

**PERSONAL EXPOSURE TO AIR POLLUTION AT A STREET  
CANYON INTERSECTION: IMPLICATIONS FOR AIR QUALITY MANAGEMENT IN THE  
CONTEXT OF SUSTAINABLE DEVELOPMENT**

**R.N. Colvile<sup>1</sup>, S. Kaur<sup>1</sup>, S. Belcher<sup>2</sup>, M. Bell<sup>3</sup>, R. Britter<sup>4</sup>, M. Nieuwenhuijsen<sup>1</sup>, A. Robins<sup>5</sup>, A. Tomlin<sup>6</sup>, D. Shallcross<sup>7</sup>**

*<sup>1</sup>Imperial College London, Department of Environmental Science & Technology, London, UK*

*<sup>2</sup>University of Reading Department of Meteorology, Reading, UK*

*<sup>3</sup>University of Leeds Institute for Transport Studies, Leeds, UK*

*<sup>4</sup>University of Cambridge, Department of Engineering, Cambridge, UK*

*<sup>5</sup>University of Surrey, School of Mechanical Engineering, Guildford, UK*

*<sup>6</sup>University of Leeds Department of Fuel & Energy, Leeds, UK*

*<sup>7</sup>University of Bristol Department of Chemistry Bristol, UK*

Most current approaches to air quality management pay limited attention to personal exposure. This often results in concerted effort and expenditure to achieve large reductions in emissions over extensive geographical areas to attain air quality standards at fixed points where monitoring is carried out. The public is expected to accept these costs but continues to experience exposure to high pollution levels on a daily basis. This contributes to poor public motivation to take responsibility for the environmental consequences of their actions at all scales from local to global. The DAPPLE project on Dispersion of Air Pollution and Penetration into the Local Environment addresses this problem by identifying the causes of peak exposures to vehicle exhaust as an individual moves through or spends time near a city centre crossroads. Here, pollution exposure is the result of conflicting needs of people travelling on different routes and living or working locally. Sustainable development can only be achieved through equitable resolution of these conflicts. This paper presents the first combined modelling and measurement of personal exposure to vehicle exhaust emissions at the DAPPLE street canyon intersection, London. It identifies some properties of urban form and road systems that determine the source apportionment of exposure in close proximity to an air pollution 'hot spot'. Finally, it speculates what air quality management measures might look like if they address personal exposure more directly than current policies, as a means of reducing the health impact of air pollution at the same time as engaging public support.