Towards better bridge management – inspection data

IPWEAQ – CQ Conference – Rockhampton - May 19

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Agenda

• Bridge management context - the journey from maintenance management to asset management…

• Level 2 bridge inspection – current state

• Proposed IPWEA accreditation

• Discussion/Summary
Bridge management - The state journey from maintenance management to AM
This will take a while…
Bridge (maintenance) management now…
Framing the current state...focus...data...and the nature of decisions...
Bridge asset management – target framework
Framing the future...focus...data...and the nature of decisions...

- Organisation journey required
- Improve existing business processes
- Cultural change
- System development
- Time and investment required – continual improvement
The Vehicle
to travel from Current to Future State
Garage
Transforming the vehicle...

Value to all stakeholders
Structured, Innovative management

VALUE
ALIGNMENT
LEADERSHIP
ASSURANCE

Transparent, simplified processes

Organisation’s assets, great culture, motivated staff

Reference: Institute of Asset Management and aligns to AS55001
## Industry current state

### Bridge Management: Score card 2019…

<table>
<thead>
<tr>
<th>What we do OK…</th>
<th>What we don’t do well…</th>
<th>What does it mean…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing use AM principles</td>
<td><strong>Focus on decision inputs</strong></td>
<td>Limited effectiveness and efficiency</td>
</tr>
<tr>
<td>Collect historical data…?</td>
<td><strong>Document decisions</strong></td>
<td>Better decisions faster</td>
</tr>
<tr>
<td><strong>Collect condition data…?</strong></td>
<td>Document basis for decisions</td>
<td>Increased liability</td>
</tr>
<tr>
<td>Collect capacity data…?</td>
<td>Link decisions (line of site)</td>
<td>Limited continual improvement</td>
</tr>
</tbody>
</table>
## Industry current state

### Institute of Asset Management maturity rating

<table>
<thead>
<tr>
<th>Maturity</th>
<th>Description</th>
<th>Typical Bridge Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Organisation demonstrates leading practice and maximises value consistent with objectives and operating context</td>
<td></td>
</tr>
<tr>
<td>Optimising</td>
<td>Organisation demonstrates systematic and consistent optimisation</td>
<td></td>
</tr>
<tr>
<td>Competent</td>
<td>Organisation demonstrates systematic and consistent delivery</td>
<td></td>
</tr>
<tr>
<td>Developing</td>
<td>Organisation has identified the means of systematically and consistently delivering – credible progress and resource plan</td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>Organisation has recognised need, and evidence of intent</td>
<td></td>
</tr>
<tr>
<td>Innocent</td>
<td>Organisation has not recognised the need</td>
<td></td>
</tr>
</tbody>
</table>
• Industry moving towards data driven decision making…
• Benchmark Level 2 bridge inspection costs have halved over past 10 years ($2,000 to $1,000)
• Inspection data is a key input to decisions for both maintenance and asset management
• ARRB notes:
  • Widely varying market prices for Level 2 inspections
  • Issues with inspection data reliability & interpretation
  • Business rules incorporating data into the asset data base
Phares et al (2001) – FHWA – key research findings

49 Bridge Inspectors – systematic research – reliability and behaviour investigated

- Average rating differs from reference (inherent variability), but major element ratings better than secondary element ratings
- Bridge inspection results are subjective and have an impact on safety and maintenance of a bridge. Results dependent on
  - Fear of traffic/heights
  - Eyesight
  - **Formal training**
  - Perception about maintenance, accessibility, complexity
- Most OK with general defects, **less so with critical/local defects**
- Accuracy correlates with **time, focus** and comfort level (experience)
Bridge Inspection current state…

Observations regarding value extraction

• Minimalist – “Just send us the Level 2 reports”
• Engaged: - consider Scope of Services
  • Alignment kick-off meeting
  • Inspector experience prescription
  • Pilot inspections
  • Maintenance register generation***
  • Data integration trial
  • Draft report & final report
  • Asset group review workshop
• Report preparation is the biggest single cost**
• Large difference in value proposition between Minimalist & Engaged
• Is data informing decisions? – If not, what liability is accrued?
Industry Gap Analysis

What is in place?
• Generally common definition of Level 2 inspection – some variation by jurisdiction
• Nationally available L2 inspection training course
• Regional inspection training courses

Gaps – what is missing?
• Inspector accreditation
• Inspector community of practice
• Standardised business rules around data integration
• Alignment with ISO55001 re business rules
### IPWEA/ ARRB accreditation proposal…

<table>
<thead>
<tr>
<th>Inspector</th>
<th>Business Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic</strong></td>
<td>Competent data integration</td>
</tr>
<tr>
<td>Competent Inspector</td>
<td>- Alignment kick-off meeting</td>
</tr>
<tr>
<td>- Current medical certificate – eyes and fears</td>
<td>- Inspector accreditation prescription</td>
</tr>
<tr>
<td>- Satisfactorily completed recognised training course</td>
<td>- Maintenance register generation</td>
</tr>
<tr>
<td>- Linked into a community of practice</td>
<td>- Exceptions reviewed and tracked</td>
</tr>
<tr>
<td>- Sample of work audited on an annual basis</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced</strong></td>
<td>ISO55001 data integration</td>
</tr>
<tr>
<td>Master Inspector</td>
<td>In addition to the above…</td>
</tr>
<tr>
<td>In addition to the above…</td>
<td>- Inspection documentation consistent with ISO55001, particularly Sections 8 and 9.</td>
</tr>
<tr>
<td>- Competent trainer of inspectors</td>
<td>- Pilot inspections (alignment)</td>
</tr>
<tr>
<td>- Industry leader in inspections</td>
<td>- Data integration trial</td>
</tr>
<tr>
<td>- Current experience in the interpretation and use of inspection data</td>
<td>- Draft report (sample/pilot) &amp; final report</td>
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<tr>
<td>- Current experience in Level 3 investigations</td>
<td>- Asset group review workshop</td>
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To what extent does accreditation address a need?

Assuming (+) does the structure of the proposal align with that need?

What is missing from the proposal?

What is excessive in the proposal?

What other constraints impact the proposal?

Is IPWEA the right vehicle to operate accreditation?

How much and by whom?

Discussion/Questions
Questions?
SHAPING OUR TRANSPORT FUTURE