


SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

ABC, FHWA SHRP2 R04: Project update, lessons learned

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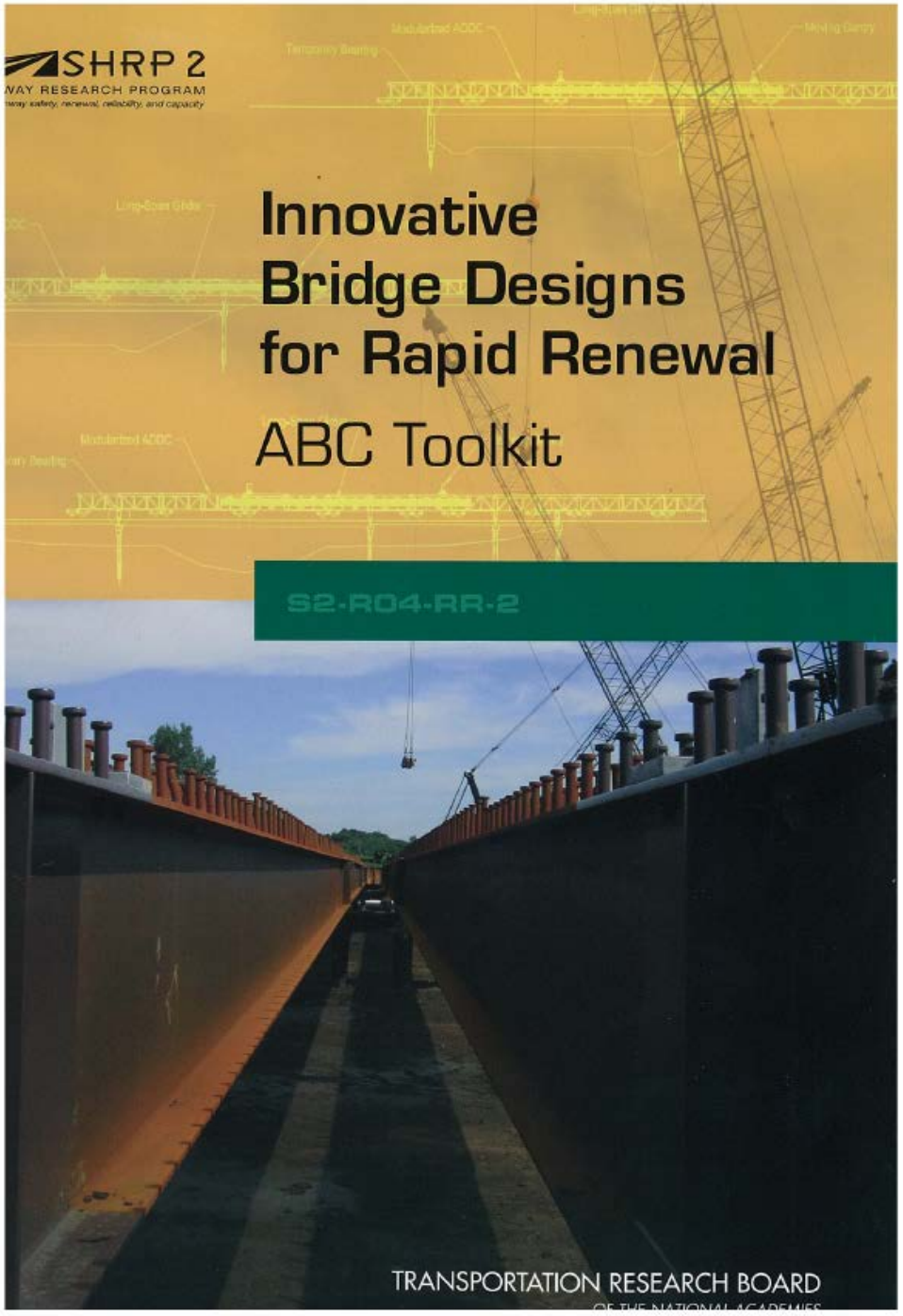
U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

Goals for ABC

- Enhanced Mobility
- Safety
- Reduced Costs***

***Who’s costs?


SHRP 2
WAY RESEARCH PROGRAM
Innovative
Bridge Designs
for Rapid Renewal
ABC Toolkit
S2-R04-RR-2
TRANSPORTATION RESEARCH BOARD

SHRP2 *Innovative Bridge Designs for Rapid Renewal* Toolkit

1. ABC STANDARD DESIGN CONCEPTS
2. ABC ERECTION CONCEPTS
3. ABC SAMPLE DESIGN CALCULATIONS
4. ABC DESIGN SPECIFICATIONS (LRFD)
5. ABC CONSTRUCTION SPECIFICATIONS

Expected Outcome: The designer, guided by the standard plans, details and the set of ABC design examples, will be able to easily complete an ABC design for a routine bridge replacement project.

Next Generation *Innovative Bridge Design* Projects

- Eight projects scattered around the county
  - Gila River Indian Reservation (Arizona)
  - California
  - Kentucky
  - Maine
  - Missouri
  - Rhode Island
  - Wisconsin
  - Michigan

Held 3 Showcases
Three Peer to Peer Exchanges

- Many lessons learned from implementation projects, showcases and peer to peer exchange

  – ABC comes in many forms
  – Differing reasons to consider ABC
  – Contracting methods can very depending on need and ABC driver

Lessons Learned So Far

- ABC comes in many forms
  - Multiple pieces assembled on site
  - Slide in Bridge Construction (SIBC)
    - Transverse
    - Longitudinal
  - Self Propelled Modular Transporters (SPMT's)

Lessons Learned So Far

- Differing reasons to consider ABC
  - Time savings
  - Safety
  - Quality
  - Reduced environmental impacts
  - Materials (Precast, Galvanized, Carbon fiber)

Lessons Learned So Far

- Contracting methods can very depending on needs
    - Design, bid, build (Traditional)
    - Design, build (Less control)
    - Construction Manager/General Contractor (CMGC)
    - A + B, Cost plus time

Lessons Learned So Far

- Identify the main goal of the project
  - Least disruption of traffic?
  - Least cost?
  - Environmental protection?
  - Length of construction season?
  - Length of detour?

Lessons Learned So Far

- Policy Related
  - The SHRP2 Toolkit can help when considering ABC alternatives
    - Precast construction
    - SIBC

Lessons Learned So Far

- Speed of ABC
  - How fast is really needed (Closure time)
  - SPMT's are very fast , but pricey
  - SIBC is a nice combination of speed and cost
  - If 14 to 21 days will work, assembling pre built pieces is cost effective
  - There is a cost for speed
    - Choose the time line carefully!

Lessons Learned So Far

- Cost of ABC
  - Generally cost more
  - ABC is showing up on design/build projects
    - What does this mean?
  - Look at big picture
    - Cost of traffic control
    - Cost of construction inspection staff
  - Simple details equal lower costs
  - Align proposed ABC method with local expertise

Lessons Learned So Far

- Technical Issues
  - Foundations selection is a big deal
    - Spread footing are fast
  - Post tensioning works, but takes time
  - Simple detail lead to successful projects
  - UHPC is a good tool, but expensive
  - Watch the weight of precast elements
  - Pay attention during shop reviews
    - Best to have issues on paper

Lessons Learned So Far

- Technical Issues
  - Geosynthetic Reinforced Soil (GRS) abutments are fast and inexpensive
    - Scour needs to be considered in their use
  - ABC can help with some weather issues
  - Grouted bar splice couplers work well for ABC
  - Deck overlays solve deck alignment issues

Lessons Learned So Far

- Owner related
  - "DOT's need to be innovative to stay relevant"
  - Durable joints are a must to gain acceptance
  - A top down and team approach with real resources committed will be needed
  - Changing the "We have always done it this way" is not easy.
  - **DOT's gain real political capital from ABC**

Lessons Learned So Far

- Contractor Related
  - Like to retain as much work as possible
  - Contractors bid labor, material and **risk**
  - Like CMGC contracts
    - Geared to their means and methods
  - Work with them, they have good suggestions

Lessons Learned So Far

- Contracting with ABC
  - CMGC contracts work well if everyone buys in
    - Owner
    - Designer
    - Contractor
  - Good communications is a must
    - New approach, moving fast
  - Pick your timeline carefully
    - Speed costs money

Lessons Learned So Far

- General ABC observations
  - Need the “A” team
    - Owner
    - Designer
    - Contractor
  - Not every project needs an ABC solution, but some really benefit from it

Conclusions

- Be open minded
- Do not be afraid to experiment with the method and materials
- Seek designer and contractor input before AND after every job for improvements
- DOTs get great publicity from ABC projects
  - Let the public know what your doing and why it is special!

SHRP2 *Innovative Bridge Designs for Rapid Renewal Toolkit*

- Access to the toolkit and other resources including implementation assistance can be found here:
  - FWHA's GOSHRP2 web site or specifically:

    http://www.fhwa.dot.gov/goshrp2/Solutions/Renewal/R04/Innovative_Bridge_Designs_for_Rapid_Renewal
  - AASHTO's SHRP2 web site or specifically:

    http://shrp2.transportation.org/Pages/Bridge-Designs-for-Rapid-Renewal.aspx
  - TRB publications site:

    http://www.trb.org/Main/Blurbs/168046.aspx