Future directions for access and bridge management in Queensland

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What does a Road Authority do?

- Access regime that supports the economy
- Industry consistently desires more productivity
  - Access to the network
- We have concerns that bridges are over stressed
  - Beyond what is acceptable under the current standards
  - But past performance has not raised any alarm bells?
Vehicle Length vs Permitted Mass

Maximum Allowable Overstress (Repeated loads)
M=3L+15
B Double 19m GA (L+32.5m)
B Double 23-25m (1.5L+29.5)
General Freight Regime
Guideline Low Loader
48t Crane
Guideline Crane
40t
36t Crane
Rigid
24t Pick & Carry Crane
90t Period Low Loader
98.5t Single Trip Low Loader
100.5t Single Trip Low Loader
78t Low Loader
68t Single Trip Crane
Guideline Low Loader
7 Axle B Double HML
9 Axle B Double HML
9 Axle B Double GML
BAB Quad GML
BAB Quad HML

Is there a problem?

1. Justification for accepting regime in 1980s no longer valid
2. Regardless of flaws, access regime accepted and still in place
3. Cannot afford to upgrade all bridges to meet current design standards over short period of time.

Continual overstress may reduce life of bridge significant
Recap of presentations

• Rapid, reliable, repeatable assessment of Transport and Main Roads’ bridges – Peter Shaw

• Risk management (assessing capacity based on satisfactory past performance) – Narelle Dobson

• New Zealand approach to asset management – Barry Wright (NZTA)

• Bridge assessment: An international perspective – Rob Heywood

• Value for money bridging in New Zealand – Barry Wright (NZTA)

• Closing the plausibility gap: A case study – Peter Shaw and Rob Heywood
Today’s presentations

Rapid, reliable, repeatable assessment of Transport and Main Roads’ bridges
(Peter Shaw)

- Use of assessment ratios
- Tools for the identification of Priority Bridges for further assessment.
Today’s presentations

Risk management – assessing capacity based on satisfactory past performance
(Narelle Dobson)

(Per Australian Standard (AS) 13822 Cl 8.1)

• “Structures designed and constructed based on earlier codes, or designed and constructed in accordance with good construction practice when no codes applied, may be considered safe to resist actions other than accidental actions (including earthquakes) provided that: …
Today’s presentations

Risk management – assessing capacity based on satisfactory past performance
(Narelle Dobson)

(Per Australian Standard (AS) 13822 Cl 8.1)

- No significant damage, distress or deterioration
- Sound structural system
- Service for sufficiently long period of time for extreme actions due to use
- Sufficient durability ensured
- No changes for a sufficiently long period of time and no such changes are anticipated".
Today’s presentations

NZ approach to asset management
(Barry Wright, NZTA)

- Simple bottom up management of the asset
- Condition rating process and the need to ensure we are sure that it is providing value.
- The key indicators of assets and what are they saying about future asset performance and real financial needs.
- Bridges are typically very resilient and forgiving.
Today’s presentations

Bridge assessment: An international perspective
(Rob Heywood)

1. Bridge assessment is a specialty
   - not design in reverse and involves going well beyond design codes

2. Internationally accepted that margins for keeping in-service bridges in operation are less than the margins for accepting new bridges into the inventor
   - It is recognised that costs can be disproportionately high to increase safety of existing bridges

3. Australian Standards provide a framework for change

4. The department is proposing Operational Parameters that will:
   - help close the plausibility gap
   - reduce strengthening / replacement demand
   - reduce access restrictions.
Today’s presentations

Value for money bridging in NZ
(Barry Wright, NZTA)

• Value for money is about balancing risk against cost.
• Documentation, costing and risk assessment of the do nothing and incremental improvement options assists good basis for decision making
• Departures to normal standards can be appropriate.
• It is critical to understand the real risks, their causes and consequences.
Today’s presentations

Closing the plausibility gap: A case study
(Peter Shaw and Rob Heywood)

• We are left with the question whether the method and required parameters are reasonable or too risky?
  - How far are we prepared to go?
Management for safe access

• Importantly Rob outlined a credibility gap
• If we try to apply design parameters to existing bridges will be out of step with international – too conservative?
• Engineers need to be able to rely on a recognised alternative framework
• Must be clear
  - when making structural engineering decisions
  - when applying decisions based on acceptance of a level of risk that is informed by structural engineering advice.
Challenges – moving forward

• Are we managing risk in a sustainable and justifiable way?
• Are we getting the best and appropriate use out of our assets?
• Do we understand our network sufficiently?
• Does the current access framework meet today’s needs?
• Are we making the best use of technology?
Recommended future directions

- Adopt and use technology
- Improve knowledge of existing bridges
- Learn from international experience and research
- Help operators make better decisions – when routing, operating for compliance, investing, in vehicle design
- Help decision makers make informed decisions on acceptable levels of risk and management of risk
Recommended future directions (cont.)

- Strategic asset management
- Predicable and consistent access regimes
  - System that has less permit admin that adds little value to asset protection or safe operation.

“Are you up for the challenge?”
Take home messages

• Assessment ≠ Design

• We must close the plausibility / credibility gap

• We need a balanced approach to risk and asset management

• Regulatory transparency, certainty and consistency, and low administrative burden lead to improved productivity and better industry investment decision making.
Thank you
Panel session

• Rob Heywood
• Peter Shaw
• Narelle Dobson
• Barry Wright