11th Annual International Bridge + Structure Management Conference

Inspection Mindset

Rebecca Nix
UDOT Bridge Management Engineer
- Inspection Program History
- Why Change?
- Programmatic Modifications
National Bridge Inspection Standards (NBIS)
Introduced in 1971 following collapse of Silver Bridge
- Programmatic Changes
  - Identified funding shortfalls
  - Identified Federal Aid shortfalls
Bridge Management System - PONTIS
1995 – Preventative Maintenance eligible for Federal Bridge Funds

Focus of funds on worst first approach – minimal preservation

Can prioritize based on sufficiency rating and NBI ratings
2012 – All Structurally Deficient bridges in Utah programmed
2012 – All Structurally Deficient bridges in Utah programmed

Dilemma – How to prioritize preservation activities

What data is needed to prioritize?
- Project history
- Detailed condition data
Are we collecting enough data with NBI ratings?
- Minor Element
- Not significant safety concern
2007
- Not overall condition assessment
- Requires identifying extent and quantity of defects
- Additional documentation time is needed
Not all defects are equal
Not all defects are equal
- Not all defects are equal
Additional data allows for a more comprehensive evaluation of condition for prioritization

\[ H_e = \frac{\sum_s k_s q_s}{\sum_s q_s} \]

Where:

- \( H_e \) = health index of the individual element
- \( s \) = index of the condition state
- \( q_s \) = element quantity in \( s^{th} \) state
- \( k_s \) = health index coefficient corresponding to the \( s^{th} \) condition state for each element

And:

- Coefficient for the 4 condition states — \( k_1 = \) NBI Factor, \( k_2 = 0.66 \), \( k_3 = 0.33 \), \( k_4 = 0 \)
- NBI conversion factors are determined from the following table, based on the most recent NBI value given to the deck, superstructure or substructure category:
Field Reviews
Quality Control Audits
Collaborative Peer Reviews
Collaboration with Planning Engineers
## 11th Annual IBSMC

### Work Candidates

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Date</th>
<th>Cost</th>
<th>Status</th>
<th>Source</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC 700_0671_246</td>
<td>Repair Waterproofing Membrane</td>
<td>1/1/1901</td>
<td>$20,263.00</td>
<td>Completed</td>
<td>NA</td>
<td>2 / Type = F</td>
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<td>Thin Bonded Polymer Removal</td>
<td>1/1/1901</td>
<td>$190.00</td>
<td>Completed</td>
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<td>Modify Expansion Joint</td>
<td>1/1/1901</td>
<td>$21,193.00</td>
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<td>9/7/2011</td>
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<td>TC 700_3550_7337</td>
<td>Clean &amp; Overcoat Steel</td>
<td>1/1/1901</td>
<td>$273,362.00</td>
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<td>3/25/2005</td>
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11th Annual IBSMC
Work Candidates

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<tr>
<th>ID</th>
<th>Description</th>
<th>Date</th>
<th>Inspector</th>
<th>Priority</th>
<th>Notes / Type</th>
<th>Action</th>
<th>Date Recommended</th>
<th>Priority</th>
<th>Date Completed</th>
<th>Target Year</th>
<th>Assigned</th>
<th>Work Assignment</th>
<th>Status</th>
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<td>High</td>
<td>2 / Type = F</td>
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<td>7/7/2014</td>
<td>High - Within 1 Year</td>
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<td>Update / Install Clearance Sign</td>
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<td>Maintenance Notes / Type = O</td>
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<td>2017</td>
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Type of Work

Candidate ID: 1D 672-IYO-061015-A8083B730E7
Structure Unit: 2 / Type = F
Action Type: None
Action: Replace Expansion Joints
Date Recommended: 7/7/2014
Priority: High - Within 1 Year
Date Completed:
Target Year: 2017
Assigned: No
Work Assignment: UDOT Structures
Status: Programmed
Source: (FIX PARAM VALUES)
Questions?