

Appendix D – Evolution of Design Principles

Design Principle suggested by stakeholders in first round of workshops	Origin	Principle proposed by Heathrow or response provided following first round of workshops	Outcome following Workshop round 2	Final Design Principle
Multiple routes are a must	Community Groups Workshop	DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures	Minor re-wording to ensure clarity	DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes
Routes should be as far apart as possible & stay apart as long as practicable & the noise impacts distributed evenly across them	Community Groups Workshop			
Those that already suffer should not suffer any more than this; use N metrics or suite of metrics to measure this	Community Groups Workshop	DP3 Must meet the three aims of the Noise Policy Statement for England* (NPSE); a) Avoid significant adverse impacts on health and quality of life b) Mitigate and minimise adverse impacts on health and quality of life c) Where possible, contribute to the improvement of health and quality of life And ANG2017	No further changes suggested	DP3 Must meet the three aims of the Noise Policy Statement for England* (NPSE); a) Avoid significant adverse impacts on health and quality of life b) Mitigate and minimise adverse impacts on health and quality of life c) Where possible, contribute to the improvement of health and quality of life *It is implicit that any airspace change proposal will be required to meet the requirements of Air Navigation Guidance 2017 and the CAA's Airspace Modernisation Strategy
The different routes should 'split' as soon as possible, but keep away from other routes and don't get them any closer & minimise numbers of people significantly affected below 1000ft	Community Groups Workshop	DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures and DP3a Avoid significant adverse impacts on health and quality of life	Minor re-wording to DP7b to ensure clarity	DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes and DP3a Avoid significant adverse impacts on health and quality of life
Where possible, do not overfly communities who are not already within the existing CPT 09 departure swathe below 6000ft	Community Groups Workshop	DP7d Avoiding overflight of communities not currently overflowed by easterly CPT departures	No further changes suggested	DP7d Avoiding overflight of communities not currently overflowed by easterly CPT departures
Routes should be designed so controllers don't have to routinely intervene below 6000ft	Community Groups Workshop	DP7c Minimising tactical intervention by ATC below 7000ft	Clarification in section 3.6.2 that this relates to ensuring predictable routes	DP7c Minimising tactical intervention by ATC below 7000ft
Avoid overflying communities with multiple routes in the same runway configuration	Community Groups Workshop	DP7f Minimising the impact on communities overflowed by other routes to/from Heathrow	No further changes suggested	DP7f Minimising the impact on communities overflowed by other routes to/from Heathrow

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Don't overfly those communities who are currently overflowed by Heathrow's westerly SIDs below 4000ft, with a CPT09 SID below 4000ft	Community Groups Workshop			
Don't be constrained by the existing NPR or the current definition of an NPR	Community Groups Workshop	DP6 Must enable the departures to stay within a Noise Preferential Route or Routes	No further changes suggested	DP6 Must enable the departures to stay within a Noise Preferential Route or Routes
Enable Continuous Climb	Community Groups Workshop	DP7a Enabling efficient, continuous climb for aircraft to be as high as possible, as soon as possible subject to compliance with Design Principle 4	Re-worded, 'enabling efficient' removed & 'balancing any benefits between community and airline industry' added	DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and the airline industry, subject to compliance with DP4
Noise should take the priority up to 6000ft	Community Groups Workshop	Covered by DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures	Minor re-wording to ensure clarity.	Covered by DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes
Minimise fuel/CO2 above 6000ft	Community Groups Workshop	Covered in part by ANG17 and also by DP7b Use of multiple routes, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those routes	Not taken forward as a specific DP	
Climb as fast as possible	Local Authority Workshop	DP7a Enabling efficient, continuous climb for aircraft to be as high as possible, as soon as possible subject to compliance with Design Principle 4	Taken forward as re-worded DP7a	DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and the airline industry, subject to compliance with DP4
Multiple (& enough) flight paths sufficiently spaced to make a difference	Local Authority Workshop	DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures	Minor re-wording to ensure clarity	DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes
Equitably share the noise and frequency of overflight	Local Authority Workshop	DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures	Minor re-wording to ensure clarity	DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes

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Where possible, fly over open spaces not residential areas	Local Authority Workshop	DP7e Positioning flights over non-residential areas whilst avoiding AONBs and National Parks, wherever possible	Re-worded to match ANG17 phrasing of 'where practicable'	DP7e Positioning flights over non-residential areas whilst avoiding AONBs and National Parks, where practicable
Take into account other routes, do not overfly the same communities below 4000ft on easterly vs westerly operations. Do this by imposing a minimum 4000ft point or a maximum noise threshold	Local Authority Workshop	DP7f Minimising the impact on communities overflown by other routes to/from Heathrow	No further changes suggested	DP7f Minimising the impact on communities overflown by other routes to/from Heathrow
Route alternation should be predictable	Local Authority Workshop	DP7b Use of multiple route structures, spread as far apart as possible, as soon as possible, to provide respite from aircraft noise for as many people as possible and whilst sharing flights equitably and predictably across those route structures	Minor re-wording to ensure clarity	DP7b Use of multiple routes, which diverge as soon as possible and converge as late as possible, to provide respite from aircraft noise, whilst sharing flights equitably and predictably across those routes
Do not degrade current air quality	Local Authority Workshop	DP4 Must meet local air quality requirements	Local Authority Workshop 2 felt this should be a lower priority to DP7 ¹	DP4 Must meet local air quality requirements
Don't increase noise more for those already significantly affected	Local Authority Workshop	DP3 Must meet the three aims of the Noise Policy Statement for England* (NPSE); a) Avoid significant adverse impacts on health and quality of life b) Mitigate and minimise adverse effects on health and quality of life c) Where possible, contribute to the improvement of health and quality of life	No further changes suggested	DP3 Must meet the three aims of the Noise Policy Statement for England* (NPSE); a) Avoid significant adverse impacts on health and quality of life b) Mitigate and minimise adverse impacts on health and quality of life c) Where possible, contribute to the improvement of health and quality of life *It is implicit that any airspace change proposal will be required to meet the requirements of Air Navigation Guidance 2017 and the CAA's Airspace Modernisation Strategy
Should factor in ambient/background noise (using BS4142 methodology)	HSPG Workshop	Specific for noise from industrial development. However, part of the noise assessment methodology is required to take account of background noise	Not taken forward as specific DP	
Should aim to define 'respite' for this ACP so we can assess our options against that benchmark	HSPG Workshop	Our understanding of respite is evolving. As that matures it will be incorporated into our noise assessment methodologies. Discussion held around the term 'valuable respite' and the research suggesting 6-8dB was required. The groups agreed that the DPs	Not taken forward as specific DP	

¹ A full explanation of this outcome is available in the main submission document, paragraphs 3.6.3-3.6.6

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		should not specifically refer to 9dB because if this isn't achievable, we should still seek to provide whatever 'amount' of respite possible.		
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Stakeholder Design Principle Suggestion	Origin	Principle proposed by Heathrow or response provided following first round of workshops	Final Design Principle
Do not overfly world heritage sites such as Hampton Court Palace	HCNF (Surrey CC)	No world heritage sites within the design space for CPT (world heritage sites not covered in CAP1616)	N/A
Do not route new CPT PBN routes over those communities which are already overflowed by departures on other routes on easterlies from southern runway (in Elmbridge, eg. Molesey, Thames/Long Ditton and Esher)	HCNF (Surrey CC)	Included in the proposed principles, without mentioning specific places	DP7d Avoiding overflight of communities not currently overflowed by easterly CPT departures
Route over non built-up areas (such as reservoirs) where possible	HCNF (Surrey CC)	Included in the proposed principles	DP7e (avoid) Positioning flights over non-residential areas whilst avoiding AONBs and National Parks, where practicable
Planes must use reduced climb thrust (over populations) and keep flaps out to at 4500ft or higher (i.e. NADP1 extended)	Teddington Action Group (TAG)	Airports cannot dictate which NADP airlines are to fly and/or when to retract flaps. The boundary fence is located approx. 0.6nm (09L) and 0.25nm (09R) from the Declared End of Runway (DER). SIDs are designed from the DER because this is the full Take off Distance Available (ToDA). The closest waypoint positioning from the runway end is 1nm (PANSOPS) although shorter distances can be achieved with acceptable safety cases. Regardless, 1500ft by a distance of 0.25nm (09R) would result in a required SID gradient from DER of 99%. 1,500ft by 5km after SoR requires a SID gradient of 38%. Compared to the existing requirements of 11% (1,000ft by 6.5km after SoR). We have proposed DP7a .	DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and the airline industry, subject to compliance with DP4
Planes must use reduced climb thrust (over populations) and keeps flaps out to at least 3000ft (i.e. NADP1)			
Planes must use reduce climb thrust (over populations) and keep flaps out to 4500ft or higher (i.e. NADP1 extended)			
SID should design routes for different plane types – For narrow bodied plans – set minimum heights of 1500ft at boundary fence (~4km from SoR)			
SID should design routes for different plane types – For 2 engined wide bodied planes – set minimum heights of 1500ft just beyond boundary fence (~4.5km from SoR)			
SID should design routes for different plane types – For 4 engined planes – set minimum heights of 1500ft at beyond boundary fence (~5km from SoR) but in principle as close as possible to boundary fence			
Should avoid overflying communities with multiple routes, including those from other airports, below 7000ft	Luton Airport	We have proposed a new design principle "Minimising the impact on communities overflowed by other routes to/from Heathrow" as this SID is largely contained within the Heathrow Radar Manoeuvring Area (RMA) ²	DP7f Minimising the impact on communities overflowed by other routes to/from Heathrow

² <https://publicapps.caa.co.uk/docs/33/CAP%201379%20final%20March%202016.pdf>

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Keep Controlled Airspace requirements to a minimum	Luton Airport	Added a design principle	DP8 Should not require any new Controlled Airspace
Should prioritise continuous climb (over descent)	Honourable Company of Air Pilots	Covered by DP7a	DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and industry, subject to compliance with DP4
Should not introduce complexity to flight deck procedures during departure	Honourable Company of Air Pilots	Added a design principle	DP1 Must be safe
These DPs should not go into detail on any particular prescriptive method, and the wording should focus on the outcome, along with a qualifier such as “maximise the equitable distribution of noise impacts” suffixed by a general concept if necessary. Please add an appropriate DP of higher priority than all others concerning the maintaining or improving standards of aviation safety. This should be a “golden DP”, always the highest priority. It would encompass technical regulations concerning flight procedure design, and operational complexity with regard to air traffic control workload (not considering the new design in isolation, but in combination with adjacent flows and procedures). However, the simple general DP would not need to specify these subjects.	NATS	Added a design principle	DP1 Must be safe
All routes should be designed to achieve the best efficiency and the lowest noise impact – as a balance.	Virgin Atlantic Airways	Added to DP7a	DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and the airline industry, subject to compliance with DP4
All routes must be flyable by all the projected fleet of aircraft operating at Heathrow.	Virgin Atlantic Airways	Already a CAA requirement (CAA Policy on Validation of Instrument Flight Procedures)	
Designs must take into account the range of aircraft weights, radius of turn and climb capabilities, for the flights that will use the proposed CPT SIDs.	Virgin Atlantic Airways		
Designs should not impose undue limitations on other routes linked to Heathrow and adjacent airports, for example, arrival routes into Heathrow	Virgin Atlantic Airways	Added a design principle	DP9 Should not affect the ability for arrivals to Runway 09L and 09R to perform a Continuous Descent Approach

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<p>Our interest is that the new east runway departure procedures employ automation and efficiently establish aircraft on a westerly or north-westerly track with a continuous climb.</p>	<p>United Airlines</p>	<p>Covered by DP7a</p>	<p>DP7a Continuous climb for aircraft to be as high as possible, as soon as possible, balancing any benefits between community and the airline industry, subject to compliance with DP4</p>
<p>Must not degrade Heathrow's runway throughput performance</p>	<p>Heathrow Airport</p>	<p>This principle was included by Heathrow. We articulated to our stakeholders that this ACP was not to increase departure capacity, but we need to ensure this is not degraded. As an example, it is not within scope to 'delete' the CPT SID and put every easterly CPT departure onto another SID as this would reduce the ability for 1-minute departure separations. Nor could we make the first turn closer to another SID for similar reasons.</p>	<p>DP5 Must not degrade Heathrow's runway throughput performance</p>
<p>All airspace change proposals should be developed in accordance with the CAA's Airspace Modernisation Strategy (CAP1711)</p>	<p>CAA</p>	<p>This proposal was received via email from the CAA, following the conclusion of our workshop engagement. The CAA stated that they believe it is 'best practice' to include a reference within the design principles for all airspace change proposals. A note was added to the bottom of DP3.</p>	<p>DP3 Must meet the three aims of the Noise Policy Statement for England* (NPSE);</p> <ul style="list-style-type: none"> a) Avoid significant adverse impacts on health and quality of life b) Mitigate and minimise adverse impacts on health and quality of life c) Where possible, contribute to the improvement of health and quality of life <p>*It is implicit that any airspace change proposal will be required to meet the requirements of Air Navigation Guidance 2017 and the CAA's Airspace Modernisation Strategy</p>