USING TIMBER TO YOUR ADVANTAGE
Benefits

- Forgiving
- Distribution of Loads
- In practice, it doesn’t match theory
- It’s an asset you already have
- Flexibility and creating options
  - Increase height of the bridge
  - Widening the bridge
  - General aesthetics
  - Bridge features
Benefits: Raising the Deck Height
Benefits: Raising the Deck Height
Benefits: Widening the Bridge

![Diagram of bridge widening](image)

L = 400 mm for 150 thick ply
L = 600 ± 10 mm

**EDGE TREATMENTS**
Benefits: Aesthetics
Benefits: Aesthetics
Benefits: Aesthetics
Benefits: Community Feature

➢ What's a good system?
Benefits: Community Feature
Benefits: Community Feature
Benefits: Community Feature
Keeping the Bridge

- When it’s a fit for purpose solution
- When it is cheaper – low material costs
- Low volume roads
- Small ratepayer or stakeholder base
- When you can’t justify significant capital expenditure
- When the existing foundations are good condition
Keeping the Bridge

➢ When you want to limit the disruption to traffic
➢ When you want to limit the disturbance to the environment
➢ When you need a quick turnaround
➢ When component construction is beneficial
➢ When you want to maintain the heritage value or aesthetics
➢ As an interim measure prior to replacement
➢ To manage heavy vehicle movements
Misconceptions

➢ You can’t get timber any more
➢ Repair costs are too expensive
➢ Ongoing maintenance is too expensive
➢ Timber bridges can’t take current loads
➢ It’s difficult to manage traffic during repairs
➢ Once the bridge starts to deteriorate it should be replaced
➢ You can’t get crash barriers on a timber bridge
Limitations

➢ Difficult to cater for excessive loads
➢ Existing practices – we’ve seen everything
➢ Large clear spans of 12m+ are difficult
➢ Availability of very large components (12m+ and 500mm dia +)
➢ Water creates difficulties
➢ Knowledge and capabilities
Other Materials

➢ There are many ways to deal with timber bridges
➢ Use the right tool for the right job
Plywood Decking & Components

➢ What's a good system?
Plywood Decking & Components

➢ What's a good system?
Fibre Composite
Fibre Composite

➢ What's a good system?
Pile Wrapping

➢ What's a good system?
Barriers over Timber Bridge
Barriers over Timber Bridge
Information is the Key

LEVEL 1 INSPECTION

LEVEL 2 INSPECTION

LEVEL 3 INSPECTION

EMERGENT INSPECTION
(POST FLOOD OR EMERGENCY)

PROGRAMMED SPECIAL INSPECTION
(UNDERWATER)

ASSET MANAGEMENT SYSTEM

BRIDGE RISK PROFILES

VULNERABLE BRIDGES

STRUCTURE MANAGEMENT PLANS

MONITORING PLANS

VALUATION/DEPRECIATION

MAINTENANCE WORKS PROGRAMS

CAPITAL WORKS PROGRAMS

ANNUAL REPORTS
Poor Quality Information

➢ What's a good system?
Poor Quality Information
## Poor Quality Information

<table>
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<tr>
<th></th>
<th>PILES</th>
<th>HEADSTOCKS</th>
<th>CORBELS</th>
<th>GIRDER</th>
<th>CAPSILLS</th>
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<tr>
<td></td>
<td>Pre-tender</td>
<td>Post-tender</td>
<td>Level 2 Inspection</td>
<td>Pre-tender</td>
<td>Post-tender</td>
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- **Pre-tender Components**: 193
- **Post-tender Components**: 265
- **Level 2 Inspection Components**: 392
Poor Quality Information

➢ Demand a good quality inspection (it’s your $)
➢ Do your own audits of the work
➢ If something doesn’t make sense……
Ongoing Considerations

➢ How long does a timber bridge last!?
Ongoing Considerations

**Inspection Frequencies**

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<thead>
<tr>
<th>Structure type</th>
<th>Overall condition state of structure</th>
<th>Inspection frequency (years)</th>
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<tr>
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<td>2</td>
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<tr>
<td>Bridges and culverts</td>
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<tr>
<td>Tunnels</td>
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<tr>
<td>Busway bridges, including elevated and underground stations and pedestrian</td>
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<td>5</td>
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<tr>
<td>Tunnels</td>
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<td>3</td>
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<tr>
<td>Other bridges over the road network</td>
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<tr>
<td>Retaining structures above/below the road network (excludes retaining</td>
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<td>Large Traffic Management Signs (LTMS) and gantries</td>
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<tr>
<td>Underwater components (all components other than steel culverts)</td>
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<tr>
<td>Confined spaces inspection (all components representing confined space</td>
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<tr>
<td>Large Traffic Management Signs (LTMS) and gantries</td>
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<tr>
<td></td>
<td>3</td>
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<tr>
<td></td>
<td>1–2</td>
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</table>
Ongoing Considerations

- Ongoing preventative maintenance
  - Termite treatment
  - Timber preservative treatments
  - Tightening
  - Waterproofing
  - Erosion control
  - Performed in-house by asset owner?
Strategic Management

➢ You need a big picture plan
➢ GIS will help
➢ Don’t be an optimist
➢ It will take a long time, but you will get there
➢ You can’t just rely on a replacement strategy
   ➢ There’s an interim timeframe
   ➢ The interim solutions are often cheaper and may be long term
Conclusion

➢ Look to keep timber bridges when it’s fit for purpose
➢ There are plenty of maintenance options
➢ Information is the key to good planning
➢ Look to use the versatility of timber to your advantage