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HEATHROW'S DESIGN PRINCIPLES FOR SLIGHTLY STEEPER APPROACHES



FINAL V1.0



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CONTENTS

1.	Introduction	4
1.1	Background	4
1.2	Statement of Need	5
1.3	CAP1616	6
2.	Design Principles for slightly steeper approaches	8
2.1	What is a Design Principle?	8
2.2	How will Heathrow use the Design Principles?	8
2.3	Heathrow's Design Principles for Slightly Steeper Approaches	8
3.	Stakeholder Engagement	9
3.1	Stakeholder Identification	9
3.2	Slightly Steeper Approaches - Stage 1 Stakeholders	9
3.3	Methods of Engagement	14
3.4	Summary of Feedback Received	15
3.5	Outcome of Feedback Received	17
4.	Final Design Principles	18

APPENDICES

Appendix A Engagement Log Appendix B Engagement Materials Appendix C Feedback received Appendix D Stakeholders Asked, Heathrow Answered Appendix E Evolution of design principles

1. INTRODUCTION

1.1 Background

- 1.1.1 Slightly Steeper Approaches, have been shown to provide noise benefits to communities living close to an airport¹. As such, Heathrow, working alongside local communities, has aspired to implement this procedure wherever feasible.
- 1.1.2 The Civil Aviation Authority has encouraged industry to consider the potential to use Slightly Steeper Approaches, where appropriate, as a means of mitigating noise². Heathrow's intent to explore the feasibility of Slightly Steeper Approaches has been made public in several documents:
 - 1. Step 5 of The Heathrow Blueprint for Noise Reduction,
 - 2. Recommendation 22 of the <u>Airports Commission: Interim Report, Appendix 1:</u> <u>Assessment of Short and Medium-Term Options, December 2013,</u>
 - 3. Section 8, reference 2.7 of <u>Heathrow's Environmental Noise Directive; Noise Action</u> <u>Plan 2013-2018</u>,
 - 4. Heathrow's commitment to implement steeper approaches at an expanded Heathrow in <u>Taking Britain Further Volume 1</u> and
 - 5. Page 42 of Heathrow's Noise Action Plan 2019-2023.
- 1.1.3 Between 2015 and 2017, Heathrow ran two live trials to investigate how Slightly Steeper Approaches for arriving aircraft (3.2° as opposed to 3.0°) would impact Heathrow operationally whilst at the same time attempt to measure the benefit in noise reduction that could be achieved.
- 1.1.4 For operational reasons, which are explained fully in the trial reports³, these Slightly Steeper Approaches can only be flown by aircraft using RNAV navigation technology⁴. Of all Heathrow approaches over the trial periods, fewer than 2% flew an RNAV Slightly Steeper Approaches. The remainder flew the standard 3.0° approaches using the Instrument Landing System (ILS).
- 1.1.5 The main reasons for the lower number of 3.2° RNAV arrivals compared to 3.0° arrivals using our Instrument Landing Systems are:
 - Instrument Landing System approaches have been the standard for over 50 years and crews are much more familiar with them compared to RNAV approaches, which are relatively new on a global level. With Heathrow's large and diverse range of airline customers, many crews are long-haul⁵ meaning that they may only fly into Heathrow once every couple of months. 69% of all the 3.2° RNAV approaches flown

¹ Page 3 https://www.heathrow.com/file_source/HeathrowNoise/Static/Heathrow_Blueprint_for_Noise_Reduction_2.pdf

² Chapter 5 of <u>CAP 1165 Managing Aviation Noise</u>

³ First trial report and Second trial report

⁴ Area NAVigation – a Performance based Navigation (PBN) specification. RNAV approaches are now known as GNSS approaches and are RNP APCH specification.

⁵ Flight duration in excess of 6 hours

during the first trial were performed by the A320 family, a short to medium-haul aircraft.

- RNAV approaches are only available in CAT I⁶ conditions, meaning that during poorer visibility they cannot be used.
- Not all the aircraft using Heathrow have the capability to fly RNAV approaches.
- RNAV approaches result in a higher ATC and workload. Therefore, even if more crews elected to fly RNAV approaches, ATC would not be able to accommodate and would decline pilot requests. This became evident in the first trial of slightly steeper approaches at Heathrow.
- 1.1.6 Local communities have supported the trials, which demonstrated that a small noise benefit (an average decrease of 0.5dBA) can be provided whilst experiencing no negative environmental or operational dis-benefit.
- 1.1.7 Since the end of the (second) trial period, the Civil Aviation Authority have allowed Heathrow to keep the RNAV Slightly Steeper Approaches operational temporarily whilst we prepare to submit an airspace change proposal for their permanent adoption.
- 1.1.8 In the Assessment Meeting with the Civil Aviation Authority (Stage 1A of CAP1616), they advised that Heathrow needed to follow the full CAP1616 process if the procedures are to be adopted permanently. However, the Civil Aviation Authority said they "*will consider any request that certain requirements of CAP1616 are not proportionate to the nature of this change*". For example, a reduced decision period by the Civil Aviation Authority is an opportunity being explored.
- 1.1.9 All the previous work conducted during the trials provided Heathrow with the information on what is and is not possible for the adoption of Slightly Steeper Approaches at Heathrow Airport at this time, and this airspace change proposal will include all the options considered.
- 1.1.10 It is Heathrow's expectation that in following the CAP1616 process for the permanent introduction of Slightly Steeper Approaches at Heathrow, it will only be possible for those aircraft flying RNAV approaches at this time.
- 1.1.11 It is important to note that the proposed permanent adoption of Heathrow's 3.2° RNAV slightly steeper approaches is for today's two-runway operation. This airspace change proposal is not related to Heathrow's Expansion project. If a 3rd runway is consented, Heathrow aspire to introduce Slightly Steeper Approaches for **all** their arrivals as part of that airspace change.

1.2 Statement of Need

1.2.1 In accordance with CAP1165⁷; the Heathrow Noise Blueprint; Airports Commission: Interim Report, Appendix 1: Assessment of Short and Medium-Term Options, December 2013, (Recommendation 22); Heathrow's Noise Action plan; and as outlined in our sustainability strategy 'Heathrow 2.0'. Heathrow would like to introduce Slightly Steeper Approaches as part of our ongoing commitment to reducing our noise footprint.

⁶ <u>https://www.skybrary.aero/index.php/Precision_Approach</u>

⁷ CAP1165: Managing Aviation Noise, CAA

- 1.2.2 This strategy applies regardless of the proposed expansion of Heathrow Airport.
- 1.2.3 It is intended that there will be no changes to the lateral tracks of aircraft over the ground and that the Slightly Steeper Approaches will allow participating aircraft to stay higher for longer, enabling only environmental benefit without any operational or environmental disbenefit. Two operational trials from September 2015 to March 2016 and May 2017 to October 2017 have supported this intention.
- 1.2.4 This proposal will not seek to increase the numbers of aircraft arriving into Heathrow Airport.

1.3 CAP1616

1.3.1 In December 2017 the Civil Aviation Authority published CAP1616 Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements.

The Airspace Change Process

- 1.3.2 The Department for Transport is responsible for all aviation policy in the UK, including airspace. The Civil Aviation Authority is the organisation responsible for airspace regulation and for the Airspace Change Process (ACP) which all airspace 'change sponsors' must follow.
- 1.3.3 Proposals for changes to flight paths are submitted to, and assessed and approved by, the Civil Aviation Authority following the Airspace Design Guidance set out in their document CAP1616. This 7-stage guidance provides a framework for changing airspace, and places great importance on engaging and consulting on airspace change proposals with a wide range of stakeholders, including potentially affected communities.

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Stage 1 DEFINE	Step 1A	Assess requirement		
	Step 1B	Design principles		
		DEFINE GATEWAY		
Stage 2	Step 2A	Option development		
DEVELOP and ASSESS	Step 2B	Options appraisal		
		DEVELOP AND ASSESS GATEWAY		
	Ctor 24			
Stage 3	Step 3A			
CONSOLI	Step 3B	Consultation approval		
	CONSULT GATEWAY			
	Step 3C	Commence consultation		
	Step 3D	Collate & review responses		
Stage 4	Step 4A	Undate design		
UPDATE and SUBMIT	otop in	opulate design		
	Step 4B	Submit proposal to CAA		
Stage 5	Step 5A	CAA assessment		
DECIDE	Step 5B	CAA decision		
		DECIDE GATEWAY		
Stage 6 IMPLEMENT	Step 6	Implement		
Otawa 7 DID	04			
Stage / PIR	Step 7	Post-implementation review		

Figure 1: Overview of the CAA's CAP1616 Airspace Change Proposal Process

- 1.3.4 At the Step 1A ('Assess requirement') an assessment meeting was held with the Civil Aviation Authority on the 11th May 2018. Heathrow submitted a Statement of Need to which was published on the Civil Aviation Authority Portal on the 27th September 2018⁸.
- 1.3.5 This document forms our submission to the Civil Aviation Authority for Step 1B of the CAP1616 Design Principles and provides evidence of our compliance with the process. It:
 - Sets out our proposed design principles;
 - Shows how these have been informed by two-way stakeholder engagement.
- 1.3.6 The Civil Aviation Authority will decide whether we have satisfied Step 1B of CAP1616 at the Define Gateway scheduled for 30th August 2019.

⁸ Date the information was migrated onto the new CAA Portal for the old website

2. DESIGN PRINCIPLES FOR SLIGHTLY STEEPER APPROACHES

2.1 What is a Design Principle?

- 2.1.1 CAP1616 describes the design principles as encompassing "the safety, environmental and operational criteria and the strategic policy objectives that the change sponsor seeks to achieve in developing the airspace change proposal."
- 2.1.2 Design principles must also consider government policy documents (e.g. Air Navigation Guidance 2017) and any local criteria, such as planning agreements and Noise Preferential Routes (NPRs)⁹.

2.2 How will Heathrow use the Design Principles?

- 2.2.1 The airspace change process requires Heathrow to develop a set of design principles with identified stakeholders. Design principles essentially provide high-level criteria that the proposed airspace design options should meet.
- 2.2.2 They also provide a means of analysing the impact of different design options and a framework for choosing between or prioritising options.

2.3 Heathrow's Design Principles for Slightly Steeper Approaches

2.3.1 Following our stakeholder engagement our design principles for Slightly Steeper Approaches are:

	Final Design Principles
1	Must be safe
2	Must achieve the objective of reducing noise compared to a 3.0° approach
3	Must not increase the numbers of go-arounds
4	Must not reduce Heathrow's capacity
5	Must not change the lateral tracks of aircraft over the ground
6	Should not reduce the ability of arrivals to perform Continuous Descent Approach
7	Should maximise the number of aircraft able to fly the slightly steeper approach
8	Should not adversely increase pilot or ATC workload

Table 1: Final Design Principles

⁹ https://www.caa.co.uk/Consumers/Guide-to-aviation/Airspace/Noise-preferential-routes/

3. STAKEHOLDER ENGAGEMENT

3.1 Stakeholder Identification

3.1.1 All relevant stakeholders such as: airspace users, technical experts, local community groups, local authorities and industry groups, were identified to ensure that all stakeholders were able to have an input into the airspace change proposal.

Stakeholder Groups

- 3.1.2 The majority of stakeholders will belong to one of the following groups (in alphabetical order):
 - Airlines
 - Aviation Industry and other airspace users (including NATS and General Aviation)
 - Heathrow Community Engagement Board
 - Local Authorities
 - Local community groups

3.2 Slightly Steeper Approaches - Stage 1 Stakeholders

- 3.2.1 Identifying stakeholders is a process that needs to be carried out at the beginning of any Airspace Change Proposal and continually assessed throughout the process as the Airspace Change Proposal develops.
- 3.2.2 CAP1616 states that during Stage 1 of the process, design principles should be drawn up through discussion with affected local stakeholders. This engagement should include elected community representatives, local community groups, the airport consultative committee and representatives of local General Aviation organisations or clubs.
- 3.2.3 The potentially impacted area is based on the extent of the final approaches for Heathrow's runways, extended from the runway threshold out to 10NM¹⁰, because all of Heathrow's RNAV approaches commence from 10NM from touchdown.
- 3.2.4 Heathrow utilised existing forums, listed in the following paragraphs to carry out the design principle engagement. The potentially impacted area was used to assess which local authorities are within it, and Heathrow ensured that they were made aware of the Airspace Change Proposal, as stated in para 3.2.12.

¹⁰ 1 nautical mile = 1.1508 statute miles

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Figure 2: Map of potentially impacted areas¹¹

3.2.5 Heathrow identified the below list of stakeholders for the Stage 1 design principle engagement.

National Air Traffic Management Committee (NATMAC)

3.2.6 NATMAC is a non-statutory advisory body sponsored by the CAA Safety and Airspace Regulations Group (SARG). The Committee is consulted for advice and views on any major matter concerned with airspace management, including Unmanned Aerial Vehicles. NATMAC is to assist SARG in the development of airspace policies, configurations and procedures in order that due attention is given to the various requirements of all users of United Kingdom airspace, civil and military.

List of NATMAC Members		
Airlines UK	Airspace4All	
Airport Operators Association (AOA)	Airfield Operators Group (AOG)	
Aircraft Owners & Pilots Association (AOPA)	Association of Remotely Piloted Aircraft Systems UK (ARPAS-UK)	
British Airways (BA)	Bae Systems	
British Airline Pilots Association (BALPA)	British Balloon & Airship Club (BBAC)	
British Business & General Aviation Association (BBGA)	British Gliding Association (BGA)	
British Helicopter Association (BHA)	British Hang Gliding & Paragliding Association (BHPA)	
British Microlight Aircraft Association (BMAA)	British Model Flying Association (BMFA)	
British Parachute Association (BPA)	General Aviation Alliance (GAA)	

¹¹ As on the CAA Portal

General Aviation Safety Council (GASCo)	Guild of Air Traffic Control Officers (GATCO)
Honourable Company of Air Pilots (HCAP)	Helicopter Club of Great Britain (HCGB)
Heavy Airlines	Isle of Man CC
Light Aircraft Association (LAA)	Low-Fares Airlines
NATS	PPL/IR (Europe)
UK Airprox Board (UKAB)	UK Flight Safety Committee (UKFSC)
Ministry of Defence – Defence Airspace & Air Traffic Management (MoD DAATM)	United States Air Force Europe (USAFE)
Navy Command Headquarters	Military Aviation Authority (MAA)

Table 2: List of NAMTAC members

Heathrow Airport Flight Operations Performance and Safety Committee (FLOPSC)

- 3.2.7 Chaired by the Head of Planning, Performance and Transformation, FLOPSC is responsible for:
 - Oversight and review of Flight Operations
 - Review of Flight Performance and Airborne Safety Performance

List of FLOPSC Members		
Heathrow	National Air Traffic Services	
British Airways	Virgin	
Flybe	United	
Qatar Airways	Lufthansa (DLH)	
KLM	Aer Lingus	
American Airlines	Germanwings	
Austrian Airlines	Delta	
SAS	Qantas	
Met Office	Airport Coordination Ltd (ACL)	
British Air Line Pilots Association (BALPA)	Civil Aviation Authority	
Department for Transport	UK Flight Safety Committee	

Table 3: List of FLOPSC members

Heathrow Community Noise Forum (HCNF)

3.2.8 The Heathrow Community Noise Forum was set up in 2015 and is made up of representatives from local authorities around Heathrow, NATS, British Airways, Virgin, the Department for Transport, the Civil Aviation Authority and Heathrow (Table 4). Heathrow

set up the forum in response to local concerns regarding future changes to airspace as a result of the Government's Airspace Modernisation Strategy.

- 3.2.9 The aim of the Forum is to:
 - Keep community representatives and local authority stakeholders informed and seek their input in preparing for and consulting on future airspace modernisation as part of the Government's Airspace Modernisation Strategy and airspace changes associated with Heathrow expansion;
 - Improve understanding of members on Heathrow's operations and airspace issues;
 - Seek input from members to inform the communications approach to public consultations regarding potential airspace changes;
 - Build trust in the Heathrow's data through members involvement in the independent verification of the data and analysis of data.

Borough	Councillor/Officer	Community Representative
Bracknell Forest		
Buckinghamshire CC		
Elmbridge		
Hillingdon		HASRA
Hounslow		
London Borough of Ealing		EANAG
Hammersmith & Fulham		
London Borough of Lewisham		Forest Hill Society
London Borough of Southwark		Plane Hell
Richmond		Heathrow Campaign (RHC) RHC Teddington Action Group (TAG)
Runnymede		Englefield Green Englefield Green Action Group (EGAG) EGAG EGAG
South Bucks		Richings Park Residents Association
Spelthorne		, Spelthorne resident
Surrey Heath		Aircraft Noise 3 Villages (AN3V) AN3V AN3V AN3V The Windlesham Society

Surrey County Council			
Slough			
Windsor & Maidenhead			
Wokingham			
Other	i		HACAN
Industry			
To70 (Independent Advisor)		В	British Airways
Virgin Atlantic	Civil Aviation Authority	D	Department for Transport
NATS	Independent Commission of Civil Aviation Noise (ICCAN	n) H	leathrow

Table 4: List of HCNF Members

Heathrow Community Engagement Board (HCEB)

3.2.10 The Heathrow Community Engagement Board was set up to increase community and stakeholder participation in Heathrow's planning and decision-making processes. They fulfil the role of Airport Consultative Committee under Section 35 guidance issued by the Department for Transport¹², replacing the Heathrow Airport Consultative Committee (HACC). They also work with local people to provide challenge and scrutiny of the airport's day-to-day operations and expansion proposals.¹³

List of HCEB Members		
Chair		
Director		
Director		
Non-Exec Board Member		
Non-Exec Board Member & Chair of Passenger Services Group		
Residents Adviser		
Executive Assistant		
Head of Communications & Strategy		

Table 5: List of HCEB Members

Heathrow Strategic Planning Group (HSPG)

3.2.11 The Heathrow Strategy Planning Group represents many of the local authorities and other public organisations responsible for planning the land use, transport, environment,

¹² https://www.legislation.gov.uk/ukpga/1982/16/section/35

¹³ Rules of the Organisation

https://static1.squarespace.com/static/5abcb26f9772aee7f0dd7ec8/t/5b98fce370a6ad55d7a94c9f/1536752868105/HCE B Rules of Organisation v1 2.pdf

List of HSPG Members		
Buckinghamshire County Council	Runnymede Borough Council	
Colne Valley Park Community Interest Company	Slough Borough Council	
Elmbridge Borough Council	Surrey County Council	
Enterprise M3 Local Enterprise Partnership	South Bucks District Council	
London Borough of Ealing	Spelthorne Borough Council	
London Borough of Hounslow	Thames Valley Berkshire Local Enterprise Partnership	
Royal Borough of Windsor & Maidenhead	Buckinghamshire Thames Valley Local Enterprise Partnership	

economic development and sustainable development of the sub-region surrounding Heathrow Airport.

Table 6: List of HSPG members¹⁴

Local Authorities

3.2.12 Potentially impacted local authorities are represented on either the HCNF and HSPG and so were encouraged to provide feedback through their HCNF member if appropriate. An email was also sent to Council Leaders and Chief Executives to inform them of this Airspace Change Proposal and provide them with details on how to feedback if they wished. This email and the list of Local Authorities is available in Appendix B, Pages 30-31 and 33-34.

3.3 Methods of Engagement

- 3.3.1 As a considerable amount of work and engagement had taken place before and during the Slightly Steeper Approaches trials, Heathrow felt a focussed approach to design principle engagement would be appropriate. Heathrow was also conscious of the significant amount of on-going engagement with stakeholders on other Heathrow projects and wanted to avoid 'consultation fatigue'.
- 3.3.2 To ensure all stakeholders had a full understanding of the proposals, Heathrow prepared a briefing document outlining the background and history of Slightly Steeper Approaches. This document is available in Appendix B, Pages 19-24.
- 3.3.3 A table of the previous engagement, along with links to meeting records/presentations was included in the briefing document, which is available in Appendix B, Page 23.
- 3.3.4 Stakeholders were presented with a list of proposed design principles (Table 7) which were based on the engagement which took place prior to, and as a result of the live trials.

¹⁴ Information taken from <u>http://www.heathrowstrategicplanninggroup.com/about-us</u>

Proposed Design Principle

Must be safe

Must reduce the noise footprint of Heathrow's arrivals by enabling aircraft to stay higher for longer

Must not increase the numbers of go-arounds

Must not reduce Heathrow's capacity

Must not change the lateral tracks of aircraft over the ground

Should not reduce the ability of arrivals to perform Continuous Descent Approach

Should maximise the number of aircraft able to fly the slightly steeper approach

Should not adversely increase pilot or ATC workload

Table 7: List of Proposed Design Principles

- 3.3.5 We then invited stakeholders to tell us whether:
 - they agree or disagree with any of the design principles proposed above,
 - they would like to make any amendments to our proposed design principles, and
 - there are any other design principles that they would like to suggest.
- 3.3.6 All our identified stakeholders; the HCNF, HCEB, HSPG, NATMAC, FLOPSC and relevant local authorities were emailed the briefing document.
- 3.3.7 In addition, a verbal briefing was provided to HCNF members on the 5th June 2019, this is available in Appendix B, Pages 2-10.
- 3.3.8 On receipt of the briefing document all stakeholders were asked to provide feedback within two weeks. All the feedback received is available at Appendix C.

3.4 Summary of Feedback Received

Industry Feedback

3.4.1 Through our engagement with members of NATMAC and FLOPSC we received feedback from the following industry organisations:

British Airways	UK Flight Safety Committee
British Helicopter Association	General Aviation Alliance
Delta Airlines	NATS
Lufthansa Group	Civil Aviation Authority (CAA)
Luton Airport	Qatar Airways
Ministry of Defence (MOD)	British Air Line Pilots Association (BALPA)
Lufthansa Group Luton Airport Ministry of Defence (MOD)	Civil Aviation Authority (CAA) Qatar Airways British Air Line Pilots Association (BALPA

Table 8: List of Industry Groups who responded to the proposed Design Principles

3.4.2 Luton Airport, Delta Airlines, NATS, Lufthansa Group and British Airways all agreed with our proposed design principles. The remaining organisations made no specific reference to our proposed principles.

- 3.4.3 Many of the industry organisations provided feedback on our proposed design principles and asked further questions concerning Slightly Steeper Approaches. All the feedback we received is available in Appendix C and all the questions/points raised have been answered and are available in Appendix D.
- 3.4.4 All the questions and points raised in the feedback we received were answered and distributed, along with our final set of design principles, to the engaged stakeholders by email on 9th August 2019.
- 3.4.5 NATS also suggested an additional design principle which is covered in section 3.5 and Appendix E.

Local Authority Feedback

- 3.4.6 We received feedback from members of the HSPG, Windsor & Maidenhead and Bracknell Forest Councils. Windsor & Maidenhead made no specific reference to our proposed design principles, however raised questions concerning the procedure. These have been answered in Appendix D and were distributed to our stakeholders via email on 9th August 2019.
- 3.4.7 Bracknell Forest Council supported our proposed design principles.
- 3.4.8 The HSPG requested a phone call from Heathrow to ask questions on the proposals prior to providing a written response. A summary of this conversation is available in Appendix B, Pages 35-37.
- 3.4.9 The written feedback received from the HSPG did not comment specifically on the proposed design principles, however they stated their support for this proposed change and the approach adopted by Heathrow to achieve continuous improvement in procedures to achieve noise reductions. Their full feedback is available in Appendix C.

Community Group Feedback

- 3.4.10 We received feedback from the HCEB, the Heathrow Association for the Control of Aircraft Noise (HACAN) and members of the HCNF; the Richmond Heathrow Campaign and the Windlesham Society.
- 3.4.11 The HCEB was in full agreement with the proposed design principles, however asked several questions, which are available in Appendix D. HACAN also supported the proposed design principles and stated that they believe Slightly Steeper Approaches are beneficial to residents and feasible for airlines to operate.
- 3.4.12 The feedback received from the HCNF members showed support for Slightly Steeper Approaches and our proposed design principles. Questions raised in this feedback have been answered and are available in Appendix D and were emailed to our stakeholders on 9th August 2019.
- 3.4.13 Richmond Heathrow Campaign, the Windlesham Society and feedback from a HCNF representative all suggested additional design principles for Heathrow to consider. Details of this and how Heathrow has utilised this feedback is available in section 3.5 and in Appendix E.

3.5 Outcome of Feedback Received

- 3.5.1 The design principle suggested by NATS, "Should not adversely impact existing or planned deployments of technology and other airspace designs (such as IPA, eTBS etc)" required further discussion prior to a decision being made.
- 3.5.2 Following a phone call between NATS and Heathrow, to discuss their suggested design principle, NATS were fully satisfied that Heathrow had already considered the points they raised and were happy for their suggestion not to be taken forward. A record of this is available in Appendix C, as additional feedback to NATS original response.
- 3.5.3 The design principle suggested by the Elmbridge representative on the Heathrow Community Noise Forum was: "No one currently not overflown by landing aircraft should be overflown as a result of this change." Heathrow felt that the original proposed design principle "Should not change the lateral tracks of aircraft on the ground", fully satisfied this suggestion.
- 3.5.4 The suggested design principle we received from the Windlesham Society was: "Aim to reduce the noise footprint of each individual flight arriving at Heathrow" and the design principle suggested by the Richmond Heathrow Campaign was "The noise impact must be less than on a 3° approach throughout the landing approach".
- 3.5.5 Heathrow felt that both of those proposals raised valuable points and therefore changed one of the original proposed design principles. The original design principle read "Must reduce the noise footprint of Heathrow's arrivals by enabling aircraft to stay higher for longer". Following the feedback from the Windlesham Society and the Richmond Heathrow Campaign it now reads "Must achieve the objective of reducing noise compared to a 3.0° approach".
- 3.5.6 The evolution of our design principles, including those suggested by our Stakeholders is in Appendix E.
- 3.5.7 The final design principles and the questions and answers document were distributed to the Stakeholders by email on 9th August 2019.

4. FINAL DESIGN PRINCIPLES

4.1.1 The table below is the final proposed design principles Heathrow has submitted to the CAA for the Slightly Steeper Approaches Airspace Change Proposal.

	Final Design Principles
1	Must be safe
2	Must achieve the objective of reducing noise compared to a 3.0° approach
3	Must not increase the numbers of go-arounds
4	Must not reduce Heathrow's capacity
5	Must not change the lateral tracks of aircraft over the ground
6	Should not reduce the ability of arrivals to perform Continuous Descent Approach
7	Should maximise the number of aircraft able to fly the slightly steeper approach
8	Should not adversely increase pilot or ATC workload

Table 9: Final Design Principles