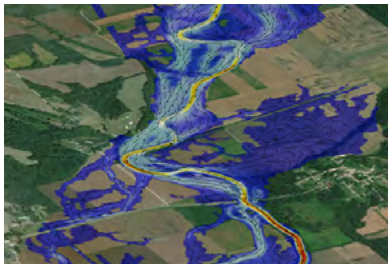
Every Day Counts:
On-Ramp to Innovation

EDC-5 Summit Summary and Baseline Report

March 2019

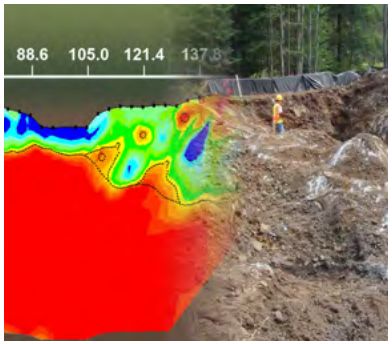




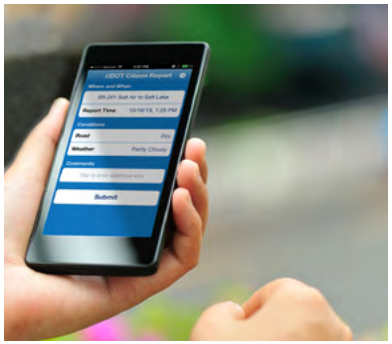
On-Ramp to Innovation
every day counts

U.S. Department of Transportation
Federal Highway Administration

Foreword

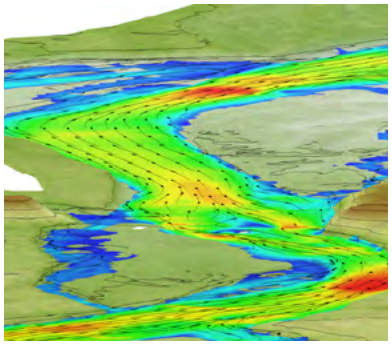


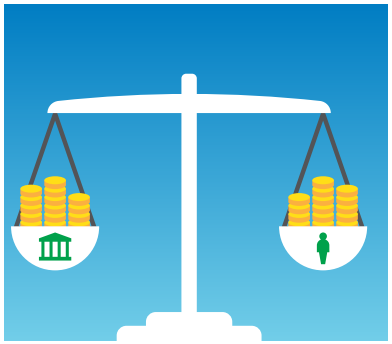





Every Day Counts (EDC) is the Federal Highway Administration's program to advance a culture of innovation in the transportation community in partnership with public and private stakeholders. Through this State-based effort, FHWA coordinates rapid deployment of proven strategies and technologies to shorten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

This report describes the innovations FHWA is promoting in the program's fifth round and documents the fall 2018 summits held to launch EDC-5. The report outlines the deployment status of the innovations at the beginning of 2019 and the goals transportation stakeholders set to broaden their adoption by the end of 2020. The report is intended to be a resource for transportation stakeholders as they develop their deployment plans and to encourage innovation in managing highway project delivery to better serve the Nation.





"All of the EDC-5 innovations support the U.S. Department of Transportation's and Federal Highway Administration's strategic priorities."

Brandye Hendrickson
FHWA Deputy Administrator

Quality Assurance Statement

The Federal Highway Administration provides high-quality information to serve government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

CONTENTS

ACRONYMS AND ABBREVIATIONS

2D	two-dimensional
3D	three-dimensional
AASHTO	American Association of State Highway and Transportation Officials
A-GaME	advanced geotechnical methods in exploration
AID Demonstration	Accelerated Innovation Deployment Demonstration
CHANGE	collaborative hydraulics: advancing to the next generation of engineering
DOT	department of transportation
EDC	Every Day Counts
EDC-5	Every Day Counts round five
FHWA	Federal Highway Administration
FLH	Federal Lands Highway
STEP	safe transportation for every pedestrian
STIC	State Transportation Innovation Council
UAS	unmanned aerial system

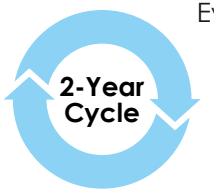
"A culture of innovation is an organizational environment that provides the space to think freely, to think differently, and to challenge how things are done today so they can be improved for tomorrow."

Tony Furst, FHWA Chief Innovation Officer

Every Day Counts: On-Ramp to Innovation

The Federal Highway Administration created **Every Day Counts** (EDC) to accelerate the delivery of highway projects and foster an innovative culture in the transportation community. Through EDC's State-based model, FHWA collaborates with the **American Association of State Highway and Transportation Officials** (AASHTO) and other stakeholders to rapidly deploy proven but underused innovations to shorten the project delivery process, enhance roadway safety, reduce traffic congestion, and integrate automation. EDC provides transportation agencies with an on-ramp to innovations that save time, money, and resources they can use to deliver more projects and better serve the traveling public.

Since its 2009 launch, EDC has had a significant positive impact on the transportation community's adoption of new technologies and processes. Every State used 14 or more of the 43 innovations promoted in the first four EDC rounds, and 28 States adopted 30 or more innovations. Many of these technologies and processes are now mainstream practices across the country. The 2015 **Fixing America's Surface Transportation Act** directed FHWA to continue working with stakeholders to advance innovation adoption through EDC.



Every 2 years, FHWA works with State transportation departments, local governments, tribes, industry, and other stakeholders to identify a new set of innovative technologies and practices that merit accelerated deployment through EDC. When choosing innovations, stakeholders consider market readiness, impacts, benefits, and ease of adoption. **EDC round five** (EDC-5), which promotes the adoption of 10 innovations in 2019 and 2020, builds on the successful deployment efforts of earlier EDC rounds.

After selecting innovations for each EDC deployment cycle, transportation leaders gather at regional summits to discuss the innovations in detail and identify opportunities to implement those that meet the unique needs of their State and local programs. Following the summits, **State Transportation Innovation Councils** (STICs) finalize their innovation selections and establish implementation performance goals for the 2-year cycle. STICs provide forums for transportation stakeholders to consider innovations FHWA recommends, along with technologies and practices from sources such as the AASHTO **Innovation Initiative** and the **second Strategic Highway Research Program**, and adopt those that add value to their highway programs.

"When you have a varied group with many talents working toward the same goals, the whole can be greater than the sum of its parts and that is what EDC represents."

Paul Karas, New York State Department of Transportation Acting Commissioner

FHWA forms deployment teams for the EDC innovations to assist States in their implementation efforts. Using feedback from stakeholders, the teams offer technical assistance, training, and outreach to help the transportation community adopt innovations and make them standard practice. FWHA 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 STIC to help institutionalize innovations. The AID Demonstration program provides an incentive of up to $1 million to support the cost of deploying an innovation on any phase of a highway project. The program allocates up to $10 million a year in incentive funds.

Throughout each EDC deployment cycle, FHWA reports regularly on innovation deployment status in each State and aggregates the data to provide a nationwide overview. FHWA also works with stakeholders to share success stories, specifications, best practices, lessons learned, and data through case studies, web conferences, presentations, and demonstration projects. The result is rapid technology transfer and accelerated deployment of innovation across the Nation.

More Information

See the **EDC-5 innovations** web page for information and resources.

Watch **introductory webinars** for overviews and examples of how agencies use the EDC-5 innovations.

Contact **EDC-5 deployment teams** for information, technical assistance, and training.

Get innovation deployment assistance and incentives through the **STIC Incentive** and **AID Demonstration** programs.

View the EDC-5 Destination Innovation video.

EDC-5 Summits: Introducing a New Innovation Cycle

About 1,300 transportation stakeholders attended five **regional summits** in fall 2018 to learn about the 10 innovations FHWA is promoting for rapid deployment in EDC-5. The summits started the process for STICs to review the innovations, choose those that fit their State and local agency needs, and develop plans to put the innovations into practice over the next 2 years.

The summits were held at five locations around the country—Florida, Maryland, Missouri, New York, and Oregon—to foster synergy among transportation professionals and encourage collaboration on innovative practices. Interactive working sessions gave participants the opportunity to explore the EDC-5 innovations and share best practices so they could make informed choices about which to implement. Participants also provided feedback on proposed implementation strategies so the deployment teams FHWA formed for each innovation could tailor their plans to State needs.

"FHWA is here to serve as a technical resource as you decide which innovations you want to advance in your State," FHWA Deputy Administrator Brandye Hendrickson told summit participants. "All of the EDC-5 innovations support the U.S. Department of Transportation's and FHWA's strategic priorities. Safety is number one, but strengthening infrastructure and planning for the future through innovation are also priorities we're all working toward."

"I would encourage any State to knock on the door of their neighbor, because you learn so much from people who are dealing with similar issues."

Richard Crawford, Maine Department of Transportation Bureau of Project Development Director

EDC-5 Innovations

At each summit, technical experts explained the EDC-5 innovations, outlined their benefits, and provided examples of how transportation agencies use them:

- **Advanced geotechnical methods in exploration** (A-GaME) generate more accurate geotechnical characterizations that improve design and construction, leading to shorter project delivery times and reducing the risks associated with limited data on subsurface site conditions.
- Tools in the **collaborative hydraulics: advancing to the next generation of engineering** (CHANGE) initiative improve understanding of complex interactions between waterways and transportation assets, enabling better design and project delivery and enhanced communication.
- **Crowdsourcing for operations** turns transportation system users into real-time sensors on system performance, providing low-cost, high-quality data on traffic operations, conditions, and patterns.
- Using **project bundling** to award a single contract for several similar preservation, rehabilitation, or replacement projects helps agencies streamline design and construction, cut costs, and decrease project backlogs.
- Systemic application of proven countermeasures to **reduce rural roadway departures** helps keep vehicles in their travel lanes, lower the potential for crashes, and lessen the severity of crashes that do occur.
- The cost-effective countermeasures in the **safe transportation for every pedestrian** (STEP) initiative can help reduce pedestrian fatalities at uncontrolled and signalized crossing locations.
- **Unmanned aerial systems** (UAS) collect high-quality data automatically or remotely, allowing agencies to expedite the data collection needed for better decision making while reducing the adverse impacts of temporary work zones on workers and travelers.
- Strategies promoted in the **value capture: capitalizing on the value created by transportation** initiative enable agencies to share in a portion of increased land values resulting from public transportation investments to build, maintain, or reinvest in the transportation system.
- **Virtual public involvement** techniques offer convenient, efficient, and low-cost methods to inform the public, encourage participation, and gather input on transportation project planning and development.
- **Weather-responsive management strategies** can increase the effectiveness of traffic operations and maintenance during adverse road weather conditions, enhancing safety and mobility and reducing the cost and negative environmental effects of chemical use.

"We want a team who understands the need for continuous improvement, and continuous improvement includes understanding the technology and innovations that are available."

Anna Barry, Connecticut Department of Transportation Deputy Commissioner

Expanding the Innovation Culture

The EDC-5 summits featured town hall sessions in which transportation leaders discussed how they cultivate innovation in their agencies, leverage expertise, and share innovation successes.

"When we talk about innovation deployment, we define success as creating an environment where everybody who works at the department feels empowered to bring forward ideas and suggestions on how to do business differently," Victoria Sheehan, New Hampshire Department of Transportation commissioner, told a town hall audience.

"We believe we can be most successful by pushing decision making down to the lowest possible level," said Monique Evans, director of FHWA's Eastern Federal Lands Highway (FLH) Division. "If we empower our employees to make decisions, to be innovative on the spot, we come up with very good solutions in the end."

"We pushed for Local Innovation Teams in our regional offices," said David Esse, Wisconsin Department of Transportation Innovation, Research, and Technology Program chief. "We give folks who bring ideas forward the option to see it through. They can sit down with senior management, present their idea, and develop an implementation plan."

To get the greatest benefit from EDC summits, the Oregon Department of Transportation brings staff experts to attend innovation breakout sessions, said Chief Engineer Steve Cooley. "We make sure we make contact with the experts who are presenting, and often we set up future peer exchanges with other DOTs that have experts in a particular area."

The Vermont Agency of Transportation holds an annual Innovation Day at which teams share their work on research topics and innovative projects with colleagues. "It's really interesting to see bridge designers talking to somebody who's leading research on winter maintenance. It reminds everybody that innovation is happening all over the organization," said Chief Engineer Wayne Symonds.

The Michigan Department of Transportation communicates with the public about innovation use. "If we can provide better value for tax dollars, we publicize that," said Tony Kratofil, chief engineer and chief operations officer. "When we were beginning to adopt **e-Construction** we were challenged with a major interstate reconstruction project. The only way to deliver it as quickly as we could was by e-Construction. We talked about the speed at which people were seeing the project as enabled by technology."

Deployment Plans

Before each summit concluded, participants met in State caucuses to start planning which EDC-5 innovations to pursue over the next 2 years to meet their unique program needs. They relayed their recommendations to the STICs in each State for further discussion and development of performance goals and implementation plans to put the selected innovations into practice.

State implementation plans for the EDC-5 innovations show that interest in all 10 technologies and practices is strong. Every State plans to explore at least three innovations and many States are deploying multiple technologies and practices. Some innovations—including CHANGE, UAS, virtual public involvement, reducing rural roadway departures, STEP, Crowdsourcing for Operations, and A-GaME—are being advanced in 30 or more States during this EDC cycle.

EDC-5 Innovation Implementation

This section provides details on the 10 innovations FHWA is encouraging States to adopt during EDC-5. It includes maps and charts that show the progress expected in advancing the technologies and practices in 2019 and 2020.

The baseline maps illustrate the state of practice in January 2019, and the goal maps indicate the implementation stage States plan to achieve by December 2020. The charts also compare January 2019 baseline data and December 2020 goals set by States.

Every 6 months, FHWA will compile a report on the status of the state of practice to track the progress of EDC-5 innovation implementation. With each progress report, the number of States in the advanced implementation stages will increase while the number of States in the initial stages will decrease as States carry out their deployment plans.

This report uses "State" 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 FLH, a total of 54 entities.

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

Innovation Implementation Stages

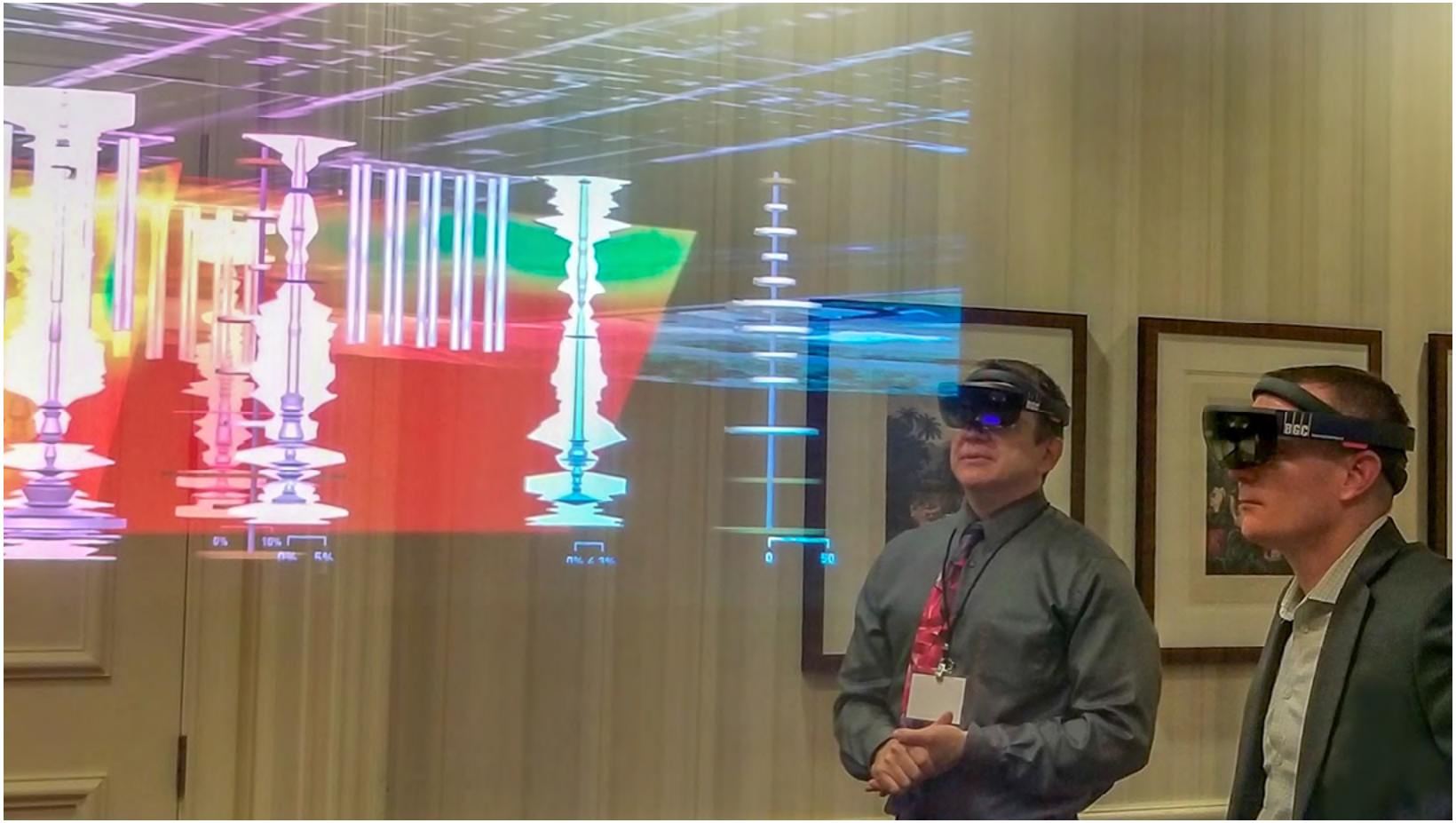
Not Implementing	The State is not using the innovation anywhere in the State and is not interested in pursuing the innovation.
Development Stage	The State is collecting guidance and best practices, building support with partners and stakeholders, and developing an implementation process.
Demonstration 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.

Advanced Geotechnical Methods in Exploration

Advanced geotechnical methods in exploration (A-GaME) offer solutions for generating more accurate geotechnical characterizations that improve transportation project design and construction, leading to shorter project delivery times and reducing risks associated with limited data on subsurface site conditions.

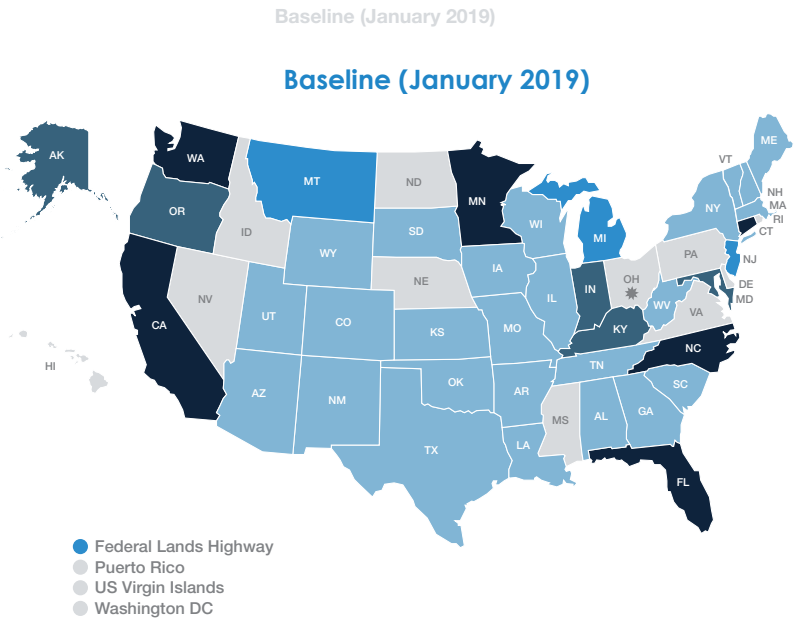
Effective site characterization is critical for recognizing potential problems that may affect design and construction and for ensuring safe, high-quality, and cost-effective projects. Conventional subsurface exploration methods, however, provide limited data, which can result in constructability issues and increased cost.

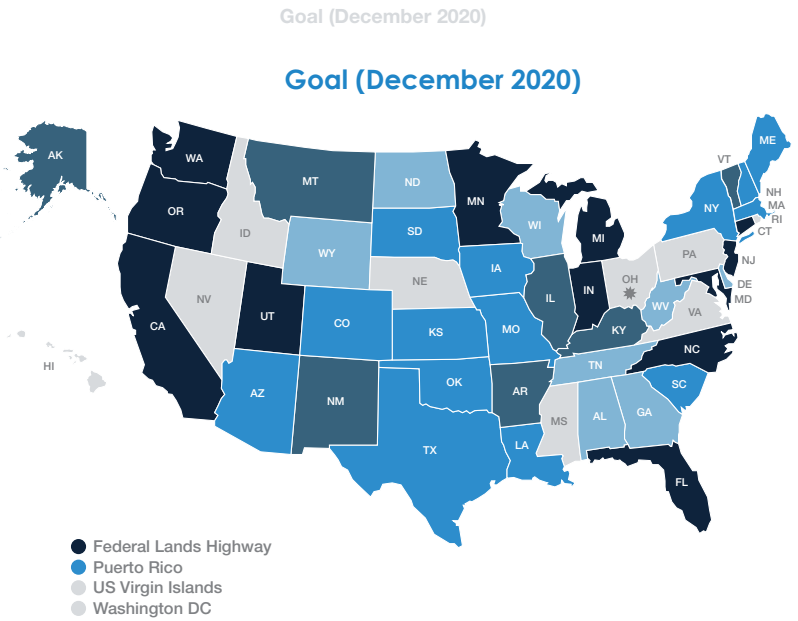
Several proven but underused technologies are available that, when combined with processes that assess risk and variability, allow optimization of subsurface exploration programs for improved site characterization. These A-GaME technologies include cone penetration testing, seismic and electrical geophysics, measurement while drilling, and optical and acoustic televiewers.

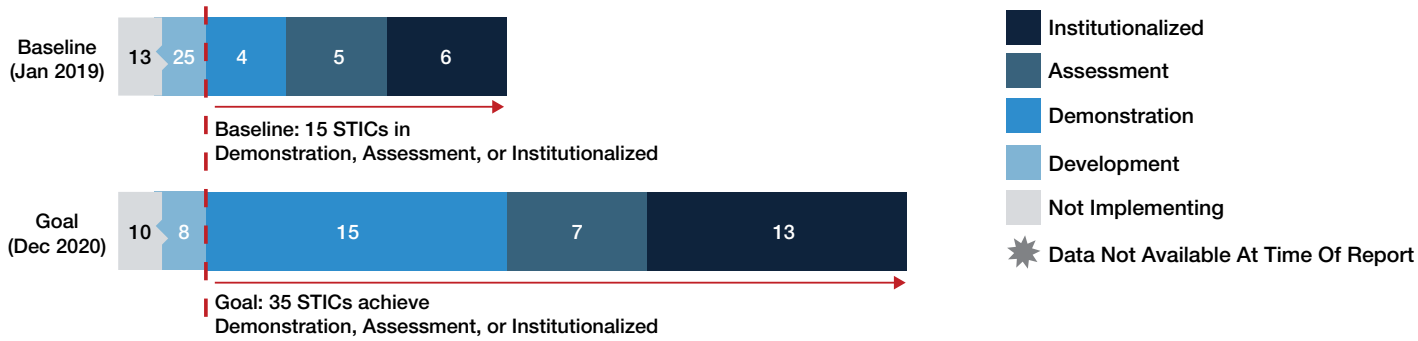


Advanced Geotechnical Methods in Exploration

Thirty-five States set goals to attain demonstration, assessment, or institutionalized implementation of A-GaME technologies, up from 15 States at the beginning of EDC-5.





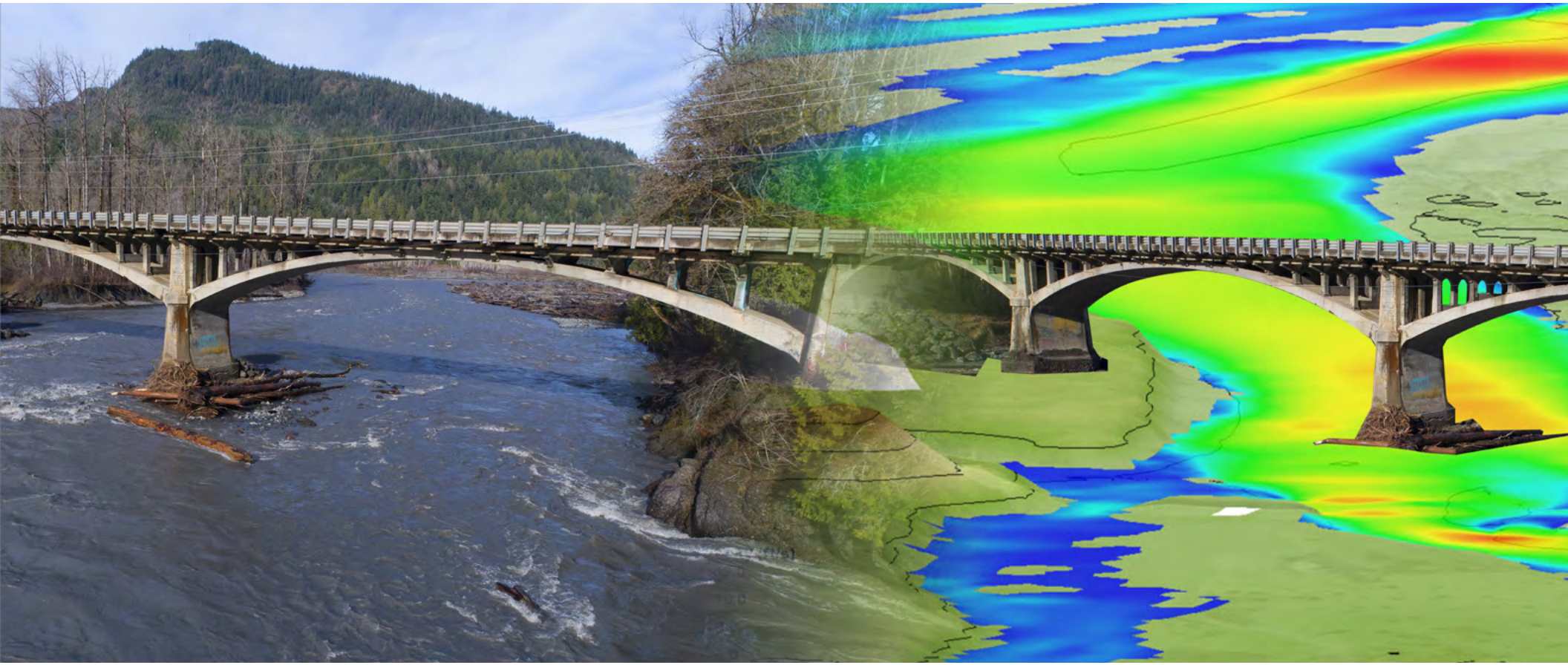


Collaborative Hydraulics: Advancing to the Next Generation of Engineering

Tools in the **collaborative hydraulics: advancing to the next generation of engineering** (CHANGE) initiative improve understanding of complex interactions between river or coastal environments and transportation assets, enabling better design and project delivery and enhanced communication.

Advances in hydraulic modeling tools have made two-dimensional (2D) modeling more efficient, intuitive, and accessible to engineers and designers. Because 2D models avoid many of the limiting assumptions required by traditional one-dimensional models, the results can significantly improve the ability of highway agencies to design safer, more cost-effective, and resilient structures on waterways.

The three-dimensional (3D) visualization capabilities of these hydraulic modeling tools aid in communicating design results and implications to a variety of stakeholders through intuitive and visually rich graphical output. That, in turn, can enhance collaboration and help streamline project development, including environmental and regulatory activities.

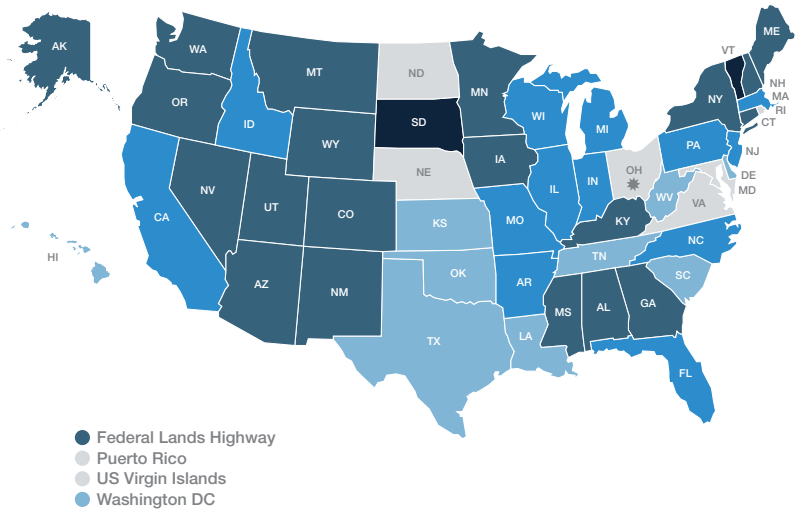


Credit: John Gussman

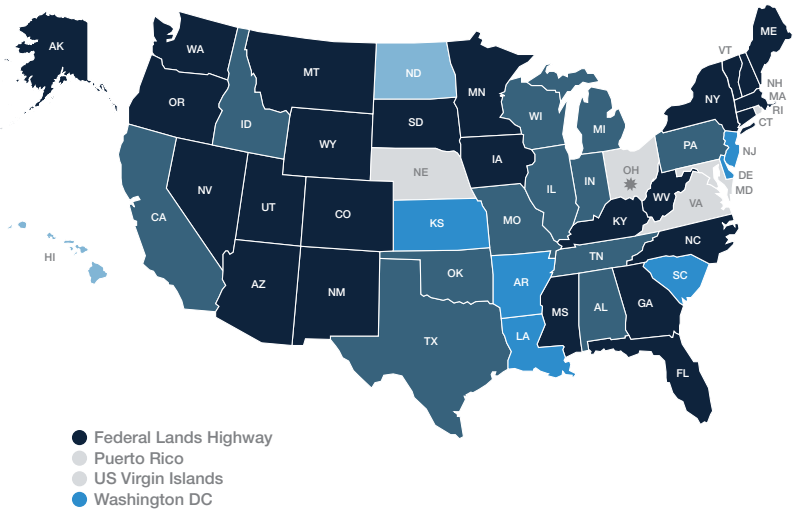
Collaborative Hydraulics: Advancing to the Next Generation of Engineering

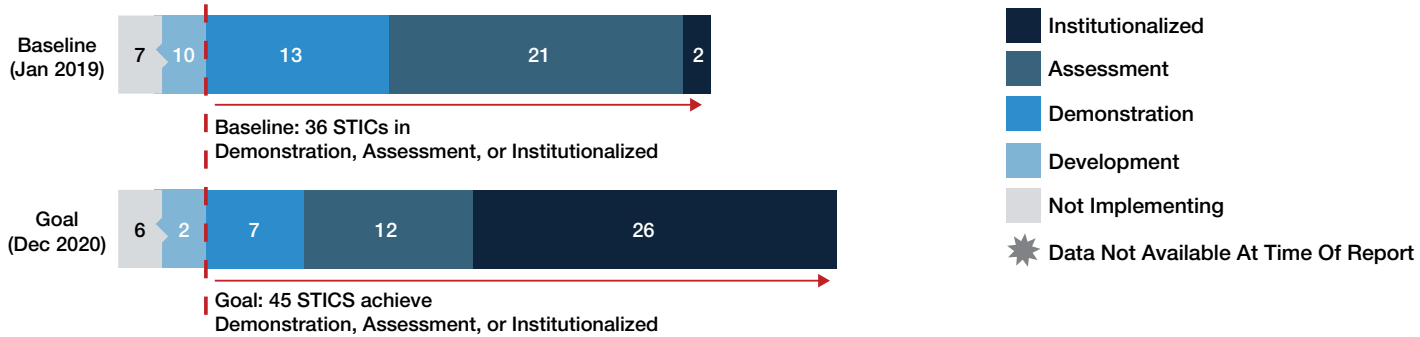
The number of States at the demonstration, assessment, or institutionalized stages of CHANGE implementation is expected to increase from 36 to 45 in EDC-5.

Baseline (January 2019)



Goal (December 2020)



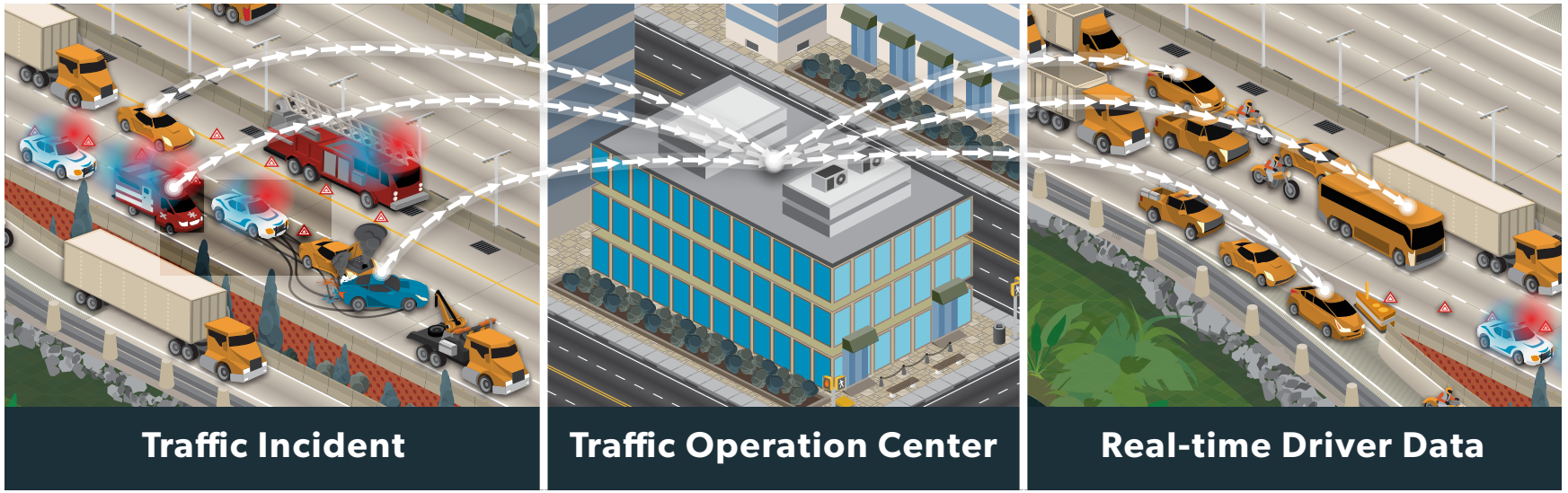


Crowdsourcing for Operations

Crowdsourcing for operations turns transportation system users into real-time sensors on system performance, providing low-cost, high-quality data on traffic operations, conditions, and patterns.

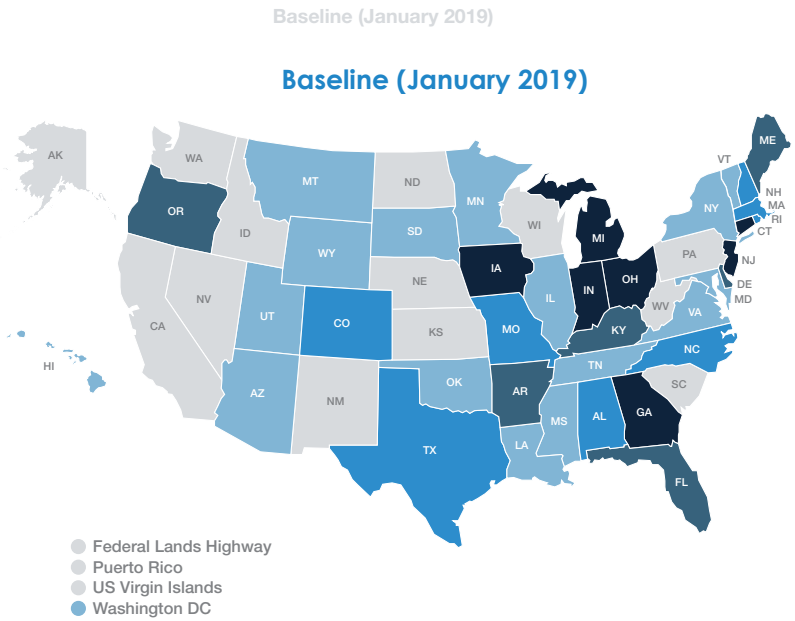
State and local transportation systems management and operations (TSMO) programs strive to optimize the use of existing roadway facilities through traveler information, incident management, road weather management, arterial management, and other strategies targeting the causes of congestion. TSMO programs require real-time, high-quality, and wide-ranging roadway information. However, gaps in geographic coverage, lags in information timeliness, life-cycle costs for field equipment, and jurisdictional stovepipes associated with fixed sensor and camera monitoring can limit agencies' ability to proactively operate the system.

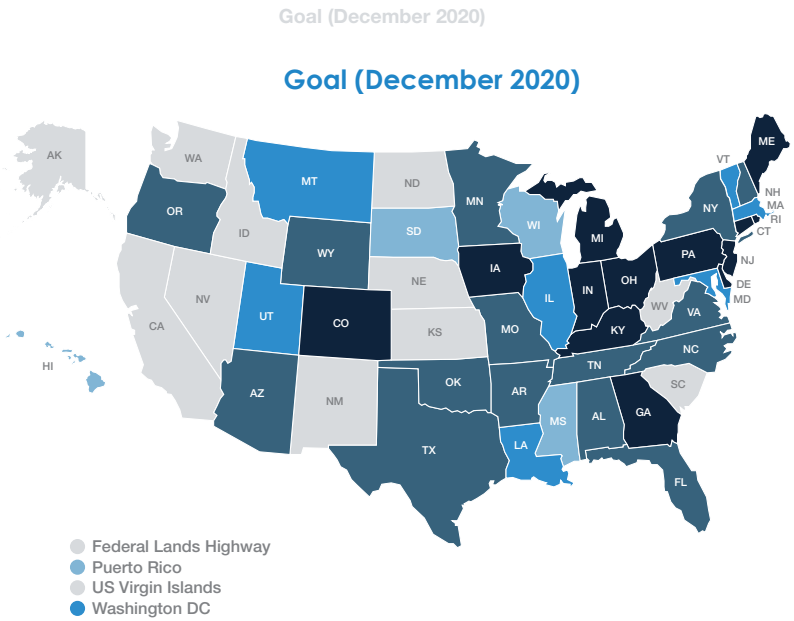
Public agencies at the Federal, State, and local levels are increasing both their situational awareness and the quality and quantity of operations data using crowdsourcing, which enables agency staff to cost-effectively apply proactive strategies and make better decisions that lead to safer and more reliable travel.

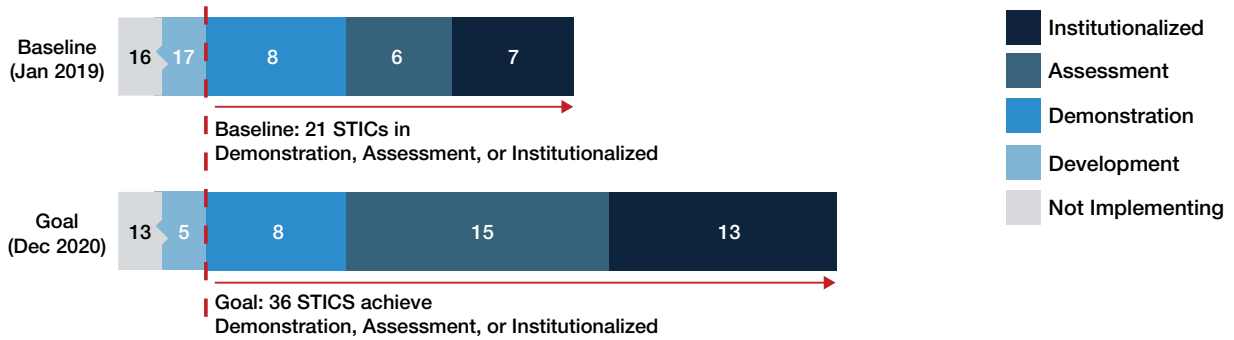


Crowdsourcing for Operations

The number of States attaining the demonstration, assessment, or institutionalized stages of crowdsourcing to advance operations is expected to grow from 21 to 36.







Project Bundling

Project bundling is a time- and money-saving process that combines multiple transportation preservation, rehabilitation, or replacement projects in a single contract. Using an advanced approach to project bundling saves State and local agencies 10 percent or more on construction costs, reduces months of delivery time, and increases efficiency.

Bundled contracts may be procured with a variety of alternative contracting methods, may cover one county or the entire State, and may involve innovative construction techniques and financing tools. A contract may be tiered to allow a combination of work types, such as design, preservation, or complete replacement. A project bundling program may use a series of bundling projects to achieve agency goals.

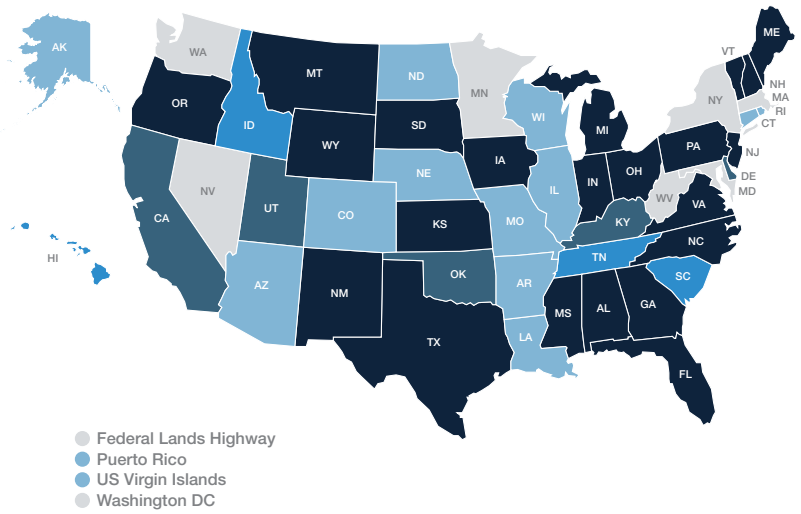
Bundling can help agencies maximize their resources, save procurement time, leverage design expertise, capitalize on economies of scale, and help keep critical transportation assets in good repair. Bundling also supports greater collaboration during project delivery and construction.

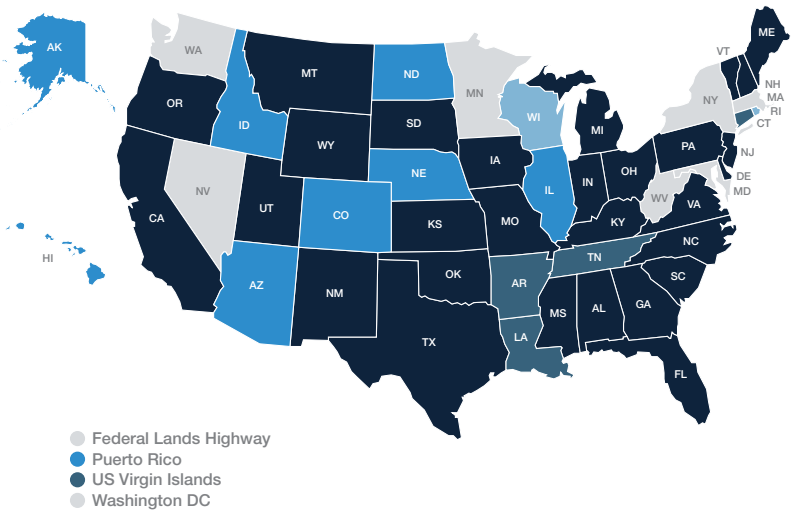
Project Bundling

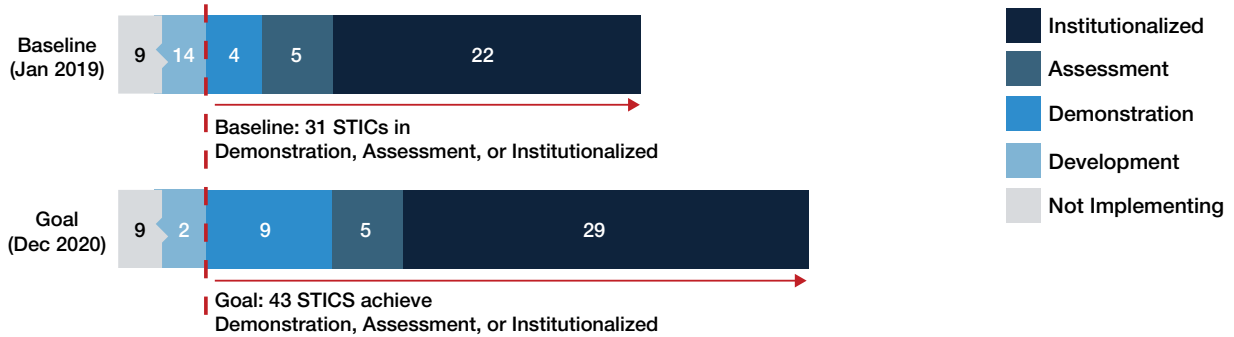
Forty-three States plan to be at the demonstration, assessment, or institutionalized stages of project bundling at the end of EDC-5, compared to 31 at the beginning.

Baseline (January 2019)

Goal (December 2020)







Reducing Rural Roadway Departures

Rural roadway departures account for about a third of all U.S. traffic fatalities—that's 30 people every day! Let's save teh people behind the numbers. Systemic application of proven countermeasures on all public rural roads, regardless of jurisdiction, is critical to **reduce rural roadway departures**. These countermeasures help keep vehicles in their travel lanes, lower the potential for crashes, and lessen the severity of crashes that do occur.

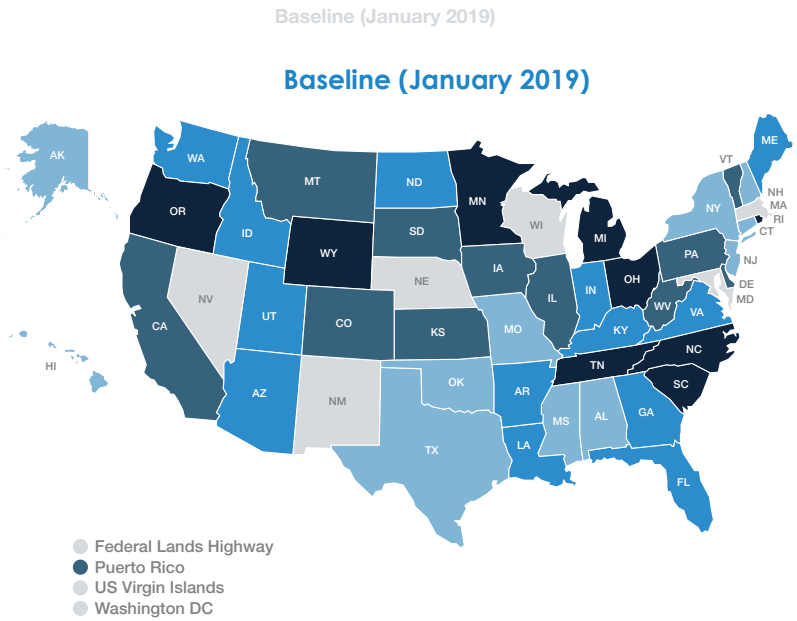
A data-driven, systemic approach can help transportation agencies prioritize the locations and countermeasures that will be most effective in reducing rural roadway departures. Agencies can use available data and a variety of tools, from simple to sophisticated, to analyze their road systems, develop an action plan, and deploy proven countermeasures.

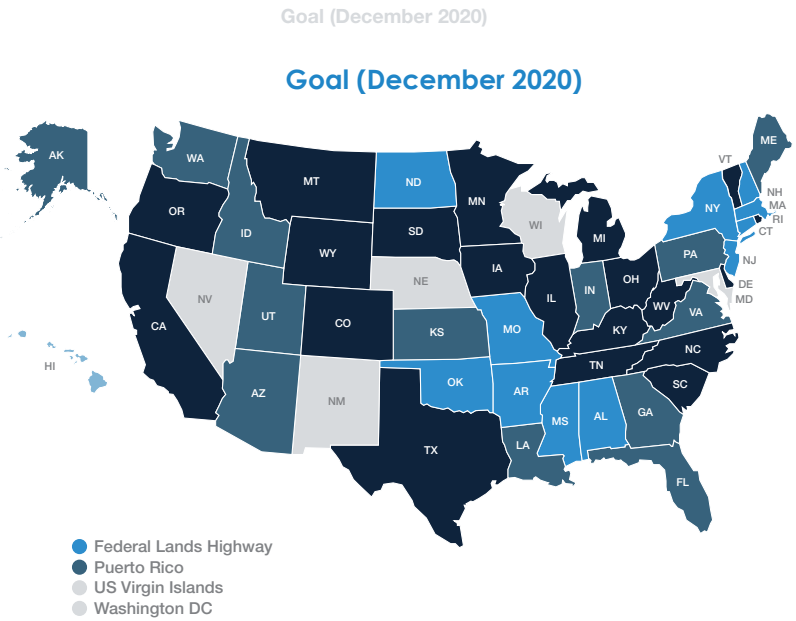
Roadway departure countermeasures agencies can apply to enhance safety include the following:

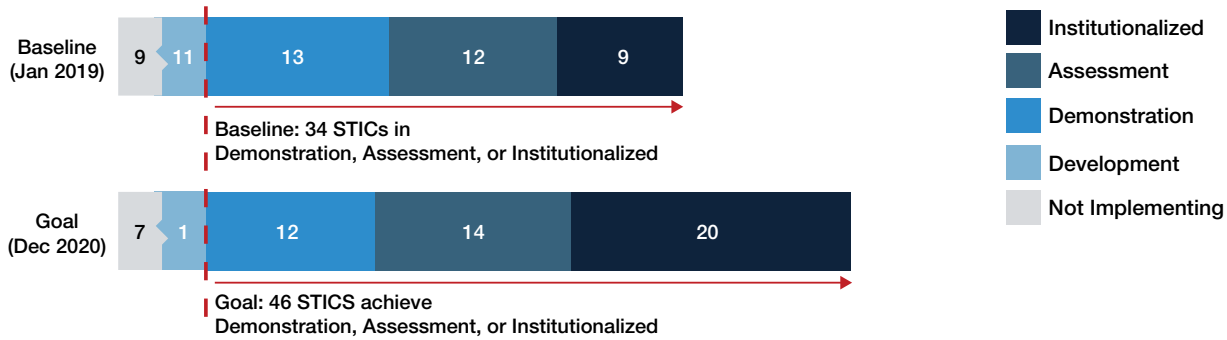
- Signage and markings delineate lane edges and alignment changes and help drivers navigate.
- Rumble strips provide an audible alert to drivers drifting from their lane.
- Friction treatments at curves or other key locations reduce loss of control.
- Shoulders, the **SafetyEdge**[SM] paving treatment, and clear zones provide opportunities for a safe recovery when drivers leave the roadway.
- Roadside hardware reduces the severity of roadway departure crashes.

Reducing Rural Roadway Departures

The number of States demonstrating, assessing, or using systemic application of safety countermeasures on rural roads as a standard practice is expected to expand from 34 to 46.







Safe Transportation for Every Pedestrian

The **safe transportation for every pedestrian** (STEP) initiative features cost-effective countermeasures with known safety benefits that can reduce pedestrian fatalities at uncontrolled crossing locations and signalized intersections. Pedestrians account for more than 16 percent of all traffic fatalities. Seventy-two percent of pedestrian fatalities occur away from intersections, such as at midblock locations, and 26 percent happen at intersections.

The STEP initiative includes seven safety countermeasures that can improve pedestrian safety when used in the appropriate roadway context:

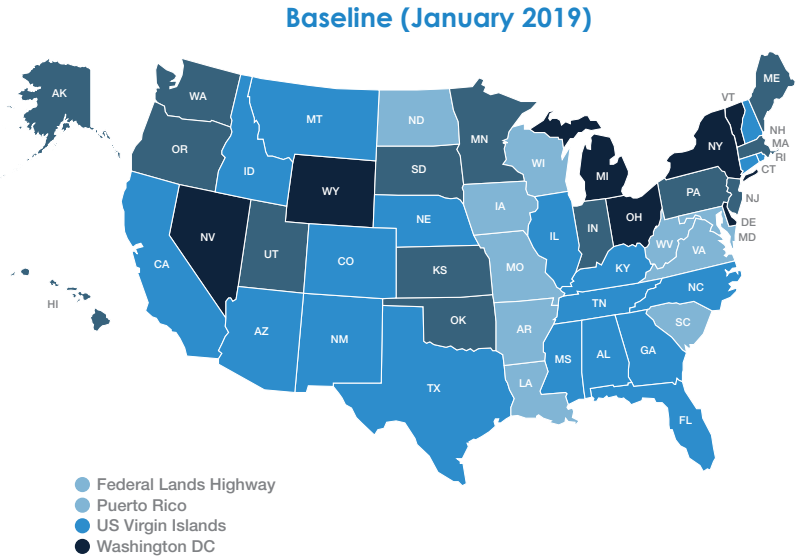
- **Rectangular rapid flashing beacons** are active (user-actuated) or passive (automated detection) amber light-emitting diodes that use an irregular flash pattern at midblock or uncontrolled crossing locations to increase driver yielding behavior.
- **Leading pedestrian intervals** at signalized intersections allow pedestrians to walk before vehicles get a green signal to turn, increasing visibility, reducing conflicts, and improving yielding.
- **Crosswalk visibility enhancements**, such as crosswalk lighting and enhanced signage and markings, help drivers detect pedestrians.
- **Raised crosswalks** can serve as a traffic calming measure and reduce vehicle speeds.
- **Pedestrian crossing/refuge islands** provide a safer place for pedestrians to stop at the midpoint of the roadway before crossing the remaining distance.
- **Pedestrian hybrid beacons**, an intermediate option between a flashing beacon and a full pedestrian signal, provide positive stop control for higher speed, multilane roadways with high vehicular volumes.
- **Road diets** can reduce vehicle speeds and the number of lanes pedestrians cross, as well as create space to add new pedestrian facilities such as pedestrian crossing/refuge islands.

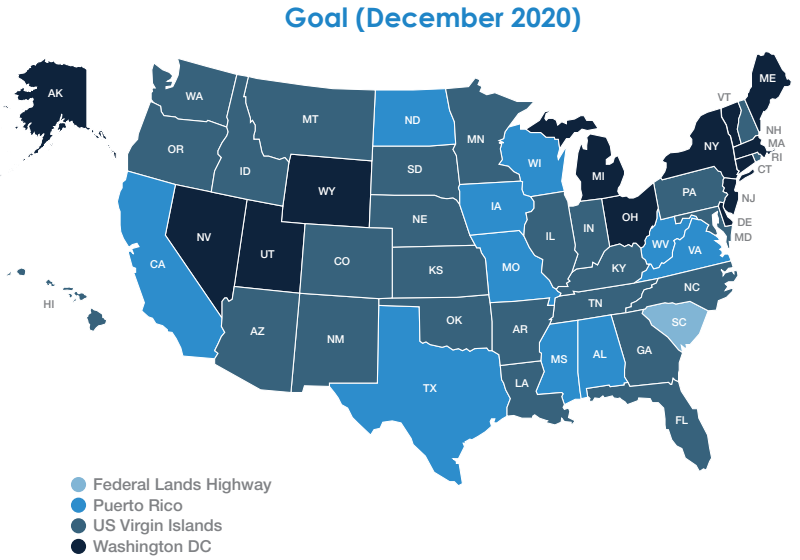
Safe Transportation for Every Pedestrian

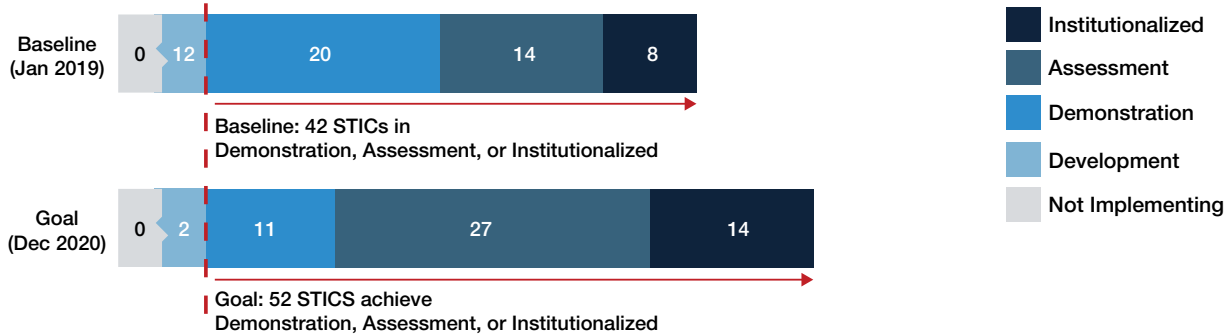
Fifty-two States plan to reach the demonstration, assessment, or institutionalized stages of STEP countermeasure deployment by the end of EDC-5, up from 42.

Baseline (January 2019)

Goal (December 2020)







Unmanned Aerial Systems

Unmanned aerial systems (UAS) can benefit nearly all aspects of highway transportation by collecting high-quality data automatically or remotely. Multiuse aircraft controlled by licensed operators on the ground, UAS can speed up data collection, increase safety and accuracy, and provide access to hard-to-reach locations.

Bridge inspection enhanced by UAS improves safety for the inspection team and the traveling public by reducing the need for temporary work zones. Construction inspection with UAS allows for a bird's-eye view of a project's progress and for the development of 3D terrain models that document construction processes and assist in assessment of earthwork quantity measurement.

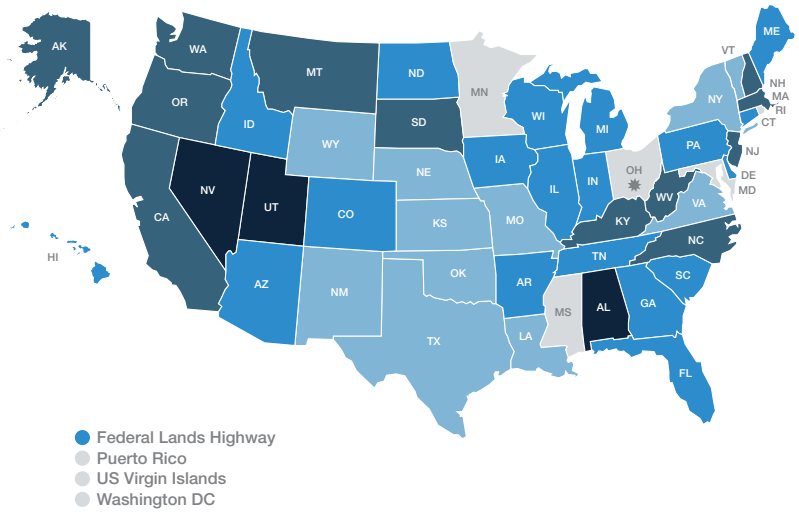
UAS technology also helps agencies with emergency response after roadway disturbances such as rockslides, avalanches, and floods and damage assessment after earthquakes, fires, and bridge hits. It allows States to obtain quality data to make more informed decisions using a relatively low-cost platform.

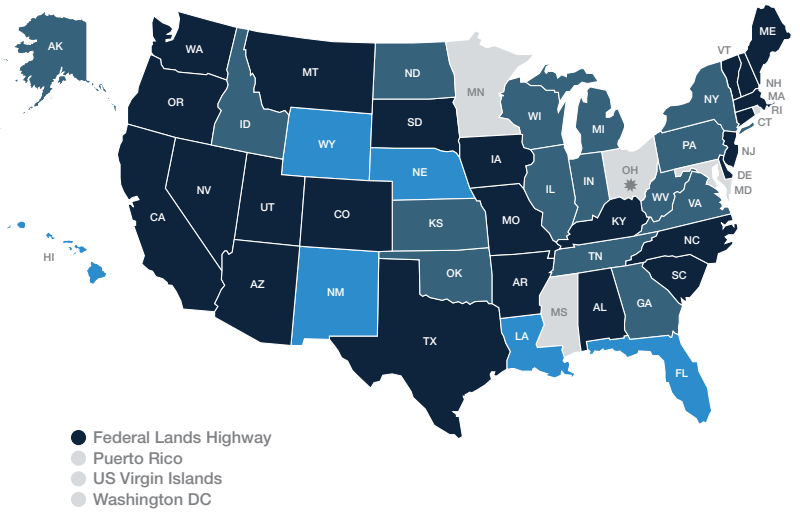
Unmanned Aerial Systems

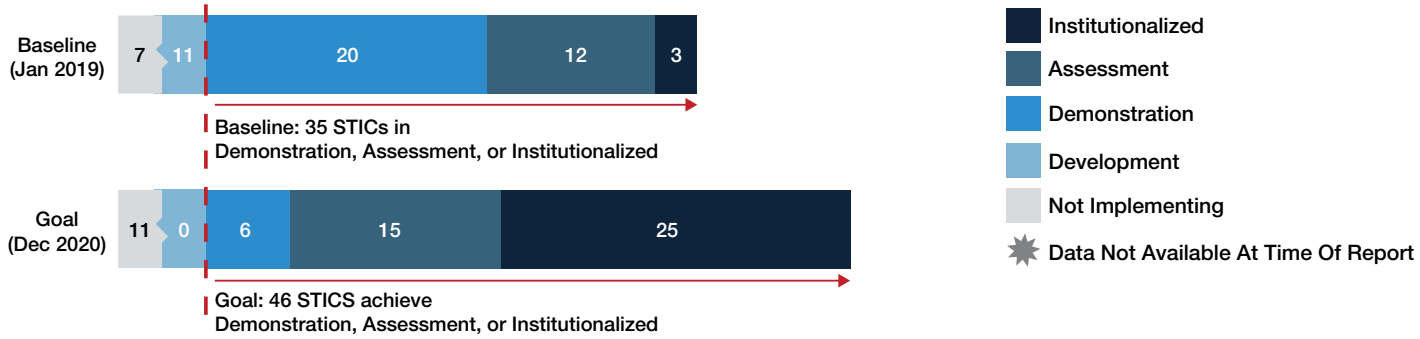
Forty-six States set a goal to demonstrate, assess, or institutionalize the use of UAS in transportation applications, compared to the current total of 35.

Baseline (January 2019)

Goal (December 2020)







Value Capture: Capitalizing on the Value Created by Transportation

When agencies invest in transportation improvements, nearby land values often rise, benefiting landowners and developers. **Value capture** techniques enable agencies to share in a portion of these increased property values to invest in future transportation projects.

The value capture initiative promotes tools agencies can use to generate new and enhanced revenue sources to build, maintain, or reinvest in the transportation system. Agencies can add these tools—such as special assessments, right-of-way use agreements, development impact fees, tax increment financing, and transportation utility fees—to the mix of funding sources for transportation improvements.

Using value capture tools enables agencies to address gaps in transportation funding and accelerate project delivery. Value capture is useful in a wide range of settings—urban, suburban, and rural. It can be used to fund capital projects as well as operations and maintenance activities.

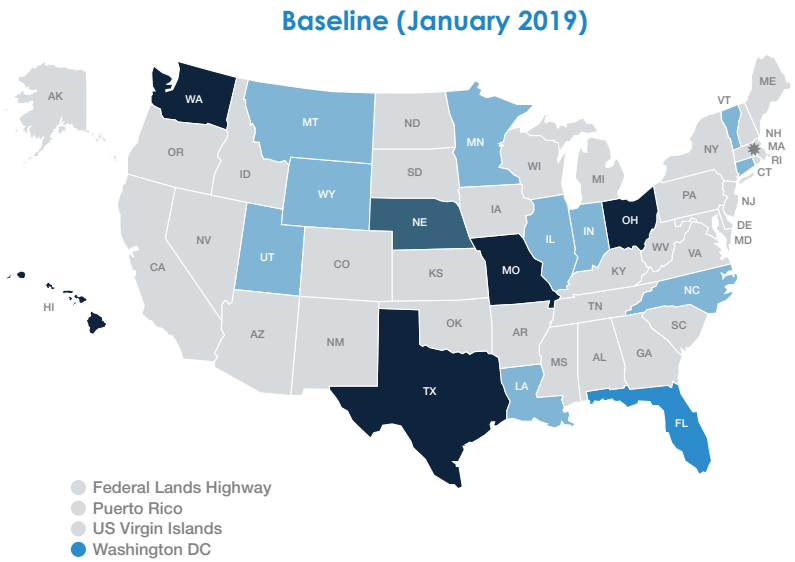
Credit: fotosearch.com

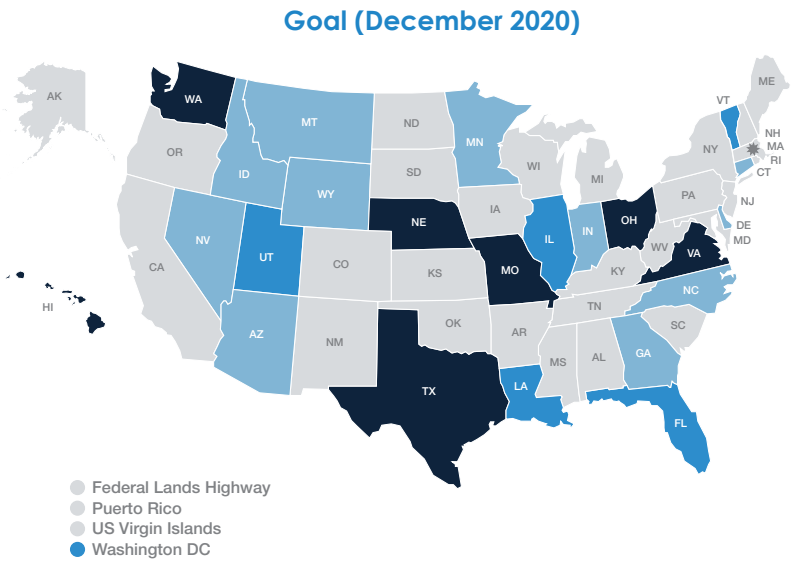
Value Capture: Capitalizing on the Value Created by Transportation

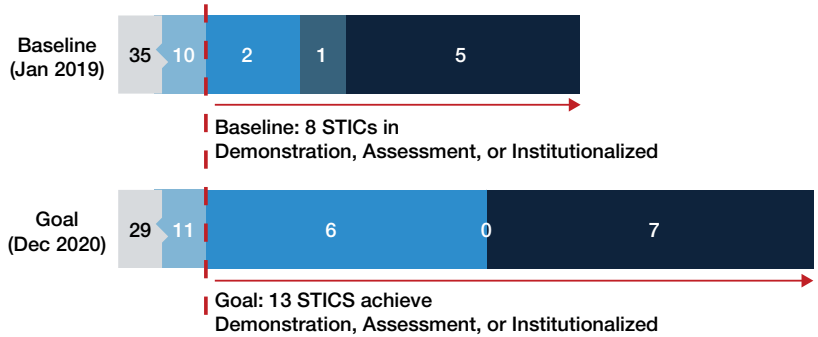
Thirteen States set a goal to demonstrate, assess, or institutionalize value capture mechanisms by the end of EDC-5, up from eight.

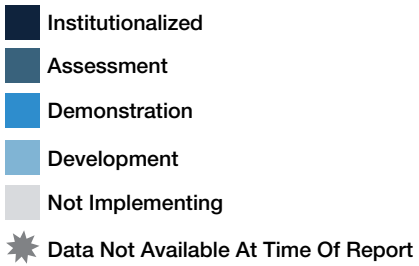
Baseline (January 2019)

Goal (December 2020)









Virtual Public Involvement

Involving the public in transportation planning and project development can help agencies accelerate project delivery by identifying concerns early in the decision-making process. **Virtual public involvement** strategies enhance agencies' efforts to engage the public by supplementing traditional processes such as face-to-face meetings with digital technology.

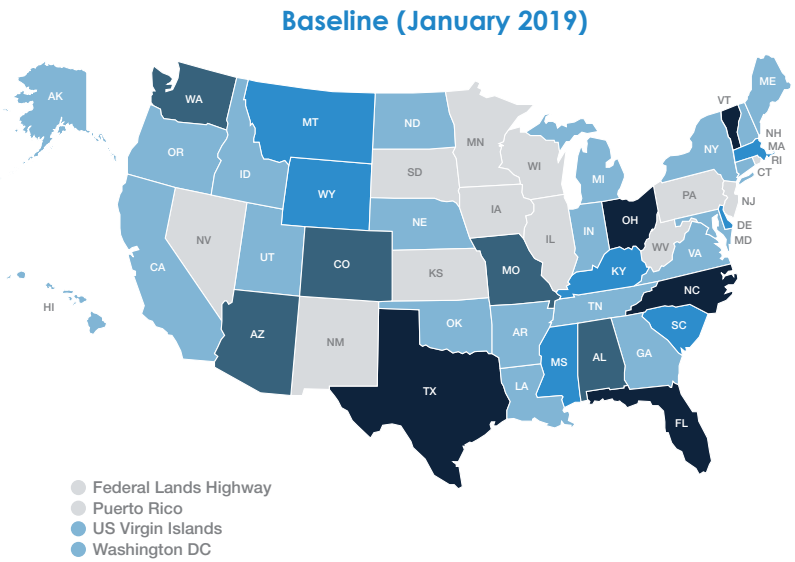
Virtual tools and strategies, such as mobile applications, project visualizations, do-it-yourself videos, crowdsourcing tools, virtual town halls, mapping tools, and all-in-one tools, make public involvement more accessible. These approaches offer convenient, low-cost methods to inform the public, encourage participation, illustrate projects and plans, and get feedback.

Virtual public involvement can aid in establishing a common vision for transportation and ensure the opinions and needs of the public are understood and considered during planning and project development. Virtual tools can also engage wider, more diverse audiences more efficiently and address barriers to public participation such as potential participants' busy schedules.

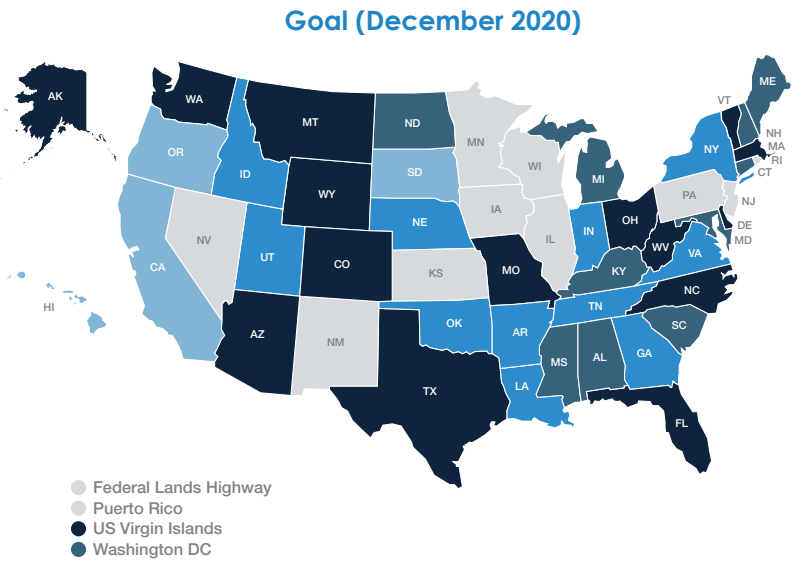
Virtual Public Involvement

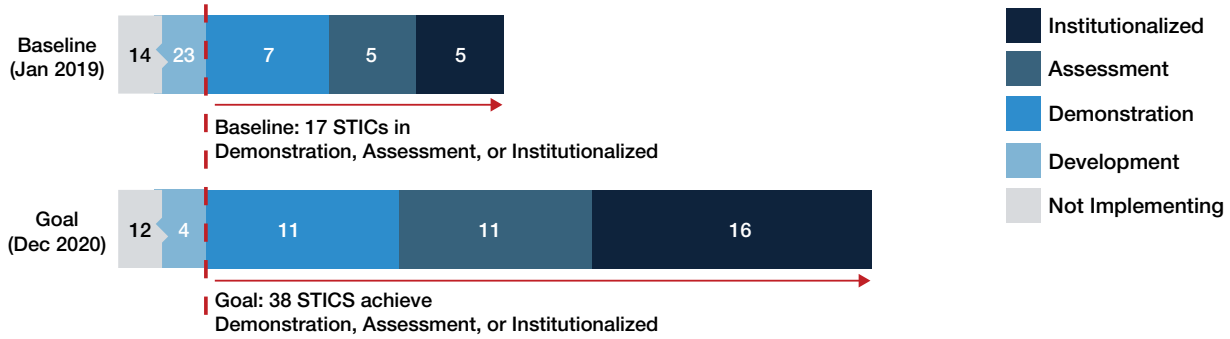
Thirty-eight States set a goal attain demonstration, assessment, or institutionalized implementation of virtual public involvement approaches, up from 17.

Baseline (January 2019)



Goal (December 2020)





Weather-Responsive Management Strategies

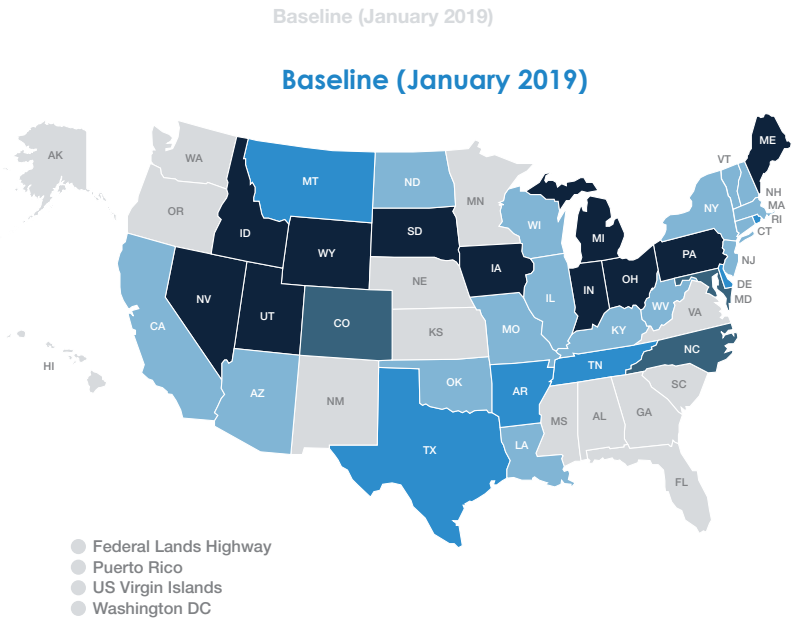
Weather-responsive management strategies can increase the effectiveness of traffic operations and highway maintenance during adverse road weather conditions.

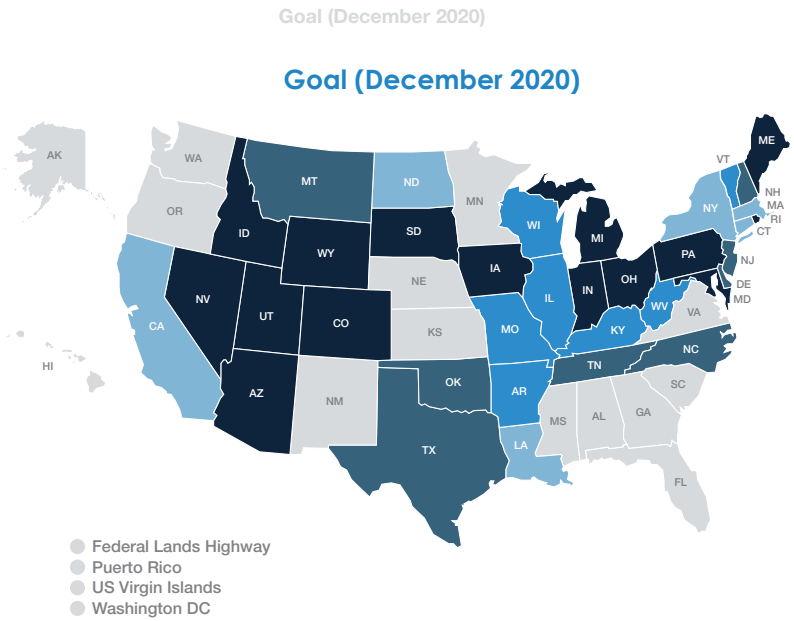
Inclement weather is a factor in one out of five crashes on U.S. roads. Each year, nearly 6,000 people are killed and more than 445,000 are injured in weather-related crashes. Inclement weather also contributes to traffic delays, increased freight costs, and environmental impacts from road salt use.

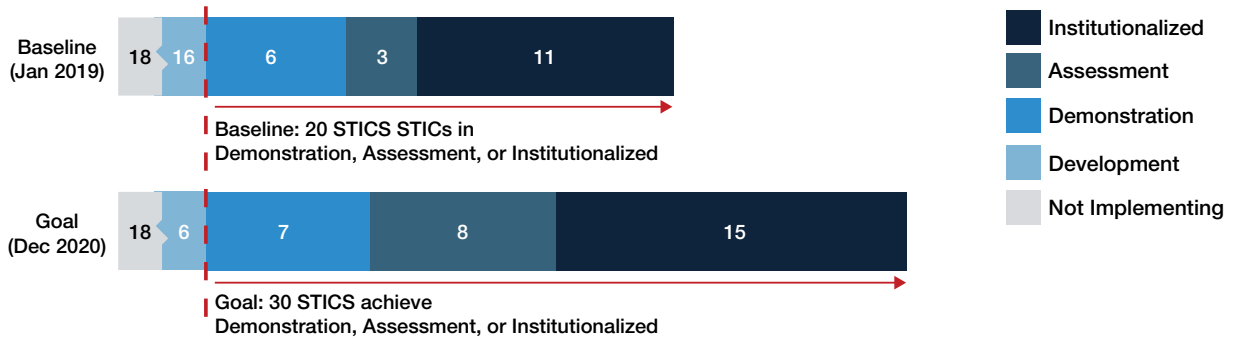
EDC-5 promotes adoption of traffic and maintenance management approaches that use road weather data from **integrating mobile observations** and connected-vehicles. Traffic management strategies such as motorist advisory systems, signal timing, and variable speed limits can help agencies improve safety and keep traffic and freight moving. Maintenance management strategies such as plowing, debris removal, and water drainage maintenance also enhance safety and mobility, while anti-icing and deicing techniques can reduce the cost and negative environmental effects of chemical use.

Weather-Responsive Management Strategies

The number of States at the demonstration, assessment, or institutionalized stages of using weather-responsive management strategies is expected to increase from 20 to 30 in EDC-5.







U.S. Department of Transportation
Federal Highway Administration

http://www.fhwa.dot.gov/everydaycounts

FHWA-19-CAI-011