A Tale of Two Bridges

Eurobodalla Shire Council
A Tale of Two Bridges

A comparison of two bridge replacements within Eurobodalla Shire
Eurobodalla Bridge Programme

- Reduce risk and maintenance costs
- Aimed at older bridges
- Combination of replacement structures and component renewal
Eurobodalla Bridge Programme

- All bridges rated in accordance with IPWEA-NSW Bridge Guide
- 20 year program developed
- Grant funding sought to accelerate works
Aim:

• Replacement or renewal of 15 bridges over 15 years
2006

- 60 Bridges
  - 43 timber
  - 14 concrete
  - 3 composite

- 17 with BCR > 40
- 4 With BCR > 50
- 28% not satisfactory
2018

- 49 Bridges
  - 33 timber
  - 13 concrete
  - 3 composite

- 6 bridges with BCR > 40
- 1 bridge > 50
- 12% not satisfactory
By 2018

- 15 timber bridges replaced or renewed

**2006**
- 60 Bridges
  - 43 timber
  - 14 concrete
  - 3 composite
- 17 with BCR>40
- 4 With BCR > 50
- 28% not satisfactory

**2018**
- 49 Bridges
  - 33 timber
  - 13 concrete
  - 3 composite
- 6 bridges with BCR > 40
- 1 bridge > 50
- 12% not satisfactory
Eurobodalla Bridge Programme

Bridge Condition Number
Eurobodalla Bridges
2006 - 2017

2006 vs 2018

2018 Composite
2018 Concrete
2018 Timber
2006 Composite
2006 Concrete
2006 Timber

<30 30-40 40-50 >50
As new Satisfactory Inadequate Unsatisfactory
Waterfall Creek Bridge

Underpass Bridge
Renewal of Runnyford Bridge
Replacement of Tyrone Bridge
Renewal of Runnyford Bridge
Runnyford Bridge

- 130m timber structure
- Constructed 1950’s
- Low volume rural road - Emergency services, local, tourists
Runnyford Bridge

- Sinking, rot
- Number of renewals/replacement of components
- 15t load limit – further reduced to 5 tonne
Runnyford Bridge

- Sanctuary zone of Marine Park
Runnyford Bridge

Scope

- Demolition and replacement
- Reconstruct one abutment
- Seal road approaches
Runnyford Bridge

Aim

- Like-for-like
- Renew in-house using internal skills
- 6 month construction period
Runnyford Bridge

Outcomes

- Replicated bridge
- 15 months to complete
- $1.5M total cost including geo-technical investigations
- 45 tonne load limit proposed to be applied
Runnyford Bridge

Key dates:

- Project initially commenced 2016
- Construction started March 2017
- Completed March 2018
Runnyford Bridge

Issues

• Change from driving from barge to driving out from bridge to protect seagrass
• Pile length increased from average 9.5m to 28-24m
• Piles required splicing to gain length
Runnyford Bridge

Issues

• Wrapping to protect from borers as double treated piles not able to be used
• Restrictions on use of scaffolding and anchor blocks for control stays whilst driving
Runnyford Bridge

Issues

• Condition of girders and piles worse than anticipated

• Increased construction time
  • variable weather
  • impact on fauna – micro-bats found in hollows
Runnyford Bridge

Issues

• Cost blow-out from $0.9m to $2.4m
• Construction period doubled
Replacement of Tyrone Bridge
Tyrone Bridge

- 70m low-level timber bridge
- High commercial use
Tyrone Bridge

• Frequent over-topping (0.5%AEP)
• Impacts on farms, businesses and community
Tyrone Bridge

• Level 3 assessment recommended 5t load limit

• Repairs undertaken to keep in service
Tyrone Bridge

Scope

• New concrete bridge
• Raised deck level
• New road approaches
• Demolition and removal of existing bridge
Tyrone Bridge

Aim

- Replacement bridge using D&C contract
- Deck at 1% AEP flood level
- Downstream of existing to maintain access for users
Tyrone Bridge

Method

- Project Management by Public Works Authority
- 3rd party review of design
- Roadworks by Council
Tyrone Bridge

Outcomes

• 85m long bridge
• 5 spans
• Concrete columns on steel piles
• $2.5M project cost
Tyrone Bridge

Outcomes

• New road approaches and intersection constructed by Council
• Previous bridge removed
Tyrone Bridge

Outcomes

• On-time and on-budget
Tyrone Bridge

Key dates:

• 2016 - Concept design prepared in-house
• Jan 2017 - Contract awarded
• Aug 2017 - Site established
• Nov 2017 - Roadworks by Council
• Mar 2018 - Existing bridge demolished
• June 2018 – Official opening
Tyrone Bridge

Issues

• Increased pile length – profile of bedrock different to geo-technical report

• Deck finish
Comparisons
Comparisons

Construction and life-cycle cost

Construction cost

- Runnyford $18,000 per lin.m.
- Tyrone $27,800 per lin.m.
Comparisons

Construction and life-cycle cost

Life-cycle cost

- Runnyford $480 per annum
- Tyrone $350 per annum
Life-cycle cost

- Runnyford: $480 per annum
- Tyrone: $350 per annum

- Based on similar replacement cost
- Runnyford Bridge replaced 2.5x within 100 years
- Knowing construction limits this would be significantly reduced in future
- Similar project at Silo Farm Bridge only at cost of $370 per annum – similar to Tyrone
Lessons Learned

Plan - Plan - Plan
Summary

• Both bridges Fit For Purpose
• Concrete used where cannot be closed for significant periods
• Timber appropriate where closure can occur
• Runnyford Bridge can be modified to meet changing needs
Two bridges. Different requirements, different outcomes but both delivering the appropriate asset for their community.

“If the building of a bridge does not enrich the awareness of those who work on it, then that bridge ought not to be built.” - Frantz Fanon

“If watching a bridge is much more exciting than crossing that bridge, then you can be sure that it is a very beautiful bridge!” - Mehmet Murat ildan
Questions?