



## How to implement ABC

### Helping bridge owners overcome major barriers to adoption

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Although the federal government strongly promotes use of accelerated bridge construction as a core technology and provides incentives for its use, many transportation agencies face implementation challenges that may be holding back more widespread adoption of ABC. This white paper offers insights and solutions to ABC's biggest barriers, based on industry best practices, and puts owners on a proven path to successful implementation.

In this white paper:

- Realize higher, initial costs will decline with use
- Owner commitment jump-starts the local industry
- A pipeline of projects and prescriptive contracts incentivize contractors
- Proven six-step process gives owners confidence to proceed

## Most states do not have ABC programs

Given its ability to minimize mobility impacts, reduce traffic delays and often build bridges faster, it's difficult to understand why so many states have not yet embraced accelerated bridge construction as a permanent bridge replacement tool. The fact is every transportation agency wants to build bridges faster, but to fully implement ABC, bridge owners must overcome several barriers:

### 1. Realize ABC's higher, delta cost will decline with use

When a bridge owner implements ABC initially, the cost difference of using ABC versus conventional methods can be 20 percent higher. Why? Much of it has to do with risks perceived by the local contractor and the owner.

Local contractors must procure new technology and heavy machinery (e.g., cranes, self-propelled modular transporters) and then invest in workforce training. But, contractors won't be willing to make a significant capital investment if owners have not indicated their commitment to ABC. Contractors need to see a commitment to ABC on the part of owners, as evidenced by a program of ABC projects that stretches into the future. One-off showcases of ABC are not adequate to generate the level of interest needed from the industry to embrace ABC.

Bridge owners haven't implemented ABC because they risk spending more to deliver fewer projects. Transit agencies, toll authorities and departments of transportation are trying to replace as many bridges as they can with limited funding. That means every extra dollar they invested in an ABC project takes a dollar away from another worthwhile bridge project. (Federal funds do not reimburse owners for the delta costs associated with ABC.)

Based on construction costs alone, it is difficult for ABC projects to compete with traditionally delivered bridge projects. Therein lies part of the problem. Construction cost shouldn't be the deciding factor. ABC requires owners consider the total cost of the project, which includes construction costs as well as:

- The cost of delays and detours to users and the local economy
- Savings in contractor overhead from schedule reductions
- Savings in administrative costs associated with shorter time frames
- Increased motorist safety as they are not driving in a construction zone
- Increased construction crew safety as they are not working in active traffic

Considering all those factors under a total project cost analysis that factors in direct and indirect costs, the bridge owner can more easily justify using ABC in a busy urban area - and even in some rural areas, where lengthy bridge closures and long detours could create undue hardship to surrounding communities. Because the goal of ABC is to reduce schedule and minimize traffic impacts during construction, it stands to reason that cost comparisons between ABC and conventional options should consider total project costs, including savings from the shortened schedule.

Knowing ABC's initial costs will decline with repetitive use also can ease owner concerns. Utah has proven this. A leader in ABC implementation, the state first used the rapid bridge replacement method in preparation for the 2002 Winter Olympics in Salt Lake City. Since then, ABC has become standard practice and with sufficient repetition, precast components have become more economical and their construction more efficient.

In Vermont, programmatic implementation of ABC may have even saved the state money. The state standardized many ABC details and precast sections and applied them to several similar-type bridges, leading to significant cost reductions over conventional construction.

Being able to justify ABC's higher cost and knowing those costs will decline with increased use helps owners build a case for implementation.

### 2. Owner commitment jump-starts the local industry

Some bridge owners have an open-door policy to ABC. They maintain if ABC is the best option for a site, the industry will propose it automatically. Unfortunately, successful implementation doesn't work that way. If ABC is to be implemented in a state, the bridge owner must take the first step and communicate its intent to add ABC as an alternate method of bridge replacement - one that will continue to play an important role in the bridge program.

### 3. A pipeline of projects and prescriptive contracts incentivize contractors

When a bridge owner demonstrates its long-term commitment to ABC by creating a pipeline of projects that extend into the future, the contractor will be more inclined to make the substantial capital investment ABC requires.

Having a program of ABC candidate projects doesn't mean every candidate will be delivered by ABC, but it does mean the owner will look at ABC as an option, compare it with conventional methods and decide which approach best meets the needs of each project.

In the initial implementation, most local contractors prefer bridge owners to be prescriptive, specifying exactly how they want the first few ABC projects built. This, too, reduces contractor risk. Later, after the local industry has had the opportunity to see ABC projects implemented and has grown familiar with the technology, contract language can be less scripted.

#### **4. A proven path to implementation gives owners confidence to proceed**

Some bridge owners are willing to commit to ABC, they just don't know where to start. HNTB recommends following a six-step process based on our experiences working with leaders in ABC implementation. Condensed for purposes of this white paper, these six steps will help take bridge owners from exploration to successful statewide ABC execution:

**Step 1 - Gather industry intelligence.** Owners can save their agencies time and money by investigating the methods and best practices of states, such as Utah, Massachusetts, Pennsylvania, New York, Vermont and Texas, that have successful ABC initiatives.

Based on industry research, the bridge owner then develops ABC policies and procedures that are A) applicable to its own bridge inventory and B) are suitable for inclusion in the bridge design manual. Policies, procedures, design details and standards must be established, so the consultants who design the ABC projects will have a document to guide them.

**Step 2 - Set criteria.** The bridge owner develops a decision tool, such as a flow diagram, decision matrix or well-defined program guidelines, that will help determine if ABC is a good fit for a specific project.

**Step 3 - Fill the pipeline.** The bridge owner creates a statewide ABC program by reviewing its five-year bridge program and identifying a list of potential ABC projects that meet the design criteria in step 2.

**Step 4 - Communicate commitment.** The owner hosts demonstration projects to showcase ABC design and construction technologies. After each project, the owner incorporates lessons learned into ABC policies, procedures and guideline drawings. Owners also may want to invite local consultants to ABC workshops and project showcases associated with demonstration projects.

**Step 5 - Implement statewide.** The owner conducts training sessions for local consultants, provides ongoing technical assistance on ABC during initial implementation, continually improves ABC standards, tracks project costs to reduce delta costs and creates performance metrics.

**Step 6 - Publicize successes.** When ABC projects are delivered without significant disruption to local traffic and daily lives, the owner needs to publicize that success through social media announcements, news media coverage, press releases and other communication channels.

#### **ABC implementation can lead to increased credibility and funding**

Owners who develop robust ABC programs often enjoy greater support from their communities, their state legislatures and even Congress. After seeing the benefits of ABC, elected officials may be more inclined to allocate and increase funding if some of those dollars can be used to minimize user costs and deliver bridges faster. But to realize those benefits, owners must take the first step and lead the local industry.

#### **Additional resources:**

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***SHRP2 Renewal Project RO4; Innovative Bridge Designs for Rapid Renewal, ABC Toolkit***, Publication S2-RO4-RR-2; Transportation Research Board of The National Academies, Washington, D.C., 2013

***SHRP2 Renewal Project RO4; Innovative Bridge Designs for Rapid Renewal, Final Report***, Prepared for the Transportation Research Board of The National Academies, Washington, D.C., 2012

**2017 ABC Conference, University Transportation Center, Florida International University**  
<https://abc-utc.fiu.edu/conference>

**Federal Highway Administration's Every Day Counts program**  
<https://www.fhwa.dot.gov/innovation/everydaycounts/about-edc.cfm>

**HNTB's *Solve* publication, Issue 4, "Accelerated Bridge Construction: Speeding the replacement of workhorse bridges to minimize traffic disruption and user costs," 2015**  
Available upon request

**HNTB's ABC press kit:**  
<http://www.hntb.com/Newsroom/Media-Kits/Accelerated-Bridge-Construction>

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