Every Day Counts:

Creating Efficiency Through Technology and Collaboration

EDC-3 Progress Report #1

January – June 2015

U.S. Department of Transportation
Federal Highway Administration

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Foreword

Every Day Counts is the Federal Highway Administration's initiative 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 2015 status of innovation deployment for the 11 innovations in the third round of EDC, which focuses on creating efficiency through technology and collaboration. The report is intended as a resource for transportation stakeholders implementing innovation deployment plans and to encourage ongoing innovation in highway project delivery to better serve the nation.

CONTENTS

ACRONYMS AND ABBREVIATIONS

3D	three-dimensional
4D	four-dimensional
5D	five-dimensional
AASHTO	American Association of State Highway and Transportation Officials
AID Demonstration	Accelerated Innovation Deployment Demonstration
DOT	department of transportation
EDC	Every Day Counts
FHWA	Federal Highway Administration
GRS-IBS	geosynthetic reinforced soil-integrated bridge system
IQED	implementing quality environmental documentation
LTAP	Local Technical Assistance Program
NEPA	National Environmental Policy Act
SHRP 2	second Strategic Highway Research Program
STIC	State Transportation Innovation Council
UHPC	ultra-high performance concrete

Every Day Counts

Every Day Counts is the Federal Highway Administration's initiative to work 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 shortening project delivery and getting proven innovations quickly and broadly deployed to benefit road users. Designed to complement other initiatives centering on innovative technologies, practices and investment, 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 two years, FHWA works with state transportation departments, 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. The **third round of EDC**, which promotes the adoption of 11 innovations in 2015 and 2016, builds on the success of the deployment efforts during EDC-1 (2011–2012 cycle) and EDC-2 (2013–2014 cycle).

After the process of selecting EDC innovations for each two-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 highway programs. Information gathered at the summits is brought back to **State Transportation Innovation Councils**, which bring together public and private transportation stakeholders to evaluate innovations and spearhead their deployment in each state.

EDC's collaborative, state-based approach to deploying innovation enables states to be in the driver's seat and decide which innovations will work best for them and their customers. Working through **STICs** or similar groups, states can consider innovations FHWA recommends, along with technologies and practices from sources such the AASHTO Innovation Initiative and the **second Strategic Highway Research Program**, and adopt those that add value to their highway programs. "EDC and other technology initiatives have really been critical in helping states save money and save time," said Bud Wright, AASHTO executive director.

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 deployment teams 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. FHWA also offers assistance through its **State Transportation Innovation Council Incentive** and **Accelerated Innovation Deployment Demonstration** programs to encourage and provide incentives for innovation deployment.

The EDC initiative has had a significant positive impact on the highway community's adoption of new technologies and processes. Every state transportation agency has used two or more of the innovations promoted under the initiative, and some have adopted dozens. Several of those innovations are now mainstream practices in many states. The initiative has also fostered a transportation workforce that is adept at putting innovation to work to address transportation challenges. "We're saving money, saving time and saving lives, exactly the results we said were possible if we made innovation a standard industry practice," said FHWA Administrator Gregory Nadeau. "And we're making a strong case to Congress and policy makers in the states for future investments in transportation."

"One of the things that's been very beneficial in our partnership with the Federal Highway Administration is the idea of Every Day Counts. The initiative is not limited to the 11 ideas in EDC-3. It's a mindset. It's a culture of innovation."

– Malcolm Dougherty, California Department of Transportation Director

EDC-3 Innovation Implementation

Every six 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-3 and includes maps and charts that show the progress made in advancing the technologies and practices by the end of June 2015.

The maps illustrate the innovation implementation stage in each state in June 2015. The charts show the number of states in each implementation stage in June 2015. The charts also compare the June state of practice to the January 2015 baseline data and December 2016 goals set by states.

As states implement their innovation deployment plans, the number of states in the advanced (darker blue) stages will increase while the number of states in the initial (lighter blue) stages will decrease with each six-month progress report.

"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, D.C., Puerto Rico, the U.S. Virgin Islands and Federal Lands Highway, 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 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.

3D Engineered Models: Schedule, Cost and Post-Construction

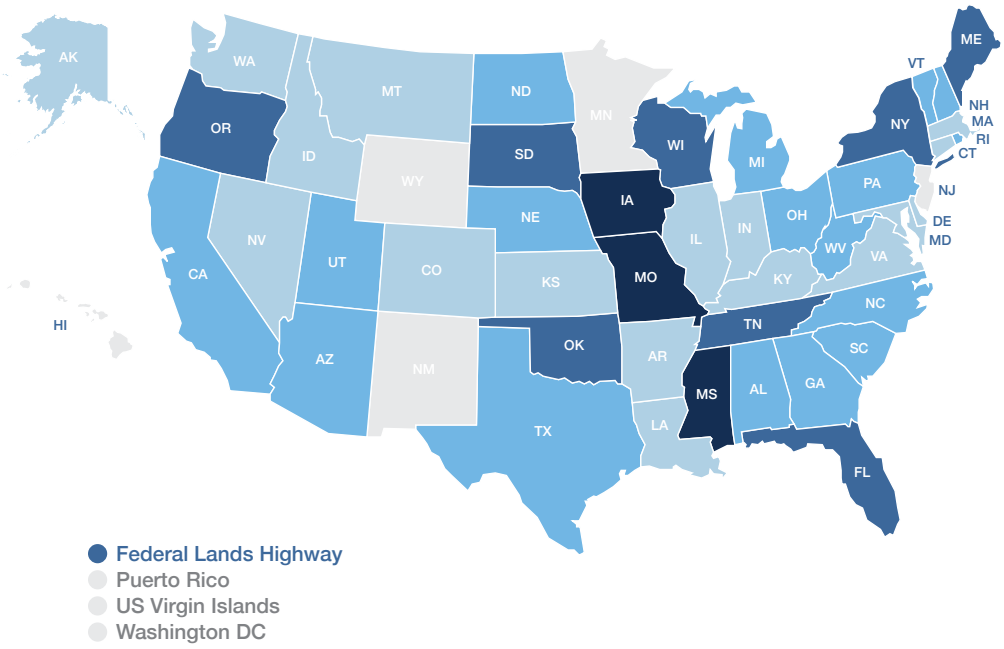
Three-dimensional engineered models are widely used by the highway community to more effectively connect a project's design and construction phases. These models can also be applied to other phases of the project delivery cycle to positively affect safety, costs, contracting, maintenance and asset management.

After encouraging adoption of 3D models in EDC-2, FHWA is continuing to promote the technology in EDC-3 with a focus on three practices: using survey data for roadway inventory and asset management purposes, incorporating schedule (4D) and cost (5D) information into models to streamline construction schedules and improve cost estimating, and using post-construction survey data to correct design models and create accurate as-built record drawings.

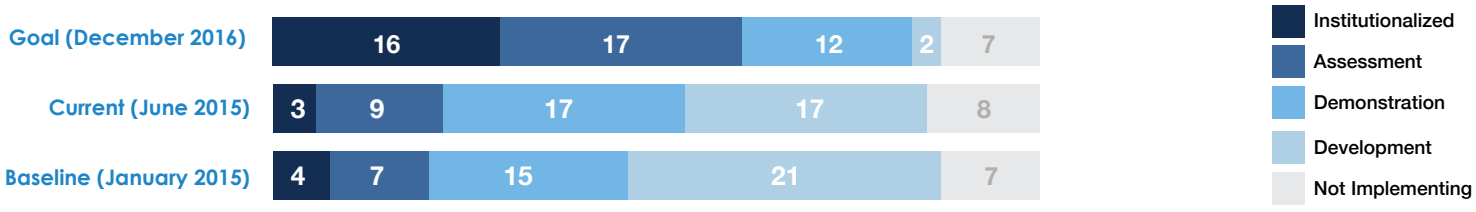
Project Planning, Design and Construction

Using 3D engineered models in project planning, design and construction is becoming a widespread practice, with 25 states and Federal Lands Highway implementing it or planning how to make it a standard practice.

Current (June 2015)



Number of States in Various Implementation Stages



Schedule and Cost

Six states are exploring the use of 4D and 5D modeling by incorporating schedule and cost data into 3D design models to improve project management and provide more accurate cost estimates.

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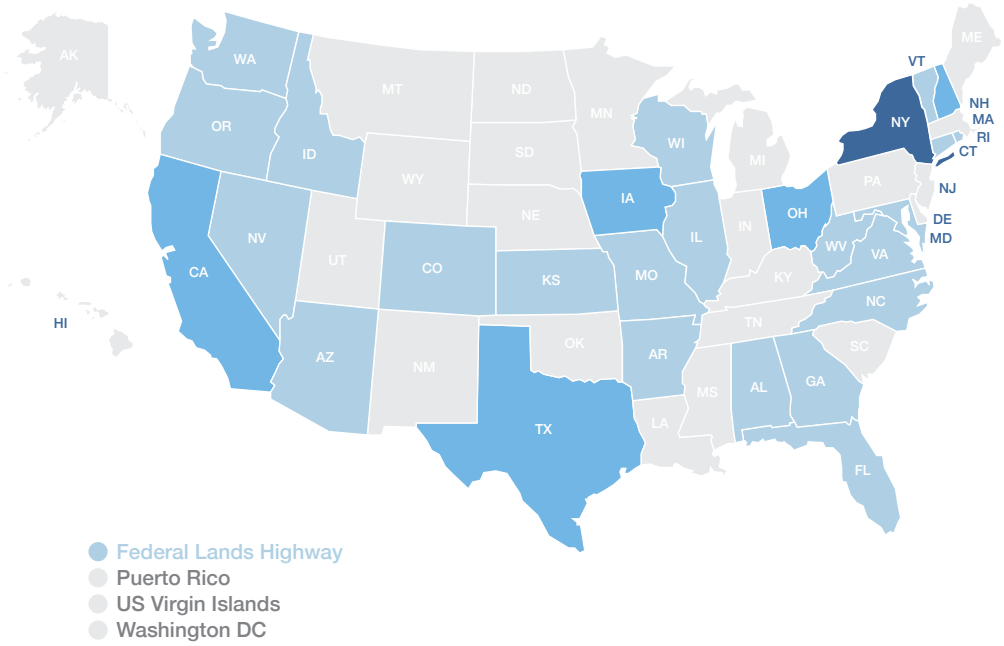

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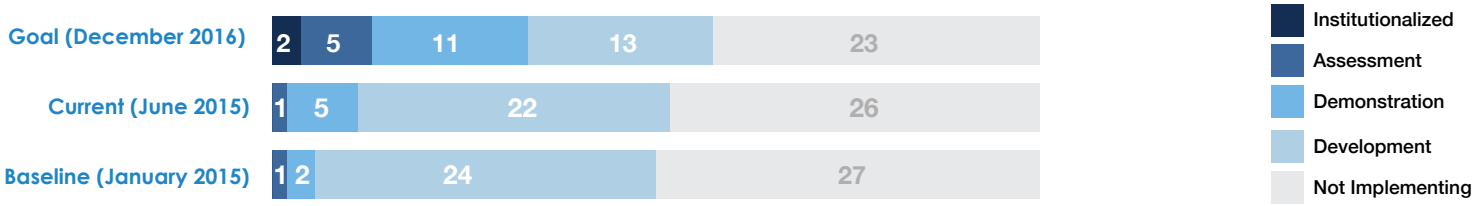

Post-Construction

Six states and Federal Lands Highway are applying 3D engineered models to post-construction applications, such as using 3D data for roadway inventory and asset management purposes and creating accurate as-built records of 3D design models.

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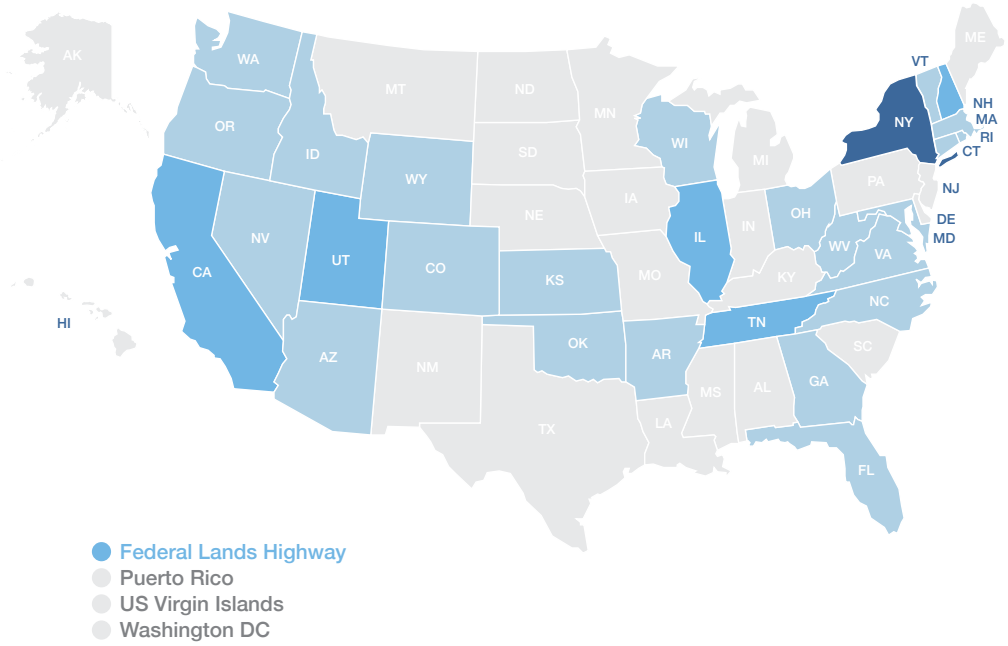

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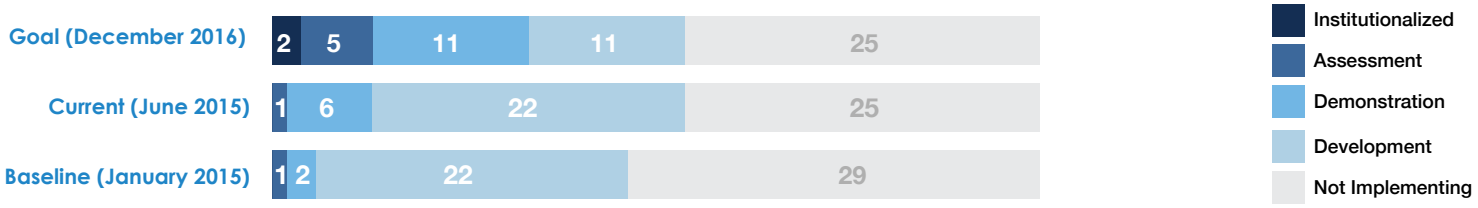

Highlights: 3D Engineered Models

Arizona

The **Arizona** DOT will provide digital ground data and design files to contractors in Live PDF format so they can develop models for bidding purposes. The files will enable contractors to create 3D engineered models more efficiently, improving the quality of bids and reducing costs.

Connecticut

The **Connecticut** DOT is piloting 3D engineered modeling on its project to build a roundabout in Seymour. The agency provided the alignments, surfaces and computer-aided design graphics files to contractors for use in automated machine guidance. The 3D modeling information is also being used for inspection purposes.

Georgia

The **Georgia** DOT is incorporating 3D modeling into its design procedures and will provide 3D information to contractors at the prebid stage. Contractors used 3D test data with the LandXML file format. The agency is designing projects using higher tolerances for cross section development and other updates to enhance the final surface information.

Idaho

The **Idaho** Transportation Department is developing a 3D specification for automated machine guidance and surveying and establishing 3D policies and procedures. Idaho has established a statewide group of representatives of federal, state and local agencies, contractors and consultants to share 3D best practices and identify needs.

Oklahoma

The **Oklahoma** DOT implemented 3D engineered models on all projects that use more than 50,000 cubic yards of earthwork.

Rhode Island

The **Rhode Island** DOT is creating a single, standard configuration for 3D engineered models. That will enable department staff to take advantage of the 3D modeling, utility, design, construction and maintenance opportunities available to manage assets throughout their life cycle.

South Carolina

The **South Carolina** DOT developed specifications and criteria to provide electronic engineering data for automated machine guidance construction. The special provision was applied on three pilot projects.

Wisconsin

The **Wisconsin** DOT is using 3D models on the Southeast Wisconsin Freeway Megaprojects program for grading, paving, milling and bridges. Applications include clash detection and resolution, multidisciplinary design and construction reviews, constructability reviews, traffic and work zone sequencing, and staged 4D models.

Data-Driven Safety Analysis

Data-driven safety analysis promotes the integration of safety performance into highway investment decisions with the goal of saving lives. Advances in highway safety analysis can provide transportation agencies with the reliable data they need to make effective investments in safety improvements.

EDC-3 focuses on broadening the use of two approaches to better target highway safety investments and reduce crashes and fatalities. Predictive approaches combine crash, roadway inventory and traffic volume data to provide more reliable estimates of an existing or proposed road's expected safety performance. Systemic approaches screen a road network for high-risk features associated with severe crashes and identify low-cost safety treatments.

Project Development

The benefits of data-driven safety analysis in project development have attracted interest across the country. Twenty-three states and Washington, D.C., are applying data-driven safety analysis in project development. Seven states have incorporated predictive safety analysis as a standard practice in their project development processes and policies.

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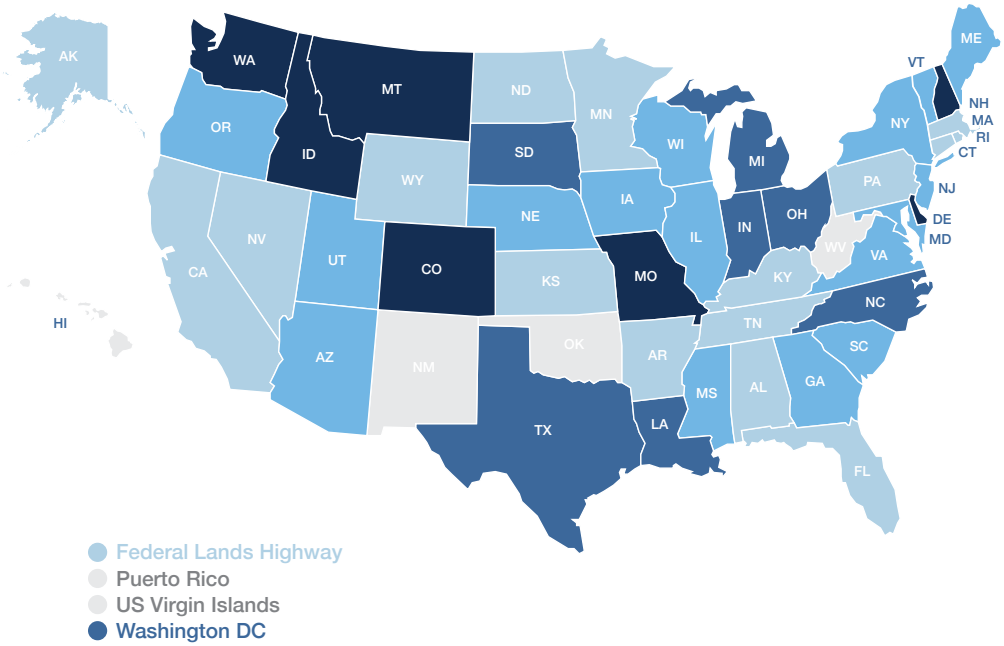

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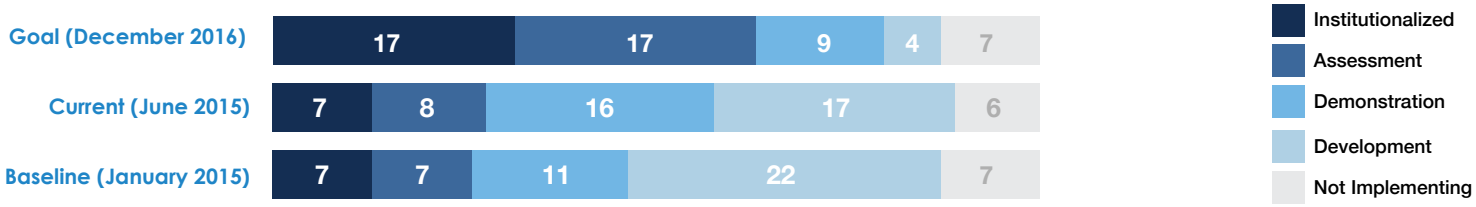
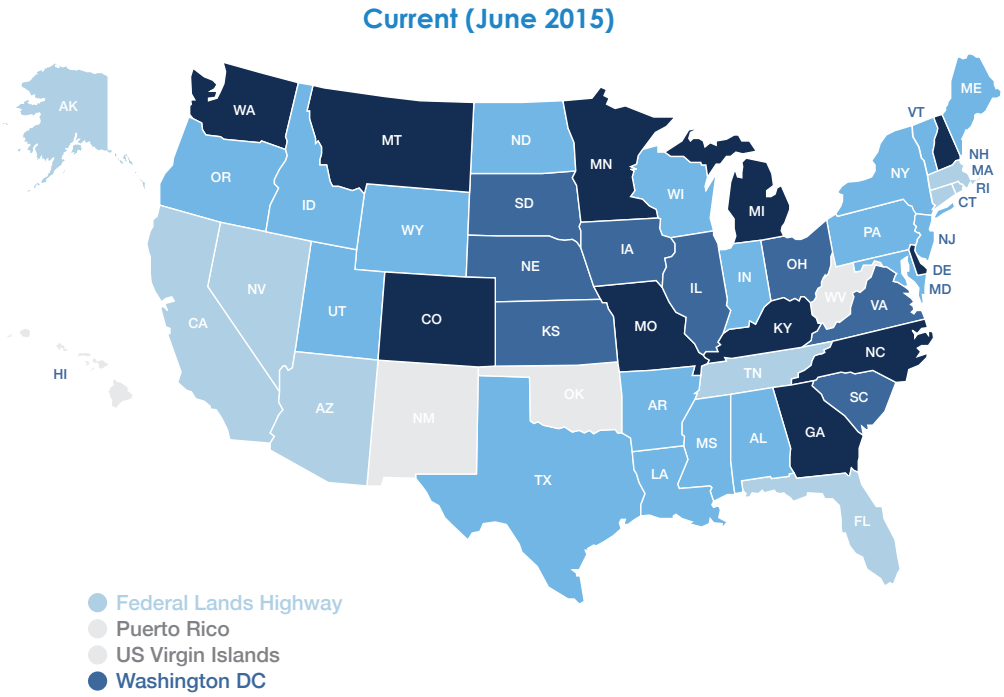
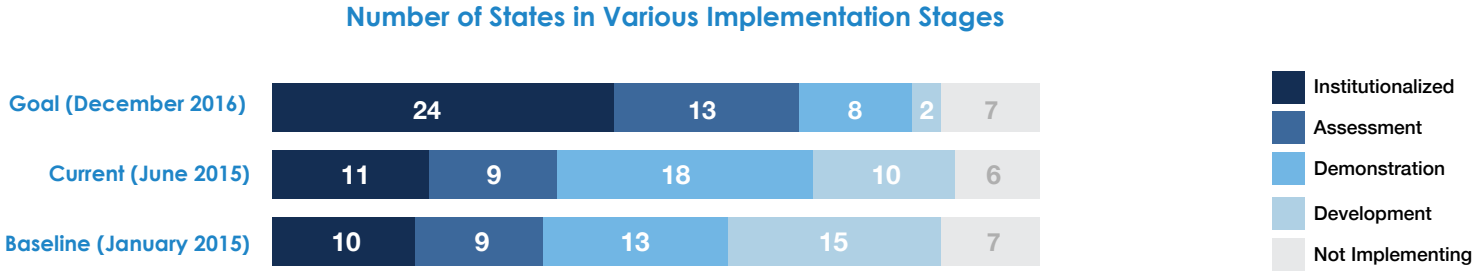


Safety Management

Many states are also pursuing the use of data-driven safety analysis to improve safety management. Twenty-six states and Washington, D.C., are applying data-driven safety analysis to their safety management process. Eleven states have made predictive and systemic safety analysis a standard part of their safety management process.





Highlights: Data-Driven Safety Analysis

Connecticut

The **Connecticut** DOT developed a strategic plan to advance safety analysis techniques that are similar to those in the AASHTO *Highway Safety Manual* and supported by analytic tools and resources such as the Interactive Highway Safety Design Model and Safety Analyst software. The agency used the Interactive Highway Safety Design Model on its Route 82 project in Norwich to quantify why one design alternative was safer than the other.

Louisiana

The **Louisiana** Department of Transportation and Development completed segment calibration and developed a template for intersection calibration factors and a statistical analysis for the predictive method using the *Highway Safety Manual* and its safety performance functions. Training and a guidance document on applying the state's Highway Safety Improvement Program and the *Highway Safety Manual* are being developed for district traffic engineers. The agency is implementing roadway departure systemic methodology on projects to address curves on two-lane rural roads using the risk factors of average daily traffic, radius, and lane and shoulder width.

Michigan

The **Michigan** DOT is developing safety performance functions for various site types (e.g., urban intersections, urban segments, rural segments) and incorporating them into prediction tools as they are developed. Michigan has implemented Safety Analyst software as a network screening tool on the state-owned system and plans to incorporate basic data elements to allow screening on the local system. The agency is drafting two local road safety plans as a pilot project and will develop local road safety plans for the rest the state in fiscal year 2016–17.

North Dakota

The **North Dakota** DOT completed local road safety plans for all counties and major cities in the state. The agency plans to adopt a new Highway Safety Improvement Program that includes a systemic safety analysis process for the state highway system to complement the process used on the local road system.

Ohio

The **Ohio** DOT is incorporating predictive crash analysis into its project development process for all highway projects. The agency will use Safety Analyst software to identify design exception locations that require further analysis and review.

Wisconsin

The **Wisconsin** DOT is incorporating the *Highway Safety Manual* into its intersection control evaluation process to quantify safety. The agency is developing Wisconsin-specific safety performance functions and crash modification factors for use in project development and planning to compare alternatives.

Wyoming

The **Wyoming** DOT piloted systemic analysis by screening rural two-lane road sections for the presence of risk factors associated with higher frequencies of particular crash types. The agency tested predictive analysis to calculate a quantified reduction in crash frequency and severity, using all of the critical factors outlined in the *Highway Safety Manual*.

e-Construction

FHWA is encouraging transportation agencies to exchange the paper-based approach to construction document management with **e-Construction**—the collection, review, approval and distribution of construction documents in a paperless environment. The EDC effort involves using readily available technologies to improve construction document management.

e-Construction saves money by decreasing paper use, printing and document storage costs and time by reducing communication delays and transmittal time. It improves communication by allowing faster approvals, increased accuracy and better document tracking. e-Construction is also an **AASHTO Innovation Initiative focus technology**.

Using a paperless approach to project document management is generating interest across the country. Pennsylvania and South Carolina have joined Michigan in making e-Construction a mainstream practice. An additional 15 states, Washington, D.C., and Federal Lands Highway are using e-Construction tools.

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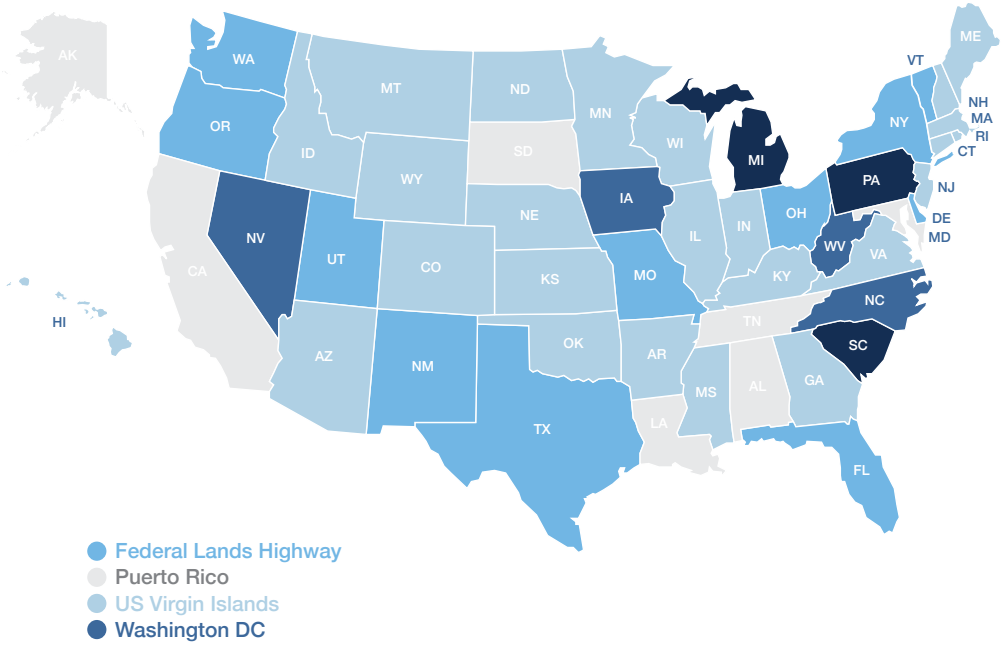

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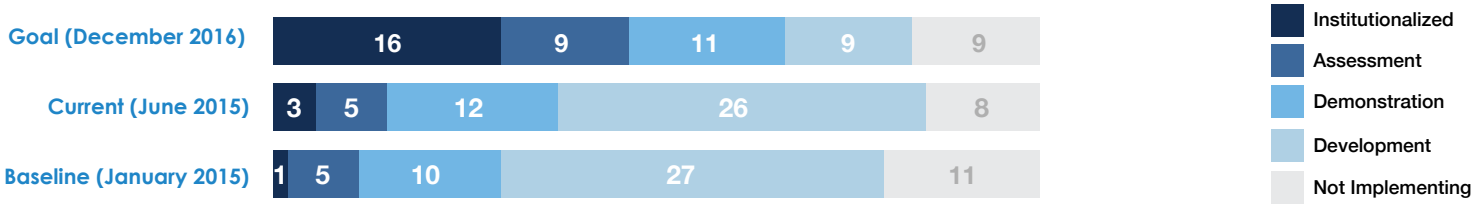

Highlights: e-Construction

Florida

The **Florida** DOT requires final as-built documents for all projects let after July 1, 2015, to be produced in an electronic format.

Idaho

The **Idaho** Transportation Department will grant contractors limited access to its SiteManager software program so they can enter their own samples and test results, which will save time for the agency.

Iowa

The **Iowa** DOT is using the Doc Express service as a document management system for workflow, material certifications, contract documents, plan room, shop drawing reviews, payroll submittals, contract modifications and electronic signatures. Ninety percent of the agency's highway construction projects are 95 percent paperless.

Michigan

The **Michigan** DOT, an e-Construction leader, has used paperless documentation on all trunk line projects since October 2014, totaling more than $1 billion in contracts. The agency is rolling out e-Construction to a few local agencies to prepare for local implementation across the state.

Minnesota

The **Minnesota** DOT is integrating e-Construction practices in its effort to develop a paperless construction documentation program that supports the State of Minnesota Sustainability Plan.

Missouri

The **Missouri** DOT implemented an e-Construction special provision for construction contracts that requires almost all documents to be submitted electronically. The only documents that are accepted in paper form are the affidavit for compliance with the prevailing wage law and the contractor's affidavit on settlement of claims because they require notarized signatures. As of June 2015, all projects are 99 percent paperless.

Texas

The **Texas** DOT uses e-Construction for design applications, contract administration, archiving and planning for data collection, and materials and core custody. The agency is preparing a paper summarizing implementation costs and time and money savings of its e-Construction program.

Utah

The **Utah** DOT is field testing and evaluating ESRI's Collector for ArcGIS application to georeference drawing sets to existing site conditions for future use. The Utah DOT is also using an internal product known as Interchange built on a SharePoint platform to manage contractor submittals, develop workflows and manage meeting minutes as collaborative tool for the agency, contractors and designers.

Geosynthetic Reinforced Soil-Integrated Bridge System

Geosynthetic reinforced soil-integrated bridge system technology can help meet the country's demand for small, single-span bridges by delivering low-cost, durable structures that can be constructed with readily available equipment and materials. A GRS-IBS project can be built in weeks instead of months, saving time and cutting work zone congestion.

GRS-IBS bridges can cost 25 to 60 percent less than bridges built with conventional methods. They use a simple design that can be adapted to suit environmental or other needs. The technology integrates the roadway approach to the bridge, eliminating the bump drivers commonly feel between the road and the bridge.

Interest continues to grow in GRS-IBS, an EDC innovation since 2011. Seven states have adopted GRS-IBS technology as a standard practice and use it regularly where appropriate. An additional 27 states, Washington, D.C., Puerto Rico and Federal Lands Highway have used GRS-IBS on projects or are preparing for full deployment of the technology.

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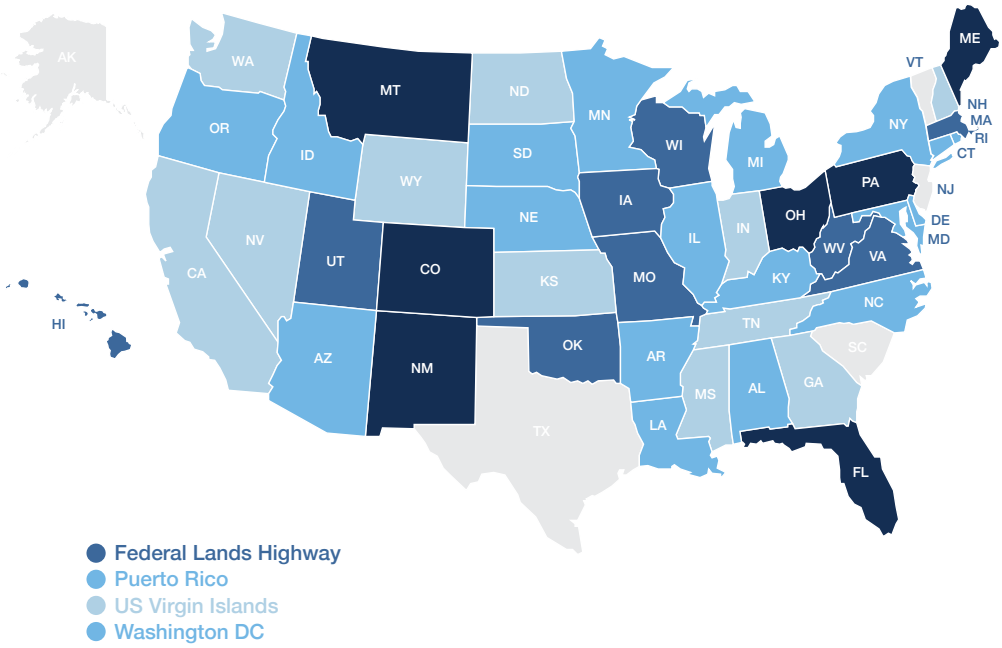

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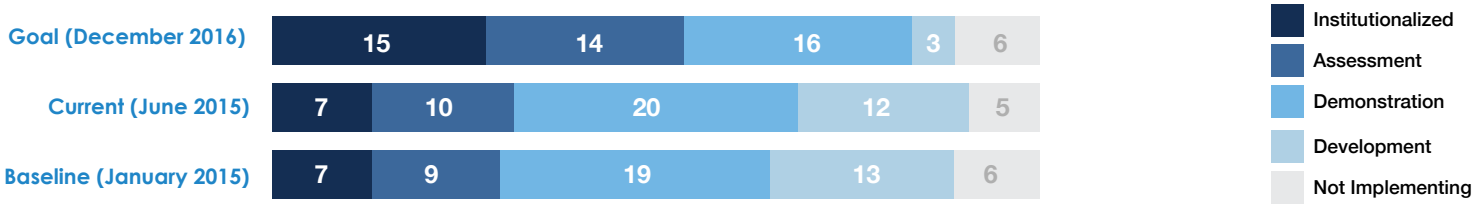

Highlights: Geosynthetic Reinforced Soil-Integrated Bridge System

California

A local public agency in **California** plans to build a small GRS-IBS structure. The project will address the seismic design criteria Caltrans requires for Federal Land Access Program projects built in the state.

Connecticut

The **Connecticut** DOT is designing GRS-IBS abutments with no fixed or expansion bearings and no bridge deck expansion joints to maintain. The superstructure rests on a concrete distribution slab to limit the bearing pressure on the GRS-IBS foundation to 4,000 pounds per square feet. Beam ends are encased in concrete that is cast monolithically with the bridge deck and anchored to the distribution slab. Substructures use wet-cast instead of dry-cast concrete masonry units for durability in winter weather.

FHWA (FLH)

FHWA is conducting a study that compares the total delivery costs of GRS-IBS structures to bridges built with conventional techniques to determine the economic impact of GRS-IBS. The study, which will include 20 to 25 structures, is scheduled for spring 2016 completion.

Florida

The **Florida** DOT requires that GRS-IBS be considered for all projects that meet documented parameters.

Michigan

The **Michigan** DOT is promoting GRS-IBS bridges to local agencies. The agency is developing a draft design guide detail for a GRS abutment for use on the trunk line system at stream crossings. The detail uses permanent steel sheet piling to protect the GRS abutment from river scour.

Nebraska

The **Nebraska** Department of Roads is collaborating with the Local Technical Assistance Program to plan a second GRS-IBS showcase. The goal of the showcase is to familiarize local agencies with GRS technology so they will consider it for use in their counties.

New Mexico

Because funding is limited, the **New Mexico** DOT is using maintenance staff to construct a GRS-IBS pilot project. The agency wants to determine the feasibility of using the GRS-IBS method for other bridge projects and whether using its own forces produces cost savings.

Pennsylvania

GRS-IBS technology is fully implemented in **Pennsylvania**. It has been incorporated into the Pennsylvania DOT's publications and standards and is considered a tool in its construction toolbox. Pennsylvania DOT districts and local agencies are installing GRS bridges on their own, without added guidance from the Central Office.

Puerto Rico

The **Puerto Rico** Highway and Transportation Authority carried out a load test on the GRS-IBS PR-2 bridge in Yauco. The data collected will be used to validate the design parameters used for the bridge.

Improving Collaboration and Quality Environmental Documentation

Shortening the time needed for National Environmental Policy Act approval for construction projects is a core need of the transportation community. Through the **improving collaboration and quality environmental documentation** effort, EDC-3 supports tools to foster collaborative, timely and transparent interagency reviews that can cut the amount of work and resources required for, save time and money on, and improve the quality of NEPA documents for projects.

The implementing quality environmental documentation, or IQED, effort that started in EDC-2 promotes best practices for simplifying and expediting the development of environmental documents. EDC-3 also incorporates eNEPA, an online workflow tool FHWA created for projects that require an environmental impact statement or environmental assessment.

IQED

Strategies to implement quality environmental documentation are now a mainstream practice in 10 states and Washington, D.C. Seventeen states have piloted the use of IQED principles on NEPA documents or are preparing for full deployment of IQED.

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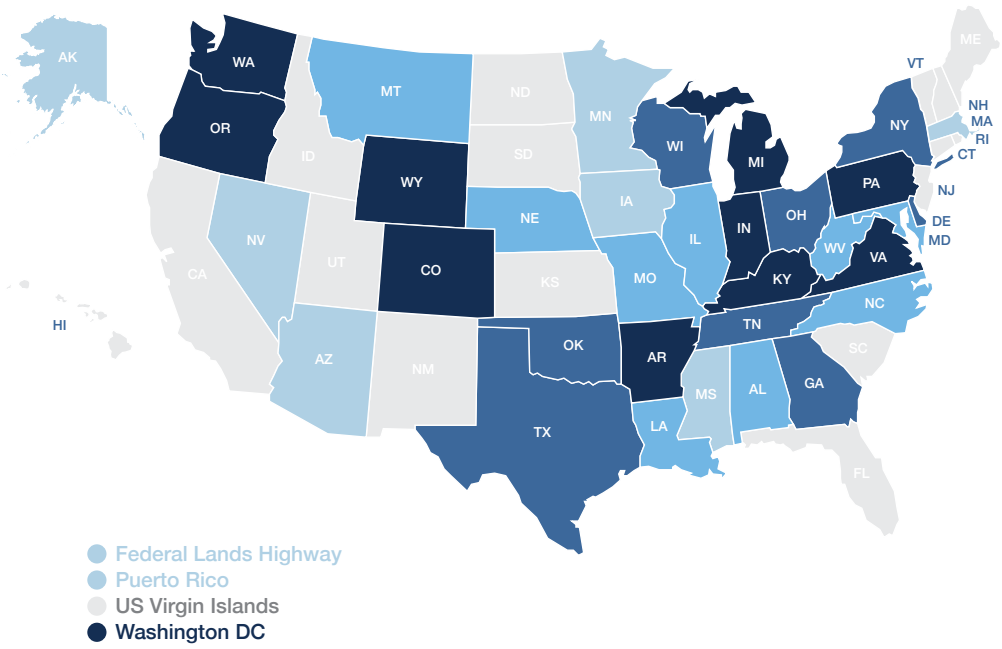

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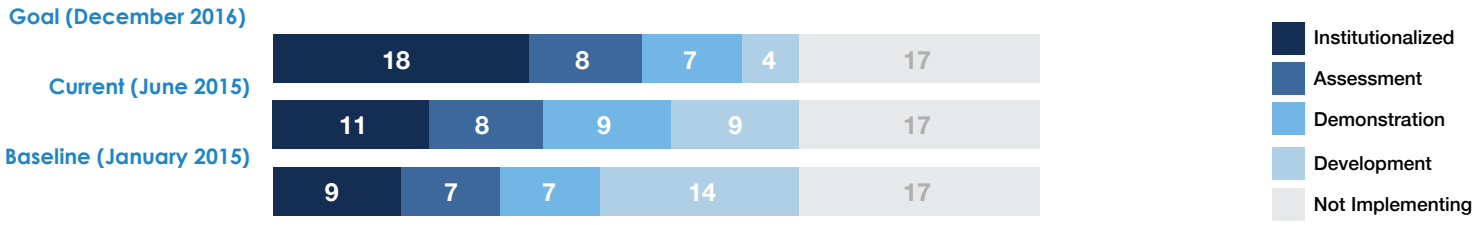

eNEPA

Conducting NEPA review processes electronically is now a standard practice in three states and Washington, D.C. Six states are demonstrating and assessing eNEPA.

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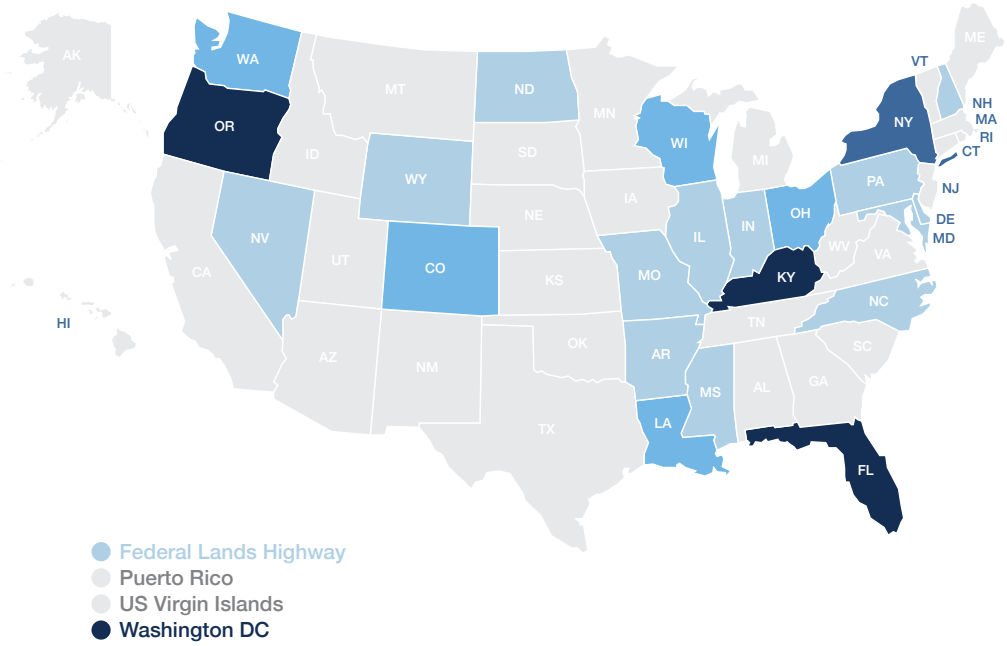

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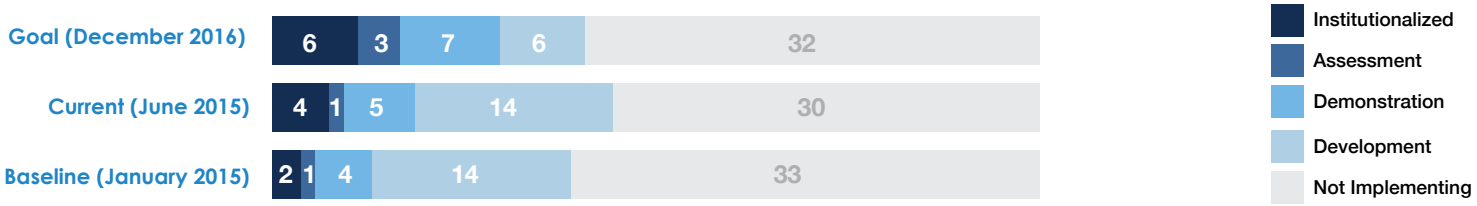


Highlights: Improving Collaboration and Quality Environmental Documentation

FHWA (FLH)

The **Federal Lands Highway** Division applied IQED principles to the environmental assessment for the project to improve Raphune Hill Road and Route 381 in the U.S. Virgin Islands to keep the document brief while ensuring legal sufficiency. The environmental assessment uses design visualization to tell the project story.

Illinois

The **Illinois** DOT is updating the environmental policy chapters of its *Bureau of Design and Environment Manual* to include IQED principles. The agency plans to develop templates for environmental assessments, environmental impact statements and NEPA Section 404 merger packages to foster development of more concise, consistent and legally sound documents.

Louisiana

The **Louisiana** Department of Transportation and Development requires all environmental documents to be reader friendly. The agency plans to use eNEPA on an environmental assessment and a supplemental environmental impact statement on the U.S. 90 and I-49 South projects.

Mississippi

The **Mississippi** DOT is developing an *Environmental Policy Manual* and a training course for local public agencies on Section 106 of the National Historic Preservation Act. The agency uses its Environmental Collaboration website to keep review agencies abreast of progress on project development.

Nebraska

The **Nebraska** Department of Roads developed new categorical exclusion forms and instructions for writing clear, concise and accurate project descriptions that strike the right balance between providing too much detail and including enough information to complete an environmental review. The goal is to increase the percentage of consultant-generated categorical exclusion documentation accepted by the agency on the first submittal.

Ohio

The **Ohio** DOT is developing guidance on how to prepare environmental assessment and environmental impact statement documents. Training on the guidance is scheduled to begin in November 2015.

Oregon

The **Oregon** DOT developed templates for environmental impact statements, categorical exclusions, programmatic categorical exclusions and Section 4(f) de minimis findings. The agency is also developing templates for Section 106 memorandums of agreement and Section 106 adverse effect notifications to the Advisory Council on Historic Preservation.

Pennsylvania

The **Pennsylvania** DOT institutionalized IQED for environmental assessments and environmental impact statements. The agency developed guidance that incorporates IQED principles, including those outlined in AASHTO's *Preparing High-Quality NEPA Documents for Transportation Projects*.

Wisconsin

The **Wisconsin** DOT is incorporating IQED principles into the chapters on preparing environmental documents in its *Facilities Development Manual*.

West Virginia

The **West Virginia** DOT applied IQED principles to the PFC Abraham G. Sams Memorial Bridge project environmental assessment. FHWA worked with the West Virginia DOT to modify the reader-friendly format for environmental assessments developed by the Colorado DOT. Using the new format decreased document development time by two months and resulted in a document that is easier for the public to read and understand. The West Virginia DOT will develop the finding of no significant impact document for the bridge project in a similar format.

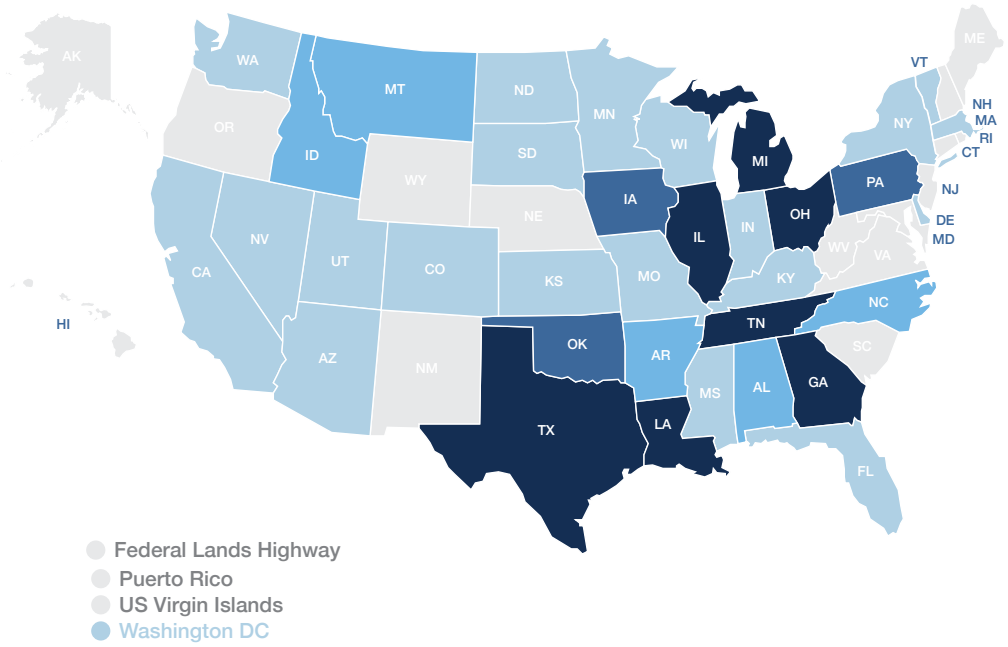
Improving DOT and Railroad Coordination

Each year, transportation departments build hundreds of projects near railroad rights-of-way. With railroad volumes projected to grow, the need for project coordination between DOTs and railroads will also increase. Improving collaboration and streamlining processes will save money and time for highway agencies and railroads and result in faster, smarter highway renewal.

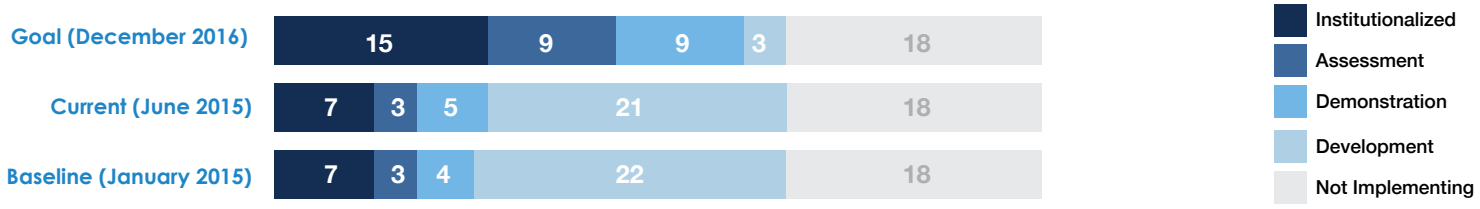
The EDC-3 effort on **improving DOT and railroad coordination** encourages agencies and railroads to identify issues and negotiate agreements to expedite development of highway projects involving railroad rights-of-way. It uses a model agreement library, tools and training developed under the **SHRP 2 R16 project**, which enables agencies and railroads to identify sources of conflict and develop memorandums of understanding for project and program needs.

Seven states have institutionalized the use of tools and practices to improve DOT and railroad coordination. Another eight states are piloting the innovation or preparing for full deployment.

Current (June 2015)



Number of States in Various Implementation Stages



Highlights: Improving DOT and Railroad Coordination

Colorado

The **Colorado** DOT is developing master agreements with Burlington Northern Santa Fe Railway and Union Pacific Railroad. The department is also working on contract templates for typical project types and a flow chart of railroad processes with time lines.

Delaware

The **Delaware** DOT is developing master agreements with each of the seven railroad companies it works with to streamline the process for construction projects. The agency has signed a maintenance agreement with Norfolk Southern Railway.

Idaho

The **Idaho** Transportation Department developed a draft highway-rail master agreement with Union Pacific Railroad that the railroad plans to review and comment on in July.

Indiana

The **Indiana** DOT developed a draft best practices and coordination process with Amtrak. It also created a draft master construction agreement that is under review by CSXT and Norfolk Southern Railway. The Indiana DOT incorporated a railroad certification in the agreement that is similar to its utilities certification.

Iowa

The **Iowa** DOT is developing a web-based safety training program for inspection staff working on railroad-related projects that it plans to implement by fall 2015. The agency developed standard specifications for work on or near Union Pacific Railroad and Canadian Northern Railway property and is working on specifications for work involving Burlington Northern Santa Fe Railway and Canadian Pacific Railway property.

Kentucky

The **Kentucky** Transportation Cabinet is developing a Kentucky Utilities and Rail Tracking System for use by cabinet staff and stakeholders to reduce utility and railroad conflicts and impacts on projects.

Louisiana

The **Louisiana** Department of Transportation and Development established a standard construction and maintenance agreement and preliminary engineering agreement with Kansas City Southern Railway. It developed a construction and maintenance agreement for design-build projects with Burlington Northern Santa Fe Railway that it will modify and use as the standard agreement for design-bid-build projects. The design-build agreement is a three-party agreement with the railroad, transportation department and contractor. The design-bid-build agreement will be a two-party agreement specifying transportation department and contractor responsibilities.

Michigan

The **Michigan** DOT has master agreements with most of the railroads that operate in the state. The agreements cover the selection, design, construction, funding and administration of railroad-highway grade crossing improvement projects.

Tennessee

The **Tennessee** DOT involves railroad companies early in the project planning process, which saves time and improves relationships. The Tennessee DOT meets twice a year with major railroad companies. Transportation department and railroad staff conduct site visits on upcoming, current and past highway projects. The Tennessee DOT sends preliminary project plans to railroads to provide prior notice of projects and obtain comments. Railroad special provisions are included in every construction contract with railroad involvement. Projects are discussed and railroad concerns are addressed before final plans are developed. The Tennessee DOT has master agreements with Norfolk Southern Railway, CSX and Illinois Central Railway.

Locally Administered Federal-Aid Projects: Stakeholder Partnering

Stakeholder partnering brings local public agency representatives together with state and federal colleagues to increase program compliance and streamline the project delivery process under the Federal-Aid Highway Program. After promoting stakeholder partnering in EDC-2, FHWA is continuing the effort in EDC-3.

Stakeholder partnering groups meet regularly to identify program-level issues, review project development processes and work on solutions through a defined decision-making process and action plans. Stakeholder partnering improves communication and trust among those involved, increases consistency by establishing a cooperative environment for reviewing project development compliance requirements and policies, and provides a platform to initiate process enhancements, training and other ways to improve program integrity.

Stakeholder partnering on local projects is now an institutionalized practice in 17 states. Another six states are making progress on their efforts to establish stakeholder partnering groups of local, state and federal representatives.

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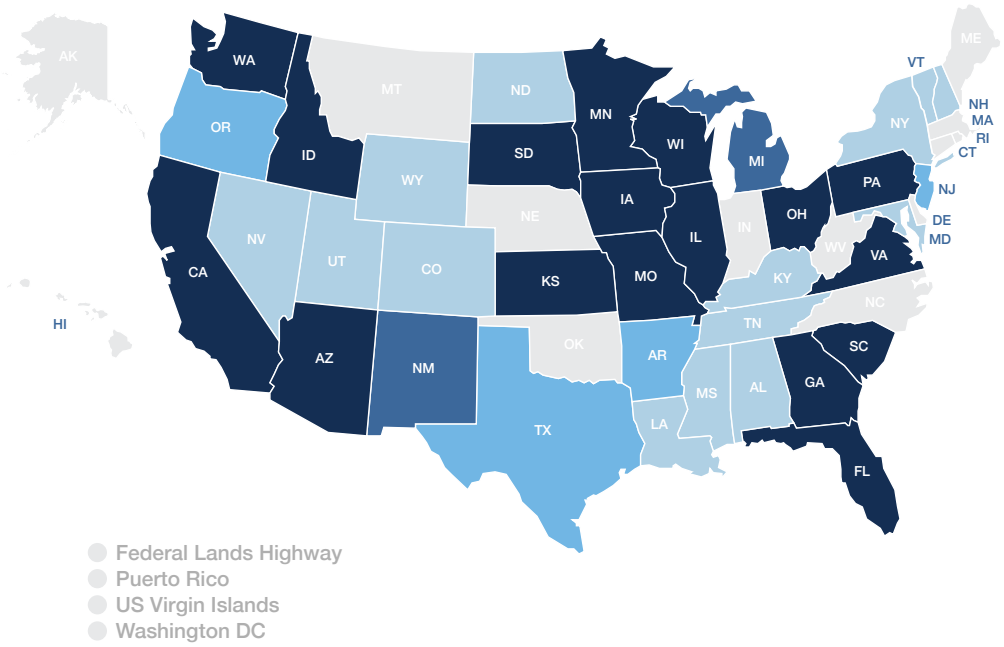

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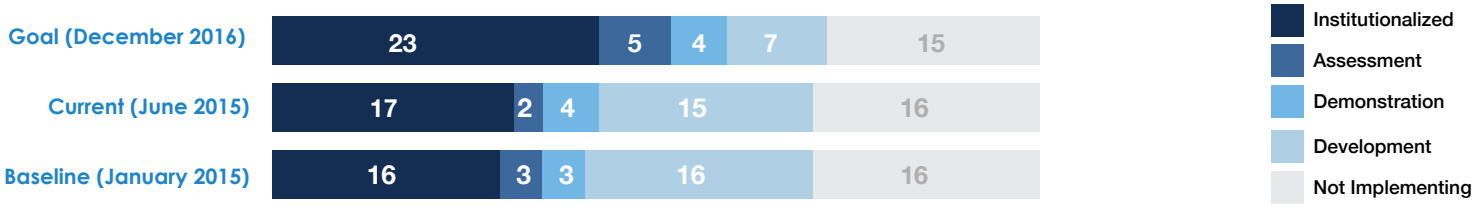

Highlights: Locally Administered Federal-Aid Projects: Stakeholder Partnering

Arizona

The **Arizona** DOT continued its progress on stakeholder partnering by establishing a communication loop with local representatives to ensure awareness of member activities. The stakeholder council used the January 2015 Rural Transportation Summit and April 2015 Roads and Streets Conference as venues to get the word out on council activities and identify potential concerns for local agencies.

Florida

The **Florida** DOT completed its goal of redesigning the Local Agency Program Community of Practice to provide better geographic representation. The group continues to focus on stakeholder partnering and developing best practices for project delivery, administration and compliance with the Florida DOT Local Agency Program.

Idaho

The **Idaho** Transportation Department is developing a framework in which the Ada County Highway District will be allowed to fill the role of resident engineer in charge of its projects.

New York

In **New York**, multiple forums and venues are used to develop and enhance working relationships among state, federal and local staffs. New York State DOT officials meet with local agency staffs to discuss concerns and troubleshoot issues on program and project delivery. The state is pursuing several initiatives on training and sharing best practices with local agencies to advance project delivery.

Ohio

Ohio's Local Public Agency Advisory Group has improved communication between local agencies and the Ohio DOT Office of Local Programs. The group made extensive use of Federal-Aid Essential videos in developing the Local Public Agency Qualification Program e-learning modules. As the modules are updated and new Federal-Aid Essential videos become available, videos will be added to the course.

Oregon

The **Oregon** DOT created a partnership with local agencies, the Association of Oregon Counties and the League of Oregon Cities to advance local program delivery. The Oregon DOT is also developing a users' group for its Local Agency Certification Program.

South Dakota

The **South Dakota** DOT created a Transportation Advisory Council to improve communication and understanding among all levels of government to ensure the delivery of a viable local program. The council has been instrumental in the development of the administrative rules for the new state-funded local bridge grant program.

Virginia

The **Virginia** DOT continues its aggressive stakeholder partnering program by engaging members in improving local program and project delivery and incorporating lessons learned. The group implemented scheduling templates, created a new tracking database, developed a *Local Agency Program Manual* starter pack and streamlined the project procurement process.

Regional Models of Cooperation

Although traffic congestion does not stop at geographic borders, transportation planning often does. Using **regional models of cooperation** can help state highway agencies, regional planning groups and other stakeholders develop agreements and coordinate planning across jurisdictional boundaries.

In EDC-3, FHWA is promoting a framework and process for developing agreements across agency boundaries, improving communication, collaboration, policy implementation and performance management. Regional models of cooperation can yield benefits such as faster project delivery, less traffic congestion and more efficient freight movement.

Planning Products and Studies Across Agencies

Use of regional planning on highway, transit, freight, air quality, congestion mitigation and other transportation issues is institutionalized in 16 states. Metropolitan planning organizations, state transportation departments and other stakeholders in eight states and Federal Lands Highway are at the demonstration stage on the innovation.

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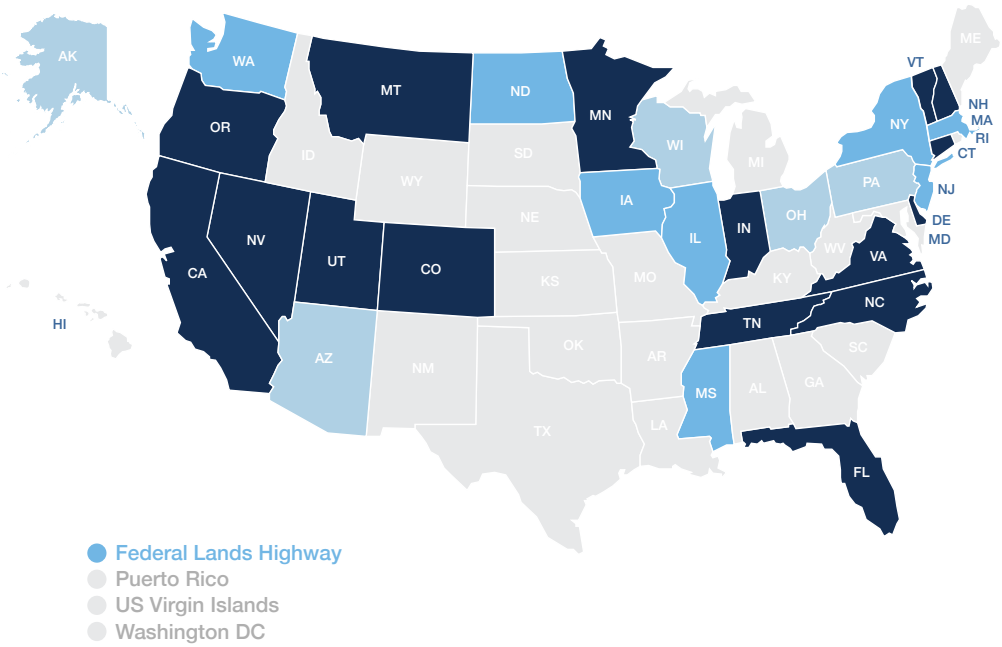
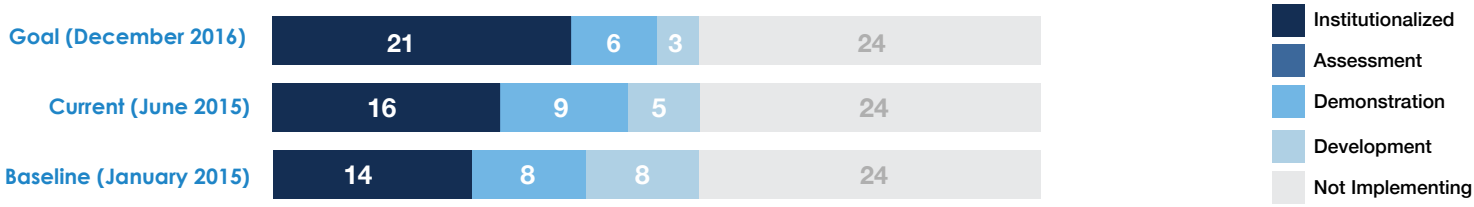


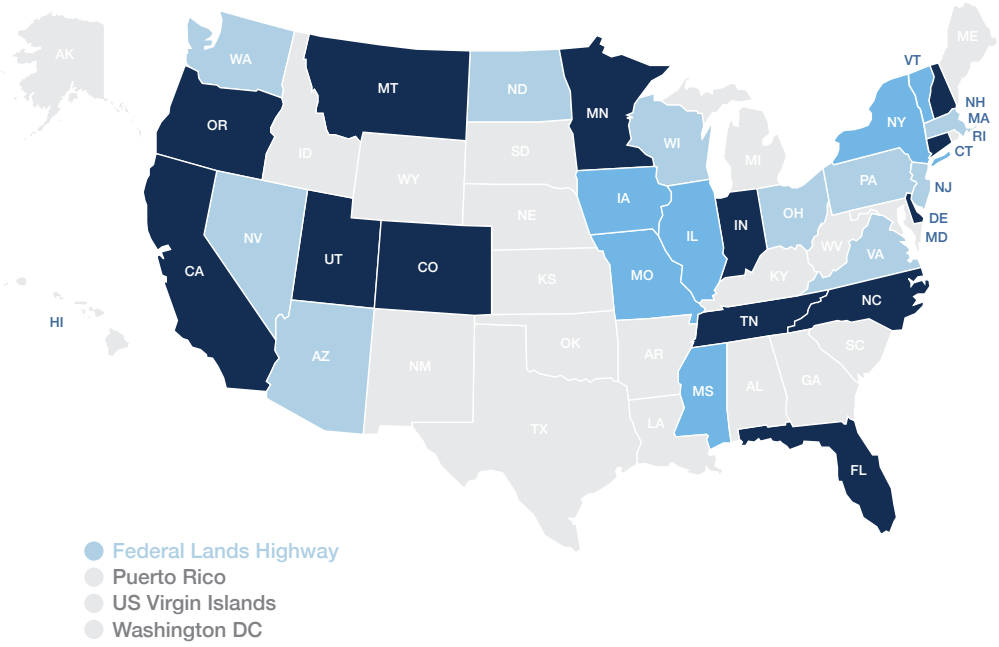
Number of States in Various Implementation Stages



Data Models and Tools

Metropolitan planning organizations, state transportation departments and other stakeholders in 13 states have institutionalized the sharing of data, models and tools such as geographic information systems, transportation models, safety data and asset management information. Another six states are conducting demonstration projects.

Current (June 2015)



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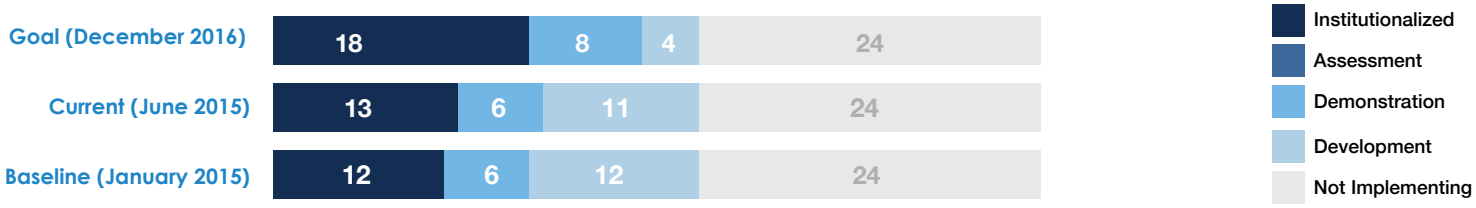

Highlights: Regional Models of Cooperation

Colorado

The **Colorado** DOT is developing a statewide travel demand activity-based model and completing a new Integrated Freight Plan. The agency is updating a statewide plan that focuses on coordination and participation by Colorado's 15 transportation planning regions.

Connecticut

Connecticut has institutionalized regional models of cooperation by coordinating studies and planning activities through the Connecticut DOT. The agency is developing a statewide Freight Plan that includes input from metropolitan planning organizations.

Connecticut DOT is developing a travel demand model that will include areas outside the state, including Massachusetts, New York and Rhode Island, and allow for better coordination on future studies.

Mississippi

The **Mississippi** DOT is preparing a Long-Range Transportation Infrastructure Plan concurrently with the state's coastal and regional metropolitan planning organizations to coordinate the efforts of the multiple entities to address congestion, safety and commerce. The Mississippi DOT is also incorporating the State Freight Plan into its long-range plan.

Missouri

The **Missouri** DOT developed a collaboration website for the Missouri DOT, metropolitan planning organizations, regional planning commissions, FHWA, the Federal Transit Administration and surrounding state DOTs that includes resources, checklists, notice of proposed rulemaking release schedules and performance management reporting examples. The Missouri DOT holds monthly coordination meetings with regional stakeholders.

New Jersey

The **New Jersey** DOT works collaboratively with NJ TRANSIT, metropolitan planning organizations, FHWA and the Federal Transit Administration. The Central Jersey Transportation Forum cooperates on regional growth strategy, complete streets initiatives, and smart growth and strategic planning for major events and emergencies. The New Jersey Bicycle and Pedestrian Advisory Council includes metropolitan planning organizations. The New Jersey Metropolitan Area Planning Forum collaborates on megaregional planning efforts, such as Amtrak's Northeast Corridor initiative.

New York

The **New York** State DOT has engaged metropolitan planning organizations and others in an external stakeholder advisory group to assist in the development of the State Freight Plan.

Utah

Utah expanded the state's Unified Transportation Plan by including statewide collaborative bicycle and pedestrian planning and safety planning.

Wisconsin

The **Wisconsin** DOT is pursuing regional cooperation through the establishment of multijurisdictional coordination of performance measures. The agency is developing a process to incorporate performance measures in the planning process.

Road Diets (Roadway Reconfiguration)

A **road diet** is a low-cost strategy that reconfigures a roadway cross-section to safely accommodate all users, increase mobility and access, reduce crashes and improve a community's quality of life. During EDC-3, FHWA is encouraging state and local agencies to consider road diets as a safety-focused alternative for mixed-use streets.

A common type of road diet involves converting a four-lane, undivided road to three lanes with two through lanes and a two-way turn lane in the middle. The reclaimed space can be allocated for uses such as bike lanes, pedestrian refuge islands, bus lanes and parking. Research shows that road diets can reduce crashes from 19 to 47 percent.

The use of road diets to enhance safety and mobility has attracted widespread interest across the country. They are a standard practice in eight states and Washington, D.C. Another 33 states are installing road diets and are developing processes for identifying potential sites for roadway reconfiguration.

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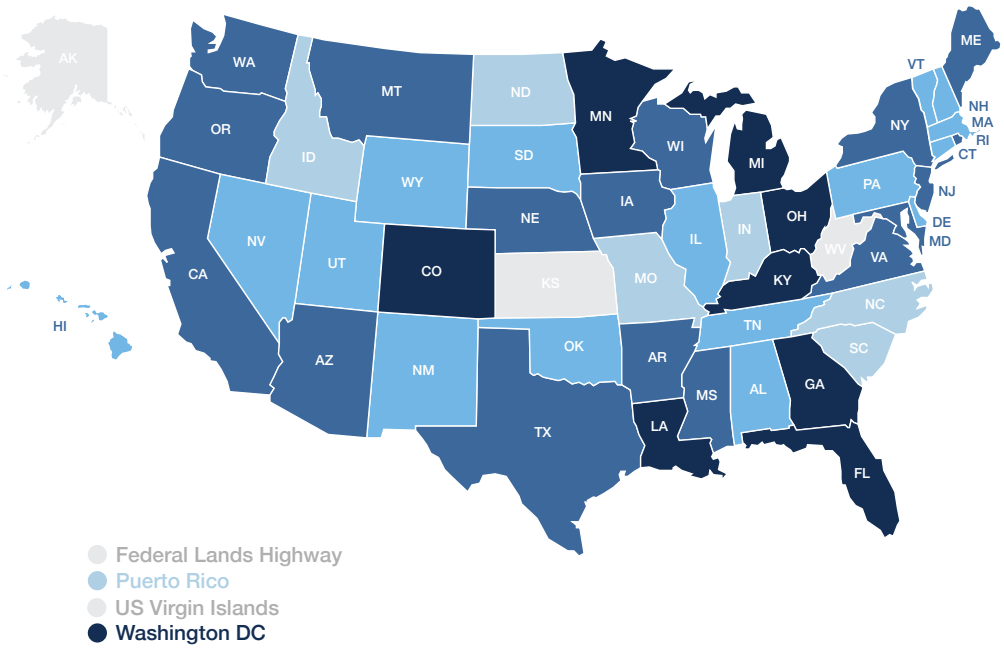

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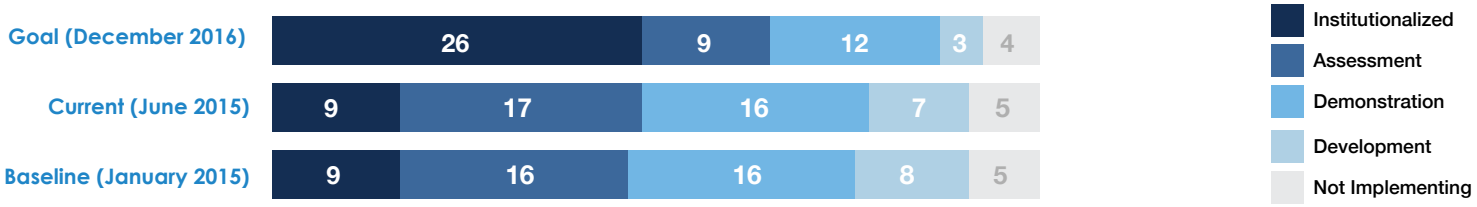

Highlights: Road Diets (Roadway Reconfiguration)

Arizona

In **Arizona**, the city of Phoenix is implementing a Comprehensive Bicycle Master Plan and complete streets ordinance. Both projects rely heavily on road diets to improve safety and add bike and pedestrian facilities. A road diet was implemented on the 12th Street project between Indian School and Camelback Roads.

Florida

The **Florida** DOT is using road diets to provide complete streets by reallocating travel lanes to other modes, with associated reductions in travel speeds. The agency's districts are using two *Lane Elimination Guidance* documents as a resource when determining the need for a lane elimination project.

Idaho

In **Idaho**, the Ada County Highway District's Emerald and Americana project incorporates road diets. The county is adding continuous sidewalks and exploring the feasibility of reconfiguring the street to accommodate bike lanes.

Maine

The **Maine** DOT developed a draft of *MaineDOT Road Diet Guidelines*. The agency identified a restriping project to temporarily reconfigure a 1-mile section of Route 202 in Manchester using road diet concepts. The roadway will be reconfigured from two eastbound lanes and one westbound lane to one eastbound lane, one westbound lane and a center left-turn lane. The Maine DOT plans to test the effectiveness of this configuration this summer.

Maryland

The **Maryland** State Highway Administration has two road diet projects under construction. The agency is repurposing existing pavement to add bicycle lanes on Maryland Route 170 from MD 648 to MD 762 and on U.S. 1 from U.S. 1 Alternate to the Baltimore city line.

Michigan

The **Michigan** DOT developed a preauthorization checklist for road diets to assure smooth administrative procedures and established a crash reduction factor for use in justifying Highway Safety Improvement Program funding. The agency has applied road diets totaling 54.1 miles on 60 state corridors and 88.3 miles on 94 local corridors.

New Jersey

The **New Jersey** DOT used the *Highway Safety Manual* to quantify the benefits of road diets. Two New Jersey Capital Program projects incorporating road diets will be funded under the state's Highway Safety Improvement Program. One road diet on Route 45 has been completed with positive results. In addition to advancing road diets on state roads, the New Jersey DOT is working with metropolitan planning organizations to select projects on local and county roads.

New York

The **New York** State DOT compiled a list of more than 40 potential locations for road diets. The agency is analyzing the locations to determine the effects of installing road diets on reducing crashes.

Ohio

The **Ohio** Local Technical Assistance Program Center is developing a road diet e-learning module on what road diets are, why they are beneficial and how they should be implemented. Funded by an FHWA Technology Transfer grant, the training module will be available on the LTAP Center's e-learning website. It will help expand the use of this safety countermeasure on local roads in the state.

Utah

Utah's largest metropolitan planning organization, Wasatch Front Regional Council, conducted a project to identify the locations of existing road diets and where they can be implemented. The council plans to add road diets to the toolbox of programs member towns can request assistance for under its Local Planning Resource Program.

Virginia

The **Virginia** DOT's Northern Virginia District is close to institutionalizing road diets. The 10 road diets installed in Northern Virginia during the past six years have produced exceptional safety results. The Virginia DOT plans to implement five additional road diets in Fairfax County in summer 2015.

Smarter Work Zones

The EDC-3 effort on **smarter work zones** encourages the adoption of two efficient work zone strategies: project coordination and technology applications. Project coordination involves construction planning that minimizes the impact of work zones and generates time and cost savings. Cities and regions are combining multiple projects in an area, correlating right-of-way acquisition and utility work, and coordinating work among agencies.

Technology applications such as queue management and speed management involve using intelligent transportation systems to manage work zone traffic. Queue management systems alert drivers to work zone backups so they can slow down safely. Speed management solutions, such as variable speed limit signs, manage work zone traffic in real time.

Project Coordination

Nine states and Washington, D.C., are incorporating project coordination strategies or work zone software tools into planning, design, operating and maintenance processes. Nine states have made it a standard practice to use project coordination to reduce work zone impacts.

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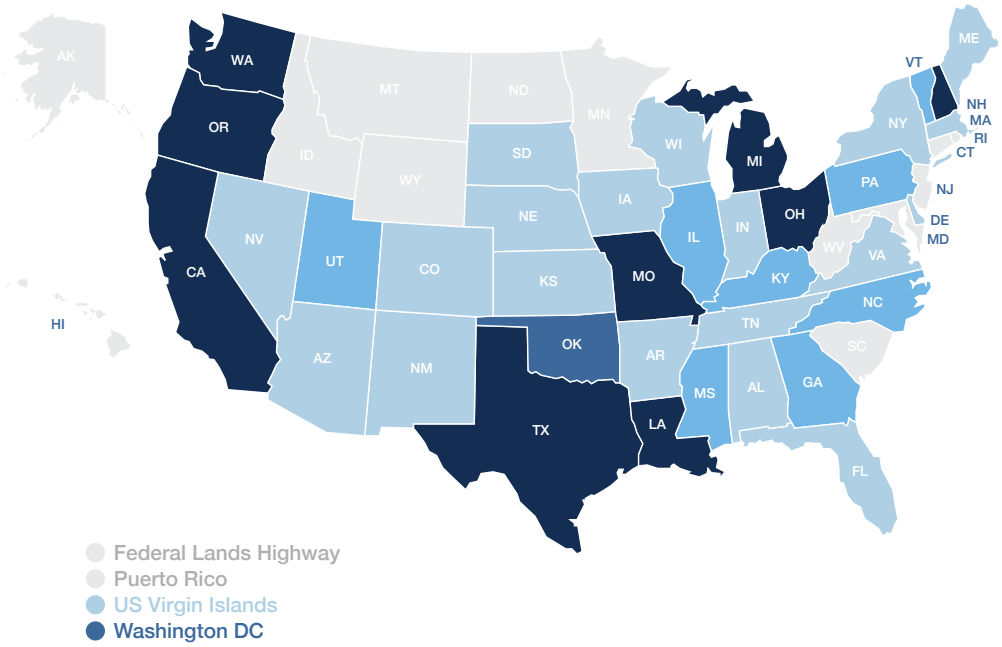

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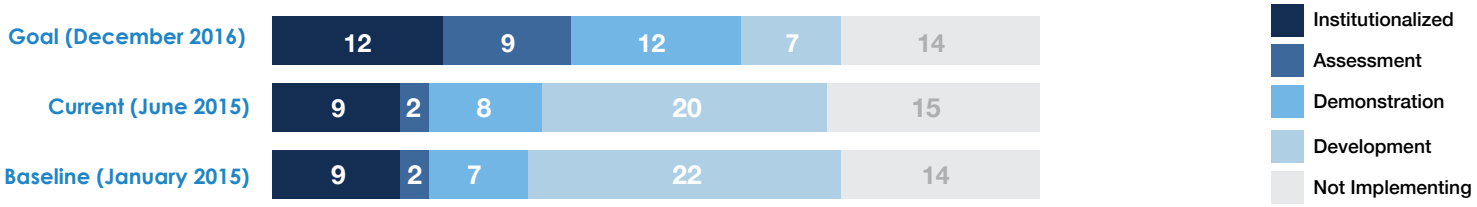
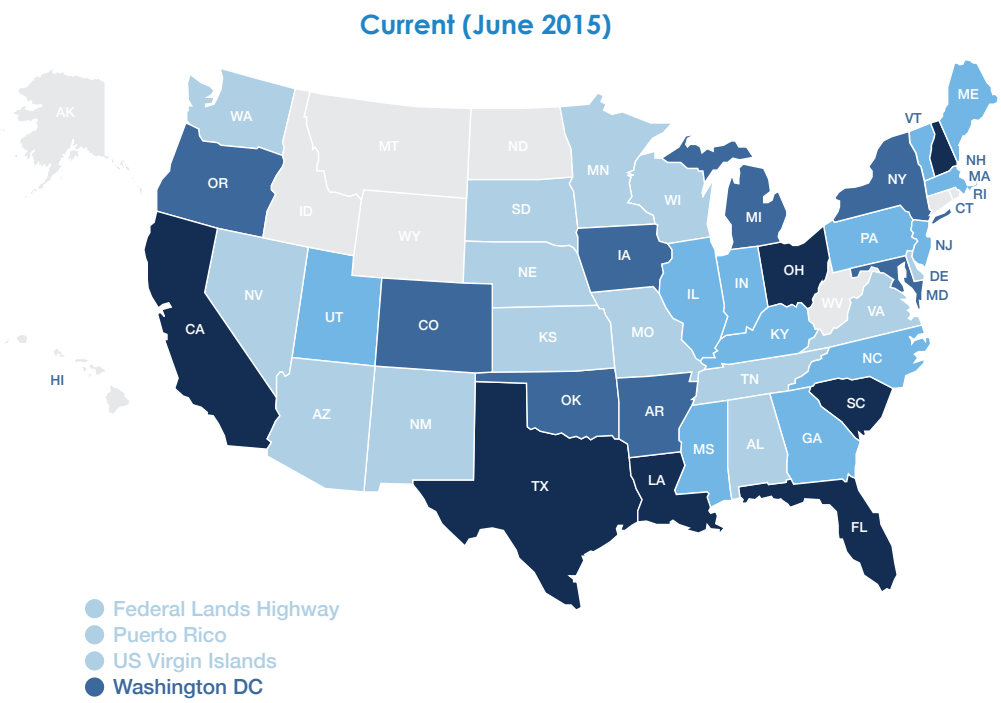
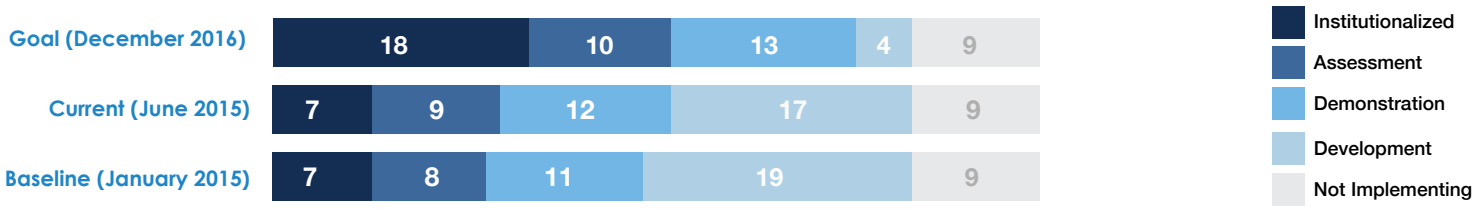


Technology Applications

Twenty states and Washington, D.C., are incorporating technology applications into work zone planning, design, operating and maintenance practices. Seven states have made using technology tools and strategies to manage work zone impacts a mainstream practice.





Highlights: Smarter Work Zones

Arizona

In **Arizona**, the Maricopa County DOT conducted a regional construction and maintenance information survey to determine how local agencies store and disseminate construction and maintenance data. The Maricopa County DOT is leading a pilot project to integrate construction data from the cities of Mesa and Glendale into the Regional Archive Data System, which is scheduled for completion in December 2015.

Colorado

The **Colorado** DOT deployed a work zone intelligent transportation system on a recent project and is identifying upcoming candidate projects. The agency is also producing a lessons-learned document on its use of smarter work zones on the I-70 Twin Tunnels project near Idaho Springs.

Iowa

The **Iowa** DOT is collaborating with the Tennessee DOT, Missouri DOT and Memphis Metropolitan Planning Organization on a SHRP 2 application for WISE Work Zone Impacts and Strategies Estimator software implementation to expand its functionality and uses. This summer, the Iowa DOT plans to deploy its first detection and warning system for trucks entering a work zone.

Maryland

The **Maryland** State Highway Administration is developing a real-time performance monitoring tool for work zones using data available through the Regional Integrated Transportation Information System.

Minnesota

The **Minnesota** DOT is piloting a variable speed notification system on I-94 in the Twin Cities metropolitan area. Based on traffic conditions, drivers will be notified of downstream speeds at several locations and other information in an effort to better manage speeds and reduce crashes when work zone congestion develops.

New Jersey

The **New Jersey** DOT will assess the applicability and effectiveness of a variable speed limit system on a 10-mile stretch of I-295 as it approaches the I-295-/I-76/Route 42 Direct Connection project in Camden County. Radar detectors will report spot speeds and vehicle volume by lane in real time and, based on reported values, the control system will automatically trigger messages on portable signs.

Pennsylvania

The **Pennsylvania** DOT developed guidance for using sequential lighting, traveler information and advanced queue warning systems on multilane roads. The agency's first dynamic advanced queue warning system was deployed in June 2015 on the I-80 Clarion County preventive maintenance project.

Vermont

The **Vermont** Agency of Transportation is using smarter work zone technologies on three projects. It is using queue warning on the I-91 design-build bridge replacement in Brattleboro. It is applying queue warning and travel time using Bluetooth capabilities on the I-89 bridge rehabilitation in Waterbury and on the I-91 bridge replacement in Hartford, a construction manager/general contractor project that includes a lateral bridge slide.

Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements

Ultra-high performance concrete is a steel fiber-reinforced material that improves durability and simplifies connection details, fabrication and construction when using prefabricated bridge elements. The availability UHPC is expected to increase the routine use of prefabricated bridge elements to accelerate bridge construction.

The EDC-3 effort focuses on demonstrating the advantages UHPC offers as an option for connecting prefabricated bridge elements. Field casting of UHPC connections between prefabricated components results in a strong connection that provides better long-term performance. The mechanical properties of UHPC allow for the redesign of common connection details in ways that promote both ease and speed of construction.

Thirteen states and Washington, D.C., are using UHPC connections on bridge projects or making plans to institutionalize use of the technology. Pennsylvania has made UHPC connections a standard practice on bridge projects that use prefabricated elements.

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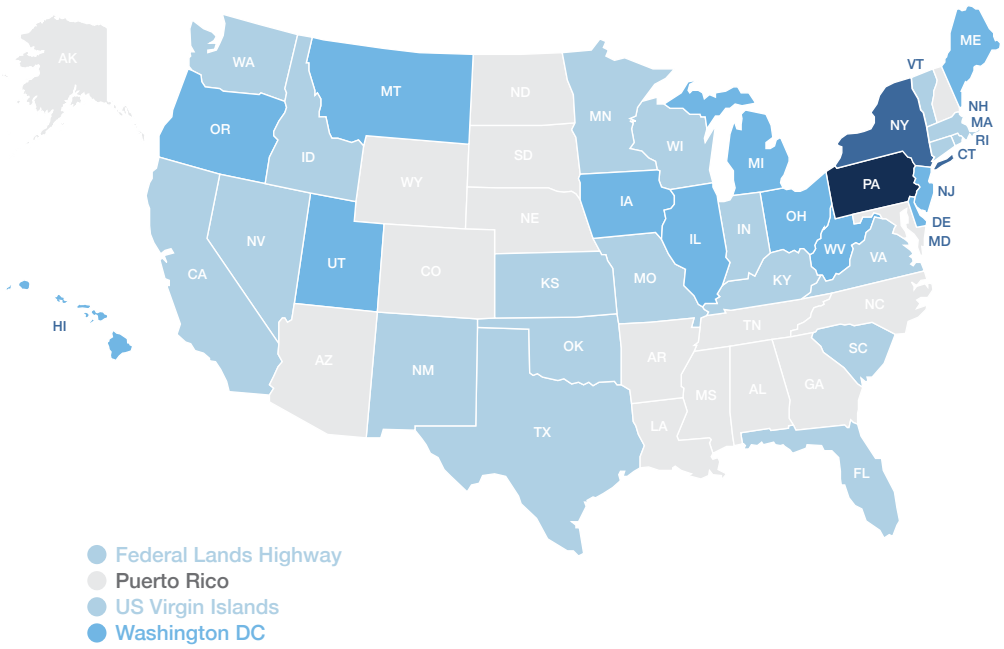

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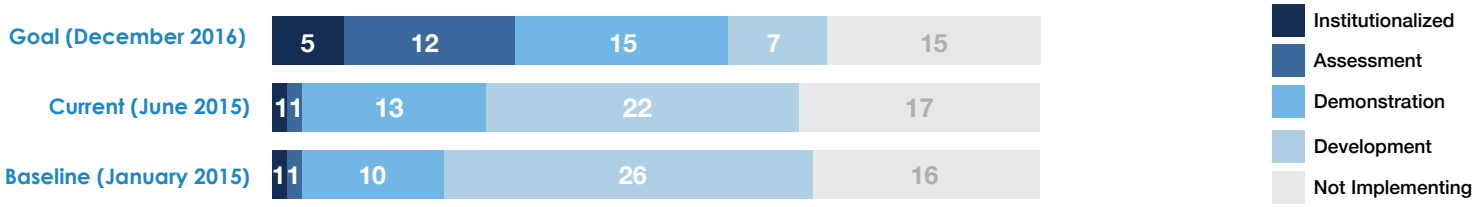

Highlights: Ultra-High Performance Concrete Connections

Delaware

The **Delaware** DOT expects to complete its first UHPC project, a bridge on Daisy Road over the Pocomoke River, this fall. The agency used UHPC in joints between prestressed box beams. The Delaware DOT plans to use UHPC on two other bridge projects: I-95 over Route 7 and State Route 141 over I-95.

Illinois

The **Illinois** DOT finished its first UHPC application as part of the Peoria Street Bridge project in Chicago. Crews used UHPC in the joints between the full-depth deck panels.

Iowa

The **Iowa** DOT is using UHPC connections on its second prefabricated bridge project, on Iowa Highway 92 over Little Silver Creek in Pottawattamie County. On a bridge construction project in Buchanan County, crews formed beams in the field using a Korean UHPC mix design.

Montana

The **Montana** DOT completed one accelerated bridge construction project using UHPC for grout pockets, closure pours and joints for a precast concrete deck system. The agency is conducting a research project, "Feasibility of Nonproprietary UHPC for Use in Highway Bridges in Montana."

New Jersey

The **New Jersey** DOT is using UHPC on three bridge deck replacements projects. UHPC performed well on the Route 46 over Musconetcong River Bridge project, although crews learned that the formwork must be leakproof to prevent UHPC leakage. A lesson learned on the Pulaski Skyway projects is that UHPC should not be pumped because the material cannot be monitored as it flows through the closed forms.

New Mexico

The **New Mexico** DOT is developing its own UHPC mix to apply to prestressed bridge girders. The agency may also use the UHPC mix for connection and closure points.

Ohio

The **Ohio** DOT has identified a deck replacement project in Licking County to pilot the use of UHPC in closure pours. The agency developed a performance-based specification for UHPC materials that does not limit the materials to a sole source. The Ohio DOT is also developing an experimental work plan for UHPC.

Pennsylvania

The **Pennsylvania** DOT incorporated UHPC into its publications and standards, and it is now considered a tool in the agency toolbox. Pennsylvania DOT districts and local agencies are able to use UHPC on projects on their own, without the need for guidance from the Central Office.

Washington, D.C.

The District DOT in **Washington, D.C.**, accelerated construction on the 16th Street Bridge project by using prefabricated bridge elements with UHPC as a closure pour. The District DOT used superior-quality material for the joints to enhance long-term performance.

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