

Category 4: Excellence in Pavement Recycling and Stabilisation in Local Government

Long Term Performance of Bound Insitu Stabilised Pavements

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Richmond Valley Council



2021 AustStab Awards of Excellence

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Project Overview

- The aim of this Research Project was to review the pavement stabilisation strategy implemented by Richmond Valley Council in 1989 and evaluate the remaining life of various road assets treated using this recycling method

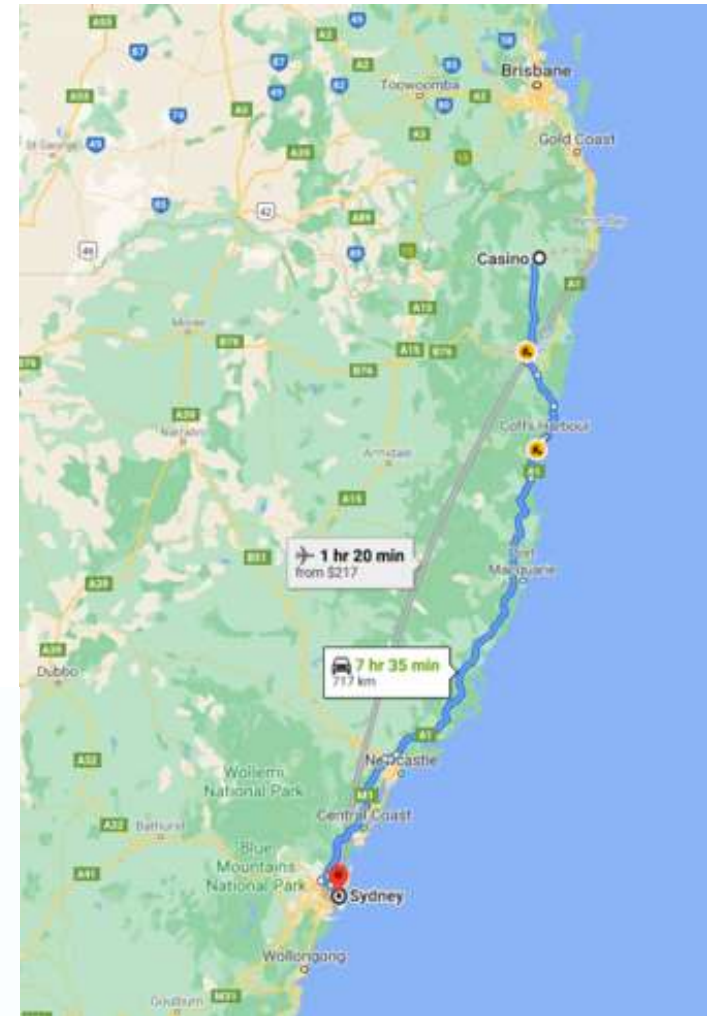


- The underpinning research question / objective, was to quantitatively evaluate, ‘Has the long term performance of bound insitu stabilised pavements with thin surfacings in Richmond Valley met the expectations of the community and the Council?’

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Description of Initiative

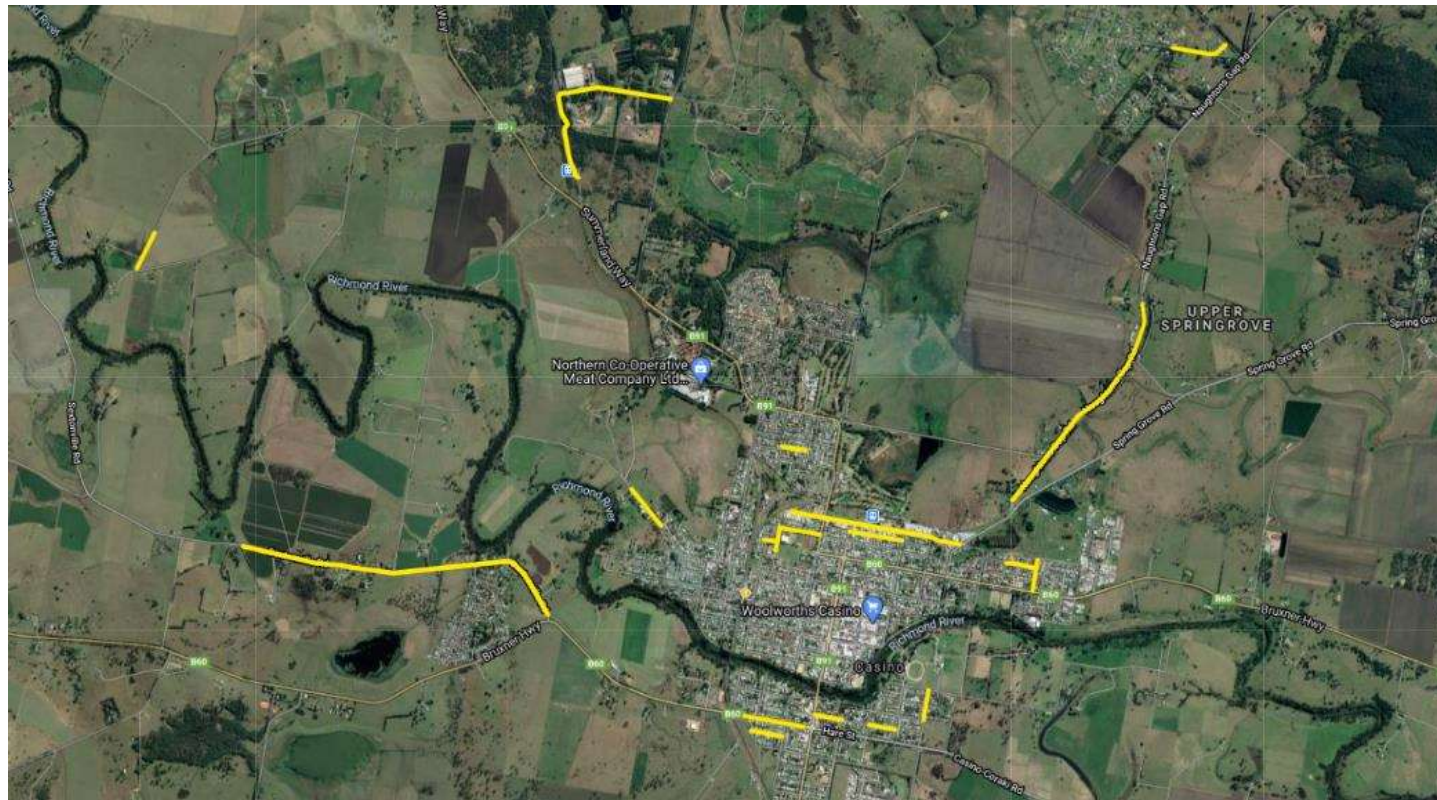
- This Research Project reviewed multiple road rehabilitation projects that have been insitu stabilised by the former Casino Municipal Council and Richmond Valley Council over the past 3 decades, including their performance from FWD testing conducted in 2020 to validate pavement remaining life
- All sites evaluated in this research were stabilised in the 10 year period between 1989 and 1998
- The Seinfeld image reflects the period 1989 – 1998 – refer to this as, ‘The Seinfeld Period’
- The map image merely shows the location of Casino, the main township within Richmond Valley Council



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Stabilisation Sites

33 sites were stabilised by Council in the 10 year period from 1989 – 1998. All sites were a mixture of urban and rural, high speed and low speed and light and heavy vehicle movements. 15 of these sites were selected for examination using Falling Weight Deflectometer measurements which would ultimately be used to back-calculate the remaining life of each site.



A typical stabilising 'train' from the early 1990s in Richmond Valley Shire (previously known as Casino Municipal Council).

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Typical Sites

- Sextonville Road and Naughtons Gap Road were basecourse rehab projects.
- Dyraaba Street was a subbase rehab project with a 200mm granular basecourse overlay and a 35mm AC wearing course.



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Project Challenges



The main challenge was to verify the pavement profiles that were then required to be fed back into the remaining life software program.

Fortunately, Steve Button from RVC has kept great records since the 1980's and we were able to have a high degree of confidence in what profiles existed on all of the sites tested in this research program.

Stabilisation Program
13th → 16th Aug.
1991

Preparation Gang

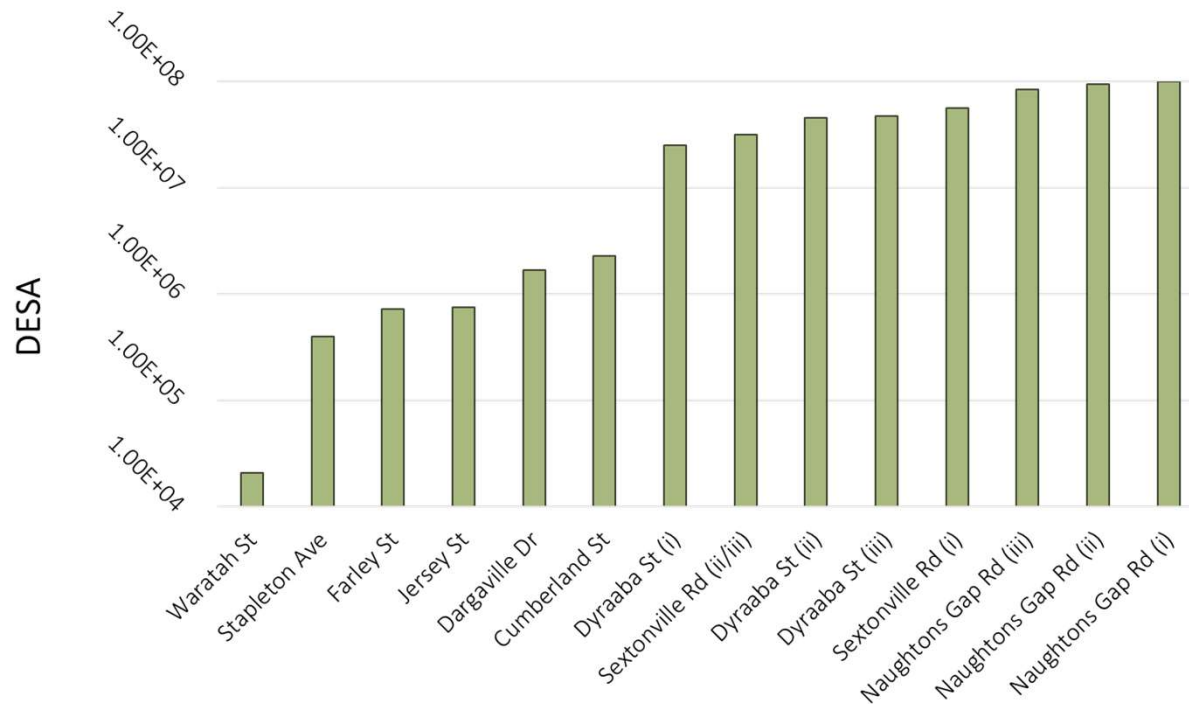
Tues 13th	- Clay Ave	spread & trim sandstone
	- Farley St	" " " "
Wed 14th	- Canterbury St	- check only
	- Naughtons Gap Rd	sandstone to

Stabilisation Gang

Tues 13th	- Sextonville Rd	2600m ²	250 deep
Wed 14th	- Clay Ave	1355m ²	250 deep
	- Farley St St	1240m ²	200 deep
Thurs 15th	- Canterbury St	250m ²	250 deep
	- Cumberland St	1300m ²	200 deep
Fri 16th	- Naughtons Gap Rd.	1430m ²	250 deep

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Key Points of Interest



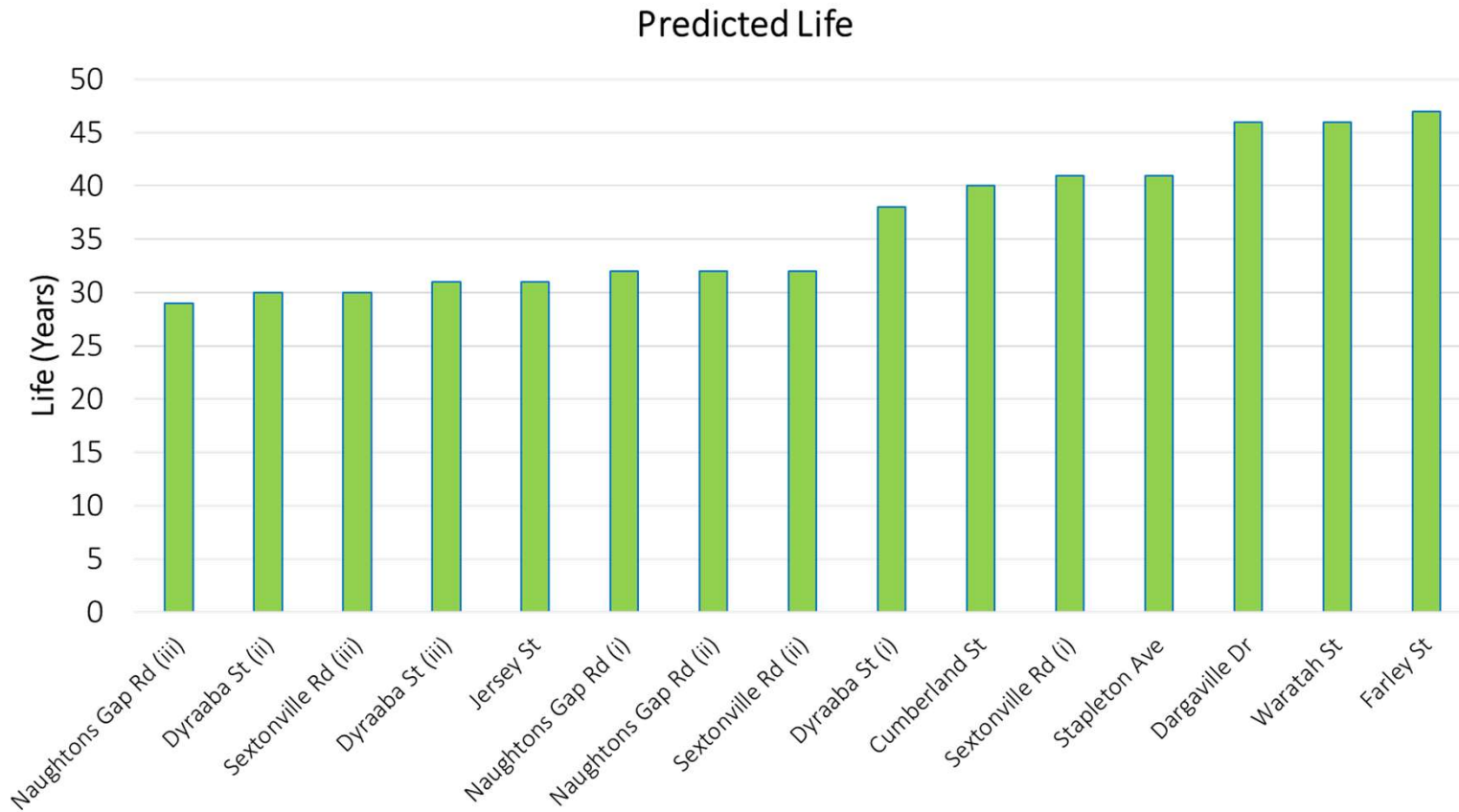
Variations in traffic loadings at the subject sites, ranging from 2.0E+04 up to 1.0E+08 – this spread of sites represented a significant variation in traffic loadings across the sites for evaluation



FWD testing being undertaken on one of the residential streets in the town of Casino – each test that was performed at 20m spacing took approximately 60s to complete

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Evidence of Success



This plot shows the PREDICTED LIFE of each pavement tested. The definition of Predicted Life is the life since construction to date + the back calculated remaining life from the FWD testing.

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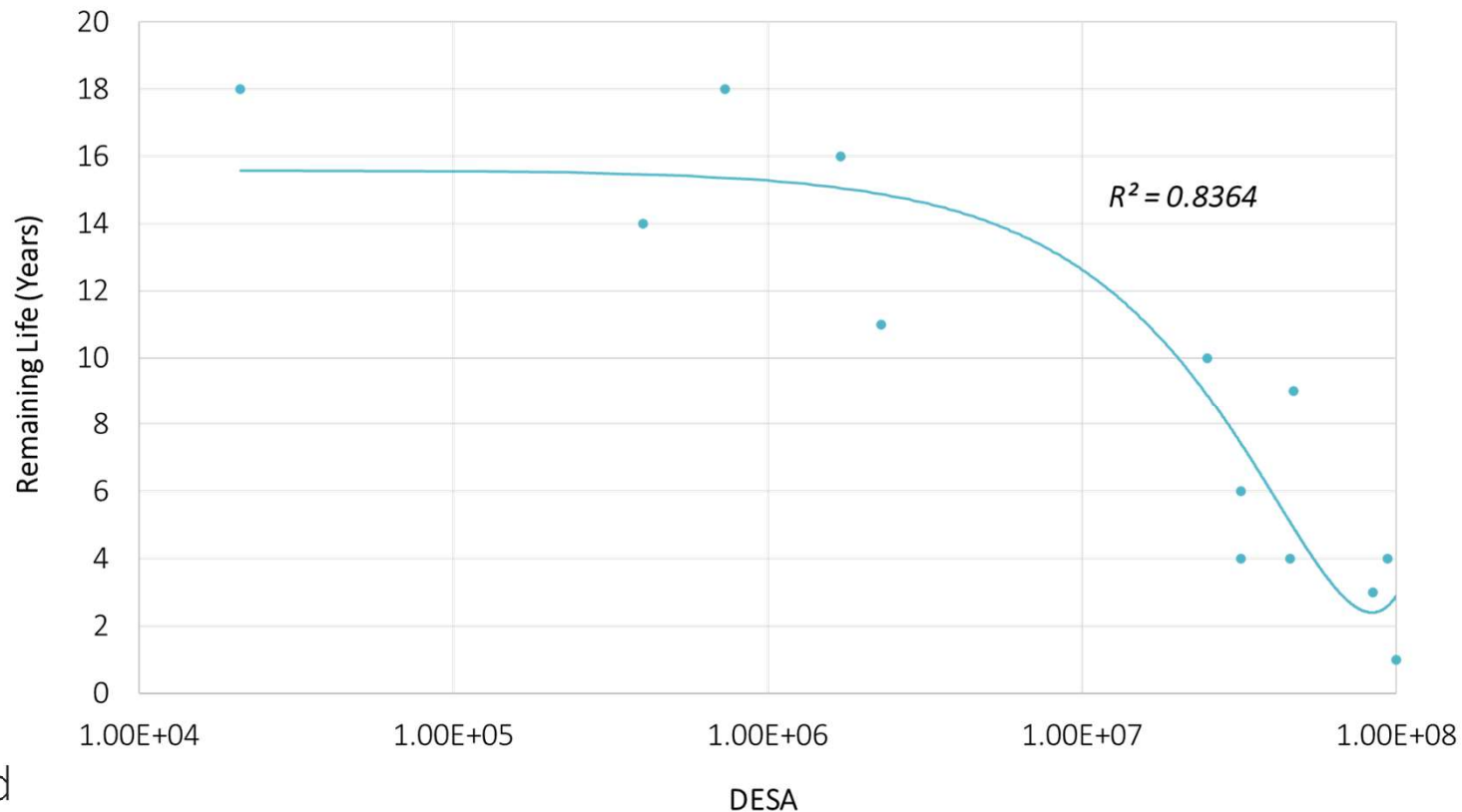


Pavement Recycling and Stabilisation Association

Evidence of Success

With 2 outliers removed (Jersey Street & 1 section of Sextonville Road), this plot shows that remaining life is not significantly effected until the DESA exceeds 10 million standard axle loads – however we need to remember that all sites have performed for in excess of 30 years.

Clearly this research demonstrates that bound insitu stabilised pavements on light to medium to heavily trafficked roads exceed the design lives originally designed for and the expectations of the asset owner.



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Results Summary

Design Deflection	1.00mm
Average Deflection	1.19mm
Average Curvature	0.32mm
Average Pavement Life	36 Years
Average Stabilised Layer Modulus	710 MPa
Average Subgrade CBR	6%

This table shows a summary of the key outputs from the FWD testing of all sites tested in this research program. Note that the subgrade CBR is a back calculated CBR and may not represent a soaked condition.

The key outcome is the average pavement life being 36 years since rehabilitation when the Council only expected 20 years – or probably less given the 90-95% reliability factor applied to the process. Ultimately the stabilised assets will have lasted for approximately twice the design life and extended the asset life and value for an additional 15-20 years.

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Demonstration of Project Initiative in Use



As a result of this research, which validated the long term performance of bound insitu stabilised pavements over multiple decades, Richmond Valley Council have confidence in continuing with this treatment as a frontline rehabilitation strategy. This image illustrates a 2020 project on Fogwells Road being undertaken with RVC and SPA.

RVC have since invested in their own new stabiliser due to their increased confidence in this process in over 3 decades of performance evidence.

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