

SHPR2 Solutions: Innovative Bridge Designs for Rapid Renewal
Sacramento, CA Peer-to-Peer Exchange Workshop May 19, 2015

California State Report

Accelerated Bridge Construction



Dorie Mellon, PE
ABC Team Chair
Structure Policy & Innovation
Division of Engineering Services
California Department of Transportation



California Department of Transportation

State wide

- 50,000 miles of freeway lanes
- 24,000 state and local bridges
- 6700 Civil Engineers

2014 Construction Statistics

- \$158 M on 30 bridges and 4 bridge widenings
- 13 of the structures used precast girders



ABC in California



Emergency Projects



Site Condition Constraints



Programmed Projects



CALTRANS ACCELERATED
BRIDGE CONSTRUCTION

Paramount Blvd OC Emergency Replacement



CALTRANS ACCELERATED
BRIDGE CONSTRUCTION

Paramount Blvd OC Emergency Replacement



- 2-span replacement structure
- PC/PS Bulb T Girders
- Steel Deck Forms
- A+B Contract
- Incentive/Disincentive

Contractor on site March 2, 2012
Open to traffic May 21, 2012



San Mateo-Hayward Bridge Widening (2002)

- Up to 270 feet of structure completed per week
- 5.15 mile long portion of south bay crossing
- PC Hollow Piles
- PC Cap Tubs
- PC Girders
- PC Deck Forms



CALTRANS ACCELERATED
BRIDGE CONSTRUCTION

Slide In



***YBI Detour Roll-out/Roll-in
Labor Day Weekend 2009***

**San Francisco Oakland Bay Bridge Yerba Buena Island Viaduct
4 Day Closure to Traffic**

**Hardscrabble Creek
Bridge 2008
8 Hour Closure to Traffic**



SPMT's



East Yard Overhead Bridge Move 2014

Programmed ABC Projects

- The transportation landscape has changed
 - Aging infrastructure
 - Population growth
 - Congestion
 - Increasing environmental constraints
 - Safety considerations
- Incorporate ABC as a progressive project delivery tool.
 - Safety
 - Reducing congestion
 - Delivery on project commitments
 - Being good stewards of the environment



ABC Policy

- ABC Team Charter 2012
 - Effectively mainstream ABC in bridge design and construction.
 - Formation of ABC Team and Council
- ABC Strategic Plan 2013
 - Support Caltrans Mission through ABC
 - CT and Industry Buy-In
 - Planning
 - Deploy Research
 - Develop Guidance

CT and Industry Buy-In

- Build widespread acceptance for ABC
 - Top Management
 - Project Development Staff
 - Funding Partners
 - Stakeholders
 - Contracting Community
 - Public



- Leverage on FHWA/Every Day Counts efforts
- Point to successes outside of California

Planning

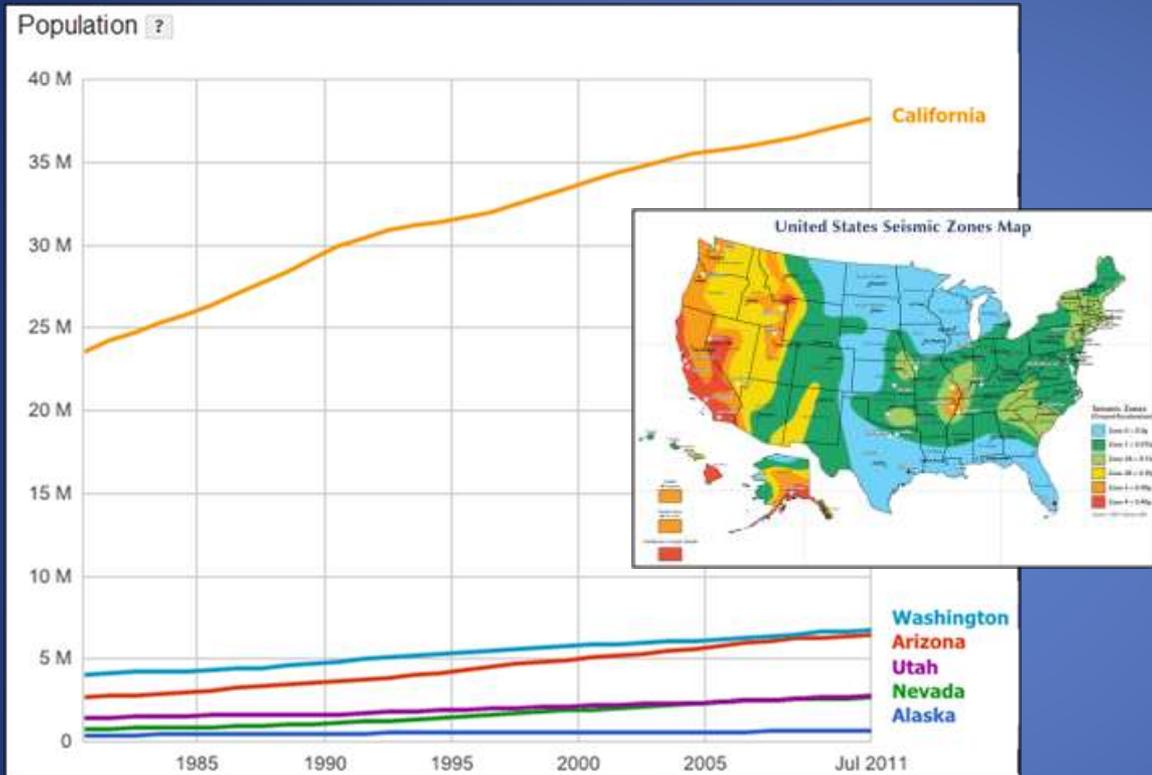
ABC Decision Making Guidance (March 2015)

- Qualitative assessment early in project planning
 - Construction Time
 - Environmental
 - User Costs and Delays
 - Site Conditions
 - Risk Management
 - Economy of Scale
- ABC evaluated for every project
- High score results in the development of an advance planning study ABC alternative
- Working Day estimates for traffic and environmental impacts.



The image shows a sample of the ABC Design Impact Questionnaire. The form is titled "ABC DESIGN IMPACT QUESTIONNAIRE" and is organized into a grid. The columns are labeled "Item", "Phase", "Rating", and "Score". The "Phase" column is further divided into "Pre-Design", "Design", and "Construction". The "Rating" column is divided into "1 = None", "2 = Low", and "3 = High". The "Score" column is labeled "Score". The rows are organized into sections: "Construction", "Design", and "Pre-Design". Each section contains several rows of questions related to project planning, design, and construction. The form is a detailed tool for assessing the impact of a project at different stages.

Deploy Research



In California the focus is on seismic performance of joints connecting prefabricated elements.

Develop Guidance

- Efficient and effective practices
- Coordinate implementation
- Reduce risk of innovative approach
- Focus on constructability
 - Design details
 - Design and Construction guidance

ABC Single Span

Significantly reduced environmental impact

Minimal traffic disruption

Well suited to streambed restoration



Hardscrabble Creek
Slide-In



Craig Creek
Prefabricated



North Fort Mill Creek
Prefabricated

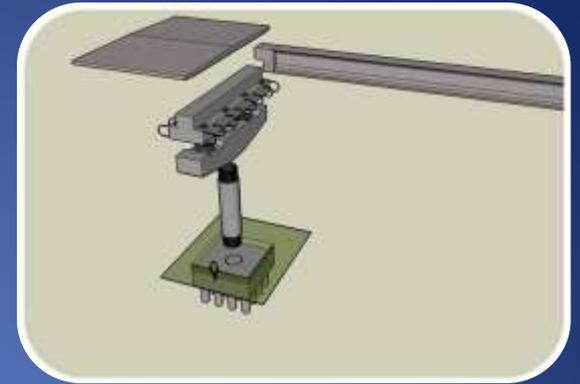
Fort Goff Creek Bridge

Lead Adopter for SHRP2 Solutions

Innovative Bridge Designs for Rapid Renewal



Multi-Span ABC



- Multi-span ABC Pilot Program
 - 3 projects currently under design
 - Precast columns, caps, and superstructure
 - Incorporating EDC 2 and EDC 3 initiatives
 - Focus on connections & constructability
- Design, detailing and specification development
- Design and construction guidance

What's working

- Outreach to decision makers
- Citing ABC Successes in other states
- Partnering with federal agencies (FHWA, SHRP2)
- Deploying research
- Early Planning
- Single span projects
 - One season solutions
 - Fish passage

Challenges

- Size of our organization
- Cast-In-Place Culture (internal and external)
- Funding - looking past comparative bridge construction costs
- Precast Industry
- Accurate Cost Data (capital, support, and user)

Thank you