

IMPACT OF HEATHROW EXPANSION ON CHILDREN'S PERFORMANCE IN AND OUT OF SCHOOL

Summary

Heathrow expansion – either through the construction of a third runway or by extending the existing northern runway – would bring many negative impacts to the environment, bringing greater noise and air pollution to over 2.2 million people across London & the South East. Recent evidence has shown that expansion will not bring the economic benefit to the UK that were previously thought and could in fact bring net negative benefits, once environmental costs are monetised.

Though there are many reasons to oppose Heathrow expansion, this briefing concentrates on the impacts that putting an additional 260,000 flights per year would have on children across London, Berkshire and Surrey, particularly in the school environment.

The Heathrow Debate

The Government will shortly bring before Parliament a final Airports National Policy Statement (NPS), which will include a recommendation to expand Heathrow. Parliamentary support of the NPS allows Heathrow to prepare a detailed planning application of its expansion proposals. Flight paths will not be published at this stage, however.

If Parliamentary approval is granted, four local authorities, including Theresa May's own local council, along with Greenpeace, stand ready to launch legal action against the plans.

How aircraft noise affects children's performance in school

"Primary age children attending noise exposed schools usually live in noise exposed homes. It seemed possible, therefore, that aircraft noise exposure outside school hours, perhaps especially in the early morning or late at night, might also have an impact on children's learning and school performance."⁵

"Tasks which involve central processing and language comprehension, such as reading, attention and problem solving and memory, appear to be most affected by exposure to aircraft noise."⁵

"Language based tasks are more affected by noise exposure than non-language-based tasks. However, a closer analysis of English tests shows that aircraft noise exposure affects performance on the reading test."³

A 5 dBA increase in daytime exposure of aircraft noise corresponded with a two months delay in reading age amongst UK pupils.

"Noise level is significantly related to mathematical performance. As noise increases by contour band, performance drops by 0.73 of a mark."³ High levels of aircraft noise may impact on everyday activities such as homework, school-work and playing."⁴



How aircraft noise affects children's health

"High noise exposed children also had higher rates of hyperactivity than those exposed to low noise."²

A South African study found that "68.7% of people residing near the air- port presented with hearing loss, compared to 6.5% of those living further away. Investigation of the influence of high-frequency aircraft noise on the function of the auditory system in school age children confirmed damage to the peripheral cochlear mechanism in the group living close to the airport."⁴

"Long term aircraft noise exposure was significantly associated with chronic noise stress. Chronic noise stress was significantly associated with prevalence of hypertension."¹

"If aircraft noise can cause stress in people we would expect to find higher usages of medicines and drugs to alleviate stress and help sleep in aircraft noise exposed neighbourhoods. This was found to be the case both for physician visits for hypertension, psychological and psychosomatic problems and cardiovascular disease and for the prescriptions of medicine drugs."¹

"Night-time exposure to aircraft noise was also significantly associated with impairment of recognition memory."⁵

Policy Framework – truncated version from an Aviation Environment federation paper on Aircraft Noise impacts to health. The document can be viewed in full [here](#)

The Airports Commission's final report estimates that an additional 24 schools will suffer from aircraft noise above the maximum levels recommended by the World Health Organisation if a third runway is built. The national average school size is 220 pupils per primary school and 950 pupils per secondary school, so this would result in somewhere between 5,280 to 22,800 extra children at risk of decreased educational attainment.

Current Government policy expects airport operators to other acoustic insulation to noise-sensitive buildings, such as schools and hospitals, exposed to levels of noise of 63 dBA Leq or more. This is, however, significantly above the onset threshold for impairing memory and learning in children indicated by the RANCH study of 50 dBA Leq.

In 2015 Heathrow Airport finished providing insulation for 42 community buildings (including schools and nursing homes) that were within the 63 dBA Leq noise contour in 2002, at a cost of £4.8 million. Over 460 schools are exposed to aircraft noise from Heathrow Airport above 54 dBA Leq and the vast majority have not received any form of insulation from the airport. According to the Airports Commission, Heathrow expansion would lead to more schools being over own than would be affected without expansion, with an additional 24 schools being newly overflowed by a significant number of planes, with a maximum noise level above 70 dBA.

It is unclear what the cost would be of insulating all schools exposed to noise above 50 dBA Leq or how this might affect the case for expansion at Heathrow.



UK primary school children in the RANCH study were exposed to aircraft noise levels ranging from 34 dBA Leq (16 hour) to 68 dBA Leq (16 hour) and the study found a linear relationship between aircraft noise and both impaired reading comprehension and recognition memory. A 5 dBA increase in daytime exposure of aircraft noise corresponded with a two months delay in reading age amongst UK pupils, with 50 dBA acting as the onset threshold.

Impacts to children

There is robust evidence to demonstrate that aircraft noise exposure has impacts on children's reading comprehension or memory skills. The RANCH (Road traffic and Aircraft Noise and children's Cognition & Health) study found that a 5dB increase in noise exposure is associated with a 2-month delay in learning in UK primary school children. This finding was echoed in similar research as part of the NORAH study around Frankfurt Airport.

An update to the RANCH study found indications of a long-term, cumulative impact from aircraft noise on memory and learning but the sample size was insufficient for the long-term relationship to be regarded significant. Around 460 schools around Heathrow are exposed to aircraft noise above 54 dBA Leq (16 hours), higher than the onset threshold of the effect on children's memory and learning, but the airport has so far paid for insulation of only 42 community buildings in total. ⁷

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