

DRAFT AIRSPACE MODERNISATION STRATEGY

CAA CAP 1690 CONSULTATION

Richmond Heathrow Campaign Response - 9 September 2018

INTRODUCTION

1. This document is the response of the Richmond Heathrow Campaign (RHC) to the CAA Consultation on Airspace Modernisation as contained in the document: *Draft Airspace Modernisation Strategy, July 2018 - CAP 1690* (referred to here as draft AMS18).
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. 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. London has the world's largest origin and destination market of 160 million passengers annually.
4. Our approach is to continue supporting the case for no new runways in the UK, notwithstanding the Parliamentary vote in favour of Heathrow's Northwest runway (NWR) option on 25 June 2018 and the subsequent Secretary of State's Designation of the National Policy Statement (NPS). We believe the evidence produced by the Airports Commission and by the DfT supports our position for no new runways, even though the Commission and the Government recommended (irrationally in our view) the NWR expansion option. Our reasoning is set out in our responses to the DfT on the RHC website at www.richmondheathrowcampaign.org and in summary in Annex 1 to this response.
5. We realise the strategy is for the UK. Our main concern is with the noise impact on ourselves and other communities around Heathrow and therefore with controlled terminal airspace up to around 10,000 feet with a radius of 50 km around Heathrow airport.

THE NEED FOR AIRSPACE MODERNISATION (CHAPTER 1)

6. We accept the need to improve safety, provide capacity to improve efficiency and resilience and the need to reduce environmental impact - noise, air pollution and carbon emissions. We do not accept the need for more airspace capacity to serve more

Heathrow flights. Annex 1 attached here, which is based on evidence published by the Airports Commission in 2015 and the DfT in 2017, demonstrates in summary that there is no need to increase the number of Heathrow's flights from the current approximate 480,000 per annum. In fact the consequences of adding 260,000 flights with a 3rd runway is harmful to the UK aviation market and economy. It is also especially harmful to human health and well being on account of the additional noise and air pollution and to climate change on account of carbon emissions.

7. As pointed out in Annex 1, Heathrow's growing passenger demand can be met without increasing the number of flights. We accept that passenger demand does justify more flights from UK airports other than Heathrow and that other London airports may require more airspace capacity. We recognise that Heathrow is in competition with other London airports for the scarce London airspace and therefore the wider issue of London's airspace demand and capacity is relevant. Indeed London's capacity could be a limiting factor on Heathrow's 3rd runway expansion. We await NATS' commissioned report on this point which we believe was due in April 2018.
8. Paragraph 3.15 of draft AMS18 says *'In 2015, a lack of airspace capacity resulted in 78,000 minutes of flight delays. These delays, whilst not substantial, are forecast to grow to 5.6 million minutes by 2030 if airspace modernisation is not delivered successfully.'* This is a NATS forecast reported in the DfT's publication - Upgrading UK Airspace - Strategic Rationale, 2017. The report says on page 7 *'Aviation traffic forecasts from NATS suggest that commercial air transport will grow by around 2% a year in the UK, from 2.25m flights in 2015 to 3.25m flights in 2030. These forecasts do not include the additional flights that might be generated by a third runway at Heathrow Airport that is planned to go live around 2025.'* The DfT's demand forecasts in 2017 estimated 2.33m UK flights by 2030, excluding Heathrow's 3rd runway. The NATS flight forecasts are therefore 39% higher than the DfT's. Flight delays are largely due to congestion, so the number of delays increases exponentially with number of flights. On this basis, the NATS forecast of delays are very substantially overstated as is the estimated cost of delays to the UK of £230 m per annum by 2030.
9. Paragraph 4 of draft AMS18 says *'Working together, the Government and the CAA have developed a shared objective for modernising airspace. This objective states that modernising airspace means changing and developing its structural design, and the operational concepts and technology that are used to fly and manage air traffic. It states that we want to ensure that airspace capacity is not a constraint on the growth of commercial aviation, with the constraint to growth instead becoming the number of runways or restrictions imposed on the use of those runways by government or planning authorities as a condition of that growth.'* We believe that the design of Heathrow's airspace very much depends on whether the design is for a two or three runway airport, not only on account of the numbers of flights but the constraints caused by airspace demand from other London airports. The design is very sensitive to numbers of flights; for example, within constrained airspace the only solution may be to increase flight path concentration and hence noise intensity. Optimising the noise impact for a 3rd runway with headroom may well be sub-optimal at lesser traffic levels. Given the Government's

decision to rule out a 4th runway, optimisation should surely be assessed for both a two and three runway airport but no more, notwithstanding this paragraph 4.

10. In conclusion, we do not believe the case has been made adequately to increase Heathrow's airspace capacity for additional flights even with a 3rd runway but we accept the need to modernise the airspace for reasons given above in paragraph 7, which include additional capacity to improve efficiency and resilience and the environment. Heathrow's airspace design should be for two cases: (1) the existing two runway 480,000 flights and (2) proposed three runway 740,000 flights a year, and it should take account of encroaching airspace demand from other London airports.

ACCOUNTABILITY OF THE ENTITIES INVOLVED (CHAPTER 2)

11. The CAA is responsible, under directions from the Secretary of State, to administer and decide on airspace changes, at least those up to 7,000 feet, which are of concern to local communities. The Airspace Change Process CAP 1616 guides the sponsor, such as Heathrow, in making an airspace change proposal. The expansion by way of a 3rd runway at Heathrow also has a parallel decision process governed by planning law and in particular the policies in NPS 2018. This is the development Consent Order (DCO) process.
12. We realise that ultimately in the case of the Airspace Change Process, it is the CAA that makes the decision (or the Secretary of State if the decision is called-in) and in the case of the DCO process it is the Planning Inspectorate and finally the Secretary of State. But it must be in the interest of stakeholders and the UK to have a high level of agreement between the stakeholders, notwithstanding that ultimately decisions are taken by the CAA and Government. Furthermore, stakeholder engagement is both sought and encouraged by the Government.
13. Accordingly we recommend what we call an **Integrated Decision Framework** at local Heathrow level that brings together noise and competing objectives and the several stakeholders and their respective interests in order to reach balanced and mutually acceptable outcomes. The variables that need to be assessed and agreed upon, inter alia, are noise impact and how it is distributed, carbon and other emissions and the reduction in noise at source, population growth and housing, and costs and benefits to the aviation industry and passengers.
14. While draft AMS18 identifies the stakeholders we believe there could be a better defined Integrated Decision Framework for airspace changes, although we appreciate this is best tailored to the local circumstances with oversight by the Government.

IMPROVING ENVIRONMENTAL PERFORMANCE BY BETTER MANAGING NOISE (CHAPTER 3)

15. Paragraphs 3.21 and 3.22 Draft AMS18 on "Ends", which we refer to as objectives, are brief and we recommend that the key noise objectives be incorporated into the draft AMS18

CAA Airspace Change Process

16. The CAA's Airspace Change Process - Cap 1616 considers Heathrow's proposed airspace changes to accommodate a 3rd runway in the context of airspace modernisation. We assume there will be no separate expansion and modernisation change proposals. The decision process involves comparison of options for the structure and operation of the airspace needed by Heathrow so as to improve safety, provide capacity to improve efficiency and resilience and to expand while minimising environmental impact. The change process has substantial limitations:
 - a. Conditions cannot be attached to any change approval.
 - b. As discussed in paragraph 9 above, a requirement of the change process is that the resultant capacity should not restrict growth, which suggests the change process cannot limit the noise impact by limiting the volume of traffic. Instead the change process is confined to minimising the noise impact of whatever future volume of traffic might be estimated at the time of the approval.
 - c. The change process has no control over the distribution of the traffic i.e. number of flights per flight path. Airlines without constraint can change the distribution for commercial or other reasons at any time following approval. Optimisation of the airspace structure and operations can become sub-optimal very quickly.

17. Our understanding is that the incremental option assessments of the change process are not between modernisation and no modernisation or between Heathrow expansion and no expansion or some combination of expansion and modernisation. The change process seeks to optimise the expansion of Heathrow while modernising the airspace. The options are confined to varying airspace structural and operational parameters using the DfT's webTAG tool for comparing incremental values. For example, if the airspace volume available to Heathrow were limited by the needs of other airports, then Heathrow's expansion might be accommodated by concentrating flight paths within the available confined airspace, notwithstanding the potential increase in total noise intensity. The change process seemingly does not have the power to conclude in this example that there is insufficient airspace and that therefore the traffic volume should be curtailed or in extremis that the expansion should not proceed. The point is that no matter what the noise objectives might be, the change process is constrained in what can be achieved. It is difficult to see under what circumstances might the change process reject expansion or increased traffic, except on grounds of safety.

The Development Consent Order Planning Process - Planning Act 2008

18. The DCO planning process on the other hand has a different approach to that of the change process. The planning presumption is that the land owner, Heathrow, can do what it wishes but subject to planning policies and constraints. The DCO needs to assess the impact of noise and other environmental dis-benefits and to attach conditions where appropriate in order to ensure planning policies and constraints are satisfied when approving expansion. The process can take account of the traffic volume, unlike the change process, and it can curtail the release of capacity or cap it or even refuse permission for expansion. The planning process would need to assess the incremental noise cost as between expansion and two runway do-minimum options, including modernisation in both cases.

The scope and discretion of the Planning Inspectorate under the DCO planning process to achieve the noise objectives is substantially constrained by policies in the NPS.

Interdependence of the Airspace Change Process and the DCO Planning Process

19. We can only conjecture at this stage, but it would seem logical that airspace design for modernisation and expansion, as approved by the CAA, needs to be plugged into the DCO planning process. The Planning Inspectorate may apply conditions based on the environmental and health impact assessments. We would expect use of the same noise objectives as applied to the change process using webTAG, albeit in respect of airspace structure and operations conditioned as seen fit by the Planning Inspectorate. It is conceivable the Planning Inspectorate could decide against expansion on the grounds that the absolute noise impact is too great.
20. It is not clear whether the change process would need to assess the two runway do-minimum case. We believe it should and that the outcome should be also plugged into the DCO decision process for an incremental assessment between expansion and the do-minimum.
21. We suggest the noise objectives used in the change process also be used in the DCO planning process. The airspace structure optimised by the change process should be applied in the DCO planning process. In practice, there might need to be several iterations of the exchange of designs between the change process and the DCO planning process. Presumably the ultimate design would need to be approved by both processes. On the other hand we may end up with some sub-optimal disjoint between the change process and the DCO planning process.

Noise Objectives

22. There are noise objectives and design principles and we suggest the latter can be defined as a means of planning and making airspace design decisions that seek to achieve the noise and other objectives. We suggest that airspace design, in common with other development projects, contains a hierarchy of decisions with layers of objectives and principles. We believe it is essential to start with the high level noise objectives. In proposing a set of subsidiary design principles, HAL we believe has failed to identify the objectives properly. Without the noise objectives it is inevitable the noise outcome will be sub-optimal and as far as the communities are concerned optimisation will be ill defined and probably unacceptable.
23. Identifying the applicable noise objectives is not straight forward. There are multiple aviation noise objectives. These have emerged over time and in various contexts going back to the Air Transport White Paper 2003 and probably further. It is difficult to comment with certainty as to the status of each of the several noise objectives and their primacy. Some will have been replaced or re-interpreted by more recent objectives.
24. The Airports National Policy Statement 2018 ('NPS') paragraph 5.67 says '*the Airports NPS must be used as the primary policy on noise when considering the Heathrow Northwest Runway scheme, and has primacy over other wider noise policy sources.*' The same

paragraph acknowledges that other policies and legislation can be used. It says *‘The proposed development must be undertaken in accordance with statutory obligations for noise (EU Regulation 598/2014; The Environmental Noise (England) Regulations 2006). Due regard must have been given to national policy on aviation noise, and the relevant sections of the Noise Policy Statement for England March 2010, the National Planning Policy Framework March 2012 and the Government’s associated planning guidance on noise . However, the Airports NPS must be used as the primary policy on noise when considering the Heathrow Northwest Runway scheme, and has primacy over other wider noise policy sources.’*

25. In addition to these sources, the Government’s direction to the CAA on environmental objectives is contained in the recently updated Air Navigation Guidance October 2017 (‘ANG17’). The emerging Airspace Modernisation Strategy (‘draft AMS18’) considered here and emerging revised National Aviation Policy Framework (‘emerging NAPF’), both scheduled for finalisation in 2019, contain references to noise objectives.

26. Noise objectives and design principles are required for the CAA’s Airspace Change Process and the DCO planning process. It is important that common noise objectives and design principles are applied to both decision processes. As outlined above, the decision processes are different as are the decisions themselves.

27. We propose that the multiple stated objectives can be reduced to three high level noise objectives:

1. To limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise.

2. Any benefits from future improvements in aircraft noise performance should be shared between the aviation industry and local communities, taking account of base year levels of noise and trends in noise reduction.

3. A fair balance should be sought between the negative impacts of noise and the positive economic impacts of flights.

There also needs to be a community noise objective that shares the noise in a fair and rational way. We therefore recommend a fourth noise objective:

4. Where there is a reduction in overall noise the benefit 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.

28. **Objective 1** was included in the Governments’s National Aviation Policy Framework 2013 (‘NAPF13’) (paragraph 17) except that it said *‘where possible reduce the number of people significantly affected by aircraft noise.’*

29. The current Objective 1, as stated above, was first included in the ANG17 paragraph 1.2(a)

The revision of the objective in NAPF13 is highly significant because the objective now takes account of not just the number of people affected but also the health and quality of life impact on those people.

30. We suggest that Objective 1 is matched reasonably closely by the aims and objectives in the NPS. The NPS says in para in 5.68 *'Development consent should not be granted unless the Secretary of State is satisfied that the proposals will meet the following aims for the effective management and control of noise, within the context of Government policy on sustainable development:*
 - a. *Avoid significant adverse impacts on health and quality of life from noise;*
 - b. *Mitigate and minimise adverse impacts on health and quality of life from noise, and*
 - c. *Where possible, contribute to improvements to health and quality of life.'*

31. ANG17 paragraph 3.5 discusses the meaning of 'significantly adversely affected'. It says there is no single threshold common to each and every individual. However it is possible to set a Lowest Observed Adverse Effect Level (LOAEL) that is regarded as the point at which adverse effects begin to be seen on a community basis. *'As noise exposure increases above this level, so will the likelihood of experiencing an adverse effect. In line with this increase in risk, the proportion of the population likely to be significantly affected can be expected to grow as the noise level increases over the LOAEL. For the purposes of assessing and comparing the noise impacts of airspace changes, the government has set a LOAEL of 51dB LAeq16hr for daytime noise and 45dB LAeq8hr for night time noise and the CAA should ensure that these metrics are considered.'*

32. We understand that shortly the WHO will be publishing its updated guidelines on noise levels and we urge the Government to:
 - a. Establish a legal status for the guideline values,
 - b. Establish a UK strategy and timetable for reducing the levels of community noise from aircraft and from other major sources to the WHO guideline values, and
 - c. Integrate the WHO guidelines with Objective 1, concerning reduction in adverse impacts.

33. **Objectives 2 to 3** originated in the NAPF13, at least in their current form. The ANG17 paragraph 4.1 re-affirmed Objectives 2 and 3 and their origin. We have modified Objective 2 to include the phrase 'taking account of base year levels of noise and trends in noise reduction'. Also, ANG17 paragraph 5.2 says *'Departure procedures should be designed to enable aircraft to operate efficiently and to limit, and where possible reduce, the total adverse effects on people from aircraft noise. This is part of a policy of sharing the impact of technical developments and other benefits between industry, communities and all other stakeholders, whilst taking into account the overriding need to maintain a high standard of safety.'* The NPS supports Objectives 2 and 3, e.g paragraphs 3.49, 4.39, 5.47, 5.55.

34. **Objective 4**, concerning the sharing of noise in the manner described, is difficult to find as Government policy but we believe the objective is essential. Historically, the Government has sought to concentrate aircraft noise but this directly opposes Objective 4, which results

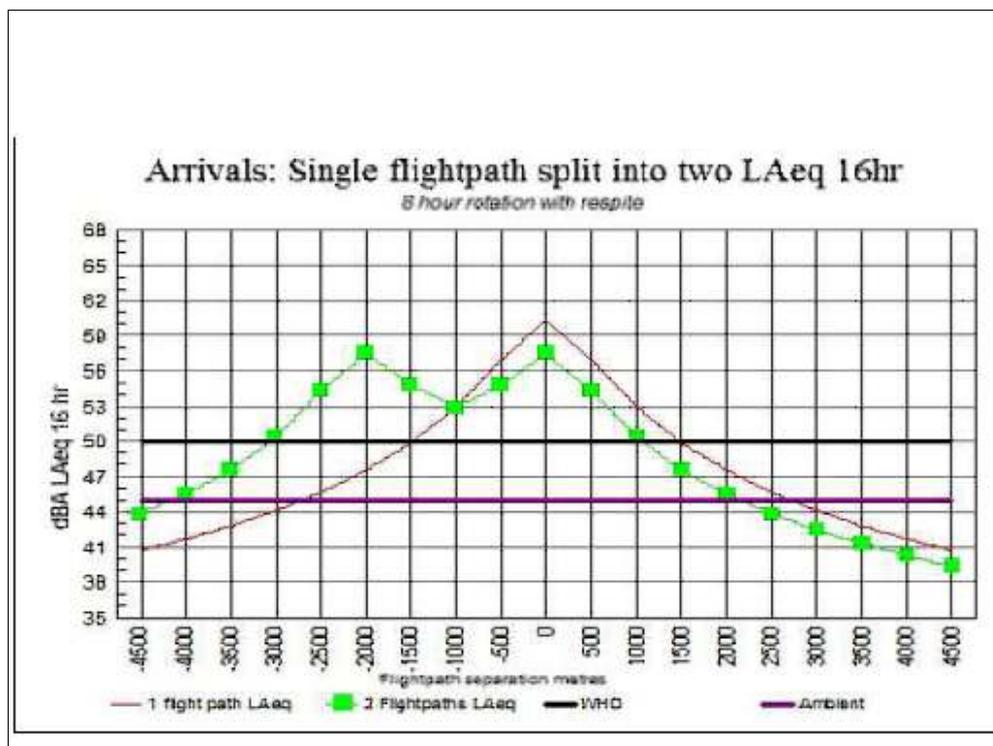
in dispersion, as we explain later.

35. Objective 4 arguably is not covered by the NPS, at least directly. This is important because of the issue of primacy discussed above. But paragraph 1.3 of the ANG17 says that *'in order to deliver [Objective 1], decisions which affect how aircraft noise is best distributed should be informed by local (our underlining) circumstances and consideration of different options. Options, and the appraisal of the pros and cons, may include concentrating traffic on single routes, which normally reduce the number of people overflown, versus the use of multiple routes, which can potentially provide relief or respite from noise if routes can be sufficiently separated.'* So ANG17, as stated by paragraph 1.4, is intended to guide the CAA and industry on how decisions they make can best give effect to the government's Key Environmental Objectives and it does recognise in paragraphs 1.3 the potential merits of dispersion and hence Objective 4.
36. ANG17 paragraph 3.19 under the heading 'Single and Multiple Routes' matches paragraph 1.3, above and then goes on in paragraph 3.20 to say *'...with regard to assessing and comparing environmental impacts of a proposed change, preferred options should normally be based on those which result in fewer total adverse effects on people.'*
37. This is re-affirmed in the emerging draft AMS18 in paragraph 3.22 which says *'In 2017 the Government issued new Environmental Guidance to the CAA to clarify that in assessing the number of people 'significantly affected by aircraft noise', the total adverse effects must be considered. This clarification of existing policy builds in an assessment of health impacts into airspace changes so that, for example, the creation of a respite route could reduce the number of people significantly affected whilst increasing the absolute number of people affected. As a result, the aviation industry is required to consider options when designing airspace to find ways to manage the distribution of noise that best reflects this policy objective.* We suggest this recognises the importance of dispersion which is what Objective 4 leads to.

Link Between Objective 4 and dispersion

38. The link between Objective 4 and dispersion can be explained as follows: In the chart below we have modelled a vertical arrivals gate about 8 km east of Heathrow, as an example. It shows a single flight path (brown line) being divided into two flight paths (albeit overlapping) (green lines).
39. Half the flights on the existing path 1 are transferred to the new path 2. This could be by halving the flow rate or introducing scheduled respite for half the time. Acoustically, reducing the number of flights by half reduces the noise level by 3 dBA. For example, directly under the flight path the ground noise level would be reduced from 60 dBA to 57 dBA on the existing flight path and increased from background of say 45 dBA to 57 dBA on the new flight path.

40. There is a substantial noise cost as monetised by webTAG of two flight paths compared to one flight path, in spite of a single flight path having twice the traffic. The incremental cost increases with noise level - in other words nearer the centre of the overflight. Optimisation of this situation suggests concentration since it reduces the total cost to communities. However, if one divides this total cost by the number of households (or people), then the average cost per household is reduced by dispersion.



41. Objective 4 by definition seeks to minimise the average cost per household or person and not the total cost. We are not recommending Objective 4 because it results in dispersion but because we believe it is rational and fair way to distribute aircraft noise. It is supported by the Government's policies on health and other impacts from noise and by the webTAG valuation. We urge the Government to endorse Objective 4 and optimisation that minimises the average cost per household or person. We appreciate this may require the Government to re-address its approach to noise where we believe the minimal total cost has been sought, at least in road and rail schemes.
42. **The consequences flowing from Objective 4 are that:**
- The impact on those already exposed to noise should not be increased by additional flights or loss of respite (this implies replication of existing flight paths).**
 - Additional noise should be distributed over areas not currently affected.**
 - It might be reasoned that dispersion should be applied also to the current distribution of noise, which tends to be concentrated given that this was the Government's intention over many years. However, those affected by additional flights would be**

overburdened by such re-distribution in the event of a 3rd runway and its additional noise. Re-distribution is not therefore recommended.

43. We recommend that this broad approach to distributing noise in the case of a 3rd Heathrow runway also seeks to contain the noise impact by limiting the rate of increase in traffic so that the increased noise intensity is offset by the reduction in noise from the introduction of less noisy aircraft into Heathrow's fleet. This probably requires phased release of capacity for additional flights. While the NPS policy is for a minimum of 740,000 flights, we do not believe the NPS policy determines the phasing and this would therefore be at the discretion of the Planning Inspectorate in relation to the noise objectives set out here.
44. It would be impossible for the pattern of 3rd runway flight paths not to extend into areas already impacted by noise from the two existing runways. So when we talk of segregating the impact of additional noise, it is perhaps best to think in terms of 'buckets' of noise energy rather than flight paths. In other words, where there is an overlap of flight paths, noise energy should be exchanged between those affected currently and those newly effected so that those currently affected are not exposed to any net increase in noise.
45. When applying Objective 4, it is probably best to apply it proportionally so that changes in noise energy can be spread across noise contours resulting in more noise to those currently least affected by noise.
46. We appreciate this section on noise objectives is more detailed than might be desirable in the strategic proposals for airspace management but we thought it would be helpful to explain how a universal set of four noise objectives can be incorporated into strategy and its application. It also attempts to place at the forefront what are otherwise somewhat fragmented expressions of noise objectives. Most importantly it introduces a fourth noise objectives that seeks to distribute aircraft noise rationally and fairly between communities. This is missing from current policy.

WAYS: THE DESIGN, OPERATIONS AND TECHNOLOGY NEEDED TO DELIVER AIRSPACE MODERNISATION (CHAPTER 4)

Altitude-based Priorities

47. ANG17 describes Altitude-based Priorities in paragraphs 3.2 and 3.3. 3.2 says '*These priorities are intended solely to inform those responsible for considering and deciding permanent changes to the UK's airspace design (section 2.1(a) of this guidance) and not for day to day operations.*'
48. Paragraph 3.3 says '*So when considering requests to change the airspace design, the CAA should apply the following altitude-based priorities of the government:*
 - a. *in the airspace from the ground to below 4,000 feet the government's environmental priority is to limit and, where possible, reduce the total adverse effects on people;*

- b. where options for route design from the ground to below 4,000 feet are similar in terms of the number of people affected by total adverse noise effects, preference should be given to that option which is most consistent with existing published airspace arrangements;*
 - c. in the airspace at or above 4,000 feet to below 7,000 feet, the environmental priority should continue to be minimising the impact of aviation noise in a manner consistent with the government's overall policy on aviation noise, unless the CAA is satisfied that the evidence presented by the sponsor demonstrates this would disproportionately increase CO2 emissions;*
 - d. in the airspace at or above 7,000 feet, the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority;*
 - e. where practicable, it is desirable that airspace routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks; and*
 - f. all changes below 7,000 feet should take into account local circumstances in the development of the airspace design, including the actual height of the ground level being overflown, and should not be agreed to by the CAA before appropriate community engagement has been conducted by the sponsor.*
49. We agree that Objective 1 applies uniquely below 4,000 feet and we recommend adding Objective 4. We believe these two objectives should apply uniquely at least to 7,000 feet and not be compromised by a carbon objective between 4,000 feet and 7,000 feet. We believe the LOAEL and indeed WHO Guideline noise levels are relevant from ground to above 7,000 feet and that the arbitrary limit could and should be increased to at least 9,000 feet (amsl). Carbon reduction is important but other mitigation should be found, and a trade-off with noise objectives is not appropriate below 9,000 feet.

AIRSPACE DESIGN PRINCIPLES

50. We suggest that airspace design principles should flow from the noise objectives set out above. We include in Annex 2 a set of design principles we believe apply to Heathrow. This is a summary and we recommend that each of the principles needs further development.

UNKNOWN: GAPS IN THE CURRENT POLICY AND REGULATORY ARCHITECTURE (CHAPTER 5)

51. We recommend that in developing a revised National Aviation Policy Framework the issue of sustainable growth be considered further. We believe that the impact of aircraft noise on health and quality of life is undervalued. For example, the Government estimated the webTAG noise impact cost of a 3rd runway as £0.6bn (60 year NPV). Our estimate is ten times greater. The current noise cost needs to be quantified and very approximates estimates we have made are around £9bn. This is the webTAG value for strokes, heart attack, annoyance etc. Also it is important to take on board the WHO Guideline noise levels of which a new set are about to be published. In paragraph 32 above we made recommendations on the legality of noise limits, noise targets and integrating the WHO values into noise objectives and we urge the CAA and Government to take these points on board.

52. AMS18 paragraph 5.14 alludes to the impact of carbon. We have no doubt at all that carbon will become a greater constraint on aviation than the Government is currently willing to admit. The idea that there will be sufficient carbon credits and offsets to allow aviation's carbon emissions to grow is fanciful in our view.

53. The Government and aviation industry are urged to give far greater emphasis to reducing noise at source. The DfT and Heathrow estimates of Heathrow's fleet composition are wildly different. This involves developing and introducing less noisy aircraft into Heathrow's fleet and is the foundation of noise reduction over the next 20 to 30 years. Only with better forecasts and incentives for less noisy aircraft will communities begin to develop trust and acceptance in the strategic management of airspace and the resulting noise impact.

Contact details:

Peter Willan, BSC Eng(Hons), MBA, ARSM, FCMA, FEI, HonRCM
Chair, Richmond Heathrow Campaign
www.richmondheathrowcampaign.org

Annex 1: Economic Benefit and Environmental Cost of Heathrow's 3rd runway

Annex 2: Summary Airspace Design Principles for Heathrow's 3rd runway and Airspace Modernisation

**3RD RUNWAY IMPACT ON UK AS AN AVIATION HUB
THE FOLLOWING IS DFT EVIDENCE**

RICHMOND HEATHROW CAMPAIGN

Without a 3rd runway:

- The number of passengers terminating their journey at Heathrow grows by 60% by 2050
Heathrow is not full.
- UK spare capacity is equivalent to 6 runways in 2050. ***UK capacity is well able to satisfy demand through to 2050.***

With a 3rd runway:

- No additional long-haul or domestic business passenger are served at the UK level. ***Economic benefit from additional business travel is non-existent.***
- The 43 million additional passengers a year comprise - 17 million cannibalised growth from other UK airports and 16 million international-to-international transfers of no value to the UK. Only 10 million additional mostly short-haul terminating passengers are served. ***A 3rd runway harms the UK regional economic balance and is inefficient use of capacity.***
- There are no additional destinations from the UK and frequency of flights at other UK airports is reduced. ***UK connectivity is impaired.***
- International-to-international transfers use 37% of additional runway capacity and 94% of the UK's additional long-haul capacity. Only 300,000 out of 24 million annual transfers are on thin routes and are insufficient to support otherwise unviable thin routes. ***Heathrow's international transfers provide no UK value and should be replaced by passengers terminating their journeys in the UK.***
- **There is a substantial dis-benefit to the UK aviation market**

**SUMMARY AIRSPACE DESIGN PRINCIPLES FOR HEATHROW'S 3RD RUNWAY AND AIRSPACE
MODERNISATION**

RICHMOND HEATHROW CAMPAIGN

1. We suggest the following design principles flow from the noise objectives. This is a summary and we recommend that each of the principles needs further development.

- 1. Safety Principle**

Safety is paramount.

- 2. Dispersion Principle**

- a. Dispersion should be sought for the additional flights from the NWR expansion.
- b. Noise from existing flight paths should not be re-distributed.
- c. There should be no increase in noise impact for those already affected by the two runway airport. This suggests replication of existing flight paths.
- d. Optimisation that minimises noise cost per household and not total noise cost.

- 3. Separation Principle**

Sufficient flight path separation should be established so as to avoid an over-lap of noise at the relevant ambient noise level or LOAEL/WHO footprint, whichever is less.

- 4. Respite Principle**

- a. In so far as dispersion is desirable for new flight paths over newly affected areas, scheduled respite should be sought especially near the airport.
- b. Introducing respite to existing flight paths is likely to result in a net noise impact cost and should normally be avoided.
- c. Reduction of scheduled respite for existing flight paths should be avoided.
- d. Since the easterly/westerly split in effect provides respite, the respite principle should require that no community should be exposed to both departure and arrival flight paths.

- 5. Night Noise Principle**

All scheduled flights between 11pm and 7am should be banned by May 2021. In the interim period there should be no increase in Heathrow flights in the early morning shoulder period 6-7am and mixed mode (TEAM) in this period should be re-assessed so as to reduce the noise impact.

- 6. Frequency Principle**

Frequency of flights is a major factor in the impact of aircraft noise. The CAA Airspace Change Process does not control the frequency of flights on any flight path. A Principle needs to be established for frequency of flights.

7. Concentration and Performance Based Navigation (PBN) Principle

The introduction of PBN will concentrate and hence reduce the dispersion around flight paths. There should be no increase in noise concentration compared to the ground based navigation that PBN replaces.

8. ICAO Reduction of Noise at Source ¹

Noise at source from individual aircraft and the introduction of less noisy aircraft into Heathrow's fleet should be sought. The principle should also require estimates of the fleet's noise energy for the medium and longer term with plans for managing the reduction in noise.

9. ICAO Land-Use Planning and management ¹

A Principle needs to be established for population encroachment, noise mitigation and flight path location.

10. ICAO Noise Abatement - Operational Procedures ¹

This covers ascent and descent rates, deployment of landing gear and use of flaps, etc. To the extent these can be controlled a design principle should be established.

11. Independent Parallel Runways and Runway Length Principles

- a. The NWR should be at least 3,500 metres in length and as far as possible the mix of aircraft (heavies, etc.) should be spread evenly by type across the three runways.
- b. There should be no mixed mode or any increase in the number of scheduled flights over and above 480,000 per annum in segregated mode prior to first flight from the NWR.

12. London Park's Principle

There should be no increase in noise over Royal Botanic Gardens, Kew, Richmond Park, Old Deer Park and other London parks.

¹ICAO Balanced Approach to Noise Management