SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

KDOT Local System ABC Experience

Rural ABC Bridges in Kansas

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September 16, 2015

U.S. Department of Transportation
Federal Highway Administration

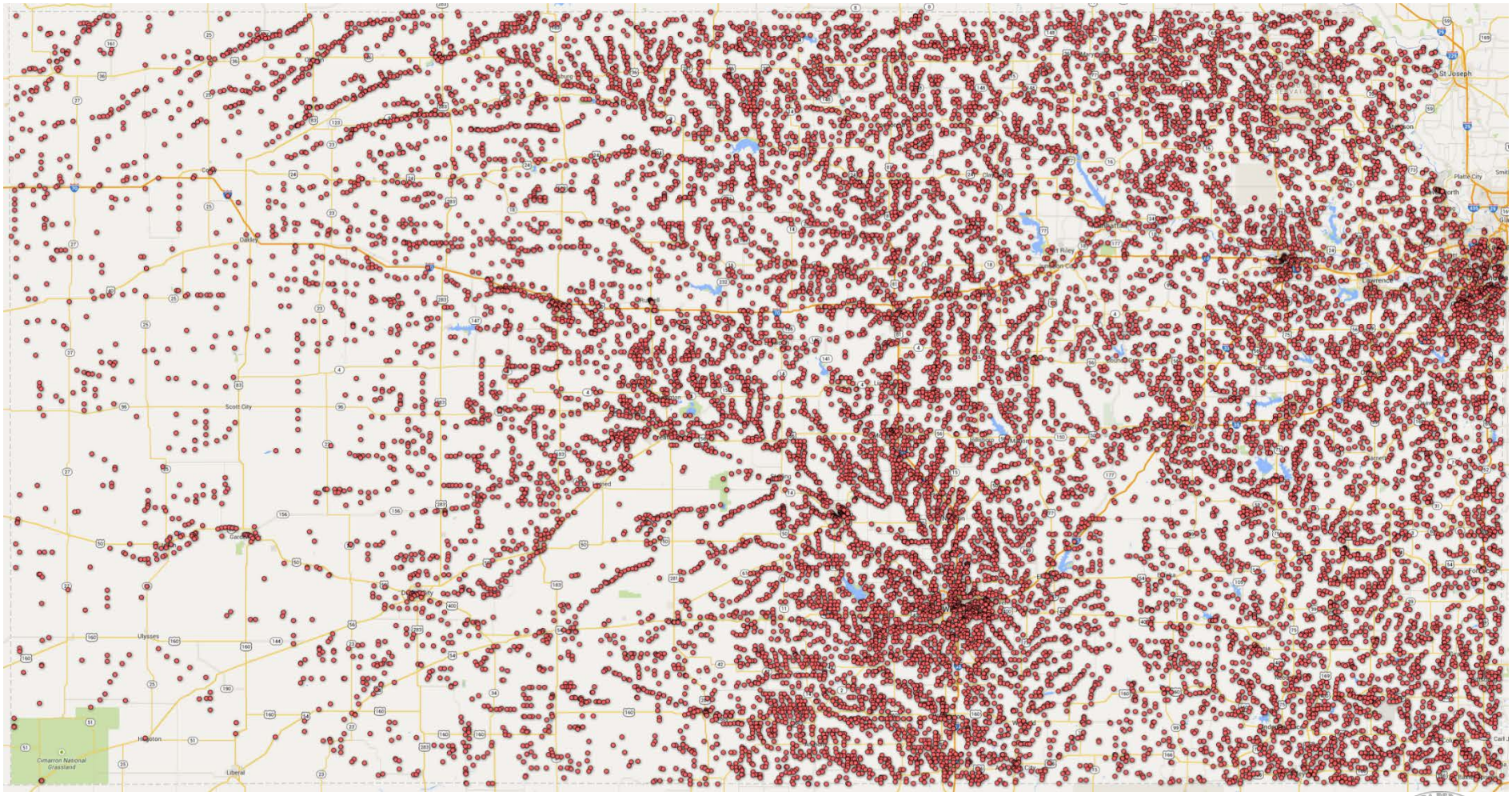
American Association of State Highway and Transportation Officials
AASHTO

Local Bridge Improvement

- Funding Hurdles likely the best improvement
  - Low-cost Bridge Options
    - Husker Bridge (Steel)
    - Oden Precast (Conventional Concrete)
  - Bureau of Local Projects Standard Designs
    - Single Span Steel
    - Single Span “Spread Box” (Pre-stress)

Kansas Department of Transportation
Bureau of Local Projects

Local Bridges in Kansas



Kansas Department of Transportation

Osborne Existing

Osborne New

Riley Existing

Riley Existing

Riley New

Rush County Before

Rush County Before

Rush County Construction

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KDOT State System ABC Experience

Proj. 9-58 KA-2101-01 Waterville Bridge: Lessons Learned

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Waterville Bridge: Lessons Learned

- KDOT ABC Timeline
  - Iowa SHRP-2 Demo Project: 2011
  - KDOT chooses Waterville Site: Early 2012
  - Prelim. Design: Summer 2013
  - Final Design Completed: Summer 2014
  - Letting November 2014

Waterville Bridge: Lessons Learned

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Waterville Bridge: Lessons Learned

- Existing Bridge Site
  - AADT (2035): 1500 vpd; 13% trucks
  - 60-84-60 ft. RDGH-2 w/ 26 ft. roadway
  - State route detour = 31 miles adverse travel
  - Split emergency services between local towns
  - Close route or use Shoofly Detour ($600K)
  - Cannot close route between end of school and beginning of wheat harvest
  - ABC chosen as alternative to Shoofly Detour

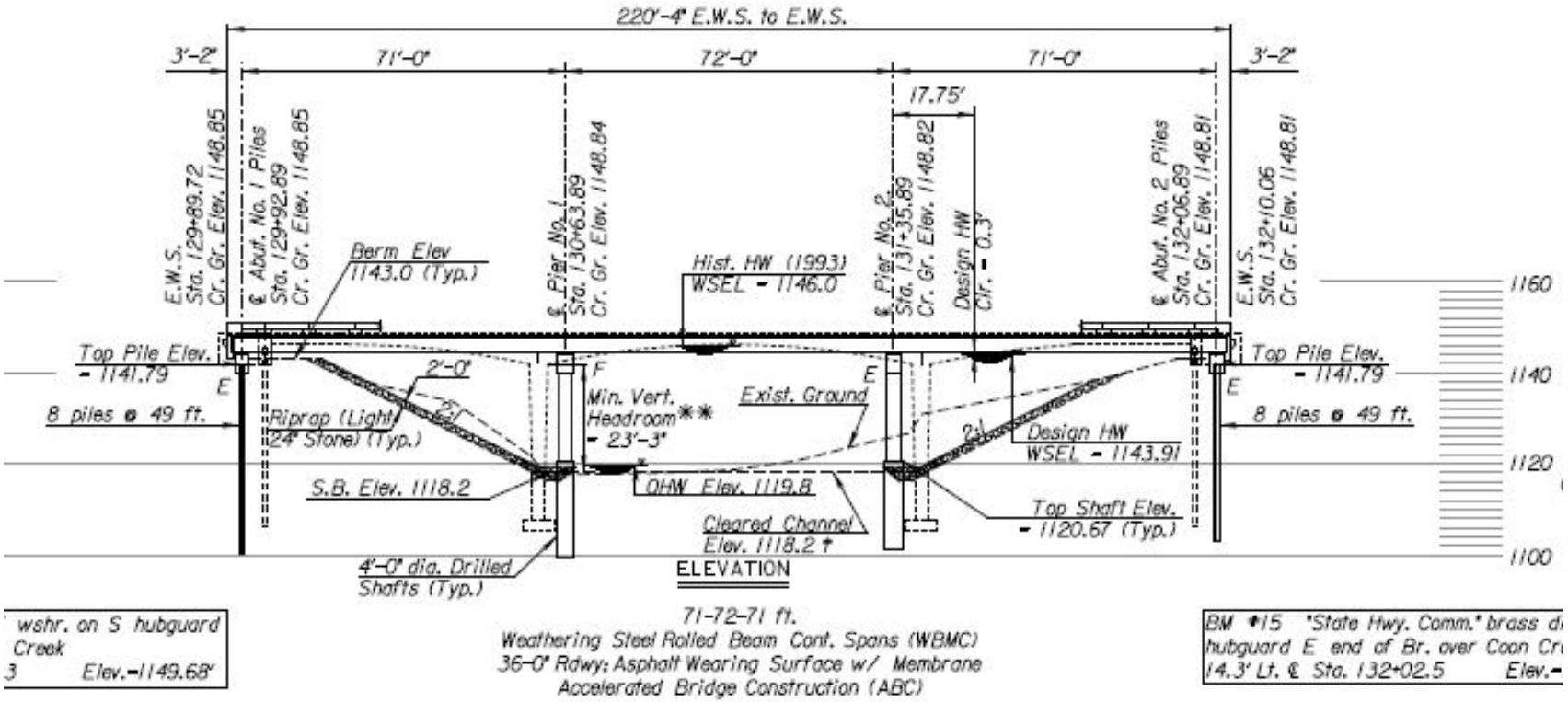
Waterville Bridge: Lessons Learned

- Proposed ABC Bridge
  - 71-72-71 ft. WBMC w/ 36 ft. roadway
  - No change in profile grade
  - Abutment piling pre-installed w/ flagged traffic
  - Pier drilled shafts placed under existing bridge using “low overhead” techniques—no straddle bent.
  - Precast abutment beams, pier columns, and pier caps installed using grouted connections

Waterville Bridge: Lessons Learned

- Proposed ABC Bridge, cont'd
  - Conventional continuous weathering steel rolled beam framing plan
  - Precast concrete full-width, full depth, 10 ft. deck sections "semi-composite" to beams
  - Abutments are backfilled using low strength flowable fill
  - Asphalt wearing surface and no approach slabs

Waterville Bridge: Lessons Learned



Waterville Bridge: Lessons Learned

- Letting(s)
  - Letting #1: one bidder; Bridge Bid Items = $2,154,810; $272/sq. ft.
  - Letting #2: multiple bidders, about the same cost
  - Cost baseline comparison: conventional bridge ($1,000,000) + shoofly ($600,000)
  - Bids were rejected

Waterville Bridge: Lessons Learned

- Lessons Learned
  - If you want a demonstration project, it has to have a champion from beginning to end.
  - Reliance on precast members could leave you at the mercy of local precasters' production schedules.
  - Future→ KDOT is looking for a new bridge site to use ABC; probably single span to reduce absolute $$ amount.