SWEDISH GOVERNMENTAL ASSIGNMENT ON MICROPLASTICS FROM ROAD TRAFFIC

Mats Gustafsson and Mikael Johannesson

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Foto Raphael Biscaldi, Unsplash

THE ASSIGNMENT IN SHORT

- 2018 – 2020, budget 20 MSEK
- Focus on tyre wear
- Dialogue with stakeholders
- Follow and interact with ongoing research on microplastics
- Compile current knowledge
- Perform research on emissions, properties, occurrence in recipients, flows etc
- Suggest mitigation measures and strategies
- Knowledge dissemination

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SOURCES, AMOUNTS, PROPERTIES

- Tyre wear emissions: just over 11 000 tons/year (Sweden), 1 300 000 tons/year (EU)
- More than half of total emissions of microplastics
- In Sweden passenger cars and light duty vehicles account for appr. 70% of emissions.
- Road wear: road marking products and polymer modified bitumen
- Significant emissions also from road markings
- Main mass of wear is composed of relatively large particles, > 20 µm, but numbers are much higher below 20 µm.
- Ca 5-10 % of tyre wear is PM10 (air quality regulated)
- Aggregates with other particles resulting in a wide variation in physical characteristics including their form, size, and density.

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DISPERSAL AND OCCURANCE

Tyre wear particles has been demonstrated in e.g. road dust, air, waterways, stormwater, snow and different sediments, including e.g. sea floor sediments on the Swedish west coast.

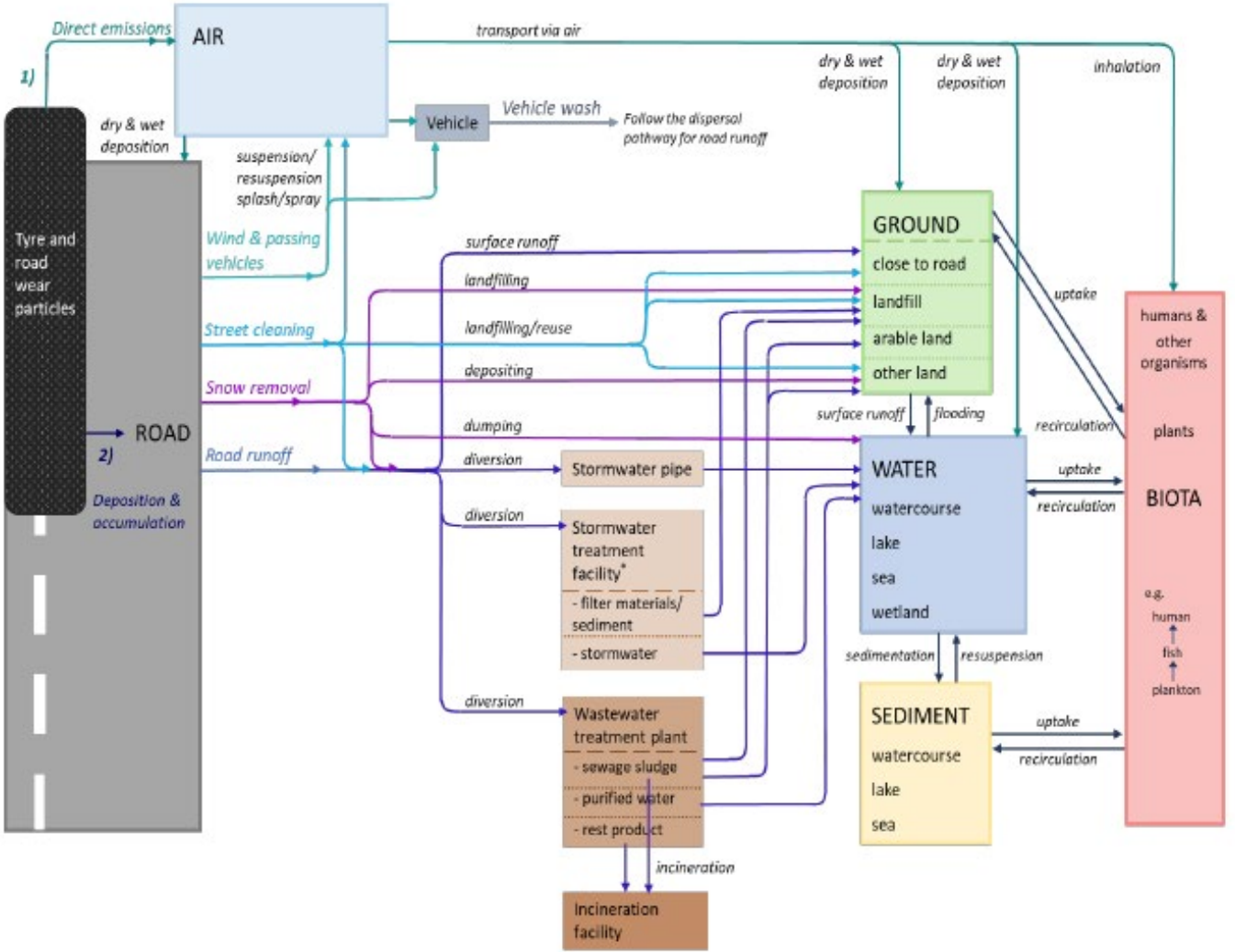
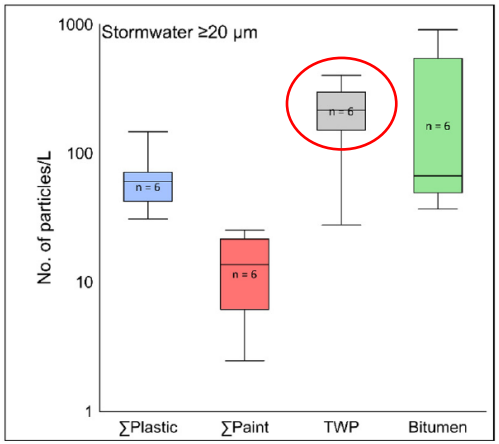
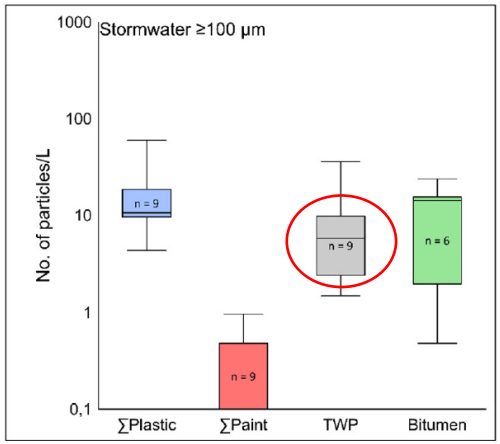


Photo: Göran Blomqvist, VTI

ENVIRONMENTAL SAMPLES

- Contain tyre wear particles (on-road, storm-water, sediments)
- Number concentrations are higher in finer fractions





Järlskog et al. (2021)

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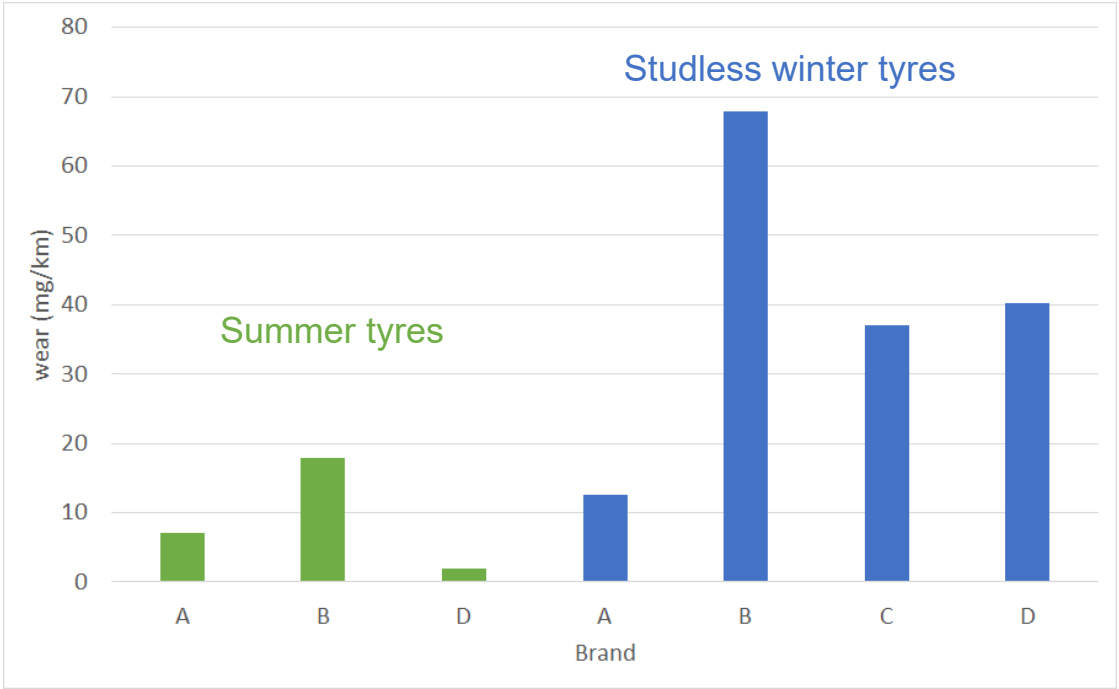
Photo: Mats Gustafsson, VTI

TYRES WEAR DIFFERENTLY DEPENDING ON TYPE AND BRAND



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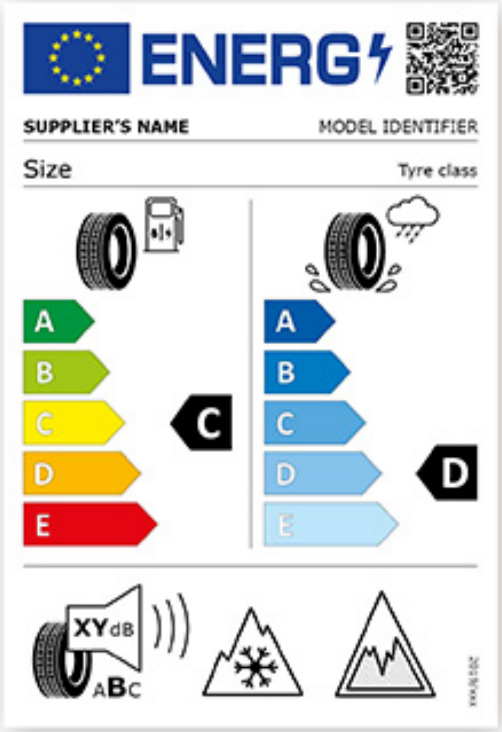

EU-labeling of tyres

POLICY INSTRUMENTS & MEASURES

- Described and ranked 58 potential policy instruments and measures
- Due to lack of information (effectiveness, costs and feasibility) the ranking is uncertain
- No suggestions of immediate implementation except for knowledge building
- Focus on limit the generation and emissions of tyre particles
- Reason: largest source and most effective to take action near the source

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THE EIGHT MOST INTERESTING

Prototype of a particle collector,
Photo: The Tyre collective

Some of them have other positive effects on the environment (e.g. air and noise pollution, climate)

- Reduced road traffic
- Changed driver-behaviour
- Tyres with lower wear propensity
- Optimisation of tyre pressure and wheel alignment
- Regulation of hazardous substances
- Collection of particles while travelling
- Management of stormwater from roads
- Knowledge generation to enable evaluation of risks and need for action

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COMMENTS EU INITIATIVE

- Suggestions in general comply with prioritized mitigation possibilities
- Reduced traffic volumes is an obvious mitigation measure that is not mentioned
- Eco-design needs to include persistence and toxicity of tyre and tyre components/chemicals used
- Re-treading of tyres will not reduce *wear emissions* (if not wearing courses are adapted) but contribute to reduced use of virgin materials
- Ongoing electrification might increase tyre wear (due to higher weights and higher torque) and needs to be followed

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MORE INFORMATION

mats.gustafsson@vti.se

mikael.johannesson@vti.se

Web: www.vti.se/mikroplast

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