



To: Place Directorate

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Subject: Essential Evidence on a page: No 128 Improving urban air quality through increased cycling use

Top line: Even modest increases in urban cycling gained from reductions in motor vehicle use could lead to improvements in respiratory health let alone the benefits of increased physical activity. There are also significant benefits to the economy including healthcare.

Evidence suggests that short episodes of high exposure to air pollution occur while commuting. These events can result in potentially adverse health effects which are distributed unequally across different modes. Conversely, a broader question as to the contribution that increases in active travel can make on air quality is one which is less well studied. Across the developed world it is common for many urban commutes to be short enough for a significant mode shift to at least the bicycle to be possible. In GB 67% of all trips are less than 5 miles in length (and 18% are less than one mile in length).¹

A few studies have sought to assess what impacts on air pollution a shift to cycling could make to improving air quality. Research in New Zealand modelling for a range of health impacts - the illness, premature deaths, vehicle pollutant and greenhouse gas emission effects of changing trips from cars to bicycles were not comprehensively covered by a single modelling instrument, therefore researchers used a number of existing tools to capture these effects.² The New Zealand Household Travel Survey was the starting dataset and this enabled light vehicle kilometres travelled in urban areas to be calculated and converted to cycling kilometres. Data from other models expressed on a per kilometre basis enabled the potential health and emission effects from moving light vehicle kilometres to cycling to be calculated. The researchers estimated the effects on health of using bicycles instead of light vehicles for varying proportions of short trips (≤ 7 km).

Air pollution: the effects on health of moving short urban car trips (≤ 7 km) to cycling (annual): from 1% to 30% of vehicle km in New Zealand

	1%	5%	10%	30%
Reduced deaths	1.1	5.6	11.3	33.9
Reduced restricted-activity days	1,515	7,574	15,148	45,443
Reduced acute cardiac and respiratory admissions	0.6	2.8	5.6	16.7
Savings in health care - hospital costs only (GB£)	704,193	3,520,807	7,041,299	21,124,844

Assumptions inherent in the modelling enabled fair confidence that the benefits of replacing car trips with cycling outweigh the harms. The effects of air pollution were limited by the modelling to adults. However, improvements in air quality of changing transport patterns would have potentially greater impacts on the respiratory health of children. The estimates are therefore likely to underestimate the true benefits. These findings are supported by a similar US study that reported that significant health benefits and benefits for the economy are possible if bicycling replaces short car trips.³ Less dependence on motor vehicles in urban areas would also improve health in downwind rural settings.

¹ Department for Transport, 2014 *National Travel Survey 2013*. London: DfT.

² Lindsay, G., Mcmillian, A., Woodward, C, 2011 Moving urban trips from car to bicycles: impact on health and emissions, *Australian and New Zealand Journal of Public Health*, 35(1): 54-60.

³ Grabow, M. et al, 2012 Air quality and exercise-related health benefits from reduced car travel in the Midwestern United States, *Environmental Health Perspectives*, 120(1): 6876.