



# Recent Research for Resource Efficiency and Sustainability

*WSP Research*



# Highlights

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## **Bitumen Alternatives**

- Renewable, biomass resource is the best long term alternative to petroleum bitumen. For examples, vegetable oil based binders and lignin.

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## **Chip Seal Recycling**

- Limited current practice, but a huge opportunity to utilise existing resource.

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[Research and case studies | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](#)



**Potential Environmental  
Impacts of Plastic  
Products used in the  
Road Corridor –  
Non-pavement assets**

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# Aims



**Identify common plastic materials used**



**Identify relevant potential environmental impacts of these materials**



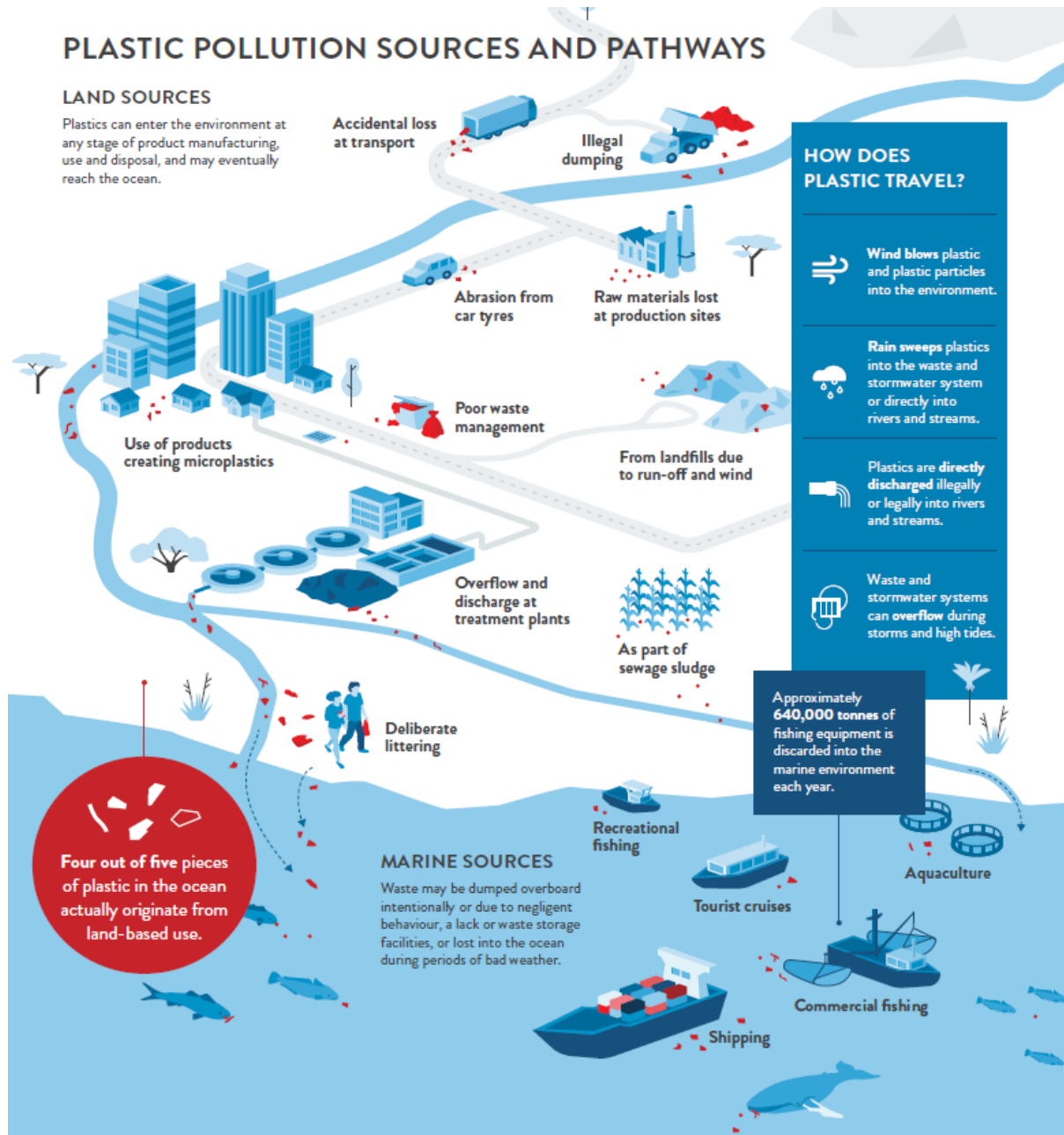
**Development of a draft assessment protocol:**

**Ensuring that decisions are made with product life cycle taken into consideration.**

# PLASTIC POLLUTION SOURCES AND PATHWAYS

## LAND SOURCES

Plastics can enter the environment at any stage of product manufacturing, use and disposal, and may eventually reach the ocean.



# Environmental impacts of plastics used in the road corridor

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**GHG and other emissions – evaporation of solvent or additives into atmosphere** (manufacture, distribution and maintenance of finished material)

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**Microplastics generation** - resulting from weathering or mechanical abrasion

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**Leaching of chemical additives** - rain and ground water

# Main contributing materials

Pavement markings

High friction surfacings, coloured surfacings and adhesives

Edge markers and road cones

Tyre wear

# Draft assessment protocol for plastic product selection

## Product prerequisites

- Complies with current engineering specifications for its application

## High level assessment

- Scale of application
- Product lifespan
- End-of-life disposal options
- Alternatives



# Draft assessment protocol for plastic product selection

## Environmental harm assessment

- Product composition
- Existing controls
- Eco-toxicity testing
  - **Emissions, Microplastics, Leaching**

## Carbon footprint

- If the scale of use warrants, LCA assessment

# Potential future work

## Case study on PVC products

- Environmentally problematic
  - Distinguish options and assist with product selection
  - Refine the draft assessment protocol

## Investigate tyre wear particles problem

- Sampling trials from road corridor
  - Effect of road surface

## Onshore recycling facility – business case

Thank you

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