



# Innovative Urban Air Quality Monitoring in MI-TRAP

*Delivering Traceable, Real-Time, Reliable  
Data on Transport Emissions*



**MI-TRAP**  
Transport • Health • Data

## What is MI-TRAP?

Despite stricter emission regulations and ongoing technological advancements, urban air pollution remains a pressing health and environmental issue. “Real-world” emissions reveal that despite best efforts, today’s controls do not always reflect reality particularly as emerging sources - such as ultrafine particles and non-exhaust emissions - gain significance.

MI-TRAP is tackling this challenge using innovative instrumentation, near real-time data analysis, and targeted field deployments across urban areas in Europe where air pollution remains a major concern. The project focuses on under-regulated yet highly impactful pollutants such as ultrafine particles (UFP) and Black Carbon (BC), along with key elemental parameters of transport-related air pollution.

By establishing a network of monitoring stations in transport emission hotspots and incorporating approaches that link public health, nature-based solutions, and community-driven innovation, MI-TRAP aims to deliver not just better data - but also better decisions for cleaner, healthier cities.

## Where we are now



*The MITRAP project has made significant progress toward building a new generation of air quality monitoring systems tailored to the complexities of modern urban emissions. With a strong focus on transport-related pollutants - including both regulated and emerging indicators - **our work is moving from development to deployment.***

## Who is Involved

Thanks to the collaboration of industry ([HAZE](#), [nanoDUST](#) and [Catalytic Instruments](#)) and research ([PTB](#), [METAS](#), [ICPE](#), [DTI](#), [INFN](#) and [NCSR-D](#)) leading institutions, MI-TRAP has developed and validated innovative, traceable measurement tools, refined calibration protocols, and assembled fully integrated instrument packages ready for real-world application.



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## Novel Instrument Development & Calibration

### What's new

Development of low-cost Particle Number (PN) sensors, named as AirPN10.

Development of catalytic strippers for solid particles.

Key instruments including Scanning Mobility Particle Sizer (SMPS), Condensation Particle Counters (CPC), Black Carbon monitors, AirPN10 sensors, and CO<sub>2</sub> monitors tested.

### Why it matters

Enable dense monitoring networks with high temporal resolution.

Designed to isolate solid particles for more accurate diesel emission measurement.

Ensures traceability and harmonization across different sites.

### Technology in Action



02

## Elemental Analysis of Non-Exhaust Emissions

Real-time elemental analysis with advanced techniques like TXRF and SR-XRF to detect trace metals in air pollution from non-exhaust sources (like brake and tire wear) combined with low-volume sampling with a cascade impactor to separate particle sizes for more detailed analysis.

More accurate, detailed, and real-time data.



03

### High-emitting Vehicles Detection

| Innovation Area | What's new                                                                                                                                                                                                                                                                                                 | Why it matters                                                                | Technology in Action                                                                                                                                                           |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p>Cost-effective method to identify vehicles with malfunctioning or missing Diesel Particulate Filters (DPFs) based on knowledge from measuring the ratio of non-volatile particle number (PN) to CO<sub>2</sub> with key results <a href="#">published</a>.</p>                                          | <p>Spotting these vehicles in real time and support target interventions.</p> |                                                                                             |
|                 | <p>Development of a field-ready air quality system combines high-resolution instruments with low-cost, pre-calibrated sensors to measure particle number, size, and composition in real time. Tools like ACSM, XRFxact, AXA, and SoFi RT support real-time source apportionment of particulate matter.</p> | <p>Makes real-time, on-site pollution tracking more accessible</p>            | <br> |

04

### Integrated Monitoring Packages for Field Deployment

## What's next

Each partner has contributed specific expertise to the development, calibration, and deployment of the air quality monitoring systems. Based on this work, pilot campaigns are now being launched across ten European cities, identified as urban pollution hotspots. **These sites will host a combination of high-resolution instruments and portable cost-effective boxes, allowing for real-time, on-site measurement of both regulated and emerging pollutants.**



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