

UTC Project Information	
Project Title	MPC-395 – Accelerated Bridge Construction in South Dakota: Pilot Study for Implementation Strategy
University	South Dakota State University
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Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08
Project Cost	\$55,000
Start and End Dates	2012 –2013
Project Duration	12 Months
Brief Description of Research Project	<p>Accelerated bridge construction (ABC) is a construction philosophy that seeks to minimize traffic interruption through reduced construction time, primarily through the use of prefabricated elements. The concept is gaining the momentum to become a recommended practice for bridge work on existing routes especially for bridges on heavily travelled corridors. Several research and implementation initiatives have been set in action around the U.S. including multiple projects in Utah [1,2], Washington [3-6], California [7], etc. An ABC research center has been established recently at Florida International University [8]. All these demonstrative projects on critical bridge sites had been very successful in minimizing traffic interruption to a level that is not possible with traditional construction methods (e.g. removal and replacement of a major bridge in a week [1]). A number of ABC applications are documented in Connection Details for Prefabricated Elements and Systems [9], published by FHWA in 2009. A summary of current ABC applications and experiences was presented in an “ABC Manual” [10] published recently by FHWA. The ABC methodology is quite general and can also be applied to relatively small scale projects and very typical high way bridge systems, as it was demonstrated in an Iowa</p>

	<p>DOT project (bridge over Keg Creek near Council Bluffs, Iowa) as part of The second Strategic Highway Research Program (SHRP 2). In order to achieve the time savings, implementation of ABC will involve pre-manufacture of modular bridge components [11] and need additional resources and special planning considerations during construction (such as special equipment [12, 13] and site management plan). These requirements tend to drive up the cost of the project when compared to traditional construction. Thus ABC is most beneficial when the potential traffic volume affected by the project is high. It is hypothesized in this study that given the project condition and current viable ABC techniques, there exist a threshold traffic volume and composition that must be exceeded in order to reap benefit from ABC implementation. This threshold value will depend on the nature of the traffic, significance of the road corridors, and the availability of immediate detour options. For most areas in South Dakota, it is very likely that this threshold traffic will not be exceeded. Thus the implementation of ABC in South Dakota must be planned carefully to ensure cost efficiency. Currently there have been guidelines used by other DOT's to assess the necessity of ABC (e.g. ABC rating system used by Utah DOT). But the effectiveness of these procedures has not been fully investigated. A quantitative approach to support decision making on ABC implementation in South Dakota has not been developed.</p> <p>Research Objectives:</p> <ol style="list-style-type: none"> 1. Identify a quantified benefit indicator to represent ABC implementation cost-benefit ratio considering project constraints such as traffic volume and site condition. 2. Develop a procedure that can be followed to evaluate ABC implementation benefit indicator for candidate bridges on the South Dakota highway system. 3. Using the proposed procedure to develop recommendations for representative sites (identified by SD Dot) in South Dakota for ABC implementation.
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>Development of a catalog of ABC techniques to inform the user of what has been used in the past and how each technique was implemented into the construction of a bridge project. The evaluation tool developed in this study laid out the framework for a simplified assessment for ABC applicability in South Dakota.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>This study provided a systematic way to evaluate the impact of ABC on projects and provided a basis for decision making regarding adoption of ABC.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<p>http://www.ugpti.org/resources/reports/details.php?id=886</p>