

TRANSFER OF CRUMB RUBBER MODIFIED ASPHALT TECHNOLOGY TO WA



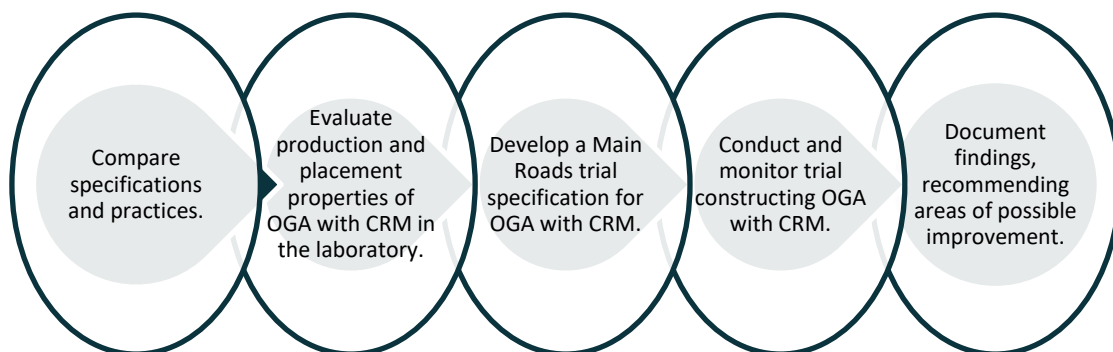
Investigating and implementing the use of crumb rubber modified binder in open-graded asphalt

Every year in Australia, millions of tyres reach their functional end-of-life and are commonly disposed in landfill. Crumb rubber derived from waste tyres can be used in bitumen for road construction, providing increased durability and cracking resistance. The use of crumb rubber modified (CRM) binder in open-graded asphalt (OGA) is commonplace internationally, but remains atypical in Australia.

Background

Incorporating crumb rubber into bitumen not only improves performance, but is also a high-value, sustainable alternative utilisation for a waste material. The use of CRM in high-performance sprayed seals has been routine practice in Western Australia (WA) for over 30 years. However, its use in asphalt has not been previously explored. The WARRIP sought to validate CRM technology in OGA for wider use by industry.

Approach



Achieved to date

- Successful development of CRM binder conforming to AAPA and draft Main Roads specification.
- Successful substitution of CRM binder for synthetic polymer modified binder in Main Roads standard OGA mix.
- Draft Specification 516 *Crumb Rubber Open Graded Asphalt* developed and validated through mix design and production trial.
- Full-scale trial sections constructed on Kwinana Freeway.
- Use of a workability additive facilitated placement of the OGA at 150°C or possibly lower temperature.

OGA CRM YARD TRIAL



Source: ARRB 2019.



Achieved to date cont.

- Personal exposure monitoring on the truck controller, paver operator and leading hand screed indicated emissions well below acceptable limits.

What's next

Substitution of CRM for synthetic polymer modified bitumen to be extended to a wider program of resurfacing work beginning in 2019/2020.

OGA WITH CRM TRIAL ON KWINANA FWY



Source: ARRB 2019.

OGA WITH 18% RUBBER: AFTER 4 HOURS AND 1 HOUR OF MIXING AT 180°C



Source: ARRB 2019.



Exploring the placement of OGA with higher in-situ air voids to achieve improved outcomes for road users and the community

FUTURE CONSIDERATIONS



Can CRM be used in other types of asphalt?



What is the maximum amount of rubber to yield the best performance of the asphalt?

