every day counts

Significant Impacts: August 2017

U.S. Department of Transportation
Federal Highway Administration

every day counts

In 2009, the Federal Highway Administration (FHWA) launched **Every Day Counts (EDC)** in cooperation with the American Association of State Highway and Transportation Officials (AASHTO) to speed up the delivery of highway projects and to address the challenges presented by limited budgets. EDC is a State-based model to identify and rapidly deploy proven but underutilized innovations to shorten the project delivery process, enhance roadway safety, reduce congestion, and improve environmental sustainability.

Proven innovations and enhanced business processes promoted through EDC facilitate greater efficiency at the State and local levels, saving time and resources that can be used to deliver more projects for the same money. By advancing 21st century solutions, the transportation community is making every day count to ensure our roads and bridges are built better, faster, and smarter.

The EDC Model

FHWA works with State and local transportation agencies and industry stakeholders to identify a new collection of innovations to champion every 2 years and accelerate deployment. Innovations are selected collaboratively by stakeholders, taking into consideration market readiness, impacts, benefits, and ease of adoption. After selecting the EDC technologies for deployment, transportation leaders from across the country gather at regional summits to discuss the innovations and share best practices. These summits begin the process for States, local public agencies, and Federal Lands Highway Divisions to focus on the innovations that make the most sense for their unique program needs, establish performance goals, and commit to finding opportunities to get those innovations into practice over the next 2 years.

Throughout the deployment cycle, specifications, best practices, lessons learned, and data are shared among stakeholders through various outreach methods, such as case studies, webinars, and demonstration projects. The result is rapid technology transfer and accelerated deployment of innovation across the Nation.

Significant Impacts of EDC Round Three

The EDC-3 initiative, which promoted 11 market-ready innovations in 2015 and 2016, had significant positive impacts on the transportation community's adoption of new technologies and practices.

- The national State Transportation Innovation Council (STIC) network, which brings together stakeholders and champions in each State to foster an innovative culture and exchange best practices on innovations to inspire widespread use across the country was completed.
- Every State adopted one or more of the 11 innovations during the 2-year deployment cycle; many are now widely used across the country.

The following highlights provide a glimpse of successful innovation deployment across the country.

Shortening Project Delivery

e-Construction is the collection, review, approval, and distribution of construction documents in a paperless environment. e-Construction uses readily available technologies to improve construction document management, saving time, saving money, and improving communication.

Connecticut: Mobile devices have allowed project inspectors to access the construction reporting system and other resources in the field. The Connecticut Department of Transportation (DOT) implemented the use of electronic signatures on internal documents and piloted the use of digital signatures externally on construction orders, cutting a 20- to 30-day approval process to 3 to 5 days.

Florida: Since July 2016, the Florida DOT has used e-Construction for all construction contracts to provide instantaneous data collection and resolve issues in the field. The agency estimates a $1.1 million investment saved $22 million per year in reduced administrative processing time.

Florida DOT saves **$22 million** per year in reduced processing time.

Geosynthetic Reinforced Soil–Integrated Bridge System (GRS-IBS) technology helps meet the country's demand for small bridges by delivering low-cost, durable structures that can be constructed with readily available equipment and materials—in many cases by an agency's own crews.

Massachusetts: The Massachusetts DOT used GRS-IBS technology on several bridge projects, including the replacement of the Ashley Falls Road Bridge over the Housatonic Railroad in Sheffield. Taking approximately half the time it would have using cast-in-place abutment, the bridge was constructed in less than 8 weeks. It consists of a 105-foot-long steel superstructure on 25-foot abutments, making it one of the largest projects constructed using GRS-IBS. The project earned several national awards for its innovative techniques.

Rhode Island: The Rhode Island DOT combined the use of GRS-IBS abutments and a bridge move when it replaced the East Shore Expressway and McCormick Quarry Bridges in East Providence. Using these innovations cut the closure times for each bridge from 1 year to 80 hours.

Improving DOT and Railroad Coordination encourages transportation departments and railroads to work together 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 second Strategic Highway Research Program (SHRP2) R16 project.

Arizona: The Arizona DOT established a process for improving coordination and reducing the project delivery time on Design-Build (D-B) projects. A typical D-B project takes 12-to-16 months, depending on the size of the project. The Bell Road D-B project, which replaced an existing at-grade crossing with a grade-separated eight-lane bridge, advanced from design to construction in 1 year. Due to the upfront partnering with the railroad and the Arizona Corporation Commission, the DOT maintained the project schedule even when an unexpected accident caused 3 weeks of downtime during construction.

Texas: The Texas DOT, which has institutionalized coordination with railroads, implemented a process to submit construction agreements to railroads electronically rather than in standard paper format. This enables railroads to load documents into their agreement management systems more easily and obtain internal approvals faster. It also reduces printing and mailing costs and makes it easier to track documents. As a result, railroad agreement processing time dropped from more than 12 weeks to as little as 3 weeks.

Texas DOT saved **9 weeks** of processing time.

Stakeholder Partnering enabled the Ohio DOT to repair or replace **200** critical or deficient bridges.

Locally Administered Federal-Aid Projects: Stakeholder Partnering brings local, State, and Federal agencies together to increase program compliance and streamline the project delivery process under the Federal-Aid Highway Program. Stakeholder partnering groups identify program-level issues, review project development processes, and work on solutions through a defined decision-making process and action plans.

Missouri: The Missouri DOT has seen remarkable improvement in project delivery since implementing a Statewide Local Public Agency Advisory Committee in 2012. Project delivery time, from programming to construction award, was reduced by a year within just 3 years of implementing stakeholder partnering.

Ohio: Ohio's Local Public Agency Advisory Group collaborated on expanding funding opportunities for local projects. The Ohio DOT created a new program that resulted in $120 million of additional money for local bridges over 3 years, which enabled repair or replacement of 200 locally owned bridges. Ohio also made turnpike toll revenue credit available to small cities for municipal bridges and for the Transportation Alternatives Program.

Regional Models of Cooperation help highway agencies, regional groups, and other stakeholders coordinate transportation planning across jurisdictions to cut project delivery times and traffic congestion. A framework and process for developing multijurisdictional agreements improves collaboration, policy implementation, and performance management.

Illinois: For the past decade, the Chicago Region Environmental and Transportation Efficiency Program (CREATE) has improved Chicago's freight, passenger, and commuter rail network by implementing 70 projects that address capacity and operational needs. Prior to CREATE, freight trains traveling from the West Coast to the East Coast spent roughly 2 days moving through Chicago. CREATE projects have cut 12 hours from freight travel times, leading to local and regional economic benefits and reduced congestion throughout the Chicago rail and roadway networks.

Kansas and **Missouri** found that traffic congestion and problematic air quality defy State boundaries. The metropolitan planning organization (MPO) for the bi-state Kansas City region addressed this by deploying Operation Green Light, a traffic signal management system that uses wireless technology to coordinate traffic signals on major routes in the Kansas City regional area. The improvement of traffic flow and air quality are two significant accomplishments of this regional coordination. Studies show that this traffic signal management system has reduced delay on the system's corridors by up to 80 percent.

Operation Green Light reduced traffic delays by up to **80 percent**.

Enhancing Safety

Data-Driven Safety Analysis (DDSA) promotes the integration of safety performance into highway investment decisions with the goal of saving lives. Advances in highway safety analysis provides transportation agencies with the reliable data they need to make effective investments in safety improvements.

Missouri: The Missouri DOT used safety analysis to identify that more than two-thirds of severe crashes were occurring on roadways carrying 400 to 1,000 in average daily traffic (ADT), and these routes typically did not have edge line striping. They took a proactive safety approach and painted edge lines on all 7,500 miles that fell into this ADT range, and the results have shown a 15 percent decrease in total crashes.

Washington: The Washington State DOT, worked with local agencies, to use DDSA tools to significantly improve the level of service at three intersections. The previous four-way intersections were backing up cars down the off ramps onto the interstate, creating a major safety risk. The team used traffic and speed test data to customize the designs of the roundabouts and built them for 1/10 the cost with the same safety benefits as typical modern roundabouts. The level of service increased from an average rating of F to B by installing a series of compact roundabouts.

Road Diets are low-cost strategies that reconfigure a roadway cross-section to safely accommodate all users, increase mobility and access, reduce crashes, and improve a community's quality of life.

Arizona: In Tucson, AZ, the city implemented a road diet on a 2-mile segment of Park Avenue. The restriping helped reduce motor vehicle crashes from an average of 95 annually to 32, a reduction of 66 percent. Crashes involving bicyclists or pedestrians fell from an average of three annually to zero.

Virginia: As part of a scheduled repaving project, the Virginia DOT implemented a road diet on a 2-mile section of Lawyers Road in Reston, VA. A safety study revealed a 70 percent reduction in crashes. Additionally, operating speeds were reduced immediately after road diet implementation and remained at the reduced speeds 5 years later.

Washington: The city of Seattle used road diets to reduce top-end speeders and other forms of aggressive driving. On two streets, the number of motorists traveling 5- to 10-mph or more over the speed limit has decreased by 80 percent and 94 percent, respectively.

Seattle road diets led to a **94 percent decrease** in top-end speeders.

Increasing Mobility

Smarter Work Zones encourage the adoption of two efficient work zone strategies to minimize travel delays and enhance safety. Project coordination involves construction planning that minimizes the impact of work zones and generates time and cost savings. Technology applications use intelligent transportation systems to manage work zone traffic dynamically.

Michigan: The Michigan DOT initiated a culture shift with project coordination by focusing on an entire I-94 corridor through the State and adding work zone performance measures to the projects. Delays were tracked with the goal of keeping individual project delays under 10 minutes and keeping overall corridor delays under 40 minutes. The Michigan DOT used user delay costs to calculate the return on investment. A change order for night work to reduce user delays on a project, resulting in a 4:1 return on investment.

Texas: The Texas DOT deployed an end-of-queue (EOQ) warning system as part of an ongoing widening effort on I-35 through central Texas. The EOQ warning system reduced crashes by 44 percent from what they would have been had the system not been used, and the crashes that did occur were less severe due to the reduction in high-speed, rear-end collisions. The EOQ warning system reduced crash costs by $1.36 million over the 216 nighttime lane closures where it was deployed.

Michigan DOT kept project user **delays under 10 minutes** and corridor delays under 40 minutes.

Improving Quality

Three-Dimensional (3D) 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.

Michigan: The Michigan DOT and M-1 Rail completed a major downtown Detroit project using advancements in 3D modeling to drastically reduce risk, save conflict time, reduce user delays, and provide a better transportation system. Woodward Avenue has utilities from the 1890s to present, and all were mapped in a 3D model for the M-1 Rail project in a main commercial corridor. Using the 3D model reduced the time it took engineers to give direction or find a new path around an unknown utility from 3 days to under an hour. The project estimated a net savings of about $310,000, or 40 percent.

Florida: The Florida DOT completed projects using 3D models that saved time and money compared to similar projects that did not use them. Contractors reported that using 3D models increased their earthwork production rate and reduced the need to rework areas; more earthwork could be moved using the 3D model data in the same amount of time.

Florida DOT's 3D models increased earthwork production rate and improved bid quality.


Photo Credit: Hennepin County, Minnesota

Hennepin County, Minnesota, replaced bridge deck in 17 weeks instead of two construction seasons. UHPC made it more durable and resilient.

Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements (UHPC). UHPC is a steel fiber-reinforced material that improves durability and simplifies connection details, fabrication, and construction when using prefabricated bridge elements. UHPC is helping the transportation community increase the routine use of prefabricated bridge elements to accelerate bridge construction.

Minnesota: Hennepin County used UHPC connections between precast deck panels to accelerate the rehabilitation of the Franklin Avenue Bridge. Using precast panels allowed construction crews to remove and replace the entire 1,000-foot bridge deck in 17 weeks instead of over two years using traditional methods. Using UHPC for the connections simplified the construction activities and increased the durability and resilience of the completed structure.

New York: The New York State DOT replaced bridge decks on four bridges near Syracuse using precast concrete deck panels and field-cast UHPC connections. The bridge decks on the two southbound bridges were replaced within a 10-day closure. Using precast concrete deck panels with UHPC connections, the DOT eliminated the closure time that would have been necessary for forming, reinforcing steel placement, and curing associated with conventional concrete decks.

New York State DOT replaced two bridge decks in 10 days using precast concrete deck panels and field-cast UHPC connections.

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