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# Relationship Between Traffic Density and Particulate Matter Concentrations

[Controlling Environmental Pollution: Practical Solutions](#) • Book Chapter • 2025 • DOI: 10.1007/978-981-97-8931-3\_5

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## Abstract

This study examines particulate matter (PM) trends and their relationship with motor vehicle numbers in a selected area. Air sampling using Dust Trax TM DRXAerosol Monitor 8534 was conducted from 8 a.m. to 12 p.m. PM concentrations (PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>) showed similar distribution patterns, with levels starting low at 8 a.m., peaking at 10 a.m., and declining by 11 a.m. The average concentrations over 4 h were PM<sub>1</sub>: 0.054 mgm<sup>-3</sup>, PM<sub>2.5</sub>: 0.055 mgm<sup>-3</sup>, and PM<sub>10</sub>: 0.064 mgm<sup>-3</sup>. PM<sub>2.5</sub> levels exceeded daily National Ambient Air Quality Standards, while PM<sub>10</sub> levels were below. Weak correlations were found between PM concentrations and motor vehicle numbers (R = 0.154 for PM<sub>10</sub>, R = 0.157 for PM<sub>2.5</sub>, R = 0.152 for PM<sub>1</sub>). Overall, PM distribution trended similarly across all sizes, peaking at 10 a.m., and showing a positive but weak relationship with motor vehicle numbers. Future studies in other Malaysian regions could enhance understanding of traffic-related pollution. © The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2025.

## Author keywords

Air pollution; Particulate matter; Traffic density

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