

Project Number: 5-21344.00

Crumb Rubber in Roads

Part 2: Action Plan

Tyrewise c/- 3R Group Limited, Regulated Product Stewardship Scheme
Manager

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Disclaimers and Limitations

This action plan ('**Plan**') has been prepared by WSP exclusively for Tyrewise c/- 3R Group Ltd. ('**Client**') in relation to the Crumb Rubber in Roads Update Report 2025 and Action Plan ('**Purpose**') and in accordance with the Short Form Agreement 14/11/24. The details in this Plan are based on and are subject to the assumptions specified in the Update Report and as per discussion with the representatives from Tyrewise and NZTA. WSP accepts no liability whatsoever for any reliance on or use of this Plan, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Plan by any third party. **The Plan is for Tyrewise to circulate amongst its Board of Trustees ONLY.**



Action Plan

This Action Plan is developed based on the barriers and opportunities as summarised in the Update Report (Issued 7 March 2025), and discussions between the representatives of Tyrewise Scheme Delivery Management team and the NZTA (21 March 2025 and 2 April 2025). A summary of the discussion notes (as per Miro board) can be found in the Appendix.

It is worth noting that Tyrewise has indicated that as part of the Regulated Product Stewardship scheme, there is ~\$8M contestable funding available annually to support R&D, Circular Solutions (Market Development) and Community Grants. Later in 2025, a Registration of Interest process will commence which will seek information from those entities who may need funding to reduce barriers to developing domestic markets and/or manufacturing finished goods. This is viewed as a potential aid to the implementation of the Action Plan.

In addition, it should be noted that the NZTA is concurrently looking into standardisation of a process to verify/approve any new materials/products/technology that enters the Agency's supply chain. Therefore, it is entirely possible that this Action Plan could inform the design of that process OR vice versa in the future.

The Plan is designed as a 'guide' for Tyrewise and the NZTA for future development and application of a detailed implementation plan. It is recognised that industry bodies such as Civil Contractors New Zealand (CCNZ) and Aggregate & Quarry Association (AQA) will be critical participants in stakeholder engagement.

The Action Plan is shaped in the following order:

1. By key end-use market applications (asphalt and chip seals);
2. Under each application, the individual actions are sequenced in the order of the product's lifecycle;

The specifics in the Plan are subject to further re-prioritisation by the suggested owners depending on timing and other considerations. The structure of the Plan focuses on enabling uptake of tyre-derived products (TDP) and tyre-derived manufactured products (TDMP) in the roading sector through a series of investigative actions. The information collected from the proposed research and evaluation will form part of the whole-of-life assessment and business cases to justify future investment and/or policy changes.

End-Use Application 1 – Asphalt

Table 1: Action Plan for Asphalt

Barriers	Actions	Responsible Owner	Timeframe	Prerequisite
1.1 Supply	1.1.1 Stakeholder engagement	Tyrewise	Immediate	-
	1.1.2 Review of NZ Specification (what can we adopt from Austroads)	NZTA	Immediate	-
	1.1.2.1 ATS3110			
	1.1.3 Assessment of supply capacity in NZ	Tyrewise	Immediate	-
	1.1.3.1 Quantity & Location			
	1.1.3.2 Link in with pipeline projects			
	1.1.4 Interlaboratory study – verification of product suitability	NZTA+	Immediate	1.1.3
	1.1.5 Identification of candidate materials for 1.2.4.	NZTA	Immediate-Medium	1.1.4
1.2 Demand	1.1.6 Gap analysis	NZTA, Tyrewise	Medium	1.1.2-1.1.5
	1.1.6.1 Investment / Incentives / business cases			
	1.2.1 Stakeholder engagement	NZTA	Immediate	-
	1.2.2 Review of M01-A	NZTA	Immediate	-
	1.2.3 Assessment of manufacturing capacity in NZ	NZTA+	Medium	1.1.3
	1.2.3.1 Investigation into current plants			
	1.2.3.1.1 Resource consent (see 1.3.1.5 and 1.3.1.6)			
	1.2.3.1.2 Technical requirements			
	1.2.3.2 Location			
	1.2.3.3 Link in with pipeline projects (combine with 1.1.3)			
	1.2.4 Independent verification of product performance to respective specifications	NZTA+	Immediate-Medium	1.1.5
	1.2.5 Interlaboratory study – validation	NZTA+	Medium	1.2.4

Barriers	Actions	Responsible Owner	Timeframe	Prerequisite
	1.2.6 Identification of candidate products/plants for field trials	NZTA	Medium-Long	1.2.5
	1.2.7 Gap analysis	NZTA, Tyrewise	Medium-Long	1.2.2-1.2.6
	1.2.7.1 Investment / Incentives / business cases			
	1.2.8 Review of Procurement Policy	NZTA	Long	1.3.1
1.3 Performance & Environmental	1.3.1 Field Trials	NZTA+	Medium	-
	1.3.1.1 Site selection			
	1.3.1.2 Selection of candidate products based on 1.2.6.	NZTA	Medium	1.2.6
	1.3.1.3 Selection of benchmark products for comparison	NZTA	Medium	-
	1.3.1.4 Monitoring & Evaluation planning	NZTA+	Medium-Long	-
	1.3.1.4.1 Development of key performance indicators / measures			
	1.3.1.4.2 Timing and frequency			
	1.3.1.5 Production phase	NZTA+	Medium-Long	-
	1.3.1.5.1 Investigation into potential barriers on resource consent			
	1.3.1.5.2 Odour suppression technology verification			
	1.3.1.5.3 Emissions			
	1.3.1.5.4 Carbon footprint			
	1.3.1.5.5 Economics / Affordability			
	1.3.1.6 Application phase	NZTA+	Long	-
	1.3.1.6.1 Investigation into potential barriers on resource consent			
	1.3.1.6.2 Odour suppression technology verification			
	1.3.1.6.3 Emissions			
	1.3.1.6.4 Carbon footprint			
	1.3.1.6.5 Microplastics			
	1.3.1.6.6 Leaching			



Barriers	Actions		Responsible Owner	Timeframe	Prerequisite
	1.3.1.6.7	Durability			
	1.3.1.6.8	Recyclability			
	1.3.1.6.9	Economics / Affordability			
	1.3.1.7	Summary			
	1.3.1.7.1	Cost-Benefit Analysis	NZTA+	Long	
	1.3.1.7.2	Best practice and guidance notes			

“NZTA+” means either NZTA and/or partnership between NZTA and key stakeholders, e.g. contractors, accredited labs, or suppliers

Figure 1: Illustration of Implementation Path for Asphalt

Orange – Implementation pathway

Green (top) – Barriers

Green (bottom) – Application lifecycle

Blue – Relevant properties of interest



End-Use Application 2 – Chip Seals (Contingent on WORKSTREAM re emulsification)

Table 2: Action Plan for Chip Seals

Barriers	Actions	Responsible Owner	Timeframe	Prerequisite
2.1 Supply	2.1.1 Stakeholder engagement	Tyrewise	Immediate	-
	2.1.2 NZ Specification review (what can we adopt from Austroads)	NZTA	Immediate	-
	2.1.3 Assessment of supply capacity in NZ	Tyrewise	Immediate	-
	2.1.3.1 Quantity & Location			
	2.1.3.2 Link in with pipeline projects			
	2.1.4 Interlaboratory study – verification of product suitability	NZTA+	Immediate	2.1.3
	2.1.5 Identification of candidate materials for 2.2.5	NZTA	Immediate-Medium	2.1.4
	2.1.6 Gap analysis	NZTA, Tyrewise	Medium	2.1.2-2.1.5
	2.1.6.1 Investment / Incentives / business cases			
2.2 Demand	2.2.1 Stakeholder engagement	NZTA	Immediate	-
	2.2.2 Review of M01-S (pilot/draft)	NZTA, WSP NZ	Immediate	-
	2.2.3 Review of procurement (in conjunction with Error! Reference s ource not found.)	NZTA	Immediate-Medium	-
	2.2.4 Assessment of manufacturing capacity in NZ	NZTA+	Medium	2.1.3
	2.2.4.1 Investigation into current plants			
	2.2.4.1.1 Resource consent (see 1.3.1.5 / 1.3.1.6)			
	2.2.4.1.2 Technical requirements			
	2.2.4.2 Location			
	2.2.4.3 Link in with pipeline projects (combine with 1.1.3)			
	2.2.5 Independent verification of product performance to respective specifications	NZTA+	Immediate-Medium	2.2.4

Barriers	Actions	Responsible Owner	Timeframe	Prerequisite
	2.2.6 Interlaboratory study – validation	NZTA+	Medium	2.2.5
	2.2.7 Identification of candidate products/plants for field trials	NZTA	Medium-Long	2.2.6
	2.2.8 Gap analysis	NZTA, Tyrewise	Medium-Long	2.2.2-2.2.7
	2.2.8.1 Investment / Incentives / business cases			
	2.2.9 Review of procurement (in conjunction with 1.2.8)	NZTA	Long	2.4.1
2.3 Emulsified TDP modified binder for chip seals	2.3.1 Investigation of bitumen modification using devulcanized rubber TDP	WSP NZ	Immediate	-
	2.3.2 Investigation of emulsification of DVR-modified binder	WSP NZ, NZTA+	Immediate-Medium	2.3.1
	2.3.2.1 Lab-scale			
	2.3.2.2 Industrial-scale			
	2.3.3 Review Supply/Demand capacity in NZ (2.1.3 / 2.2.4)	NZTA+	Immediate-Medium	2.1.3, 2.2.4
2.4 Performance & Environmental	2.4.1 Field Trials	NZTA	Medium	-
	2.4.1.1 Site selection			
	2.4.1.2 Selection of candidate products based on 2.2.7.			
	2.4.1.3 Selection of benchmark products for comparison	NZTA	Medium	-
	2.4.1.4 Monitoring & Evaluation planning	NZTA+	Medium-Long	-
	2.4.1.4.1 Development of key performance indicators / measures			
	2.4.1.4.2 Timing and frequency			
	2.4.1.5 Production phase	NZTA+	Medium-Long	-
	2.4.1.5.1 Investigation into potential barriers on resource consent			
	2.4.1.5.2 Odour suppression technology verification			
	2.4.1.5.3 Emissions			

Barriers	Actions	Responsible Owner	Timeframe	Prerequisite
	2.4.1.5.4 Carbon footprint			
	2.4.1.5.5 Economics / Affordability			
	2.4.1.6 Application phase			
	2.4.1.6.1 Investigation into potential barriers on resource consent			
	2.4.1.6.2 Odour suppression technology verification			
	2.4.1.6.3 Emissions			
	2.4.1.6.4 Carbon footprint	NZTA+	Long	-
	2.4.1.6.5 Microplastics			
	2.4.1.6.6 Leaching			
	2.4.1.6.7 Durability			
	2.4.1.6.8 Recyclability			
	2.4.1.6.9 Economics / Affordability			
	2.4.1.7 Summary			
	2.4.1.7.1 Cost-Benefit Analysis	NZTA	Long	-
	2.4.1.7.2 Best practice and guidance notes			

“NZTA+” means either NZTA and/or partnership between NZTA and key stakeholders, e.g. contractors, accredited labs, or suppliers

Figure 2: Illustration of Implementation Path for Chip Seals

Orange – Implementation pathway

Green (top) – Barriers

Green (bottom) – Application lifecycle

Blue – Relevant properties of interest



Appendix

Notes from Miro board (Meeting 21/03/2025)

Barrier	Key Considerations
<u>Supply</u> Key Outcomes – Meeting specifications, security of supply, and cost-effective solutions	Specification needed for manufacturing
	Targeted investment to achieve adequate/secured supply
	Interlaboratory testing of supply
	Review of specifications – application dependent
	Chip seals focus for biggest impact
	Mapping of supply and processing capabilities
<u>Demand</u> Key Outcomes – Products meeting specifications and self-sustaining market	Investigation into incentives for generating demand
	Procurement
	Contractors engagement
<u>Viability of TDP-modified bitumen emulsions</u> Key Outcomes – Confirm the viability of this technology path	Targeted research into TDP modified binder
	Targeted research into emulsification of TDP modified binders
	Field trial – production
	Field trial – application
<u>Uncertainties in Performance</u> Key Outcomes – To overcome uncertainties in performance	Demonstration of use/effectiveness in NZ market
<u>Environmental Uncertainties</u> Key Outcomes – To overcome key uncertainties in environmental impacts of the technologies	Investigations into resource consent issues for contractors
	Public perception / impact of odour issues
	Perceived odour issues – plant locations
	Comprehensive and comparative study on emissions/leachates/microplastics
	Recyclability trials
	Practical measurements / field trials