MANAGING FUTURE DEMANDS

MANAGING SOUTHLAND DISTRICT COUNCIL’S AGING BRIDGE NETWORK

HARTLEY HARE
Asset Management Engineer
Southland District Council

JOHN LASKEWITZ
Client Service Manager
MWH Global
Before 1989 approx 850 bridges managed by 4 different agencies

After 1989 approx 1080 bridges are being managed by one Council
SDC BRIDGE NETWORK STATISTICS

Stock Underpasses
Concrete Box Culverts
Concrete Pipes
Timber Culverts
Concrete Bridges
Steel Concrete Bridges
Steel Timber Bridges
Timber Bridges
Corrugated Steel Culverts
Steel Timber & Timber Bridges

0 50 100 150 200 250

- Up to 1944
- 1945-1971
- 1972-1991
- 1991 Onwards
RESTRICTED BRIDGES

- 101 posted bridges (33 at 100% Class 1)
- 82 - 50MAX restricted bridges (4 speed only)
- Education, enforcement and signage issues
### Axel Set Weight Limits

<table>
<thead>
<tr>
<th>Axle Set</th>
<th>Full Class 1</th>
<th>90%</th>
<th>80%</th>
<th>70%</th>
<th>60%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two single standard-tyred axles:</td>
<td></td>
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<tr>
<td>In a twin-steer set</td>
<td>10,800</td>
<td>9,720</td>
<td>8,640</td>
<td>7,560</td>
<td>6,480</td>
<td>5,400</td>
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<tr>
<td>Two twin-tyred axles:</td>
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<tr>
<td>Spaced less than 1.3 m from the first axle to the last axle</td>
<td>14,500</td>
<td>13,050</td>
<td>11,600</td>
<td>10,150</td>
<td>8,700</td>
<td>7,250</td>
</tr>
<tr>
<td>Spaced 1.3 m or more but less than 1.8 m from the first axle to the last axle</td>
<td>15,000</td>
<td>13,500</td>
<td>12,000</td>
<td>10,500</td>
<td>9,000</td>
<td>7,500</td>
</tr>
<tr>
<td>Three twin-tyred axles:</td>
<td></td>
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<tr>
<td>Spaced 2.5 m or more from the first axle to the last axle</td>
<td>18,000</td>
<td>16,200</td>
<td>14,400</td>
<td>12,600</td>
<td>10,800</td>
<td>9,000</td>
</tr>
<tr>
<td>Total Truck and Trailer Weight</td>
<td>44,000</td>
<td>39,600</td>
<td>35,200</td>
<td>30,800</td>
<td>26,400</td>
<td>22,000</td>
</tr>
</tbody>
</table>
AGING TIMBER BRIDGES

- 118 bridges with timber beams, 99 posted

- Issues with identifying internal rot/timber species/grade
AVAILABILITY OF HARDWOOD

Results show that the accepted value of \( f_b = 19 \text{ MPa} \) is a conservative estimate of the capacity of Hardwood timbers used in the Southland District.
PRE AND POST SEALING DECKS

Boundary Road

Unsealed deck - water leaking through deck causing decay and algae on timber beams

Sealed deck - dry beams

Lauderdale Bush Road

DECK/APPROACH SEALING
REINFORCING OF BEAMS

Gray Road

McDonald Road
Aging Corrugated Steel Culvert Bridges

- History
- Locations
- Concreting bases
- Lessons learned
PARTIAL CULVERT COLLAPSE LESSONS

Walker Road
• Risk Management - closing Pyramid Bridge during floods

• Accepting earthquake risks where alternative available

• Culverts with overflows

• Pipe fords on very low volume roads
RISK MANAGEMENT

Riversdale Pyramid Road Bridge
BRIDGE PLAN AVAILABILITY

- Stock Underpasses
- Concrete Box Culverts
- Concrete Pipes
- Timber Culverts
- Concrete Bridges
- Steel Concrete Bridges
- Steel Timber Bridges
- Steel Timber & Timber Bridges
- Timber Bridges
- Corrugated Steel Culverts

Legend:
- Red: Total Structures
- Blue: Total Plans

Who has got what...
ASSET MANAGEMENT PRACTICES

- Data collection/inspection
- Database options
- Stock underpass
- Cycle Trail bridges
Use priorisation process:
- Economic value of bridge
- Consultation with users and industry
- Degree of risk/restriction/inconvenience
- Extent of network

Develop long term plans for each bridge:
- Ongoing maintenance
- Replace
- Upgrade
- Long term posting
- Disposal
QUESTIONS?