Case Study: Environmental Benefits and Pavement Performance

1.5km Unsealed Gravel Section of Road; Kosciuszko National Park.

Product: RDC - Road Dust Control.

Background

To support road maintenance efforts on the primary access road a 1.5km section of unsealed gravel road was selected for a trial. The trial was to assess improvements in dust control and pavement stability through the application of RDC (Road Dust Control).

Maintained by Transport for New South Wales (TfNSW) within the Kosciuszko National Park, undergoes annual upkeep, including water cart usage, re-sheeting, and pavement upgrades after each snow season. The trial, conducted on 3rd October 2024, offered an opportunity to evaluate the environmental and functional benefits of RDC on unsealed roads.

Trial Details

Pre-treatment Pavement Condition:
The trial section, as well as the untreated control sections, consisted of uncompacted new pavement material (DGB/DGS quality). At no point was the road closed to traffic during the application of RDC, which demonstrated the ease of integration into routine maintenance without requiring detours. Traffic movement even facilitated the penetration of RDC into the road base.

Application Process:

1. **Initial Application:** RDC was applied using a water cart at a rate of 1 litre/sqm to the uncompacted road base.
2. **Rolling and Further Applications:** Following light rolling, two additional applications of RDC were added to the road base.
3. **Final Compaction:** The pavement was compacted using rubber tyre rollers and left to cure.
4. **Weather Exposure:** The treated surface experienced rainfall overnight, which did not appear to negatively impact the treatment upon inspection.



First Application | Second Application | Third Application | Final (treated- untreated)

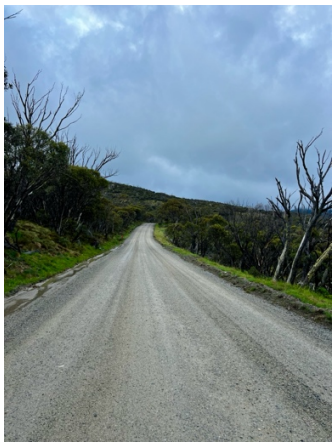
Site Inspection and Observations (5th December 2024)

Ten weeks post-trial inspection revealed the following results:

Performance of Treated Sections:

- **Surface Finish:** The treated road maintained a smooth, well-compacted surface with excellent aggregate retention.
- **Pavement Integrity:** Minimal deformation was observed, even under traffic loads. Deliberate wheel spins on an uphill corner caused no significant damage to the treated surface, which remained intact and resilient.

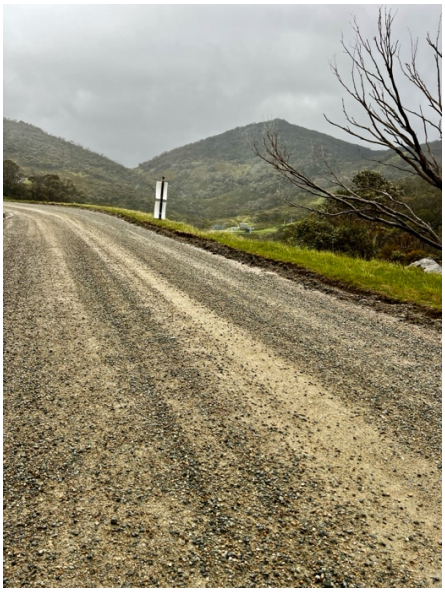




Comparison to Untreated Sections:
Untreated sections of the road, which had been re-sheeted and rolled simultaneously with the RDC-treated areas, showed noticeable deterioration:

- Aggregate loss
- Formation of corrugations
- Development of potholes
- General unravelling of the pavement surface

The untreated areas highlighted the superior performance of RDC-treated sections in terms of durability, dust control, and aggregate retention.


Pot Holes & sign of corrugations

Erosion of fines causing dust aggregate loss and unsafe conditions

Environmental and Practical Benefits

The trial demonstrated the following advantages of RDC-treated material:

1. **Reduced Maintenance Needs:**
    - Enhanced aggregate retention and surface stability reduce the frequency of grading and water cart usage.
    - Fewer maintenance activities mean reduced operational disruptions and resource usage.
2. **Minimized Dust Emissions:**
    - Improved air quality for road users and the surrounding environment.
3. **Sustainability:**
    - Preservation of natural resources through reduced material loss and waste.
    - Decreased environmental impact of maintenance operations.

Client Feedback

The client expressed high satisfaction with the trial results, commissioning GLA to treat road shoulders on a nearby arterial road, a major highway section leading into a regional centre during the Christmas 2024 period. This initiative is expected to:

- Improve dust control.
- Maintain aggregate retention, reducing risk of loose aggregate and potential windscreen damage to traffic.

This successful trial underscores the potential of RDC to support sustainable road management practices.

Conclusion

The RDC trial on this road demonstrates clear environmental and functional benefits:

- Significant dust reduction, improving air quality.
- Enhanced road durability under varying traffic and weather conditions.
- Reduced maintenance needs, lowering maintenance costs and environmental impacts.

By aligning with TfNSW's commitment to sustainable infrastructure within the Kosciuszko National Park, this approach sets a benchmark for innovative and eco-friendly road management practices.