Accelerated Bridge Construction

Research, Design and Practice

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UDOT Director of Research
**Why Use ABC?**

- **Significant advantages**
  - Reduced on-site construction time
  - Minimized traffic disruption – *months to days*
  - Reduced environmental impact
  - Improved work zone & worker safety
  - Provides positive cost-benefit ratios when user costs are considered
  - Improved product quality – *controlled environment, cure times, easier access, etc.*
Presentation Outline

- Research
  - Accelerated Bridge Construction (ABC) initial efforts
- Design
  - Program implementation
- Practice
  - Projects
Research Outline

- Perform scanning tours
- Conduct pilot project
- Identify a program of projects
- Get involved nationally
Research Scanning Tours

- Market internally and externally
- Conduct workshops
- Engage industry
- Obtain senior leadership involvement
- Promote marketing and media plan
- Develop messaging
- Prepare visual animation
- Evaluate project risks
- Define scope, schedule and budget
- Identify procurement method
Research Messaging

SAM WHITE BRIDGE
I-15 CORE | A UDOT PROJECT

354 Feet Long | Two Spans | One Big Night

INNOVATE 80
Research
Visual Animation
Research

Program of Projects

- Prescriptive projects – gain experience
  - Design-Bid-Build
  - Construction Manager General Contractor (CMGC)
- Performance projects – innovations led by contractor
  - Design-Build
Research
Get Involved Nationally

- Coordinate with FHWA
- Participate in AASHTO Subcommittees
- Host showcase projects
- Share lessons learned and best practices
Design

Outline

- Educate and communicate with industry
- Evaluate projects
- Implement standardization
- Improve based on lessons learned
Design

Educate and Communicate With Industry

- ABC goals
  - Reduce traffic congestion during construction
  - Improve worker and traveler safety
  - Improve quality
Design
Evaluate Projects

- Scope
- Schedule
- Budget
- Quality
- Risk
- Communications
- Procurement
Design

Evaluate Projects

Total Project Cost

Total Project Cost = Construction + User Costs

Lowest Project Cost

Lowest Construction Cost
Design

Evaluate Projects

- ABC
- CMGC/CM at Risk
- Design-Build
- P+T
- Total Closure
- Lane Rental
Design

Implement Standardization

- Develop guidelines for ABC project inclusion
- Develop typical details and manuals
- Include user costs in analysis
- Encourage innovation
- Provide training and obtain feedback
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<thead>
<tr>
<th>Rating Procedure</th>
<th>Value</th>
<th>Description</th>
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<td><strong>Enter values for each aspect of the project. Attach applicable supporting data.</strong></td>
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<td><strong>Average Daily Traffic</strong></td>
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<td>3</td>
<td>10000 to 15000</td>
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<tr>
<td></td>
<td>4</td>
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<td>Multiple mainline railroad tracks</td>
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Design
Implement Standardization
Design
Implement Standardization

- ABC Manual and Standard Drawings
Design
Lessons Learned

- Perform program review
- Find program deficiencies
- Repair deficiencies
- Review design decisions
- Measure design assumptions vs. reality
- Innovative elements and methods
- Timeline and history
- Project highlights
- Upcoming projects
- Program evaluation
Practice

Innovative Elements and Methods

Innovative Accelerated Bridge Construction

- Precast Concrete Elements
- Modular Construction
- Structure Placement Methods
- Accelerated Geotech Work
Practice

Innovative Elements and Methods

Precast Concrete Elements; I-80; Wanship Bridge
Practice

Innovative Elements and Methods

Modular Construction; I-215 over 3670 South
Practice

Innovative Elements and Methods

Structure Placement Methods
Practice

Innovative Elements and Methods

Accelerated Geotechnical; Geofoam Embankment
## Practice
### Timeline and History

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Practice
Timeline and History

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<td>Heavy Lift Cranes</td>
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<td>Precast Bent Caps</td>
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<td>Prefabricated Pedestrian Bridge</td>
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<td>Precast Box Culvert</td>
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Practice
Project Highlights

800 North over I-15; Precast Deck Panels; CMGC
Practice
Project Highlights

Riverdale Road over I-84; Lego Bridge; CMGC
Practice

Project Highlights

4500 South over I-215; SPMT; CMGC
Project Highlights

I-80; State Street to 1300 East; SPMT; CMGC
Practice
Project Highlights

I-70; Eagle Canyon Bridge; Precast Deck Panels; CMGC
SR-66 Over Weber River; Slide-in; Design-Bid-Build
Practice
Project Highlights

I-80; Two Bridges Near Echo Junction; Slide-in; Design-Build
South Layton Interchange; Launch; Design-Build
Practice
Project Highlights

U.S. 89 over I-15; SPMT; Design-Build
Practice
Project Highlights

I-15 CORE Proctor Lane over I-15; SPMT; Design-Build
I-15 CORE Sam White Lane over I-15; SPMT; Design-Build
SPMT bridge move
  – I-15 CORE Provo Center Street; April 7

Slide-in
  – I-80 over Weber River; Spring 2011
  – I-80 at Atkinson; Summer 2011
  – I-80 at Summit Park; Summer 2011

Prefabricated bridge elements
  – SR-193 over UPRR and UTA; Spring 2012
Program Evaluation

Utah ABC Costs; SPMT

Valued Added (includes user cost savings)

- I-215; 4500 South
- I-80; State St. to 1300 East
- I-80; Mt. Delle to Lambs Canyon
- 3300 South over I-215
- I-15; Widening, 500 North to I-215
- Pioneer Crossing
Program Evaluation

ABC Because...

- Value added to the public
- Societal costs minimized
- Public support for innovation
- Political capital