

AVIATION 2050: THE FUTURE OF UK AVIATION CONSULTATION

Richmond Heathrow Campaign (RHC) Response - 20 June 2019

INTRODUCTION

1. This document is the response of Richmond Heathrow Campaign (RHC) to the Government's Consultation on the Green Paper as contained in the document: '*Aviation 2050: The future of UK aviation, December 2018 plus supporting documentation*'. We responded as required to Annex A on 11 April 2019. Annex A deals with the interdependence of multiple airport airspace and changes to that airspace. The main consultation is about aviation growth and how the benefits can be achieved. The environmental costs of growth in terms of noise, climate change, air pollution and surface access are discussed.
2. The Richmond Heathrow Campaign (RHC) represents three amenity groups in the London Borough of Richmond upon Thames: The Richmond Society, The Friends of Richmond Green, and the Kew Society, which together have over 2000 members. The members of our amenity groups are adversely affected by noise from Heathrow Airport's flight paths, poor air quality and road and rail congestion in west London. We acknowledge Heathrow's contribution to the UK economy and seek constructive engagement in pursuit of a better Heathrow. Economic regulation is an important part of this. We are an active participant in the Heathrow Community Noise Forum.
3. Our premise is that it would be preferable to aim for a better Heathrow rather than bigger Heathrow and to capitalise on the world beating advantage of London's five airports, in particular by improving surface accessibility to all five airports, which would be a major benefit to users.
4. Our approach is to continue supporting the case for no new runways in the UK. We believe the evidence produced by the Airports Commission's Final Report 2015 and by the government in the Airports National Policy Statement June 2019 (ANPS) supports this position, even though Heathrow's Northwest runway (NWR) expansion option was recommended in both cases. Our reasoning is set out in our responses to the DfT on the RHC website at www.richmondheathrowcampaign.org.
5. Our response is by chapter. We have placed our response to Chapter 3 issues (Ensure Aviation can Grow Sustainably) in four annexes:
Annex 1 Aviation Noise
Annex 2 Surface Access
Annex 3 Air Quality
Annex 4 Climate Change
6. The Aviation Strategy Consultation questions are listed in Annex 5. We have not answered these directly but believe that our response does address the issues raised and adds some too.
7. We have not had the opportunity to review Heathrow's recently published Master Plan 18 June 2019 but we believe our comments and conclusions set out here are likely to remain largely valid.

8. We have focussed our attention on Heathrow in this response but we see no reason why the comments made should not apply generally to other airports across the UK and therefore they should be considered in the UK Aviation Strategy. But also, Heathrow will be by far the largest UK airport with the NWR expansion and therefore UK Strategy does need to recognise the major UK impact of Heathrow's growth.

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RHC RESPONSE BY CHAPTER

CHAPTER 1 ROLE OF AVIATION IN A CHANGING WORLD

9. **This chapter describes the past, present and future challenges of the aviation industry.** It emphasises the benefits and the reflected importance of the sector but we believe the economic benefits of air transport are overstated and that the environmental harm is under-stated. The description of future challenges places the environmental harm as a secondary issue but we believe a major shift in policy is required to place it on a comparable footing with the benefits. The Policy should start with the principle that the polluter should pay.
10. We agree there is a need for a new Aviation Strategy.
11. The breach of almost all the many promises and commitments by Heathrow and other airports to protect the environment is surely a major failure in law and trust.
12. We believe objectives are generally presumed without critical assessment and that this then leads to policy that is unfit for purpose.
13. We agree Strategy should be evidenced based but are concerned that bias still exists, as was exemplified by the Airports Commission and the DfT in ignoring their own evidence leading to the Airports National Policy Statement in June 2018, and decisions on Heathrow being driven by political expediency and lobbying from business. We are very concerned with timing, whereby the Government's sequencing of Air Transport decisions and the gathering of evidence and the public consultation to support these decisions is haphazard and often cart before the horse.
14. We agree that the purpose of air transport is to facilitate the end user but believe that consumers should not all be given the same policy weighting (e.g. international-to-international transfers and terminating passengers or business and leisure) and we disagree that those exposed to environmental harm should be treated as secondary consideration, which is inequitable.
15. Emphasis on the benefits of leisure travel by UK residents is too high. There is the benefit of well-being but this type of travel represents around 50% of air travel and contributes negatively to the UK balance of payments. International-to-international transfer passengers that currently represent around 10% of air travel are of no value to the UK. The two market segments that should have prime importance are business (UK and overseas resident) representing 25% and inbound tourists representing 15% of the UK's air travel. We do not recognise the contribution to the UK economy of £68bn from tourism (page 21). We believe the figure was £22bn from inbound tourism in 2014 of which 73% reached the UK by air.
16. The air transport sector does facilitate business travel but academic support is mixed for the causal benefit to UK economic growth and productivity. We accept that leisure travel makes a positive contribution to people's well-being but there is lack of evidence on its importance to the UK.
17. We believe Heathrow's hub concept and international-to-international transfers is vastly over-rated and that there should be a full review of the pros and cons of the hub system. We explain our position further in our response to Chapter 2.

18. We believe Heathrow exhibits market dominance leading to excess profits and inefficient allocation of resources, in spite of the CAA's regulation. We believe Heathrow should be investigated by the Competition and Market Authority and that UK Aviation Strategy should take the findings into account. Our response raises the issue of spare runway capacity around the UK and the harm Heathrow would inflict on the UK aviation market by a 3rd runway.
19. We do not believe the economic benefits and costs of aviation and its current structure have been adequately addressed. Seemingly, there is no impact assessment that supports the Strategy proposed and in particular takes account of the health and other costs of noise, air pollution and surface access congestion. Nor has the impact of aviation on climate change been evaluated. We believe the scarcity rent at Heathrow assessed by the DfT is vastly overstated at over £70bn (NPV) (IAG has publicly expressed the same view).
20. We believe there is a failure of the Air Transport industry to provide its fair share of tax and to allocate the tax efficiently - for example the APD exemption on international-to-international transfer passengers. We add here that the Government's decision to exempt airports from the recently introduced cap on interest tax relief is unjustified.
21. We are concerned that the Treasury will be placed upon to support Heathrow expansion. Our assessment of Heathrow's financeability based on corporate cashflows available in 2017 shows that if the aero charge is to remain unchanged in real terms from today then the Heathrow's incremental net loss of expansion is of the order of £10bn. We will be re-visiting this assessment now that Heathrow's Master Plan has been published.

CHAPTER 2 BUILD A GLOBAL AND CONNECTED BRITAIN

22. Table 1 is sourced from the DfT's 2017 Demand Forecasts and estimates growth in UK passenger numbers from 267 mppa in 2016 to 410 mppa in 2050 or 435 mppa with Heathrow's 3rd (NWR) runway. We recognise the importance of air transport in supporting the UK economy and are concerned that the proposed Strategy is likely to fail the country in several ways.

Table 1	DfT 2017 Passenger Demand Forecasts with and without Heathrow's northwest runway (NWR)			
	Base 2016	Base 2050	NWR 2050	NWR-Base 2050
Million Passengers per annum				
Heathrow	76	93	136	43
London ex Heathrow	86	112	112	0
Larger Regional airports	81	151	143	-7
Other Regional Airports	23	53	44	-10
Total UK	267	410	435	26
I-I Transfers	24	5	21	16
UK Terminating	243	405	414	10

23. We believe the estimated growth is over optimistic when taking account of environmentally managed demand. We can anticipate less noisy aircraft being developed and introduced into the UK aircraft fleet but population growth means the reduction in noise impact on health and quality of life is substantially offset. Starting from the point that WHO Guidance tells us that noise levels are already too high around UK airports, it seems reasonable that noise reduction should not be offset by aviation growth, at least until the negative health impact is significantly reduced. We are not proposing to debate here the estimates but suggest that from the estimates produced by the CAA accompanying the consultation, we believe there is a substantial risk that noise envelopes will limit UK growth to less than 435 mppa in 2050. We discuss the noise issues in Annex 1.
24. In a similar way to the noise issue, air pollution (NOx and particulates) may also restrict growth. Optimistically, the restriction should reduce overtime as the main source of the pollution - surface access vehicles - electrify their propulsion. But this still leaves pollution from aircraft. As our response on air quality demonstrates in Annexes 2 and 3 there is a high probability Heathrow's demand will have to be restricted. Even by 2050, air pollution could restrict UK growth to below 435 mppa.
25. Climate change will also be a constraint on growth as we explain in Annex 4. The Committee on Climate Change has recommended no more than 60% UK passenger growth, based on 230 mppa in 2005 rising to 368 mppa in 2050. The Committee's recent advice to Government on a net-zero carbon target suggests the UK passengers numbers should be even less. In our view the Strategy relies unrealistically on aviation greenhouse gases being offset by negative emissions such as afforestation.
26. The point we make here is that the Strategy on demand in our view needs to take more

seriously the possibility that the environmental capacity of UK aviation could be less than 435 mppa. In doing so, demand deficiencies should be addressed to make better use of such capacity as is permitted. We discuss this below but first comment on UK operational capacity.

27. It may be that the environmental capacity will exceed 435 mppa but we believe the Strategy over-estimates the operational capacity needed and is misguided in focussing on the investment in new operational capacity.
28. We calculate spare runway capacity as the capacity less Do-Minimum use, i.e. less 435 mppa in 2050 and we define capacity and use in terms of the number of flights (ATMs). Terminals may act as a constraint but generally speaking the more usual constraint is runway capacity. The capacity figures provided by the DfT appear to be similar to those assumed by the Commission. According to these two sources, the UK spare runway capacity is around 2.7 million ATMs in 2050, which is the equivalent of around 10 runways of unused capacity now and through to 2050. Clearly, not all the spare capacity is suited to servicing the demand - for example because of its location relative to that of the demand and also because many of the regional runways cannot handle large aircraft. The 8 Larger Regional airports have spare capacity of around 1 million flights or the equivalent of 4 runways now and through to 2050. The Other Regional airports have spare capacity of around 1.5 million ATMs or 6 equivalent runways but capacity is restricted to relatively small aircraft. The 5 London airports have little spare runway capacity, although Luton and Stansted have the equivalent of around one third of a runway to spare through to 2050.
29. In the context of constrained demand, we believe the Strategy should focus on demand deficiencies:
 - a. Heathrow's NWR expansion adds capacity of 43 mppa but scavenges 17 mppa from regional airports (7 mppa from larger regional airports and 10 mppa from other regional airports).
 - b. Heathrow's NWR expansion adds capacity of 43 mppa but of this international-to-international (I-I) transfers comprise 16 mppa. As we explain below I-I transfers provide no net value to the UK.

These figures from Table 1 are sourced from the DfT's 2017 demand forecasts.

30. The deficiencies are far worse in a more constrained world where carbon is capped, as estimated by the Airports Commission in its AON carbon capped scenario (its central case). This is shown in Table 2

Table 2	Airports Commission Passenger Demand Forecasts 2015 with and without Heathrow's northwest runway (NWR)			
Million Passengers per annum	Base 2016	Base 2050	NWR 2050	NWR-Base 2050
Heathrow	76	94	135	41
London ex Heathrow	86	107	93	-14
Larger Regional airports	81	133	105	-28
Other Regional Airports	23	52	36	-16
Total UK	267	386	369	-17
I-I Transfers	24	8	30	22
UK Terminating	243	378	339	-39

The deficiencies are:

- a. Heathrow's NWR expansion adds capacity of 41 mppa but scavenges 14 mppa from other London airports and 44 mppa from regional airports (28 mppa from larger regional airports and 16 mppa from other regional airports).
 - b. Heathrow's NWR expansion adds capacity of 41 mppa but of this international-to-international transfers comprise 22 mppa.
31. This situation adversely impacts the north-south aviation and economic balance. Strategy should seek to avoid this outcome.
 32. The I-I transfers are of no value to the UK. The idea that I-I transfers support otherwise uneconomic routes is myth. RHC has examined data provided by the DfT for 2011 and 2016 and the results are very similar, which gives weight to their robustness.
 33. Most I-I transfers arise at Heathrow (e.g. in 2016: Heathrow 20.7 mppa, Gatwick 2.1 mppa, other 1.1 mppa). Without NWR expansion the I-I transfers are priced out of Heathrow, given the lower charging competitors such as Schipol. The I-I transfers at Heathrow decrease to 3.8 mppa by 2050. But the NWR expansion results in an increase of 15.8 mppa I-I transfers at Heathrow by 2050, compared to the Do-Minimum. By far the greatest beneficiaries of NWR expansion are the I-I transfers, as shown in Tables 2 and 3.
 34. The Commission and DfT17 give weight to the importance of I-I transfers supporting new long-haul destinations with potentially rich business opportunities. However, we question whether these transfers support thin destinations or business passengers and we question the diminishing returns from adding frequency to already popular routes serving the leisure market and other high frequency routes. Our analysis below suggests the answers are negative in each case.
 35. In December 2017 RHC examined the DfT's dis-aggregated data set published as part of the DfT 17 forecasts. Our assessment is that the additional I-I transfers from the NWR expansion option have a substantial negative impact on the aviation market and on the UK economy. The assessment can be seen on the RHC website www.richmondheathrowcampaign.org 'Revised Draft Airports National Policy Statement'.
 36. In our December 2017 response to the Revised draft NPS, we concluded the following in regard to I-I transfers:
 - a. I-I transfers add no economic benefit to the UK and the webTAG valuation in the Revised draft NPS erroneously includes £5.5bn (present value) in "Passenger Benefits" for I-I transfers - resulting in an overstatement of the NWR incremental value by like amount. Consultants PW and others came to the same conclusion.
 - b. Only 1% of I-I transfers in 2016 were on thin long-haul destinations from Heathrow (a thin route being defined as less than one departure and one arrival a day). Out of 36 such destinations, there were only 8 that had any I-I transfers and our examination suggested that even these would be viable without transfers because there were sufficient terminating passengers to maintain the frequency of service or to provide at least a weekly service.

Analysis of a similar data set for 2011 provided very similar results. The figures are annual averages so that in practice with variations in demand over the year, there could be occasions where I-I transfers do contribute to sustaining an otherwise unviable service. But we pointed to further evidence in the DfT17 forecasts, which showed that a forecast reduction in Heathrow's I-I transfers from 21 million passengers per year (mppa) in 2016 to 4 mppa in 2050 in the Do-Minimum case does not seem to harm the growth in terminating business passengers from 14 mppa to 27 mppa over the same period.

- c. Table 4 shows the distribution of I-I transfer passengers between long-haul and short-haul destinations and between thin and thick destinations in 2016. There were just 317,000 I-I transfer passengers to thin long-haul destinations out of 24 million I-I transfer passengers (i.e.1%). Conversely, 99% travelled to thick destinations, including short-haul.

Table 4	Heathrow International Destinations in 2016 I-I Transfer passengers ('000)		
Source CAA	Long-haul	Short-haul	Total
Thin destinations	317	0	317
Thick destinations	13,091	10,560	23,651
Total	13,408	10,560	23,968
Thin destinations: under 2 movements per day (arrival & departure); Long-haul: 3,500km and over			

- d. Most I-I transfer passengers travel to popular destinations that already have high frequency service as demonstrated by Table 4. For example, adding more passengers, say, to the 28 daily departures from Heathrow to New York (JFK and Newark) has little marginal benefit in terms of convenience.
- e. People prefer direct flights and direct flights produce less CO2 and noise emissions. The NWR expansion concentrates noise pollution over an already heavily polluted London, not only from the 17 mppa taken by Heathrow from growth dispersed across other UK airports but also from 16 mppa unnecessary I-I transfers, together representing 77% of the NWR capacity.
- f. RHC's analysis shows that the NWR expansion adds 15.8 mppa I-I transfers by 2050; 1.0 mppa are on journeys in which both legs are short-haul, 13.0 mppa are on journeys where one leg is long-haul and the other is short-haul and 5.6 mppa are on journeys where both legs are long-haul (i.e. 19.6 transfers in total). The point here is that the short-haul leg takes up Heathrow's capacity for no direct benefit. It is claimed that Heathrow's capacity is best used for long-haul. The short-haul does feed the long-haul leg, where there is one, so we need to examine the long-haul segments. NWR expansion adds 9.3 mppa long-haul I-I transfers by 2050.

OECD Destinations. There are 5.0 mppa additional long-haul I-I passengers travelling to/from OECD countries by 2050. But the NWR expansion only adds 1.8 mppa terminating Direct international and Domestic interliner passengers by 2050 to the OECD destinations (i.e. around 73% of additional passengers to the USA, Canada and Australia

are I-I transfers).

NIC Destinations. NWR expansion adds 3.5 mppa long-haul I-I transfers to NIC countries by 2050. But the NWR expansion adds only 1.5 mppa terminating Direct international and Domestic interliner passengers by 2050 to the NIC destinations. (i.e. around 70% of additional passengers to the Far East, India, Latin America, Middle East and South Africa are I-I transfers).

LDC Destinations. NWR expansion adds 0.8 mppa long-haul I-I transfers to LDC countries by 2050. But the NWR expansion adds only 0.1 mppa terminating Direct international and Domestic interliner passengers by 2050 to the LDC destinations. (i.e. around 90% of additional passengers to Africa are I-I transfers).

We submit there is little or no economic value to the UK from the additional I-I travel to OECD, NIC or LDC countries and the outcome is highly inefficient use of Heathrow's additional NWR capacity.

37. Table 5 below shows that the NWR expansion results in only 0.8 mppa additional terminating long-haul passengers for the whole of the UK by 2050. Conversely, there are 9.3 mppa long-haul I-I transfer passengers. We should place the matter into context - the forecast number of passengers in 2050, assuming the NWR expansion, is 136 mppa for Heathrow and 435 mppa for the UK as a whole. The table demonstrates how the additional NWR capacity is wasted on I-I long-haul transfers.

Table 5	Incremental (LHR NWR minus Do-Minimum) Passengers, 2050				
mppa	Heathrow	Rest of UK	Total UK	Heathrow I-I	UK Terminating*
Long-haul	12.8	-2.7	10.0	9.3	0.8
Short-haul	29.5	-14.4	15.1	6.5	8.6
Domestic	0.8	-0.2	0.6	na	0.6
Total	43.0	-17.2	25.8	15.8	10.0
Note: There are rounding differences. *excludes de-minimis impact of the NWR expansion on the relatively few I-I transfers at airports other than Heathrow.					

38. Regarding short-haul destinations, an additional 8.6 mppa terminating short-haul passengers are serviced by the NWR expansion. But the UK has ample existing and planned short-haul capacity for the foreseeable future. It does not need the highly expensive NWR expansion to service this segment of the market. Moreover there are 6.5 mppa short-haul I-I transfers of no economic value to the UK.
39. Moreover, unlike passengers terminating in the UK, I-I transfers are exempt from Air Passenger Duty. The Terminal Five Public Inquiry was informed that an increase in transfer passengers reflected a new airline strategy. The adoption of this strategy, which diverges from the likely passenger preference for direct flights, may have been influenced by two state interventions in the early 1990s:

- In 1993 the "use it or lose it" rule was introduced for airlines holding slots at Heathrow and other major airports, whereby slots have to be used for not less than 80% of the allocation or surrendered (with no compensation) for re-allocation to competing airlines.
- In 1994 Air Passenger Duty was introduced with an exemption for transfer passengers for the specific purpose of encouraging transfers at UK airports (primarily Heathrow). Sir John Cope MP (Paymaster General) said "*We are concerned to maintain the international position of the British air transport industry particularly that of Britain's hub airports, such as Heathrow, and to help the airlines serving them, by preventing the tax from acting as a disincentive to passengers changing planes in Britain.*" (Hansard, 31 Jan 1994, Col. 643).

40. RHC proposes that reducing I-I transfers through proper taxation would also be an effective and efficient way to reduce UK demand without negative consequences and in doing so it would reduce UK aviation emissions. It is surely preferable to reduce I-I transfers than UK resident terminating demand in a demand constrained environment. Strategy needs to recognise this situation.

41. In considering demand deficiencies we also need to look at the purpose of travel. This is shown in Table 6. It shows that UK wide business travel is not materially impacted by the NWR expansion; there is less than one mppa added to UK business travel by 2050. There is a small gain of 2 mppa leisure foreign resident passengers (e.g. inbound tourists). The gain of 6.4 mppa of leisure UK resident passengers is relatively small and in any event has a negative balance of payments outcome. Surely, such de minimus benefits from NWR expansion should be considered by the Strategy - otherwise it is failing to use airport capacity in a beneficial way.

Table 6	2016	Do-Minimum 2050			Increment LHR NWR-DM 2050		
		Total UK	Heath row	Rest of UK	Total UK	Heath row	Rest of UK
million passengers per annum							
<i>Business UK resident, international</i>							
Short-haul	15.0	7.1	21.2	28.3	3.3	-2.6	0.7
Long-haul OECD	1.8	2.5	0.8	3.2	0.1	-0.1	0.0
Long-haul NIC	1.8	3.7	1.1	4.7	0.1	-0.1	0.0
Long-haul LDC	0.2	0.4	0.0	0.4	0.0	-0.0	0.0
Total Business UK resident, international	18.7	13.6	23.0	36.6	3.4	-2.7	0.7
<i>Business foreign resident, international</i>							
Short-haul	13.4	7.6	16.5	24.1	3.1	-2.9	0.2
Long-haul OECD	1.7	2.1	0.4	2.5	0.1	-0.1	0.0
Long-haul NIC	1.5	3.3	0.6	3.9	0.0	-0.0	0.0
Long-haul LDC	0.1	0.2	0.0	0.2	0.0	-0.0	0.0

Total Business foreign resident, international	16.7	13.2	17.5	30.7	3.2	-3.0	0.2
Leisure foreign resident, international	51.2	22.1	56.1	78.2	6.9	-4.9	2.0
Leisure UK resident, international	124.8	39.4	170.5	209.9	13.0	-6.6	6.4
Business domestic end-end	15.1	0.7	22.7	23.4	0.4	-0.3	0.1
Leisure domestic end-end	16.2	0.6	25.2	25.8	0.4	0.1	0.5
International-to-international transfers	23.9	3.8	1.1	4.9	15.8	0.0	15.8
Total	266.6	93.4	316.1	409.5	43.0	-17.3	25.8

42. Connectivity is a further area where the Strategy is failing. The DfT 2017 forecasts demonstrate that the NWR expansion results in a net loss of just one destination from the UK, based on 394 destinations. There is a loss of 3 short-haul and a gain of 2 long-haul destinations.
43. The DfT 17 forecasts show that the increase in frequency of flights at Heathrow as a result of the NWR expansion is likely to benefit the already popular routes with diminishing marginal benefit and without much if any increase in the frequency on thin routes. Furthermore the regional airports seemingly reduce route frequency.
44. So the NWR expansion is negative on the number of destinations from the UK and the frequency of flights, which together define connectivity. Surely, this is a failure of Strategy.

CHAPTER 3 ENSURE AVIATION CAN GROW SUSTAINABLY

45. Please see the following:

Annex 1	Aviation Noise
Annex 2	Surface Access
Annex 3	Air Quality
Annex 4	Climate Change

CHAPTER 4 SUPPORT REGIONAL GROWTH AND CONNECTIVITY

46. We have shown in our Chapter 2 response the negative impact of Heathrow's NWR expansion on regional aviation growth. We have also said in our Chapter 2 response that regional connectivity is impaired by the NWR expansion. Inbound tourism is diverted to London from the regions. We conclude that north-south economic balance is harmed by Heathrow expansion.
47. Furthermore, as a result of the NWR expansion, noise and air pollution is concentrated around Heathrow instead of being dispersed across the UK at regional airports. The expansion of Heathrow increases Heathrow's captive area which increases travel from greater distance in the UK and adds to London's surface access congestion and pollution and public transport over-crowding.
48. There is a question as to whether Heathrow's monopoly should be challenged by the Competition and Markets Authority.
49. The CAA, which in its regulatory duties is bound to look after the interests of passengers, fails to recognise in its emerging economic regulation the negative impact of Heathrow on passengers UK wide.

CHAPTER 5 ENHANCE THE PASSENGER EXPERIENCE

50. Chapter 5 is concerned with a new Passenger Charter, mobility and additional needs, disruptive passengers, border control, complaints and compensation, and access to information.
51. Broadly we support the proposals but the issues considered are outside the area of RHC's focus and expertise. Accordingly we are not responding to the nine specific chapter questions.
52. However, one area in which we have taken great interest is the economics of Heathrow expansion and economic regulation by the CAA. The CAA has a duty of responsibility towards passengers. One area seemingly not examined in detail by the Strategy is ticket pricing which surely is a major part of passenger experience. On this point we say two things.
- a. We do not believe there is scarcity rent at Heathrow. The Government claims in the APNS that the excess pricing would disappear once the capacity constraint said to exist at Heathrow is relieved by a 3rd runway. The Government claims the benefit to the UK economy would be £74bn (NPV).

The airline Group IAG and consultants PW and others have published their assessment of scarcity rent and also conclude it does not exist. If ticket prices at Heathrow are higher than at other UK airports on a like for like route basis, which the Government claims is the case, we submit that is largely because Heathrow's cost base is higher. Heathrow is the most expensive large airport in the world with commensurately high aero charges to the airlines.

A quick look at Heathrow's Master Plan just published shows use of the expanded capacity building up from 505,000 at first flight in 2026 to 740,000 in 2035 and 750,000 in 2040. This is slower than in the DfT 2017 forecasts used for the APNS and therefore if there is a scarcity rent it would be reduced more slowly and the £74bn of economic benefit would be overstated.

- b. Heathrow has just published its Master Plan and we have not yet examined the revised economics. But based on DfT estimates in 2017 supporting the APNS, the aero charge may have to increase by over 30% from today if the expansion is to be financeable. The Government has said the aero charge should not increase in real terms. We do not think today's passengers should pay for the expansion (pre-loading the aero charge) and ticket prices after first flight and hence passenger experience we believe to be significantly at risk.

CHAPTER 6 ENSURE A SAFE AND SECURE WAY TO TRAVEL

53. Chapter 6 is concerned with concentration of safety risks, emergency safety risks, data and reporting, global variations in safety standards.
54. Broadly we support the proposals but the issues considered are outside the area of RHC's focus and expertise. Accordingly we are not responding to the nine specific chapter questions. We agree that safety is paramount.
55. However, we are concerned. We have seen no safety report for Heathrow's expansion. There may be one with the Heathrow consultation just launched but in our view such a report should have been produced and then updated as far back as the Airports Commission Final report in 2015. Our particular concern is with the number of flight paths feeding in and out of Heathrow (currently 24) but with PBN and flight path alternation this could rise to 90 or more. There is a risk, which to some extent may be mitigated by automation, when pilots are required to take control that errors could arise, especially where pilots with airlines with less frequent use of Heathrow only visit the airport a few times a year.
56. The introduction of curved flight paths in order to allow for flight path alternation, even with modern technology, is inherently more risky as aircraft line up for landing.
57. The existing southern and northern runways are too close for independent use and the 3rd runway will be even closer to the existing northern runway. The issue of vortex interference on arrivals and the need for adequate separation does surely risk safety.
58. The issue of go-arounds involving a three runway airport is inherently more risky than in the

case of a two or four runway airport.

59. 14 airports share the airspace around Heathrow. The increasing number of flights, not just from Heathrow, challenges proper co-ordination in this multiple airport airspace and this in turn risks safety.
60. We are concerned that in order to avoid risking safety, flight operations may increase noise impact, air pollution and fuel burn and hence impact climate change.
61. Flights in and out of Heathrow are over one of the most densely populated areas in the world, so should there be an accident the loss of life on the ground could be high.
62. The Strategy does not appear to tackle these issues.

CHAPTER 7 SUPPORT GENERAL AVIATION

63. Chapter 7 is concerned with reducing regulation, general aviation strategic network, commercial activities, airspace, safety, training, skills, environmental impacts of GA.
64. Broadly we support the proposals but the issues considered are outside the area of RHC's focus and expertise. Accordingly we are not responding to the eight specific chapter questions.
65. However, we do believe that Heathrow and Northolt and its GA activities potentially compete for airspace and any restriction on Heathrow airspace will lead to less flight path separation and respite from noise for communities on the ground.

CHAPTER 8 ENCOURAGE INNOVATION AND NEW TECHNOLOGY

66. Chapter 8 is concerned with areas of opportunity for innovation in aviation - automation, electrification, digitalisation and data sharing and barriers to innovation and alignment of policy and investment.
67. Broadly we support the proposals but the issues considered are outside the area of RHC's focus and expertise. Accordingly we are not responding to the nine specific chapter questions.
68. However, the development of less noisy aircraft and the timing of improvements and the introduction of new aircraft into Heathrow's fleet of aircraft is key input into the reduction of noise impact on the ground, with which RHC is primarily concerned. Environmentally managed growth depends directly on the introduction of less noisy aircraft.
69. Reducing the noise on departures and arrivals depends to some extent on technological advances and RHC is particularly interested.
70. The size of aircraft and their loads is important in determining the number of flights and hence noise impact and technology plays an important part in aircraft sizes and weights.

71. Aircraft have achieved increasing maximum distances travelled and can now fly non-stop half way around the world. This changes the way people fly and the type of aircraft and hence noise impact. Again technology plays an important part.
72. Technology is especially relevant to airspace design and use, for example PBN and the potential for concentration of aircraft and noise or perhaps flight path rotation and respite.
73. Technology is important in better management of flights to avoid congestion at airports.
74. Technology and safety go hand in hand.
75. Technology is important in reducing fuel burn and carbon emissions and in the case of Heathrow environmentally managed growth.
76. Technology is important in the NO_x and particulate emissions not only from aircraft but from surface access to airports
77. Technology is important in seeking to reduce noise, No_x and carbon emissions without compromise in one or other of these emission reductions.
78. Technology is important in measuring and modelling noise, NO_x and carbon emissions.
79. Technology is important in translating the noise, NO_x and carbon emissions into health and quality of life impacts.
80. It can be seen from the above that RHC and other communities are very much recipient of technology advances in aviation. We strongly recommend the Strategy seek ways to engage communities in the technological advances in a way that they can best handle given limitations on their ability to understand the technology.

END

Annexes 1-5

AVIATION NOISE
Aviation Strategy 2019 - Chapter 3

Richmond Heathrow Campaign (RHC) has not had the opportunity to review Heathrow's recently published Master Plan 18 June 2019 but we believe our comments and conclusions set out here are likely to remain largely valid.

We have focussed our attention here on Heathrow but we see no reason why the comments made should not apply generally to other airports across the UK and therefore they should be considered in the UK Aviation Strategy. But also, Heathrow will be by far the largest UK airport with the NWR expansion and therefore UK Strategy does need to recognise the major UK impact of Heathrow's growth.

National Noise Objective.

1. A national noise objective was set out in the Airports National Policy Statement (APNS) June 2018, paragraph 5.68:
 - avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise adverse impacts on health and quality of life; and
 - where possible, contribute to the improvement of health and quality of life.

Ambiguity and Interpretation of National Noise Objective:

2. We support 'reducing the effects of noise on health and quality of life', but -
 - a. **'Where possible'** is ambiguous. What evidence and criteria are required to decide whether reduction is possible?
 - b. **'To limit'** is ambiguous. Is the limit relative to some point in time or a trend and can it result in a noise increase even if only for a period of time? Heathrow suggests the 2013 noise level be a limit but how this is defined and if and when noise will be reduced is pure speculation. It is essential the 2013 levels of impact are defined. For example, are they based on Total Noise Impact across Heathrow's communities and hence concentration or on the Average Impact per person or household and hence dispersion? Concentration over a few people would reduce the Total Noise Impact but would not be fair and equitable and an objective RHC and others would wholly oppose. A 54 LAeq 16hr metric as the comparator is too high in our view. RHC seek a reduction in noise from a two runway airport and merely limiting noise in a three runway airport to 2013 levels is insufficient and unacceptable. RHC cannot support this approach strategically.
 - c. **'Regular breaks'** is open to wide interpretation and in the case of Heathrow's expansion and the Richmond area, the current 8 hour respite each day will be reduced to 4 hours. We generally support 'regular breaks from scheduled flights during the day and night'. Respite provides relief from noise and is a form of flight and noise dispersion, which we support. But the benefit of respite for one community is usually offset by a cost to another community and also the two may not be equal and opposite in value. Therefore, our support only applies when the allocation of noise by way of

respite is fairly shared across Heathrow's communities and fairness requires an additional noise objective, which is discussed below under point 3.

- d. **'Proportionate and cost effective'** could give preference to growth and aviation profits over environmental cost and ignores the "polluter should pay" principle. The issue is to what extent should the rate of reduction in noise be lessened by sharing benefits with the aviation industry and economic growth. The Noise Policy Statement for England's vision is to "Promote good health and a good quality of life through the effective management of noise within the context of government policy on sustainable development." What is meant by 'sustainable development' in Heathrow's case?

Additional Local Noise Objective

3. RHC on a number of occasions, including those at HCNF meetings during the last year, has proposed an additional local noise objective:

Where there is a reduction in overall noise the benefits be distributed proportionately to those already most affected and where there is an increase in overall noise the dis-benefit be distributed proportionately to those already least affected.

4. The RHC objective results in dispersion of noise and minimization of the average noise per individual. In the absence of such an objective Heathrow seemingly has convinced the Civil Aviation Authority (CAA) that additional noise from expansion should be focussed on those already experiencing noise while minimizing the noise over those not already effected. RHC regards this as unfair and inequitable and we continue to challenge Heathrow, the CAA and government on the issue of concentration versus dispersion of flight paths and noise. In our view those already exposed to noise should not be additionally exposed by Heathrow's expansion. The consequences of our proposed objective are:

- The impact on those already exposed to noise should not be increased by additional flights or loss of respite, and
- Additional noise should be distributed over areas not already affected.

For completeness, we add that the consequences in a two runway scenario, where the introduction of less noisy aircraft over time reduces the noise impact, are that airspace modernisation would not involve re-allocating existing noise levels across Heathrow's communities.

8. This is not the time and place to expand on the monetisation of noise impact on health and quality of life (e.g. using the government's WebTAG tool), but in our view it is important that WebTAG minimises the average cost per individual or household rather than minimising the total societal cost. The former tends to result in noise dispersion, whereas the latter tends to result in concentration.
9. In August 2018 Heathrow submitted its proposed airspace design principles to the CAA as part of Stage 1 on the airspace design change under the CAA's CAP 1616 process for CAA approval. Heathrow has rejected RHC's proposed new local noise objective and in doing

so proposed a set of airspace design principles to which we and other communities substantially disagree. Heathrow's airspace design principles give priority to concentrating noise over those already affected by aircraft noise and they minimise noise over those newly affected.

10. Admittedly, Heathrow's airspace design principles seek to disperse the noise over those already affected, mainly by respite but flight path separation is likely to be so constrained that respite is only partial. As it stands, we believe the airspace design principles are unfair and irrational and that Heathrow's arguments for its chosen design principles are groundless, we believe the airspace change process has been a serious failure on this occasion.
11. Heathrow's support of concentrated noise is to its advantage because the number of people potentially opposing expansion are reduced and because the lack of airspace is less of a limiting factor on expansion.
12. Heathrow's Development Consent Order (DCO) process, involving the planning inspectorate, runs in parallel with the CAA's airspace change process, and we see no reason why the DCO process cannot include an additional local noise objective, such as we propose, while still recognising the national noise objectives incorporated into the ANPS approved by parliament in June 2018.

Dispersion of Aviation Noise Across the UK

13. We believe that in the UK aviation context it may be possible to better balance economic benefit with environmental cost by sharing out the environmental cost across the UK. We have consistently made the case that growth should be spread across the UK and not concentrated at Heathrow (see RHC response to Chapter 2).
14. The current noise levels around Heathrow are excessive and we seek a reduction towards World Health Organisation (WHO) Guideline levels. Any increase in noise is not acceptable. Heathrow is by far the noisiest airport in Europe and has by far the highest noise impact on people's health. Under these circumstances, we believe Heathrow's communities should not be expected to accept a slower rate of noise reduction so as to allow for wider commercial and economic benefit from expansion.
15. Not only is the concentration of airport capacity in the southeast at the disadvantage of the regions but it also stifles competition.

Balanced Approach to Management of Aviation Noise

16. RHC supports the international approach to management of aviation noise called the ICAO Balanced Approach. This requires priority be given to:
 - reducing noise at source (i.e. the aircraft),
 - land use planning whereby local authorities avoid noise sensitive developments being exposed to flight paths near airports, and
 - operational mitigation (e.g. steeper descents and ascents).

Failing these priorities, then restrictions can be considered in proportion to the harm caused (e.g. a night noise ban).

17. However, in RHC's opinion the use of the Balanced Approach has been defective:
 - a. The reduction of noise at source is critical to improved noise climate but there is uncertainty with the rate of technological change to aircraft and the rate of replacement of the UK's aircraft fleet. In the past, Heathrow assumed a much faster rate of replacement than did the Airports Commission and the current assumptions are uncertain.
 - b. Notwithstanding the recent announcement on cessation of A380 production, the average number of passengers per flight is forecast by Heathrow to increase from around 170 today to nearly 200 passengers by 2050. Larger aircraft and associated mass and longer route distances and hence additional fuel on take-off will increase the noise at source - a factor that tends to be ignored and places doubt on claims for reducing noise at source. Aviation Strategy needs to better recognise the changing UK fleet of aircraft.
 - c. Currently, Land Use planning under the provisions of the ICAO's Balanced Approach is largely unworkable and is ineffective in controlling harm from aircraft noise. London's population growth is sizable (37% 2011-2050) and the ICAO Balanced approach to reducing noise impact requires Land Use planning so that homes and noise sensitive schools/hospitals etc are not exposed to excessive aviation noise. The expansion of Heathrow will make it even harder (if not impossible) for local authorities to plan additional homes. London is too densely populated for flight paths to avoid homes, other sensitive buildings and quiet areas such as Kew Gardens, Richmond Park etc. The blight over the next 35 years and more from noise will effect over a million people in an area extending at least 30 miles from the airport. Aviation Strategy should consider how the ICAO Balanced Approach on Land Use planning can be integrated effectively with local authority Local Plans for housing in the boroughs surrounding the Heathrow and for that matter any other UK airport.
 - d. The evidence historically suggests that the reduction in noise from individual improved operations, such as steeper descents, is relatively small. We welcome all operational improvements because in aggregate they can be of benefit but overall we find the aggregate impact has been and is likely to remain small. We realise modernisation of airspace is intended to provide benefits but we believe any benefits will be more than offset by the increased number of flights.
18. Therefore, restrictions such as a night flight ban and a cap on the number of flights and passengers are essential if there is to be a reduction in noise towards WHO Guideline values.

Monitoring Progress Against the Noise Objectives

19. We believe it is essential that noise objectives are used to prepare medium and long term plans for targeted reductions in noise. It is essential that the plans and outturns are used to

monitor progress against proposed noise objectives. These plans need to include a decision framework that includes the several stakeholders including the communities, airports and airlines.

Noise Envelopes

20. The Strategy advocates noise envelopes so as to only release capacity as and when noise criteria are met. In the case of Heathrow's expansion, these envelopes will be determined at the DCO planning stage.
21. We do believe it is essential to include WHO Guidelines in the controls and to base controls on the impacts rather than just the numbers of people affected. The WHO recognises environmental noise as the second largest environmental health risk in Western Europe behind air quality and the WHO has established Noise Guidelines (most recent update being in 2018). We believe the WHO Guidelines need to be adopted as targets, notwithstanding the higher thresholds estimated by the government's SoNA noise study. The targets need to be legally binding with use restricted when targets are missed.
22. The use and choice of Noise Metrics for control are important, although sometimes it seems too much emphasis is spent on trying to choose a metric and establish precision when in practice several metrics lead to similar conclusions.
23. It is important to focus on flight path impacts and not just broad contours of noise. Also, we believe attention should be given to all people exposed so that those fewer in number but severely impacted are not ignored.
24. RHC tends to use four metrics - single event, hourly, daily and annual. The hourly reflects the volume of traffic and the daily metric reflects respite. Easterly and westerly and landings and take-offs are also useful segments of analysis and control.
25. We believe controls on noise should be developed to better match the legal approach to air quality. The health and quality of life impacts are sizable in both cases. Not only should noise levels be compliant with legally binding standards established to protect communities but a condition of any development should be a reduction in noise impact as required by planning legislation.
26. The notion that noise envelopes will be sufficient control and a planning cap on Heathrow's use should not be necessary, we believe would be a serious mistake. We seek a cap on the overall number of flights and number of passengers as well as noise envelopes applied to flight paths.
27. Not only are the noise restrictions important in themselves but the trade-offs between noise, air quality and carbon are material. We are especially concerned that the altitude limit (i.e. 7,000 feet) up to which noise control is given priority is only applicable in design of airspace and not in its operation. This means airlines can ignore giving noise the priority up to 7,000 feet, which we find unacceptable. We believe the ceiling should be higher than 7,000 feet.

28. As we have pointed out, the noise objectives should refer to environmental cost and benefit of growth in number of flights. We are deeply concerned that Defra, Dft and others tasked with examining the recent WHO update, will not report their findings until at least 2021, which is after Heathrow's DCO decision. The comparison of benefits from economic growth with the environmental cost applying WHO Guidelines has not been made we understand and needs urgent attention.
29. RHC contends that the noise objectives and noise management should apply to the night period (11:00 pm to 7am). However, the criteria and values change. Noise impacts communities in different ways at night compared to day and with different health outcomes and there are different volumes of air traffic and different economics in play. We seek a ban on scheduled and unscheduled flights at Heathrow between 11pm and 7am. See section below on Night Flights.
30. Currently Heathrow has a planning restriction of a maximum 480,000 flights a year, which we believe should not be lifted. RHC website explains that the evidence produced for the Airports Commission and for the ANPS does not support expansion at Heathrow. We are opposed to any increase, including the 25,000 extra flights being considered before a 3rd runway begins operations. The ANPS requires an additional 260,000 flights a year, which would result in 740,000 flights a year from a three runway Heathrow.
31. However, from time to time the use is expressed at 'at least' 740,000 flights a year. A Jacobs report for the Airports Commission in 2015 and a York Aviation report for the DFT's ANPS in 2018 estimated a potential for 900,000 flights a year. The difference is achieved by mixed mode where planes depart and arrive using the same runway. The two existing runways each serve 240,000 flights a year but only one runway is operated at any one time and the runways are alternated with 16 hours of respite shared between the two. A three runway Heathrow will logically require one runway always operating in mixed mode at any point in time while one other runways operates in segregated mode and the other provides respite, as at present.
32. In theory, a three runway Heathrow has runway capacity of 960,000 flights a year (double the number today assuming the 480,000 is also a practical limit) but in practice mixed mode results in a slower flow rate for safety and taxiing reasons. For safety reasons, the middle of three runways can only operate in segregated mode so the current southern runway and the new 3rd runway have to provide for the extra mixed mode flights. The southern runway and new third runway end up with 50% of a to 300,000 flights a year or a 25% increase compared to today in the case of the southern runway. The total Heathrow flights under these circumstances could amount to 840,000 flights a year (300k+240K+300k) or a 75% increase compared to today. This excludes any increase in the busy 6am to 7am hour, which Heathrow is also promoting.
33. We believe the Balanced Approach should operate to restrict any increase in total Heathrow flights to 740,000 or less a year and only one runway in mixed mode at any point in time.
34. Should the NWR expansion not proceed for any reason we believe the throughput of the ongoing two runway Heathrow should not be increased above 480,000 flights a year. In

other words the introduction of mixed mode and an increase in capacity should not be assumed in the event of no 3rd runway.

Night Flights

35. RHC seeks an 8 hour ban on all flights between 11pm and 7am. The Airports Commission recommended a 6 1/2 hour ban from 11:30pm to 6am and the ANPS proposed a 6 1/2 hour ban with the timing to be determined in the period 11pm and 6pm. Were the ban to be for 6 1/2 hours, we would propose it should run from 11:30pm to 6am and that Heathrow should commit to extending the ban from 11pm to 7am at a future date or dates. We oppose runway start times of 5:15am and 5:30am for the two options proposed by Heathrow and therefore both options are unacceptable.
36. Night flight noise affects a large number of people - over 400,000 people around Heathrow and only a 10% reduction is forecast over the next 35 years and this is 50 years after restrictions were introduced. There is no end in sight for those suffering from the noise. Government proposals for restrictions over the last 10 years have had little or no impact on night time noise and the current proposals will have little impact.
37. There is minimal loss of benefit from shifting night flights to the daytime after 7am and Heathrow's daytime capacity is sufficient to absorb all Night Flights from 11pm to 7am. The Balanced Approach fails to reduce noise to acceptable levels and the ban between 11pm and 7am is a proportionate restriction in the context of health impacts. The WHO recommends 8 hours sleep. We discuss these reasons below.
38. RHC examined substantive evidence on all Heathrow's night flights in its 2017 response to the DfT on the current night flight regime (see RHC's website - Night Flights). Comparing the details of flights and originating airports Our response, as in 2017, was based on the following:
 - a. Minimal loss from shifting Heathrow's night flights to the daytime,
 - b. Heathrow's daytime capacity is sufficient to absorb All Night Flights from 23:00 to 07:00
 - c. Failure of the Balanced Approach to sufficiently reduce Heathrow's night noise,
 - d. Environmental Imperative for a Night time Ban at Heathrow from 23:00 to 07:00.
39. **(A) Minimal Loss to the UK from Shifting Heathrow's Night Flights to the daytime.**
The evidence demonstrates that shifting to the day around 16 flights arriving at Heathrow between 23:30 and 06:00 and around 25 departures and 40 arrivals between 06:00 and 07:00 can be achieved with minimal net commercial or economic cost. We believe the Airports Commission supports this assessment, at least for the period 23:00 to 06:00. There should be no loss in connectivity as the ban re-times the flights to the day and in most cases there are already flights from the displaced night time airports. Examination of the 13 arrivals in the night quota period 11:30pm to 6am in 2011 and 2013 raises the following questions:
 - a. What is so special about the 13 routes that they require night flight arrivals in the 65 minutes between 04:50 and 05:55 whereas 179 routes are without night flights?

- b. What makes the 13 routes operate up to 4 flights a night while 179 routes are served by no flights at night?
 - c. 11 of the 13 routes operated direct flights to Heathrow but Melbourne's night flight are via Singapore. One of Sydney's night flights are via Singapore and the other two are via Hong Kong. Of the 13 night time routes, 6 are in the Far East, 4 in Africa, 2 in America and 1 in the Near East.
 - i. To arrive in the morning after 07:00 at Heathrow broadly requires local time departures after midnight in the Far East and Africa. So are curfews at departure airports the reason for arrivals before 7am at Heathrow. Surely this is no good reason to impact the health of nearly half a million people in London. Curfews apart, Heathrow is served by 30 airports in the far east so why do only 6 need access to Heathrow pre 6am?
 - ii. Night time arrivals from America are not due to curfews, given the time difference, so why do Boston and Chicago require pre-6am arrivals when other dense routes such as New York and Los Angeles require none.
 - d. 12 of the 13 routes have additional flights after 6am most days of the week (Melbourne is the exception). So why do not 12 overseas airports rely on alternative flights in the daytime?
 - e. Why have some routes ceased and been replaced since 2013 when they were claimed to be so necessary?
40. In answer to the above questions, there does not seem to be any reason why specific services should operate at night other than that the Department for Transport allows them to.
41. The Airports Commission appears to come to the same conclusion with the following comments in its Final Report 2015:
- a. *'A review of existing schedules at Heathrow suggests that there would be no insurmountable demand or supply-side barriers to providing alternative overnight services to arrive after 6:00am:*
 - b. *Of 13 arrival routes in the core night period with a scheduled capacity of more than 10,000 seats in 2014, 11 were also served by an arrival between 6:00am and 8:00am.*
 - c. *Of the two remaining routes (Lagos and Kuala Lumpur) there is currently no operating curfew at the originating airport that would prevent a later departure and arrival.*
 - d. *The majority of passengers on arrivals in the core night period are origin and destination passengers for whom a slightly later arrival would be unlikely to be a*

cause not to travel. Travelling via a rival European hub would remain a longer and less attractive option.

- e. Transfer passengers (those arriving at Heathrow to transfer to another flight) make up on average around 37% of passengers on core night arrivals. For some of these passengers there may be a quicker option via an alternative hub airport, but this will only be relevant to the most time-sensitive customers within a relatively small transfer window for whom arrival at Heathrow before 6:00am is necessary to achieve their final arrival time.'*
42. We understand that at the Terminal Five Public Inquiry, British Airways claimed that it could eliminate all but one of its flights in the night quota period due to larger terminal and aircraft capacity but this promise has not been delivered.
43. Heathrow has little value as a hub airport. The Airports Commission says international-to-international transfers provide little economic value to the UK. They do not leave the airport. Moreover, unlike passengers terminating in the UK they are exempt from Air Passenger Duty. The idea that Heathrow is a hub airport that needs transfers to make routes viable is fiction. Evidence from the CAA and DfT demonstrates that in 2011 and 2016, for example, only 1% of transfers were on Heathrow's thin long-haul routes and only 8 out of 36 thin long haul routes had any international-to-international transfers (See our response to Chapter 2). The imminent cessation of production of the largest commercial aircraft, the A380, is indicative of the point-to-point network winning over the hub concept - an outcome predicted by Boeing. The notion that early arrivals are needed to support international-to-international transfer and in turn thin routes is fiction.
44. It is claimed that belly-hold freight is economically important and we do not doubt this claim. But we do doubt the claim that freight has to arrive at Heathrow before 6am. All night flights other than 18 from Melbourne have alternative flights in the day and 'just-in-time' processes can be rescheduled to day time arrivals. The Airports Commission did not raise freight as a reason not to ban night flights.
45. We conclude there is minimal loss to the UK from shifting Heathrow's night flights to the day time.
46. **(B) Heathrow's daytime capacity is sufficient to absorb All Night Flights from 23:00 to 07:00.** Lack of day and evening capacity into which to shift the night flights is often stated as preventing there being a night time ban.
47. Heathrow is currently limited to 5,800 flights in the night quota period – 3,250 in the summer season and 2,550 in the winter season. This equates to around 16 arrival flights a night. In the evening shoulder period (23:00 to 23:30) there are no flights scheduled. In the morning shoulder period (06:00-07:00) there are around 40 arrivals and 25 departures scheduled (we do not have the latest exact figures). On average there are approximately 2 unscheduled late running flights a night after 23:30.
48. We have previously examined Heathrow's daily runway scheduling limits for movements

per hour for each winter season from 2000-01 to 2011-12 and each summer season from 2001 to 2012 . The largest scheduling limit in any hour was 90 movements in the winter season and 88 in the summer season. Averaging 90 movements over 16 hours (07:00-23:00) and 365 days a year results in a theoretical scheduled capacity of 526,000 movements. Deducting the legal limit of 480,000 air transport movements and 6,000 non-ATMs a year leaves contingency capacity of 40,000 per year (110 flights a day) or 7.6% of the theoretical scheduled capacity.

49. The maximum of 90 scheduled movements an hour already makes allowance for unscheduled contingencies across the day and therefore underestimates the peak capacity in any single hour. Furthermore, Heathrow has been working over recent years along with the South East Task Force (SETF) to reduce delays and improve punctuality and resilience. We understand that improvements are being made successfully and that the calculation of contingency capacity referred to above is now an under-estimate.
50. In September 2016 Heathrow said it would like to unlock the 480,000 ATM legal limit and add 25,000 flights a year before a 3rd runway is opened. It said that ‘Overall flight numbers will rise by 25,000 a year with four million more passengers. The airport says new technology will allow this without causing more delays for existing flights.’ This plan has since been developed.
51. On the basis of our analysis above and the fact that Heathrow itself has published indicative plans to handle another 25,000 flights a year in the day time without increasing delays, we submit that Heathrow has the capacity to enable movements that are currently scheduled between 23:00-07:00 (16 in the night quota period and 65 in the early morning shoulder period) to be re-scheduled between 07:00-23:00. This amounts to 30,000 flights a year which exceeds the spare capacity Heathrow has admitted by 5,000 flights but not the capacity we believe is available and more the case in the event of a 3rd runway.
52. Our proposed ban on movements (23:00-07:00) would therefore mean that Heathrow would still be able to handle its legal maximum of 480,000 movements per year, albeit only in the day and evening 19 periods (07:00-23:00); that the airlines holding slots between 23:00-07:00 would retain those slots, albeit re-distributed between 07:00 and 23:00; and that passengers who currently use scheduled services between 23:00 and 07:00 would be able to access Heathrow services from 07:00 to 23:00, along with other passengers.
53. While we believe a night flight ban is justified even without a 3rd runway, it surely is the case that a relatively small proportion of the additional capacity could be used to shift night flight demand to capacity in the day time after 7am.
54. **(C) Failure of the Balanced Approach to sufficiently reduce Heathrow’s night noise.**
We do not believe the results of the ICAO Balanced Approach and available restrictions are sufficient to reduce the already excessively high level of aircraft night time noise and in a timely manner. Our conclusion is that there is a strong case for the only remaining remedy, which is a ban on night flights.

55. **(D) Environmental Imperative for a Night time Ban at Heathrow from 23:00 to 07:00**
In our opinion the environmental harm from night flights is sufficiently great that even were there to be some commercial or economic benefit from night flights, which we have argued there is not, a ban on night flights would still be justified. Our overall assessment on night flight noise, as supported by the evidence in this response, is that the negative community impact is far too high with damaging consequences to health, productivity and children's learning. Furthermore, the noise impact, as experienced by each individual and in relation to the WHO Guidelines, has and will continue to reduce too slowly.
56. Despite a succession of government restrictions on night flights at Heathrow over the last fifty years, more people around Heathrow than around any other European Union airport are exposed to levels of aircraft noise at night that exceed the WHO's Guideline limit values on community noise. Other airports such as Frankfurt have a ban on night flights. In 2013 the number of people exposed to aircraft noise above 48 decibels (LAeq 8 hour) in the night period (23:00-07:00) was 11,600 people at Gatwick compared to 421,300 people at Heathrow. We argue that the government should take the WHO Guidelines much more seriously and not only introduce a night time ban but reduce the noise in the shoulder periods.
57. We very much support the concept of a period of uninterrupted silence as being of key importance to residents sleeping under flight paths. The first flight to break that silence and wake people up has a high social cost. We believe the period of uninterrupted silence during the night should be eight hours (2300-0700). The number of interruptions is also important to health.

SURFACE ACCESS

Aviation Strategy 2020

Figure 8 of the Consultation Document

1. The figure is useful however needs to be strengthened by allocating responsibilities and authorities to ensure accountability of the aviation industry. In particular under Community engagement, 'quantify and minimise adverse impacts' should be included.

2. Under Air quality, it is assumed that 'Surface across' should be 'Surface access'

Surface Access

3. Para 3.67 is supported. However with respect to Heathrow expansion we are not clear that the developer has conformed to the requirements and have seen no evidence nor quantification that to show that congestion, emissions and other local impacts have been minimised.

Sustainable journeys to the airport

4. Para 3.99; it is proposed that the Air Transport Forums will monitor an airports targets for sustainable passenger and staff travel. Is it proposed that other (freight, business) airport demands will also have targets for sustainable surface access? If an airport does not meet its targets, what enforcement measures/penalties are envisaged?

Air Quality

5. Para 3.124; reference is made to 'in the section of this document on improving surface access to airports'; is that the Regional Transport Hubs section paras 4.32 to 4.40?

Regional Transport Hubs

6. Paras 4.34 to 4.36 describes how government does not currently have a role in monitoring or enforcing surface access strategies, and the lack of jointed up planning on the development and delivery of transport facilities. Obviously funding is a fundamental element that should be included.

7. Proposals are set out in para 4.37 to remedy these inadequacies, however, again, no mention is made of enforcement and penalties should (agreed) targets not be met.

Funding

8. Funding should be linked to the requirement to minimise adverse impacts on non airport users. Indeed projects to support airport expansion should be delivered that result in no net increase in congestion, emissions and other impacts for the 'with expansion case' when compared with the 'no airport expansion case'. For example on roads and public transport, levels of service/crowding should be no greater with airport expansion than when there is no airport expansion. The developer of airport expansion and in turn the passenger/freight user and not the UK Treasury should pay the full cost of mitigating adverse impacts of surface access.

9. In terms of transport impacts, the area of influence of airport expansion should be defined as locations where the increase in traffic and public transport demands resulting from airport expansion exceeds 5% of one way highway and public transport hourly volumes. That figure being based on previous standards and the fact that at capacity a 5% increase results in an large increases in congestion.

THE IMPACT OF HEATHROW EXPANSION ON AIR QUALITY

Aviation Strategy June 2019

General comments

1. Richmond Heathrow Campaign (RHC) is extremely concerned about air pollution associated with Heathrow Airport and its potential effects on health, not only of travellers and staff at the airport, but also of the London residents overflown by incoming and departing aircraft. In our view building a third runway is likely to hugely exacerbate this problem. Airports generate air pollution from planes on the ground, taking off and landing, in the air, and from vehicles on the ground transporting people and freight to or from the airport. The third northwest runway proposal represents a 54% increase in the number of take-offs and landings from the current 480,000 p.a. to at least 740,000 p.a. Passenger numbers will almost double from 74 million p.a. to 135 million by 2050. In addition, Heathrow plans to double its cargo capacity.
2. Air quality at Heathrow is currently very poor. It is designated an Air Quality Focus Area (AQFA); that is, a location where the EU/UK annual mean limit value (40 ug/m³) for nitrogen dioxide (NO₂) is exceeded and where there is high human exposure to pollution. Heathrow is the largest single AQFA of the 187 AQFAs in London¹.

Predictions in the most recent London Atmospheric Emissions Inventory (LAEI 2017), which take account of revised road transport emission factors (COPERT 5), indicate annual mean NO₂ concentrations at Heathrow will remain at or above the EU limit of 40 ug/m³ in 2020². Total nitrogen oxides, NO_x, (NO + NO₂), for which there are no legally defined limit values but which are important in the formation of particulate matter as well as of NO₂, are predicted to greatly exceed 40 ug/m³ in 2020. Thus, additional pollution resulting from the operation of a Heathrow NW runway from 2026 is unlikely to be offset by future marked reductions in pollution locally, or more generally in Greater London.

3. Air pollution is one of the greatest public health challenges in the UK. Strong evidence indicates that it is linked to an increased incidence of a wide spectrum of human disease, including asthma, stroke and heart disease, cancer, diabetes and dementia. It is estimated that air pollution is responsible for almost 40,000 premature deaths annually in the UK, of which about 10,000 are in Greater London (Royal College of Physicians Report 2016, Every breath we take: the lifelong impact of air pollution). WHO estimated the cost of deaths from air pollution in the UK as £54 billion p.a., or 3.7% of GDP³, so developments which worsen air quality are a significant problem for the UK economy. Thus, it is essential that action must be taken to reduce all sources of air pollution, including aviation, and to plan future developments to be air quality neutral.
4. Air pollution is one of the greatest public health challenges in the UK. The lung

¹ <https://data.london.gov.uk/dataset/laei-2013-london-focus-areas>

² <https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory-2013>

³ http://www.euro.who.int/__data/assets/pdf_file/0008/276956/PR_Economics-Annex_en.pdf?ua=1

development of children living in areas of poor air quality is compromised, predisposing them to respiratory disease in youth and in later life. Nitrogen oxide gases, emitted from vehicle or plane engines burning carbon fuels have well established adverse effects inducing, or worsening asthma, even in normally developed lungs. They also have additive effects on diseases induced by particulate matter (PM), another component of exhaust emissions (Royal College of Physicians Report 2016, Every breath we take: the lifelong impact of air pollution). Particulate matter is classified by particle size. There is strong evidence implicating fine particles (diameter 2.5 microns or less, PM_{2.5}) in the development of a raft of medical disorders, including heart attacks, strokes, type 2 diabetes, Alzheimer's disease, lung cancer, pre-eclampsia, and low birth weight.

5. Statutory upper concentration limits for nitrogen dioxide and PMs are in place for the UK/EU and are advised by the World Health Organisation (WHO). The limit concentration for PM_{2.5} advised by WHO is much lower (10 ug/m³) than the current UK/EU limit (25 ug/m³). This lower limit acknowledges the view of many experts that there is no health-safe concentration for fine particulate matter. This has been acknowledged by the UK Government in the newly published Clean Air Strategy⁴. This states *"we will set a bold new goal to progressively cut public exposure to particulate matter pollution, as suggested by the WHO. By implementing the policies in this Strategy, we will reduce PM_{2.5} concentrations everywhere, so that the number of people living in locations above the WHO guideline level of 10 ug/m³ is reduced by 50% by 2025, compared to our 2016 baseline. Areas above the 10 ug/m³ guideline limit in 2025 will have lower concentrations than today, and we will set out our plans to reduce PM_{2.5} concentrations even further in due course"*.

In the past has recorded PM_{2.5} concentrations of 10 ug/m³, or above, at all its monitoring sites, reported in Heathrow Air Quality Strategy 2011-2020, Fig 6⁵

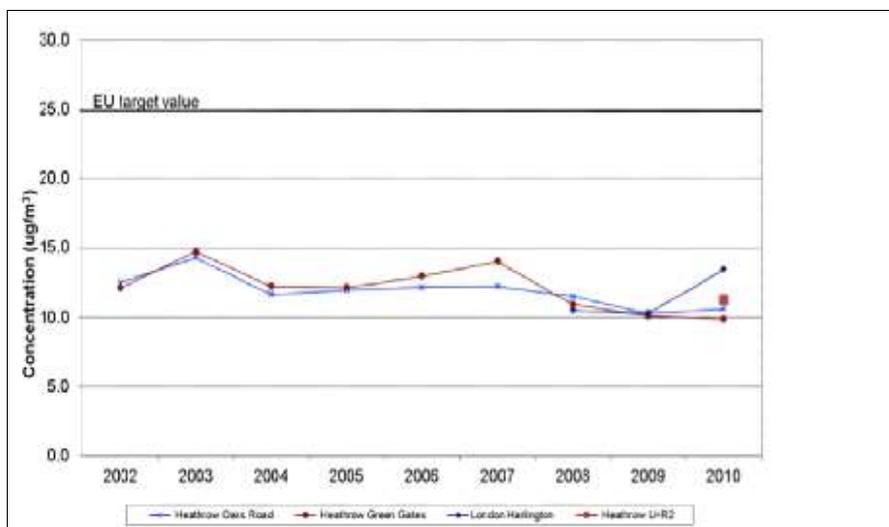


Fig. 6 - Annual average gravimetric PM_{2.5} measurements at HAL's monitoring sites from 2002

⁴https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

⁵https://www.heathrow.com/file_source/Company/Static/PDF/Communityandenvironment/air-quality-strategy_LHR.pdf

Despite claims of more efficient aircraft engines, cleaner fuel, etc., since these data were recorded, PM2.5 concentrations have not changed. **On 19th June 2019 The PM 2.5 concentration (24h mean) at four sites at and around Heathrow Airport (Heathrow LR2, Heathrow Oaks Rd, Harlington and Spelthorne Sunbury Cross) was 10-11 ug/m3⁶.** Thus RHC believes that, even with further improvements in engines and fuel, **it will be impossible for an expanded airport** with a 54% increase in flights, an 82% increase in passengers, and a doubling of freight traffic, travelling to and from the airport, **to operate with PM 2.5 concentrations below 10 ug/m3, in accord with the UK Governments Clean Air Strategy above.** The likely scenario is that PM2.5 concentrations will rise with airport expansion.

6. The Minister of Transport informed the House of Commons Transport Select Committee that Heathrow will be able to expand without breaching legal limits for air quality⁷. In contrast, The Department for Transport's consultant (WSP) reported in the Department's 2017 Plan Update to Air Quality Re-Analysis that *"Given the inherent uncertainties in air quality modelling, there remains, however, a risk that the (NW runway) option could delay compliance with limit values"* (their bold font, not ours!) and *"The risk of an impact on compliance with limit values increases the earlier the assumed opening year for the option. The risk of impact on compliance is high up to 2029 since the option potentially impacts on compliance in central London and exists whether or not the Government's 2017 Plan actions are fully implemented"*⁸. We note that (i) HAL intend to operate an expanded airport from 2025 and (ii) that the Dept for Transport's consultant made these cautionary comments about compliance well before the Governments Clean Air Strategy 2019, aspiring to a much lower PM2.5 concentration by 2025. Thus, we have no confidence in Mr Grayling's assurance to the Select Committee that Heathrow will be able to expand without breaching legal limits.
7. It is noteworthy that particulate emissions from jet exhausts are almost all in fine fraction ($\leq 2.5\mu$)⁹. Aviation accounts for 3% of PM2.5 in Greater London, a proportion similar to that from commercial gas (2%) and domestic gas (4%)¹⁰. These proportions of course relate to the overall atmosphere of Greater London. Some may be tempted to dismiss them as insignificant. However to comply with the PM2.5 level of $\leq 10\text{ ug/m}^3$ proposed in the Clean Air Strategy every source of particulate pollution will need to be radically reduced. No one would say, for example, that emissions from domestic or commercial gas burning should be ignored in policies to reduce particulate pollution. It follows that there is no reason to exclude reducing aviation emissions from such policies either. Moreover, as we will discuss below, the overall concentration is misleading when discussing possible adverse effects on health since incoming aircraft create exhaust plumes which expose those living

⁶ http://www.heathrowairwatch.org.uk/latest?site_id=SBC01,
https://www.airqualityengland.co.uk/site/latest?site_id=LHR2

⁷ <https://www.parliament.uk/documents/commons-committees/transport/Letter-from-Chris-Grayling-MP-to-Committee-Chair-re-Airports-NPS-revised-draft-23-2-2018.pdf>

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/653775/2017-plan-update-to-air-quality-re-analysis.pdf

⁹ <https://www.environmental-protection.org.uk/policy-areas/air-quality/air-pollution-and-transport/aviation-protection>

¹⁰ https://www.london.gov.uk/sites/default/files/appendix_2_evidence_base.pdf

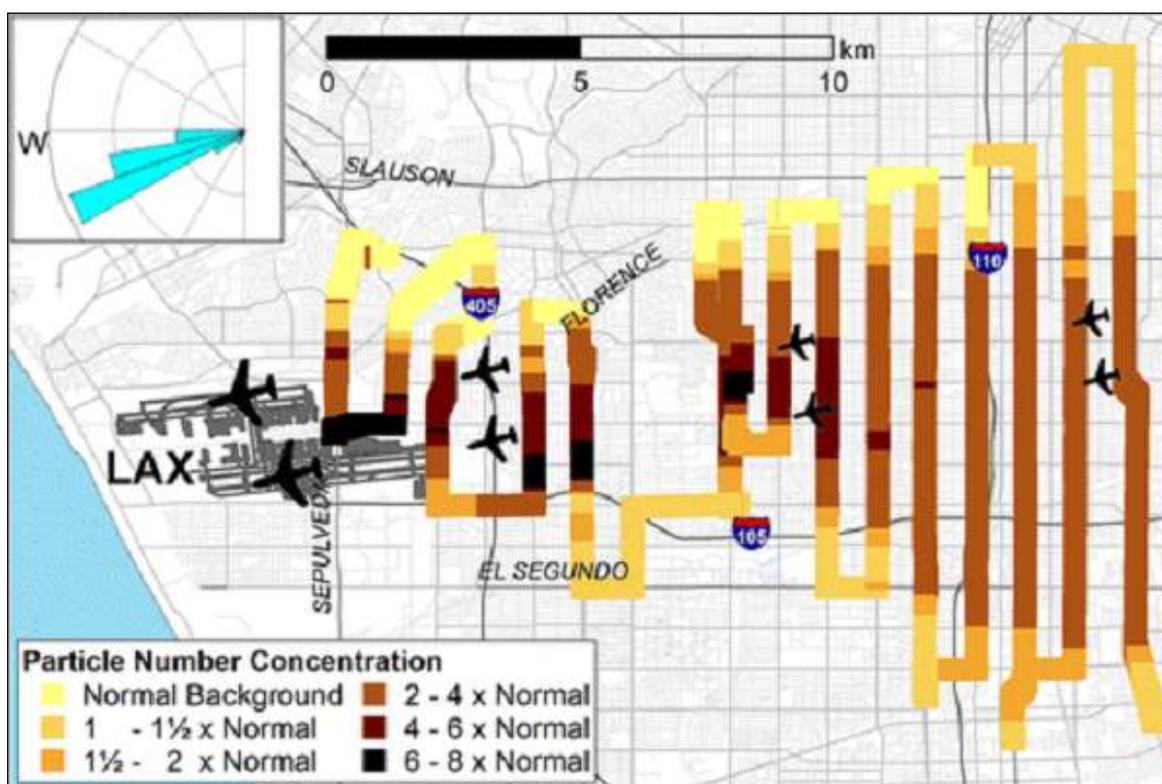
under the areas where they disperse to much higher than average concentrations of PM2.5.

Pollution emitted at Heathrow Airport

8. The LHR2 on-airport monitor provides repeated real-time sampling of the air quality on the airport itself. During 2018 NO₂ levels frequently exceeded 40 ug/m³ and the annual mean value is 40 ug/m³ - i.e. at the legal limit. The annual mean values for the dangerous PM_{2.5} particles is 9 ug/m³, on the borderline of the World Health Organisation's recommended safe limit (10 ug/m³). Results for previous years showed that NO₂ concentrations at the LHR2 site frequently exceed legal limits (e.g. annual mean NO₂ concentration for 2014 = 46.4 ug/m³). Heathrow Airport Ltd (HAL) claim that data from LHR2 is irrelevant to members of the public since they are not exposed to the air on the airfield itself. However, we believe the data is important because it confirms that the airfield itself is a significant source of toxic pollutants, whether generated by aircraft, or by the many ground vehicles driving on the airfield.
9. The Ricardo-AEA report on Heathrow Airport air quality in 2013 calculated NO_x emissions (tonnes/year) by airport source - (i) aircraft elevated [between ground and 1000m], (ii) aircraft ground, (iii) general service equipment, (iv) road traffic for airport related trips within an 11x11 km rectangular major road network, (v) heating plant, (vi) other sources, and (vii) non-airport related traffic within the same 11x11km rectangle ¹¹. The total airport-related emissions (i-vi) were 4957.19 tonnes and non-airport traffic contributed a further 1829.76 tonnes. By category, elevated aircraft account for 55.7% and grounded aircraft 30.7% of the airport generated NO_x pollution - a total of 86.4%. Non-airport related traffic accounts for only 27% of the grand total of 6786.95 tonnes of NO_x emitted in the Heathrow Airport area. We propose that this analysis, carried out for Heathrow, gives a reasonable idea of where the pollution in the area comes from. The actual tonnes of NO_x emitted may have reduced since 2013, but the proportion generated by each source is unlikely to have altered greatly. Thus planes, both air-born up to 1000m and on the ground, are the major generators of NO_x pollution. We conclude that an additional 260,000 flights at an expanded Heathrow will generate a huge increase in NO_x, even if newer, lower emitting, planes are brought into use.
10. Pollutant gases and particles disperse and therefore contribute to air pollution over a much wider area than on the airfield alone. A recent study of Los Angeles International Airport (LAX), where prevailing winds are westerly, found a 4 to 5-fold increase in particulate number 5-6 miles downwind of the airport and a 2-fold increase extending to 10 miles downwind (Hudda. N et al., Environ. Sci. Technol. 2014, 48, 6628-6635) (see figure below).

This study indicates that the area affected by the exhaust emissions of incoming aircraft at major airports was previously seriously under estimated. Other studies confirm the finding. The prevailing winds at Heathrow are south westerly, so pollutant gases and particles generated both by incoming aircraft and on-airport are likely to impact a large area of West London. Increased numbers of flights to an expanded Heathrow can only exacerbate this problem, further compromising the health of those living below.

¹¹http://www.heathrowairwatch.org.uk/documents/Heathrow_Airport_2013_Air_Quality_Assessment_Detailed_Emissions_Inventory.pdf.



[from Hudda, N et al. 2014 - see full ref above)

11. There is a 3 to 5-fold increase in ultra fine particle (UFP) concentrations under the landing approach of aircraft to airports, relative to surrounding urban areas, indicating that their exhaust plumes mix downwards to a significant extent (Riley, E.A. et al., Atmos. Environ., 139, 20-29, 2016). DEFRA commented recently that there is potential for considerable exposure to UFP from aircraft at Heathrow, where aircraft usually approach from the east over urban London¹². UFP are very small (diameter < 0.1 μm), penetrate the blood capillaries in the lung, and disperse around the body via the circulation. A recent assessment indicates that they have effects on pulmonary/systemic inflammation, heart rate variability and blood pressure (Ohlwein S. et al., Int J public Health, 64, 547-559, 2019).

Off-airport air quality measurements

12. The London Boroughs of Hillingdon and Hounslow maintain a number of automatic monitors and nitrogen dioxide diffusion tube monitors at kerbside locations on main roads close to Heathrow Airport. The results are reported annually¹³. Some locations consistently markedly exceed the legal limits for NO₂, for example London - Hillingdon (on the M4 close to the Heathrow spur road junction), Hillingdon Hayes (just north of the Hayes exit from the M4), Heston, Feltham, and Hatton Cross. Much of the air pollution at these sites is undoubtedly generated by vehicle exhaust emissions. Some of these, will be vehicles

¹²https://ukair.defra.gov.uk/assets/documents/reports/cat09/1807261113_180703_UFP_Report_FINAL_for_publication.pdf

¹³https://hounslow.app.box.com/s/i0offxwd7nij45owxx24pbfltqzloed7, and https://www.aef.org.uk/uploads/2018/06/Hillingdon-AQ-Progress-Report-2017_final.pdf

going to, or coming, from the airport (see below for further discussion of numbers). Some pollution may come from landing aircraft, as discussed above (see Riley et al and Hudda et al, cited above). The significance of the data in our view is that it confirms that Heathrow Airport is currently located in a dangerously polluted area. Further increases in passengers, freight or employee traffic, resulting from airport expansion can only add to this pollution.

Contribution of aviation to poor air quality in West London

13. The London Atmospheric Emissions Inventory, published by the Greater London Authority, was updated in 2017 and reports concentrations of key pollutants between 2008-2013 and projections as far as 2030. One section presents borough by borough air quality data and shows the modelled contribution of each emission source (e.g. road transport, aviation, rail, industry, domestic and commercial gas, etc.¹⁴). We have examined data for various London Boroughs, for example Hillingdon and Hounslow, close to Heathrow Airport, and Enfield and Barnet which are distant from the airport. We selected Enfield because it is an industrial borough (about half its NO_x comes from industry) and Barnet because it is semi-rural. In 2020, the total NO_x emissions predicted for these boroughs (tonnes p.a.) are Hillingdon (4,321), Hounslow (1,966), Enfield (2,013) and Barnet (1,227). What is striking is that aviation accounts for 55% of NO_x in Hillingdon and 28% in Hounslow, whilst it contributes nothing to NO_x in Enfield and Barnet. Total NO_x emissions are predicted to reduce in all four boroughs by 2030 - Hillingdon (3,235), Hounslow (1,507), Enfield (1,697) and Barnet (836), but it is noteworthy that the proportion of NO_x contributed by aviation does not change in boroughs near the airport - Hillingdon, 56%, and Hounslow, 28%. Enfield and Barnet continue to have no NO_x pollution from aviation. The conclusion from the LAEI data we reproduce here is clear. NO_x pollution is very high in boroughs neighbouring the airport with aviation contributing very significantly to it.

Travel to Heathrow by car and taxi

14. We discussed above that several air quality monitors on main roads near Heathrow exceed statutory annual mean NO₂ concentrations and that vehicles travelling to and from the airport are a contributory factor. The Jacobs report for the Airports Commission (2014) assessed that 59% of passengers go to the airport by car or taxi¹⁵. Today there are about 74 million passengers p.a., but about 25% are transfers and do not leave the airport. Thus if 59% of the other 55 million passengers arrive or leave by car, this equates to 32.75 million car journeys. If, as planned, the airport expands to cater for 109 million passengers in 2030 and 33% are transfers, 42.4 million would arrive or leave by car - an increase of about 10 million, or 30%. With further increases in passenger number by 2030 and 2040 the situation deteriorates yet further. In addition to this there may be increased number of employees driving to the airport as it expands. These figures have not been updated to the recently published Heathrow Master Plan and are slightly different to those in our response to Chapter 2 but we believe broadly remain valid for the purpose of illustration here.
15. HAL puts commendable emphasis on public transport links to the airport, stating that they will ensure that 50% of passengers will arrive at the airport by public transport in 2030, and 55% in 2040 (Airport Expansion Consultation Document, January 2018). Currently 41% of passengers use public transport. However major problems remain. First, even if the target

¹⁴<https://data.london.gov.uk/dataset/llaqm-bespoke-borough-by-borough-air-quality-modelling-and-data>

¹⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/371829/4-surface-access--lhr-nwr.pdf

of 50% is achieved, there will still be an increase in car journeys to and from the airport compared to today. In 2030 for example, there will be 70 million passengers coming to or from the airport, of which 50% will travel by car, i.e. 35 million. This is still an increase of over 2 million compared to today. The Airports Commission have said that by 2040 there could be 128 million passengers, with 30 million being transfers. If 55% use public transport, the remainder using car transport will make about 44 million journeys - about 12 million more than today. This inevitably will lead to greatly increased air pollution. Second, and perhaps more importantly HAL's plans for increasing the numbers using public transport are speculative and the means to achieve them are largely outside their control. Central and local government, rail franchises and coach companies control the expansion of public transport and the finance to carry it out, not HAL.

We conclude that, at best, if the percentage of passengers using public transport rise from 41% to 50%, the number of passenger car journeys may only rise by a few million by 2030. We believe that more likely, car journeys will increase dramatically with airport expansion with inadequate provision of public transport to accommodate the huge increase in travellers. This will lead to continued failure in the years ahead to comply with UK air quality limits.

16. We acknowledge that new cars and taxis are becoming cleaner with respect to NO₂ emissions. However the Society of Motor Manufacturers and Traders record that average age of a car at scrappage is 13.9 years and the average age of a car on the road in the UK is 7.8 years¹⁶. About 8% of the car fleet is replaced each year¹⁷. Currently 2 out of every 5 of the 31 million cars on the road are diesel-powered and most were purchased before the last two years when cleaner diesels were introduced¹⁸. It follows that large numbers of diesel cars with high NO₂ emissions will still be driving on UK roads well into the time beyond 2026 when the 3rd runway is scheduled to open. NO₂ pollution is therefore not about to be eliminated because of the introduction of cleaner vehicles. Although Heathrow plans to introduce its own ULEZ for cars entering the airport area from 2022, it currently proposes a charge of only between £10 - £15 for non-compliant vehicles. Some have estimated that only a charge of £40 or more would deter cars from entering the airport.
17. We have discussed above the importance of small particulate matter (PM_{2.5}s and nano-particles) on health. Whilst 18% of PM_{2.5}s come from exhaust emissions from carbon fuel engines, 11% are generated from tyre and brake wear¹⁹. Thus, even the introduction of "cleaner" electric cars will still generate PM_{2.5} pollution. Whilst the UK currently complies with the National Emissions Ceiling Directive (NECD) for PM_{2.5}s²⁰, we are due to be in breach of the limit by 2020 and Heathrow expansion is predicted to worsen this breach²¹.

¹⁶<https://www.smmmt.co.uk/industry-topics/sustainability/average-vehicle-age/>

¹⁷<https://www.racfoundation.org/motoring-faqs/mobility#a1>

¹⁸<https://www.petroprices.com/news/number-diesel-cars-record/>

¹⁹<https://www.autoexpress.co.uk/car-news/101677/government-to-target-particulate-pollution-from-brakes-and-tyres>

²⁰<http://naei.beis.gov.uk/about/why-we-estimate?view=necd>

²¹<https://www.aef.org.uk/2017/11/20/seven-air-quality-reasons-not-to-expand-heathrow/>

Freight

18. Heathrow aims to double its cargo capacity with the opening of the 3rd runway. It already handles about 1.3 million tonnes p.a. (2015 data), about half the total UK air freight ²². Currently most freight arrives in lorries, powered by diesel. Even if a large part of air freight arrives at, or leaves, the airport by rail in future, it must still be transported between plane and railhead by lorry. These increases in freight movements to and from the airport and their impact on pollution were not considered by the Airports Commission ²³

Car Parking

19. One approach to stimulate increased use of public transport by passengers going to and leaving the airport would be to severely limit car parking availability. This is a measure within Heathrow's control. However, instead, HAL is planning to build a new £800 million car park ²⁴. HAL argues that this will replace some current car parks. However, with an income of £107 million from car parking in 2015 (20% of Heathrow's retail income), we remain to be convinced that HAL seriously wants to discourage passengers from using their cars and adding to pollution ²⁵.

Conclusion

20. The evidence we have presented above demonstrates conclusively in our view that Heathrow expansion will be an unmitigated disaster for air pollution and its consequences for human health. We think that the notion that this expansion can be achieved without seriously compromising achieving legal UK air quality standards in the Heathrow area and further afield in large parts of London is untenable.

²²<http://www.airportwatch.org.uk/uk-airports/heathrow-airport/briefing-the-key-facts-figures-about-a-heathrow-3rd-runway/>

²³<http://content.tfl.gov.uk/tfl-response-to-airports-commissions-final-recommendation.pdf>.

²⁴<http://www.travelweekly.co.uk/articles/62089/walsh-hits-out-at-runway-costs-and-says-heathrow-rips-off-customers>

²⁵<http://www.airportwatch.org.uk/2016/08/heathrow-retail-revenue-in-2015-around-about-20-21-of-total-at-568-million-7-58-per-passenger/>

CLIMATE CHANGE Aviation Strategy 2019

Background

1. The report by the Committee on Climate Change (CCC) '*Net Zero: The UK's contribution to stopping global warming May 2019*' recommends to Government a new omissions target for the UK which is **net zero greenhouse gases by 2050**. The target fully meets the Paris Agreement, 2015 which has been committed to by the UK. The report says this is necessary and achievable, and in doing so it excludes international credits and includes international aviation. The main component of greenhouse gases (GHG) is long-lived CO₂ but the target also includes short-lived gases such as methane. The Government has now backed the net-zero carbon target in law with a Statutory Instrument The new target replaces that set in law in 2008 which targeted a UK reduction of GHG by 80% from 800 MTCO_{2e}¹ in 1990 to 160 MTCO_{2e} in 2050. There have been successes, particularly in power generation, with the UK's total GHG emissions, including aviation and shipping, reduced to 503 MTCO_{2e} by 2017.
2. The CCC says current pledges around the world would lead to warming of around 3°C by the end of the century compared to pre-industrial temperatures. This is well short of the Paris Agreement's long-term goal to limit the rise to well below 2°C and to pursue efforts to achieve 1.5°C.
3. A UK net-zero target requires deep reductions in GHG emissions, with any remaining sources offset by removals of CO₂ from the atmosphere (e.g. by afforestation). Net emissions, after accounting for removals, must be reduced by 100%, to zero.
4. The current CCC estimates are in the form of three options - Core, Further Ambition and Speculative. The CCC's Core estimates see GHG emissions reducing to around 210 MTCO₂ in 2050 or 195 MTCO_{2e} net. The Further Ambition scenario sees GHG emissions of around 90 MTCO_{2e} or net 35 MTCO_{2e} by 2050. The CCC believes that with speculative policies and efficiency improvements it should be possible for the UK to reach net-zero by 2050.

Aviation

5. Aviation remains one of the 'hard to reduce' sectors. The target set in 2008 was for aviation emissions to be no higher in 2050 than in 2005, i.e. 37.5 MTCO_{2e}. Aviation GHG emissions have more than doubled since 1990 and stood at 36.5 MTCO_{2e} in 2017. The majority of aviation emissions are from international flights (96%) measured as emissions from departing flights (UK international arrivals are for the account of other territories).
6. Chapter 6 of the CCC's Net Zero Report focuses on Aviation and Shipping and says that

¹ MTCO_{2e} is metric tonnes of carbon dioxide including equivalent tonnage for other greenhouse gases.

there will be a further report in 2019 but it is not clear what might be added.

7. The topic is important in relation to the Government's Green Paper on Aviation Strategy that seeks to establish the relationship between UK aviation growth and environmental sustainability. It is also crucial in defining the planning conditions for any DCO approval of Heathrow's NWR expansion, whereby capacity is only released as environmental constraints are satisfied, i.e. environmentally managed growth..
8. The CCC's Core options are aligned to the 2008 planning assumption, i.e. aviation 37.5 MTCO_{2e} by 2050. The CCC says in Chapter 6 page 173 of its report that these aviation emissions could be achieved through a combination of fuel efficiency improvement of around 0.9% per year, limited use of biofuels (i.e. 5% in 2050), and by limiting growth in UK passenger demand to 60% above the 2005 level of 230 million passengers per annum (mppa), i.e. 368 mppa in 2050.
9. The CCC's Further Ambition options identify additional opportunities to reduce aviation emissions below the Core options, to 30 MtCO_{2e} in 2050 (29.0 MTCO_{2e} from international flights). The assumptions are that fuel efficiency improvement rises to 1.4% per annum and biofuel uptake rises to 10% in 2050.
10. The CCC's Speculative options examine two scenarios - scenario one, where UK passenger demand is constrained to 40% above 2005 levels, i.e. 322 mppa in 2050, which saves around 4 MTCO_{2e} (compared to the 60% option), and scenario two, where UK passenger demand is constrained to 20% above 2005 levels, i.e. 276 mppa, which saves around 8 MTCO_{2e} (compared to the 60% option). Actual UK passengers were already 267 mppa in 2016. The Speculative options could reduce aviation emissions to 22 MTCO_{2e}.
11. Clearly aviation itself will be far in excess of net zero emissions by 2050. The use of the UK's negative emissions (e.g. afforestation) to offset aviation's gross emissions may not be the most effective or efficient use of the offsets. For example, choices may have to be made between offsetting long-haul flights for leisure and offsetting agricultural emissions that are also 'hard to reduce'.

Aviation Environmentally Managed Growth

12. Besides fuel efficiencies and use of biofuels, the CCC advises the Government to manage aviation passenger demand. We referred in our response to Chapter 2 to the DfT's 2017 passenger demand forecasts in support of the Airports National Policy Statement (APNS), which parliament approved in June 2018 in support of Heathrow's northwest runway expansion (NWR). The passenger estimates for 2050 were 410 mppa in the Do-Minimum case and 435 mppa in the NWR case. The Government said the planning limit of 37.5 MTCO_{2e} in 2050 could be met by a variety of abatement measures. But it would appear that achieving the limit also depended on including the price of purchasing global carbon credits. Almost exactly the same passenger numbers were modelled by the Airports Commission in 2015 in its AON carbon traded scenario.
13. The CCC has now advised against the UK relying on global credits and the use of global

credits is excluded by the CCC when modelling of UK net zero target emissions. This suggest aviation passenger demand will have to be managed down to the CCC's target of passenger growth of no more than 60% between 2005 and 2050 in order to limit aviation emissions to 37.5 MTCO_{2e}, i.e. a maximum of 368 passengers in 2050.

14. To examine the consequences of deeper demand management, we refer to the Airports Commission's forecasts 2015 (see Table 2 in our Chapter 2 response). The so called AON CC (carbon capped) case was the central case prepared by the Commission. There are no carbon credits assumed but a carbon price is applied to tickets so as to constrain demand and achieve aviation emissions of 37.5 MTCO_{2e} in 2050. In the Do-Minimum case demand is restricted to 386 mppa. This is higher than the CCC 60% growth limit or 368 mppa in 2050, but it achieves the same 37.5 MTCO_{2e} of emissions.
15. As we have pointed out above, it will be necessary to reduce aviation emissions to much lower levels than 37.5 MTCO_{2e} and the equivalent 368 mppa passengers in order for the UK to achieve net zero emissions. But the reduction needed will depend on allocation of the negative emissions between aviation and other sectors of the economy. In addition, a contingency requiring further reduction in demand growth is needed to cover the uncertainties in mitigation of emissions, not only from aviation but other sectors of the economy.
16. If the NWR expansion proceeds there is a large risk that demand will have to be restricted to such an extent that the project becomes financially at risk. However, as we see from forecasts by the DfT and Airports Commission, demand management reduces growth at other UK airports and not at Heathrow. This has a seriously negative impact on the north-south aviation and economic balance.
17. The Strategy needs to explain how aviation demand can be reduced to satisfy the UK climate change net-zero target. The indications are that the Government is relying on offsets - mainly international offsets arranged by the ICAO CORSAIR scheme set to start in 2020. Given the huge future growth in aviation around the world, we do not believe UK aviation should be relying on CORSAIR. Nations around the world will be desparately competing for carbon credits and offsets. Similarly, UK aviation should not be relying on UK offsets, which from evidence in the CCC's Net-zero report will not be sufficient and in any event better used for other hard to reduce sectors of the economy instead of UK resident leisure travel.
18. We need confirmation that the Government is not relying on international credits or offsets in netting off the gross greenhouse gas emissions from aviation. At the moment the policy and strategy on aviation greenhouse gases remains incomplete on these points and on the introduction of essential environmental demand management. The policy needs to inject urgency into remedying the deficiencies.

AVIATION STRATEGY CONSULTATION QUESTIONS

RHC has not answered the Strategy questions specifically but for completeness these are listed here.

General

1. How could the policy proposals be improved to maximise their impact and effectiveness in addressing the issues that have been identified?
2. How should the proposals described be prioritised, based on their importance and urgency?
3. Are you aware of any relevant additional evidence that should be taken into account?
4. What implementation issues need to be considered and how should these be approached?
5. What burdens, both financial and regulatory, are likely to need to be managed and how might those be addressed?
6. Are there any options or policy approaches that have not been included in this chapter that should be considered for inclusion in the Aviation Strategy?
7. Looking ahead to 2050, are there any other long term challenges which need to be addressed?

Chapter Questions

The following 7 questions are replicated in chapters 2 to 8:

1. How could the policy proposals be improved to maximise their impact and effectiveness in addressing the issues that have been identified?
2. How should the proposals described be prioritised, based on their importance and urgency?
3. Are you aware of any relevant additional evidence that should be taken into account?
4. What implementation issues need to be considered and how should these be approached?
5. What burdens, both financial and regulatory, are likely to need to be managed and how might those be addressed?
6. Are there any options or policy approaches that have not been included in this chapter that should be considered for inclusion in the Aviation Strategy?
7. Looking ahead to 2050, are there any other long term challenges which need to be addressed?

There are specific chapter questions

There are specific questions for each chapter in addition to the above 7 questions:

Chapter 2

8. How should the UK use its global leadership and international influence to further the aims of the UK aviation sector?

9. What should the UK's priorities be for strengthening existing connections and establishing links with emerging markets?

Chapter 3

8. To what extent does the proposed partnership for sustainable growth balance realising the benefits of aviation with addressing environmental and community impacts?

9. How regularly should reviews of progress in implementing the partnership for sustainable growth take place and are there any specific triggers (for example, new information or technological development) that should be taken into account?

Chapter 4

8. To what extent do these proposals provide the right approach to support the complex and varied role that airports play in their regions?

9. To what extent are the proposals on skills the right approach to ensuring the aviation sector is able to train and retain the next generation of aviation professionals?

Chapter 5

8. To what extent does the proposed Passenger Charter adequately address the issues that are most important to passengers?

9. How should the operating model for border service be designed to improve the passenger experience?

Chapter 6

8. To what extent do these proposals sufficiently address existing and emerging safety and security risks in order to maintain business and passenger confidence in the UK aviation industry and in the UK as a destination?

Chapter 7

8. To what extent do these proposals strike the right balance between the needs of General Aviation and the rest of the aviation sector?

Chapter 8

8. To what extent are the government's proposals for supporting innovation in the aviation sector the right approach for capturing the potential benefits for the industry and consumers?

9. Do the proposals in this chapter sufficiently address the barriers to innovation?