

FACT SHEET: *Urban Road with Medium to High Traffic Volume*

This document presents further information in regard to the [PowerUp NetZero OPEN CALL FOR INNOVATION PROJECTS](#), specifically the activities expected for Consortia presenting innovation projects to the **Strand B: City of Turin Challenges**.

Innovative solutions for street cleaning, pollutant capture, and the reduction of pollutant concentrations on urban roads with medium to high traffic volumes

Type of Area	Urban Road with Medium to High Traffic Volume
Duration	Up to 10 months from the date of signature of the Grant Agreement, with all activities to be completed by 30 November 2027, including baseline monitoring, solution implementation, pilot testing, maintenance, final evaluation, and reporting
Technological Focus Areas	Solutions focused on the reduction of airborne road dust emissions, ranging from advanced street cleaning to integrated monitoring.

Context

Medium- to high-traffic urban roads are characterized by the accumulation and resuspension of dust, consisting of a mixture of natural and anthropogenic particles. These originate both from seasonal organic matter, particularly during autumn and winter, when dry leaves are crushed by vehicle traffic, and from tyre and brake wear, microplastics, hydrocarbons, heavy metals, and other pollutants.

The test area will support the validation of innovative solutions under real urban and operational conditions.

Objective of the Pilot Testing

Testing solutions designed to:

- Improve the effectiveness of street cleaning
- Reduce dust resuspension
- Treat contaminated road runoff water
- Reduce water and energy consumption
- Measure the environmental and operational effectiveness of the tested solutions.

Test Area

A medium- to high-traffic urban road section, preferably characterized by:

- High traffic volumes and the presence of public transport
- Frequent congestion

- A significant presence of mapped street trees, with species and densities capable of generating a representative load of dry leaves during the autumn and winter months
- Significant accumulation of dust and road debris
- The possibility of identifying a comparable untreated control section.

Solutions Sought

1. Advanced Street Cleaning

- Electric or low-emission street-cleaning vehicles
- High-efficiency suction and filtration systems
- Technologies capable of reducing dust dispersion and resuspension
- Low-water-consumption washing systems
- Technologies for water recovery and reuse
- Retrofit devices for existing vehicles

2. Smart and Predictive Cleaning

- Sensors and computer vision systems for the detection of dirt and dust
- Algorithms to optimize routes, frequency, and timing of interventions
- Integration with traffic, meteorological, and air quality data
- Fleet management and decision-support platforms

3. Capture of Non-Exhaust Emissions

- Systems for capturing particles generated by tyre and brake wear
- Filtration devices installed on vehicles or infrastructure
- Roadside barriers, panels, or localized suction systems
- Technologies for collecting microplastics and heavy metals

4. Timely Collection of Organic Matter

- Phenological monitoring systems and integration with the public tree inventory to accurately identify critical tree species
- Weather-based predictive algorithms to estimate peaks in leaf fall
- Shredding and volumetric compaction technologies
- Equipment dedicated to the removal of wet or degraded leaf litter
- Intermodal logistics and lightweight temporary storage facilities

5. Treatment of Road Runoff Water

- Caditoie filtranti e pozzetti di ispezione
- Filter drains and inspection chambers
- Systems for the separation of oils and hydrocarbons
- Filters for microplastics, dust, and tyre wear residues
- Solutions for the treatment of first-flush stormwater

6. monitoring solutions

Proposals shall include simple but reliable monitoring systems, such as:

- Fixed or mobile sensors for measuring PM10, PM2.5, and deposited dust concentrations
- Monitoring of microplastics, metals, hydrocarbons, and runoff water quality
- Sensors installed on vehicles or camera-based street-cleaning assessment systems
- Dashboards integrating environmental, traffic, meteorological, and operational data
- Before-and-after comparisons, preferably supported by the presence of a control section.

Pilot Testing Methodology

The proposal shall include:

1. Initial assessment of the test area.
2. Installation or application of the solution.
3. Pilot testing under real operating conditions.
4. Monitoring before, during, and after the intervention.
5. Comparison with conventional cleaning methods or with an untreated road section.
6. Environmental, operational, and economic assessment.
7. Definition of the conditions required for future large-scale application.

Expected Results

- Reduction of deposited and resuspended dust
- Reduction of the organic fraction of PM10 through the preventive removal of leaves
- Measurable reduction in the concentration of relevant air pollutants
- Capture of microplastics, metals, and hydrocarbons
- Improved cleaning effectiveness
- Reduced water and energy consumption
- Reduced duration or frequency of interventions
- Availability of reliable performance data
- Demonstration of the scalability and economic sustainability of the solutions.

Indicative KPIs

#	KPIs
01	Quantity of material collected per kilometre
02	PM10 and PM2.5 concentrations before and after treatment
03	Quantity of air pollutants captured
04	Water and energy consumption

#	KPIs
05	Duration and frequency of cleaning operations
06	Performance of filters or materials and related maintenance requirements.
07	Installation and operating costs
08	Impact on traffic and service continuity

Indicative Duration

Up to 10 months from the signing of the Agreement with Fondazione Piemonte Innova, as explained in the Open Call Guidelines, with completion by 30 November 2027, including baseline monitoring, solution implementation, pilot testing, maintenance, final evaluation, and reporting.

Final Outputs

- Report on technical and environmental performance
- Monitoring dataset
- Comparison with conventional methods
- Economic and operational assessment
- Maintenance plan
- Scale-up and replicability model
- Technical requirements for future procurement procedures

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EISMEA. Neither the European Union nor the granting authority can be held responsible for them.