

Evolution of Traffic-Related Atmospheric Pollutants Near Roadways

Cheol-Heon Jeong, Greg J. Evans, John Liggio, Jeremy Wentzell, Ralf Staebler, Jeff Brook

Traffic-Related Atmospheric Pollutants (TRAP) vary spatially and temporally, making it challenging to estimate the exposure of populations to TRAP. The evolution of ambient pollutants near a highway was investigated in Toronto during the summer of 2010 through the Fast Evolution of Vehicle Emissions near Roadways (FEVER) campaign.

The University of Toronto's mobile laboratory (MAPLE) was deployed to measure the concentration of TRAP at varying distances from the highway. MAPLE is equipped with an Aerosol Time-of-Flight Mass Spectrometer (ATOFMS) and other instruments to analyze particle size distributions and chemical compositions. Traffic-related particles such as, ECOC, Ca-rich, and EC-soot (a particle only found near the highway) were identified. The decay rate of traffic related ultrafine particles varied depending on particle sizes, pre-existing particles, and wind speed. On average they were found to decay by about 40 to 50 per cent every 10 meters for the first 27 meters, and 3 per cent every 10 meters for distances between 27 to 280 meters from the highway.