

Building Climate Resilient Unsealed Roads

COUNCIL NAME

Bland Shire Council

WEB ADDRESS

blandshire.nsw.gov.au

SIZE

8,560 square kilometres

POPULATION

6,000

Overview

With droughts becoming more intense and frequent, availability of water becomes a major constraint to maintaining unsealed roads. Without the optimum moisture content for compaction, the lifespan of the pavement structure reduces due to excessive loss of fines and the poor binding of material causing pavement degradation. With the need for resilient, safe, efficient and cost effective road networks, Bland Shire Council conducted a 12-month trial using different treatments on ten 500-metre sections of homogenous unsealed road.

Background

Bland Shire Council is located on the northern fringe of NSW's Riverina region, providing a major transport hub connecting the Mid-Western and Newell Highways. A highly productive agricultural and gold mining area, Bland Shire has a small population but an extensive rural road network, including more than 2,500 kilometres of unsealed roads.

Climate change is exacerbating the already significant Council time and resources devoted to road maintenance, particularly during droughts as water is a critical component of roadworks. Without optimum moisture content for compaction, the pavement structure life span is shortened due to loss of fines and poor material binding, resulting in pavement degradation.

During the 2017-2020 drought, road building and maintenance became increasingly difficult as the local farmers who Council relied on for water supplies ran low themselves.

With warmer temperatures and lower rainfall impacting the Riverina region, sourcing water from the community is not feasible long term. Accordingly, it is critical that the Shire modify its roadworks methods to meet the challenge of climate change and ensure the ongoing safety and prosperity of the area.

The resulting Hollands Lane treatment trial investigated a number of emerging road construction technologies to extend the life span of unsealed roads. The aim was to determine an environmentally-friendly, cost-effective method that reduces maintenance while optimising resources, such as water, gravel, operators and plant equipment.

Implementation

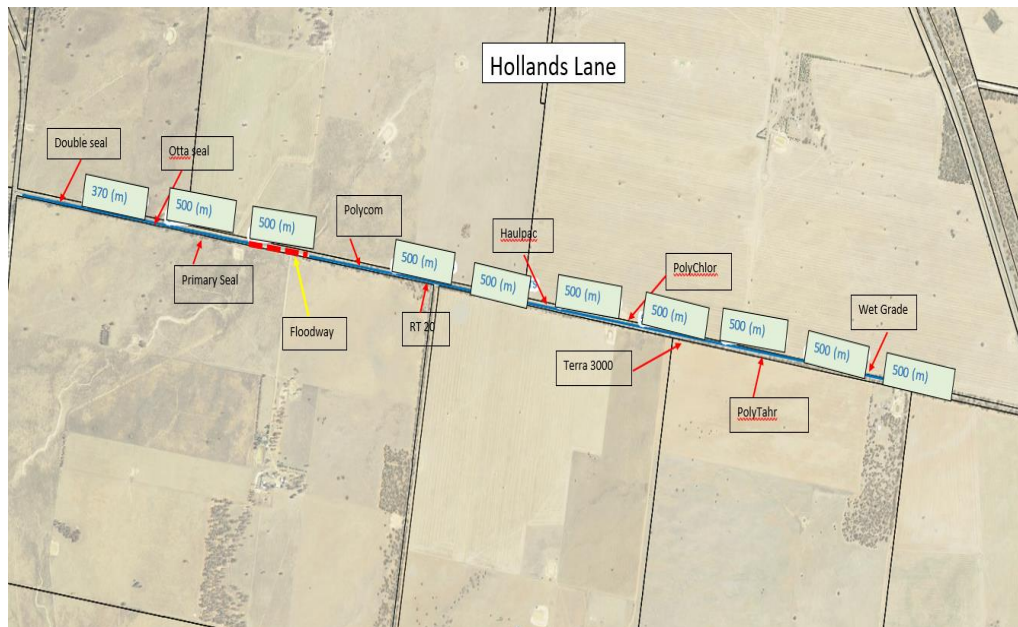
Council considered various test sites before selecting Hollands Lane — a high-traffic, heavy vehicle route where the existing pavement and straight lengths facilitated the construction process. It is also a resource-intensive thoroughfare requiring significant maintenance at least twice a year.

Nine treatment options were chosen for the trial: double/double seal; primer seal; Otta seal; HaulPac; PolyCom; RT20 Dynamic; TERRA-3000; Polychlor Omega; and

Polytahr. A final section of road was wet graded to provide a benchmark for measuring the relative performance of the different treatments.

Each trial section was constructed according to specifications provided by the suppliers. The construction sequence and techniques were overseen by the subject matter experts while Council officers recorded critical aspects of the construction process. The asset team monitored the products' performance using Hawkeye and Rough-o-Meter Technology and gathering Annual Average Daily Traffic (AADT) data. Price comparisons were calculated at a per metre squared rate and considered emissions, human resources, plant equipment and product-enhancement cost.

The March 2021 flood event impacted all 10 sections of the trial with water covering most of Hollands Lane.



Aerial map of Hollands Lane with type and location of trial treatments

Monitoring and geotechnical testing was conducted throughout the trial but Council will continue to assess the treatments throughout the pavement's anticipated life for longevity and performance.

Outcomes

This project is designed to identify more effective treatments for climate-affected unsealed roads within the local government area.

Double/double seal is expected to be the most expensive but also most durable treatment, providing the underlying pavement structure with the greatest protection from environmental and traffic factors. However, all the treatments improved the pavement characteristic and performed well, considering the flooding experienced during the trial.

Further trials are being undertaken on Monia Gap Road and Bootoowa Road in the west of Bland Shire. These byways see significant vehicle movements, particularly road trains and heavy machinery, and require constant repairs. Council is trialling

Haulpac, PolyCom and TERRA-3000 treatments to reduce maintenance requirements on these roads.

Findings from the Hollands Lane trial have led to a revised Roads Strategy Procedure for future projects to ensure best practice is embedded into “business as usual”. The successful treatments from the trial can be replicated throughout the Council area and this information circulated to stakeholders and other rural councils.

Key Learnings

Prior to starting the project, it was noted that drainage at the test site was inadequate with Hollands Lane becoming a watercourse during heavy rains. After landholders were asked to remove the “levy banks” protecting cropland adjacent to the laneway, better drainage allowed water to dissipate faster and not pool in low-lying areas of the roadway.

Although the project’s focus was on extending the life span of unsealed roads under hotter and drier conditions, significant rainfall led to repeated flooding during the trial. Maintenance to the affected sections may have hampered results from certain treatments but this also shed light on their performance during periods of high rainfall.

Ravel tests to establish particle loss could not be conducted due to heavy rains washing material on and off the trial sections.

Further information

The full project report is available on the [Bland Shire website](#).

Contact

Name: Trevor Turner

Position: Facilities Foreman

Phone: 02 6972 2266

Email: tturner@blandshire.nsw.gov.au



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