



APPENDIX 8 - TABLE OF DESIGN PRINCIPLES CONSIDERED

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- Over 4000 suggestions for design principles were identified through our direct engagement with stakeholders and our public consultation. Those suggested at Consultation can be found listed with a 'suggestion' prefix in Appendix D of the Wood/Ipsos Mori Consultation Feedback Report (ANNEX A). Those suggested through direct engagement with stakeholders are provided in Appendix 11 and Appendix 12.
- We have undertaken a thorough review of all the suggestions for design principles, and have determined which to take forward to our final set of design principles, and which should not be considered further. Those that are not being taken forward can be broadly grouped into categories covering similar themes which are listed in Table A8.1 below. This table also outlines our rationale for excluding them from our final set of principles.

Table A8.1: Table of Design Principles Considered

	Proposed Design Principle	Source	Rationale
1	Prioritise avoiding urban areas over rural areas, or vice versa	Principle proposed by Heathrow at consultation. Excluded due to consultation feedback and feedback at stakeholder focus groups	We have not included a principle to prioritise avoidance of either urban or rural areas, despite asking a question relating to this at the consultation. Considering the raw numbers, the consultation response indicated a preference to avoid overflying of urban communities, however, it is recognised that a greater proportion of the consultation respondents live in urban areas. The qualitative feedback from the consultation included comments that rural areas are valued for their peaceful character and therefore there is the potential for the overall noise impact to be greater, despite it affecting fewer people. These concerns were supported by subsequent community focus groups. We have therefore not included a specific principle on this subject. This means that our airspace design will be determined by the other principles and the noise assessment criteria for both the DCO ¹ application and the airspace change proposal.
2	Avoid Areas of Outstanding Natural Beauty (AONB) / Sites of Special Scientific Interest (SSSI) / ancient woodlands / green belt / conservation areas/rivers/open space public amenity areas	Suggestion for new principle drawn from the response to the consultation. Stakeholder feedback in relation to draft design principles.	We are not proposing a generic principle of avoiding such areas since each area will have its own characteristics and sensitivity, and avoiding overflight of all of these areas would be impossible. However, we amended our principle on overflying parks and open spaces to exclude AONBs and National Parks where practicable, based on multiple stakeholder feedback and Government Policy/CAA guidance ² .
3	Consider non-aviation background noise in the	Suggestion for new principle drawn from the	This is not being taken forward as a specific generic principle but is captured indirectly through the principle to seek to overfly industrial areas (because background noise is

¹ Development Consent Order. See Section 1.2 in the main document for explanation of the process Heathrow will follow to seek a Development Consent Order for changes to Heathrow's physical infrastructure

² Air Navigation Guidance, 2017, and the CAA's CAP1616, 2018 both state that "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"



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	positioning of routes/position routes over noisy areas/avoid routes over tranquil areas or areas where there is less background noise	response to the consultation	one key characteristic of such areas that justifies this principle). It will also be captured through our ongoing engagement, including Consultation 2, where we will find out more about any local characteristics or noise sensitive areas that we should consider. This could include areas which are particularly valued for their relative quiet.
4	Different routes for night/weekend	Consultation feedback in response to Heathrow's proposed principle that different design principles might be suitable at night.	Heathrow is aware that some places are more/less noise sensitive at night than during the day, or more/less noise sensitive during the weekend than the week. Examples are schools and parks where activity is primarily in the daytime. At the design principles consultation, we asked whether different principles should be applied at night. Feedback to this generally related to the proposed ban on scheduled night flights (which is outside the scope of this work as it sits within the DCO process: see item 33 later in this table). There was no clear mandate for differing design principles by time of day. Some stakeholders proposed that we should use different routes at different times of day and we will consider this at a local level following feedback on specific local noise sensitive areas at Consultation 2.
5	Reduce overflight of parks	Suggestion for new principle drawn from the response to the consultation	Engagement to date suggested an overall preference for favouring routes that avoid the more densely populated urban areas and minimising number of homes overflown rather than avoiding parks, and so we are not taking this principle forward. This applies to both day and night. However, we recognise that there may be specific local parks or other areas where exceptions should be considered and we will seek feedback on these at Consultation 2.
6	Do not overfly parks where there are adjacent populated areas	Suggestion for new principle drawn from the response to the consultation	Concerns have been raised that a principle to overfly parks and open spaces would affect surrounding populations, where the parks are relatively small and embedded in urban areas. We are taking forward a number of principles that focus on mitigating negative effects on people/populations. The impact of our airspace design on local communities will be accounted for via the principles to minimise newly overflown, share noise, and minimise total overflown, and the impact of overflying any parks or open spaces will therefore be considered as a part of this approach. There is therefore no need for a design principle to take account of the size or position of an open space.
7	Plan to evolve the design as land use and or technology changes/ensure future noise monitoring	Suggestion for new principle drawn from the response to the consultation	We will seek to futureproof our designs, as far as is practical given current knowledge, but we do not believe that this requires a design principle. We recognise that circumstances can change over time and so the performance of the airspace will be monitored on an ongoing basis. This is a requirement of the DCO: the DCO will set the noise envelope criteria which the performance will be assessed against and which will



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			determine monitoring requirements. CAP1616 ³ also includes a formal review of the airspace performance after 12 months of operation. Should there be a need/opportunity to change the airspace due to unforeseen changes in local circumstances and/or available technology then this would be covered in a new ACP ⁴ once that need or opportunity becomes apparent.
8	Put routes over the sea/Fly directly towards the sea to minimise time overland	Suggestion for new principle drawn from the response to the consultation	This is rejected as a design principle given the distance from the airport to the nearest coastal areas which means by the time they are over the sea they would be well above 7000ft and beyond the scope of our airspace design for Heathrow.
9	Avoid routes over high ground	Suggestion for new principle drawn from the response to the consultation	Terrain is taken into account in detailed noise calculations and is therefore part of the appraisal criteria, so this suggestion does not need to be taken forward as a design principle.
10	Have a balanced approach to applying principles/Do not favour one principle in all circumstances	Suggestion for new principle drawn from the response to the consultation	This suggestion is implicit in our approach to design. Chapter 3.3 of this report describes how the design principles and their prioritisation provide a framework for evaluation but are not a strict formula for decision making. We will record the basis for all design decisions and share them at consultations and in our submissions to the CAA.
12	Maintain today's routes/Return to flight paths of a previous period	Suggestion for new principle drawn from the response to the consultation	Our principle to minimise new people overflow will mean that the position of today's flight paths will be a consideration in our design. However, new flight paths will be required to accommodate a new runway and to enable Heathrow to meet the capacity requirements of the Airports NPS. This, coupled with the UK airspace modernisation programme which will see the introduction of new technology, will mean that all routes will need some change.
13	Position routes over private land rather than public amenity land	Suggestion for new principle drawn from the response to the consultation	In the case of privately owned areas that are populated (i.e. residential areas), feedback has shown the balance to be in favour of overflying public amenity land (i.e. parks and open spaces) (Principle 6h). With respect to privately owned open spaces (e.g. farmland), we believe that each area would need consideration of its own local characteristics/sensitivities. For example, we expect that most large areas of private land will also be crossed by public rights of way which may have their own amenity value. Finding out more about these circumstances/characteristics will be part of our ongoing engagement including Consultation 2.

³ The CAA's Airspace Change Process

⁴ Airspace Change Proposal



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14	Reduce visual intrusion/light pollution	Suggestion for new principle drawn from the response to the consultation	The Government's Air Navigation Guidance (2017) does not prioritise visual impact and assessment of visual impact is not a requirement of CAP1616. The design principles do not therefore refer to visual pollution. Visual/light impacts at low levels close to the runway will be considered in the EIA ⁵ undertaken for the DCO application.
15	Avoid overflying areas that do not benefit from jobs	Suggestion for new principle drawn from the response to the consultation	Heathrow directly employs approximately 76,500 people. Many more people are employed by local businesses that supply the airport, or as employees of associated businesses such as the airlines. It is not possible to identify where all the beneficiaries live, and it is unlikely that they would be in distinct areas.
16	Align to road/rail system where the background noise is likely to be higher	Suggestion for new principle drawn from the response to the consultation	Aircraft noise is generated at height and it therefore has the potential to spread across a much wider area than road or rail noise. Aligning to road or rail routes could therefore potentially impact areas beyond those impacted by the road/rail routes themselves. It is also the case that road and rail route generally connect populated areas which means that aligning to them as a design principle may lead to these populations being exposed to more noise. It could also be argued that these areas are already exposed to high levels of noise. For these reasons, we have not included this as a generic design principle, but we remain open to consideration of local circumstances identified at Consultation 2.
17	Use WHO ⁶ guidelines for noise assessment/ develop new metrics of noise assessment/ consider health and wellbeing in design decisions	Suggestion for new principle drawn from the response to the consultation	This is a process issue rather than a design principle. The effects of aircraft noise on health and quality of life will be assessed and monetised as part of the DCO and airspace change processes. The government's Aviation National Policy Statement and Airspace Policy require that Heathrow's proposals meet the following aims for the effective management and control of noise, within the context of Government policy on sustainable development: <ul style="list-style-type: none"> • Avoid significant adverse impacts on health and quality of life from noise; • Mitigate and minimise adverse impacts on health and quality of life from noise; and • Where possible, contribute to improvements to health and quality of life. The aircraft noise adverse effect levels (LOAEL ⁷ s and SOAEL ⁸ s) that will be used in the assessment are either defined in government policy or derived from available evidence, including from the World Health Organisation. A Noise Expert Review Group has been established to independently peer review Heathrow's approach to aircraft noise assessment to ensure it is robust, and Heathrow set out its proposed DCO

⁵ Environmental Impact Assessment

⁶ World Health Organisation

⁷ Lowest Observed Adverse Effect Level

⁸ Significant Observed Adverse Effect Level



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			methodology for scoping and assessing aircraft noise in the Scoping Report ⁹ submitted to the Planning Inspectorate. The evidence base on health and quality of life effects supporting the noise assessments will be updated throughout the assessment periods as new evidence emerges.
18	Penalise flights that do not follow prescribed routes, do not climb quickly enough, descend too early, arrive early or depart late	Suggestion for new principle drawn from the response to the consultation	This is not a design principle as it would apply to the operation of the airport, rather than the design of the airspace.
19	Heathrow should fulfil previous commitments on noise	Suggestion for new principle drawn from the response to the consultation	This is not a design principle, but Heathrow will be seeking to address its' noise commitments where relevant to the airspace design for a third runway. This includes our committed goal to expand Heathrow whilst affecting fewer people with noise than today.
20	Design principles should be the same as other airports/should be coordinated	Suggestion for new principle drawn from the response to the consultation	The CAA requires separate design principles to be defined for each airspace change, so that they take account of local criteria and local sensitivities. However, we will work closely with the other airports in the south-east of England to develop an integrated approach to airspace modernisation.
21	Maintain existing Noise Preferential Routes (NPRs)/make NPRs longer	Suggestion for new principle drawn from the response to the consultation	The NPRs ¹⁰ are related to today's routes. We have a blank sheet approach to design and therefore these NPRs may, or may not, be relevant in a future airspace design. We will base the future airspace design on the design principles that we are establishing now and the DCO will establish a noise envelope which will define the limits, mitigations and monitoring mechanisms for the new airspace. It is assumed that suggestions to maintain the existing NPRs are effectively seeking to minimise impacts on new communities from changing low level routes. This is captured in the principle of minimising the number of new people overflown (Principle 6b).
22	Designs for noise benefit should not be constrained/cost should not be considered	Suggestion for new principle drawn from the response to the consultation	CAP1616 recognises that there are technical constraints that apply to airspace design relating to: <ul style="list-style-type: none"> • safety constraints; • operational constraints; • technical constraints; • economic constraints; and, • the policy and regulatory framework with which the proposal must comply.

⁹ <https://infrastructure.planninginspectorate.gov.uk/projects/london/expansion-of-heathrow-airport-third-runway/?ipcsection=overview>

¹⁰ For an explanation of NPRs, see <https://www.heathrow.com/noise/heathrow-operations/departure-flight-paths>



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			These sit alongside the design principles as factors to consider in the design process, for example our designs must fit with the available technology and within cost constraints. The Noise Policy Statement for England (NPSE) states that the noise policy objectives apply within the context of Government policy on sustainable development, which includes a requirement to be economically sustainable.
23	Engage with all/specific stakeholders in the generation of route options	Suggestion for new principle drawn from the response to the consultation	We recognise the importance of engagement in finding the best overall airspace design solution and we therefore plan to engage throughout the design process, hence our three-stage consultation strategy. However, this is a process suggestion rather than a design principle so we have not included it in our list of design principles.
24	Airspace should be designed by an independent third party	Suggestion for new principle drawn from the response to the consultation	This is a process issue rather than a design principle. It is Heathrow's responsibility to design its airspace and the design process is overseen and regulated by the CAA, who are independent and who ultimately decide whether the proposal (and the process used) is acceptable. The CAA process provides the framework for ensuring that correct engagement is undertaken throughout the process, and that the ultimate design finds an appropriate balance for all stakeholders. All evidence will be provided to the CAA for approval.
25	Treat all communities equally/benefits and burdens of expansion should be shared by all	Stakeholder feedback	This is captured under the broader principles of 'sharing' (Principles 6c, 6d and 6e) which include designing additional routes to spread flight paths over a larger area to enable respite or to disperse traffic.
26	Communities currently affected by noise should see a reduction in noise in future	Stakeholder feedback	This is captured under the broader principles of 'sharing' (Principles 6c, 6d and 6e) which include designing additional routes to spread flight paths over a larger area to enable respite or to disperse traffic. Any sharing solution will be applied in the context of the other principles (such as minimise new people overflown and minimise total population overflown) which may mean it is not possible to deliver in all circumstances.
27	Overflown communities should receive respite of 50%/8 hours/etc	Stakeholder feedback	Respite through airspace design is captured under the broader principles of 'sharing' (Principles 6c, 6d and 6e) which covers designing routes to provide respite. The specifics of a respite scheme will be considered later in the airspace design process. Respite may be provided by runway alternation – this is considered in item 28 below.
28	Various suggestions for a specific runway alternation pattern for respite or otherwise.	Suggestion for new principle drawn from the response to the consultation	The airspace design will accommodate runway alternation as required by the Airports NPS; consideration of runway alternation is therefore not required as a separate airspace design principle.
29	Change or maintain the runway direction preference (currently a westerly preference).	Suggestion for new principle drawn from the response to the consultation	The design will be able to operate in either direction and so this requirement does not affect the airspace design. The runway preference will be determined through the DCO process and will be consulted on prior to DCO application.



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30	Limit the noise impact/no more noise than today.	Suggestion for new principle drawn from the response to the consultation	The DCO will establish a noise envelope to define aircraft noise limits that Heathrow must operate within. Failure to meet these noise envelope requirements with the fleet/operating procedures/airspace design is likely to mean that Heathrow would need to limit flights. The design will therefore be tested against the noise envelope so this is not required as a specific design principle. However, our committed goal remains to expand Heathrow whilst affecting fewer people with noise than today.
31	Incentivise/mandate quieter/cleaner fleet and/or flight operating procedures	Suggestion for new principle drawn from the response to the consultation	Having a quieter/cleaner fleet is an enabler for traffic growth within the noise envelope (see item 30 above). Incentives to achieve this are not an airspace design principle. The design will accommodate all aircraft but will seek to ensure that procedures exist to exploit higher aircraft performance capabilities where they present a benefit (this is captured in Principle 9).
32	Limit the overall number of flights and/or types of flights (e.g. Cargo, night flights, heavy aircraft etc...)	Suggestion for new principle drawn from the response to the consultation	The design is being developed to accommodate the capacity requirement set out in the Airports NPS. Traffic numbers/types within this will be effectively limited by the noise envelope, as we will need to ensure the noise impact stays within the noise envelope criteria, and quieter aircraft/procedures are likely to be required.
33	Introduce night curfew period/operations	Suggestion for new principle drawn from the response to the consultation	The airspace design will include flight paths to be used in the night, but the DCO will address the night flight regime, including curfews, restrictions, exceptions and other operational considerations. Consideration of alternative principles for the night period is captured in item 4 above.
34	Limit ground noise	Suggestion for new principle drawn from the response to the consultation	Ground noise will be determined by the schedule and associated ground operation, and these will be captured by the DCO process. The airspace will be designed such that any aircraft could operate off any runway.
35	Limit impacts on ecology/biodiversity	Suggestion for new principle drawn from the response to the consultation	Both the Airports NPS and CAP1616 require an assessment of the likely significant effects on biodiversity. We do not therefore believe that a specific design principle is required.
36	Limit impact on schools/hospital and other amenity buildings.	Suggestion for new principle drawn from the response to the consultation	The ACP and DCO require assessment of our proposal against the NPSE ¹¹ requirements, including consideration of noise impacts on sensitive receptors. This is also an expectation of the Airports NPS and a requirement of the EIA Regulations ¹² . The assessment will include sensitive receptors such as dwellings, schools, hospitals, hospices etc. We do not therefore have a specific design principle to generically avoid such buildings but the potential impact to them and potential mitigation measures will form part of the DCO criteria and resultant noise envelope limitations. We will also consider any local characteristics that are highlighted through Consultation 2.

¹¹ Noise Policy Statement for England

¹² The Town and Country Planning (Environmental Impact Assessment) Regulations 2017



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37	Design exclusively to meet environmental criteria and do not consider the costs to airport/airlines/passenger	Suggestion for new principle drawn from the response to the consultation	The development must meet the environmental requirements of the DCO. However, as Heathrow is regulated by the CAA under the Civil Aviation Act, the cost to the airport, airlines and passengers of the development and operation of the airspace must also be considered. This is further supported by the NPSE, which states that the noise policy objectives apply within the context of Government policy on sustainable development, which includes a requirement to be economically sustainable.
38	Move airport/build new airport/send traffic elsewhere/develop rail or road infrastructure instead	Suggestion for new principle drawn from the response to the consultation	The Airports NPS specifically sets Heathrow's north-west runway scheme as the location for additional runway capacity. It is not an airspace design consideration.
39	Various suggestions relating to runway position, length, thresholds	Suggestion for new principle drawn from the response to the consultation	This is not a matter for the airspace design principles. The design of the physical infrastructure is covered by the DCO not the airspace change process.
40	Various suggestions for Compensation schemes	Suggestion for new principle drawn from the response to the consultation	This is not a matter for the airspace design principles. We will comply with Government policy and legislative requirements for noise mitigation and compensation.
41	Various suggestions for avoiding noise sensitive buildings or areas.	Suggestion for new principle drawn from the response to the consultation	We do not have a generic principle on avoiding noise sensitive areas or buildings. This is because the scope of this airspace change means that it has potential effects over a large geographic area, within which there will be a wide range of noise sensitive buildings/areas to consider. Therefore we do not believe that it is appropriate to include a single generic principle relating to noise sensitive buildings/areas. As we are starting design from a 'blank sheet', the potential impacts on different areas are not yet known. We have developed our 3-phase consultation strategy to address this, and Consultation 2 will ask stakeholders for local information once we have a better understanding of the geographical areas likely to be overflown. Local information could include suggestions for noise sensitive areas or buildings that stakeholders believe should get special consideration. Following this consultation we will consider all suggestions for noise sensitive buildings/areas on a case by case basis.
42	Consultation should not be undertaken until/unless greater design detail is available.	Suggestion for new principle drawn from the response to the consultation	This is not a design principle as it relates to the airspace change process rather than the airspace design itself. We recognise that some people will want to see detailed flight path options before engaging in our design process. We also recognise that some people want to be involved from the outset, so that they have a chance to influence the development of the options whilst we still have a blank sheet. We have therefore developed a 3-phase consultation strategy designed to involve people at key stages as soon as design detail



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			<p>becomes available. Consultation 1 was on design principles for those wanting to influence from the outset. Consultation 2 will seek feedback on the developing design once we have a view on the number of routes and the range of choices for where they could be positioned. Consultation 3 will seek feedback on detailed route options and specific impacts.</p> <p>This approach gives stakeholders a choice as to when they contribute to the design process.</p>
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