Heathrow Airspace

APPENDIX 10 - INDUSTRY RESPONSES TO DRAFT DESIGN PRINCIPLES

Engagement

As part of our two-way engagement on design principles for expansion, we shared initial consultation feedback and emerging themes with our industry stakeholders during the period June-July 2018. At these sessions we:

- Provided a summary of key findings from the consultation on airspace principles;
- Set out proposed, and prioritised, design principles based on consultation findings; and,
- Asked for further feedback to help us confirm or amend our principles.

Date	Stakeholder Event	Venue	Stakeholders	Attendees
1 June 2018	NATMAC	CAA office	General Aviation Airlines Other Airports MOD	HAL airspace rep (x2)
4 June 2018	DfT Airspace Working Group	DfT office	DfT	HAL airspace rep (x2)
22 June 2018	Airline Working Group	Compass Centre	Airlines	HAL airspace rep (x2)
2 July 2018	Joint Expansion Board	Compass Centre	Airlines	HAL airspace rep (x1)
17 July 2018	AODM[1] Away Day	Terminal 3	HAL AODMs	HAL airspace rep (x1)

We also emailed a pack containing our draft design principles to a wider group of industry stakeholders. Appendix 9 contains the information pack, email and list of stakeholders these were sent to.

Stakeholders were invited to provide comments on these principles by 27 July 2018, to give us sufficient time to consider them before our submission to the CAA.

Feedback

The key issues raised were generally consistent Heathrow's existing awareness of stakeholder issues through historic engagement, with:

- General Aviation seeking protection of existing operations outside controlled airspace, and a reduction in the size of controlled airspace.
- Airlines' focus was on the cost of operation (fuel/delay), capacity, resilience and cost, but they were also supportive of measures to minimise local impact.
- Neighbouring airports sought to ensure that their local operations and potential growth would not be negatively affected or limited by Heathrow's airspace change for expansion.

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[1] Airport Operational Duty Managers

Heathrow Airspace

AIRSPACE PRINCIPLES

The table below captures the responses Heathrow received through this engagement process:

Stakeholder	Stakeholder Representative	Email Response	Documents
BA	▉▉▉▉▉▉		See response attached to this Appendix
BBGA	▉▉▉▉▉▉	Dear Sir/Madam, As our community is effectively excluded from LHR operations and the fact that we are now a very small part of the overall movements I do not see us impacting your decision making process. The only thing I would say is that our aircraft types are likely to have more modern avionics equipment fitted and operational performance better than many of the airlines. As a consequence our aircraft are able to meet most of the requirements outlined in any performance based navigation approach. However, if the new operations at LHR with a third runway are seeking to secure more business aviation movements then please let me know. The assumption being made at the moment is that in terms of future planning many of the London airports LHR, LGW, LTN and STN will likely be closed to commercial GA (business aviation) by 2040. Therefore any airspace design might need to take into account where new commercial GA airfields might be located. Perhaps take input from DfT research by York Aviation and consider the Future Aviation Strategy consultation under way through into 2019.	
Biggin Hill Airport	▉▉▉▉▉▉	We write in response to your emerging design principles overview. We think that your plans are moving in the right direction, but that they cannot and should not be ratified or fixed until it has been established that they will not preclude adequate airspace access for other London airports. The ongoing LAMP process will determine this by early next year when the final positons of the 'letterboxes' will be fixed by NATS. However, at the present time, we do not see your letterboxes as impacting upon those we would seek for London Biggin Hill Airport.	
British Helicopter Association	▉▉▉▉▉▉	We support the Principles you have drawn up. We particularly for highlighting the needs of other modes of air transport besides commercial airplanes which is what the 3rd runway project is mainly about. We have a major interest as an Association in Principles 7, 8 and 9 and would like to see the scheme incorporate a system of PBN routes and let downs around the	

Heathrow

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		airspace intended for the modified LHR operations – this would assist in less infringements of the London CTZ.	
Gatwick Airport	███████		See response attached to this Appendix
General Aviation Alliance	███████	In considering minimising impact on airspace stakeholder, our comment at this stage is that we would urge you to engage with GA stakeholders at the earliest stage of airspace design and well-ahead of the formal airspace change process.	
Helicopter Club of Great Britain	████████	Our main concern is the size of the Heathrow CTZ. We do not want it to increase in size, and feel it could be reduced, given the performance of modern aircraft. We also want to see the helicopter routes remain as they are, with minor adjustments as discussed at last winter's meeting at Swanwick.	
Humberside Airport	███████	No comment from Humberside Airport other than to state that we look forward to a potential route to/from Heathrow if it is deemed viable.	
IATA	█████████		See response attached to this Appendix
MOD	████████		See response attached to this Appendix
NATS	██████	Thank you for sight of your proposed principles and the further opportunity to respond. Our position remains as it was articulated in our response to your consultation. With respect to the latest draft of principles we note that they reference the need to deliver the capacity requirements of the ANPS. Delivering this capacity will require NATS to modernise the airspace above 7000ft alongside your development of low level Airspace. We would therefore like to suggest a principle that refers to the need for the Heathrow airspace design to complement the broader FASI-S airspace change programme which will be required to ensure future capacity and efficiency for the LTMA, including Heathrow expansion. We look forward to working collaboratively with you in the years to come on the FASI-S programme.	

Heathrow

**BRITISH AIRWAYS ENGAGEMENT FEEDBACK TO HEATHROW AIRPORT LIMITED
STAGE 1 – HEATHROW'S AIRSPACE DESIGN PRINCIPLES AND PRIORITISATION**

INTRODUCTION

1. British Airways (BA) is pleased to submit further comments to HAL in response to the proposed shortlist of key design principles and priorities for how Heathrow designs its future airspace.

2. In January 2018, HAL published an initial list of example design principles (DPs) to engage and elicit feedback from the industry. BA responded on 28th March 2018, providing a company overview, general views on the urgent need for airspace modernisation and feedback on each of the example DPs. This response now focusses on HAL's refined DPs but for the avoidance of doubt, BA still stands by all comments submitted in its original response.

EXECUTIVE SUMMARY

3. BA appreciates that many of the comments submitted in its original response have been considered. Further observations are included in this response but overall, we are broadly in favour of Heathrow Airport's refined DP's and prioritisations which are set out very clearly.

4. **BA must stress the importance of maximising airspace capacity, efficiency and resilience** across all TMA airports and at a network level. We consider this to be a core requirement second only to safety principles when it comes to modernising UK airspace. **This is clearly a pre-requisite to the deliverability and viability of the expansion programme however, it is of critical importance to secure airspace change as quickly as possible just to cope with current and short term anticipated growth in air traffic**. Where airspace change is not expansion specific and can deliver benefits, it should be progressed at the earliest opportunity. **BA would like to see more emphasis in the DP's on enabling increased operational resilience** and would point out that maximising airspace capacity and creating headroom is the key to unlocking everything else. This includes resilience and other operational efficiencies, enhanced safety/technical standards, reduced noise, improved environmental/economic performance, and reduced impacts on other users.

5. On the technology aspects, **BA supports DP's that look to stretch navigation standards beyond 1990s RNAV technology**. We support the ICAO requirement for PBN in all phases of flight. Where it can be proven to optimise the capacity and resilience of the network we should be looking to press for advancement of RNAV/RNP operations in the LTMA and take advantage of existing technology now, where it not already used. **Of course, this must identify the technology road map and capabilities required to meet performance and navigational needs for the LTMA**, e.g. the equipage and flight crew training needed to meet potential long-term mandates for advanced functionality. To this end, we would recommend full alignment with the NATS LAMP2 design principles which puts the emphasis on using 'an appropriate standard of PBN' as opposed to setting 'minimum navigational standards' which can be widely interpreted.

6. Regular interfaces between NATS, Airports and aircraft operators will be a key element of the design process. Importantly, the **Heathrow ACP must encompass collaborative engagement links with LAMP2 and sponsors of other lower-level airspace changes**, with gateways/milestones agreed with industry to ensure delivery. A strong governance framework and Government

enforcement mechanisms will be necessary to secure the commitment required by all stakeholders to manage all the programme risks in a more expedient, dynamic and focussed way, with full integration across a variety of technical disciplines and full alignment of ACP's across different organisations.

7. Whilst it has been deduced that a different prioritisation of airspace DP's is not needed for the night period, we are somewhat dismayed to see concluding remarks from the first consultation that only focus on the (to be expected) community support for a scheduled night flight ban but ignore the airline community conviction that there are more innovative solutions that could deliver better respite for communities and less impactful outcomes for the airport, airlines and consumer masses.

VIEWS ON KEY AIRSPACE DESIGN PRINCIPLES AND PRIORITIES

PRINCIPLE 1 (CORE) – MUST BE SAFE

8. BA strongly agrees that safety is a fundamental requirement of the industry and should never be compromised by other airspace DPs. We agree that this should be a **core requirement**. Any design must be able to handle the anticipated growth in UK air traffic with levels of safety that are at least equivalent to today.

PRINCIPLE 2 (CORE) – MUST MEET THE ANPS CAPACITY REQUIREMENTS

9. BA strongly agrees that meeting ANPS capacity requirements should be a **core requirement**. However, as well as catering for an additional 260,000 movements per year, we would also like to see more emphasis here on safeguarding enough headroom capacity and redundancy in the system to enable **increased operational resilience** in line with the NATS LAMP2 DP's. The need for resilience is not only about ensuring airspace is designed to enable recovery from disruption on a bad day but also about managing day-to-day traffic with acceptable levels of performance and minimal delays. Realistically, increased resilience will only be achieved by maximising capacity.

PRINCIPLE 3 (CORE) – MUST MEET THE 3 ANPS NOISE POLICY TESTS

10. BA agrees in principle that meeting noise policy tests needs to be a **core requirement**. In terms of using WebTAG methodology to assess options, we need to ensure that the aviation module is fit for purpose. Our understanding is that the WebTAG road and rail modules are more developed than the aviation module, e.g. we understand that WebTAG is currently not capable of assessing respite associated with airspace change options. Any noise policy tests must be in step with International ICAO standards and EU regulations which require a 'Balanced Approach'.

PRINCIPLE 4 (CORE) – MUST MEET THE LOCAL AIR QUALITY REQUIREMENTS

11. BA agrees in principle that meeting air quality requirements needs to be a **core requirement** however, other areas such as surface access policy must be considered alongside aviation to ensure compliance with local air quality requirements.

12. One point to note here is that whilst flight efficiencies below 1000ft is a core principle, in reality there is little room for changing aircraft flight profiles up to 1000ft. In general, we cannot make any significant turns below 500ft and the vertical profile is determined by Regulated Performance Rules. Thrust is the only control and yet here we must consider that less thrust takes aircraft lower

BRITISH AIRWAYS

over the ground and more thrust creates more noise and emissions. The BA view is that minimising air quality emissions below 1000ft can only be achieved by maximising the use of flex thrust which is something we already do.

PRINCIPLE 5 – MINIMISE NOISE EFFECTS

13. BA agrees that noise is the next highest priority after the core requirements identified above. BA also agrees with the priority of identified sub principles contained within this DP, although a degree of balance is also required here with Principle 7 in delivering an improved system for consumers in terms of minimising delays and maximising safety, runway throughput and resilience on a sustainable basis.

14. As mentioned in our initial feedback of 28th March 2018, BA is prepared to operate airspace is designed in accordance with the sub principles outlined here, providing it does not limit or constrain throughput or compromise trajectories and entry/exit point links with upper airspace. In the interests of efficient operations, the sub principles contained here should not result in unreasonably long flight tracks or steep turns and climb gradients, especially as this often has detrimental consequences for noise and emissions. Whilst Government policy prioritises noise over carbon emissions below 7,000ft this DP should possibly reflect the fact that there is a provision for CAA intervention to address disproportionate increases in carbon emissions, and that there are international obligations and commitments made by both Governments and industry to mitigate against climate change issues.

15. Safety and the capability of aircraft must also be considered here, with the technology road map required to meet performance and navigational needs for the LTMA identified, e.g. the equipage and crew training needed to meet potential long-term technical, design and airspace change deployment mandates. Whilst we believe current equipage levels should be sufficient to deliver an 'appropriate standard of PBN', we would be somewhat wary of the proposals for multiple flight paths under Principles 5C and 5E. We would hope the number of options would be limited both to simplify flight planning, Flight Management System management and crew issues and to minimise confliction (and a reduction in capacity) at LTMA airfields, including LHR. Engagement and involvement of NATS and other sponsors of airspace change below 7,000ft is essential for avoiding sub-optimal designs here.

16. Finally, for sub principles 5H and 5I and the desire to move flights over rural areas and parkland rather than built-up areas, there is the issue of 'peace and tranquillity' versus higher ambient noise in urban areas. It's worth remembering that LAMP plans for Gatwick were ultimately rejected following a campaign to minimise the impact of aviation on areas of open countryside.

PRINCIPLE 6 – MINIMISE FUEL/CO2/GREENHOUSE GASES

17. BA agrees that optimising network fuel performance and CO_2 emissions performance per flight should be a high priority. As mentioned above, there are international obligations and climate change commitments to consider here.

18. To an extent, BA would be comfortable with the concept of fuel trade-offs for long-term capacity benefits but all in all, it is imperative that airline operators are involved in developing scenarios that ultimately optimise capacity, fuel burn and resilience.

Submission by British Airways Plc – 25th July 2018

19. In the context of the wider network and as 'primary' airfield, Heathrow should work to ensure that it is not unduly penalised in seeking a balance of fuel trade-offs for upper airspace change. In so far as optimising capacity, fuel burn and resilience are concerned, we believe an element of optioneering is needed with different weightings for different airports based on the relative benefits to the network. Principally, we judge that Heathrow should be prioritised with the highest weighting. If Heathrow fails the network fails, and so Heathrow should be the starting point for design before building out from there.

PRINCIPLE 7 – MAXIMISE BENEFITS FOR PASSENGERS

20. BA agrees that this is an important principle. There needs to be strong links here to Principle 2 in terms of maximising airspace capacity, efficiency and resilience, not only at Heathrow but across all TMA airports and at a network level. Where airspace change is not expansion specific and can deliver consumer benefits, it should be progressed at the earliest opportunity in collaboration with NATS and other sponsors of lower-level airspace change.

21. BA would like to see more emphasis in Principles 2 and 7 on enabling increased operational resilience and would point out that maximising airspace capacity and creating headroom is the key to unlocking everything else. As per Principle 2, the need for resilience is not only about ensuring airspace is designed to enable recovery from disruption on a bad day but also about managing day-to-day traffic with acceptable levels of performance and minimal delays. Realistically, increased resilience will only be achieved by maximising capacity.

PRINCIPLE 8 – USE THE LATEST NAVIGATION TECHNOLOGY

22. BA agrees with this principle and the need to stretch navigation standards beyond 1990s RNAV technology. We support the ICAO requirement for PBN in all phases of flight and would therefore recommend full alignment with the NATS LAMP2 design principles which puts the emphasis on using 'an appropriate standard of PBN' as opposed to setting 'minimum navigational standards' which can be widely interpreted. Where it can be proven to optimise the capacity and resilience of the network and where we are capable (through equipage and training), we should be looking to incentivise advancement of RNAV/RNP operations to take advantage of existing technology now, where it is not already used.

23. Of course, this must identify the technology road map and capabilities required to meet performance and navigational needs for the LTMA, e.g. the equipage and flight crew training needed to meet potential long-term mandates for advanced functionality (please refer to our comments in Paragraph 15 for Principle 5).

PRINCIPLE 9 – MINIMISE IMPACT ON OTHER AIRSPACE USERS

24. BA is comfortable with this principle, as long as designs are ultimately optimised for all airspace users with the primary goal of maximising airspace capacity, efficiency and resilience as highlighted throughout the preceding DP's. Where increases in controlled airspace volumes impact other users, trade-offs can be explored to achieve common goals.

END

A LETTER FROM
Gatwick

25 July 2018

Heathrow

Gatwick Airport Second Round Feedback on Heathrow Expansion Airspace Design Principles

Thank you for the opportunity to respond to the second version of your proposed Design Principles associated with your plans for expansion and FASI-S. We offer the following perspectives:

- **Principle 4   Meeting Air Quality Requirements**.

We will be very interested to learn more during the options stage of the ACP on how Heathrow proposes to design routes that prioritise air quality up to 1000ft, and the practicality of route and procedure design during critical phases of flight without compromising Principle 1, Safety.

- **Principle 5   Minimise Local Noise Effects**.

    (c) **Maximise Sharing**. We believe that 'respite' should be both 'predictable' and 'effective' and therefore, will be keen to learn how you plan offer respite options that help to mitigate and minimise adverse impacts.

    (d) **Avoid Overflight with Multiple Routes**. This is an aspect of common interest. We consider it a key requirement of Heathrow's airspace design that all practical steps are taken to avoid the overflight of communities that, owing to airspace design constraints, are already/likely to be exposed to traffic movement from neighbouring airports, such as Gatwick. We would not wish for our own efforts to minimise the impact on our local communities to be compromised by the routing of Heathrow traffic. We hope that you will continue to work closely with us to prevent this, and the reciprocal, from occurring below 7000ft.

- **Principle 7   Operational Efficiency to Maximise Benefits**.

We believe there are many aspects of operational efficiency, and if the ambition is to maximise benefits from airspace redesign, it may, on occasion, be inappropriate to prioritise noise mitigation strategies over operational efficiency benefits. The operational efficiency principle should carry equal importance to Principle 5, minimise noise effects, to help to maximise overall benefits.

- **Principle 8   Using Latest Navigation Technology.**

This principle would benefit from being clearer and to specify the navigation standards that regulators expect London airports to apply and the technologies/navigation standards you may adopt if they offer additional benefits. It would also be appropriate to have aspects of this principle prioritised on an equal footing to the four core principles.

INVESTORS IN PEOPLE

- **Principle 9   Minimise Impact of Design on Other Airspace Users.**

We anticipate that to reduce, or eliminate, areas of route and procedure conflict, airport airspace design options will need to offer degrees of flexibility in their application and may need to compromise and/or offer airspace sharing solutions to secure an overall airspace design, for the FASI-S Programme, that can be successfully implemented. Given the complexity of the airspace modernisation programme we would also suggest that this is a core principle for all airports within, or adjacent to the LTMA. We hope that in your options appraisal Heathrow considers how it will seek to minimise operational constraints imposed by its design.

Yours sincerely

HAL's Design Principles for Airspace below 7000ft

Introduction

On behalf of the London (Heathrow) Airline Consultative Committee (LACC), the Airline Operators Committee (AOC) and collectively representing the 86 airlines currently operating at Heathrow Airport, we remain of the strong conviction that airspace must be modernized as quickly as possible. This will secure the necessary capacity, resilience and safety outcomes aligned, particularly, with the Government's decision to expand Heathrow as the national hub and consequently realise the wider economic benefits for the UK in a sustainable manner.

Summary

The Heathrow airline community is broadly supportive of the 4 key core principles for airspace design as outlined in the HAL presentation to the Airline Working Group on 22 June 18. These are safety, capacity, NPS noise tests, and air quality.

Several observations include the following are highlighted including:

- The need to identify, ideally, a quantified additional resilience factor into principle 2, the *design* capacity as distinct from the *declared* capacity as identified in the NPS
- Principle 5C, maximise the sharing of noise through predictable respite, needs to acknowledge that there may be dependencies on the avionics capabilities of aircraft which require further study, planning and alignment with international standards.
  - In this regard, Principle 8, should identify in due course the technology road map and the capabilities to be developed to meet Heathrow Airport's performance and navigational needs
  - Note that the world's airlines fleet is not homogenous and careful planning is required to secure pragmatic elements of avionic upgrades, flight crew training and any potential longer term mandates anticipated for advanced functionality.
- Principle 5J needs to recognise that fuel burn/emissions are an equally significant component to noise and that there are international obligations and commitments made by both Governments and Industry to mitigate against climate change issues

Future Governance of airspace

Although the governance framework is outside the scope of this consultation, CAP 1616, has identified that the design principles are not immutable and that there are many iterative and qualitative aspects to be considered. There are also many risk factors. Whilst NATS is responsible for airspace over 7000 ft, HAL's programme for airspace below 7000 ft needs to be developed in the light of the recently adopted Airport National Policy Statement.

As identified in the airline community response to NATS LAMP2 Stage 1B Updated Design Principles and Priorities (see annex 3), it will be essential to secure full integration across a variety of technical disciplines (airspace design, airborne architecture incl flight management systems, planning and delivery) and alignment across different organisational entities, different regulatory arrangements and different stakeholder needs. Consequently the governance process to achieve a successful outcome must be recognised as a critical success factor. This will require a new approach including sponsorship by Government at the highest levels, the CAA as the national airspace and safety regulator and an industry centric programme based governance structures.

The delays experience in the past with programmes to modernise UK airspace are no longer acceptable. There are complex dependencies and trade-offs between capacity, noise, safety, environmental factors; these all are very challenging considering the sensitivities associated with Heathrow airport expansion. This together with the additional rise in the current demand in SE England and the optimisation required across all TMA airports will require a commitment now by all stakeholders to manage all the programme risks in a more expedient, dynamic and focussed way.

A copy of this response will be provided to NATS NSL, the CAA and the DfT.

HAL Ltd proposed shortlist of key prioritised design principles

Proposed Principle 1 - Heathrow Airport airspace must be safe

<u>Agreed</u>:

This is a core requirement and a priority principle 1

Proposed Principle 2 – Heathrow Airport must meet ANPS Capacity Requirements – Additional 260k movements per year

<u>Agreed but resilience level is not identified</u>:

This is a core requirement and a priority principle 1. However, the **concept and application of resilience, for example, how to protect the current schedule in a variety of scenarios is missing**. The *design* limit should be set at a level which takes account of a resilient factor, x%, which enables operations to recover from a disrupted day. The x factor will need to take account of any policy or regulatory requirements to satisfy consumer or airline needs around disrupted operations and opportunities to restore services to certain standards within a disrupted day.

The airline objective is to secure enough headroom in the system to maintain non-disrupted days to acceptable levels of performance and minimal delays – as per Principle 7

Proposed principle 3 – meet three NPS noise policy tests

<u>Agreed in principle</u>:

Whilst this is a core requirement and airlines understand the importance of meeting NPS noise policy tests, these must be in step with International ICAO standards and EU regulations which require a "*Balanced Approach"*.

The European Union in its Regulation regarding Operating Restrictions (EU 598/2014) has ensured that ICAO's Balanced Approach is directly applicable across the 28 Member States ensuring that there is a level playing field in the application of any operating restrictions and consequently ensuring there are no market distortions. In the context of a "*Balanced Approach*", we look forward to the benefits of increased investment and new technology with local communities over time.

Proposed principle 4 – meet local air quality requirements

<u>Agreed in principle</u>:

Whilst this is a core requirement, it should be noted that aviation is not the primary cause of a lack of any compliance with air quality requirements and that other policy

levers including various surface access measures will be used and developed to ensure compliance.

From an operational perspective whilst flight efficiencies <1000agl is a core principle, in reality there is little room for changing aircraft flight profiles up to 1000'. In general we can't make any significant turns below 500' and the vertical profile is determined by Regulated Performance Rules. In this phase of flight engine thrust is the only control available; however if thrust is less then this takes aircraft lower over the ground, and if more this creates more noise and emissions.

Proposed principle 5 – Heathrow Airport Ltd airspace design should minimise local noise effects from flights.

Here HAL proposes that local circumstances will apply and 10 sub principles have been identified as follows:

Principle A – Use more noise efficient operational practices where practicable.

Agreed that this is top priority noting the emphasis on "where practicable". There is a need to comply with procedures for operational safety in the cockpit and the route based Air Traffic Management policies

Principle B – Minimise no of people newly overflown

We share HAL's suggestion that the design principles should minimise the number of people "newly overflown" whilst "sharing" noise to the greatest extent possible.

Principle C – Maximise sharing through predictable respite

Two options have been identified:

- predictable respite using multiple flight paths and only using one at a time
- dispersal of aircraft with multiple flight paths in use at the same time

Predictable respite has been identified as valuable to local communities and has traditionally been achieved by runway alternation. Splitting flight paths into multiple routes will need to take into account the business case for changes to the existing concept of operation including any implications for avionics capabilities, the complexity of operational procedures including manpower resourcing and the safety case arising from a mixed international fleet. These aspects are particularly important for later phases in the CAA's airspace design process where assumptions need to be made regarding avionics capabilities which will be linked to Principles 1 and 2 above.

It should be noted that as illustrated in the attached reports (reference Attachments 1 and 2) empirical evidence highlights that airspace users (AU) including those operating into Heathrow fly a wide variety of airframe types equipped with an equally **varied level of communications, navigation and surveillance (CNS) avionics**. Also of significance is the **disparity between airframe equipage and flight crew**

certification. It's imperative that Heathrow project planners be cognizant of this during any airspace re-design process. It must also be borne in mind that it typically takes a number of years to upgrade large fleets of aircraft when supported by a positive cost benefit analysis (CBA) and/or airspace mandates. Any requirement for new airborne CNS equipage and/or ground infrastructure must be determined in coordination with AUs so that pragmatic elements of avionic upgrades and flight crew training can be fully accounted for.

Principle D – avoid overflying communities with multiple routes.

Agreed in principle, although the delivery of this concept does imply a network analysis with other airports below 7000ft and with NATS for airspace over 7000ft

Principle E – maximise sharing through dispersal

Air navigation guidance 2017 has identified dispersal as one form of respite but recognised that multiple flight paths could also be operated at the same time but with an alternating pattern of operation. As highlighted under the response to Principle C, the splitting flight paths into multiple routes will need to take into account the business case for changes to the existing concept of operation including any implications for avionics capabilities, the complexity of ATM operational procedures including manpower resourcing and the safety case arising from a network scenario where there may be a mixture of capabilities in the international fleet which currently use or plan to use Heathrow airport once new capacity becomes available.

Principle F – Minimise total population overflown

We share HAL's suggestion in principle B - that the design principles should minimise the number of people "newly overflown" whilst "sharing" noise to the greatest extent possible. However we also recognise that principles C, D and E means that a larger number of people are likely to be overflown.

Principle G – Design flight paths over commercial and industrial areas

Agreed

Principle H – Prioritise routing flights over rural rather than urban areas

Agreed this makes sense from an airline perspective but further guidance from the relevant stakeholders may be useful.

Principle I – Prioritise routing flights over parks and open spaces rather than residential areas

Agreed as H above.

Principle J - prioritise flight paths that reduce aircraft noise for local communities over fuel burn/ emissions

IATA has recognised the need to address the global challenge of climate change and has adopted an ambitious set of targets to mitigate co2 emissions from air

transport including an average improvement in fuel efficiency per year together with a 50% in net emissions by 2050

There is a need to reognise international obligations for climate change and consequently fuel burn in the design principles. Consequently this principle should be revised to reflect these obligations.

Proposed principle 6 – HAL Ltd airspace design should minimise fuel/co2 emissions

Agreed and in accordance with international obligations as determined by ICAO, the European Union and the UK's Climate Change commitments

Proposed principle 7 – HAL's airspace design should ensure operational efficiency to maximise benefits for all stakeholders.

Maintaining the airlines schedule to an acceptable and predictable level of performance with minimum delays is essential for our passengers, consumers and the national economy. Heathrow Airport operates in a wider local, regional, UK and international network where consistency and coherence in the design and planning process is required across a far wider group of stakeholders, States and institutions.

Principle 8 – Heathrow's airspace design should be based on the latest navigation technology which is widely available.

Modern navigation technology will bring benefits in safety, capacity and with reduced environmental impact. The requirement is to modernise airspace in line with international standards including avionics capabilities where airlines get direct operational benefits from their investments.

As noted in principles C and E above, splitting flight paths into multiple routes will need to take into account the business case for changes to the existing concept of operation, including any implications for avionics equipage, the complexity of operational procedures including manpower resourcing and the safety case arising from a mixed international fleet.

In the context of HAL's presentation, it remains unclear as to what navigation technology is being referred to. For example the technology that is having the biggest impact on airport capacity and operations in the USA is a "communication" (CPDLC) rather than a "navigation" function. Whilst Performance Based Navigation (PBN) is a factor in this case, this will require a lot more definition by the Heathrow developers to clarify if we are referring to GBAS, a re-introduction of MLS or the more traditional CAT IIIb ILS.

Until we get more definition as to what "new navigation technology" actually means, it's hard to be technically more precise in this response. A recent EU-SESAR report confirmed that airlines are very focused in their airframe equipage planning. For example, European airlines are currently equipping only their long-haul fleets with DO-260B transponders to meet the USA ADS-B OUT mandate. We cannot assume that an airspace mandate in another region will result in mass absorption of the technology in all regions. It may happen in time but will likely require a specific regional mandate. If Heathrow are planning to use ADS-B OUT and/or ADS-B IN and/or Multilateration for operations, they need to be very specific as to the airborne requirement(s).

We are also not convinced by the broad brush statement that "industry" supports new technology. Airlines will not purchase airborne kit or pay for ground infrastructure without a positive CBA or a regulatory mandate in line with SESAR requirements.

Proposed principle 9 – HAL will minimise the impact of its airspace design on other airspace users.

Agreed subject to meeting the overall objective of Proposed Principle 2 – Heathrow Airport must meet ANPS Capacity Requirements – additional 260k movements per year

Attachments:

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For further information on this response, please contact:

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Sent by email to airspace@Heathrow.com on 12 July 18

Ministry of Defence

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20180726-Heathrow Airspace Design
PrinciplesV2_MOD Response

26 July 2018

Heathrow Airport Ltd
LHR Airspace Consultation

MINISTRY OF DEFENCE RESPONSE TO THE HEATHROW AIRSPACE PRINCIPLES VERSION 2 CONSULTATION DOCUMENT

Thank you for the opportunity to comment on the updated Heathrow airspace principles consultation. In response to this first stage consultation, the MOD again has no specific comments on your proposed design principles, but would wish to see military airspace requirements considered throughout the process either as a design principle or through other means. This would include the integration of RAF Northolt operations. To facilitate this, the MOD is willing to engage throughout the process to ensure our respective requirements are satisfactorily met. The MOD would also be interested in assessing any potential opportunities for improving current operations that might be realised from this undertaking.

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