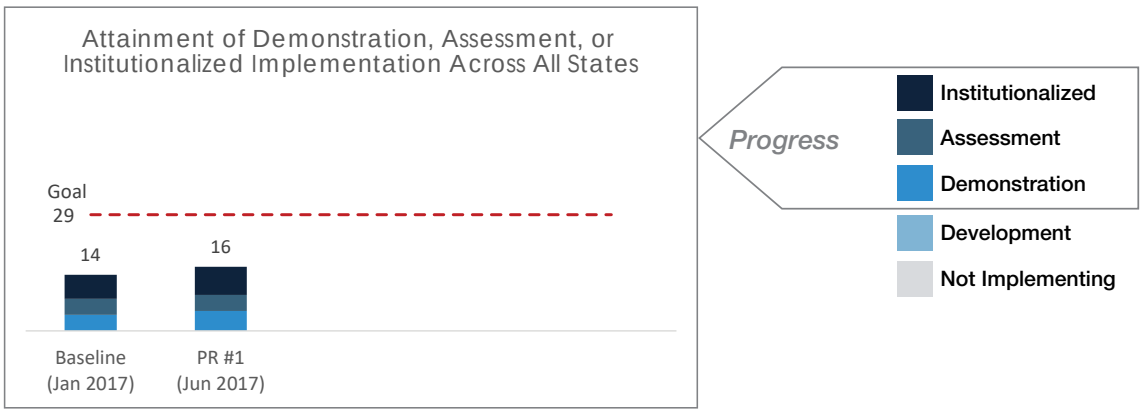
Sixteen States are developing implementation plans and learning more about the Pathfinder process. Eight States are demonstrating and assessing the Pathfinder process to collaborate on clear, consistent road weather messaging to help drivers make better travel decisions. Another six States have institutionalized the process.



Road Weather Management: Integrating Mobile Observations

Sixteen States are developing implementation plans and learning more about integrating mobile observations into their road weather management process. Agencies in nine States are demonstrating and assessing vehicle-based technologies to gather data to use to mitigate the negative impacts of road weather. An additional seven States have made integrating mobile observations a standard practice.





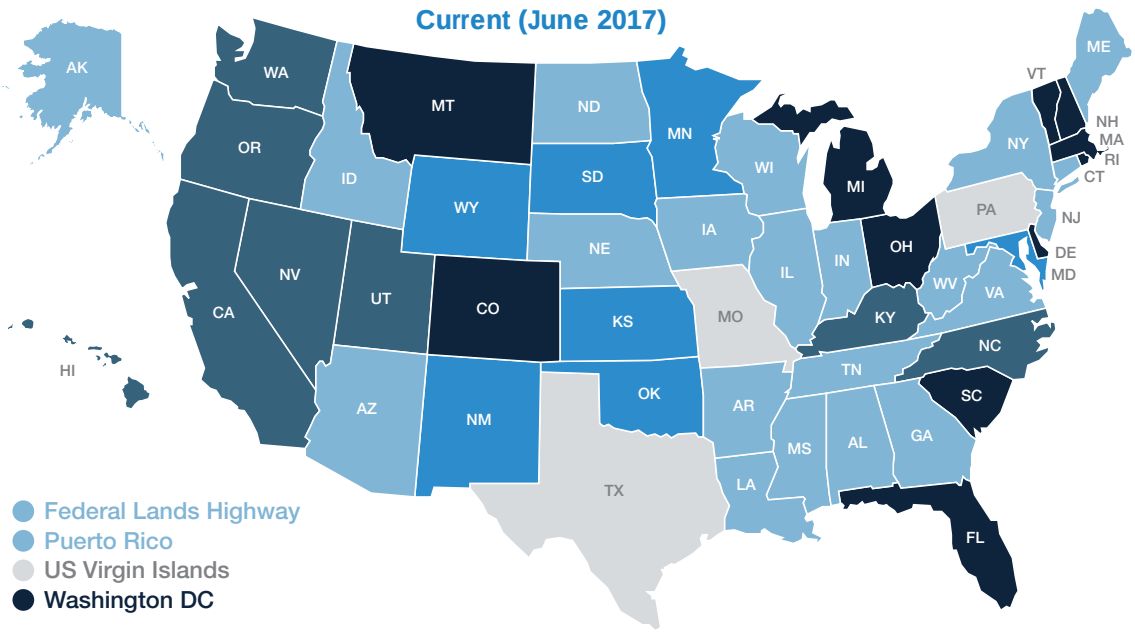
Safe Transportation for Every Pedestrian (STEP)

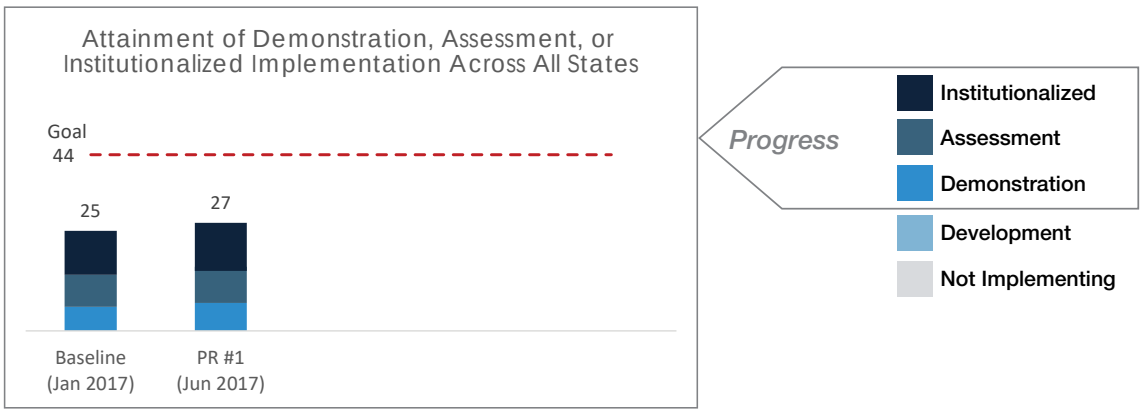
Safe transportation for every pedestrian (STEP) features proven, cost-effective countermeasures that can reduce pedestrian fatalities at uncontrolled crossing locations and unsignalized intersections. Pedestrians account for more than 17.5 percent of all traffic fatalities. More than 66 percent of pedestrian fatalities occur at nonintersection locations such as midblock areas, and about 16 percent happen at intersections with no signals or stop signs.

The STEP program includes five safety countermeasures:

- **Crosswalk visibility enhancements**, such as crosswalk lighting and enhanced signing and marking, help drivers detect pedestrians.
- **Raised crosswalks** are a traffic calming technique that can reduce vehicle speeds and encourage drivers to yield to pedestrians.
- **Pedestrian refuge islands** provide a safer place for pedestrians to stop at the midpoint of the road before crossing the remaining distance.
- **Pedestrian hybrid beacons** provide pedestrian-activated stop control in areas where pedestrian volumes are not high enough to warrant a traffic signal.
- **Road diets** reconfigure a roadway cross-section to safely accommodate all users.

The STEP program is expanding the use of safety countermeasures to reduce pedestrian fatalities. Twenty-one States, Puerto Rico, and FLH are developing implementation plans and learning more about this innovation. Sixteen States are demonstrating and assessing STEP countermeasures. Another 10 States and Washington, DC, have institutionalized STEP countermeasures.





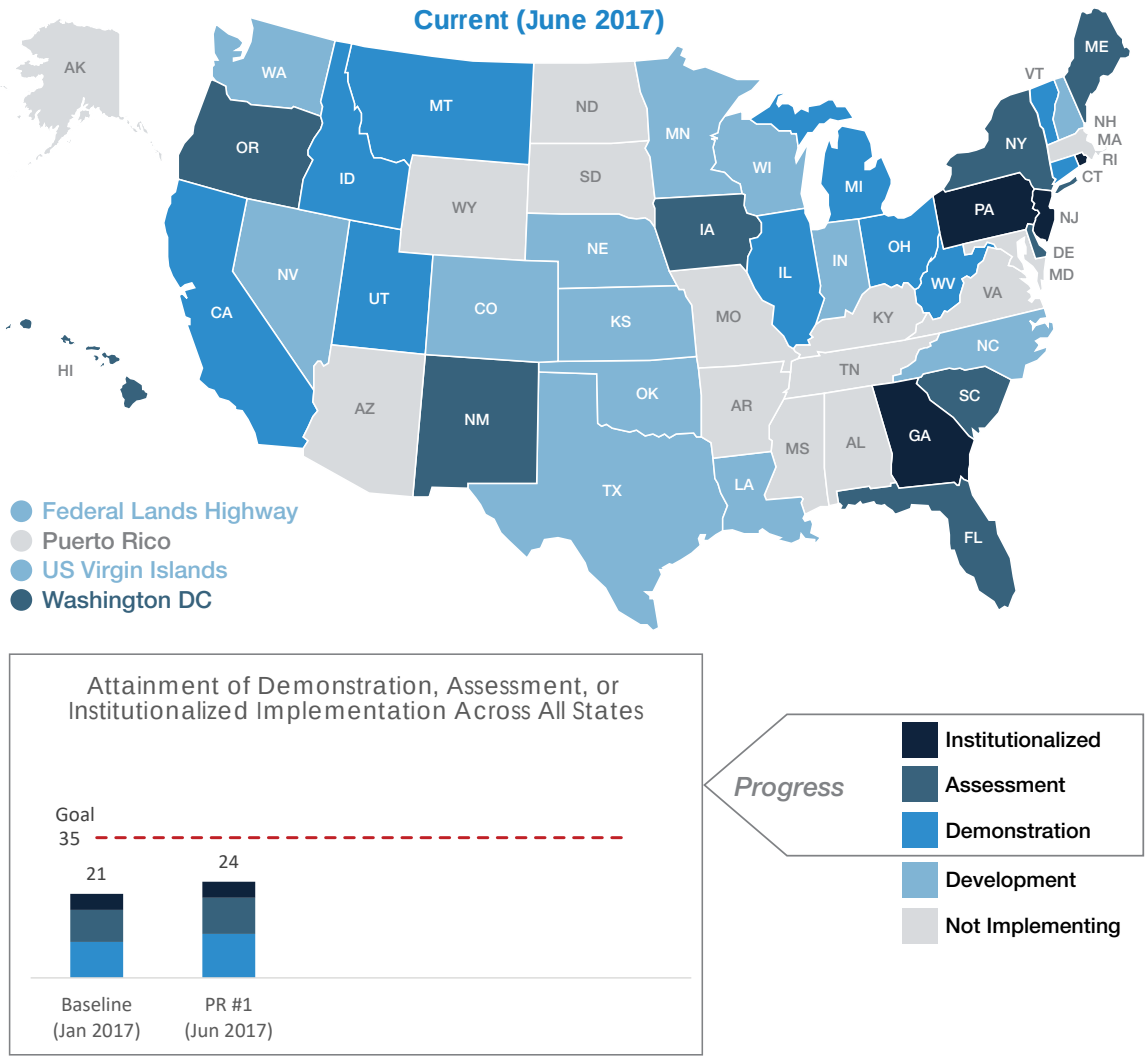
Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements

Ultra-high performance concrete (UHPC) can be used to create the simple, strong, long-lasting connections needed for successful construction using prefabricated bridge elements. UHPC is a steel fiber-reinforced, portland cement-based composite material that delivers performance far exceeding conventional concrete.

Prefabricated bridge elements, structural components that are built offsite and brought to the project location for installation, shorten onsite construction time, enhance safety, and offer superior durability. Field-cast UHPC has emerged as a solution for creating connections between prefabricated components with better long-term performance than typical connection designs.

UHPC allows for small, simple-to-construct connections that require less concrete and do not require post-tensioning. The mechanical properties of UHPC allow for redesign of common connection details in ways that promote ease and speed of construction. This makes using prefabricated bridge elements simpler and more effective.

Thirteen States, the U.S. Virgin Islands, and FLH are developing implementation plans and learning more about the use of UHPC connections. Nineteen States and Washington, DC, are demonstrating and assessing the use of UHPC connections in bridge-building processes. Another four States have made UHPC connections a standard practice on bridge projects that use prefabricated elements.



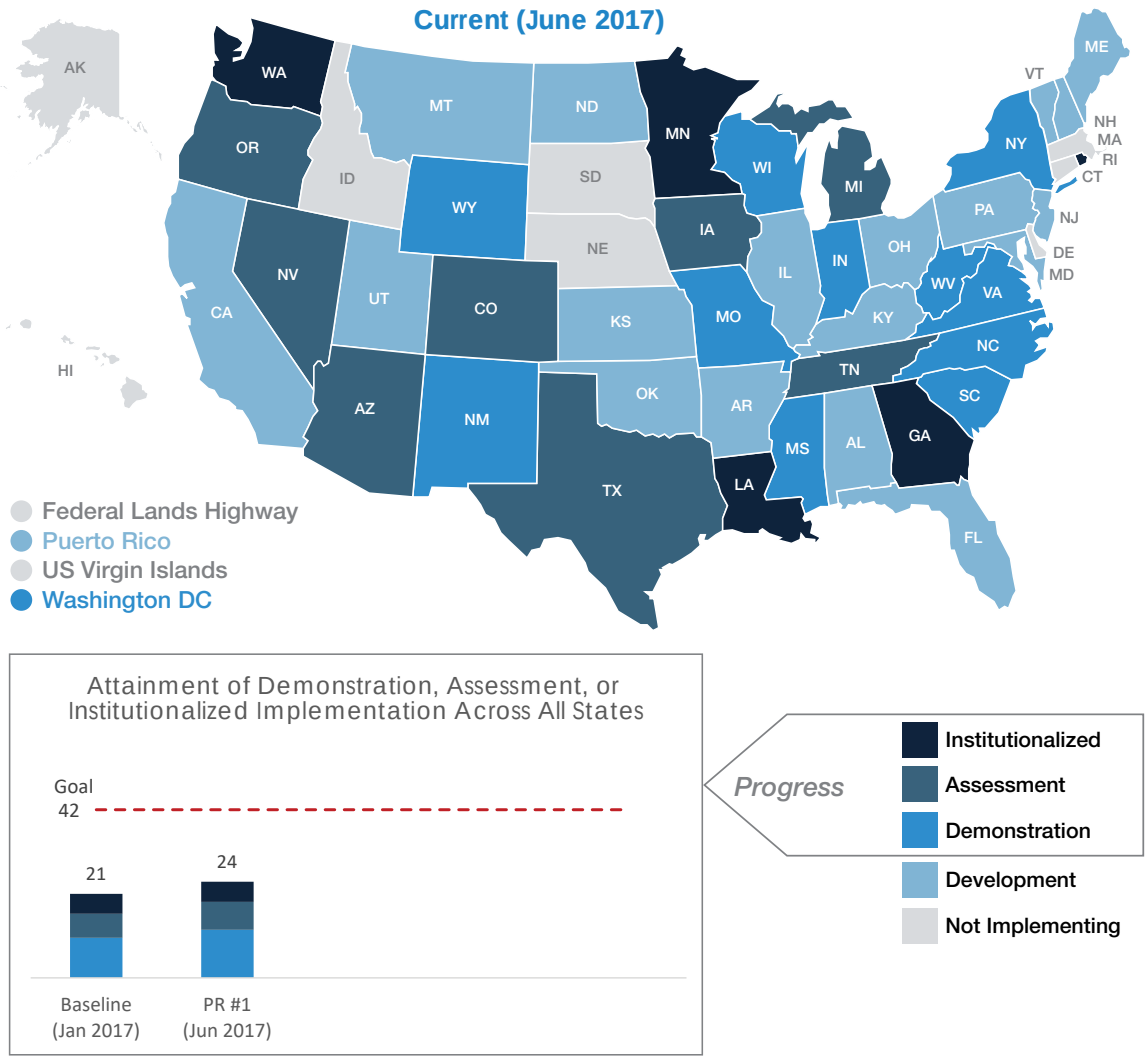
Using Data to Improve Traffic Incident Management

Using data to improve traffic incident management (TIM) focuses on increasing the amount, consistency, and quality of data collection to support the development of performance measures for evaluating and improving traffic incident response programs.

Traffic incidents put travelers' and emergency responders' lives at risk and cause a quarter of all traffic delays. Resulting congestion can lead to secondary crashes. TIM programs to coordinate response among agencies are reducing the duration and impact of incidents.

FHWA is promoting the use of low-cost, off-the-shelf technologies to collect data to help agencies enhance TIM programs. FHWA is also encouraging adoption of three key TIM performance measures: length of time travel lanes are closed, length of time emergency responders are on an incident scene, and number of secondary crashes. Better data collection enables agencies to demonstrate program effectiveness through quantified safety and economic benefits and improve program performance, resource management, and planning.

Nineteen States and Puerto Rico are developing implementation plans and learning more about using data to improve incident management. Eighteen States and Washington, DC, are demonstrating and assessing technologies to collect data and adopt TIM performance measures to evaluate and improve their TIM programs. An additional five States have made using data to improve TIM a standard practice.



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