SLIGHTLY STEEPER APPROACHES CONSULTATION RESPONSE DOCUMENT

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Heathrow Slightly Steeper Approaches – Consultation Response Document

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CONTENTS

1. INTRODUCTION

1.1.1 Between 5th March – 2nd April 2021 Heathrow consulted on the permanent adoption of 3.2° Slightly Steeper RNAV[1] Approaches (SSA) for some of the aircraft arriving at the airport.

1.1.2 As part of Stage 3A of the Airspace Change Process under CAP 1616, three key documents were prepared for the consultation and can be viewed on the Civil Aviation Authority (CAA) Airspace Change Portal here. These comprised:

- detailed analysis of SSA in the Full Options Appraisal;
- an in-depth Consultation Document; and
- a 2-page quick read and easy to understand Overview.

1.1.3 Please see the above documents for more information regarding the SSA Airspace Change Proposal (ACP).

1.1.4 Following the CAA's Stage 3B Gateway, where the CAA approved the Consultation Strategy and documents, Heathrow commenced Stage 3C and consulted with stakeholders, asking the main question:

Do you support the permanent adoption of slightly steeper approaches at Heathrow airport?

1.1.5 The consultation was held online and a total of **134 responses** were received. After analysis, the admissible total number of responses was consolidated to **132**, as there were two cases of duplicate responses received from the same person.

1.1.6 Following completion of Stage 3C, Stage 3D of the Airspace Change Process requires Heathrow to carry out a fair, transparent and comprehensive review and categorisation of consultation responses. This is detailed within the Stage 3D Consultation Categorisation Document which can be viewed on the Airspace Change Portal here.

1.1.7 This Consultation Response Document forms part of our Stage 4A submission. It outlines the outcome of the SSA consultation and how we have considered the feedback received.

1.1.8 This document picks out key themes and messages from the consultation responses and provides feedback to consultees. We have also provided supporting evidence to justify our responses to the feedback raised and explanations as to whether feedback has/has not impacted the final design. To view every response to the SSA consultation, and Heathrow's categorisation and response to each piece of feedback, please see the Consultation Categorisation document here.

[1] This document refers to 'RNAV (GNSS) approaches' as we have used that term throughout the live trials, engagement and reports to-date and we will remain with this term for this process. The new and correct term is now 'RNP Approach'.

2. SSA CONSULTATION OVERVIEW – WE ASKED

Consultation Summary

2.1.1 The consultation took place over 4 weeks between Friday 5th March – Friday 2nd April 2021. In line with the Consultation Strategy here, the consultation was held entirely online, with no public events taking place.

2.1.2 The CAA requires the use of the online portal (Citizen Space) as the platform for the Stage 3 consultation. The consultation material was structured in a tiered system:

Tier	Document	Content
1	Overview/Summary Document	2-page, aimed to be a quick read and easy to understand document with diagrams.
2	Main Consultation Document	Summary of the ACP so far, including links to documents on the portal. The main consultation document described the slightly steeper approaches procedure in more detail and how Heathrow arrived at the final option they are requesting to implement.
3	Full Options Appraisal (FOA)	The FOA provided detailed technical and environmental analysis for the CAA as well as consultees who wish to read the technical data.

Table 1: Consultation Material Tiers

2.1.3 All the consultation material was uploaded onto the Citizen Space portal, which could be reached via:

- The CAA's Airspace Change Portal
- Heathrow's Website
- Links provided in emails to targeted stakeholders.

2.1.4 Alongside the consultation material there were also links to the previous SSA trial reports, the Stage 1 and Stage 2 CAP1616 documents, the Consultation Strategy, and the Full Options Appraisal (FOA) Noise Contours and Data Tables.

Consultation Questions

2.1.5 As part of the consultation, we asked consultees the following 8 questions. The primary method of responding to these questions was via the SSA Consultation page on the Citizen Space Portal. Heathrow also provided a consultation feedback form as an appendix within the main consultation document. Hard copies were posted upon request and included this form for any consultees who were unable to access the Citizen Space portal.

1. Name
2. Who are you representing (self/organisation)?
3. What is your postcode?
4. What is your email address?

5. Would you like your details published alongside your response?
6. Do you support the permanent adoption of Slightly Steeper Approaches at Heathrow Airport?
7. If no, would you like to tell us why?
8. Do you have any further feedback on this airspace change proposal?

Frequently Asked Questions (FAQs)

2.1.6 A 'Frequently Asked Questions' page was uploaded onto the Citizen Space site at the start of the consultation, with some initial questions Heathrow felt might be useful for consultees.

2.1.7 Heathrow monitored the consultation responses regularly. If it became apparent that themes were developing in comments received as part of consultation questions 7 and 8, the FAQ document was added to and updated on the site. The FAQ document was updated twice during the 4-week consultation.

2.1.8 The final FAQ document is shown in Appendix A.

Target Audience

2.1.9 Prior to the start of the consultation, emails were distributed to the targeted audience (outlined in Section 9 of the Consultation Strategy here), to inform them of the consultation start date and provide them with a link to the Citizen Space site.

2.1.10 Following the approval of the Consultation Strategy and prior to the start of the consultation Heathrow added two stakeholder groups to the targeted audience: Heathrow Airline Managers and Heathrow's Local Focus Forum.

2.1.11 Due to the considerable upheaval and changes of personnel which has taken place due to the COVID-19 pandemic Heathrow felt that directly informing all Airline Managers would be valuable.

2.1.12 Heathrow's Local Focus Forum is a community forum attended by representatives of Community organisations, including resident associations and local councillors in Heathrow's most local communities. At the forum meetings, Heathrow shares information on operational impacts and business updates that might affect the local community. Heathrow considered this forum a beneficial addition to the targeted audience.

2.1.13 Appendix B provides a list of targeted stakeholders and Appendix C provides the engagement emails sent to those stakeholders.

2.1.14 After the consultation closed and during the analysis of responses Heathrow discovered that NATMAC, one of the organisations within our targeted audience, had been missed from the engagement emails.

2.1.15 Heathrow engaged with the CAA to inform them of the situation. During discussions the CAA informed Heathrow that NATMAC was not a statutory consultee for level 1 ACPs, and they had indicated to the CAA that they would prefer to only be contacted about consultations relevant to their individual organisation. It was therefore determined that the key stakeholders within NATMAC would be targeted if they had not already responded to

the consultation. The key NATMAC stakeholders for this ACP were NATS and the Ministry of Defence. NATS had already responded to the consultation.

2.1.16 Subsequently, Heathrow reached out to the Ministry of Defence (MoD) and provided them with the consultation material. The MoD responded and the response was manually uploaded to the Citizen Space portal and has been included in this report. Copies of the email are available in Appendix C.

Telephone helpline and email

2.1.17 At the start of the consultation a phone helpline and email address were provided within the material, for stakeholders who wished to request hard copies of the consultation material or ask any further questions about the consultation.

2.1.18 Heathrow did not receive any enquiries via the telephone helpline, however there were enquiries via email. These were mainly concerning issues accessing the consultation website, which were resolved, or requesting new/updated contact details be added to Heathrow's airline stakeholder lists. There was one email request for consultation material to be sent out via the post and some emails requesting further information/clarification about SSA.

Social Media

2.1.19 Heathrow promoted the consultation on the Heathrow website and with posts on the @HeathrowNoise and @yourHeathrow twitter accounts, Heathrow LinkedIn, and the Heathrow Airport Facebook page. The initial link on the online posts directed interested stakeholders to the Heathrow website, which contained a short paragraph about the SSA consultation and a link to the Consultation website. On subsequent reminder posts, this link was updated to take interested stakeholders directly to the Citizen Space website. Copies of the social media posts are available at Appendix D.

2.1.20 The social media posts on Heathrow's Twitter, Facebook and LinkedIn accounts provided the engagement statistics shown in Table 2 below.

Table 2: SSA Social Media Engagement Statistics

Social Media Channel	Date of post	Impressions	Engagement/ Clicks	Likes/ Reactions	Shares/ Retweets	Comments
Twitter	4 March (@Heathrow Noise)	3,989	462	11	4	5
	5 March (@your Heathrow)	2,029	44	10	2	0
	22 March (@your Heathrow)	35,851	905	75	21	3
Facebook	11 March	25,098	20,686	307	17	19

	19 March	1,181	1,105	307	27	18
Heathrow LinkedIn	5 March	16,044	549	237	9	6

3. CONSULTATION ANALYSIS – YOU SAID

Who responded to our Consultation?

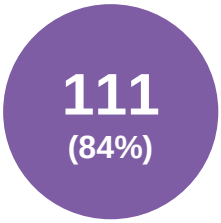
Overall Responses

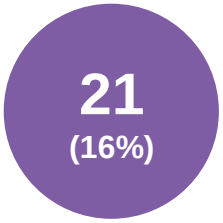
3.1.1 During the consultation period, between 5th March – 2nd April 2021, a total of **134 responses** were received. All these responses were provided via the Slightly Steeper Approaches consultation site on the Citizen Space portal. Heathrow did not receive any responses via the post.

3.1.2 After analysis, the admissible total number of responses were consolidated to **132**, as there were two cases of duplicate responses received from the same person.

Respondents

3.1.3 Out of the 132 responses, 111 (85%) of respondents selected that they were representing themself, and 21 (15%) selected that they were representing an organisation.





Respondents within impacted area

3.1.4 As SSA are already in operation at Heathrow, and there are no changes to the lateral flight paths as a result of the SSA procedures, it was possible for Heathrow to define a very small geographical area that could potentially be impacted as a result of SSA.

3.1.5 This area potentially impacted by SSA is based on the extent of the final approaches for Heathrow's runways, extended from the runway threshold out to 10 nautical miles (NM) and so is the defined consultation zone. The impacted area is shown on figure 1 below.

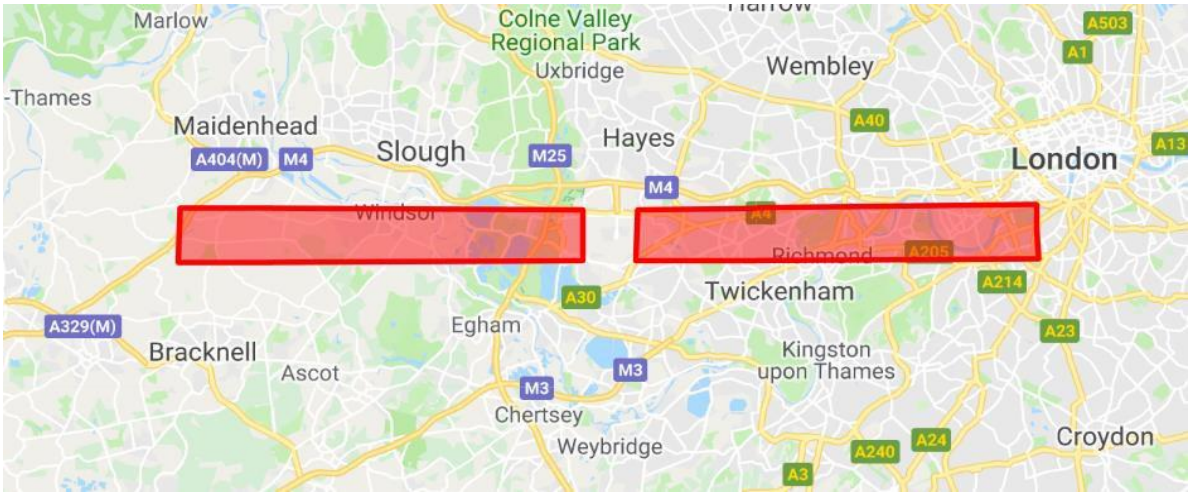
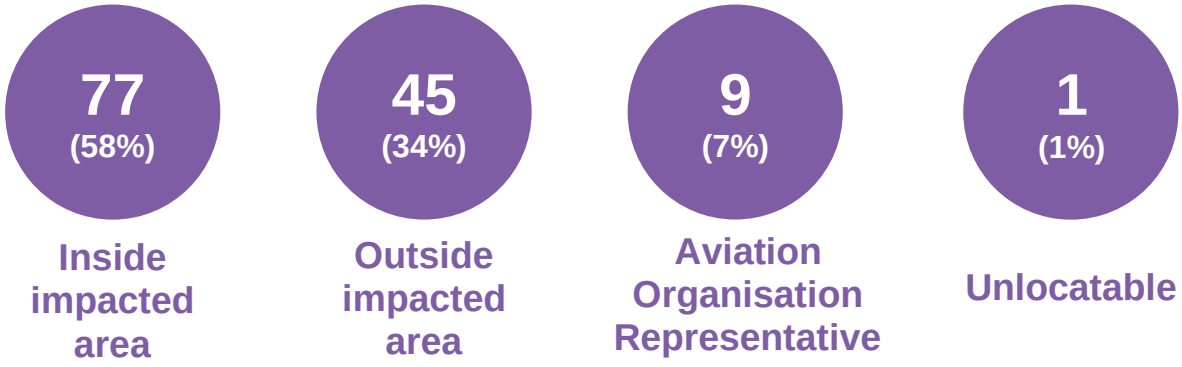


Figure 1 SSA Impacted Area *1 nautical mile = 1.508 statute miles*

3.1.6 Out of the 132 responses received for the SSA consultation, 77 (58%) were from individuals and organisations who represent communities within the impacted area. 45 responses received (34%) were from outside of the impacted area. It should be noted that some of these responses included pilots who identified as representing 'self' and although they live outside of the impacted area, they have an interest in the SSA consultation.

3.1.7 Nine responses (7%) were received from aviation-based organisations such as airlines, where being inside or outside the impacted area is not relevant. One response was received which did not contain a locatable postcode.



Targeted Organisations

3.1.8 Throughout the ACP to date, and within our Stage 3 Consultation Strategy, we have detailed who our targeted audience is for this SSA ACP. This is based on the impacted area shown in the section above and previously identified aviation stakeholders.

3.1.9 Table 3 below outlines whether our targeted audience responded to the SSA consultation.

Table 3 Target Audience Response to SSA Consultation

Targeted Audience	Responded to SSA Consultation	
Heathrow Community Noise Forum (HCNF)	✔	Responses were received from 4 organisations who are members of the HCNF.
Heathrow Community Engagement Board (HCEB)	✘	No consultation response was received from the HCEB.
Heathrow Strategic Planning Group (HSPG)	✔	A response was received on behalf of the HSPG.
Heathrow Airport Flight Operations Performance and Safety Committee (FLOPSC)	✔	The FLOPSC is made up of Airlines and ATC. 5 responses were received from airlines and 1 from Heathrow ATC (NATS).

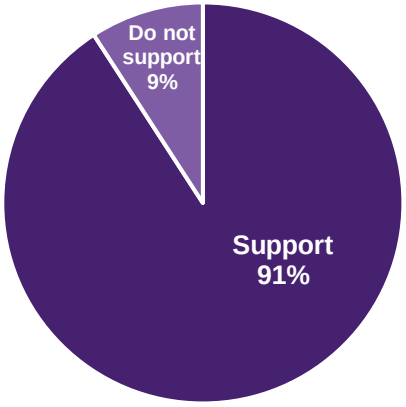
National Air Traffic Advisory Committee (NATMAC)	✔	A response was received from a NATMAC member (UK Flight Safety Committee). Responses were also received from NATS (NERL) and the Ministry of Defence (MoD)
Local authorities (within the impacted area)	✔	2 Local Authorities and 2 County Council responded to the consultation. There was also a response from the Local Authorities' Aircraft Noise Council (LAANC).

Responses to our main consultation question (Question 6)

Overall Response to our main Consultation question

3.1.10 The main question we asked as part of the SSA consultation is:

"Do you support the permanent adoption of slightly steeper approaches at Heathrow airport?"



3.1.11 Out of the 132 responses, 120 (91%) supported the permanent adoption of SSA at Heathrow. 12 respondents (9%) did not support the permanent adoption of SSA.

Responses based on impacted area and audience

3.1.12 Table 4 provides a breakdown of our difference audiences and how they responded to the SSA consultation:

Table 4 Responses to the main consultation question based on impacted area and audience

Respondent	Support SSA	Do not support SSA
Individual inside impacted area	65	2
Individual outside impacted area	36	7
Organisation representative inside impacted area	8	2
Aviation Organisation representative	9	0
Organisation representative outside impacted area	1	1
Unlocatable (Individual)	1	0
Total	120	12

Targeted Audience Responses

3.1.13 Table 5 shows the responses we received from the target audience we identified as part of our Consultation Strategy:

Table 5 Responses to the main consultation question based on targeted audience

Targeted Audience	Support SSA	Do not Support SSA
Heathrow Community Noise Forum (HCNF)	2	2
Heathrow Community Engagement Board (HCEB)	0	0
Heathrow Strategic Planning Group (HSPG)	1	0
Heathrow Airport Flight Operations Performance and Safety Committee (FLOPSC)	6	0
National Air Traffic Advisory Committee (NATMAC)	3	0
Local authorities/County Councils (within the impacted area)	4	1

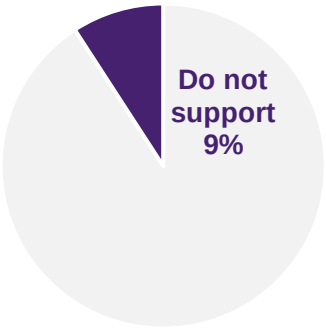
Qualitative Responses (Question 7 and 8)

3.1.14 As part of the SSA consultation, there were two opportunities for respondents to provide qualitative feedback. Question 7 gave respondents who answered 'no' when asked whether they supported SSA, an opportunity to say why they didn't support the proposal. Question 8 gave all respondents the chance to provide any further feedback about the airspace change proposal.

3.1.15 Within this section of the document, we have split the analysis into two sections; one which analyses the qualitative answers of people who are in support of SSA and one which analyses the answers of people who didn't support SSA. We have combined the qualitative feedback from questions 7 and 8 for each respondent.

3.1.16 The following sections pick out key themes within the feedback. To view each individual consultee response and our categorisation and response, please see our Consultation Categorisation Document published on the Airspace change portal here.

Respondents who do not support of SSA – Qualitative Feedback Analysis



3.1.17 The following section analyses the responses from consultees who said that they did not support the permanent adoption of Slightly Steeper Approaches at Heathrow.

3.1.18 In total 12 consultees answered 'no' they did not support the permanent adoption of SSA, and of these, all 12 provided qualitative feedback as part of questions 7 and 8.

Key Themes

3.1.19 Figure 2 below shows the key themes that were highlighted within the qualitative feedback provided in response to question 7 and question 8 that relate to SSA:

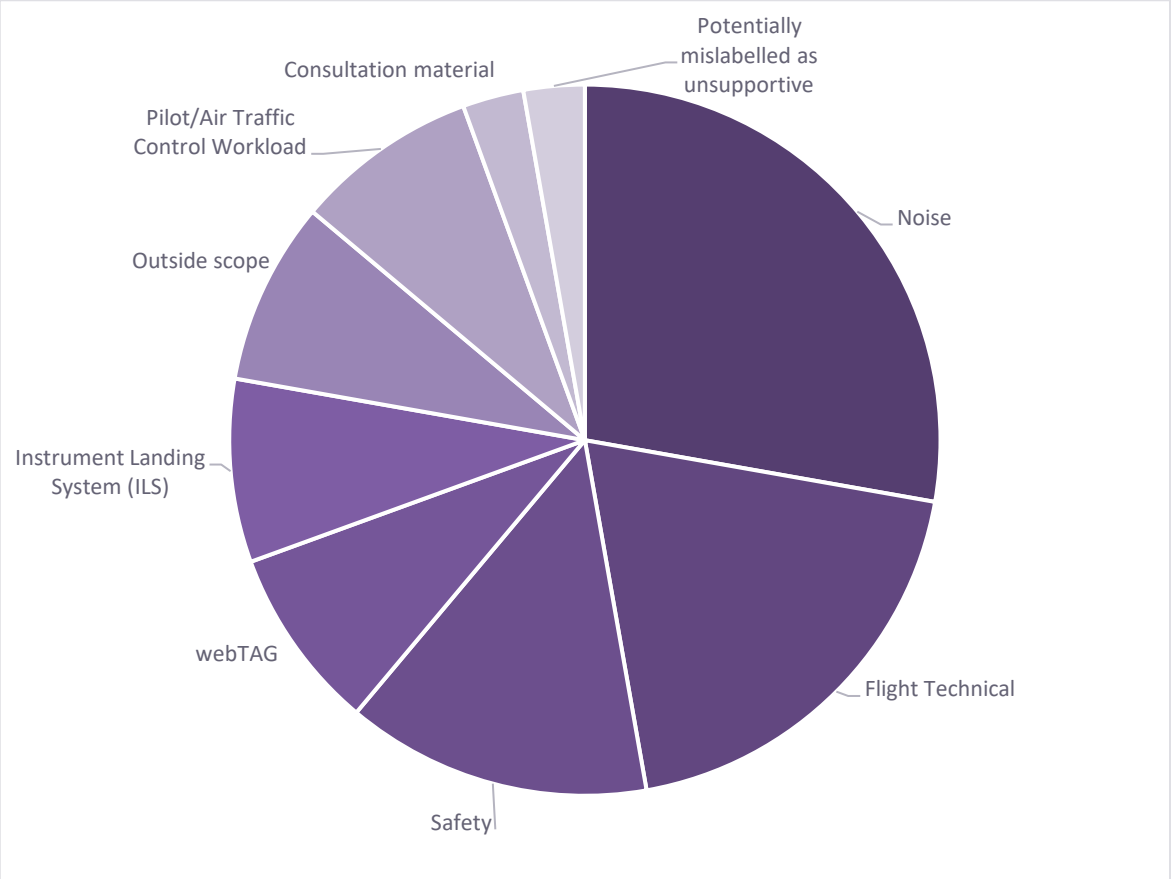
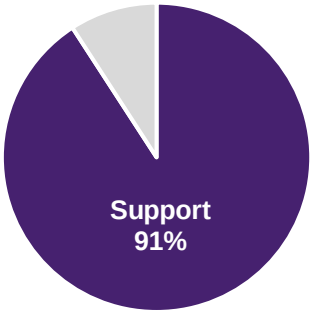


Figure 2 Key themes within responses (Do not support SSA)

3.1.20 Within section 4 'Consultation Outcome – We Did' of this document, we have explained in further detail the key themes raised within the feedback alongside our response.

Respondents in support of SSA – Qualitative Feedback Analysis



3.1.21 The following section analyses the responses from consultees who said that they support the permanent adoption of SSA at Heathrow.

3.1.22 In total 120 consultees answered 'yes' they support the permanent adoption of SSA and, of these, 76 provided qualitative feedback as part of questions 7 and 8.

3.1.23 Out of the 76 qualitative responses, 53 were broadly supportive of SSA, with the remaining 23 raising points for consideration or raising feedback outside of the scope of this ACP.

3.1.24 The following diagram picks out key themes within the feedback.

Key Themes

3.1.25 Figure 3 below shows the key themes that were highlighted within the qualitative feedback provided in response to question 7 and question 8 that related to SSA:

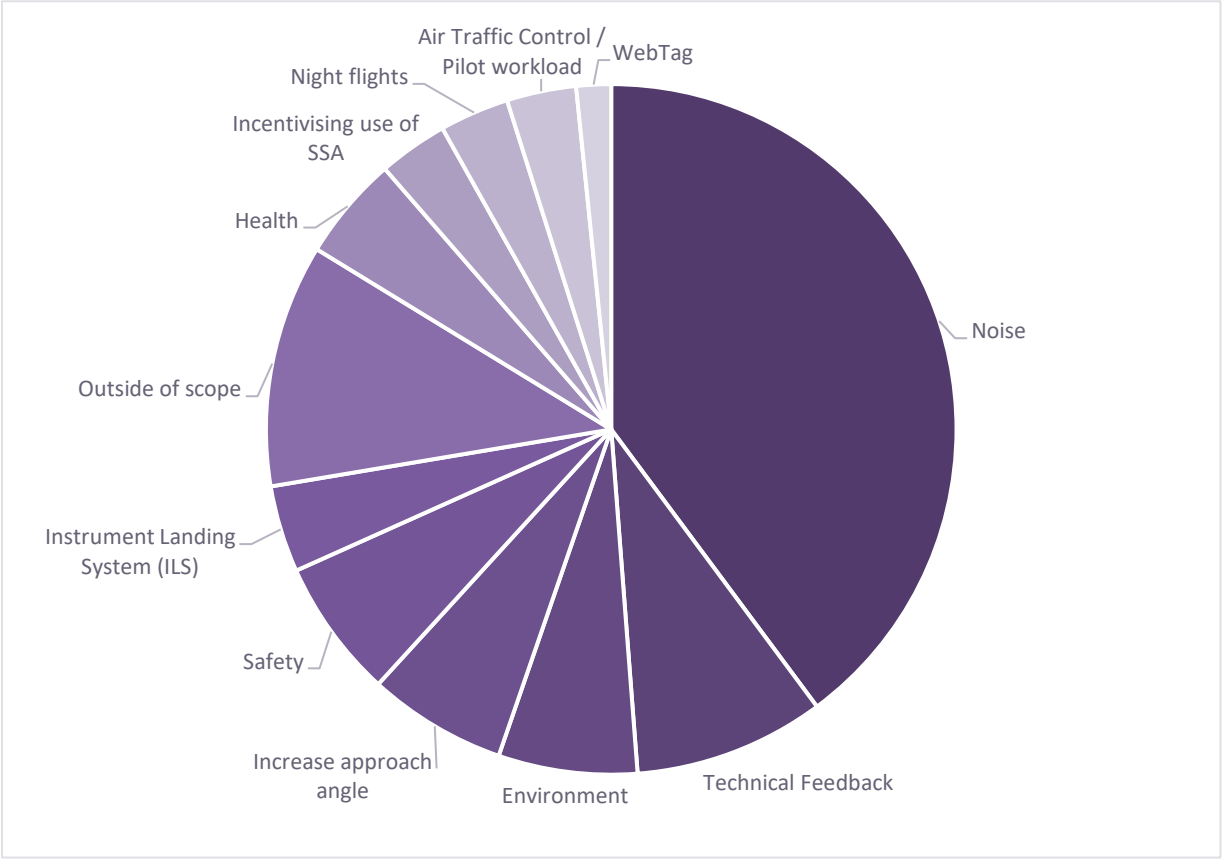


Figure 3 Key themes within responses (Support SSA)

3.1.26 Within Section 4: Consultation Outcome – 'We Did' of this document, we have explained in further detail the key themes raised within the feedback alongside our response.

4. CONSULTATION OUTCOME – WE DID

4.1.1 Within this section of our Consultation Response Document, we first briefly outline the work that has been completed to date as an outcome of our SSA consultation. We then expand upon the key themes identified in Section 3 and explain how we have considered and responded to these as part of our SSA ACP.

Consultation Actions and Outcomes (to date)

FAQs added during the Consultation

4.1.2 Throughout the consultation period, responses to the consultation were monitored alongside any enquiries made by telephone or email. This allowed us to update a 'Frequently Asked Questions' (FAQ) document which was published on the Citizen Space Portal alongside the main consultation material.

4.1.3 Initially six FAQs were published at the start of the consultation which were based on questions that had been asked during the Stage 1 and Stage 2 engagement activity. The list included questions relating to the airspace change process, as well as SSA.

4.1.4 As responses to the consultation were monitored and common themes were captured, the FAQ document was updated. The final update of the FAQ document was published on the portal on 25 March 2021, prior to the consultation deadline, and the document contained 12 FAQs. The full FAQ document is available in Appendix A here.

Consultation Categorisation Document (Stage 3D)

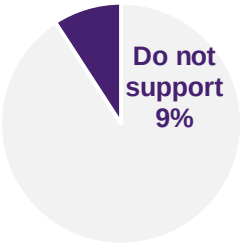
4.1.5 At Stage 3D we published a Consultation Categorisation document. This is where we reviewed each individual consultation response and categorised them into those that presented information that could lead to a change in the design and those that could not, including those raising issues which are outside of our control (such as government policy). Where we determined that a consultation response did not impact the final design, we have clearly set out why we believed that to be the case.

4.1.6 All the responses received as part of the consultation were determined to not impact the final design proposal.

4.1.7 The full Stage 3D Consultation categorisation document is available on the CAA's airspace change portal here.

SSA Consultation: Themes of Qualitative Feedback

4.1.8 In section 3, we outlined the key themes that were observed in the qualitative feedback we received in response to the SSA consultation. These were broken down by whether the respondent answered yes or no to our main consultation question 'Do you support the permanent adoption of Slightly Steeper Approaches at Heathrow Airport?'. In the following sections, we look in further detail at the common themes raised and explain how we have considered these when determining our final proposal for SSA.



Themes raised by consultees who do not support SSA

4.1.9 As outlined in section 3, a total of 12 consultees answered 'no' they did not support the permanent adoption of SSA, and of these, all 12 provided qualitative feedback as part of questions 7 and 8. The following sections look at the key themes raised within this feedback and how Heathrow has responded.

Key Themes	You Said (Summary of Feedback)	We Did
Flight Technical/ Noise	Technical feedback was provided (some from pilots) regarding the following aspects of approaches with concerns that flying SSA would lead to aircraft performance changes that could negatively impact the noise footprint: • Early landing gear deployment • Use of speedbrakes • Deployment of flaps	As SSA are already in operation, and aircraft performance and noise were monitored during the trials held between 2015-2017, we already have data and evidence that shows how aircraft perform when flying a slightly steeper approach. The data gathered during the trials showed that on average for medium aircraft the landing gear was deployed at the same distance from the runway, but the aircraft was higher. For larger aircraft, the trials showed the landing gear was deployed slightly closer to the runway and the aircraft was at a similar height to the deployment for standard approaches. The trials also showed that there was slightly improved speed adherence on final approach compared to an ILS approach. The noise monitoring undertaken during the trials demonstrated that there is a very small noise benefit of SSA which is an average decrease of 0.5dBA Sound Exposure Level (SEL) recorded at the noise monitoring sites when aircraft operate SSA. Given the evidence already collected around the benefits of SSA, this feedback has not impacted the final proposal.
Flight Technical/ Safety/ Workload	Five pieces of technical feedback were raised around the safety of SSA. Concerns were raised around speed control and the potential for increased go-arounds and unstable approaches. Three respondents raised issues around increased pilot and controller workload when flying SSA. Within one response, it appeared the consultee thought that the ACP was proposing to make SSA the default approach at Heathrow.	During the 2015-2017 trials aircraft performance was monitored and there were no increases in missed approaches. ATC did however report that there was a reduction in the number of requests to operate SSA when there was a tailwind. Since the trials in 2017, SSA have continued to be operated on a temporary basis and no safety observations have been raised (as of May 2021). This is further supported by various airlines who responded to the consultation, including British Airways who stated, 'British Airways has no evidence to raise safety concerns with the SSA at Heathrow'.

Key Themes	You Said (Summary of Feedback)	We Did
		As an outcome of the trials, we are aware of the increased ATC and Pilot workload due to the RNAV approaches and we have highlighted this throughout our consultation and engagement material. It is important to note that the standard 3.0° ILS approach will continue to be available should SSA be permanently adopted and SSA will remain an elective procedure. In response to local community feedback Heathrow has committed to continuing to monitor the use of SSA, and considering ways, where possible, to incentivise the usage of SSA to maximise the benefits whilst maintaining a safe operation. However, we have made it clear that the current ATC and Pilot limitations on the number of aircraft able to perform SSA will remain. The feedback received around safety has been carefully considered and given that SSA are safely flown today and SSA are not mandatory for pilots, Heathrow are satisfied that SSA are safe. Therefore, this feedback will not impact the final proposal.
WebTAG/ Noise	Three pieces of feedback were received that referenced the noise metrics and WebTAG calculations. Some feedback referenced the ease of understanding the noise metrics. Respondents also raised queries about the WebTAG workbook which showed some increases in the number of households experiencing an increase in noise as a result of SSA (as well as decreases).	The SSA Full Options Appraisal provided noise contours and metrics that met the CAA's requirements as part of the CAP1616 Airspace Change Process. Alongside this noise assessment work that was required as part of CAP1616, the SSA trials (2015 and 2017) collected noise data from noise monitors located under the final approach. This meant that we were able to present metrics outside of the requirements of CAP1616 that were based on actual data rather than noise modelling. We understand noise metrics and WebTAG are complex, and we endeavoured to simplify and explain the information provided whilst still meeting the requirements of CAP1616. We have noted feedback around this and will consider it for future ACP submissions and proposals. For further details with regards to WebTAG please see the WebTAG section below.
Technical /ILS	Three respondents raised the ILS as part of their feedback around why they did not support SSA.	Altering the ILS or introducing additional ILS equipment at a steeper approach angle was considered as part of the Airspace Change Process. In the Design Principle Evaluations (Stage 2A), the option of changing the ILS did not perform well against the Design Principles (DP) agreed with stakeholders at Stage 1B; failing to meet one DP, partially meeting five, and meeting two DPs. The option to increase the approach angle

Key Themes	You Said (Summary of Feedback)	We Did
	One respondent said 'The correct way to implement this is to change the ILS glide slope angle to 3.2 degrees and cannot be supported until this is the case'. There was also feedback around the advantages of the ILS over RNAV approaches, including how RNAV approach angles are not as precise as the ILS and can be impacted by temperature.	of RNAV approaches met six DPs and partially met the other two, and therefore the ILS option was discounted and the RNAV option continued through the process. Heathrow recognises that RNAV SSA presents a small incremental step in reducing the airport's overall noise footprint. As part of the wider UK Airspace Modernisation airspace change required by 2030, the application of SSA will be considered within the context of investigating the feasibility of increasing the angle of descent for the ILS. The precision of RNAV approaches was explored as part of the original SSA trials and as part of this we considered the impact of temperature on RNAV approaches as part of the trial preparation prior to the promulgation of SSA. The published procedures have a required minimum temperature to ensure that a safe approach angle is maintained. The impact of temperature of RNAV approaches was assessed in both trials, for more information please see the trial reports here and here. Following feedback around this, we also added an FAQ which was published on the airspace change portal. It is important to note that the standard 3.0° ILS approach will continue to be available should SSA be permanently adopted and SSA will remain an elective procedure. As the overall feedback around the ILS and the precision of RNAV approaches has been considered as part of the trial preparation and as part of this ACP, this feedback will not impact the final proposal.
Material	One response highlighted the technical nature of the consultation material and metrics used and suggested that it was not understandable by laypeople.	We recognise that some of the documentation required by CAP1616 is technical in nature and we endeavoured to provide accessible documents, such as the two-page summary which outlined our proposals in non-technical language, alongside the main CAP1616 requirements. The technical metrics provided in our consultation material are based on the CAP1616 requirements and therefore we are required to provide these as part of our consultation materials. Feedback around the technical nature of the material has been noted. As SSA are already in operation and the changes are considered imperceptible, on this occasion we have not provided detailed location specific noise information as no impacts were identified. Throughout this consultation we offered a telephone helpline and an email address for questions around the ACP, and we will ensure that we continue to offer ways for consultees to ask questions in future.

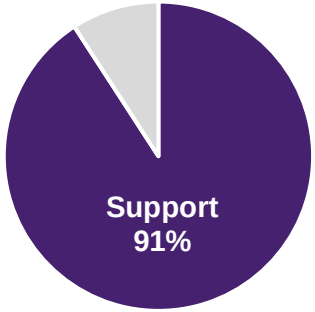
Outside of scope and potentially mislabelled responses

4.1.10 Three responses included feedback that was outside of the scope of the SSA ACP. As part of our Stage 3D Consultation Categorisation document, we have highlighted this in our responses to individual pieces of feedback.

4.1.11 One consultee answered 'no', they did not support the permanent adoption of SSA but then said in the response to question 8 *'Living under the LHR flight path i do not want any more noise pollution'* suggesting that this could potentially be a mislabelled response to the overall consultation question. This response has remained within the 'Does not support' group of responses but has been flagged as potentially mislabelled.

Themes raised by consultees who support SSA

4.1.12 As outlined in section 3, a total of 120 consultees answered 'yes' they support the permanent adoption of SSA, and of these, 76 provided qualitative feedback as part of questions 7 and 8. The following sections look at the key themes raised within this feedback and how Heathrow has responded.



Key Themes	You Said (Summary of Feedback)	We Did
Noise/ Health/ Environment	Overall, most of the qualitative feedback that mentioned noise was in support of SSA and the small noise footprint benefit. Feedback stated that any reduction in noise was beneficial for residents in the local area. Of the 49 responses which commented on noise, eight also added feedback on the environment. The majority stating that any reduction in pollution would also be beneficial. Six respondents commented on the impacts of flights on their personal lives and how it affects health, sleep, and stress levels. Responses said that any measures to help improve this, by a reduction in noise levels would be welcome.	As all this feedback commented on the positive aspects of SSA, and as it is supportive of the current proposal, it has not impacted the design of the final proposal.
Technical Feedback/ Noise	Although supportive of the proposal, some of these responses commented that landing gear would need to be deployed earlier and that speeds would be reduced earlier in the approach causing an increase in noise.	As SSA are already in operation, and aircraft performance and noise were monitored during the trials held between 2015-2017, Heathrow already have data and evidence that shows how aircraft perform when flying a slightly steeper approach. The data gathered during the trials showed that, on average, for medium aircraft the landing gear was deployed at the same distance from the runway, but the aircraft was higher. For larger aircraft, the trials showed the landing gear was deployed slightly closer to the runway and the aircraft was at a similar height to the standard approaches.

Key Themes	You Said (Summary of Feedback)	We Did
		The noise monitoring undertaken during the trials demonstrated that there is a very small noise benefit of SSA which is an average decrease of 0.5dBA SEL recorded at the noise monitoring sites when aircraft operate SSA. Given the evidence already collected around the benefits of SSA, this feedback has not impacted the final proposal.
Technical Feedback/ Safety	Technical feedback was provided (some from pilots) regarding the following aspects of approaches: • Speed on approach/unstable approach • Pilot workload Although supportive of the proposal, some of these responses raised points surrounding the stability of the SSA approach, aircraft speeds, landing gear deployment and pilot workload. Of the eight responses that specifically mentioned safety the majority commented that either the approach was safe (Heathrow ATC NSL) or that if safety was not compromised, they were supportive of SSA. Two comments referenced safety negatively, with remarks on maintaining safety with increased traffic levels in the future and the possibility of an unstable approach when flying SSA.	During the consultation, where Heathrow recognised a theme was developing, for example on landing gear deployment, an FAQ was added to the consultation website. In response to comments regarding landing gear deployment and unstable approaches Heathrow referred to the trial data. During the trials, aircraft performance was monitored and there were no increases in missed approaches. ATC did however report that there was a reduction in the number of requests to opt for SSA when there was a tailwind. Since the trials in 2017, SSA have continued to be operated on a temporary basis and no safety observations have been raised (as of May 2021). However, the trials did note that ATC and Pilot workload is slightly higher with RNAV approaches compared to ILS approaches. SSA are elective, not mandatory and ILS will continue to be available for pilots wishing to fly a 3.0^{o} approach into Heathrow.
Technical Feedback / ILS	Five respondents commented on the ILS, the majority referencing whether improvements/ upgrades to that system would be considered in the future.	Altering the ILS or introducing additional ILS equipment at a steeper approach angle was considered as part of the Airspace Change Process. In the Design Principle Evaluations (Stage 2A), the option of changing the ILS did not perform well against the Design Principles (DP) agreed with stakeholders at Stage 1B, therefore the ILS option was discounted and the RNAV option continued through the process. Heathrow recognises that RNAV SSA presents a small incremental step in reducing the airport's overall noise footprint. As part of the wider UK Airspace Modernisation airspace changes, currently required by 2030, the application of SSA will be considered within the context of investigating the feasibility of increasing the angle of descent for the ILS.

Key Themes	You Said (Summary of Feedback)	We Did
Increase the approach angle	Eight consultees raised feedback around increasing the approach angle more than 3.2° or increasing the approach angle as part of future projects.	During the consultation, where Heathrow recognised a theme was developing, an FAQ was added to the consultation website. In response to feedback concerning steeper angles of approach two FAQs were added, referring stakeholders to the work carried out in Stage 2 of the CAP1616 process. Approaches steeper than 3.2º were considered earlier in the process and discounted due to technical constraints. As part of the wider UK Airspace Modernisation airspace change (currently required by 2030), the application of SSA will be considered within the context of investigating the feasibility of increasing the angle of descent for the ILS.
Increase use of SSA in future	Four responses (from local authority/county council organisations) asked if the usage of SSA could be incentivised to encourage airlines to use the procedure and requested Heathrow investigate this option in the future. Four respondents also commented on night flights in their remarks, and although some of the responses were outside the scope of this ACP, it was suggested that SSA be made compulsory during the night hours.	Heathrow will continue to monitor the use of SSA and consider ways, where possible, to incentivise the usage of SSA to maximise the benefits whilst maintaining a safe operation. However, it should be noted that the current ATC limitations, as described in the Stage 3 material, on the number of aircraft able to perform SSA will remain.
WebTAG	Two respondents raised feedback regarding the WebTAG assessments, the first asking for further information that was used within the assessment and the second raising concerns about the WebTAG workbook which showed some increases in the number of households experiencing an increase in noise as a result of SSA.	We have noted all comments regarding the noise metrics and WebTAG and where possible we will look to make improvements to how we communicate this information during future consultations/ACPs whilst balancing the requirements of CAP1616. For further details with regards to WebTAG and the number of households impacted by changes in noise please see the WebTAG section below.

Outside of scope

4.1.13 14 responses included or partially included feedback that was outside of the scope of the SSA ACP. As part of our Stage 3D Consultation Categorisation document, we have highlighted this in our categorisation of individual feedback.

Themes across supportive and unsupportive feedback

4.1.14 As discussed in the sections above, we received some similar feedback from consultees who supported and did not support SSA around the noise and environmental analysis, in particular, the WebTAG appraisal and the information used to inform the 2031 forecast. The following two sections provide further detail around these areas:

WebTAG

4.1.15 Responses were received which queried the output of the WebTAG assessment from consultees who supported and did not support SSA. In particular, respondents noted that within Appendix A of the Full Options Appraisal, the quantitative data input into the WebTAG workbook showed an increase in the number of households experiencing increased daytime noise (as well as decreases).

4.1.16 As part of the CAP1616 process, Heathrow is required to provide specific noise metrics and quantify the benefits and impacts of an airspace change using the Department for Transport's WebTAG tool. The WebTAG workbook tool uses calculations and formulae that are provided by the Government.

4.1.17 Following the trials and throughout the SSA ACP process we have reported on the small, but quantifiable reduction to Heathrow's noise footprint that SSA enables. In the trials we found an average 0.5dB SEL reduction between 3.2˚ SSA and 3.0˚ ILS arrivals. This is an average, from readings taken from Heathrow noise monitors as single sound events.

4.1.18 The CAA's airspace change process requires WebTAG analysis methods to be used for the evaluation of quantified noise benefits and disbenefits. The WebTAG analysis uses L_{Aeq} average 92-day noise levels, rather than SEL single sound events.

4.1.19 The very small changes in the noise environment from SSA, in conjunction with the small percentage of aircraft flying SSA, mean that the average noise effects when expressed in average L_{Aeq} over 92 days are very small. In general, changes of less than 1dB may be considered negligible.

4.1.20 WebTAG is not designed for such small changes and only deals in 1dB band increments. Therefore, if the change in noise within the model is, for example, just 0.06dB (i.e. imperceptible, and therefore of no impact to an individual), it has been rounded to 0.1dB for WebTAG analysis in the workbook, which is enough for a household in a 50.9dB band to move from the 50-51dB band into the 51dB-52dB band. This is categorised as an increase within the WebTAG workbook. The same is true for decreases in noise.

4.1.21 For aviation, WebTAG's main objective is to evaluate airspace changes where flight paths may change and/or where there are options for distributing noise. Other Government WebTAG assessments are also designed in this manner, for example for infrastructure such as new or realigned roads and railways, WebTAG assessments are used to establish the relative benefits of different route options.

4.1.22 The WebTAG analysis for SSA shows that there are many smaller beneficial movements of houses into lower bands than there are movements into higher bands, hence the net benefit of £27,632,143.

Fleet Mix

4.1.23 Responses were received from consultees which raised questions around the fleet mix and future fleet mix used within the Full Options Appraisal.

4.1.24 The Full Option Appraisal considered the future fleet mix in 2031. The table in Appendix E shows the percentage of fleet mix considered as part of the 2019 assessment and the future 2031 assessment.

5. CONCLUSION AND NEXT STEPS

5.1.1 Following the close of the consultation, we have categorised and analysed the consultation responses for our SSA ACP.

5.1.2 The analysis showed that 91% of stakeholders supported the permanent adoption of 3.2° RNAV SSA at Heathrow Airport and 9% of stakeholders did not.

5.1.3 After consideration of all the qualitative responses provided, it was determined that none would impact the final design. Given the balance of support for SSA, Heathrow have decided to proceed with applying to permanently adopt 3.2° Slightly Steeper RNAV Approaches.

5.1.4 Our assessment has concluded that further engagement or consultation is not required for SSA as we have not made any amendments to the final proposal. As SSA are already in operation at Heathrow, and the outcome of the consultation does not propose to make any changes to the final design, there will be no revisions to the approved Instrument Flight Procedures designs.

Next Steps

5.1.5 As part of our Stage 4 submission, this Consultation Response Document, and the Final Options Appraisal are submitted to the CAA and published on the Airspace Change Portal. We will also prepare and submit the formal airspace proposal to the CAA. The formal submission is required to follow a standard template/structure which is outlined in CAP1616.

5.1.6 Heathrow will submit the final proposal to the CAA in Q2 2021. This will also be published on the Airspace Change Portal.

5.1.7 Following the Stage 4 submission, Heathrow will move onto Stage 5: Decide. Stage 5 is where the CAA assesses the Airspace Change Proposal and all the documentation and evidence accompanying it, holding a Public Evidence Session when it is proportionate to do so for Level 1 proposals (Step 5A), before making its decision (Step 5B). SSA is a Level 1 proposal.

5.1.8 Heathrow have agreed with the CAA that a shortened decision timeline of 10 weeks (+1 week document check) would be acceptable to the CAA following Stage 4 submission.

APPENDIX A: PUBLISHED FAQS

The Airspace Change Process (ACP)

Why are Heathrow consulting when some aircraft are already flying SSA?

We are consulting on this airspace change to make SSA **permanent** at Heathrow - up until now, SSA have been in place on a temporary basis whilst Heathrow prepares and submits an Airspace Change Proposal (ACP) for their permanent adoption.

Between 2015-17 we held two SSA trials and since the second trial SSA have continued to be in operation, as the CAA permitted this on a temporary basis. As part of the ACP process outlined in the CAA's CAP1616 document, we are required to undertake a consultation as part of Stage 3. This is where we are now and we are asking the question 'Do you support the permanent adoption of slightly steeper approaches at Heathrow airport?'.

Why can't I respond to the consultation via email?

In accordance with the CAA's airspace change guidance (CAP 1616), we would request that you send your consultation response via the online portal (Citizen Space). CAP1616 states that "*The CAA sees no justification for allowing responses by email direct to the change sponsor or to the CAA, rather than using the online portal. We will therefore permit sponsors to disregard such responses as they could equally have been made via the portal".*

About Slightly Steeper Approaches (SSA)

Will this affect the height or position of aircraft before they join the final approach?

SSA increase the angle of approach for some aircraft arriving at Heathrow, meaning that some aircraft stay slightly higher for longer. SSA do not affect the lateral tracks of aircraft on final approach at Heathrow. There is more information about this in Section 3 of our Consultation Document.

Is this Airspace Change a form of PBN?

SSA use Global Navigation Satellite Systems (GNSS) which is a form of Performance Based Navigation (PBN). The Slightly Steeper Approach procedures follow exactly the same lateral profile as the Instrument Landing System (ILS) but rely on on-board equipment and satellite navigation as opposed to physical infrastructure.

Why do only a small number of arrivals use Slightly Steeper Approaches?

During the first SSA trial in 2015 it was identified that the number of aircraft able to operate SSA is limited due to Air Traffic Control workload. This is because of the type of satellite-based procedure that SSA use, not because the angle of approach itself is steeper. There are several other reasons that contribute to the number of aircraft that operate SSA and more information regarding this can be found within the 'Current SSA usage' section of our Consultation Document.

Are there any negative effects from increasing the angle of approach?

Our Full Options Appraisal demonstrated that, based on the levels of uptake observed in the trials and current operations, there are no negative impacts associated with permanently adopting SSA. The Full Options Appraisal is included in the consultation documents.

Do you plan to use a steeper angle than 3.2 degrees in future?

The options for different approach angles were considered as part of this ACP and you can find more information with Section 3 of our Consultation Document. All future airspace change remains under review and any plans for extending the usage of 3.2 degrees or a steeper angle will be communicated through the established stakeholder channels when known.

Why did you choose 3.2 degrees and not a steeper angle?

As part of Stage 2 of this Airspace Change Proposal, we explored options to introduce 3.2°, 3.5° or steeper than 3.5° RNAV approach angles, as well as reverting to RNAV approaches operating at 3.0°. Each option was then assessed against the Design Principles from Stage 1B and the outcome was that 3.2° SSA progressed to the next stage and the other options were discounted. There is more information about how we considered different approach angles and how they were discounted within Section 3 'Steeper Approach Angles Considered' (page 20) of our Consultation Document.

Will slightly steeper approaches have any impact on the number of aircraft landing at Heathrow?

The permanent adoption of SSA will not change the number of aircraft arriving (or departing) at Heathrow. Heathrow will continue to operate within its legal operating cap of 480,000 aircraft movements a year (arrivals and departures) with or without SSA. SSA will not have any impact on Heathrow's operating hours.

Does the landing gear need to be deployed earlier on a slightly steeper approach?

We did not find any evidence of this in our trials. Landing Gear deployment is associated with an airline's Standard Operating Procedure (SOP), which for most airlines is on passing a certain height. Therefore, with a slightly steeper approach, that height is reached slightly closer to the runway compared to 3.0° approaches. The data gathered during the trials showed that for medium aircraft the landing gear was deployed at the same distance from the runway, but the aircraft was higher. For larger aircraft, the trials showed the landing gear was deployed slightly closer to the runway and the aircraft was at a similar height to the standard approaches.

More information on the deployment of the landing gear can be found in the trial reports here and here.

What are the impacts of temperature on slightly steeper approaches?

Temperature only affects RNAV approaches, not the ILS. Our slightly steeper RNAV approaches use a type of vertical guidance, where the aircraft's height is determined with reference to barometric air pressure. As a result, the angle of the approach (the aircrafts height over the ground) varies with temperature. The published descent angle is based on the angle at the International Standard Atmosphere (ISA) temperature at mean sea level which is 15°C. When the temperature is not exactly 15°C, the barometric approach angle starts to alter slightly. The colder the temperature, the shallower the approach angle. The warmer it gets, the steeper the approach angle. This applies to 3.2° RNAV slightly steeper approaches and if we were to revert to 3.0° RNAV approaches; the table below shows the impact of temperature on the angle of approach.

Temperature (°C)	0°	15°	30°
Published Approach Angle	Aircraft Angle of Approach		
3.0°	2.84°	3°	3.16°
3.2° (SSA)	3.03°	3.2°	3.37°

The procedures have a required minimum temperature to ensure that a safe approach angle is maintained. You can find further detail in the trial reports here and here.

Does a slightly steeper approach increase the likelihood of go-arounds and if so, is that a safety concern?

Design Principle 3 for this airspace change proposal is "Must not increase the number of go-arounds". Therefore, an option that contradicted this would not have progressed through the airspace change process.

Prior to the 2015-2017 trials, some airlines raised concerns regarding a potential increase in the number of go-arounds, early landing gear deployments and poor speed adherence. None of these issues materialised during the 1st or 2nd trial. SSA have continued to be flown since the end of the trial period and there has been no safety reports made by airlines regarding SSA.
More information on go-arounds can be found in the trial reports here and here.

APPENDIX B: LIST OF STAKEHOLDERS

Heathrow Airline Station Managers			
AEGEAN AIR	CATHAY PACIFIC	KUWAIT AIRWAYS	TAROM
AER LINGUS	CHINA EASTERN	LATAM AIRLINES	THAI AIRWAYS
AEROFLOT	CHINA SOUTHERN	LIBYAN AIRLINES	TRANSAERO
AEROMEXICO	CROATIA AIRLINES	LUFTHANSA	TUNIS AIR
AIR ALGERIE	DELTA AIRLINES	MALAYSIA AIRLINES	TURKISH AIRLINES
AIR ASTANA	DHL	MIDDLE EASTERN AIRLINES	UNITED
AIR CANADA	EGYPT AIR	OMAN AIR	UZBEKISTAN AIRWAYS
AIR CHINA	EL AL	PAKISTAN INT. AIRLINES	VIETNAM AIRLINES
AIR FRANCE	EMIRATES	PHILIPPINE AIRLINES	VIRGIN
AIR INDIA	ETHIOPIAN AIRLINES	QANTAS	VUELING
AIR MALTA	ETIHAD	QATAR AIRWAYS	
AIR MAURITIUS	EUROWINGS	ROYAL AIR BRUNEI	
AIR SERBIA	EVA AIR	ROYAL AIR MAROC	
ALITALIA	FINN AIR	ROYAL AIR MAROC	
AMERICAN AIRLNES	GULF AIR	ROYAL JORDANIAN	
ANA	HAINAN AIRLINES	SAS	
ASIANA	ICELANDAIR	SAUDIA AIRLINES	
AZERBAIJAN AIRLINES	IRAN AIR	SINGAPORE AIR	
BIMAN BANGLADESH	JAPAN AIR	SOUTH AFRICAN AIRWAYS	
BRITISH AIRWAYS	KENYA AIRWAYS	SRI LANKAN AIR	
BRUSSELS AIRLINES	KLM	SWISS AIR	
BULGARIA AIR	KOREAN AIR	TAP	

Heathrow Airport Flight Operations & Safety Committee (FLOPSC)	
Heathrow	National Air Traffic Services (NATS)
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 Airline Pilots Association (BALPA)	Civil Aviation Authority (CAA)
Department for Transport (DfT)	UK Flight Safety Committee (UKFSC)

Heathrow Airport's Local Focus Forum	
Iver Parish Council	Stanwell Moor Residents Association
Pavilion Association	Stanwell Preservation Action Group
Colnbrook with Poyle Parish Council	Cranford Residents Association
Colnbrook Residents Association	Spelthorne Council
HASRA – Harmondsworth & Sipson Residents Association	Hillingdon Council
Stanwell Village Hall	

Local Councils & Authorities	
Windsor & Maidenhead	Slough
Hillingdon	Hounslow
Bracknell Forest	Spelthorne
Richmond upon Thames	Hammersmith & Fulham
Kensington & Chelsea	Wandsworth
Buckinghamshire County Council	Elmbridge
Ealing	Runnymede
South Bucks	Surrey Heath
Surrey County Council	Wokingham

Heathrow Community Noise Forum (HCNF)		
Borough	**Councillor/Officer**	**Community Representative**
Bracknell Forest	[redacted]	[redacted] LAANC
Buckinghamshire CC	[redacted]	[redacted]
Elmbridge	[redacted]	[redacted]
Hillingdon		[redacted] HASRA
[redacted]		
Hounslow	[redacted]	
London Borough of Ealing	[redacted]	[redacted] EANAG
Hammersmith & Fulham	[redacted]	
London Borough of Lewisham		[redacted] Forest Hill Society
London Borough of Southwark		[redacted] Plane Hell
Richmond	[redacted]	[redacted] Richmond Heathrow Campaign (RHC) [redacted] RHC [redacted] Teddington Action Group (TAG) [redacted] TAG
Runnymede	[redacted]	[redacted] Englefield Green [redacted] Englefield Green Action Group (EGAG) [redacted] EGAG [redacted] EGAG
South Bucks	[redacted]	[redacted] Richings Park Residents Association
Spelthorne	[redacted] [redacted]	[redacted] [redacted] Spelthorne resident
Surrey Heath	[redacted]	[redacted] Aircraft Noise 3 Villages (AN3V) [redacted] AN3V [redacted] AN3V [redacted] The Windlesham Society
Surrey County Council	[redacted]	
Slough	[redacted]	
Windsor & Maidenhead	[redacted]	
Wokingham	[redacted]	
Other		[redacted] HACAN
Industry		
To70 (Independent Advisor)	Anderson Acoustics	British Airways
Virgin Atlantic	Civil Aviation Authority	Department for Transport

NATS	Independent Commission on Civil Aviation Noise (ICCAN)	Heathrow

Heathrow Community Engagement Board (HCEB)	
Chair	[redacted]
Director	[redacted]
Director	[redacted]
Non-Exec Board Member	[redacted]
Non-Exec Board Member & Chair of Passenger Services Group	[redacted]
Residents Adviser	[redacted]
Executive Assistant	[redacted]
Head of Communications & Strategy	[redacted]

Heathrow Strategic Planning Group (HSPG)	
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

Targeted NATMAC Members	
NATS	Ministry of Defence (MoD) via DAATM

APPENDIX C: ENGAGEMENT EMAILS

Email sent to stakeholders prior to start of consultation

Subject: Slightly Steeper Approaches Consultation

Dear xxx

On Friday 5 March, Heathrow will be launching a consultation on the permanent adoption of Slightly Steeper Approaches for some of the aircraft arriving at the airport.

Slightly Steeper Approaches (SSA) have been in operation at Heathrow on a temporary basis following trials held between 2015 and 2017. Most aircraft arriving into Heathrow fly a standard 3.0° approach angle which is similar to most airports around the world. However, a small percentage fly a 3.2° SSA, causing them to fly higher for longer. The trials demonstrated that this helps to reduce the noise footprint on the ground.

Minimising the impact of aircraft noise is a priority for Heathrow. We have been at the forefront of efforts to tackle noise and as a result Heathrow's noise footprint has shrunk considerably over the past few decades. The permanent adoption of SSA is one of the steps we are taking as we continue to make efforts to reduce the impact of noise.

The four week consultation will run from 5 March to 2 April and will give you a chance to examine our proposals and let us know if you support the adoption of SSA at Heathrow.

The consultation is part of the Civil Aviation Authority's (CAA) Airspace Change Process, which we are required to follow to implement permanent changes to airspace. Following the creation of design principles, and the development and initial appraisal of options for SSA, we are now at Stage 3 of the Airspace Change Process. This is the stage where we undertake detailed analysis of SSA and then consult with our stakeholders. We would like to thank everyone who provided input into the earlier stages of this process.

The consultation documents and response form will be available from Friday 5 March at https://consultations.airspacechange.co.uk/heathrow/heathrow-consultation-slightly-steeper-approaches. If you are unable to respond online, you may respond in writing using the feedback form provided in the consultation documents. If you have any questions about our consultation, or would like to request a hard copy of our consultation material, please contact the Heathrow Community Helpdesk (0800 344844) or email airspace@heathrow.com.

Best regards,

Reminder email sent to stakeholders at the consultation mid-point

Subject: Slightly Steeper Approaches Consultation

Dear xxx

Just a reminder that our Slightly Steeper Approaches (SSA) consultation closes next Friday 2nd April at 09:00. We would encourage you to examine our proposals and respond to the consultation to let us know if you support the adoption of SSA at Heathrow.

Slightly Steeper Approaches (SSA) have been in operation at Heathrow on a temporary basis following trials held between 2015 and 2017. Most aircraft arriving into Heathrow fly a standard 3.0° approach angle which is similar to most airports around the world. However, a small percentage fly a 3.2° SSA, causing them to fly higher for longer. The trials demonstrated that this helps to reduce the noise footprint on the ground and the permanent adoption of SSA is one of the steps we are taking as we continue to make efforts to reduce the impact of noise.

The consultation documents and response form are available at https://consultations.airspacechange.co.uk/heathrow/heathrow-consultation-slightly-steeper-approaches. If you are unable to respond online, you may respond in writing using the feedback form provided in the consultation documents. If you have any questions about our consultation, or would like to request a hard copy of our consultation material, please contact the Heathrow Community Helpdesk (0800 344844) or email airspace@heathrow.com.

Email sent to MOD following the close of the Consultation

Hi [redacted]

As discussed, on the phone. Please find attached the following documents relating to Heathrow's airspace change proposal to permanently introduce slightly steeper approaches at Heathrow Airport.

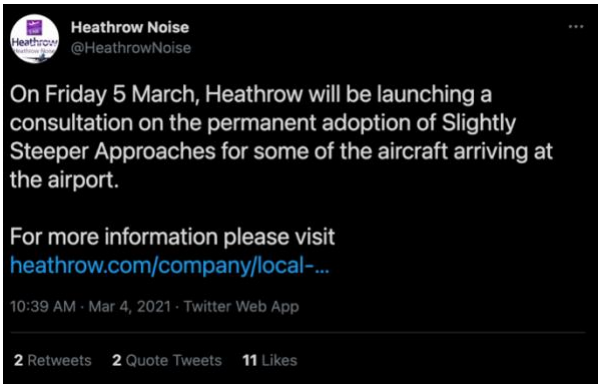
- 2-page overview document
- Main Consultation document
- Full Options Appraisal
- Feedback Form (in word)

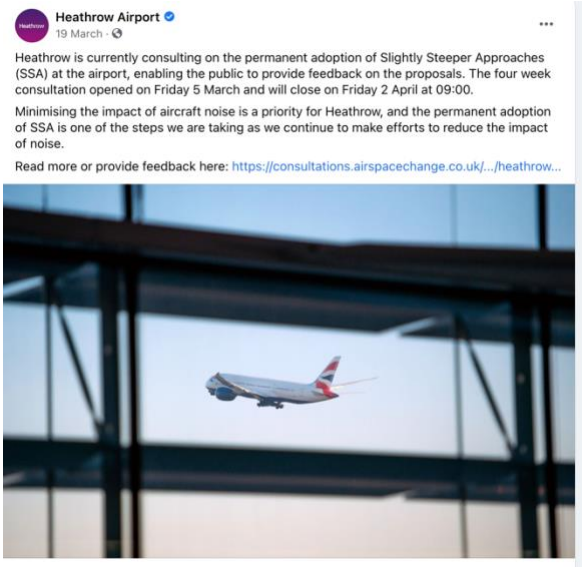
If you have any questions, please get in touch.

Kind Regards,

[redacted]

APPENDIX D: SOCIAL MEDIA POSTS





APPENDIX E: FLEET MIX TABLES

5.1.9 The table below outlines the percentage fleet mix changes that were used when undertaking the Full Option Appraisal noise and environmental analysis at Stage 3.

Table 6 Fleet Mix and Future Fleet Mix

Aircraft (IATA Code)	Aircraft (ICAO Code)	2019 Movements %	2031 Movements Assumed %
77W	7773ER	4.5	5.3
321	A321-232	13.4	4.2
333	A330-343	1.3	1.5
772	777200	4	0
788	7878R	3.6	6.6
789	7879	4.4	10.7
763	767300	0.2	0
7M8	737MAX8	0.5	1
319	A319-131	21.8	2.2
320	A320-211	17.1	9.4
32A	A320-232	12.6	0
738	737800	1.1	0.3
E90	E190	0.5	0
32B	A321	0.5	0.4
359	A350-941	0.7	2
388	A380-841	2	0
744	747400	2.7	0
DH4	Dash -8	1.2	0
332	A330-200	1.2	0.4
773	7773ER	0.4	1.9
74N	7478	0.1	0
74Y	747400	0.2	0
346	A340-600	0.6	0
76W	767300	1	0
32Q	A321neo	0.8	0
75W	757200	0.2	0

Aircraft (IATA Code)	Aircraft (ICAO Code)	2019 Movements %	2031 Movements Assumed %
752	757200	0.2	0
77X	777200	0.1	0
73H	737800	0.8	0
73J	737900	0.1	0
73W	737700	0.5	0
CS1	737700	0.2	0
CS3	CS300	0.5	0
339	A330neo-900	0.2	0.5
32S	A320-211	0.3	0
351	A350-1000	0.1	7.8
ABY	A300-600	0.3	0
318	A318-100	0.1	0
320N	A320neo	0	31.2
321N	A321neo	0	7.6
781	78710	0	0.6
32H	A320 (s)	0	3.2
319N	A319neo	0	0.4
E95	EMB195	0	1
7M9	737MAX8	0	0.3
74H	7478	0	0.1
7M7	737MAX8	0	1
779	777X-900	0	0.4
	Total	100	100