



Road traffic: a major source of ultrafine particles in Paris, a health-threatening yet unrestricted pollutant.

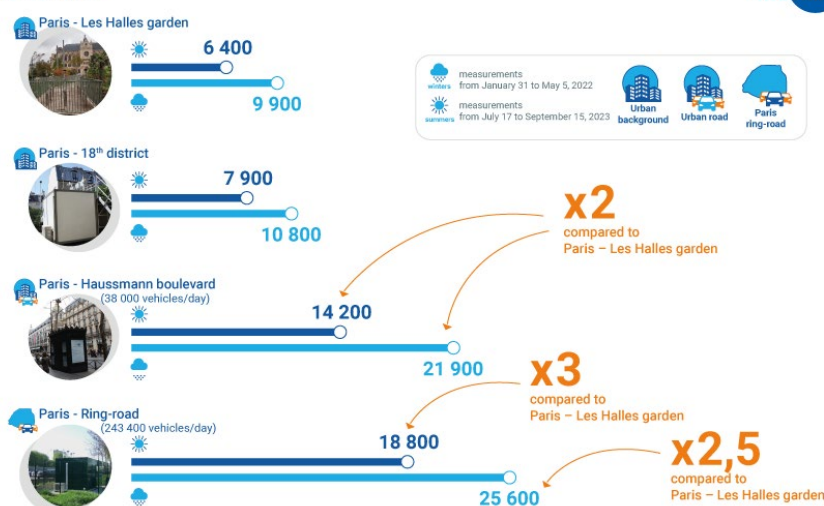
[June, 20 2025] In collaboration with the City of Paris, Airparif is publishing the conclusions of a study identifying ultrafine particle sources in Paris, with the support of Breathe Cities. The results confirm that road traffic is a major source of ultrafine particles throughout the year, with levels two to three times higher close to the capital's main roads. Because of their very small size, inhaled ultrafine particles, as they pass through the bloodstream, are harmful to health by affecting vital organs. Monitoring them and developing knowledge about their sources and health hazards are essential to enable the establishment of regulatory thresholds for this pollutant.

Road traffic, a major source of ultrafine particles with levels two to three times higher close to road traffic

In Paris, the number of ultrafine particles has been measured at levels two to three times higher along the monitored roads (14,200 particles/cm³ along the Haussmann boulevard, 18,800 particles/cm³ along the eastern section of the ring road in the summer) compared to locations further away from these roads (between 6,400 and 7,900 particles/cm³ in the summer). The analysis of their chemical composition and particle size distribution highlighted the major impact of road traffic.

Measured ultrafine particle levels are higher in the winter than in the summer (up to 25,600 particles/cm³ in the winter against 18,800 particles/cm³ in the summer). This difference is explained by the contribution of wood heating in the winter, another source of ultrafine particles with a specific chemical composition and particle size. Meteorological conditions are also generally less dispersive during this season.

AVERAGE PARTICLE NUMBER CONCENTRATION OF UFP IN PARIS in particles/cm³



Strengthening the knowledge about ultrafine particle sources and their presence in Paris

The permanent monitoring of ultrafine particles is carried out by Airparif at the Paris Les Halles site, and along the ring road. In addition, Airparif has been conducting a study since 2022 with the support of Bloomberg Philanthropies and Breathe Cities, in collaboration with the City of Paris. Its purpose is to improve the understanding of ultrafine particles, in order to better guide future public policies aiming at improving the air quality in Paris. The aim of the study is to better understand the spatial and temporal variability of this air pollutant, in order to progressively improve its monitoring beyond the pioneering central Paris station. Two monitoring campaigns have been carried out in this framework: the first one in the winter-spring period from February to April 2022 and the second one during the summer period, from July to September 2023. The study of the spatial variability of the ultrafine particles' presence was carried out using four monitoring sites: two in urban background areas and two near road traffic. The study of temporal variability is made possible by taking into account seasonal variations with the two monitoring campaigns.

A study to take the recommendations further

The assessment of health risks linked to ultrafine particles is progressing, with early evidence already showing their impact on human health. Because their diameter is smaller than 100 nanometres — about the size of a virus — these particles can pass through the alveolar-capillary barrier, enter the bloodstream, and therefore reach all organs and vital functions.

The City of Paris is including the issue of ultrafine particles into its public policies. This approach is materialised in the new Climate Plan and Parisian Health and Environment Plan, which recognise the need for an increased monitoring of these particles and emphasise the urgent need for action to better protect the health of Parisians. While particles PM₁₀ and PM_{2.5} are regulated, ultrafine particles - which are extremely dangerous because of their ability to penetrate deep into the body - are not subject to any regulatory standards. The 2024 European directive requires them to be monitored, but does not set a threshold that must not be exceeded. Urgent action is needed to protect the health of local residents.

"This study confirms that road traffic is a major source of ultrafine particle emissions in Paris, which are particularly harmful to health. It reinforces our commitment to reducing car use in Paris. Every pedestrianised street, new bike lane, and widened pavement contributes to making Paris more breathable." Dan Lert, Deputy Mayor of Paris in charge of the ecological transition, the climate plan, water and energy

Ultimately, the strengthening of permanent monitoring of ultrafine particles and a better understanding of their emission sources (road and air traffic, agriculture, wood heating, etc.) are intended to provide input for the population's exposure assessment, which is a key factor in conducting the epidemiological studies needed to set regulatory thresholds that must not be exceeded, as recommended by ANSES in France and the WHO at international level.

"This study contributes to the regional study programme set up by Airparif, with its partners and members, to document this pollutant close to its sources, in different environments, and to encourage technical exchanges with other European metropolitan areas. A campaign to measure ultrafine particles in the Paris region is planned for the summer of 2025, to complete our knowledge of background levels at various points in the region. A third permanent monitoring site will be opened in the inner suburbs." Karine Léger, Executive Director of Airparif

About Breathe Cities:

Breathe Cities is an initiative led by the Clean Air Fund, C40 Cities and Bloomberg Philanthropies aiming to reduce air pollution, cut carbon emissions and improve public health. Inspired by London, Breathe Cities aspires to tackle urban air pollution on a global scale.

"In two years, the initiative has spread to 14 cities around the world - from Paris to Nairobi, from London to Rio de Janeiro. It brings together air quality data, local communities and city officials to achieve one goal: Achieve a 30% reduction in air pollution and climate-warming emissions in participating cities by 2030 (compared to 2019 levels)." Breathe Cities

- The report summary : AIRPARIF Ultrafine Particles Monitoring in Paris – Winter/Spring 2022 and Summer 2023 monitoring campaigns - Summary [online]. June 2025
Available _____ at _____ :
https://www.airparif.fr/sites/default/files/document_publication/Synthese_Etude_PUF_Paris_ENG_liens_1.pdf
- **The report** : AIRPARIF Campagne de mesure parisienne sur les particules ultrafines (PUF). Volet n°2 - mesures estivales du 17 juillet au 15 septembre 2023 et enseignements globaux de l'étude – Report [online]. June 2025.
Available _____ in _____ French _____ at _____ :
https://www.airparif.fr/sites/default/files/document_publication/Rapport_Etude_PUF_Paris_VF.pdf