

London pollution has improved but ULEZ had small effect soon after it was brought in, finds study

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The researchers say their findings highlight that ULEZs are not a silver bullet and that sustained improvements in air pollution require multiple

measures.

Between 2016 and 2020, the number of Londoners living in areas with illegally high levels of nitrogen dioxide [fell by 94 percent](#), and alongside this there were other reductions in London's [air pollution](#). New research from Imperial has found that the April 2019 introduction of the ULEZ contributed only minimally to these improvements.

The researchers used publicly available air quality data to measure changes in [pollution](#) in the twelve-week period from 25th February 2019, before the ULEZ was introduced, to 20th May 2019, after it had been implemented. They controlled for the effects of weather variations, and then used [statistical analysis](#) to look for and quantify changes in pollution.

Corresponding author of the research Dr. Marc Stettler, from Imperial's Department of Civil and Environmental Engineering and Centre for Transport Studies, said: "Our research suggests that a ULEZ on its own is not an [effective strategy](#) to improve air quality—the case of London shows us that it works best when combined with a broader set of policies that reduce emissions across sectors like bus and taxi retrofitting, support for active and public transport, and other levies on polluting vehicles."

Air pollution caused 40,000 deaths in the UK in 2019—around 4,000 of which were in Greater London. Worldwide, outdoor air pollution accounts for around [4.2 million deaths per year](#) due to conditions such as stroke, heart disease, lung cancer, and acute and chronic respiratory diseases.

In April 2019 the Mayor of London introduced the ULEZ, an area in which drivers of more polluting vehicles must pay a daily charge, with the aim of reducing air pollution emissions from road transport and

accelerating compliance with EU air quality standards. The ULEZ is one of several London air pollution policies introduced since 2016 like the Low Emission Zone, Low Emission Bus Zones, and bus and taxi electrification.

To carry out the study, the researchers analyzed air quality data from roadside and non-roadside air quality monitors across London, comparing data over a twelve week period from before and after the ULEZ was introduced.

They found that, compared to the overall decrease in London's air pollution levels, the ULEZ caused only small improvements in air quality: an average reduction of less than 3 percent for nitrogen dioxide concentrations, and insignificant effects on ozone and [particulate matter](#) (PM2.5) concentrations.

They also found that the biggest improvements in [air quality](#) in fact took place before the ULEZ was introduced in 2019.

They detected changes in levels of nitrogen dioxide and ozone at 70 percent and 24 percent of the monitoring sites around the time that the ULEZ was introduced, respectively. Among these sites, changes in air pollution varied quite significantly and at some sites pollution actually worsened, with relative changes ranging from -9 percent to 6 percent for nitrogen dioxide, -5 percent to 4 percent for ozone, and -6 percent to 4 percent for PM2.5

The researchers suggest that other cities considering implementing these schemes should consider them only alongside a combination of other measures. Dr. Stettler said: "Cities considering air pollution policies should not expect ULEZs alone to fix the issue as they contribute only marginally to cleaner air. This is especially the case for pollutants that might originate elsewhere and be blown by winds into the city, such as

particulate matter and ozone."

"Since the London ULEZ was introduced, similar schemes have been introduced in Bath, Birmingham and Glasgow, yet on a much smaller scale. Several other cities have plans to implement clean air zones and our findings could contribute to the development of their policy."

The study is published in *Environmental Research Letters*.

More information: "Has the Ultra Low Emission Zone in London improved air quality?" *Environmental Research Letters*, 2021.

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