

Some thoughts on long-term trends in NO₂, NO_x and NO₂:NO_x ratios.

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This presentation comprises almost entirely a series of CUSUM plots of concentrations of NO₂, NO_x and the NO₂:NO_x ratio at several sites from their start dates somewhere in the 1990s to 31 December 2009. Put very simply CUSUM (cumulative sum) analysis enables the identification of deviations from a previously steady (or near steady) value, the point at which that deviation occurred and whether the deviation is short term or long term and whether it is a step change, a series of step changes or a steady drift.

What these charts show is that at the two Urban Background sites studied there was a step change increase in the NO₂:NO_x ratio in the late 1990s but that there has been little significant change in the ratio since then. This was also the case at the roadside sites.

The plots of concentrations of NO₂ and NO_x show that there was generally a fall in total NO_x in the late 1990s at all sites but that this has largely levelled out with short periods of slight increases in concentrations followed by similar slight decreases. The position with NO₂ is more complex. At the two background sites there was, again, a decrease in concentrations in the late 1990s but this appears to have stabilised with little change through the first decade of the 21st century.

At the roadside sites there are two contrasting pictures. Bury Roadside and Haringey Roadside show similar trends to the background sites, albeit with some slightly more marked periods of increased NO₂ concentrations. In contrast Bath Roadside, Camden Kerbside and Marylebone Road all show increases in NO₂ concentrations from 2005/2006 although the increases are more marked at the two London sites. A similar increase is also apparent at Glasgow Kerbside, although seeming to start a bit later, but the picture here is complicated by an earlier increase (and subsequent decrease) in NO₂ concentrations from about 2002.

These differences can possibly be explained as follows. Bury and Haringey, although classified as "Roadside" sites, are perhaps a little further from the roads than the other sites but the key difference is that traffic near these two sites is relatively free-flowing. All the other four are located on roads where traffic tends to be slow moving and congested. The apparent oddities of Glasgow Kerbside are probably attributable to the fact that the earlier increase in NO₂ concentrations coincides with a period when taxis were parking adjacent to the site and, in addition, that

there were a number of mobile food outlets parking there, at least in part to serve the drivers.