

Caltrans Accelerated Bridge Construction

Caltrans / PCMAC Workshop
November 17, 2011

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Caltrans - Accelerated Bridge Construction (ABC)

Overview

- Why ABC?
- ABC Applications
- Research
- Planning Phase Decision Making Tool - Overview
- Action Plan - What's Next For Caltrans and ABC?
- ABC On-Line



Why are we interested in ABC?

FHWA has been actively promoting Prefabricated Bridge Elements and Systems (PBES) and the advantages of Accelerated Bridge Construction (ABC) as part of the “Every Day Counts” Innovation Initiative.

Proven PBES/ABC benefits include:

- Reduced disruption to the public
- Improved work zone safety
- Reduced on site environmental impacts
- Expedited capital improvements
- Stimulate & improve the State’s economy



I-580 Connector Span Replace



Use of Precast Concrete Bentcap and Steel Girders
Construction Complete in 20 Days



I-5 Truck Route UC- Repair (Precast Girders)



Big rigs crash in Los Angeles County - Photo 1 of 7

Trucks burn early Saturday, October 13, at a tunnel on Interstate 5 in north Los Angeles County, California. Dozen big rigs crashed the night before. AP Photo



15 Precast Girders Erected, Steel Deck Forms and
Cast-In-Place Deck all Completed in 3 Days!



I-40 Mustang Wash Bridges



Use of Single Span Precast Bulb T Girders and Precast Abutments Expedited the Bridge Construction



District 2 – Craig Creek Bridge, Route 99 (Precast Abutments and Box Beams)

CF **Con-Fab California Corporation**

DAILY QUALITY CONTROL REPORT #4

JOB NAME: **Craig Creek Bridge**
CALTRANS NUMBER: **02-2C1104**
CONTRACT BID ITEM NUMBER: **56**
CONTRACT BID ITEM CODE:
CONTRACTOR: **Blaisdell Construction**
PRODUCT: **Precast Wingwall**



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Sent: **February 9, 2011**

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SFOBB Yerba Buena Island Viaduct (Superstructure Roll-In)



Demolition of Existing Bridge Superstructure and Roll-In New Superstructure
Completed and Open to Traffic in 4 Days



District 1 - Hardscrabble Creek Bridge, Route 199



On-Going ABC Research

- Seismic Performance of Precast Column to Foundation Connections for Accelerated Bridge Construction
- Rapid Construction of Bridge Piers with Concrete Filled Tubes
- Seismic Performance of an I-Girder to Inverted-Tee Bent Cap Connection
- Girder-to-Cap Connection Details
- Decision Making and Economic Modeling Tool
"Just Completed !!!"



Planning Phase Decision-Making Tool

- Joint Venture - Pool Funded Study by FHWA, and numerous State DOT's
- Tool available in October

State	Members and Titles
Oregon	Benjamin Tang, P.E., Br Preservation Manager
	Steve Soltesz, Research Coordinator
	Dawn Mach, Bridge Fin. Analyst
	Holly Winston, Sr. Local Bridge Standards Engineer
FHWA	Mary F. Huie, Highways for LIFE, Program Coordinator
	Tim Rogers, P.E., Division Bridge Engineer
	Nat Coley, Asset Manager
California	Paul Chung, Sr. Bridge Engineer
Iowa	Ahmad Abu-Hawash, Chief Structural Engineer
Minnesota	Kevin Western, Bridge Design Engineer
Montana	David Johnson, Bridge design Engineer
Texas	Courtney Holle, Transportation Engineer
Utah	Daniel Hsiao, P.E., S.E., Sr. Project Manager
Washington	Bijan Khaleghi, Design Engineer
	DeWayne Wilson, Bridge Management Engineer

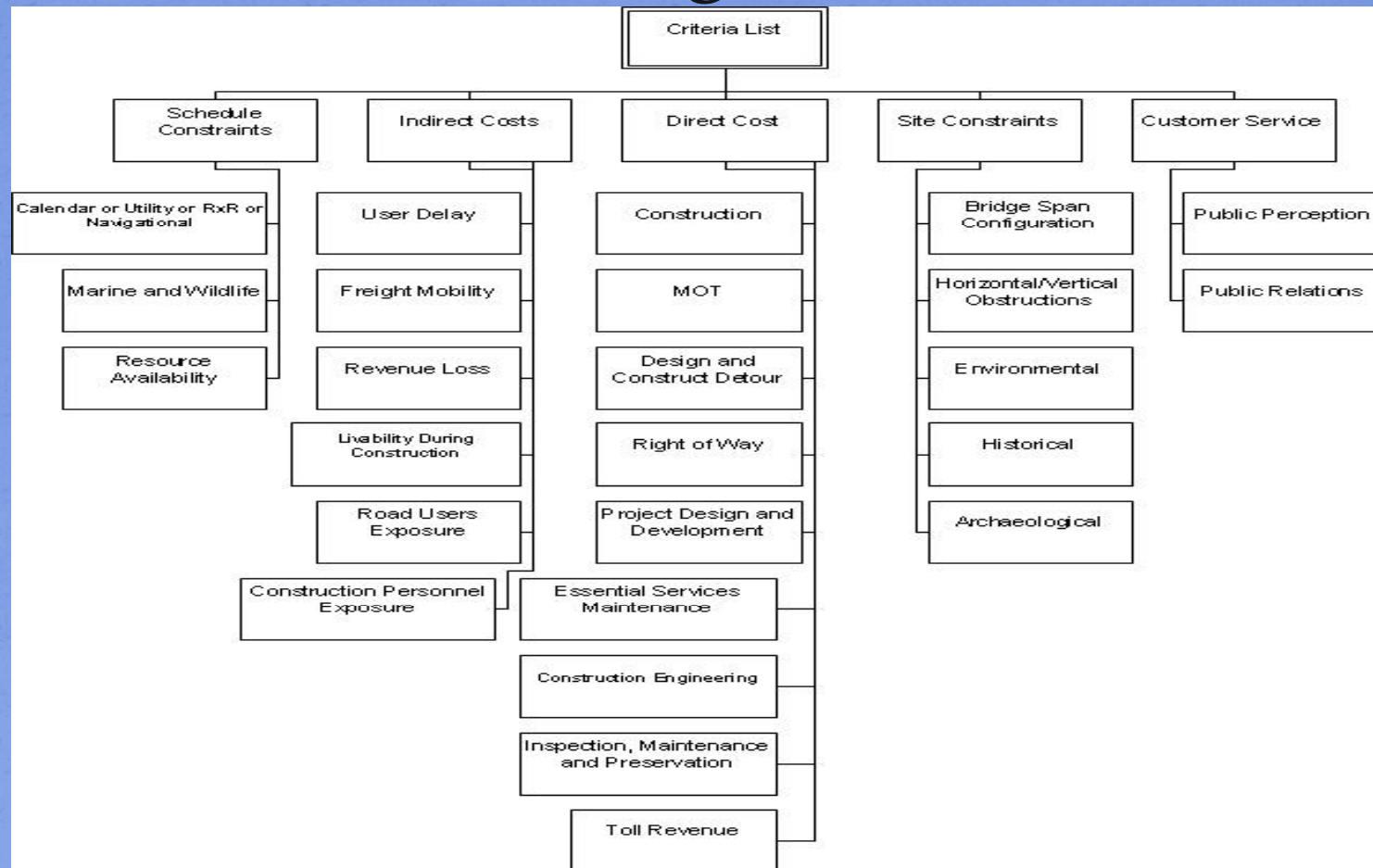


Planning Phase Decision-Making Tool

- Determines which construction approach (ABC vs. conventional construction) is appropriate for a specific bridge site.
- Provides a tool to help analyze different bridge alternatives and multi-criteria simultaneously using a Analytical Hierarchy Process (AHP) and pair-wise decisions.
- AHP analysis allows decision makers to insert or eliminate levels and elements as necessary to sharpen the focus on one or more parts of the analysis. Less important criteria and sub-criteria can be dropped from further consideration (see next slide).



Criteria Organization

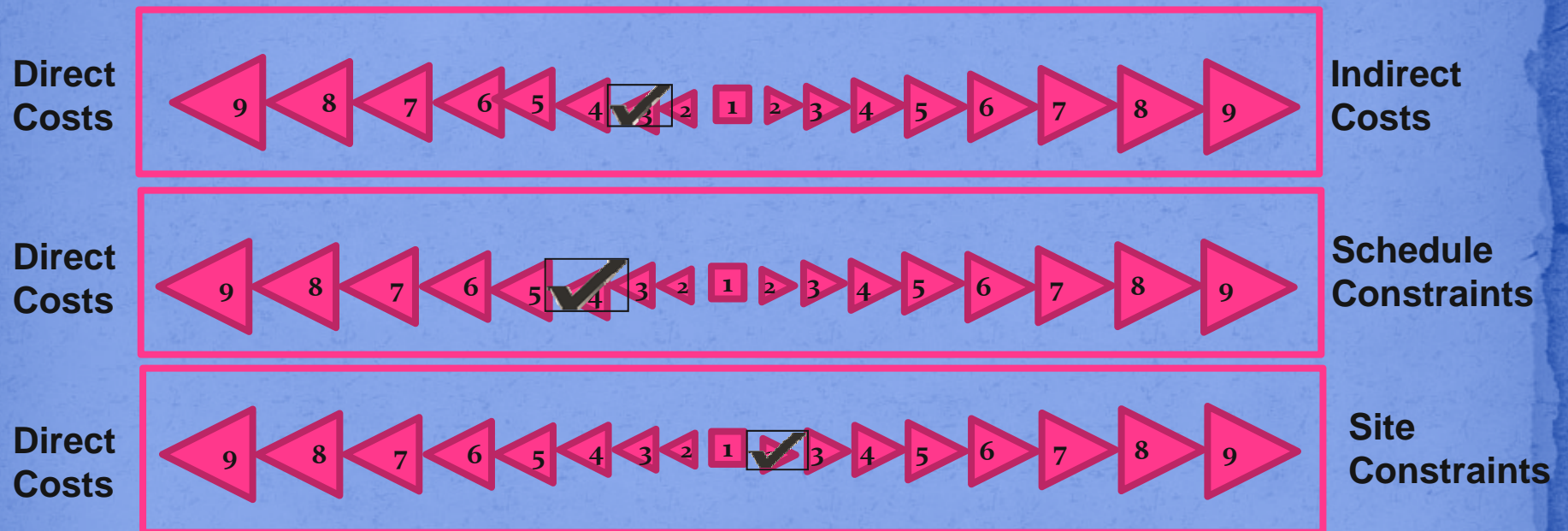


- The hierarchy organizes the decision-making process.
- A decision maker can insert or eliminate levels and elements as necessary to sharpen the focus.

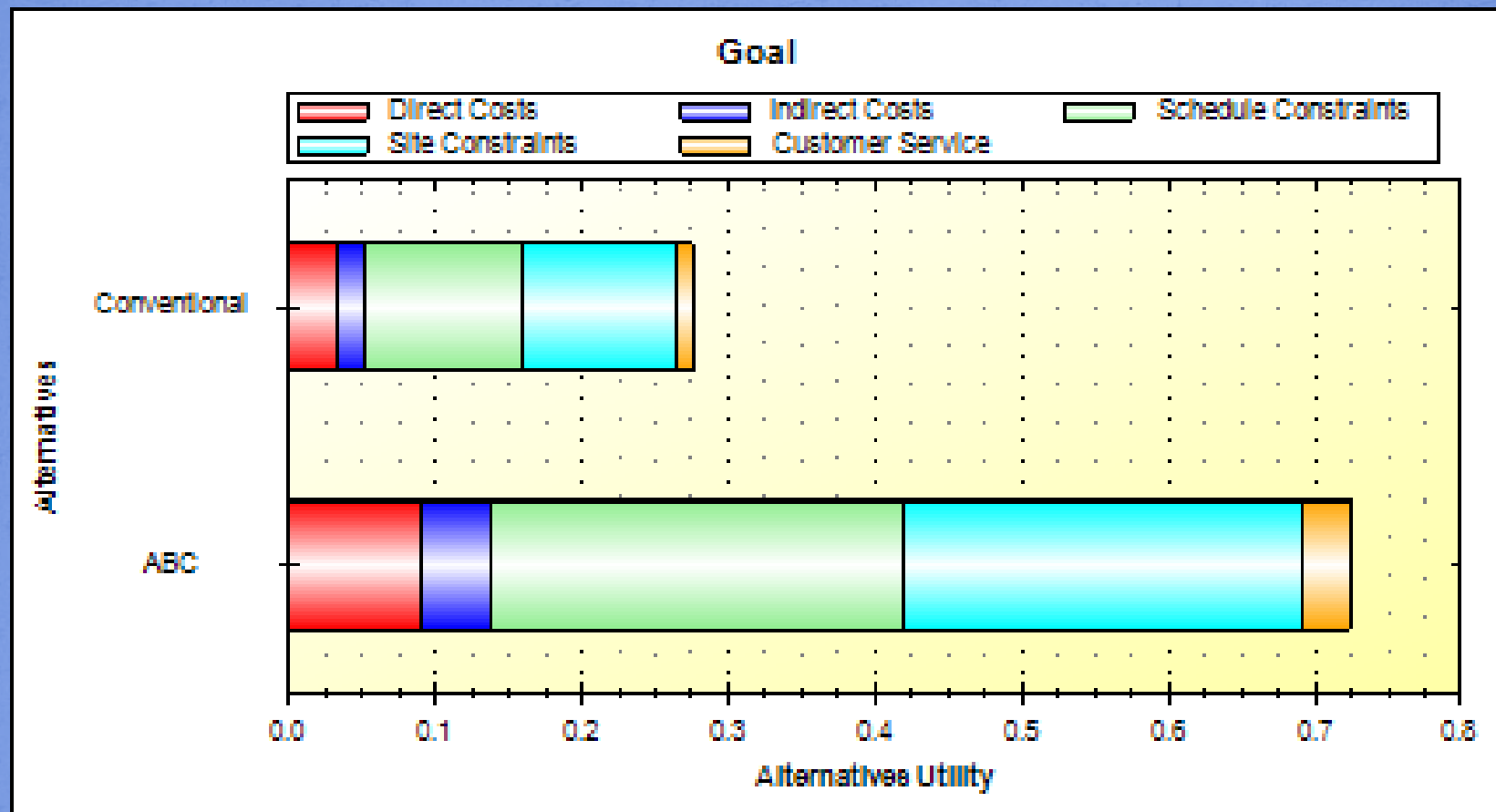


AHP Analysis Details

- Comparisons between criteria and between sub-criteria.



ABC Versus Conventional Output



Action Plan

What is Next for Caltrans and ABC?

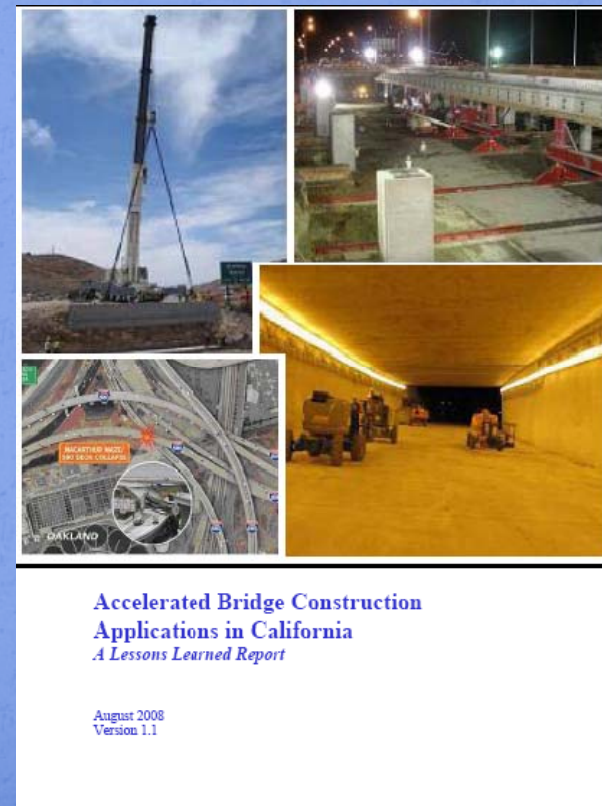
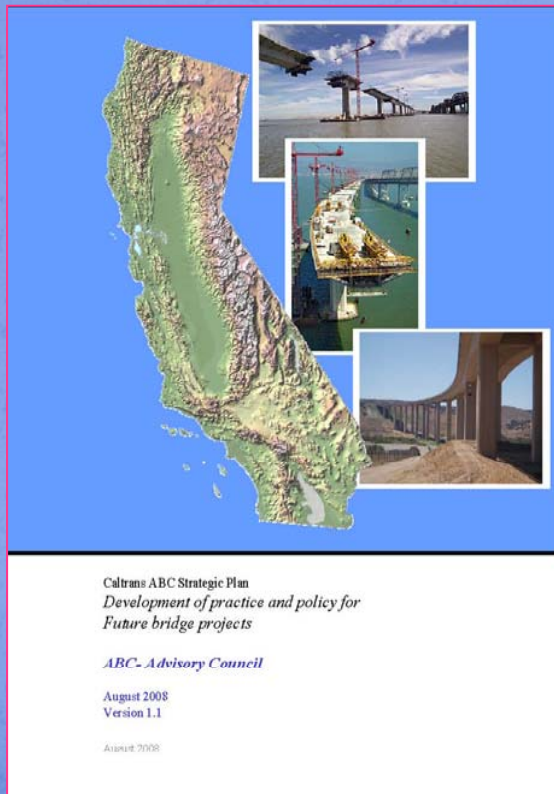
Fall 2011

- ABC Presentation to DES Structure Policy Board.
- ABC Presentation to Chief Engineer and Project Delivery Division Chiefs.
- ABC Presentation to the DMB, PMB and CMB.
- ABC Presentation to PDAC.
- Establish ABC Team
 - Sponsors: Division Chiefs of DES, PM, Const & Design
 - Team Members: DES, PM, Const, Design, Planning, Maintenance
- ABC Team responsible for:
 - Develop Department's ABC policy
 - Implementation Plan
 - Oversight of key ABC research projects to validate seismic performance
 - Development of ABC technical standards and guidance
 - ABC Training and education for the Project Development Team



ABC On-Line

- 2007 FHWA Seismic ABC Workshop Report
- Caltrans ABC Strategic Plan
- ABC Lessons Learned Report- CA Applications
- http://onramp.dot.ca.gov/hq/esc/sd/bridge_design/sac/accel_bridge_construction/index.htm



QUESTIONS?

