

Establishing a high resolution road fugitive dust emission inventory in Kaifeng City, China

*Yiming Xu¹, Shili Liu¹, Xinyue Cao¹, Xianbao Shen¹, Zhiliang Yao¹

1. Department of Environmental Science and Engineering, Beijing Technology and Business University

Due to the rapid urbanization and industrialization in many Chinese cities, ambient particulate matter pollution such as road fugitive dust pollution becomes a serious environmental problem. However, the emission of road fugitive dust is relatively difficult to quantify as it is of high uncertainty and spatial heterogeneity. The research aims to build a high resolution road fugitive dust emission inventory which is transferrable and applicable to other cities in China. High spatial resolution images were utilized to digitalize whole road network of Kaifeng City, Henan Province, China. Vehicle flows of the whole road network were estimated by incorporating the whole road network, field measured data and GPS data on an hourly, daily, weekly, monthly and yearly basis at city level. By fusing the road network information, vehicle flow, road dust load, average vehicle weight, a high resolution road fugitive dust emission inventory was established. The results showed that the total emissions of PM₁₀, PM_{2.5} and Total Suspended Particulate from road fugitive dust at commuter time and downtown were much higher compared with other time and location in Kaifeng City. The framework of this road fugitive dust emission inventory can be applied to other cities, and it can provide data support and guide fugitive dust management in China.

Keywords: Road Fugitive Dust, High Resolution Remote Sensing, Satellite Data, Air Pollutant Emission Inventory