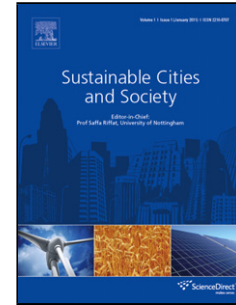


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## **Pedestrian exposure to traffic PM on different types of urban roads: A case study of Xi'an, China**

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### **Highlights:**

- The pedestrian exposure to PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub> mass and particle-number concentrations in the size distribution range of 0.25 to 32  $\mu\text{m}$  were investigated on various typical urban roadways.
- Correlations between the PM mass and particle-number concentrations, and traffic volume and meteorological parameters, were analyzed using the principal component analysis (PCA) method.
- The effect of meteorological parameters on particle number concentration differed among the four road types. Traffic flows on urban expressways, collector roads and local roads all have an important influence on the particle number concentration, especially for the particles in the size range of 1.0-9.99 $\mu\text{m}$ .

### **Abstract**

To investigate the pedestrian exposure to fine particulate on various typical urban roadways, mass concentration of PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub> and particle number concentrations in the given size distribution were obtained at four types of urban roads in Xi'an City: urban expressway, arterial road, collector road, and local road. The principal component analysis (PCA) was used. Measurement and analysis results showed that the mean particle number concentration for the size range of 0.25-32  $\mu\text{m}$  on the urban expressway was 9%, 29% and 32% higher than those on the arterial road, the collector road and the local road, respectively. However, the mass concentration of particles, especially for PM<sub>2.5</sub> and PM<sub>1</sub>, varied little. Traffic volumes on the urban expressway,

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