Replacement versus Rehabilitation of Pier

Ben Foster
Maine DOT
Pier Deterioration

• Pier in poor condition
• Satisfactory bridge components
• Optimize Remaining Service Life
• Bridges with a series of simple spans
• Typical of our Interstate bridges
Pier Issues
Impact on Bearing Capacity
Pier Rehabilitation

- Support traffic while pier is compromised
  - Support beams
  - Support cap
- How extensive of a rehab?
  - Determined to go below rebar
- How much at a time?
Fairfield I95 / Route 201

- Supported by Jackposts
- Chipped and patched small sections
- Crews were no happy
- Impact on public
Fairfield I95 / Route 201

- COST = $235k per pier, 2.5 yrs
- How can process be improved?
  - Reduce cold joints
  - Speed work by having larger sections
  - Longer design life
  - Reduce costs
Final Product
Waterville I95 / KMD – Phase 1

- Supported beams by Bailey Bridge
- Chipped and patched larger sections
- Labor intensive
Waterville I95 / KMD – Phase 1

- COST = $215k per pier, 7 mos.
- How can process be improved?
  - Longer Design Life
  - Reduce Costs
- Still have Cold Joints
Waterville I95 / KMD – Phase 2

- Supported Pier Cap by Bailey Bridge
- Chipped and patched larger sections
- Crews felt this was an improvement from Phase 1
Waterville I95 / KMD – Phase 2

- COST = $200k per pier, 8 mos.
- How can process be improved?
  - Longer Design Life
  - Reduce Costs
- Still have Cold Joints
Pier Replacement

- Supported beams by Bailey Bridge
- Splice beams to make them continuous
- Remove pier down to footing
- Place new pier
Jacking Towers
Connection
Hammering Pier
Pier Cap Prep
Costs

- Orono – Kelley Road
  - $235k per pier, 6 mos.
- Bangor - Kenduskeag Ave
  - $150k per pier cap, 5 mos.
Costs

- Fairfield – Western Ave
  - Pier 2 (rehab) – $250k / pier, 7 mos.
  - Pier 3 - $200k / pier, 5 mos.
  - Pier 1 - $220k / pier, 4 mos.
Benefits

- New Pier
- No Cold Joint
- Clean and Paint Bearings
- Cost Competitive
Benefits

- Faster Construction
- Less Wear on the Crews
- Sense of Accomplishment
What’s Next

- Strengthening Bailey Bridge Panels
  - Allow a 5’ section
- Standardize the process
- Use of FRP Column Wraps