EVERY DAY COUNTS:
The FHWA Technology Deployment Initiative
Accelerating Bridge Construction



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The Federal Highway Administration's (FHWA) Every Day Counts (EDC) initiative is designed to shorten project delivery, accelerate innovative technology deployment, and "go greener." The focus of this article is on accelerated bridge construction (ABC) using prefabricated bridge elements and systems (PBES) in support of the initiative. In the next issue of *ASPIRE*™, we will share the lessons learned from the regional EDC Innovation Summits, and case studies of states that are implementing concrete PBES in the EDC Initiative.

Everyone Counts

Essential to the success of the initiative is the engagement of our leadership, our workforce, our partners, and our stakeholders. Everyone plays an important role in EDC. A collaborative process engaging representatives from FHWA, state DOTs, local agencies, industry, academia, and other stakeholders was used to identify and select technologies for the initiative. The five technologies selected for the initial phase of deployment are: warm-mix asphalt, adaptive signal control technology, highway safety edge, geosynthetic reinforced soil, and PBES. Deployment teams were then formed for developing implementation, marketing, and training roadmaps for each of these technologies.

Training

The deployment team for PBES developed eight modules for training FHWA field personnel in preparation for a national rollout of EDC. Training topics included defining and exploring PBES, understanding details and methods of ABC, and guidelines for communicating these issues effectively. The training phase is very important as the states begin to implement EDC this year.

EDC Innovation Summits

FHWA partnered with the American Association of State Highway and Transportation Officials (AASHTO) to host 10 regional EDC Innovation Summits that were strategically located throughout the United States. These 1½-day summits were supported by a wide range of partners and stakeholders, including the Association of General Contractors of America, the American Road and Transportation Builders Association, the National Association of County Engineers, the American Public Works Association, the Local and Tribal Technical Assistance Programs, the American Council of Engineering Companies, and various state and federal resource agencies. The purpose of the summits was to roll out a proposed model that could be used by the states to implement the EDC initiative and to initiate discussions that would lead to the development of action plans by the states.

An EDC initiative forum has been created on the FHWA website to serve as a market place of ideas and opinions from people in the transportation community. Several prominent executives of the partner and supporting organizations shared their opinions in the forum. The internet address of the EDC Forum is: http://www.fhwa.dot.gov/everydaycounts/forum/whyinnov_nadeau.cfm.

Prefabricated Bridge Elements and Systems

For the EDC initiative, PBES is defined as bridge structural elements and systems that are built off the bridge alignment to accelerate on-site construction time relative to conventional practice. Conventional practice is described as nonadjacent girders that have a cast-in-place concrete deck and a cast-in-place concrete substructure.

With PBES, many time-consuming

During a 1-night closure of I-15 near American Fork, Utah, an entire span was moved 1200 ft from a fabrication staging area to its final position on the abutment and bent. In total, four spans were moved on self-propelled modular transporters with 1-day highway closures each. The longest span was 191 ft 9½ in. (For more information about the Pioneer Crossing Interchange, see the Winter 2011 issue of ASPIRE*, p. 16.) Photos: FHWA.*

construction tasks no longer need to be accomplished sequentially in the work zone. Instead, PBES are constructed concurrently off site or off alignment, and brought to the project location ready to install. Time of construction can often be reduced from months to just days. Because PBES are usually fabricated under controlled environmental conditions, weather has a smaller impact on the quality, safety, and duration of the project. Through the use of standardized bridge elements, PBES offers cost savings in both small and large projects.

The use of rapid on-site installation for PBES can reduce the environmental impact of projects in environmentally sensitive areas. Prefabricated bridge construction can help minimize traffic delays and community disruptions by reducing on-site construction time and improving quality, traffic control, and safety of workers and the traveling public. Using PBES means that time-consuming formwork construction, concrete placement and curing, and other tasks associated with fabrication can be done off site in a controlled environment without affecting traffic.

The Role of Concrete in EDC

Many of today's bridge construction and replacement projects take place in areas of heavy traffic, where detours and bridge closures severely impact the flow of people and goods on transportation corridors. One of the most common ways to accelerate bridge construction is prefabrication. Frequently, PBES are constructed with concrete: conventionally reinforced, pretensioned, or post-tensioned (or a combination of these), for superstructures as well as substructure members.

Contractors can avoid harsh weather conditions through prefabrication in protected environments; thereby improving the quality of the finished concrete products. In line with these methods, the implementation of PBES to accelerate bridge projects is tailor-made to continue the national implementation of high-performance concrete that state DOTs have been aggressively pursuing.

Depending on the size and scope of the project, unique placement techniques can be deployed to accelerate bridge projects. These include self-propelled modular transporters, longitudinal launching, and transverse sliding or skidding into place for long-span structures. For shorter span structures that make up the majority of the national bridge inventory, conventional equipment will often prove to be most effective.

Closing Remarks

FHWA's EDC initiative emphasizes an improved driving experience for the American public, through rapid deployment of several proven technologies and solutions to speed up project delivery with minimal disruption to traffic. PBES will continue to demonstrate that bridges can be built better, faster, and more safely.

To learn more about the FHWA's EDC initiative, please contact any of the FHWA Division Offices using http://www.fhwa.dot.gov/field.html.

Route 103 over the York River in Maine employs the Northeast Extreme Tee (NEXT) Beam, developed by the Northeast Chapter of PCI to accommodate accelerated construction of bridges in the region. (Additional information on the NEXT beam and York River Bridge can be found on page 46 in this issue.) Photo: Dailey Precast LLC.

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Two spans for the Pioneer Crossing Interchange project in Utah are seen in the fabrication staging area before their move on self-propelled modular transporters to one of two bridges over I-15. Photo: Kiewit/Clyde, a joint venture.