AIR QUALITY IN RAIL

THE UIC AIR QUALITY SECTOR

Is a working group dedicated to air quality management in rail.
It especially addresses understanding of pollution from wear and management of ambient air pollutants.

The Sector has set a detailed list of priority focus for the current and upcoming period, in its “ambition paper”:

- List of Air Quality improvement solutions into a catalogue of solutions [report].
  - ▸ To avoid or reduce wear/exhaust emissions from all sources
  - ▸ To manage Air Quality:
    - for underground stations/tunnels: solutions tested or not, technological watch, expert opinion, etc.
    - onboard trains (air pollutants, virus, bacteria, if relevant)
    - in open environment if relevant to rail operation
- Air Quality measurement (Common situations, ventilation, filtering efficiency, …)
- Wheel/rail wear related emissions
- Unified method to define Particulate Matter from wear (brake, contact line, wheel/rail wear)
- Communication on Air Quality in stations
- Low-cost sensors for stations for monitoring
- Cleaning (dust/filters): Downstream impact on environment/water (water framework directive: Substances [emitted to air] that get evacuated to water)
- Legislation (worldwide) overview/comparison: Country specific regulation for platforms / closed environments
- Future handling of construction sites and works’ dust (not using water to clean)
- Reasons to fund Research on Air Quality (Emission of dust and related health issues)

SOURCES OF POLLUTION FOR TRANSPORT

- Brake system
- Wheel / tyre / track
- Pantograph / catenary / connector
- Exhaust

POLLUTANTS

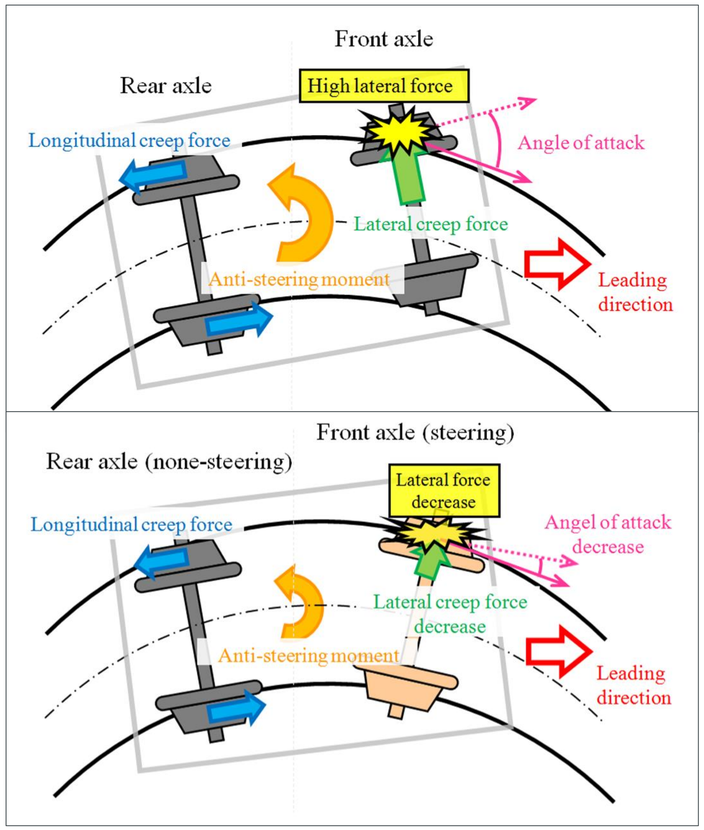
- Particulate matter (plastics/metals/…)
  - PM10 (Fine dust)
  - PM2,5 (Very fine dust)
  - PM0,1 (Ultra fine dust)
- Volatile organic compounds
- Nitrogen oxides
- Hydrocarbons
- Carbon monoxide
- Formaldehyde

What influences emission?
How to reduce emissions?
How to avoid emitting?
How harmful?
How to improve Air Quality?

Explore these by joining the Air Quality workshop on 13 March 2025 morning

Platform screen/edge doors (PSD/PED or automatic platform gates):
It helps containing air masses surrounding tracks to not spread on passenger platforms, thus reducing the risk of dust being breathed in by passengers

SUSTAINABILITY
Action Week



Steered bogies and driving style
Track curves, with train speed, influence wheel and track wear intensity. This is correlated to dust emission.

PROMISING SOLUTIONS!

Avoiding emissions:
- **Electrodynamic/electromechanical braking**

Reducing emissions:
- **Driving Advisory System (DAS) & efficient driving**
- **Steering bogies**

Improving Air Quality:
- **Mechanical filtration (air purifying)**