Surrey’s Global Centre for Clean Air Research Identifies Tall, Dense Trees as Effective Weapon Against Traffic’s Toxic Nanoparticles

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Toxic airborne nanoparticles from vehicles on our roads, which enter our bodies and lungs and damage human health, can more effectively be screened out by tall, dense trees than other “green infrastructure,” finds a new study from the University of Surrey.

Surrey's Global Centre for Clean Air Research (GCARE) has developed a model to help predict how different types of the green infrastructure placed in and around a city can impact the spread of toxic nanoparticles and whether they help improve the air quality.

Professor Prashant Kumar, co-author of the study and the founding Director of GCARE at the University of Surrey, said:

"There is an inexplicable knowledge gap when it comes to understanding the impact typical green infrastructure has on the dispersion of the harmful nanoparticles from traffic that are harming human health.

"Our research is advancing understanding of how nanoparticles move in air and can assist in securing agreement within the scientific community on how we quantify the number of particles in a given space. Across the University, our sustainability research is equipping humanity with the technologies and tools to tackle climate change, clean our air and reduce the impacts of pollution on health "

The team looked at the road network in the South East of England --- including the M25, A3, A31 and A331 and other minor roads --- and investigated the effects that coniferous trees (evergreen and dense), deciduous trees (trees at maturity which shed their leaves in autumn), and grassland had on traffic-related pollution dispersion.

GCARE's study also modelled a future scenario of how nanoparticles could spread in 2039 – the year when the UK is set to adopt new vehicle standards that could greatly reduce car pollution. The study found that while the government's efforts will significantly reduce the number and spread of nanoparticles in 2039, regulation might be needed to make sure the country doesn't waste the opportunities electric cars present.

Professor Kumar explains:

"The switch to hybrid vehicles, and ultimately electric, is undoubtedly the solution to much of our vehicle-based air pollution problems - and we welcome the UK government's efforts to promote those vehicles.

"We would like to see nanoparticles completely eliminated, and for that to happen, regulation is needed to address non-exhaust emissions from electric and hybrid vehicles."

The study was published in Science of the Total Environment. The study is supported by the EPSRC-funded INHALE project (EP/T003189/1), the UGPN's SCAN project, and the RECLAIM Network+ (EP/W034034/1). This work builds on the University of Surrey's extensive work around green infrastructure.

The University of Surrey is a research-intensive university, producing world-leading research that transforms lives and changes the world for the better. Sustainability is an institution-wide area of focus, delivering multi-disciplinary research to tackle the many challenges of climate change. The University is also committed to improving its own resource efficiency on its estate and being a sector leader. It has set a commitment to be carbon neutral by 2030. A focus on research that makes a difference to the world has contributed to Surrey being ranked 55th in the world in the Times Higher Education (THE) University Impact Rankings 2022, which assesses more than 1,400 universities' performance against the United Nations' Sustainable Development Goals (SDGs).

Read the original article on University of Surrey.