

New study examines commuter characteristics and traffic pollution exposure among commuters

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The link between on-road traffic and air pollution is well-known, as are the negative health impacts of pollution exposure. However, the many

factors that may influence commuters' exposure to pollutants—such as frequency, time, and duration of commute—and the overall impact of commuting remains a matter of on-going scientific discovery.

Dr. Jenna Krall, assistant professor at the George Mason University College of Health and Human Services, is using statistical methods to better understand exposure to [air pollution](#). Krall studies how commuting patterns impact exposure to fine particulate matter (PM2.5) from various traffic-related sources such as tailpipe emissions, road salts, and brake wear.

New research from Krall and colleagues published in *Environmental Research* examines commuter characteristics to better understand how factors such as departure time, commute length, and number of trips are associated with exposure to PM2.5. Building on a study of 46 women's exposure to PM2.5 using personal air pollution monitors, the new research clustered commuters to determine whether these clusters were associated with traffic pollution exposures. The new study reveals that commuters that travel to work during rush hour have higher overall exposure to traffic-related air pollution compared to sporadic commuters, though the difference was not statistically significant.

As COVID-19 infection rates decline in most areas of the country and employers weigh whether to continue work-from-home policies, studies such as this provide important insight into the role that daily commutes can play in personal air pollution exposure and the public's health.

"This is one of the first studies to utilize in-vehicle monitoring, specifically on-board diagnostics data loggers, to understand real-world commuting behaviors for environmental health," said Krall, "Linking these data with personal air pollution monitoring allowed us to better understand how commuter characteristics are associated with sources of air pollution exposures."

"The current research cannot tell us whether modifying commutes, for example by avoiding highways or commuting outside of rush hour, will lower traffic pollution exposures for commuters. More research is needed to determine what changes would be effective to lower exposures," says Krall.

Krall's on-going research seeks to distinguish between similar sources of traffic pollution, such as pollution generated by brake wear or from [tailpipe emissions](#), and to develop statistical methods to better estimate exposure to pollution sources.

Study participants included 46 women commuters in northern Virginia who were exposed to [pollution](#) generated by mobile vehicles, road salts, and other sources throughout a 48-hour period.

More information: Jenna R. Krall et al, Commuter types identified using clustering and their associations with source-specific PM2.5, *Environmental Research* (2021). [DOI: 10.1016/j.envres.2021.111419](https://doi.org/10.1016/j.envres.2021.111419)

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