



SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP2 Implementation Update for the Subcommittee on Bridge Structures

Barton Newton
California State Bridge Engineer
Caltrans

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U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO
The Voice of Transportation

TRB

What we will cover

- Update on SHRP2 Implementation Assistance Program
- SHRP2 bridge products
- Fort Goff bridge design

SHRP2 Moving Forward

Implementation Assistance Program

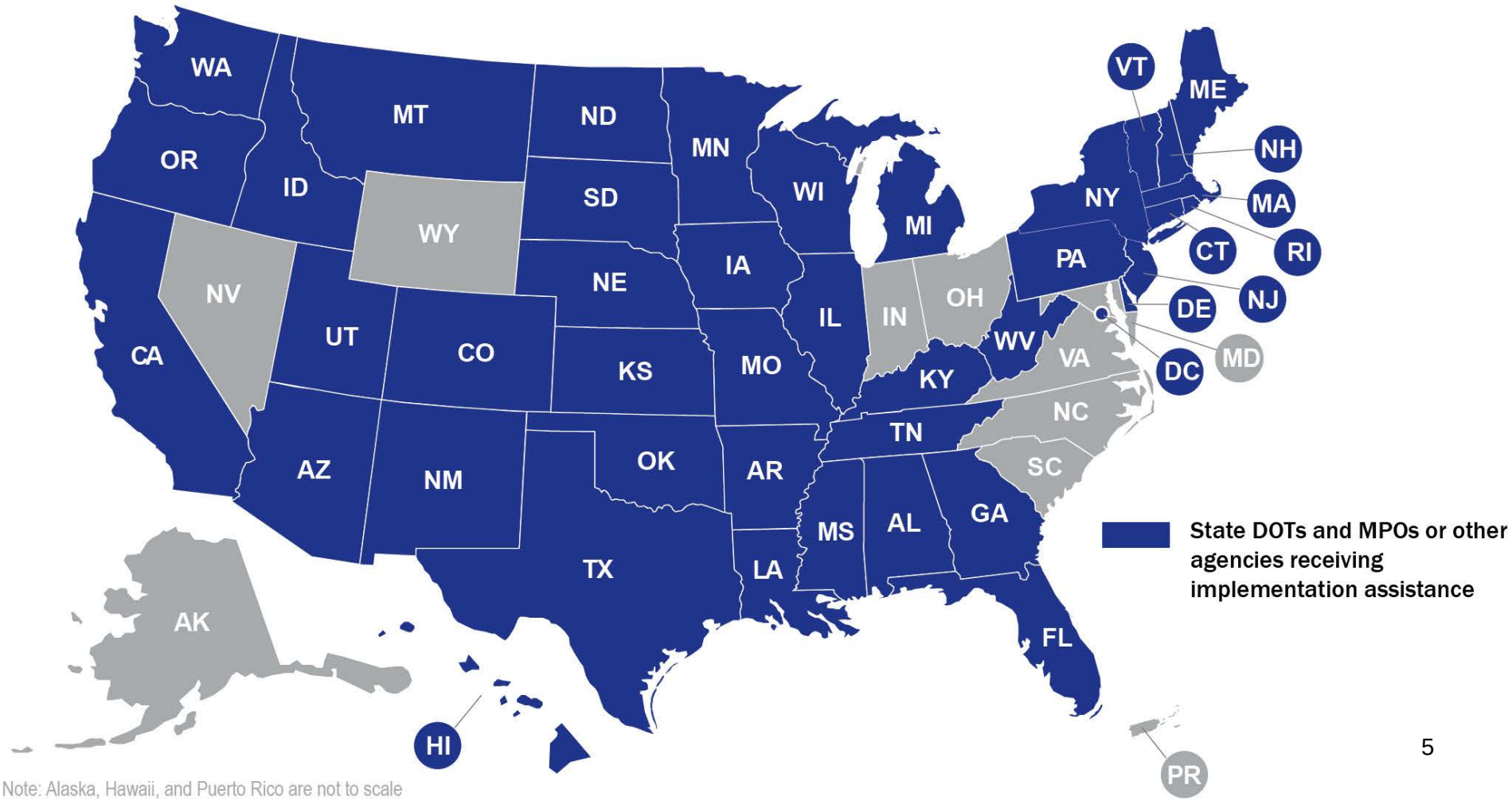
Renewal Area Update

Renewal in the IAP

- 41 states engaged
- Implementing 10 Renewal products
  - First round - **4 renewal products**
  - Second round - **3 renewal products**
  - Third round - **4 renewal products**
- More than 115 renewal projects are in process

Renewal Focus Area

Transportation Agencies Begin Implementing SHRP2 Rounds 1,2, and 3 Products – FHWA/AASHTO Implementation Assistance Program



Note: Alaska, Hawaii, and Puerto Rico are not to scale

Innovative Bridge Designs

Activities:

- Seven states (including the Gila River Indian Community) receiving IAP funds
- Teleconferences held and information collected for each project
- Showcases scheduled in Missouri and Arizona with two others in planning
- Four peer exchanges planned for 2015
- PBES workshop at 2015 TRB meeting

Innovative Bridge Designs

Rhode Island – East Providence – Interstate On-Ramp

- Project Details: Current bridge in need of replacement; closure must be less than 30 days; total est. cost $1.9 million
- Substructure assembled with bar slicers; super to be delivered in 2 longitudinal pieces

Rhode Island

Wisconsin – Road Over I-39/90

- Project Details: ABC being applied to pier construction; saving of 3 weeks; est. cost $6.9 million; Precast columns and caps on cast-in-place footings; 5 median piers between I-39 lanes planned

Kentucky – Knox County, Stewarts Creek Bridge

- Project details: 3 weeks max closure permitted; total project: 38 days; A + B bidding (Cost plus time); est. $700,000 cost; two bridges; galvanized and painted steel superstructure

Innovative Bridge Designs

Maine – Route 1 Kittery Overpass to I-95

- Project details: Maximum allowed closure time is 30 days; est. $2.56 million cost; precast abutment elements on cast-in-place footing on rock

California – Route 96 over Fort Goff Creek

- Project Details: Remote location in Northern California; estimate $1.77 million cost; simple span for seismic reasons; Summer 2014 delivery

Missouri – Route B bridge over Route 70

- Project Details: One-two week closure planned; estimate $695,000 cost; proposed concrete prestressed boxes to sit directly on GRS abutments; no concrete abutment body needed, no approach slab needed; using ABC and Geosynthetic Reinforced Soil Abutments (GRS)

SHRP2 Bridge Products in Round 4

- **Fourth round of solicitations close on June 27, 2014 (12 products)**
- **Available products of interest to this committee include:**
  - Nondestructive Testing for Concrete Bridge Decks (R06A)
  - Service Life Design for Bridges (R19A)
  - Managing Risk in Rapid Renewal Projects (R09)
  - Project Management Strategies for Complex Projects (R10)

Nondestructive Testing for Concrete Bridge Decks (R06A)

What is the Product?

- Collection of geophysical technologies for evaluating and inspecting concrete bridge decks.
- Web-based evaluation tool to select appropriate NDT technologies for specific applications.
- An NDT repository for recommended test procedures, guidelines, results, equipment, specifications, and other information.

How can a DOT use this?

- Provides greater inspection accuracy, more detailed and objective condition assessment data, and identifies progression of deterioration.
- Evaluates the appropriate NDT technologies for specific defect types and conditions and smarter preventative maintenance programs.
- Minimizes road closures and delays due to inspection.
- Fulfills asset management requirements under MAP-21.

Service Life Design for Bridges (R19A)

What is the Product?

- Design guide with procedures for systematically designing for service life and durability for both new and existing bridges.
- 12-step framework applicable to all bridges and adaptable to specifics.
- Body of knowledge relating to bridge durability under different exposure conditions and constraints to establish an array of options.

How can a DOT use this?

- Apply a formal approach to service life design for bridges either programmatically or individually.
- Plan, design, construct, evaluate and preserve bridges and bridge components for a targeted service life.
- Create a uniform process for designing bridges for service life, culminated with a Life Cycle Cost Analysis to assist in the decision making process.

Managing Risk in Rapid Renewal Projects (R09)

What is the Product?

- A formal risk management process with practical methods to identify, assess, evaluate, mitigate, allocate, monitor, and manage risk.
- Case studies, a risk/action checklist, implementation tools, a risk register, and a training course for conducting risk assessment.

How can a DOT use this?

- Enables project managers to better manage their budgets and schedules by anticipating and managing risks.
- Brings more discipline to existing management processes by allowing project managers to establish appropriate budgets, milestones, and contingencies.
- Can be used on projects of any size and type.
- Attractive for states using PPPs, design-build, and other alternative delivery methods.

Project Management Strategies for Complex Projects (R10)

What is the Product?

- Guide that incorporates a five-dimensional project management approach; adding project context and financing to the three standard factors of cost, schedule, technical.
- Step-by-step process to assess project complexity, define critical project success factors, evaluate resources, and address needs.
- Includes case studies, application tools, and training material.

How can a DOT use this?

- Addresses all aspects of managing a complex project earlier.
- Considers critical success factors, human resources, administrative and financial arrangements, communications, risk management plan, and project action plans .
- Allows for integrated teams as early as possible in projects to develop action plans and identify resources.

California's Approach to Implementing Innovative Bridge Designs

Fort Goff Creek Bridge

Fort Goff Creek Bridge

Challenges:

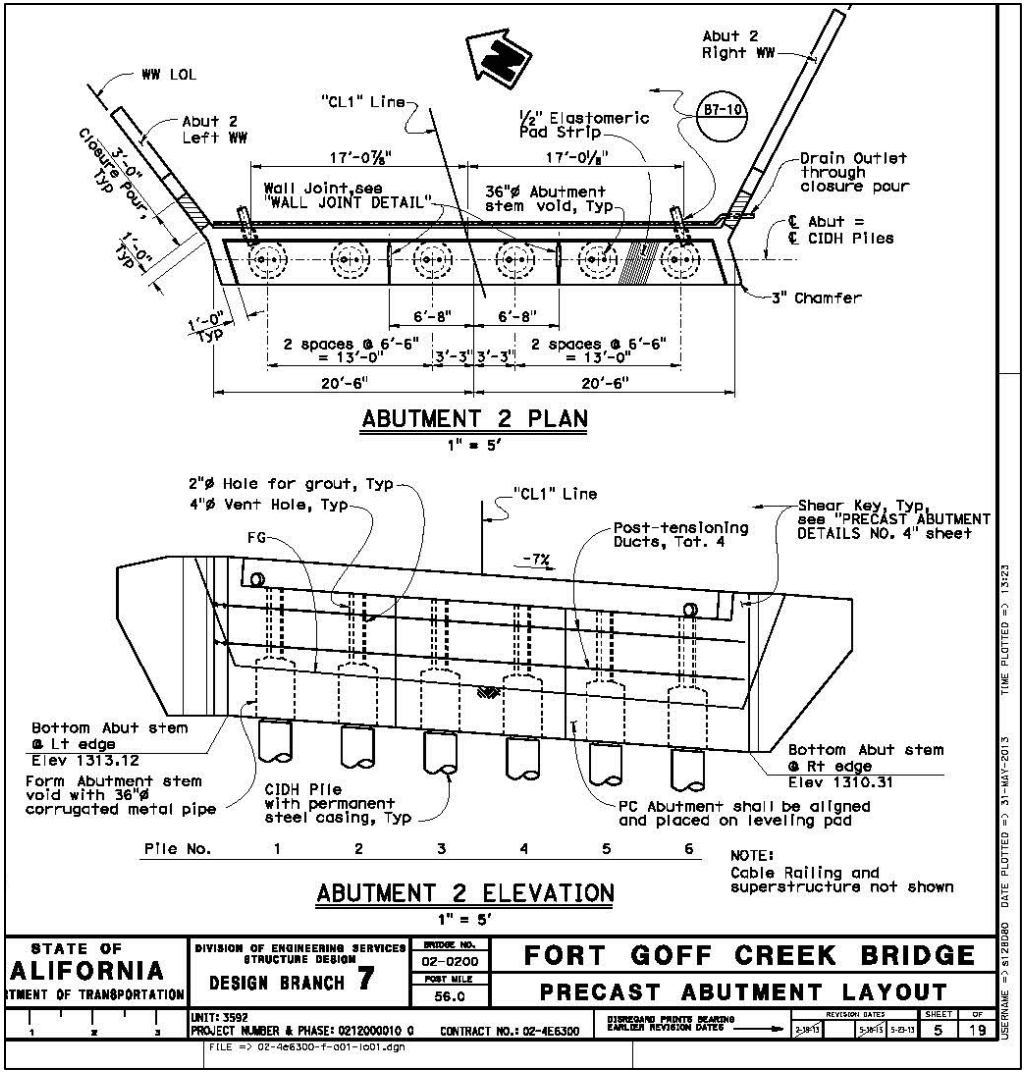
- Project in severe climate area
- Freeze-thaw cycles and heavy salting
- Batch plant located 90 minutes away from site

Fort Goff Creek Bridge

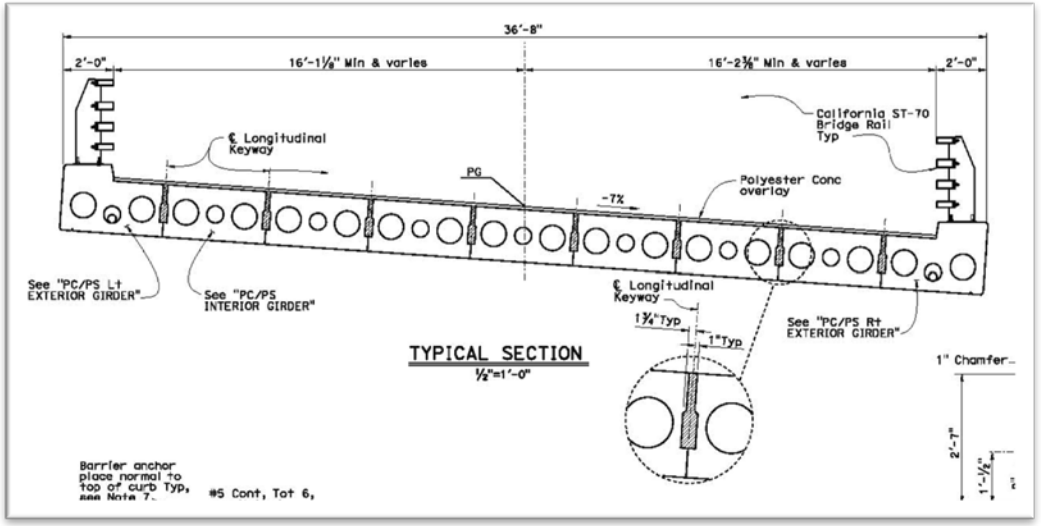
- Streambed restoration project to provide fish passage
- Replace 60-year-old culvert with 60’ long single span bridge
- Temporary detour under one-way traffic control

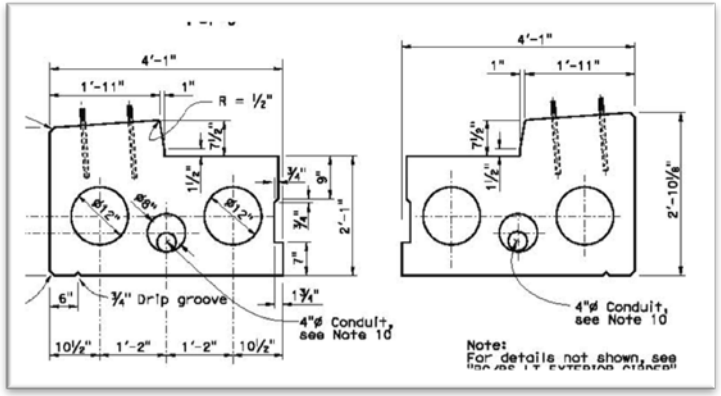
Precast Substructure

- Single row of piles
- Repeatable elements
- Pick weight under 95K
- Pre-assemble substructure elements prior to shipping
- Fabrication tolerances in specifications



Precast Superstructure





- Repeatable elements (PC/PS Voided Slabs)
- Prefabricated bridge rail (California ST-70)
- Rail curb precast on exterior slab elements
- Construction sequence on plans

Innovative Bridge Design Applications in California

- **Emergency projects** in which restoring traffic is a top priority. Time is everything.
- Projects with **constraints that preclude conventional construction methods**

I-580 Connector Span Replacement

SFOBB Yerba Buena Island Viaduct superstructure roll-in

SHRP2 Value to California

- **Goal:** Mainstream ABC in California
- **Time savings:** Reduce the on site construction days
- **Cost savings:** Use standard designs for many bridges
- **Minimize use of detours:** Deliver projects more rapidly and less intrusively to our travelling public.
- **Advance state of practice**: Add to existing knowledge and experience using accelerated bridge construction
- Opportunity to **share our experiences** with other states

Questions