



The pros and cons of plastic

Posted on February 18, 2020 by **Holly Keys**

An Austroads report, written by Level 5 Design, reveals findings from a literature review and practical trials of recycled plastic in roads. The report calls for Australian and NZ road authorities to provide further guidance for the use of these materials.



By July 2021, exporting waste plastic which has not been turned into value-added material will be banned in Australia.

The announcement of the waste export ban will see many streams of waste products banned from leaving Australian shores.

In 2019, there was an increase in the use of recycled plastics in asphalt mixes on Australian roads, with trials happening across a number of states.

The ban is likely to inspire the road construction sector to incorporate greater volumes of recycled plastic into pavements in the future.

Both the addition of plastic into asphalt mixes and its combination with bitumen for spray sealing are being investigated as a viable option to reduce Australian waste plastic.

The Austroads report 'Viability of Using Recycled Plastics in Asphalt and Sprayed Sealing Applications' examines the practicality of using recycled plastics in asphalt and spray seals.

The report focuses on Australian and New Zealand applications and comes in the wake of these changes to the waste sector.

The report cites major benefits for using recycled plastics in road applications such as reduced energy consumption, reduced waste to landfill and alleviating the need for use of some virgin materials.

It details a number of occupational health and safety matters that need to be further explored and also identifies issues in relation to microplastics, future reuse of pavement modified with recycled plastics, material storage stability and gas emissions.

Its lead author, Christina Chin, Victorian State Manager at Level 5 Design – an advisory consultancy firm, says the research found many benefits to using recycled plastics in asphalt, including virgin resource savings.

"We don't know how long virgin material resources are going to last, so if you can reuse waste plastics, it could help with sustainability," Ms. Chin says.

However, the report notes the performance and long-term durability of asphalt modified with recycled plastics needs to be monitored and studied closely to better understand pavement behaviour under different traffic loading and environmental conditions.

It states this investigation should be conducted by an independent third-party reviewer.

The report also recommends an independent third-party review be conducted of the most commonly used proprietary products.

It calls for the review to be compared with standard Australian bitumen and asphalt mix specifications, as well as against individual state road authority standards and guidelines.

Ms. Chin says most of the literature found for the report was based on overseas laboratory testing. However, these were not subjected to the Australian standards and specifications.



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The report recommends the flexible pavements industry and road authorities collaborate to develop a suitable approach to ensure that the road network does not become a "landfill" for unsuitable waste materials. This is said to be especially the case with increasing pressure to recycle waste plastics.

Ms. Chin says the report suggests there is a need for a strong governance framework to be developed to set rules and to provide guidelines and procedures to achieve desired outcomes.

"This is a very hot topic at the moment and it is an innovative idea for reducing waste plastic. The concerns raised need to be addressed because our road network isn't just about one person or one community. Therefore, there is a need to understand its usability and long-term performance," Ms. Chin says.

With no specification currently endorsed for asphalt or spray seal use, different manufacturers are using different recycled plastic components, such as soft plastics, plastic bottles, milk cartons, toner and other similar products.

While Ms. Chin says it is positive to see the sector innovating, there is currently a lack of fit-for-purpose standards and specifications in Australia. Consequently, there is a need for performance-based specifications to be developed for these materials. By taking this approach, she says it will allow the industry to innovate more.

The report recommends that in the development of a framework, specific elements should be considered and addressed. These include long-term performance and durability, environmental, health and safety and digestion and storage stability.

As the use of recycled plastic in asphalt is increasing, its application in spray sealing is still emerging in Australia and New Zealand.

The combination of recycled plastics and bitumen for spray seal applications is an area the report identified needs more research.

While there is potential to use recycled plastics in spray seals, Ms. Chin says no road trials could be identified in Australia at the time of the report.

Ms. Chin says research showed bitumen is very well categorised in Australia with performance testing, but at the moment there are no guidelines for the modification of bitumen with recycled plastics.

She says in the most basic form, the report calls for a better understanding of the properties of recycled plastic products being used in Australian roads.

Ms. Chin hopes the recommendations in the report are picked up and executed as the popularity of using recycled plastics in asphalt is growing.

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