WP2: Air Quality Monitoring Network & City Pilot Campaigns

Linking Technological Innovation with Real-World Deployment

MI-TRAP
Transport • Health • Data

What is the role of Work Package 2 in MI-TRAP?

MI-TRAP's WP2 plays a key role in linking technological innovation with real-world deployment, delivering traceable, near real-time data that support informed policymaking and urban planning decisions.

Urban air pollution continues to pose severe health and environmental risks. Despite stricter emission standards, real-world transport emissions remain a major source of ultrafine particles and non-exhaust pollutants.

More specifically through its coordinated city pilot campaigns, WP2 is generating applicable evidence on transport emissions under real-world conditions. The datasets produced support the European Union's air quality policies and contribute to ongoing health and exposure studies as a continuation of other major European projects. By integrating near real-time source apportionment with traffic monitoring, WP2 enhances Europe's capacity to measure, understand, and manage urban air pollution at scale.

How?

WP2 is a core technical component of MI-TRAP, responsible for developing and deploying a distributed, state-of-the-art air quality and noise monitoring network across **10 European pilot cities.**

By combining advanced **High-Resolution** (HR) and **Cost-Effective** (CE) stations, WP2 enables near real-time characterization of emissions from road, port, airport, and rail transport.

WP2 activities are led by **NCSR Demokritos** and involve close collaboration with many European partners.

Progress Update

Full-scale monitoring campaigns are concluded in Athens and Lisbon, while the ones in Rotterdam and Florence are currently ongoing.

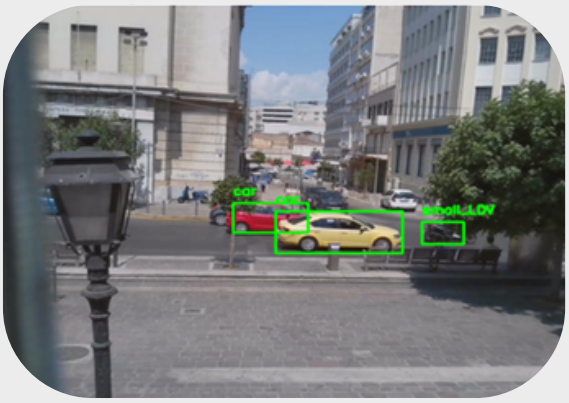
Objectives

01 **Monitor** and characterize transport-related emissions in real-world conditions using harmonized networks.

Enable real-time identification of ultrafine particles, black carbon, and co-emitted pollutants and their sources. 02

03 **Provide** datasets supporting source apportionment, health impact, and policy making.

HR Station in Athens (outside & inside)



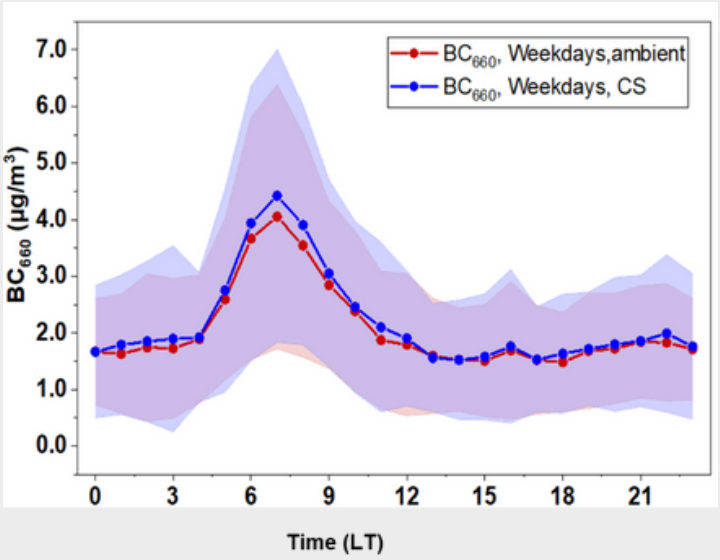
Traffic classification system screenshot

Technical Advances

The near real-time (NRT) Source Apportionment method (AXA method, Manousakas et al., 2025, AMT) has been extended and applied in Athens. This approach enables **automatic source attribution** (traffic, secondary aerosol, biomass burning).

The alternating use of catalytic strippers enables the measurement of both ambient and solid particles within the same setup, providing valuable insights into atmospheric processes. All measurements can be integrated with MI-TRAP's camera-based vehicle classification system.

Preliminary results: diurnal variability of BC in Athens (red-line ambient, blue-line catalytically stripped)



What's next

- Continue synchronized **City Pilot campaigns** across Europe using harmonized protocols.
- Expand integration of **NRT source apportionment** with vehicle classification and traffic flow data.
- Consolidate all city datasets in **shared visualization platforms**.
- Support **policy uptake** and health assessment studies using WP2 outputs.

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