Research gives new meaning to 'green' cross code

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Pedestrians could reduce the amount of traffic pollution they breathe in simply by crossing the street, according to the latest research from the University of Leeds.

The research, led by Professor of Environmental Modelling Alison Tomlin from Leeds' Faculty of Engineering, has shown that air pollution levels change dramatically within small geographical areas dependent on wind patterns, the location of traffic queues and the position and shapes of the surrounding buildings.

The findings showed that pollution hotspots tend to accumulate on the leeward side of the street, (the sheltered side) in relation to the wind's direction at roof-top level.

They also revealed that that carbon monoxide levels were up to four times lower in parallel side streets compared to the main road.

The team monitored traffic flow and carbon monoxide (CO) levels over an eight week period at one of the busiest junctions in the UK - the intersection between Marylebone Road and Gloucester Place in West London.

"CO levels were highly variable over remarkably short distances," says Professor Tomlin. "As you'd expect, the junction itself showed high levels caused by queuing traffic, but with some wind patterns these hotspots moved further down the street. However, the leeward side of

the street had consistently higher concentrations of carbon monoxide than the windward side. The same trends would be expected for other traffic related pollutants such as ultrafine particles and nitrogen dioxide."

"Most people would expect pollution levels to be slightly lower away from the main body of traffic, but our figures show a very significant difference," she says.

"Pollution can be trapped within the street where it is emitted by recirculating winds. If it escapes to above roof-top level, it doesn't tend to be mixed back into neighbouring streets very strongly. It would be worth cyclists and pedestrians rethinking their regular routes, as they can massively reduce their pollution exposure by moving just one street away from the main traffic thoroughfares."

The research also has significance for local authorities and other bodies monitoring air quality levels in urban areas. Currently every city has a number of sites monitoring pollution levels to ensure compliance with EU standards, but Professor Tomlin says these may need to be looked at in relation to the other factors identified by the research to ensure an accurate spatial picture.

"Monitoring stations tend to be sited in what are expected to be pollution hotspots, but our research has shown that hotspots move depending on meteorological conditions, particularly wind direction," says Professor Tomlin. "We need to develop models which take these factors into account, so that the data from monitoring sites can be accurately analysed to provide a true reflection of air quality across the whole of an urban area."

The research is published in the latest issue of *Atmospheric Environment*.

Source: University of Leeds (news : web)