



***AIRSPACE MODERNISATION AIRSPACE CHANGE PROPOSAL***

***STAKEHOLDER ENGAGEMENT APPENDIX D***

***IOA CORRESPONDENCE & ENGAGEMENT MATERIAL PART 2***





## Table of Contents

<b>1. Session invitations and RSVPs.....</b>	<b>3</b>
<b>2. Community session reminder emails &amp; RSVPs .....</b>	<b>40</b>
<b>3. Confirmation invites (community).....</b>	<b>59</b>
<b>4. Confirmation invites (industry) .....</b>	<b>79</b>
<b>5. Community technical session 1 attendees &amp; follow ups .....</b>	<b>89</b>
<b>6. Community session 2 emails &amp; attendees.....</b>	<b>96</b>
<b>7. Industry session 1 emails &amp; attendees.....</b>	<b>107</b>
<b>8. Industry session 2 emails &amp; attendees.....</b>	<b>126</b>
<b>9. Community session 3 emails &amp; attendees.....</b>	<b>141</b>
<b>10. Industry session 3 emails &amp; attendees .....</b>	<b>145</b>
<b>11. Industry session 4 emails &amp; attendees .....</b>	<b>159</b>
<b>12. Engagement material issued .....</b>	<b>160</b>
<b>13. Stakeholder feedback.....</b>	<b>177</b>
<b>14. HACAN additional engagement session attendees.....</b>	<b>194</b>
<b>15. TAG Meeting logistics &amp; response to FRP Feedback .....</b>	<b>195</b>
<b>16. Engagement slide pack .....</b>	<b>204</b>
<b>17. Dashboard example .....</b>	<b>264</b>
<b>18. Community session note .....</b>	<b>265</b>
<b>19. Industry session note.....</b>	<b>276</b>

The material in this document is shown in chronological order.

All airspace design options in this document are subject to change throughout the airspace change process, as options are matured in detail and refined in accordance with safety requirements, design principles, appraisals and stakeholder engagement and consultation.



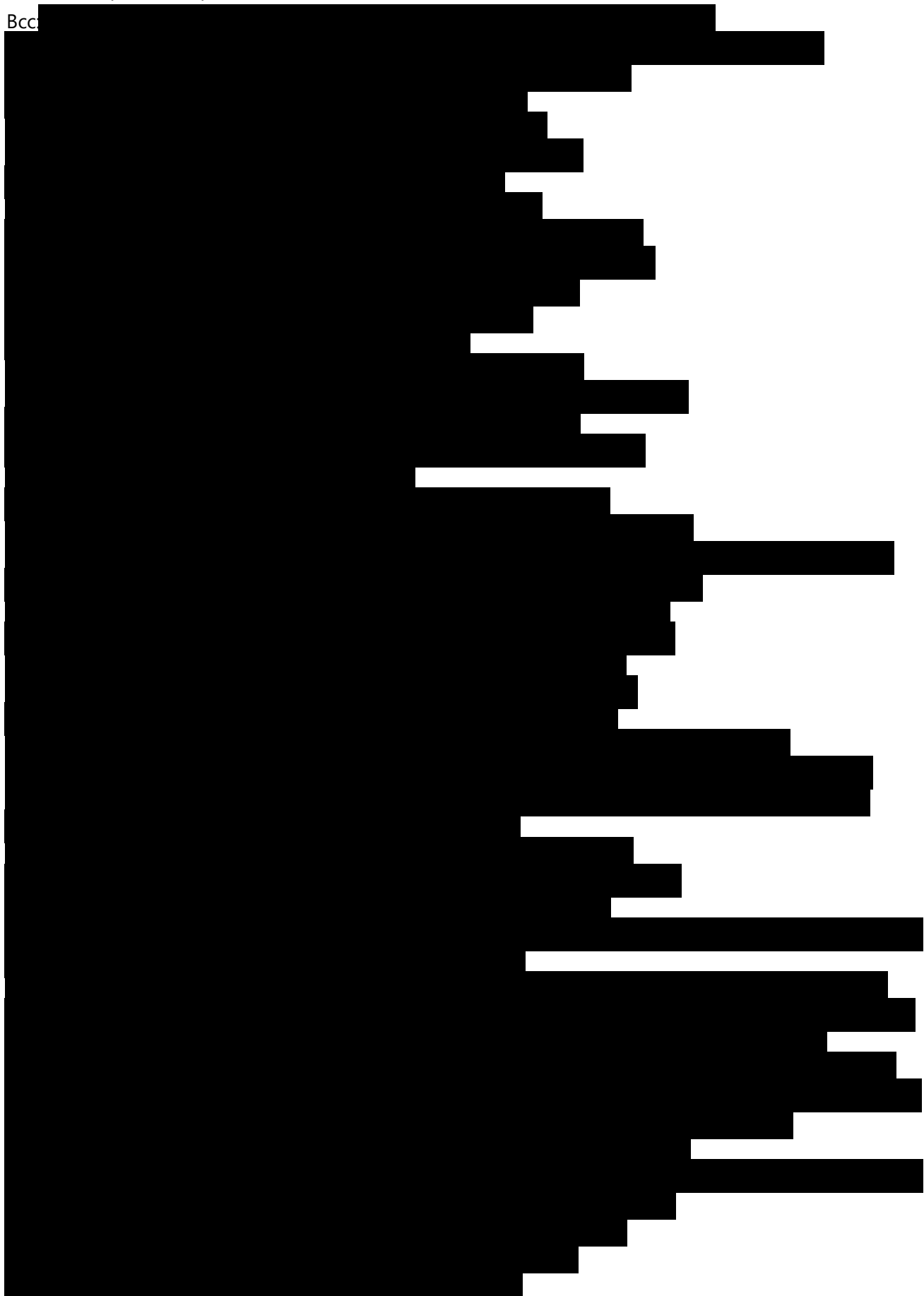
# Heathrow Step 2B IOA Update Session Engagement Material


DD - Airspace

Fri 07/07/2023 11:33

To:DD - Airspace <airspace@heathrow.com>

Bcc:



 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear Sir/Madam,

Thank you to those of you who attended one of our recent sessions where we provided an update on our Initial Options Appraisal. We very much appreciate the time that you gave for this engagement. As promised in the sessions, we have now attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L for the day period.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,



Airspace & ATM Engagement Specialist

Heathrow

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:33

To: [REDACTED] DD - Airspace <airspace@heathrow.com>

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear [REDACTED],

We recently concluded our Step 2B Initial Options Appraisal update sessions with community and industry stakeholder groups. Please could you share the attached engagement material with FLOPSC? The material includes:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L for the day period.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you or any of the committee members have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[REDACTED]

[REDACTED]

Airspace & ATM Engagement Specialist

**Heathrow**

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:34

To:DD - Airspace <airspace@heathrow.com>

Bcc

[REDACTED]

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear Sir/Madam,

We recently concluded our Step 2B Initial Options Appraisal update sessions with community and industry stakeholder groups. We have attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms

- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[Redacted]

[Redacted]

Airspace & ATM Engagement Specialist

**Heathrow**

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:36

To:DD - Airspace <airspace@heathrow.com>

Bcc

[Redacted content]

[REDACTED]



[REDACTED]

[REDACTED]

 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear Sir/Madam,

Thank you to those of you who attended one of our recent sessions where we provided an update on our Initial Options Appraisal. We very much appreciate the time that you gave for this engagement. As promised in the sessions, we have now attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L for the day period.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

  
  
Airspace & ATM Engagement Specialist

## FW: Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:40

To: [REDACTED] DD - Airspace  
<airspace@heathrow.com>

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear [REDACTED],

Please could you share the email below and attached engagement material regarding our recent Step 2B IOA update sessions with [REDACTED]?

Many thanks,

[REDACTED]

---

**From:** DD - Airspace <airspace@heathrow.com>  
**Sent:** Friday, July 7, 2023 11:36 AM  
**To:** DD - Airspace <airspace@heathrow.com>  
**Subject:** Heathrow Step 2B IOA Update Session Engagement Material

Dear Sir/Madam,

Thank you to those of you who attended one of our recent sessions where we provided an update on our Initial Options Appraisal. We very much appreciate the time that you gave for this engagement. As promised in the sessions, we have now attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L for the day period.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[REDACTED]

[REDACTED]

Airspace & ATM Engagement Specialist

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:44

To: [REDACTED] DD - Airspace  
<airspace@heathrow.com>

Cc: [REDACTED]

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear [REDACTED],

We have now concluded our recent sessions where we provided an update on our Initial Options Appraisal. We are sorry that you were not able to attend a session. We have attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com). We are happy to arrange a separate call to discuss anything specific in the material if useful.

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[REDACTED]

[REDACTED]

Airspace & ATM Engagement Specialist

**Heathrow**

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:44

To: DD - Airspace <airspace@heathrow.com>

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear

We have now concluded our recent sessions where we provided an update on our Initial Options Appraisal. We are sorry that you were not able to attend a session. We have attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com). We are happy to arrange a separate call to discuss anything specific in the material if useful.

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

Airspace & ATM Engagement Specialist

**Heathrow**

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 11:44

To: [REDACTED] DD - Airspace <airspace@heathrow.com>

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear [REDACTED]

We have now concluded our recent sessions where we provided an update on our Initial Options Appraisal. We are sorry that you were not able to attend a session. We have attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com). We are happy to arrange a separate call to discuss anything specific in the material if useful.

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[REDACTED]

[REDACTED]

Airspace & ATM Engagement Specialist

**Heathrow**

# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 12:00

To: DD - Airspace <airspace@heathrow.com>

📎 2 attachments (16 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics Dashboard Example\_Runway 27L PBN Dep Option A.pdf;

Dear Sir/Madam,

We recently concluded our Step 2B Initial Options Appraisal update sessions with community and industry stakeholder groups. We have attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[Redacted]

[Redacted]

Airspace & ATM Engagement Specialist

**Heathrow**



# Heathrow Step 2B IOA Update Session Engagement Material

DD - Airspace

Fri 07/07/2023 12:08

To:DD - Airspace <airspace@heathrow.com>

Bcc:

📎 1 attachments (5 MB)

Step 2B IOA\_Inform\_Engagement Material\_Final.pdf;

Dear Sir/Madam,

Thank you to those of you who attended one of our recent sessions where we provided an update on our Initial Options Appraisal. We very much appreciate the time that you gave for this engagement. As promised in the sessions, we have now attached the slide pack presented in the sessions, including:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps

I have attempted to email you a copy of the supplementary metrics dashboard example shown on slide 19 of the slide pack for PBN Departures Option A from runway 27L but the file size appears to be too large for your inbox. All engagement material and Heathrow's Stage 2 ACP work can be found on the CAA's Airspace Change Portal after our submission, however, if you would like to view the dashboard please get in touch and we can explore other methods for sharing it with you.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Many thanks for your support in this engagement.

Kind regards,

[Redacted]

[Redacted]

Airspace & ATM Engagement Specialist

**From:** [REDACTED]  
**Sent:** 07 July 2023 23:00  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

[REDACTED]

Can these materials now be distributed to others beyond those in the workshops?

Thks

[REDACTED]

**From:** DD - Airspace  
**Sent:** 10 July 2023 11:27  
**To:** [REDACTED]; DD - Airspace  
**Subject:** RE: WHO LOAEL

Hi [REDACTED]

Thanks for your email and sorry that we couldn't answer this question during the session. We have checked with the modellers and can confirm that the 2019 model was prepared using actual flight track data and validated using aircraft event measurements taken at the noise monitoring terminals around the airport.

I hope that answers your question but please let us know if you have any further queries.

Many thanks for your engagement,  
[REDACTED]

[REDACTED] | Airspace Modernisation Programme

**From:** DD - Airspace  
**Sent:** 10 July 2023 15:19  
**To:** [REDACTED]; DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: Invitation to update on Airspace Modernisation at Heathrow: June 2023

Dear [REDACTED]

Thank you for your email re the sharing of GIS files.

The CAA's airspace change process (CAP1616) requires airports to undertake public consultation on preferred flight path options at Stage 3. At that stage we will have detailed maps to share so that communities can understand, and give feedback on, the specific geographical nature of the proposed changes. However, at Stage 2 we still have a very large number of options, and those flight path options are subject to change as we work to develop system options (with arrivals and departures for easterly and westerly operations working together) and look to minimise the impacts of those options based on information collected in our recent Initial Options Appraisal. It is not appropriate for us to share detailed maps at this stage of design maturity, and it would be misleading for us to give the wider public information that is still subject to significant review and refinement.

We will be developing a stakeholder engagement strategy at the beginning of Stage 3 which will include consideration of more detailed and localised engagement as our flight path options reduce in number. Our plans will also set out how the public consultation we undertake during Stage 3 will meet the Gunning Principles.

We will consider your request for more detailed information and data as our options are refined and shortlisted in Stage 3.

Once again, thank you for your continued engagement.

Kind regards,  
[REDACTED]

**From:** DD - Airspace  
**Sent:** 10 July 2023 18:21  
**To:** [REDACTED] DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: Heathrow FASI and Surrey Hills AONB

Good afternoon, [REDACTED]

Thank you for your email in respect of the ongoing work on proposed new boundaries for the Surrey Hills AONB. As you are aware, Air Navigation Guidance 2017 requires an airspace change sponsor to consider AONBs in the following way.

*'Where practicable, it is desirable that airspace routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks;'*

In our work to date, we have considered the current boundary of relevant AONBs & National Parks and have provided an initial appraisal of these areas as they currently stand within our Initial Options Appraisal. We commit to keep up to date with the review process these areas are currently undergoing and if the boundaries are changed because of this work, we will adapt our future assessment and appraisal of these areas to include any additional area covered under AONB status.

Kind regards

[REDACTED]

[REDACTED]  
Airspace Change Policy Manager

**Heathrow**

**From:** [REDACTED]  
**Sent:** 11 July 2023 09:24  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: [EXTERNAL] RE: Heathrow FASI and Surrey Hills AONB

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Dear [REDACTED],

Many thanks for your reply, that's useful to know that the review of the AONB will be accounted for.

Many thanks

[REDACTED]

[REDACTED]

**Principal Planning Policy Officer  
Mole Valley District Council**

**From:**

[REDACTED]

**Sent:**

11 July 2023 11:23

**To:**

DD - Airspace

**Subject:**

RE: WHO LOAEL

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

[REDACTED]

Thanks

[REDACTED]

[REDACTED]

Environmental Health, Reigate & Banstead Borough Council, Town Hall,  
Castlefield Road, Reigate, Surrey, RH2 0SH.

**From:** DD - Airspace  
**Sent:** 11 July 2023 15:46  
**To:** DD - Airspace; [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Hi [REDACTED]

We have heard from [REDACTED] that you are keen to have a follow up session with us regarding the latest round of engagement on the IOA technical work and shortlisting process.

Please let me know what dates you are available and we can arrange a session with you?

Many thanks,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**



**From:** [REDACTED]  
**Sent:** 11 July 2023 20:24  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Hi [REDACTED]

Thanks very much for getting in touch. I appreciate the team is exceptionally busy but if you could find some time to meet that would be very much appreciated.

I've got decent availability on 17th, 19th, 25th and 26th July if any of those dates work your end.

Kind regards

[REDACTED]

[REDACTED]  
Coordinator

**From:** DD - Airspace  
**Sent:** 12 July 2023 17:48  
**To:** [REDACTED]; DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Hi [REDACTED]

We'd be happy to meet with on Wednesday 19<sup>th</sup> July. We are flexible on timings so please let me know what time best suits you?

We will be available to meet at Compass Centre or we can set something up remotely on Teams if you'd prefer.

Kind regards,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**

**From:** [REDACTED]  
**Sent:** 12 July 2023 20:02  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Thanks [REDACTED]

Anytime between 10am and 2pm would work nicely.

Virtual would be my preference if that's ok.

Kind regards

[REDACTED]

[REDACTED]  
Coordinator

**From:**  
**Sent:**  
**To:**

12 July 2023 11:25

**Cc:**

**Subject:**

**Attachments:**

Heathrow Step 2B IOA Update Session Engagement Material  
Step 2B IOA\_Inform\_Engagement Material\_Final.pdf; Supplementary Metrics  
Dashboard Example\_Runway 27L PBN Dep Option A.pdf

Dear FLOPSC members,

We recently concluded our Step 2B Initial Options Appraisal update sessions with community and industry stakeholder groups. The engagement material is attached and includes:

- Appendix 1: A glossary of terms
- Appendix 2: The shortlisting outcome maps
- A copy of the supplementary metrics dashboard example shown on slide 19 for PBN Departures Option A from runway 27L for the day period.

We are open to receiving any comments or questions on our approach to the IOA and shortlisting of options. Please note that there will be ample opportunity to discuss and feedback on the specific geographical areas or potential impact of the flight path options during Stage 3.

If you have any questions or feedback on anything within the material, or difficulty in accessing the materials, please email us at: [airspace@heathrow.com](mailto:airspace@heathrow.com).

We will be in touch soon to provide you with an update on our Stage 2 Submission.

Kind regards,

**From:** DD - Airspace  
**Sent:** 13 July 2023 15:55  
**To:** [REDACTED]; DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Hi [REDACTED]

All Stage 2 material will be publicly available to view on the CAA's Airspace Change Portal after our submission at the end of this month. You are welcome to share the information you received from us as a representative of your group, however, given the complexity of the information it might be beneficial for those who are less involved to view all of the material on the portal to better understand the process and context of the work.

Kind regards,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**

**From:** DD - Airspace  
**Sent:** 13 July 2023 17:03  
**To:** [REDACTED]; DD - Airspace  
**Cc:**  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Hi [REDACTED]

No problem - I've set up a Teams call on Weds 19<sup>th</sup> 10.00-11.30.

Please let me know if you have any issues joining.

Kind regards,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**

**From:** [REDACTED]  
**Sent:** 13 July 2023 20:49  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Thanks [REDACTED], much appreciated.

Kind regards

[REDACTED]

[REDACTED]  
Coordinator

**From:** [REDACTED]  
**Sent:** 17 July 2023 08:30  
**To:** DD - Airspace  
**Cc:** DD - Airspace; [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Dear [REDACTED]

1. Thank you for your email of 7 July on the Step 2B Engagement Initial Options Appraisal presentations dated June/July 2023 and for providing the slides from the presentations and other supporting material.
2. We are pleased to see (Slide 23) that Richmond Park has been identified as a specific area that should be avoided where possible and that therefore the impact on Richmond Park is considered in deciding whether an option should be discontinued.
3. We agree that option I on 27R would impact Richmond Park significantly more than today and that it was appropriate for it to be discontinued.
4. We have not yet been provided with sufficient information to assess all the options being taken forward and the extent to which they would impact Richmond Park significantly more than today, but from what we have seen we foresee that there could be a number of other options that would impact Richmond Park significantly more than today.
5. Could you please confirm that all the relevant information we need will be included in the information to be uploaded shortly on the CAA portal?.
6. Separately:
  - please could you let us know if you have any comments on the Stakeholder Engagement Record we provided to you on 7 May; and
  - please could you provide us with any documents that support the approach to “do minimum” in Stage 2, for example, guidance from the CAA or your internal assessment.

Thank you.

Regards

[REDACTED]

[REDACTED]

Chairman, The Friends of Richmond Park  
[www.frp.org.uk](http://www.frp.org.uk)  
Friends of Richmond Park | Twitter, Instagram, YouTube | Linktree





**From:** [REDACTED]  
**Sent:** 17 July 2023 11:34  
**To:** DD - Airspace  
**Subject:** Re: Heathrow Step 2B IOA Update Session Engagement Material

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Hi [REDACTED]

I hope that you are well.

It has been a busy period, and I would just like to check by when you need our feedback.

Kind regards,

[REDACTED]

**From:** DD - Airspace  
**Sent:** 18 July 2023 11:55  
**To:** [REDACTED]; DD - Airspace  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Hi [REDACTED]

Thank you for your email and I hope you are well.

We are not formally asking stakeholders for feedback on the IOA Inform material, however we are always open to receiving any comments or feedback that you do have.

We are currently finalising all documentation for our submission next Friday (28<sup>th</sup> July), so if you would like us answer any of your questions and include your feedback in our submission, we'd appreciate receiving it by the end of this week if possible.

Kind regards,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**

IOA Engagement Session for Heathrow Association for the Control of Aircraft Noise (HACAN)

Wednesday 19 July 2023, 10:00 - 11:00, Online Microsoft Teams

Name	Organisation
[REDACTED]	Heathrow
[REDACTED]	Heathrow
[REDACTED]	Heathrow
[REDACTED]	HACAN

**From:** [REDACTED]  
**Sent:** 21 July 2023 10:48  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Stakeholder Engagement Record - HAL-TAG

**Caution: external email. Unless you recognise the sender and know the content is safe, do not click links or open attachments.**

Dear [REDACTED]

Thank you for your email and the SER with HR AM responses. We haven't had a chance to go through in detail yet but will do so shortly.

We are also in the process of going through the CAP 1616 Stage 2 Engagement and IOA documentation and will be responding on this as quickly as we are able.

Thank you for the offer of a meeting to discuss the IOA. We would like to take you up on this and believe it could be very helpful. Do you have any thoughts on timing of this?

Kind regards

[REDACTED]

**From:** [REDACTED]  
**Sent:** 25 July 2023 08:18  
**To:** [REDACTED]  
**Cc:** DD - Airspace  
**Subject:** Heathrow Stage 2 Shortlisted Options

Dear [REDACTED]

Thank you for continuing to take the time to engage with us on Heathrow's Airspace Change Proposal, including at the recent sessions where we talked through our proposed methodology and shortlisting for the Initial Options Appraisal as part of Step 2B.

Following the engagement sessions, and pre-submission of our Stage 2 documentation, we have been conducting a final internal review and sign-off of all our Stage 2 documentation. During this review, it was noted that the shortlisting approach applied to PBN Arrival Option 'I' to runway 27R was not entirely consistent with the approach taken to other PBN Arrival options.

As we explained in the sessions, we applied 6 'tests' to each option, founded on the altitude-based priorities set out in the government's Air Navigation Guidance 2017. In the sessions we proposed that Option 'I' would be discontinued on the basis of increased overflight of AONBs and Richmond Park (tests 4 and 5). However, on further review we have identified other options that have a similar level of overflight of both AONBs, and Richmond Park and we think it is more appropriate to address these local issues when we develop system options at the beginning of Stage 3. Our aspiration is that we will be able to refine some of these options to reduce the potential overflight and/or impacts over AONBs and Richmond Park.

We have therefore taken the difficult decision to reinstate Option 'I' and to include it in the shortlisted options. This is not a decision we have taken lightly, and we are aware of the disappointment this will cause; however, the CAA and other stakeholders will expect us to demonstrate consistency in our approach to the shortlisting of options.

We highly value the working relationship that [REDACTED] and the wider team have built with you over the past year and sincerely hope that we can continue to work closely with Friends of Richmond Park when developing system options based on our current shortlisted options. This work will take place over the coming months and, as we set out in the recent engagement material, we will be seeking to avoid impacts to Richmond Park as far as possible given it has been identified through community engagement as "a local circumstance".

To enable this I, as the ACP lead, commit to the following:

1. When compiling system options based on the current shortlisted options, we will seek to minimise impacts to Richmond Park and will engage closely with Friends of Richmond Park in this process.
2. This process will include an assessment of the overall viability and impacts of PBN Arrival options, including their impact on Richmond Park.
3. We will undertake a more detailed Biodiversity & Tranquillity assessment of Richmond Park, as set out in the latest Stakeholder Engagement Record (SER), commencing at the beginning of Stage 3 (likely September 2023). We will engage with you on both the proposed methodology and emerging findings of this work.

If you wish to discuss any of the matters outlined above, please do contact myself or [REDACTED] directly.

Kind regards,



Airspace Change Policy Manager

**Heathrow**

**From:** DD - Airspace  
**Sent:** 25 July 2023 09:53  
**To:** [REDACTED] DD - Airspace  
**Cc:** DD - Airspace; [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Dear [REDACTED]

Thank you for your email received last Monday. You will hopefully have seen the email today from [REDACTED] re the discontinuation of Option I. I'd like to add that I am sorry for any disappointment caused and please be assured that this decision has not been taken lightly. We look forward to working more closely with you as we begin work on compiling system options at Stage 3 and we remain hopeful that we can refine these options to further minimise impacts to the park.

All of the information on the options will be published on the CAA's Airspace Change Portal once we have submitted our Stage 2 documentation to the CAA. We will email you to let you know when it is there. The information includes dashboards for each option, including data for overflight of Richmond Park (total area of Richmond Park overflowed between 0-7000ft at least once per day on average). As discussed previously, we will be happy to compile a separate dashboard for you that summarises the options that might impact the park in one place.

I have provided below our rationale for not explicitly naming any of our options as a "do minimum" at this stage. Please do let us know if you have any questions or comments on it.

Many thanks,  
[REDACTED]

As part of the IOA, CAP1616 requires airspace change sponsors to set a baseline which is used for environmental evaluation of the options. A baseline's primary purpose is to enable stakeholders to understand the impact/effect of each option against the environment they currently experience. CAP1616 explains that this will be a 'Do Nothing', and sometimes a 'Do Minimum' scenario and will largely reflect the current-day environment, although taking due consideration of known or anticipated factors that might affect that baseline, for example a planned housing development close to an airport, forecast growth in air traffic, or expected changes in airlines' fleet mix.

CAP1616 also caters for a potential 'Do Minimum' scenario where "doing nothing is not a feasible option in reality", for example where airspace has to be changed to reflect the UK's international obligations. CAP1616 indicates that in such cases, in addition to the 'do nothing' baseline, the change sponsor must set out its informed view of the future and the minimum changes required to address the issues identified – a 'do minimum' option. Appendix C of CAP2492 provides further clarification and describes a Do Minimum option as: "the minimum changes necessary to address another requirement e.g. a legal obligation". There may be some legal obligations where a 'Do Minimum' option is applicable, for example to implement a single type of procedure or a requirement to 'implement PBN'. In the latter case, the 'Do Minimum' may be suitable to describe the option of PBN replication of existing, conventional SIDs. However, in the case of Airspace Modernisation, the requirement is not just to 'implement PBN' but is also to undertake a:

- complete redesign of the route network in busy terminal airspace to take account of advances in new technology, especially satellite navigation and alternative position navigation and timing systems for resilience, and to realise the potential for system design optimisation;
- re-design of airport arrival and departure routes at lower altitudes to allow flights to climb and descend continuously, improving CO<sub>2</sub> performance and better management of aircraft noise;

- review of airspace classifications in accordance with the published procedure, seeking to ensure that the amount of controlled airspace is the minimum required to maintain a high standard of air safety, and
- development of airspace structures and enabling technologies for the greater integration of piloted and remotely piloted operations.

In the case of Heathrow, whilst PBN replication of existing SID centrelines is one of the options, complete PBN replication of all existing arrival and departure flight paths between the ground and 7000ft is unlikely to deliver the benefits set out in the AMS and in Heathrow's Statement of Need. In the case of this ACP, Heathrow does not consider that a 'Do Minimum' option is feasible or appropriate to define at this stage and a 'Do Nothing' scenario provides for a suitable, existing baseline against which to compare design options. As part of the FOA in Stage 3, it may be possible to articulate which of the system options represents the minimum level of change to the baseline.



**From:** DD - Airspace  
**Sent:** 25 July 2023 17:11  
**To:** [REDACTED]; DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** RE: Stakeholder Engagement Record - HAL-TAG

Dear [REDACTED]

Thanks for confirming receipt of the SER.

I appreciate this is short notice, but [REDACTED] and I would be available to meet before NACF either at Compass Centre or The Academy on Thursday 27<sup>th</sup> July at 12:00? Please let us know if that would work for you?

Kind regards,

[REDACTED]

[REDACTED]  
Airspace & ATM Engagement Specialist

**Heathrow**

**From:** [REDACTED]  
**Sent:** 25 July 2023 19:58  
**To:** DD - Airspace  
**Cc:** [REDACTED]  
**Subject:** Re: Stakeholder Engagement Record - HAL-TAG  
**Attachments:** image001.png

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Hi [REDACTED]

Thank you for the offer but I think it would be beneficial to allow a little more time to go through the document thoroughly. We have been busy this week going through the Stage 2 Engagement and IOA presentation as well as preparing for the Respite deep dive on Thursday. Perhaps we can get a date in the diary when we meet on Thursday.

Kind regards

[REDACTED]

**From:** [REDACTED]  
**Sent:** 26 July 2023 15:07  
**To:** DD - Airspace  
**Cc:** DD - Airspace; DD - Airspace; [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

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[REDACTED]

Thank you for this email. We are considering this email and the one from [REDACTED]

Please could you let us know whether you are still working to the same timetable i.e. submission to the CAA Portal on 28 July with publication a couple of weeks later.

Thank you.

[REDACTED]

**From:** DD - Airspace  
**Sent:** 26 July 2023 15:24  
**To:** [REDACTED]; DD - Airspace  
**Cc:** DD - Airspace; DD - Airspace; [REDACTED]  
**Subject:** RE: Heathrow Step 2B IOA Update Session Engagement Material

Dear [REDACTED]

Yes we are submitting all Stage 2 work to the CAA on the 28<sup>th</sup> July and expect it to be publicly available on the CAA Portal within a couple weeks of this date.

Kind regards,  
[REDACTED]

June/July 2023



# Airspace Modernisation: Airspace Change Proposal Step 2B Engagement on Initial Options Appraisal

Heathrow



## **DISCLAIMER:**

**The information contained within this document does not constitute a formal company position and does not necessarily reflect a final view.**

**It is provided to you to facilitate discussions with Heathrow Airport on our developing proposals. The incomplete and preliminary nature of the information should be recognised when reviewing this material.**

**Heathrow Airport Limited will not accept or assume any responsibility or liability for the accuracy or correctness of the information or of any figures provided, or any assumptions that may be drawn from them. All route options shown are for discussion only.**

**This information is intended for your sole purpose, is confidential and should not be shared outside your organisation or with any third party without the express consent of Heathrow Airport Limited.**

**Heathrow will submit a formal submission that will be publicly available on the CAA Airspace Change Portal in 2023.**

All options and data in this document are subject to change throughout the airspace change process as options are matured in detail and refined in accordance with safety requirements, our Design Principles, our appraisals and stakeholder engagement and consultation.







# Workshop Agenda

1. Purpose of the workshop
2. Recap
3. Initial Options Appraisal:
  - a) CAP1616 Requirements
  - b) Heathrow's Approach to the IOA

**Break**

4. Heathrow's Approach to Shortlisting Options
5. The Shortlisted Options
6. Update on Respite Concepts
7. Next Steps

**Appendix: Glossary**

# PURPOSE OF THE STAKEHOLDER ENGAGEMENT SESSIONS

- Heathrow to explain the approach taken to the **Initial Options Appraisal (IOA)** and the shortlisting of options, summarising the results
- Heathrow to share a progress update on respite concepts
- Heathrow to answer any stakeholder questions on our approach to the IOA and the shortlisting of options

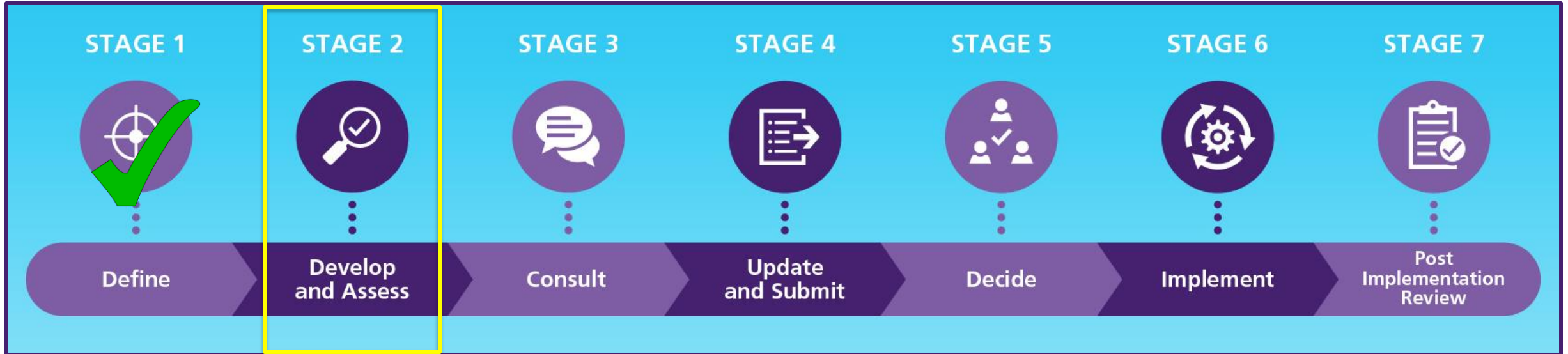


\*At today's session we do not intend to discuss in detail the previous ACP elements or the wider political/regulatory landscape



# WE ARE CURRENTLY AT STAGE 2 OF THE CAA'S CAP1616 AIRSPACE CHANGE PROCESS

## CAP1616 PROCESS OVERVIEW



## INDICATIVE TIMELINE\*



\*Timeline dependent upon ACOG Masterplan, and coordination with NATS and other airports' airspace change proposals

# HEATHROW'S DESIGN PRINCIPLES WERE APPROVED BY THE CAA AND USED IN STAGE 2 TO PRODUCE A LIST OF FLIGHT PATH OPTIONS

## CAP1616 Stage 1 Gateway Requirements

### DEFINE GATEWAY

In order for the CAA to sign-off the 'Define' gateway:

- the change sponsor must have produced a Statement of Need and the CAA has determined that an airspace change is an appropriate option to consider against the requirements in [Appendix A](#)
- the change sponsor must have met with the CAA to discuss the airspace change process (unless a meeting was not required) and demonstrated that it understands what will be required of it
- the CAA must have agreed the change sponsor's proposed timescales
- the change sponsor must have produced design principles
- the change sponsor must have explained to the CAA's satisfaction how the design principles were influenced through stakeholder engagement against the requirements in [Appendix D](#)
- the CAA must have accepted the process and approach used to develop the design principles against the requirements in [Appendix D](#)
- the CAA must have accepted the design principles as a well-founded shortlist of principles to inform the development of airspace design options

### Status

Complete

Complete

Complete













Complete

Complete

Complete

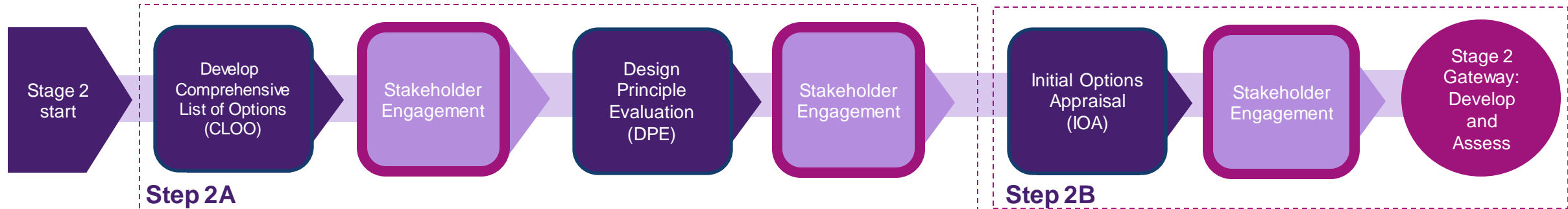
Stage 1 Gateway Passed Mar 22

### Our Design Principles for Airspace Modernisation:

1		Be safe	
2	Our new airspace design <b>must</b>	Remain in accordance with the CAA's published Airspace Modernisation Strategy and any current or future plans associated with it and all other relevant UK policy, legislation and regulatory standards (for example, Air Navigation Guidance). This includes preventing any worsening of local air quality due to emissions from Heathrow's aircraft movements, to remain within local authorities' limits	
3		Use noise efficient operational practices to limit and, where possible, reduce adverse impacts from aircraft noise	
4		Reduce the contribution to climate change from CO2 emissions and other greenhouse gas emissions arising from Heathrow's aircraft activities	
5		Enable Heathrow to make the most operationally efficient and resilient use of its existing two runways, to maximise benefits to the airport, airlines and cargo handlers, passengers, and local communities	
6		Provide predictable and meaningful respite to those affected by noise from Heathrow's movements	
7		Seek to avoid overflying the same communities with multiple routes including those to/from other airports	
8		Contribute to minimising the negative impacts of night flights	
9	And <b>should</b> also	Keep the number of people who experience an increase in noise from the future airspace design to a minimum	
10		Keep the total number of people who experience noise from the future airspace design to a minimum	
11		Enable the efficiency of other airspace users' operations	
12		Minimise the impact to all stakeholders from future changes to Heathrow's airspace	

There is no prioritisation of the principles beyond this grouping into "must" and "should"

# AT STAGE 2 WE ARE REQUIRED TO EVALUATE AND APPRAISE THE COMPREHENSIVE LIST OF OPTIONS



## CAP1616 Stage 2 Gateway Requirements

DEVELOP AND ASSESS GATEWAY	Status
In order for the CAA to sign-off the 'Develop and Assess' gateway:	<b>Complete</b>
<ul style="list-style-type: none"> <li>the change sponsor must have produced a comprehensive list of airspace change design options</li> </ul>	<b>Complete</b>
<ul style="list-style-type: none"> <li>the change sponsor must have engaged with relevant stakeholders to explore those options to the CAA's satisfaction against the requirements in <b>Appendix C</b></li> </ul>	<b>Complete</b>
<ul style="list-style-type: none"> <li>the change sponsor must have produced a design principle evaluation that the CAA has accepted, showing how its design options have responded to the design principles</li> </ul>	<b>Complete</b>
<ul style="list-style-type: none"> <li>the change sponsor must have produced an Initial options appraisal (phase I)</li> </ul>	<b>Complete</b>
<ul style="list-style-type: none"> <li>the CAA must have produced and then published an assessment that the options appraisal is satisfactory against the requirements in <b>Appendix E</b></li> </ul>	<b>Stage 2 Gateway August 2023</b>

We are here



# THE OPTIONS HAVE BEEN SPLIT INTO THREE SETS FOR ANALYSIS IN THE DPE AND IOA

At Stage 2, all options have been assessed per single runway operation, not as a complete system of westerly and easterly departures and arrivals to/from both runways. This allows us to consider many more options for a final solution.

**There are 181 options in total.** At Stage 3 we will develop "system options".

## PBN Departures

PBN departure options have been assessed as a collective group of six SIDs per Option, which need to be sufficiently separated from each other.



PBN Departure Option A for Runway 27L

## PBN Arrivals

PBN arrival options have been assessed as individual route options for operations between 04:30 and 06:00.

This enables us to consider whether it would be technically feasible and beneficial to use any one or more routes for arrivals during less busy times.



PBN Arrival Option A for Runway 27L

## Vectored Arrivals

Vectored arrival options have been **assessed in distance bands** (nautical miles) from the runway. The options assume a similar dispersion pattern to today, but with different Instrument Landing System (ILS) joining points.

This helps us determine whether it would be beneficial and/or feasible to use different vectoring areas during different periods to provide respite or relief from noise.



Vectored Arrival Option A for Runway 27L

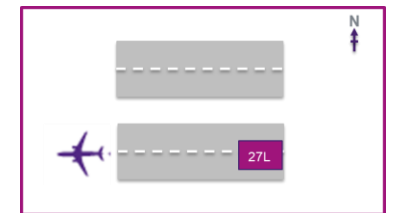
# THE DESIGN PRINCIPLE EVALUATION ASSESSED HOW WELL THE DESIGN OPTIONS ALIGN WITH THE DESIGN PRINCIPLES

- In Step 2A we carried out a Design Principle Evaluation (DPE), which is a high-level assessment of how the 181 options have performed against the Design Principles, as required by CAP1616
- The options were evaluated as **not met**, **partially met** or **met**. A Red, Amber, Green (RAG) assessment was used to illustrate the DPE results. Where assessment was not possible at this stage, the option was coloured Grey
- Many of the options emerged as **amber**, validating the need to carry out greater analysis of the options in the IOA to inform shortlisting

**DPE Results Summary for groups of departure options from the southern runway when on westerly operations (runway 27L)**

Design Principle	'Do Nothing'	Option A	Option B	Option C	Option D	Option E	Option F	Option G	Option H
1	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
2	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3	Red	Green	Green	Green	Green	Green	Green	Green	Green
4	Red	Red	Yellow	Green	Green	Red	Yellow	Red	Red
5	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow
6	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
7	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
8	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
9	Grey	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow
10	Grey	Green	Green	Yellow	Yellow	Green	Yellow	Green	Green
11	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
12	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow

Only the 12 "Do Nothing" options were discontinued based on the DPE results. We took 169 options into the next step.



27L = Aircraft departing the Southern runway to the west



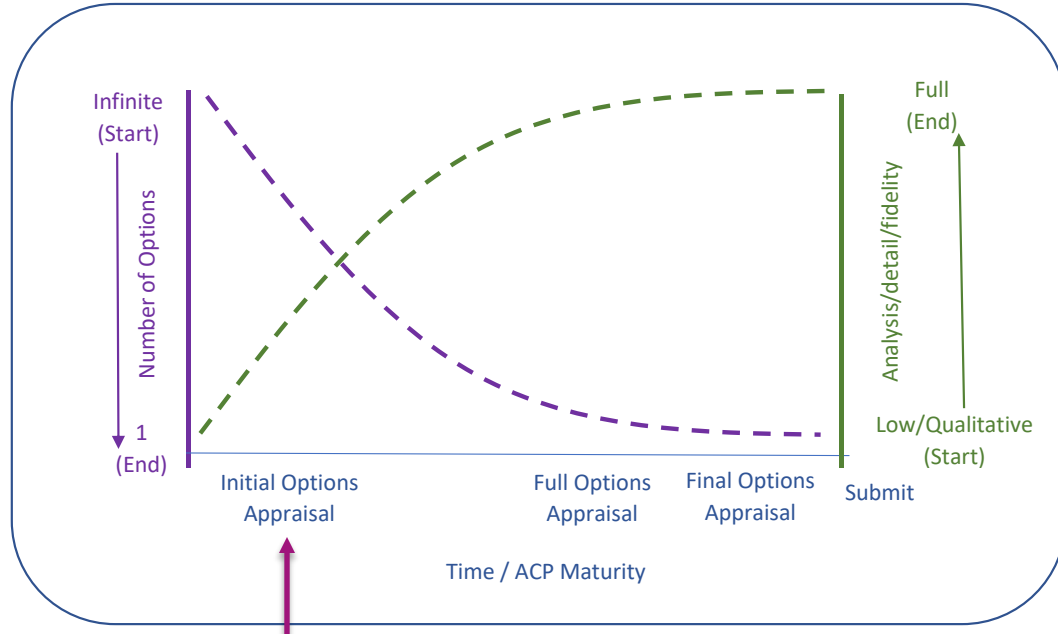
# IOA Approach

# CAP1616 REQUIRES THREE PHASES OF APPRAISAL THROUGHOUT AN ACP

The Initial Options Appraisal (IOA) is the first of three appraisal phases, and **the level of detail will increase as we move through the appraisal phases**

Step 2B: 'Initial' Options Appraisal:	Qualitative and/or quantitative assessment of longlist of options
Step 3A: 'Full' Options Appraisal:	Quantitative assessment of shortlist of options, shared at public consultation
Step 4A: 'Final' Options Appraisal:	Update based on any changes required following public consultation

CAP1616 phases of appraisal



**WE ARE HERE**

Our IOA includes both qualitative and quantitative assessment of PBN Departures, PBN Arrivals and Vectored Arrivals separately.

Later phases of appraisal will assess full system options (arrivals + departures on westerly and easterly operations)



# CAP1616 REQUIRES US TO UNDERTAKE AN INITIAL OPTIONS APPRAISAL (IOA) AT STEP 2B

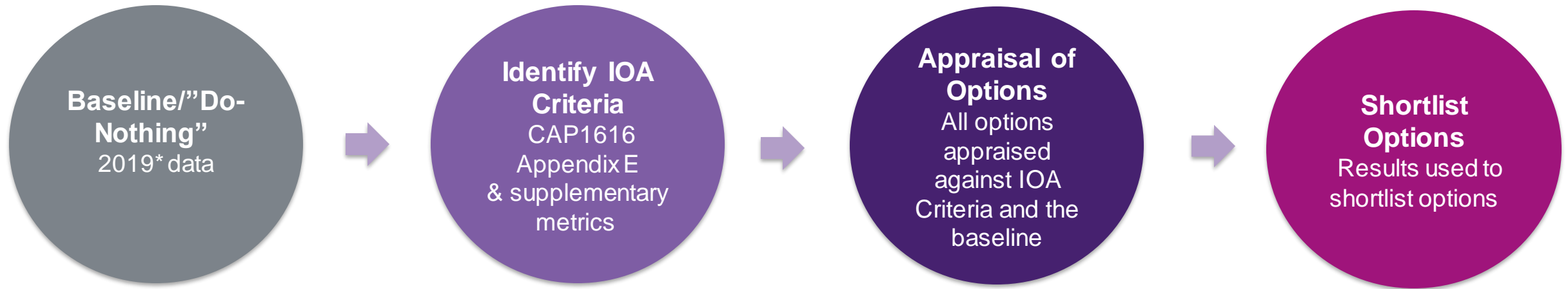
CAP1616 (Appendix E, E12) states: "*the Initial appraisal must contain the following, as a minimum:*

- *A comprehensive list of viable options. This must include the 'do nothing/minimum' option which will act as the baseline for the analysis. The baseline should be fully described. The list of options must also include:*
  - *a description of the change proposal*
  - *an indicator of the likely noise impacts*
  - *a high-level assessment of costs and benefits involved*
- *Criteria for assessing the list of options, and the application of those criteria to the list to develop the shortlist of options*
- *Shortlist options described qualitatively and an indication of the preferred option*
- *What evidence the change sponsor will collect, and how, to fill in its evidence gaps and to develop the Full appraisal."*

CAP1616 is not prescriptive. Other ACP sponsors have used a range of different approaches to assessment at Step 2B: **there is no single approach considered to be "best practice"**



# HEATHROW'S APPROACH TO THE IOA COMPARED ALL OPTIONS TO A 2019 BASELINE



\*2019 is a more suitable base year than 2020/2021/2022 due to the impacts of Covid-19

The IOA provides an initial assessment against our Comprehensive List of Options, which was created based on high-level assumptions; our options will be refined as we get more information on:

- Other airports' proposed airspace designs
- NATS' design for Heathrow's future arrivals mechanism ("holding stacks")

Our options will also evolve as we build system options (arrivals + departures together, easterly operations and westerly operations) and links into the wider airspace network in Stage 3

# THE CRITERIA IN THE IOA ARE BASED ON CAP1616 REQUIREMENTS

Criteria Group	Impact	Quantitative/ Qualitative	Source	Ref. on Appendix E Dashboards
Communities	Noise	Quantitative	CAP1616 Appendix E	A
	Air Quality	Qualitative	CAP1616 Appendix E	B
Wider Society	Greenhouse Gas Impact	Quantitative	CAP1616 Appendix E	C
	Tranquility	Quantitative	CAP1616 Appendix E	D
	Biodiversity	Quantitative	CAP1616 Appendix E	E
	Resilience	Qualitative	CAP1616 Appendix E	F
General Aviation	Access	Qualitative	CAP1616 Appendix E	G
General Aviation / Commercial Airlines	Economic Impact	Quantitative	CAP1616 Appendix E	H
	Fuel Burn	Quantitative	CAP1616 Appendix E	I
Commerical Airlines	Training Costs	Qualitative	CAP1616 Appendix E	J
	Other Costs	Quantitative	CAP1616 Appendix E	K
Airport / Air Navigation Service Provider	Infrastructure, Operational & Deployment Costs	Qualitative	CAP1616 Appendix E	L
All	Safety	Qualitative	CAP1616 Appendix E	M
ACOG Airspace Change Masterplan	Interdependencies, Conflicts & Trade-offs	Qualitative	Required by AMS	N
Airspace Modernisation Strategy (AMS)	Adherence to AMS	Qualitative	Required by AMS	O

# WE HAVE ALSO USED SUPPLEMENTARY METRICS TO HELP EXPLAIN THE POTENTIAL NOISE IMPACTS OF THE OPTIONS

Daytime period (07:00–23:00) / Night-time period (23:00–07:00)

Group	Quantitative/ Qualitative	Metrics and Approach	Ref. on Supplementary Metrics Dashboards
Overflight	Quantitative	Measures the average rate of overflight below 7000ft from 1-200 times per day and 1-5 times per night	P
Noise exposure contours	Quantitative	The noise exposure contours are based on daily average movements that take place in the 16 hour daytime period or 8 hour night-time period	Q
Aircraft noise events	Quantitative	<p><b>Day:</b> The "N65" measures the number of single aircraft noise events above a noise level of 65 decibels (dB)</p> <p><b>Night:</b> The "N60" measures the number of single aircraft noise events above a noise level of 60dB</p>	R
Noise exposure change	Quantitative	<p>Measures 1dB and 3dB changes in noise exposure for day and night periods.</p> <p><b>Beneficial change</b> = option results in a <b>reduction</b> in noise exposure of 1dB or more</p> <p><b>Adverse change</b> = option results in an <b>increase</b> in noise exposure of 1dB or more</p> <p><b>No change</b> = option results in changes to noise exposure of less than 1dB</p>	S

# IOA RESULTS WERE GENERATED FOR PBN DEPARTURE OPTIONS, PBN ARRIVAL OPTIONS AND VECTORED ARRIVAL OPTIONS

This dashboard summarises the IOA results for PBN Departure Option A from the southern runway when on westerly operations (runway 27L)


**CAP1616 - INITIAL OPTIONS APPRAISAL - APPENDIX E**

### PBN SIDs – RWY 27L Option A

**Option Description**  
This option was developed to address DP2.

**Communities – Noise impact on health & quality of life**

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA <sub>eq</sub> , 16h)	124,700	-50,100
Population above Partial LOAEL (night-time, LA <sub>eq</sub> , 8h)	21,800	-4,500
Population experiencing at least one event of N65 (daytime)	450,200	-238,800
Population experiencing at least one event of N60 (night-time)	183,100	-97,600



**Communities - Air Quality**

Introduction of PBN SIDs at Heathrow could affect track distribution below 1000ft within an AQMA. This may or may not have an effect on Air Quality. This is the same for all departure options and is not a differentiating factor at this stage. Any Air Quality impacts will be investigated at Full Options Appraisal (FOA).

**Wider Society – Greenhouse Gas Impact**

Metric	Option Value	Difference to Baseline
Overall Track Miles of the option (nm)	455	+3

**Wider Society – Tranquillity & Biodiversity**

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflowed between 0-7000ft once a day on average (daytime)	109km <sup>2</sup>	-184km <sup>2</sup>
Total Area of AONBs/NPs overflowed experiencing at least one event of N65 on average (daytime)	39km <sup>2</sup>	-11km <sup>2</sup>
Total Area of Richmond Park overflowed between 0-7000ft at least once a day on average (daytime)	0km <sup>2</sup>	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflowed between 0-1640ft which observe a potential change in location overflow	0	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflowed between 0-3000ft which observe a potential change in location overflow	4	+4

**Wider Society – Capacity/Resilience**

Expected to perform better than the 'Do Nothing' scenario owing to anticipated improved departure separations.

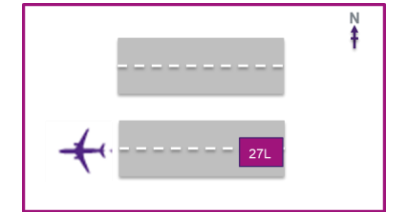
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

**General Aviation – Access**

No additional CAS envisaged.

Systemised SIDs requiring less tactical intervention and with improved CCO could facilitate release of portions of CAS.

Option not expected to impact existing helicopter routes.



27L = Aircraft departing the Southern runway to the west

A: Noise metrics – aircraft events and noise exposure

C: Track miles and carbon emissions metrics

E: Biodiversity metrics

F: Airport resilience statement

B: Air quality statement

D: Tranquillity metrics

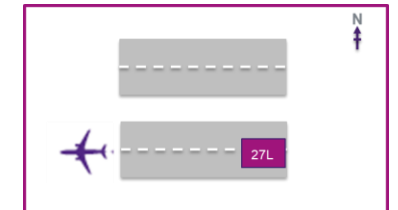
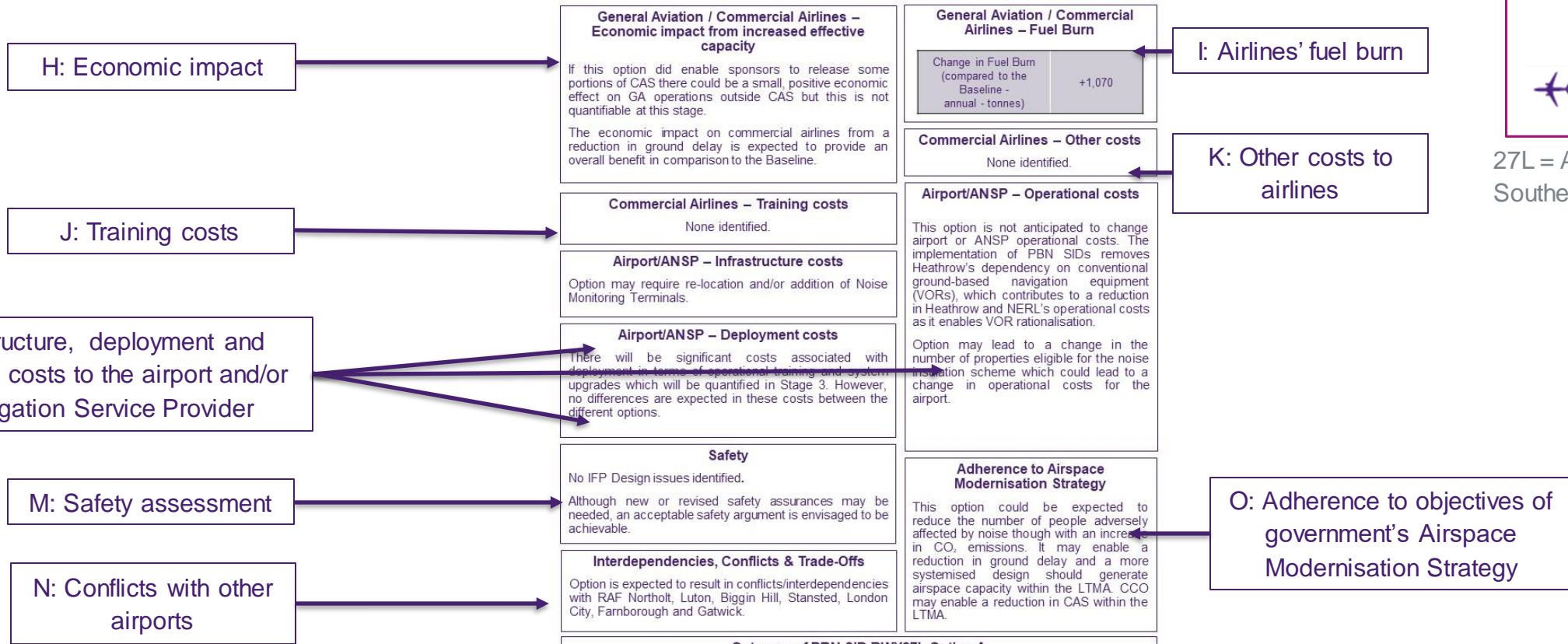
G: Airspace access statement

Options and data shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

# THE RESULTS PROVIDE AN INITIAL UNDERSTANDING OF HOW EACH OPTION PERFORMS COMPARED TO THE BASELINE

This dashboard summarises the IOA results for PBN Departure Option A from the southern runway when on westerly operations (runway 27L)

## CAP1616 - INITIAL OPTIONS APPRAISAL - APPENDIX E



27L = Aircraft departing the Southern runway to the west

Options and data shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

**Outcome of PBN SID RWY27L Option A**  
 We recognise the small increase in track miles flown, however this option significantly reduces noise exposure (both within the Partial LOAEL and outside) compared to the Baseline.  
**OPTION CARRIED FORWARD TO STAGE 3**



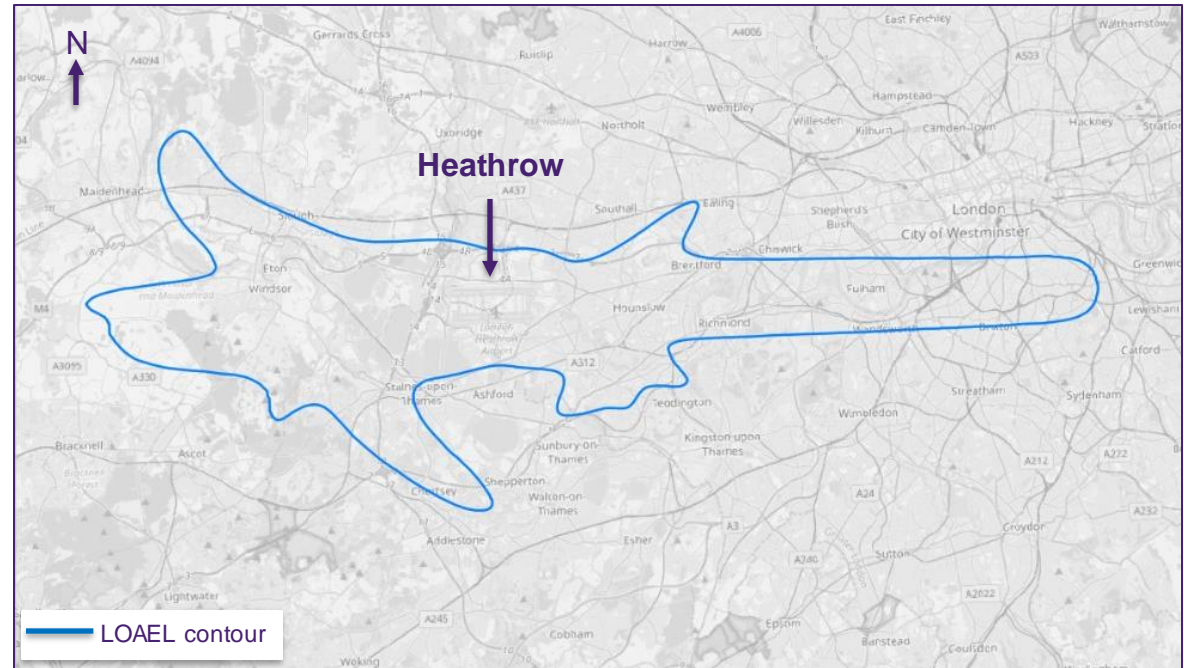
# THE IOA ASSESSES NOISE IMPACTS WITHIN THE LOAEL, AND FURTHER FROM THE AIRPORT AT THE REQUEST OF COMMUNITY STAKEHOLDERS

The **Lowest Observable Adverse Effect Level (LOAEL)** contour is defined in UK airspace policy and is used to evaluate the benefits and impacts of an airspace change. The LOAEL is “*the point at which adverse effects begin to be seen on a community basis*” Source: ANG17

The “**N65 metric**” accounts for the number of people who experience one single noise event of 65dB or more. N65 is defined in policy for daytime noise and a lower threshold of N60 is defined for night-time noise assessment.

We have also considered **World Health Organisation (WHO) guidance** on recommended maximum noise levels for sleep and education. This captures changes in noise exposure levels for communities situated beyond the LOAEL.

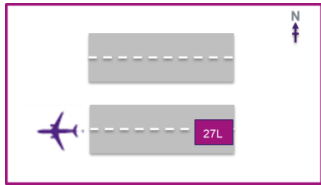
DAY	Threshold	NIGHT	Threshold
WHO	45 dB	WHO	40 dB
LOAEL	51 dB	LOAEL	45 dB



The 2019 LOAEL baseline contour for departures and arrivals from Heathrow

At this *initial* phase of appraisal, we have quantified the number of people adversely affected by an option using *partial* LOAEL contours. This is a simplified approach to that set out in government’s Transport Analysis Guidance (TAG). At Stage 3, when we have designed system options, we will create *full* LOAEL contours and use TAG to monetise the adverse impacts of aircraft noise for each option

# SUPPLEMENTARY METRICS ARE SHOWN ON ADDITIONAL DASHBOARDS, TO HELP ILLUSTRATE POTENTIAL NOISE IMPACTS



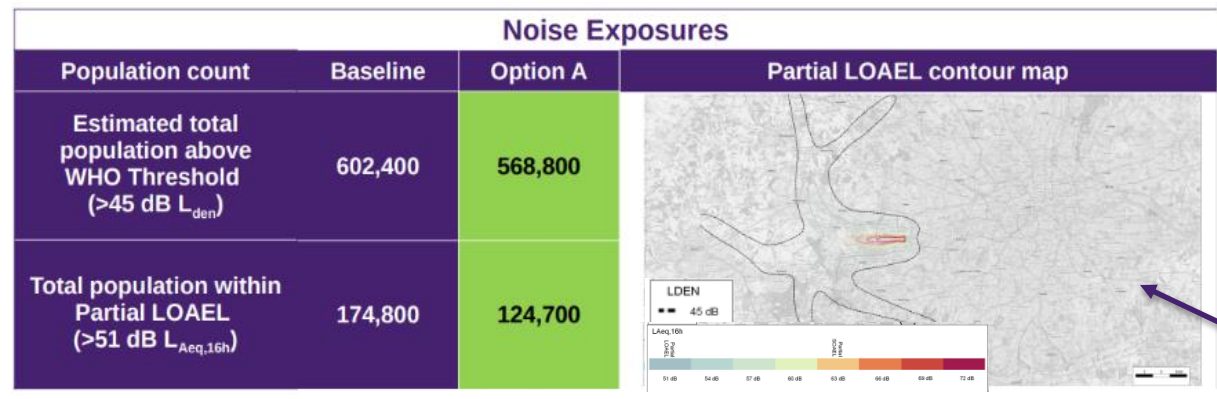
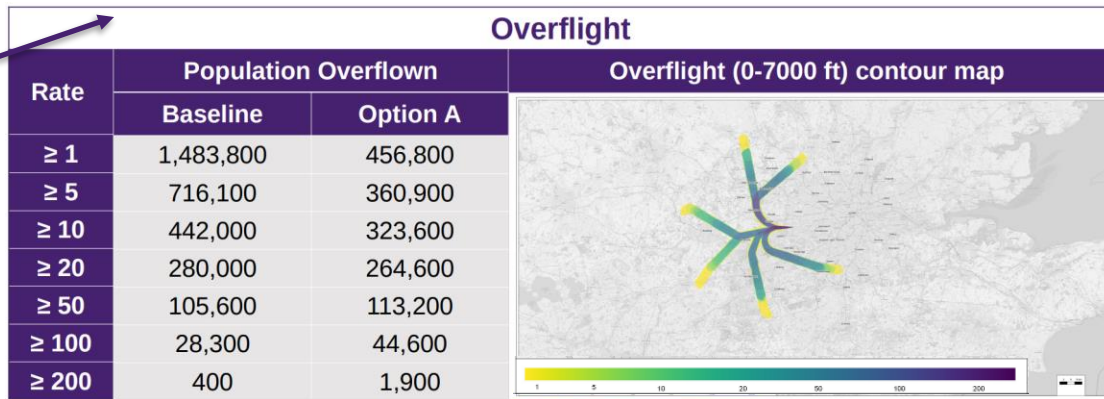
The dashboard below shows the supplementary metrics for PBN Departure Option A from runway 27L.



27L = Aircraft departing the Southern runway to the west

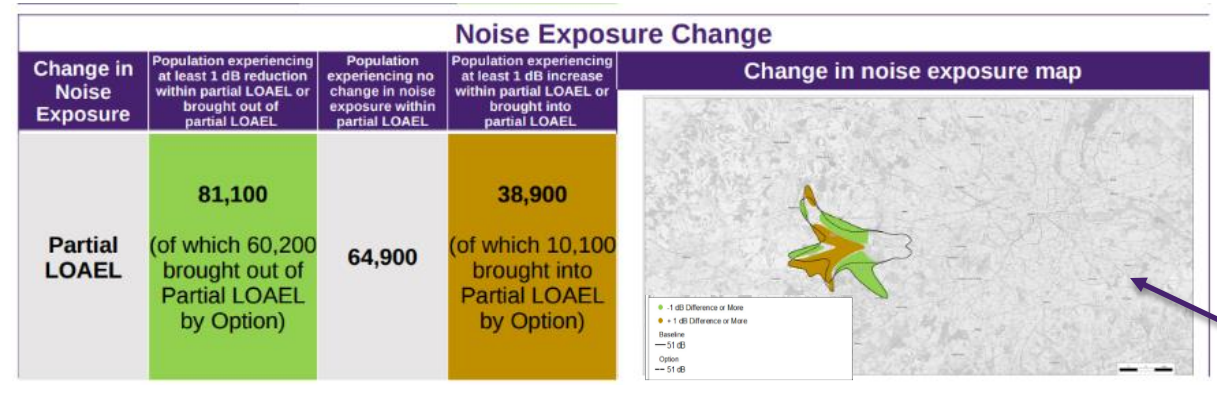
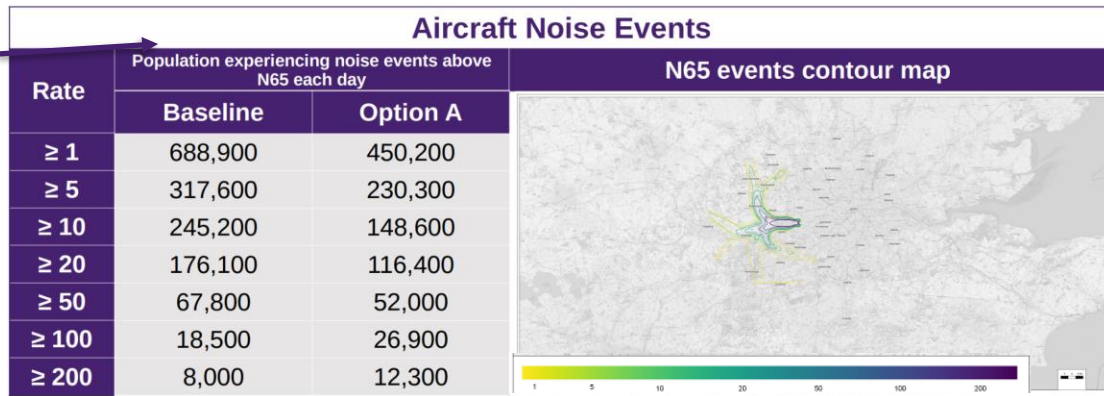
We have separate dashboards for day and night periods.

P



Q

R



S





# Shortlisting of Options



# HEATHROW'S SHORTLISTING OF OPTIONS AT THIS STAGE IS BASED ON KEY PRINCIPLES SET OUT IN GOVERNMENT POLICY

There is no methodology in CAP1616 for shortlisting options, however the guidance highlights the need for ACP sponsors to be transparent in their approach and decision-making.

**We have based our approach to shortlisting options on Appendix E in CAP1616 and on the government's Air Navigation Guidance (ANG17)**

ANG17 sets out government's key environmental objectives which are to:

- a) **limit and, where possible, reduce** the number of people in the UK **significantly affected by adverse impacts** from aircraft noise\*;
- b) ensure that the aviation sector makes a **significant and cost-effective contribution** towards **reducing global emissions**; and
- c) **minimise local air quality emissions** and in particular ensure that the UK complies with its international obligations on air quality.

\*In March 2023 the government published a revised overarching aviation noise policy statement: *"The impact of aviation noise must be mitigated as much as is practicable and realistic to do so, limiting, and where possible reducing, the total adverse impacts on health and quality of life from aviation noise"*. Source: [Overarching aviation noise policy](#), DfT, 27 March 2023

# OUR SHORTLISTING APPLIES GOVERNMENT'S ALTITUDE-BASED PRIORITIES

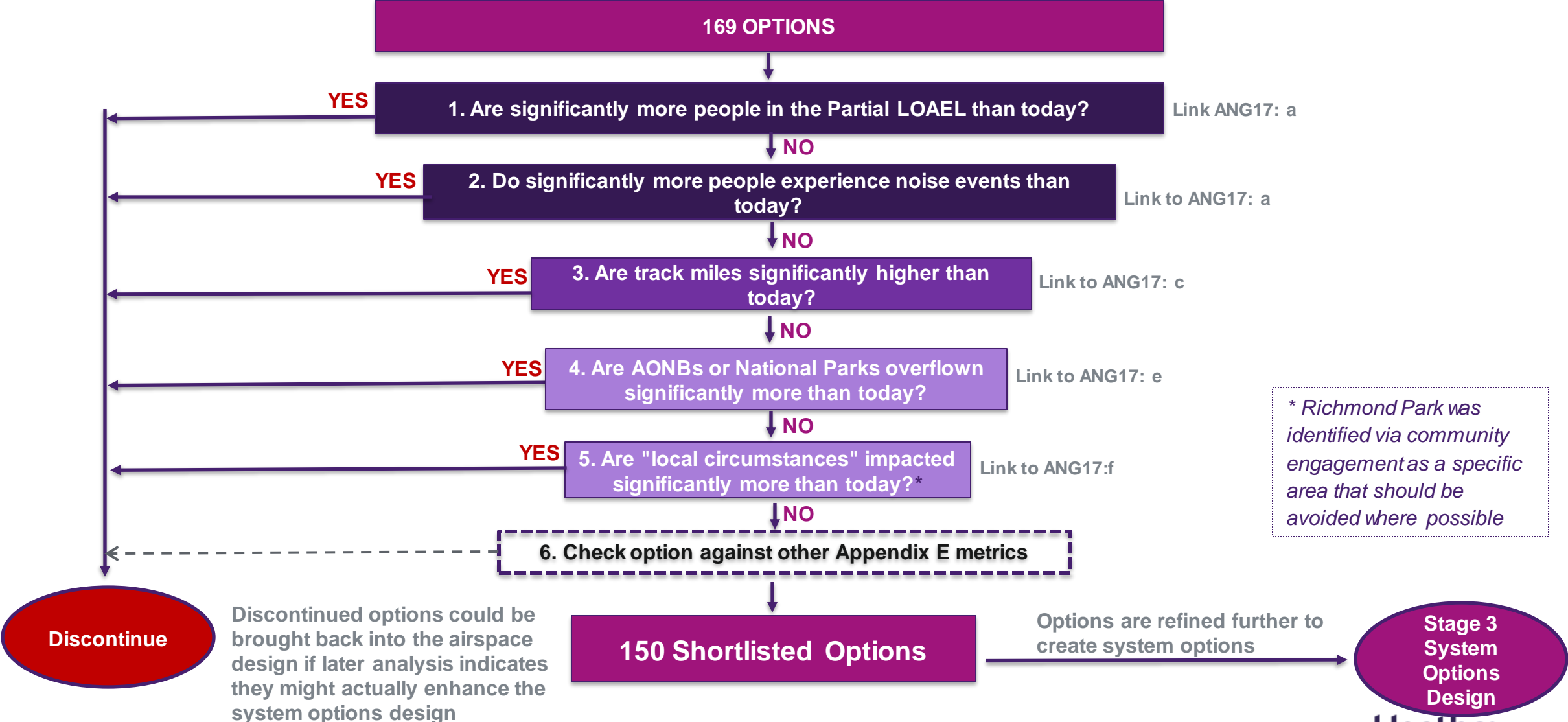
ANG17 sets out "altitude-based priorities" which should be considered when assessing the potential environmental impact of airspace changes. These priorities are intended to inform those responsible for considering and deciding permanent changes to the UK's airspace design.

Altitude-Based Priorities from Air Navigation Guidance 2017	Heathrow Approach at Step 2B
a. below 4,000 feet the priority is to limit and, where possible, reduce the total adverse effects on people;	<ol style="list-style-type: none"> <li>1. Are significantly more people in the partial LOAEL than today?*</li> <li>2. Do significantly more people experience noise events than today?</li> </ol>
b. where options are similar in terms of the number of people affected, preference should be given to that option which is most consistent with existing published airspace arrangements;	<i>This will be assessed at Stage 3 when we have a smaller number of system options and will be able to assess how different those options are to the existing airspace design</i>
c. above 4,000 feet to below 7,000 feet, the priority should continue to be minimising the impact of aviation noise, unless this would disproportionately increase CO2 emissions;	3. Are track miles significantly higher than today?
d. above 7,000 feet, the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority;	<i>n/a (our ACP only considers routes up to 7000ft)</i>
e. where practicable, routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks;	4. Are AONBs or National Parks overflown significantly more than today?
f. all changes below 7,000 feet should take into account local circumstances in the development of the airspace design and should not be agreed to before appropriate community engagement has been conducted.	5. Are "local circumstances" impacted significantly more than today? **

22 \* At Stage 3 we will be able to apply respite concepts to help further limit and reduce adverse effects on people

\*\* Richmond Park was identified via community engagement as a specific area that should be avoided where possible

# OUR SHORTLISTING APPROACH APPLIED A SIMPLE SET OF TESTS TO THE OPTIONS, RESULTING IN 19 OPTIONS BEING DISCONTINUED AT STAGE 2B




# CRITERIA FOR SHORTLISTING WERE TAKEN FROM THE IOA DASHBOARDS

**CAP1616 - INITIAL OPTIONS APPRAISAL - APPENDIX E**

**PBN SIDs – RWY 27L Option A**

**Option Description**  
This option was developed to address DP2.



**Communities – Noise impact on health & quality of life**

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA <sub>eq</sub> , 16h)	124,700	-50,100
Population above Partial LOAEL (night-time, LA <sub>eq</sub> , 8h)	21,800	-4,500
Population experiencing at least one event of N65 (daytime)	450,200	-238,800
Population experiencing at least one event of N60 (night-time)	183,100	-97,600

**Communities - Air Quality**

Introduction of PBN SIDs at Heathrow could affect track distribution below 1000ft within an AQMA. This may or may not have an effect on Air Quality. This is the same for all departure options and is not a differentiating factor at this stage. Any Air Quality impacts will be investigated at Full Options Appraisal (FOA).

**Wider Society – Greenhouse Gas Impact**

Metric	Option Value	Difference to Baseline
Overall Track Miles of the option (nm)	455	+3

**Wider Society – Tranquillity & Biodiversity**

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown between 0-7000ft once a day on average (daytime)	109km <sup>2</sup>	-184km <sup>2</sup>
Total Area of AONBs/NPs overflown experiencing at least one event of N65 on average (daytime)	39km <sup>2</sup>	-11km <sup>2</sup>
Total Area of Richmond Park overflown between 0-7000ft at least once a day on average (daytime)	0km <sup>2</sup>	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-1640ft which observe a potential change in location overflown	0	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-3000ft which observe a potential change in location overflown	4	+4

**Wider Society – Capacity/Resilience**

Expected to perform better than the 'Do Nothing' scenario owing to anticipated improved departure separations.

Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

**General Aviation – Access**

No additional CAS envisaged.

Systemised SIDs requiring less tactical intervention and with improved CCO could facilitate release of portions of CAS.

Option not expected to impact existing helicopter routes.

1. Are significantly more people in the Partial LOAEL than today?

2. Do significantly more people experience noise than today?

3. Are track miles significantly higher than today?

4. Are AONBs or National Parks overflown significantly more than today?

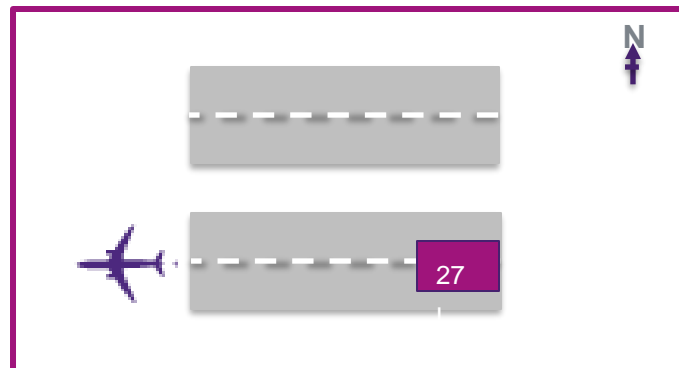
5. Is Richmond Park overflown significantly more than today?

6. Check option against other Appendix E metrics: Air quality, biodiversity and operational resilience

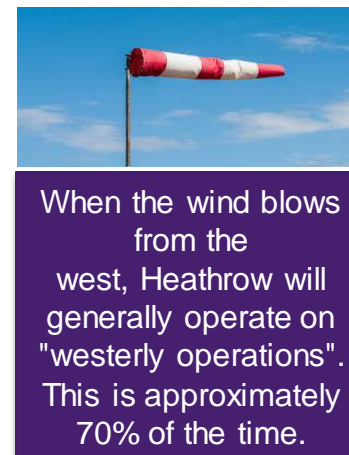
Options and data shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

# WE HAVE PRODUCED AN EXAMPLE TO DEMONSTRATE HOW THE SHORTLISTING METHODOLOGY HAS BEEN APPLIED

- We have applied the shortlisting methodology to each of the options for PBN arrivals and PBN departures to/from each runway end, producing 8 sets of results
- Vectored arrival options were assessed in the IOA but were not taken through the shortlisting process: all 44 vectored arrival options will be taken through to Stage 3 for further appraisal
- The following slides show a worked example of the shortlisting methodology for PBN departure options from runway 27L

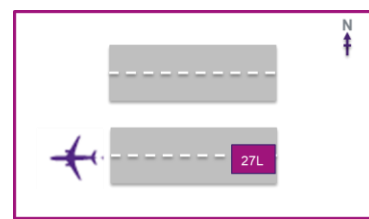


27L Departures = Aircraft departing the Southern runway to the west





# SHORTLISTING OF DEPARTURE OPTIONS FROM RUNWAY 27L



27L = Aircraft departing the Southern runway to the west

## 1. Are significantly more people in the Partial LOAEL than today?

Option	DP link	Pop above Partial LOAEL (daytime)	Difference to Baseline	Pop above Partial LOAEL (night time)	Difference to Baseline
Option E	DP9	120,100	-54,700	27,100	800
Option G	DP10	124,400	-50,400	21,700	-4,600
Option A	DP2	124,700	-50,100	21,800	-4,500
Option H	TPI	126,400	-48,400	28,200	1,900
Option B	DP2A	148,300	-26,500	26,500	200
Option F	DP9A	172,700	-2,100	29,400	3,100
Option C	DP4	173,300	-1,500	36,900	10,600
"Do Nothing"/ Baseline	n/a	174,800	0	26,300	0
Option D	DP5	205,300	30,500	29,600	3,300

Options shown in orange are those that are discontinued at this stage

Options C and D discontinued here as significantly more people are within the Partial LOAEL

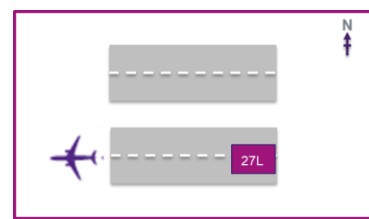
## 2. Do significantly more people experience noise events than today?

Option	DP link	Pop experiencing >1 N65 noise events/day (daytime)	Difference to Baseline	Pop experiencing >1 N60 noise events/day (night time)	Difference to Baseline
Option A	DP2	450,200	-238,700	183,100	-97,500
Option G	DP10	457,200	-231,700	183,000	-97,600
Option H	TPI	548,600	-140,300	227,700	-52,900
Option E	DP9	586,000	-102,900	222,700	-57,900
Option F	DP9A	683,500	-5,400	276,600	-4,000
"Do Nothing"/ Baseline	n/a	688,900	0	280,600	0
Option B	DP2A	769,900	81,000	252,300	-28,300
Option D	DP5	803,500	114,600	324,600	44,000
Option C	DP4	916,600	227,700	308,800	28,200

Option B is discontinued here as significantly more people experience N65 noise events during the day

Options that are discontinued continue in the flowchart in grey

# SHORTLISTING OF DEPARTURE OPTIONS FROM RUNWAY 27L



27L = Aircraft departing the Southern runway to the west

The best performing carbon options were discontinued based on previous noise tests, in line with ANG priorities. We will seek opportunities to reduce track miles when developing system options.

### 3. Are track miles significantly higher than today?

Option	DP link	Track miles	Difference to Baseline
Option C	DP4	433	-18
Option D	DP5	438	-13
Option B	DP2A	441	-10
Option F	DP9A	446	-5
Option E	DP9	450	-1
"Do Nothing"/ Baseline	n/a	451	0
Option H	TPI	452	1
Option A	DP2	455	4
Option G	DP10	455	4

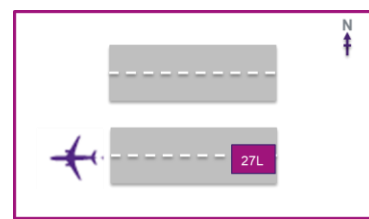
No options discontinued since there is minimal difference between the options

### 4. Are AONBs or National Parks overflowed significantly more than today?

Option	DP link	Total Area overflowed (km <sup>2</sup> ) >1 time/day on average	Difference to Baseline
Option H	TPI	79	-214
Option B	DP2A	85	-208
Option F	DP9A	88	-205
Option E	DP9	103	-190
Option C	DP4	106	-186
Option A	DP2	109	-184
Option G	DP10	112	-181
Option D	DP5	117	-175
"Do Nothing"/ Baseline	n/a	293	0

All options perform better than the baseline for this test: no options discontinued

# SHORTLISTING OF DEPARTURE OPTIONS FROM RUNWAY 27L



27L = Aircraft departing the Southern runway to the west

## 5. Are “local circumstances” impacted significantly more than today?

Option	DP link	Total Area of Richmond Park overflow (km <sup>2</sup> )	
		1x/day	Difference to Baseline
"Do Nothing"/ Baseline	n/a	0	N/A
Option A	DP2	0	N/A
Option B	DP2A	0	N/A
Option C	DP4	0	N/A
Option D	DP5	0	N/A
Option E	DP9	0	N/A
Option F	DP9A	0	N/A
Option G	DP10	0	N/A
Option H	TPI	0	N/A

No departure options from runway 27L overfly Richmond Park

## 6. Check option against other Appendix E metrics

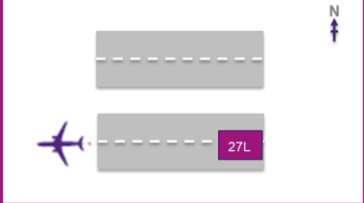
Option	DP link	Is AQ affected below 1000ft?	Do significantly more biodiversity sites experience a potential change in overflight?	Is the airport's operational resilience impacted?	Summary
		a	b	c	
"Do Nothing"/ Baseline	n/a	-	-	-	-
Option A	DP2	N	N	N	N
Option B	DP2A	N	N	N	N
Option C	DP4	N	N	N	N
Option D	DP5	N	N	N	N
Option E	DP9	N	N	N	N
Option F	DP9A	N	N	N	N
Option G	DP10	N	N	N	N
Option H	TPI	N	N	N	N

No additional options discontinued based on the “other Appendix E metrics check”



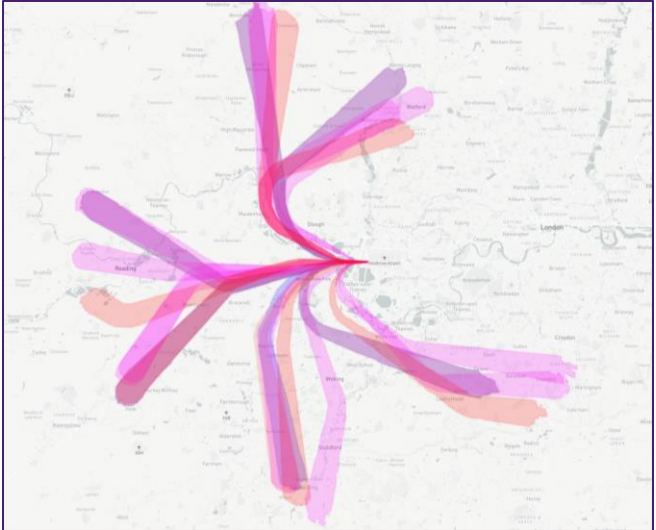
# IOA SHORTLISTING OUTCOME: 27L PBN DEPARTURES

27L = Aircraft departing the Southern runway to the west

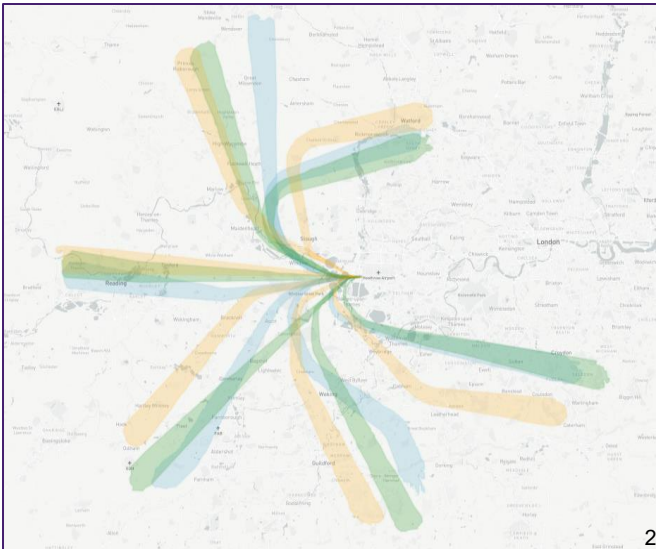


Option	DP Link	Shortlisting Rationale
A	DP2	Significantly reduces noise exposure (both within the Partial LOAEL and outside) compared to today, but has greater track miles
E	DP9	Reduces noise exposure (both within the daytime Partial LOAEL and outside) compared to today
F	DP9A	Reduces noise exposure (both within the daytime Partial LOAEL and outside) compared to today
G	DP10	Significantly reduces noise exposure (within the Partial LOAEL and outside), but has greater track miles
H	Blended DPs	Reduces noise exposure (both within the Partial LOAEL and outside) compared to today

Option	DP Link	Discontinuation Rationale
B	DP2A	Over 10% more people would experience noise events during the day
C	DP4	Population within the Partial LOAEL for night would be 40% higher than today
D	DP5	Population within the Partial LOAEL for daytime would be nearly 20% higher than today



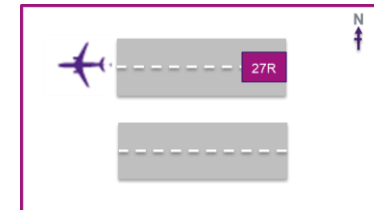
Shortlisted 27L Options A, E, F, G & H



Discontinued 27L Options B, C & D

# IOA SHORTLISTING OUTCOME: 27R PBN DEPARTURES

27R = Aircraft departing the Northern runway to the west

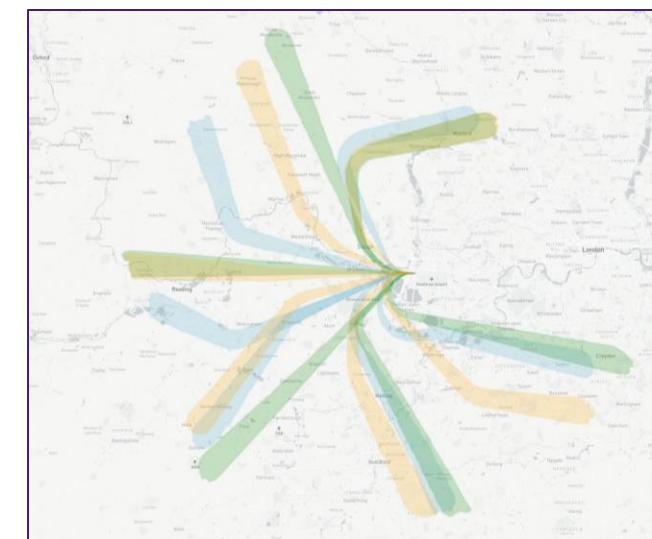


Option	DP Link	Shortlisting Rationale
A	DP2	Performs well for noise metrics, reducing the size of the population within the Partial LOAEL in the daytime by almost half compared to today
E	DP9	Option performs similar to today in terms of noise metrics
F	DP9A	Option performs similar to today in terms of noise metrics
G	DP10	Reduces noise exposure (both within the daytime LOAEL and outside) compared to today
H	Blended DPs	Reduces noise exposure (both within the daytime LOAEL and outside) compared to today



Shortlisted 27R Options A, E, F, G & H

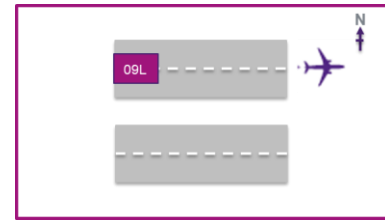
Option	DP Link	Discontinuation Rationale
B	DP2A	Population within the Partial LOAEL for night is more than twice as large as today
C	DP4	Population within the Partial LOAEL for night is twice as large as today
D	DP5	Population within the Partial LOAEL for night is more than twice as large as today



Discontinued 27R Options B, C & D

# IOA SHORTLISTING OUTCOME: 09L PBN DEPARTURES

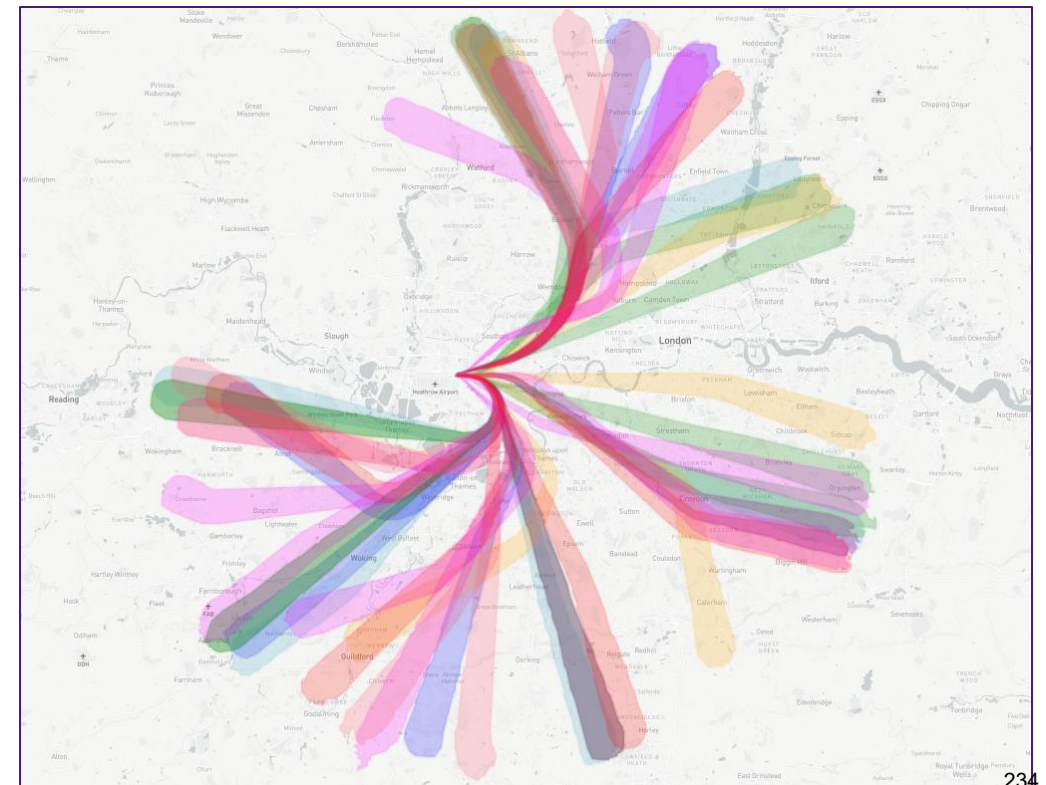
09L = Aircraft departing the Northern runway to the east



Runway 09L is not generally used for departures today, due to the legacy of the Cranford Agreement. All departure options from this runway therefore perform worse than the baseline.

We have not discontinued any of these options and will investigate the likely impacts of them at Stage 3, in collaboration with Heathrow's project to introduce Easterly Alternation.

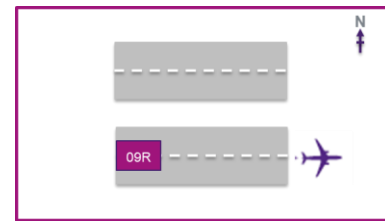
Option	DP Link	Shortlisting Rationale
A	DP2	N/A
B	DP2A	N/A
C	DP4	N/A
D	DP4A	N/A
E	DP5	N/A
F	DP9	N/A
G	DP9A	N/A
H	DP10	N/A
I	Blended DPs	N/A
J	Avoid RP	N/A



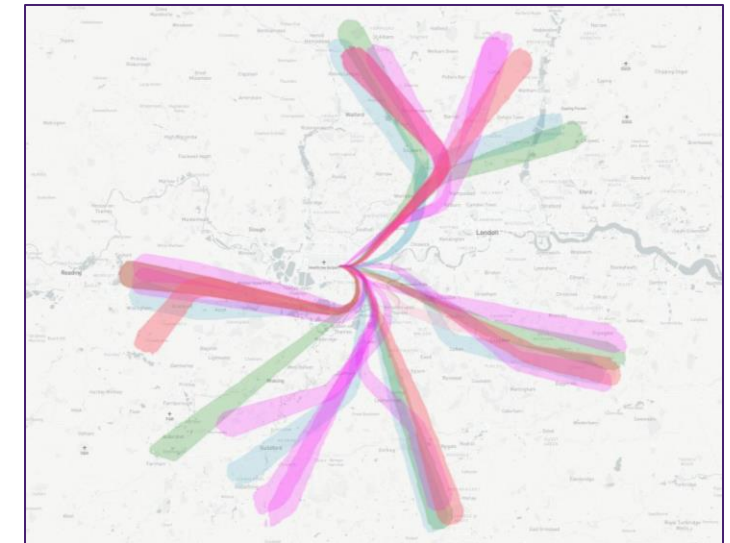
Shortlisted 09L Options A - J

# IOA SHORTLISTING OUTCOME: 09R PBN DEPARTURES

09R = Aircraft departing the Southern runway to the east

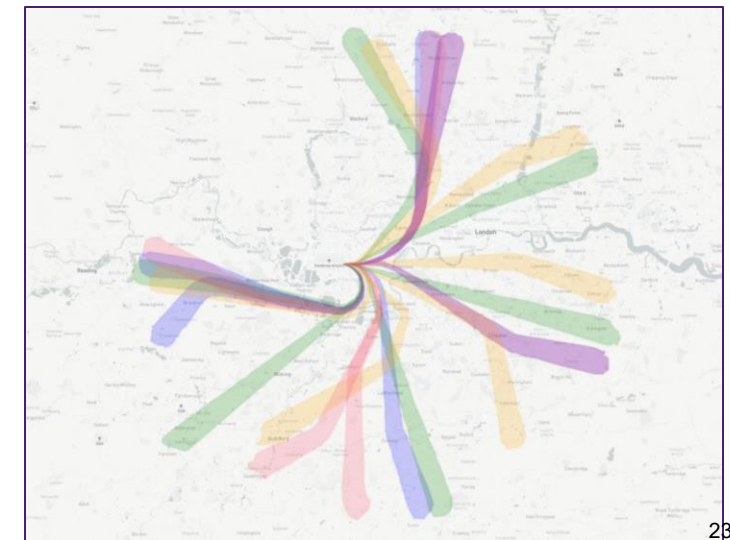


Option	DP Link	Shortlisting Rationale
B	DP2A	Option performs similar to today in terms of noise metrics
C	DP4	Option performs similar to today in terms of noise metrics
F	DP9	Option performs similar to today in terms of noise metrics
G	DP9A	Option performs similar to today in terms of noise metrics
I	Blended DPs	Option performs similar to today in terms of noise metrics
J	Avoid RP	Option performs similar to today in terms of noise metrics



Shortlisted 09R Options B, C, F, G, I & J

Option	DP Link	Discontinuation Rationale
A	DP2	Population within the Partial LOAEL for night is more than 50% larger than today
D	DP4A	Over 20% increase in the number of people experiencing noise events during the day
E	DP5	Significant increase in the number of people experiencing noise events: 40% increase for day and 15% increase for night
H	DP10	Population within the Partial LOAEL for night is 50% larger than today

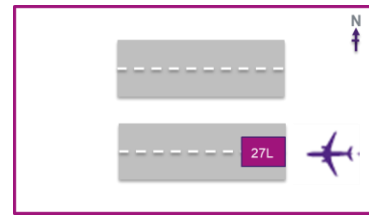


Discontinued 09R Options A, D, E & H

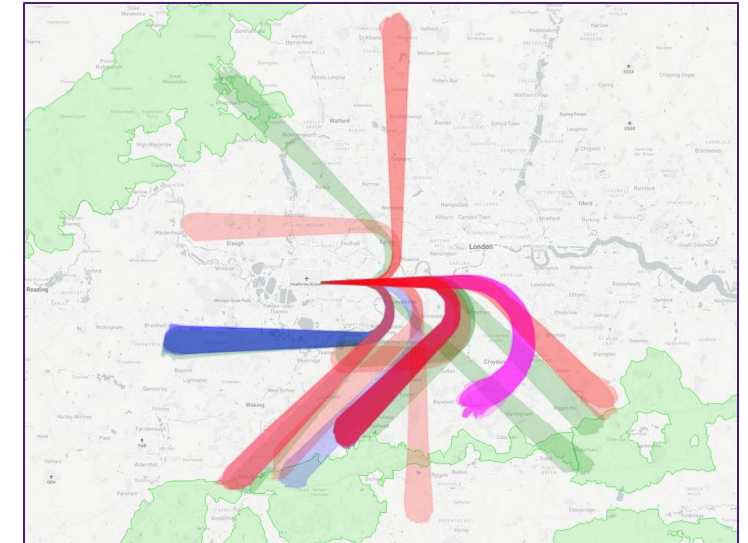


# IOA SHORTLISTING OUTCOME: 27L PBN ARRIVALS

27L = Aircraft approaching the Southern runway from the east

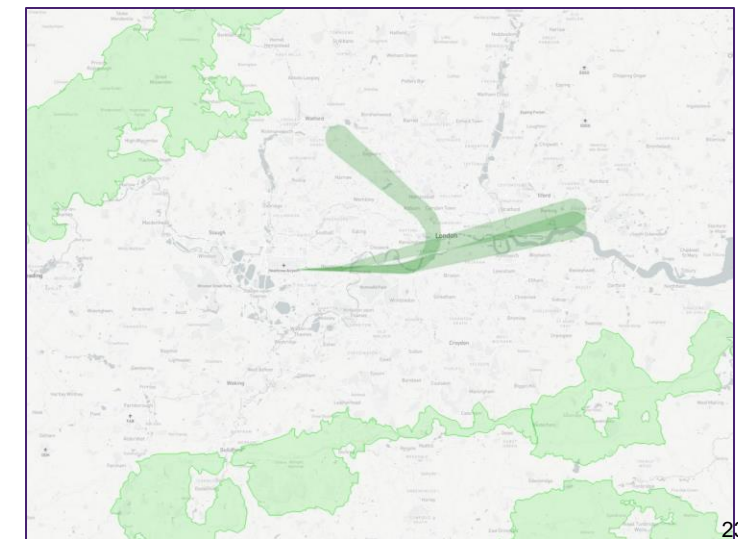


Options	DP Link	Shortlisting Rationale
A, B & C	DP2	Options perform better than the baseline for noise metrics
D, E, F, G, H, L, M	DP4	Options perform better than the baseline for noise metrics
N	DP9	Option performs slightly better than the baseline for noise metrics
O & P	DP10	Options perform better than the baseline for noise metrics
Q, R, S, T, U, V, W	Blended DPs	Options perform better than the baseline for noise metrics



Shortlisted 27L Options A-H & L-W

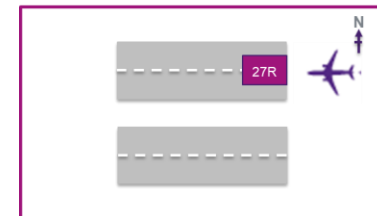
Option	DP Link	Discontinuation Rationale
I	DP4	More than 10% increase in population within Partial LOAEL
J	DP4	10% increase in population within Partial LOAEL
K	DP4	Nearly 20% increase in number of people experiencing noise events



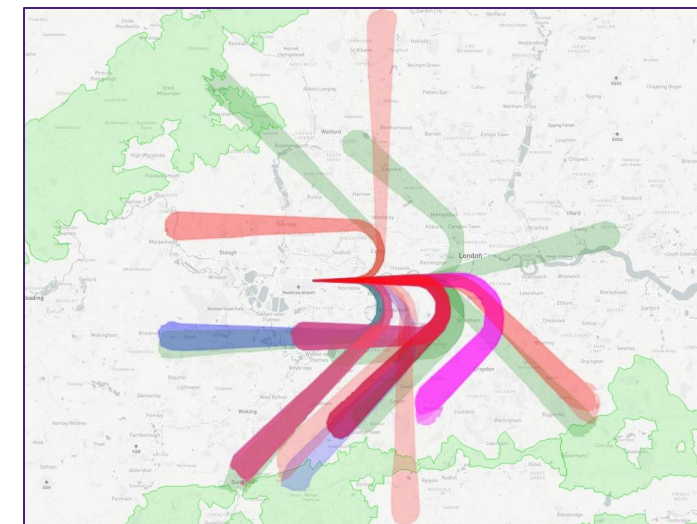
Discontinued 27L Options I, J & K

# IOA SHORTLISTING OUTCOME: 27R PBN ARRIVALS

27R = Aircraft approaching the Northern runway from the east

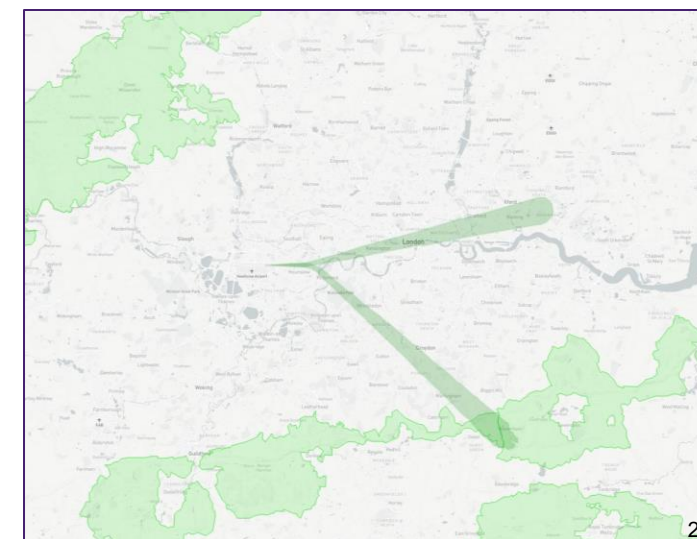


Options	DP Link	Shortlisting Rationale
A, B, C, D & E	DP2	Options perform better than the baseline for noise metrics
F, G, H, J, K, M, N & O	DP4	Most options perform better than the baseline for noise metrics. Options K and M have a small increase in number of people experiencing noise events
P	DP9	Option performs similar to today in terms of noise metrics
Q & R	DP10	Options perform better than the baseline for noise metrics
S, T, U, V, W & X	Blended DPs	Options perform better than the baseline for noise metrics



Shortlisted 27R Options A-H, J-K & M-X

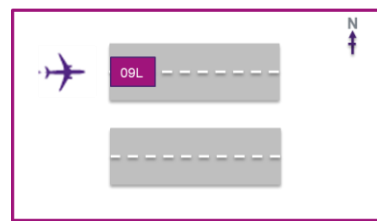
Option	DP Link	Discontinuation Rationale
I	DP4	Option would result in significant increase in overflight of AONBs and Richmond Park
L	DP4	Nearly 20% more people would experience noise events



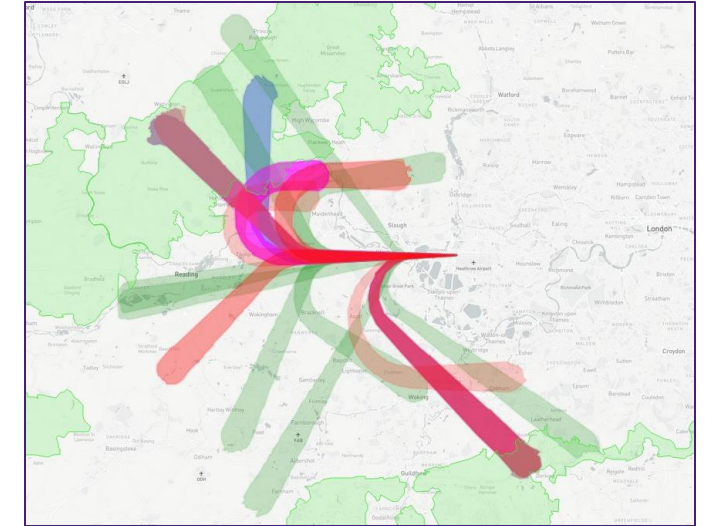
Discontinued 27R Options I & L

# IOA SHORTLISTING OUTCOME: 09L PBN ARRIVALS

09L = Aircraft approaching the Northern runway from the west

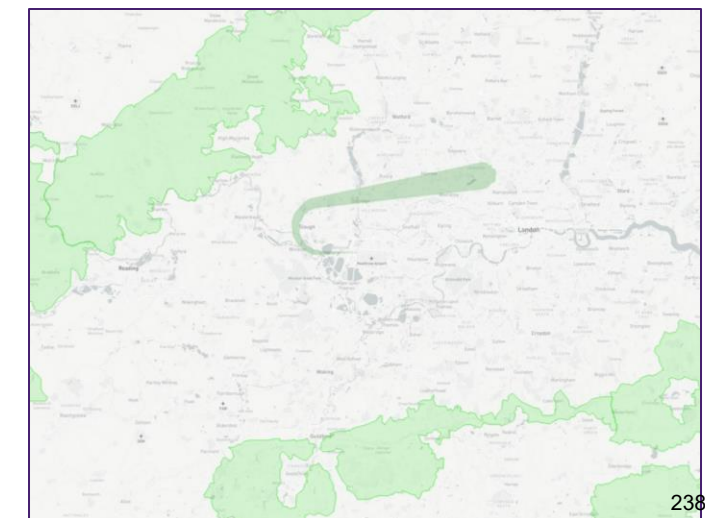


Options	DP Link	Shortlisting Rationale
A, B & C	DP2	Options reduce noise exposure within the Partial LOAEL but increase number of people experiencing noise events
D, E, F, G, H, I, K, L, M	DP4	Options reduce noise exposure within the Partial LOAEL but increase number of people experiencing noise events
N	DP9	Options reduce noise exposure within the Partial LOAEL but increase number of people experiencing noise events
O & P	DP10	Options reduce noise exposure within the Partial LOAEL but increase number of people experiencing noise events
Q, R, S, T, U	Blended DPs	Options reduce noise exposure within the Partial LOAEL but increase number of people experiencing noise events



Shortlisted 09L Options A-I & K-U

Option	DP Link	Discontinuation Rationale
J	DP4	Significant increase in the number of people experiencing noise events (8 times as many people as today)

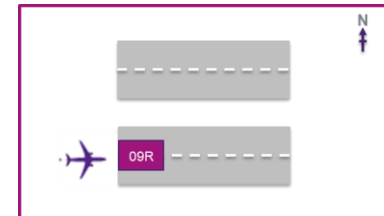


Discontinued 09L Option J



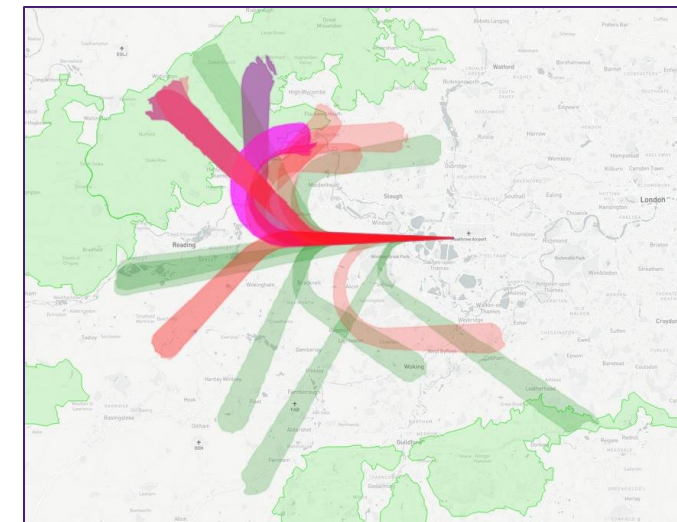
# IOA SHORTLISTING OUTCOME: 09R PBN ARRIVALS

09R = Aircraft approaching the Southern runway from the west



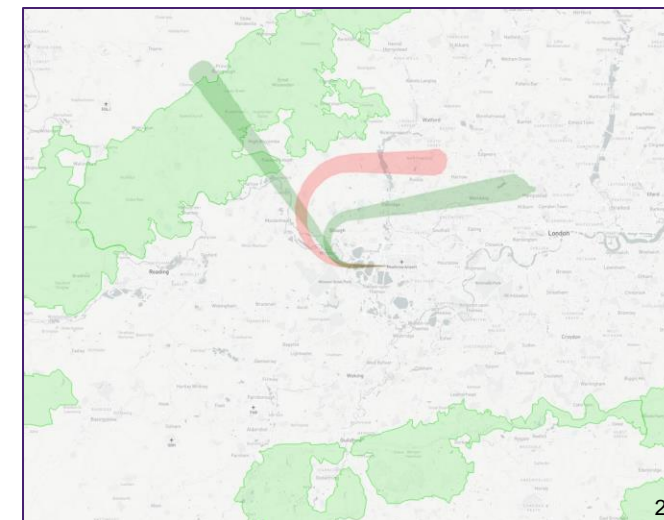
Runway 09R is not generally used for arrivals today, due to the legacy of the Cranford Agreement.

Options	DP Link	Shortlisting Rationale
A & B	DP2	All 09R options perform worse than the baseline for noise metrics, since this runway is not routinely used for arriving aircraft today
C, D, E, F, G, H, J & L	DP4	
M	DP9	
N & O	DP10	
P, Q, S, T, U	Blended DPs	



Shortlisted 09R Options A-H, J, L-Q & S-U

Option	DP Link	Discontinuation Rationale
I	DP4	Population within Partial LOAEL would be over 5 times larger than today
K	DP4	Population within Partial LOAEL would be nearly 5 times larger than today
R	Blended DPs	Population within Partial LOAEL would be 4 times larger than today



Discontinued 09R Options I, K & R





# Respite Concepts Update



# WE HAVE APPLIED SOME SENSITIVITY TESTING TO THE OPTIONS TO ASSESS OUR RESPITE CONCEPTS

We tested four concepts to understand the potential to provide relief or respite from aircraft noise to overflowed areas.

“Valued”	$L_{Aeq}$ differences between modes of operation are greater than 9dB
“Noticeable”	$L_{Aeq}$ differences between modes of operation are between 4-9dB
“Worth Having”	$L_{Aeq}$ differences between modes of operation are less than 4dB

$L_{Aeq}$  means ‘equivalent continuous noise level’

Source: Anderson Acoustics, 2023

## Relief via dispersion of aircraft

**Test:** To combine three PBN routes within one future Noise Preferential Route (NPR). The test assumes that three departure routes could be used sequentially to create the effect of dispersing aircraft across an NPR.

**Initial Findings:** Produced limited differences in the pattern of noise exposure, particularly for those further away from the airport.

## Respite via runway alternation

**Test:** To keep routes from the two runways separate for longer after departing from the runway. Currently routes leaving the northern and southern runway tend to converge shortly after departure, meaning the same communities are overflowed by multiple routes.

**Initial Findings:** Potential to create “noticeable” respite in areas within the LOAEL and further away from the airport. More people would be overflowed but less frequently.

## Respite via route alternation

**Test:** To alternate between two departure designs at different times of day. This would help inform whether we should consider adding extra respite routes to certain departure options

**Initial Findings:** Potential to create “valued” or “noticeable” respite in areas overflowed. This most valued respite is likely to occur in locations further from the airport.

# ALL FOUR RESPITE CONCEPTS WILL BE ASSESSED AND DEVELOPED FURTHER AT STAGE 3, ONCE WE HAVE SYSTEM OPTIONS

## Respite via alternation of vectored arrivals

**Test:** To alternate the point at which vectored arrivals join final approach to determine whether it would be beneficial and/or feasible to use different vectoring areas during different periods to provide respite or relief from noise.

This concept would be used in combination with runway alternation.

**Initial Findings:** Potential to provide large areas of “valued” respite within and beyond the LOAEL, in locations where vectored arrivals are separated

The four respite concepts will be applied to the system options designs at Stage 3 to further develop our understanding of the potential to deliver relief or respite from noise

Once we have system options that combine arrivals and departures, for easterly and westerly operations, we will be able to better test the different concepts for providing predictable and meaningful respite from noise. At this stage we will also be able to seek to avoid overflying the same communities with multiple routes.





# Next Steps

# THANK YOU FOR YOUR ENGAGEMENT

All Stage 2 work, including evidence of engagement with stakeholders, is expected to be submitted to the CAA on 28 July and published on the Airspace Change Portal: <https://airspacechange.caa.co.uk/>

We will provide you with a copy of this presentation after completion of the engagement sessions


As always, we are open to receiving comments and questions on the material shared today. Please email any feedback to: [airspace@heathrow.com](mailto:airspace@heathrow.com)

We will be in touch to let you know when the Heathrow Stage 2 Submission is publicly available on the CAA Airspace Change Portal. We will communicate the outcome of the Stage 2 Gateway in due course, and our plans for continued engagement with you as we begin Stage 3

**We welcome your comments and questions on our approach to the IOA and to the shortlisting of options**

**Detailed discussion on specific geographical areas or potential impacts of the flight path options will take place at Stage 3 once we have designed system options and have more information to share**





# Appendix 1 – Glossary



# GLOSSARY

Term	Description
ACP Sponsor	An organisation that proposes, or sponsors, a change to the airspace design in accordance with the CAA's airspace change process. Heathrow is the sponsor of this airspace change.
Airspace Change Organising Group (ACOG)	<a href="#">ACOG</a> was established in 2019 at the request of the DfT and CAA to coordinate the delivery of key elements of the UK's Airspace Modernisation Strategy. ACOG is a fully independent organisation and is responsible for coordinating airport's individual airspace changes via an Airspace Masterplan.
Airspace Change Portal	The CAA's <a href="#">Airspace Change Portal</a> is a publicly-accessible website where all ACP Sponsors are required to upload information on their ACPs.
Airspace Change Process	The CAA's airspace change process is known as ' <a href="#">CAP1616</a> '. The process is designed to ensure that the CAA meets modern standards for regulatory decision-making, and is fair, transparent, consistent and proportionate. The process ensures that when the CAA decides whether or not to approve a proposal to change UK airspace, it does so in an impartial and evidence-based way that takes proper account of the needs and interests of all affected stakeholders.
Airspace Change Proposal (ACP)	Airspace change proposals (ACPs) are requests from a 'change sponsor', usually an airport or a provider of air navigation services (including air traffic control), to change the notified airspace design. ACPs must follow the CAA's CAP1616 airspace change process.
Airspace Modernisation Strategy (AMS)	The <a href="#">Airspace Modernisation Strategy</a> , or AMS, is co-sponsored by the CAA and DfT. It sets out the 'ends', 'ways', and 'means' of modernising the design, technology, and operations of airspace. A nationwide airspace modernisation programme is underway across UK airports in support of the AMS.
Air Traffic Control (ATC)	Air Traffic Control, or ATC, is a service provided by ground-based air traffic controllers who direct aircraft on the ground and through a given section of controlled airspace and can provide advisory services to aircraft in non-controlled airspace.
Air Traffic Movement (ATM)	An aircraft take-off or landing at an airport. For airport traffic purposes one arrival and one departure are counted as two movements. Heathrow airport currently operates under an annual cap of 480,000 ATMs, which is set by the government.
Altitude Based Priorities	Altitude based priorities are a set of rules, incorporated in statutory guidance and used by the CAA. They are designed to ensure that potential noise impacts are prioritised over other factors such as carbon emissions in airspace change proposals up to 7,000 ft above sea level.

# GLOSSARY

Term	Description
Area of Outstanding Natural Beauty (AONB)	An area of outstanding natural beauty is an area of countryside in England, Wales or Northern Ireland that has been designated for protection by the Countryside and Rights of Way Act 2000 (CROW Act) due to its significant landscape value. The Act protects the land to conserve and enhance its natural beauty.
Baseline	As part of the IOA, CAP1616 requires airspace change sponsors to set a baseline which is used for environmental evaluation of the options. Heathrow has used a 'Do Nothing' scenario which uses 2019 data to best reflect the current environment. The baseline scenario was modelled to generate a set of environmental metrics that have been used to compare each option against.
Biodiversity	Biodiversity is the variety of all life on Earth including all species of animals and plants. Biodiversity supports the vital benefits humans get from the natural environment.
CAP1616	<a href="#">CAP1616</a> is the CAA's airspace change process guidance, introduced in December 2017. CAP1616 established additional CAA scrutiny and validation of sponsors' work and evidence as they develop proposals; increased requirements relating to transparency and engagement; and introduced new opportunities for those impacted by proposals to have their voices heard.
Civil Aviation Authority (CAA)	The CAA is the UK's aviation regulator, overseeing and regulating all aspects of civil aviation in the UK. The Secretary of State for Transport placed a statutory duty upon the CAA to have a strategy and plan for modernising airspace.
CAP2250	<a href="#">CAP2250</a> is the CAA's "Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Further Analysis" published in December 2022. It sets out recommended categories for noise levels and annoyance that can be used by ACP sponsors when carrying out noise modelling.
Controlled Airspace (CAS)	A defined area of airspace in which Air Traffic Control (ATC) services are provided. Controlled airspace usually exists in the immediate vicinity of busier airports and at higher <a href="#">levels</a> where air transport flights would tend to cruise.
Comprehensive List of Options (CLOO)	Airspace change sponsors are required to develop a Comprehensive List of Options at Stage 2 of the CAP1616 process. The CLOO should include a comprehensive set of airspace design options that address the Statement of Need and align with the Design Principles set at Stage 1.
Continuous Climb Operations (CCO)	CCO is a departure procedure whereby the aircraft climbs continuously to its cruising level without levelling off. Heathrow's Comprehensive List of Options assumes that aircraft will perform a CCO to at least 7,000ft.

# GLOSSARY

Term	Description
Cranford Agreement	<p>Runway alternation currently only happens on westerly operations (when aircraft come into land over London and take off towards Windsor). This is because of the legacy of the Cranford Agreement which was established in the 1950s. Cranford is a village at the eastern end of the northern runway. The agreement prevented aircraft from taking off over the village except in exceptional circumstances and applied when Heathrow was on easterly operations.</p> <p>This means that during easterly operations, most arriving aircraft will land on the northern runway, with most departures taking off from the southern runway. In 2009, the Government announced that the Cranford Agreement should end following consultation with local residents.</p>
Department for Transport (DfT)	The Department for Transport (DfT) is the United Kingdom government department responsible for the English transport network (and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved).
Design Principle (DP)	Design Principles encompass the objectives that the airport seeks to achieve through the airspace change, including safety, policy, environmental, and operational factors. Design Principles are set through engagement with stakeholders at Stage 1, and they guide the airspace designers to create suitable flight path options at Stage 2.
Design Principle Evaluation (DPE)	The Design Principle Evaluation is a requirement of the CAP1616 airspace change process at Stage 2. It involves assessing the Comprehensive List of Options against each Design Principle.
Dispersion	The dispersion patterns around Heathrow's departure routes are a result of ground-based navigation technology and a high degree of vectoring by ATC. This means that current dispersion patterns are generally larger than would occur within a PBN environment, where modern satellite navigation technology results in the aircraft flying a narrower flightpath.
Easterly Alternation	A Heathrow project to enable respite for easterly operations. The timescales to deliver full easterly alternation will be subject to both the ACP and the process for seeking permission for revised planning requirements and associated groundworks.
FASI	Heathrow is part of the 'Future Airspace Strategy Implementation-South' programme to re-design airspace in the south of the UK. There is also a 'FASI-N' programme for the north of the UK.
Flight Path Options	Flight path options are operationally viable (flyable) flight paths developed by Heathrow's technical team.
Full Options Appraisal (FOA)	The FOA is required at Stage 3A of the CAP1616 process. It involves a quantitative assessment of the shortlist of flight path options, and these will be shared at public consultation.

# GLOSSARY

Term	Description
General Aviation (GA)	All civil flying other than commercial airline operations, encompassing a wide range of aviation activity from powered parachutes, gliding and ballooning to corporate business jets, and including all sport and recreational flying.
Holding Stack	Holding stacks are areas of airspace used as a waiting room which allow air traffic controllers to organise the planes before they land. Heathrow has four holding stacks located over navigation beacons that lend them their names. The locations of Heathrow's stacks have been the same since the 1960s.
Initial Options Appraisal (IOA)	The IOA is required at Step 2B of the CAP1616 process. It involves an assessment of the impacts (costs and benefits) of each of the viable options. The appraisal must use TAG, the DfT's appraisal guidance, which includes consideration of environmental impacts, economic impacts and health impacts associated with noise.
Instrument Landing System (ILS)	The Instrument Landing System is a precision radio navigation system that provides short-range guidance to arriving aircraft on approach to the runway.
NATS En-Route Limited (NERL)	NATS is the air navigation service provider responsible for the UK's airspace above 7,000ft, and at many airports (including at Heathrow). NATS is the parent company of NERL who provide ATC services to aircraft flying in airspace over the UK and the eastern part of the North Atlantic.
$L_{Aeq, 16hr}$ and $L_{Aeq, 8hr}$	$L_{Aeq}$ is the most common international measure of noise and means 'equivalent continuous noise level'. 51dB $L_{Aeq, 16hr}$ (daytime noise) and 45dB $L_{Aeq, 8hr}$ (night-time noise) contours form part of the primary CAP1616 metrics used to evaluate the benefits and impacts of an airspace change. These contours represent the daytime and night-time Lowest Observable Adverse Effect Level (LOAEL) contour defined in UK airspace policy. $L_{Aeq}$ contours are the equivalent sound level of aircraft noise in dB. This is based on the daily average movements that take place in the 16hr daytime period (0700-2300) or 8hr night period (2300-0700).
$L_{Amax}$	$L_{Amax}$ is the maximum sound level measured during a single noise event.
Lowest Observed Adverse Effect Level (LOAEL)	Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected. It is set at 51 dB $L_{Aeq}$ for daytime periods and 45 dB $L_{Aeq}$ for night-time periods. The LOAEL and the $L_{Aeq}$ metrics which underpin it are based on average noise measured over a 92-day period, taking into account all arrival and departure operations.

# GLOSSARY

Term	Description
N60/N65 noise events	A noise metric which describes the number of aircraft noise events above a noise level of 60 LAmax for night-time periods and 65 LAmax for daytime periods. These are event-based metrics which can be used to better understand the number of noise events that occur and where.
Overflight	CAA's <a href="#">CAP1498</a> document sets out a definition of overflight for use in ACPs. "Overflown" is defined as "an aircraft in flight passing an observer at an elevation angle of 48.5° from the ground at an altitude below 7000ft" (CAA). The overflight metric enables calculation of the number of times a location may be considered to be overflown.
Nautical Miles (nm)	A nautical mile is a unit of length used in air, marine, and space navigation.
Night Flights	There is no formal ban on night flights at Heathrow, but the Government has placed restrictions on them since the 1960s. Night-time (23:30 - 06:00) operations at Heathrow are heavily restricted by the Government, which sets a limit of 5,800 night-time take-offs and landings a year. A night quota limit is also in place, which caps the amount of noise the airport can make at night. Around 80% of the night flights at Heathrow are between 04:30 - 06:00 with an average of 16 aircraft arriving each day between these hours. Heathrow has a voluntary ban in place that prevents flights scheduled between 04:30 - 06:00 from landing before 04:30. We also do not schedule any departures between 23:00 - 06:00.
Noise Efficient Operational Practices	Noise efficient operational practices are considered to be: Continuous Climb Operations (CCO), Continuous Descent Operations (CDO), Noise Abatement Departure Procedures (NADPs), Steeper Approaches, Steeper Climbs, Landing Gear Deployment, and Low Power Low Drag.
Noise Preferential Route (NPR)	Aircraft taking off from some airports are required to follow specific flight paths called Noise Preferential Routes (NPRs), unless directed otherwise by Air Traffic Control (ATC). The NPRs at Heathrow are designated and overseen by the Secretary of State for Transport (not the CAA) and were designed to avoid the overflight of built-up areas where possible. They set a path for the aircraft to take-off from the runway until they reach the main UK air traffic routes.
Overflight	CAA's <a href="#">CAP1498</a> document sets out a definition of overflight for use in ACPs. "Overflown" is defined as "an aircraft in flight passing an observer at an elevation angle of 48.5° from the ground at an altitude below 7000ft" (CAA). The overflight metric enables the number of overflights experienced at locations on the ground to be calculated according to the agreed definition.
Overflight Cones	The CAA's <a href="#">CAP1498</a> document states that overflight above a given location should be measured using a cone. The cone identifies the airspace above a given location within which an aircraft might be perceived as "overflying" that location. This is because an aircraft does not need to be directly overhead to have an impact (noise and/or visual) on the local population.
Partial LOAEL	At Stage 2 we have quantified the number of people adversely affected by noise impacts of options using Partial LOAEL contours. This is because the options are being assessed per single runway operation (e.g. an arrival route to one runway end) and a complete system of westerly and easterly departures and arrivals to/from both runways is required to develop a LOAEL contour.

# GLOSSARY

Term	Description
Performance Based Navigation (PBN)	PBN improves the accuracy of where aircraft fly by using modern satellite navigation and moving away from outdated and conventional navigation techniques using ground-based beacons (it is similar to GPS "sat nav" devices that most people use in their cars today). PBN is being adopted worldwide through International, Regional and State level initiatives and regulations.
Qualitative Analysis	A method of assessment based on observations and expertise of the technical team, including non-numerical information such as air traffic control procedures or other airports' design options.
Quantitative Analysis	A method of assessment based on numerical data and metrics.
RAMSAR	A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention (also known as "The Convention on Wetlands"), an intergovernmental environmental treaty established in 1971 by UNESCO in Ramsar, Iran.
Relief	A break from, or a reduction in, aircraft noise.
Respite	Scheduled relief from aircraft noise for a set period of time.
Runway Alternation	Heathrow has two runways, with one used for arrivals and one used for departures at most times. During the day, when planes are landing and taking off to the west (westerly operations), we alternate the use of our two runways to provide local communities with respite. The alternation pattern means that for part of the day we use one runway for landings and the other for take-offs, then halfway through our operational day (at 15:00) we switch over. Runway alternation is not currently possible when planes are landing and taking off to the east (easterly operations).
Special Areas of Conservation (SAC)	Protected areas in the UK designated under UK Government environmental regulations. These sites are classified as making a significant contribution to conserving habitats and species identified in the <a href="#">Habitats Directive</a> .
Shortlisting	At Stage 2 CAP1616 requires sponsors to assess the CLOO against criteria and use the IOA results to narrow down the list of options, producing a shorter list of options that will be progressed to Stage 3 for further analysis.
Significant Observed Adverse Effect Level (SOAEL)	This is the noise level above which significant adverse effects on health and quality of life occur. The SOAEL is likely to be different for different noise sources, for different receptors and at different times. The SOAEL threshold is 63dB and encompasses areas near to the airport.
Sites of Special Scientific Interest (SSSI)	An SSSI is an area that is of particular interest to science due to the rare species of fauna or flora it contains - or important geological or physiological features that may lie in its boundaries. These areas have high conservation value and need to be protected. Natural England is the official authority in England determining which sites have SSSI status.

# GLOSSARY

Term	Description
Special Protection Areas (SPA)	A special protection area are protected areas in the UK for migratory birds and certain particularly threatened birds.
Standard Instrument Departure procedures (SIDs)	Heathrow's Standard Instrument Departures are air traffic control (ATC) procedures that provide a clear path from the runway end to 6 common network points in the airspace for flights to depart.
Statement of Need (SoN)	At the first stage of the airspace change process, airport sponsors are required to outline the objectives of the ACP, by setting out the airspace issue or opportunity it is seeking to address and what outcome it wishes to achieve.
Supplementary Metrics	Supplementary metrics are those that have been used to better articulate the likely noise impacts of the options to stakeholders. These include overflight, noise exposure contours and single aircraft noise events.
System Options Design	At Stage 3 Heathrow will design system options which are arrivals and departures together, on easterly and westerly operations.
TAG	TAG (formerly known as WebTAG) is the DfT's suite of guidance on how to assess the expected impacts of transport policy proposals and projects. As part of the CAP1616 process, Heathrow is required to apply specific noise metrics and quantify the benefits and impacts on an airspace change using the TAG tool. The TAG tool is a workbook using calculations and formulae that are set by DfT. The CAP1616 process requires TAG analysis methods to be used for evaluation of quantified noise benefits and disbenefits.
Vectoring	Vectoring is the provision of navigational guidance to aircraft by air traffic controllers (ATC). Vectoring helps to maximise use of available airspace.
World Health Organisation (WHO)	WHO is a specialised agency of the United Nations responsible for international public health. WHO has provided guidance on recommended maximum noise levels for sleep and education.

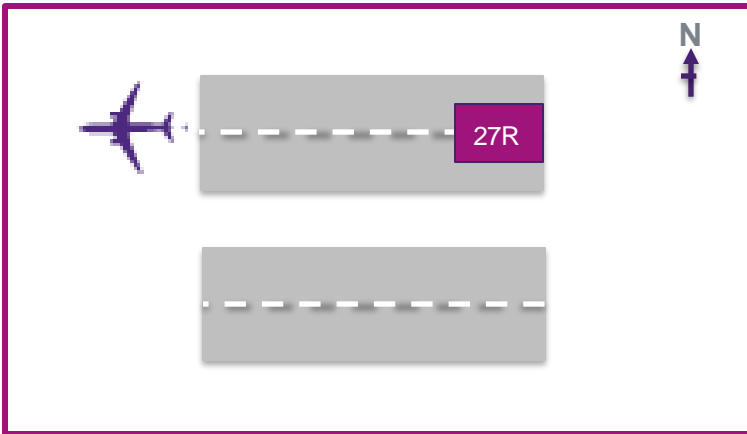




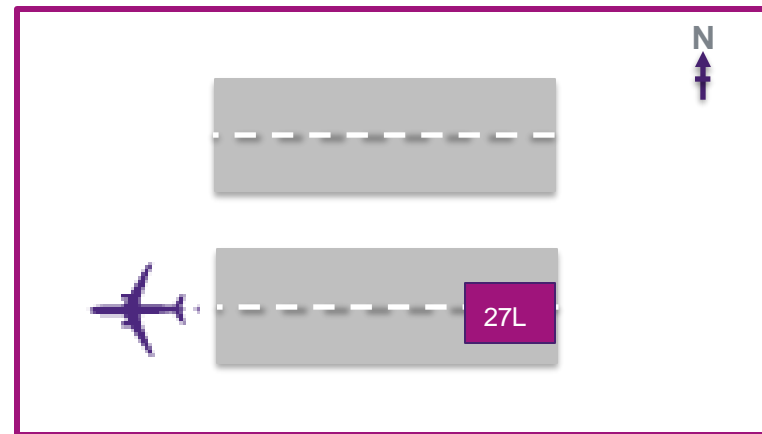
# Appendix 2 – Shortlisting Outcome Maps

# RUNWAY NAMES FOR PBN DEPARTURE OPTIONS

## WESTERLY OPERATIONS



27R = Aircraft departing the Northern runway to the west



51 27L = Aircraft departing the Southern runway to the west

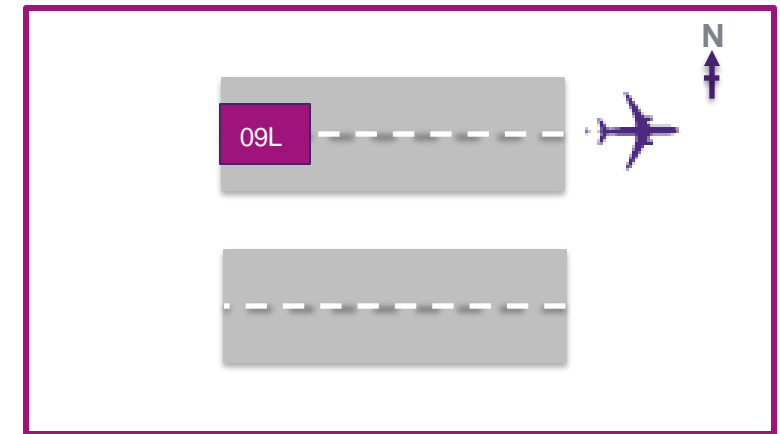


When the wind blows from the west, Heathrow will generally operate on "westerly operations". This is approximately 70% of the time.

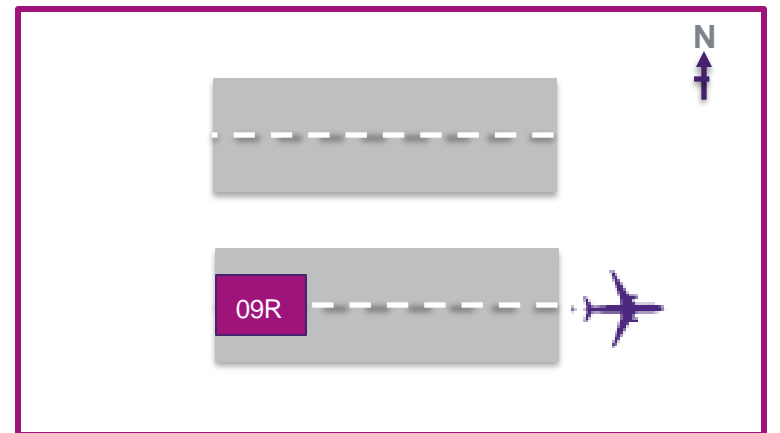


When the wind blows from the east, Heathrow will generally operate on "easterly operations". This is approximately 30% of the time.

## EASTERLY OPERATIONS



09L = Aircraft departing the Northern runway to the east



09R = Aircraft departing the Southern runway to the east



# IOA SHORTLISTING OUTCOME PBN DEPARTURES 27L

## The Comprehensive List of Options



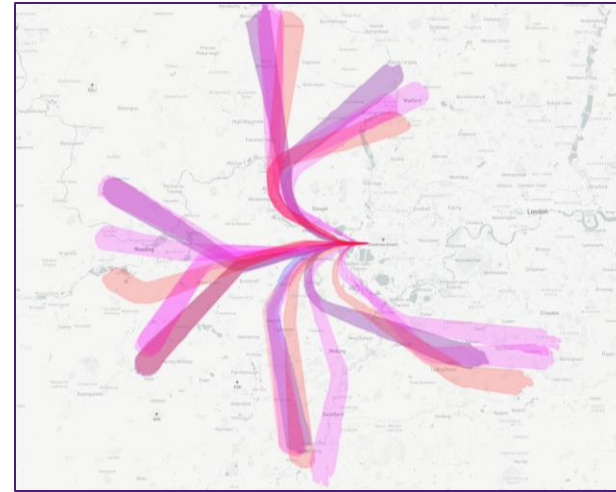
All 27L PBN Departure Options A - H



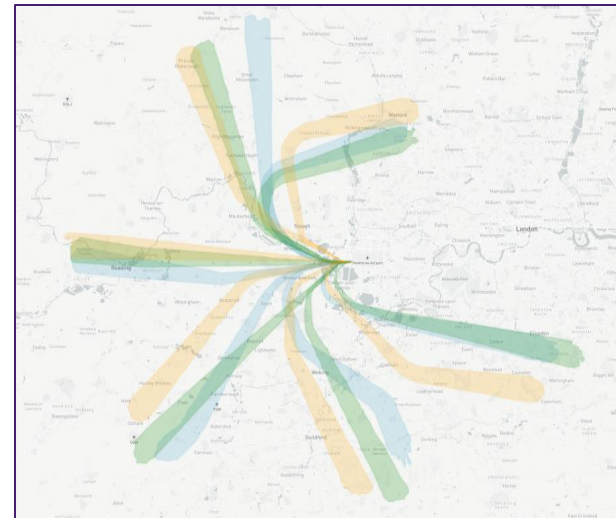
27L Departures for "Do-nothing" scenario



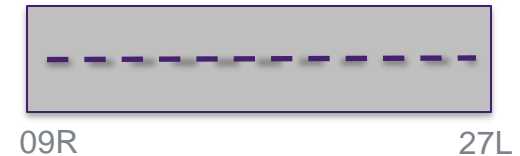
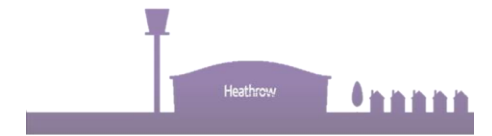
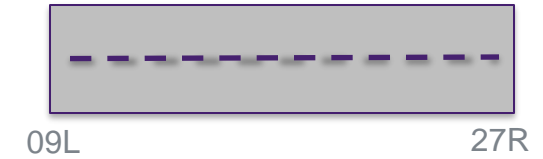
## IOA Shortlisting Outcome



Shortlisted 27L PBN Departures Options A, E, F, G & H



Discontinued 27L PBN Departures Options B, C & D



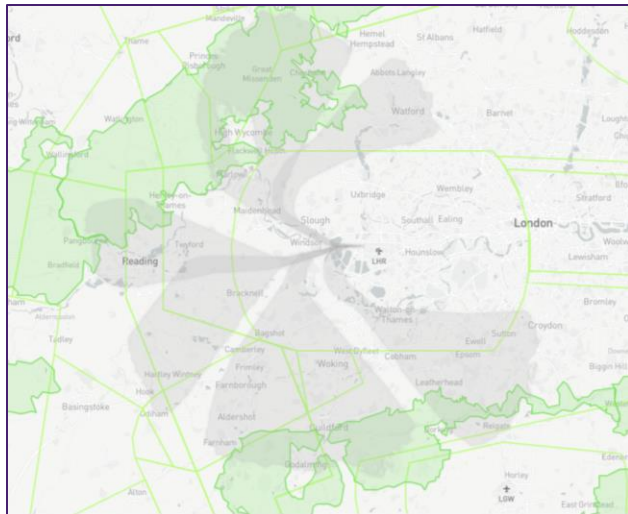
Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

# IOA SHORTLISTING OUTCOME PBN DEPARTURES 27R

The Comprehensive List of Options



All 27R PBN Departure Options A - H



27R Departures for "Do-nothing" scenario



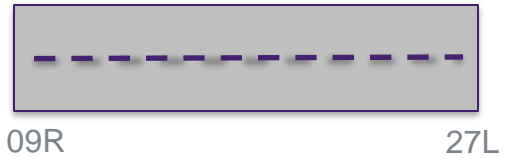
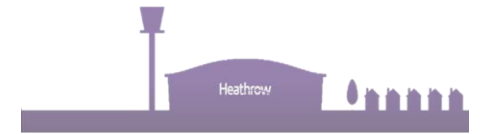
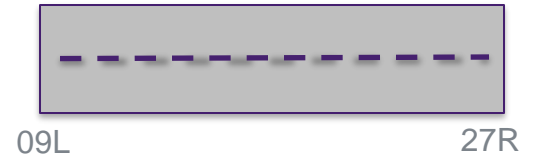
IOA Shortlisting Outcome



Shortlisted 27R PBN Departures Options A, E, F, G & H



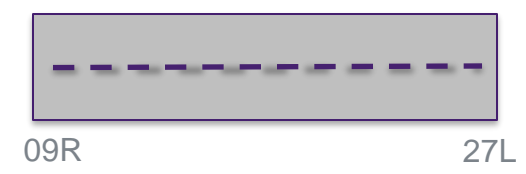
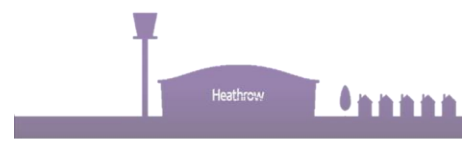
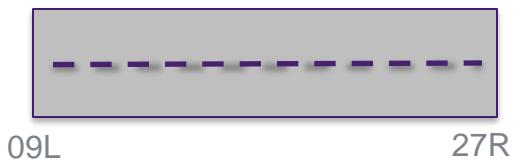
Discontinued 27R PBN Departures Options B, C & D



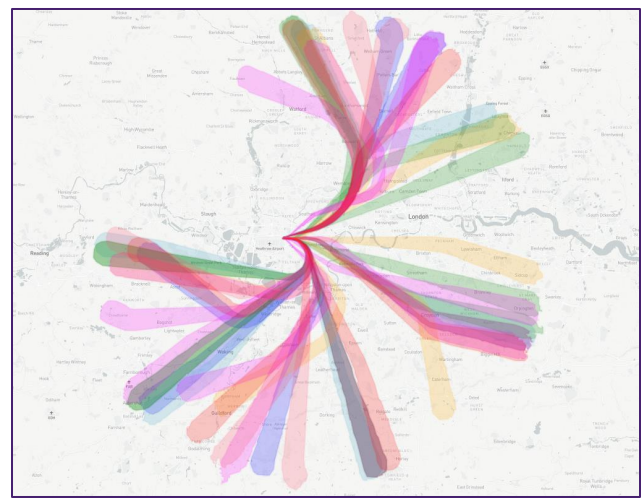
Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received



# IOA SHORTLISTING OUTCOME PBN DEPARTURES 09L



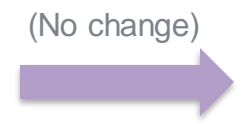
## The Comprehensive List of Options



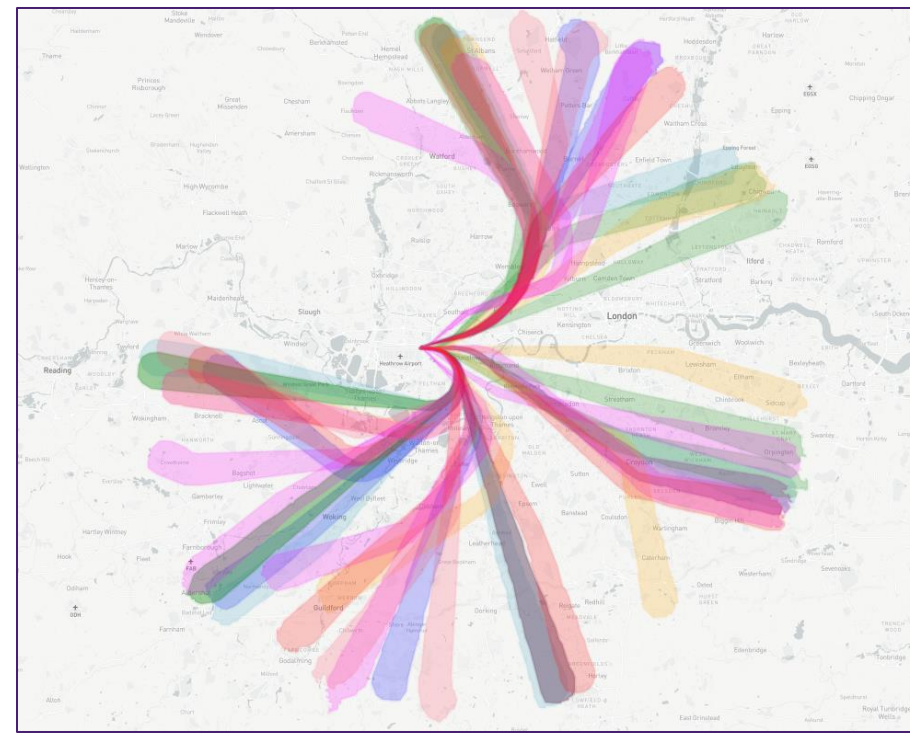
All 09L PBN Departures Options A - J



09L Departures for "Do-nothing" scenario



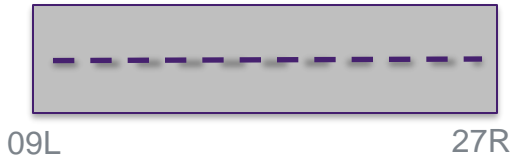
## IOA Shortlisting Outcome



Shortlisted 09L PBN Departures Options A - J

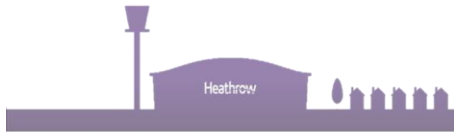
Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

# IOA SHORTLISTING OUTCOME PBN DEPARTURES 09R



09L

27R



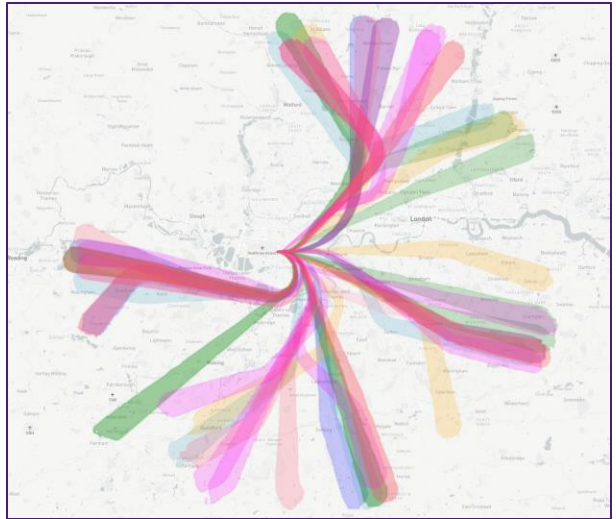
Heathrow



09R

27L

## The Comprehensive List of Options



All 09R PBN Departure Options A - J



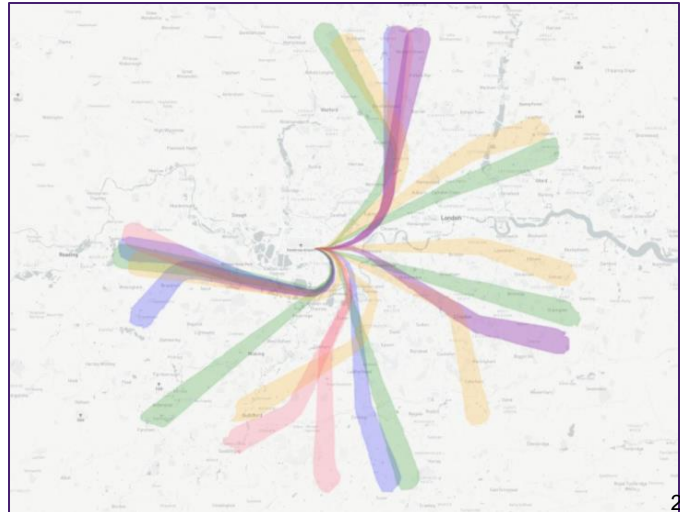
09R Departures for "Do-nothing" scenario



## IOA Shortlisting Outcome



Shortlisted 09R PBN Departures Options B, C, F, G, I, & J

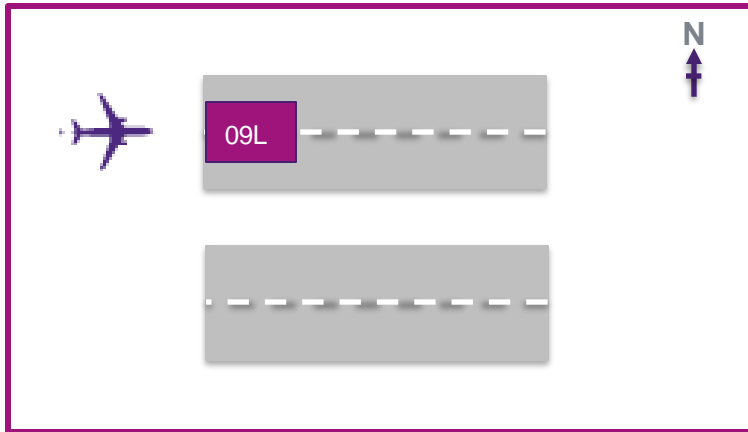


Discontinued 09R PBN Departures Options A, D, E & H

Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

# RUNWAY NAMES FOR ALL ARRIVALS OPTIONS

## EASTERLY OPERATIONS



09L = Aircraft approaching the Northern runway from the west

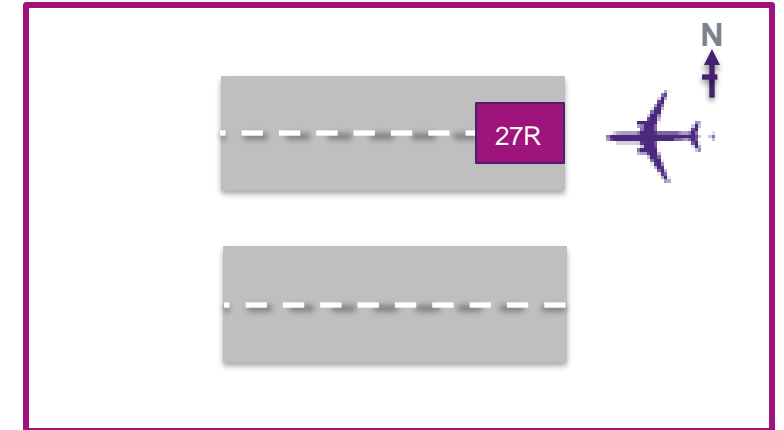


When the wind blows from the west, Heathrow will generally operate on "westerly operations". This is approximately 70% of the time.

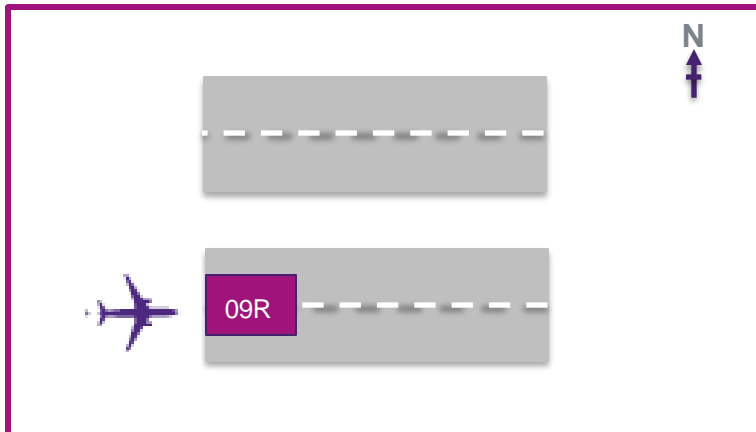


When the wind blows from the east, Heathrow will generally operate on "easterly operations". This is approximately 30% of the time.

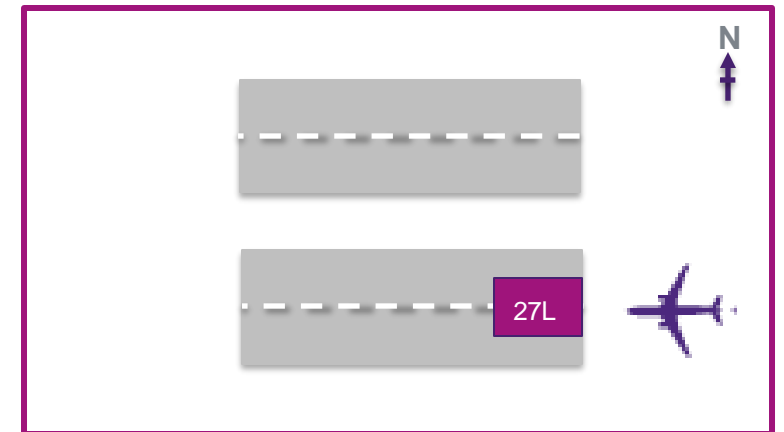
## WESTERLY OPERATIONS



27R = Aircraft approaching the Northern runway from the east



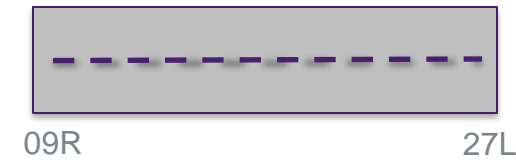
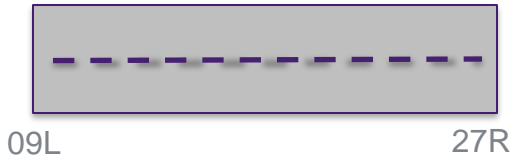
09R = Aircraft approaching the Southern runway from the west



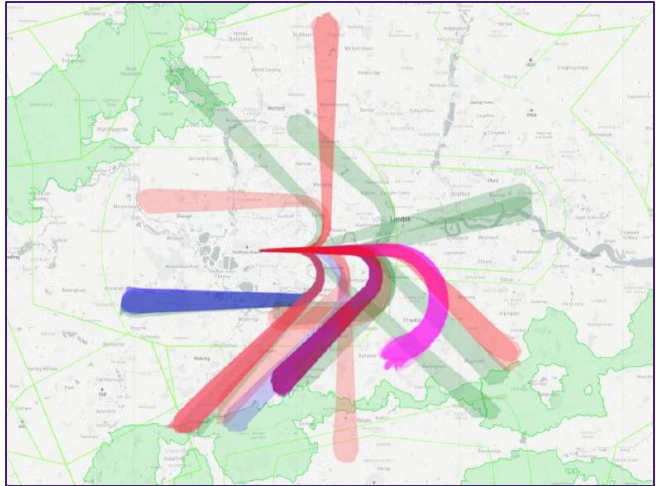
27L = Aircraft approaching the Southern runway from the east <sup>259</sup>



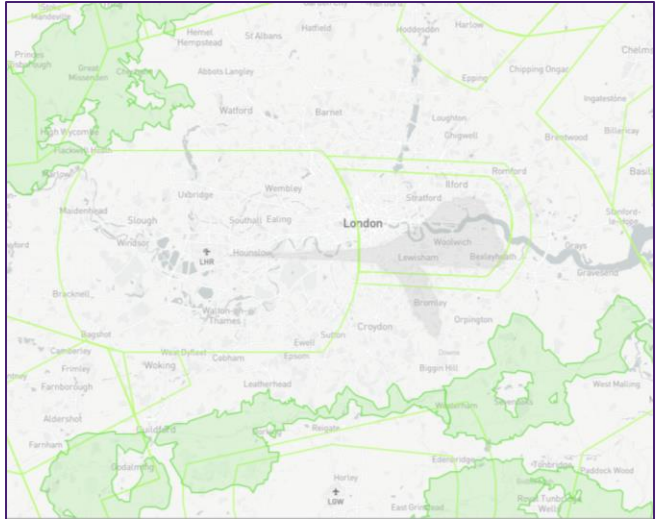
# IOA SHORTLISTING OUTCOME PBN ARRIVALS 27L



## The Comprehensive List of Options

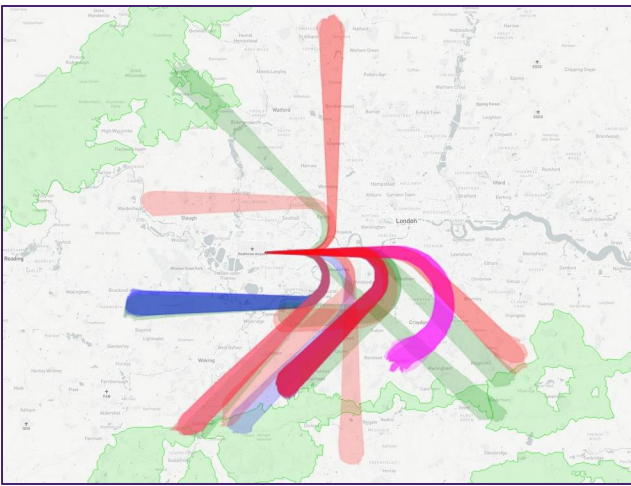


All 27L PBN Arrivals Options A - W

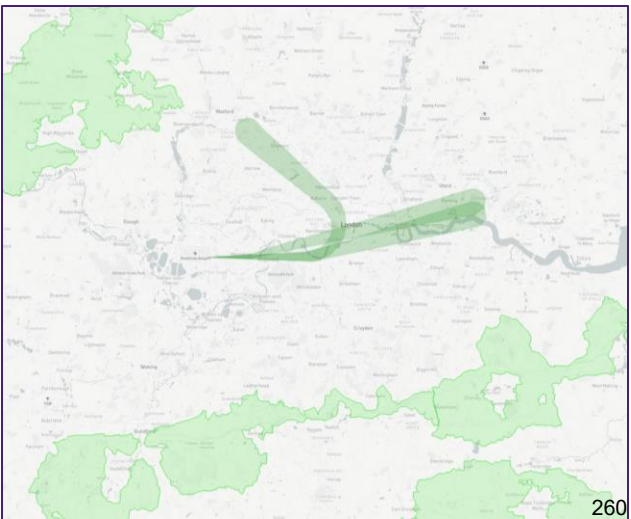


27L Arrivals for "Do-nothing" scenario

## IOA Shortlisting Outcome



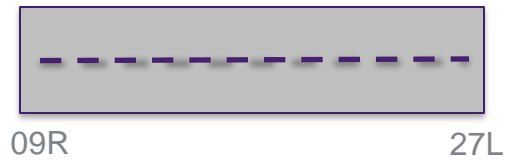
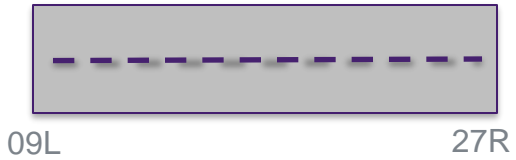
Shortlisted 27L PBN Arrivals Options A-H & L-W



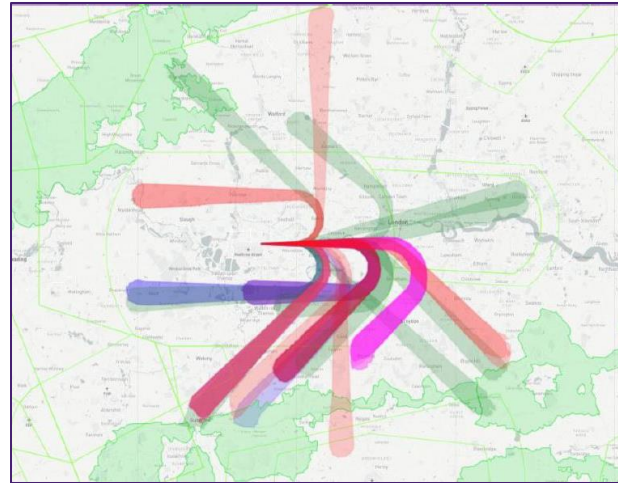
Discontinued 27L PBN Arrivals Options I, J & K

Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

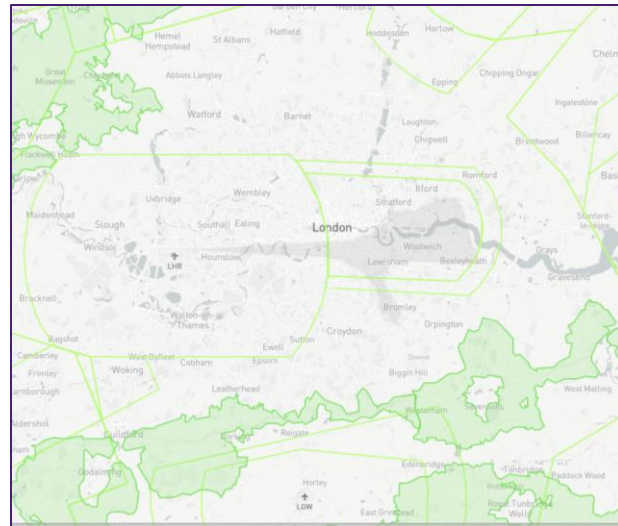
# IOA SHORTLISTING OUTCOME PBN ARRIVALS 27R



## The Comprehensive List of Options



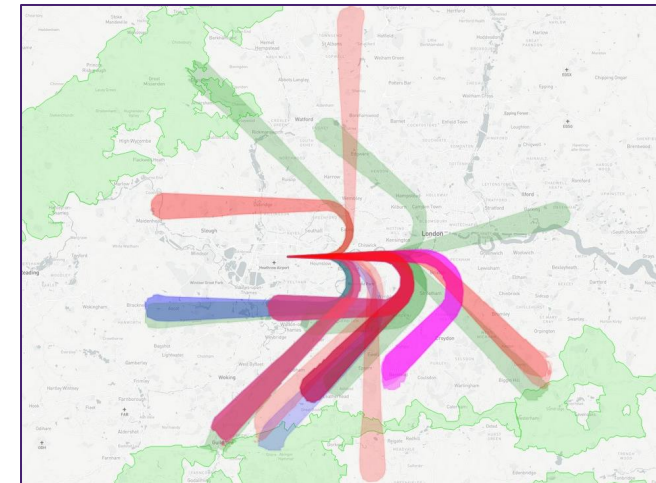
All 27R PBN Arrivals Options A - X



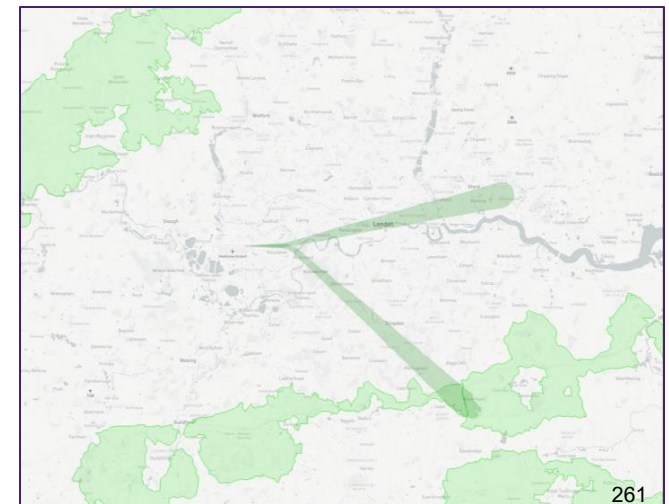
27R Arrivals for "Do-nothing" scenario



## IOA Shortlisting Outcome



Shortlisted 27R PBN Arrivals Options A-H, J-K & M-X



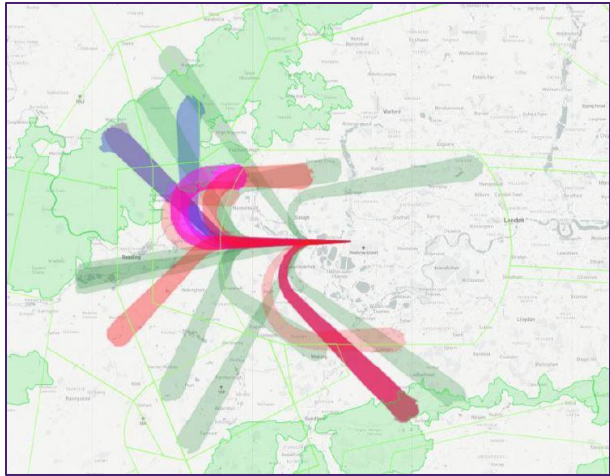
Discontinued 27R PBN Arrivals Options I & L

Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

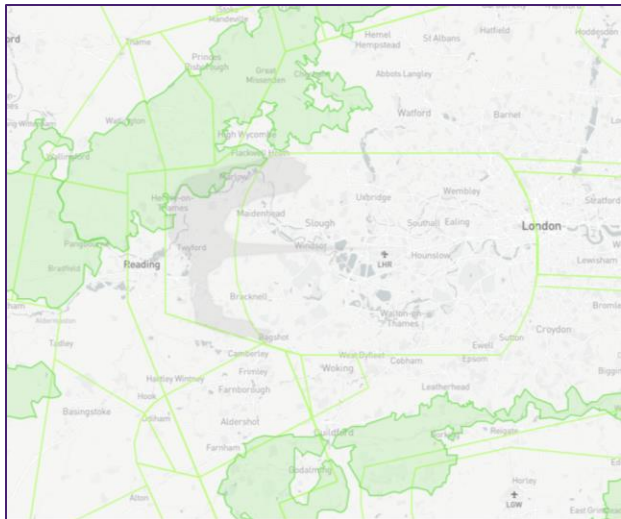


# IOA SHORTLISTING OUTCOME PBN ARRIVALS 09L

## The Comprehensive List of Options



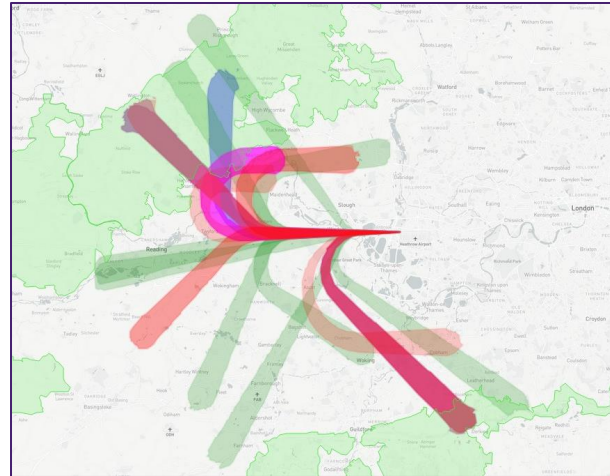
All 09L PBN Arrivals Options A - U



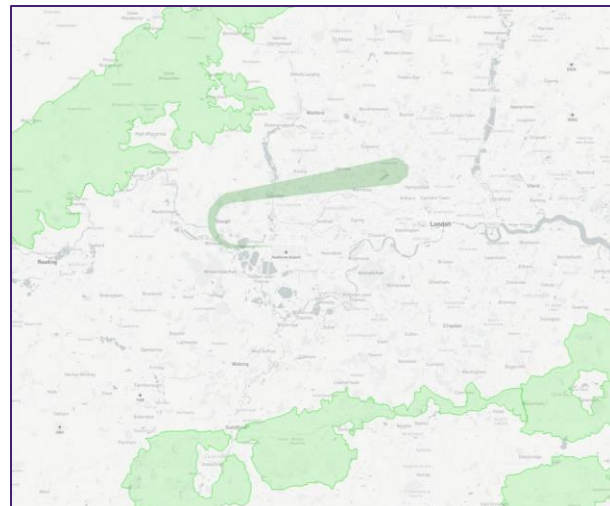
09L Arrivals for "Do-nothing" scenario



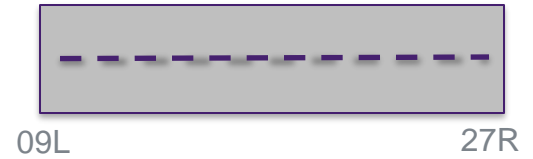
## IOA Shortlisting Outcome



Shortlisted 09L PBN Arrivals Options A-I & K-U



Discontinued 09L PBN Arrivals Option J



09L

27R



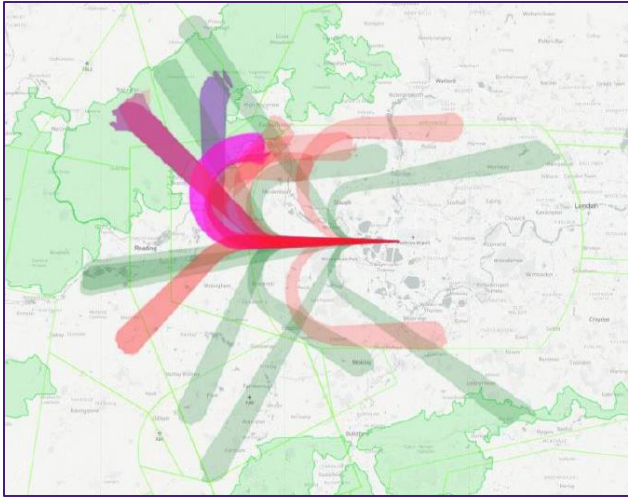
09R

27L

Options shown in this document are subject to change throughout the ACP as the level of analysis becomes more detailed and additional information is received

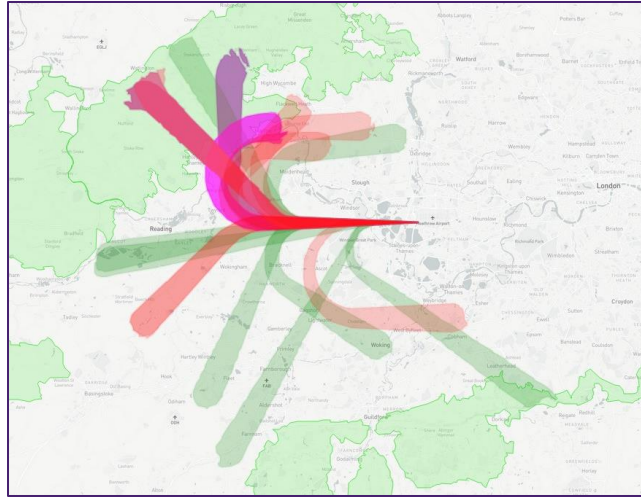
# IOA SHORTLISTING OUTCOME PBN ARRIVALS 09R

## The Comprehensive List of Options

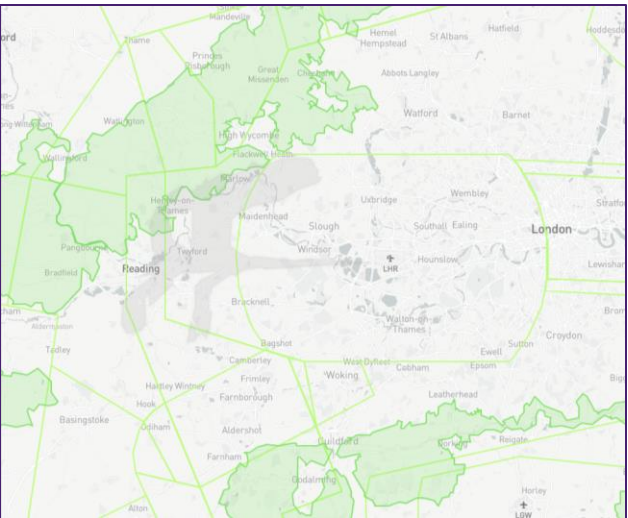


All 09R PBN Arrivals Options A - U

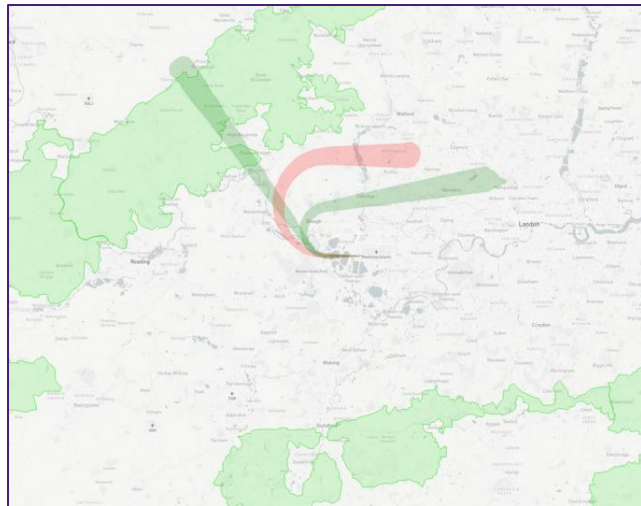
## IOA Shortlisting Outcome



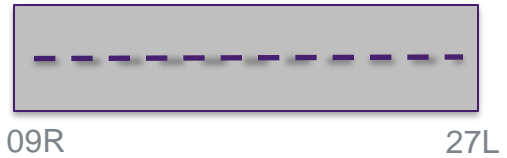
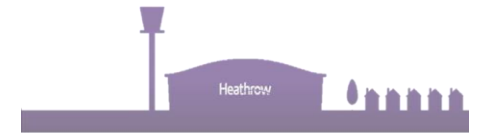
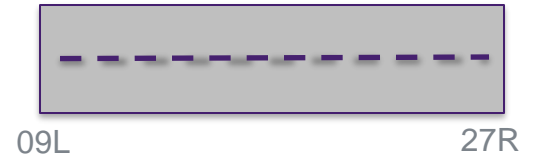
Shortlisted 09R PBN Arrivals Options A-H, J, L-Q & S-U



09R Arrivals for "Do-nothing" scenario



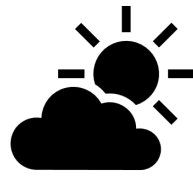
Discontinued 09R PBN Arrivals Options I, K & R



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# CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS



07:00 - 23:00

## PBN Departures – RWY27L Option A (Day)

### Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option A	
≥ 1	1,483,800	456,800	
≥ 5	716,100	360,900	
≥ 10	442,000	323,600	
≥ 20	280,000	264,600	
≥ 50	105,600	113,200	
≥ 100	28,300	44,600	
≥ 200	400	1,900	

### Aircraft Noise Events

Rate	Population experiencing noise events above N65 each day		N65 events contour map
	Baseline	Option A	
≥ 1	688,900	450,200	
≥ 5	317,600	230,300	
≥ 10	245,200	148,600	
≥ 20	176,100	116,400	
≥ 50	67,800	52,000	
≥ 100	18,500	26,900	
≥ 200	8,000	12,300	

### Noise Exposures

Population count	Baseline	Option A	Partial LOAEL contour map
Estimated total population above WHO Threshold (>45 dB L <sub>den</sub> )	602,400	568,800	
Total population within Partial LOAEL (>51 dB L <sub>Aeq,16h</sub> )	174,800	124,700	

### Noise Exposure Change

Change in Noise Exposure	Population experiencing at least 1 dB reduction within partial LOAEL or brought out of partial LOAEL	Population experiencing no change in noise exposure within partial LOAEL	Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL	Change in noise exposure map
Partial LOAEL	81,100 (of which 60,200 brought out of Partial LOAEL by Option)	64,900	38,900 (of which 10,100 brought into Partial LOAEL by Option)	





## Step 2B Initial Options Appraisal Sessions

Report of sessions between the Heathrow Airspace Modernisation Team and community stakeholder group representatives (27 June – 4 July 2023, 3 x 2-hour online sessions, Microsoft Teams)

### Attendees:

Stakeholder Group / Organisation:	Heathrow Representatives:
Airspace Change Organising Group (ACOG)	██████████
Buckinghamshire Council	██████████
Campaign Against Gatwick Noise Emissions (CAGNE)	██████████
Central Bedfordshire Council	██████████
Chiltern Society	██████████
Council for the Independent Scrutiny of Heathrow Airport (CISHA)	██████████
CPRE Oxfordshire	██████████
Department for Transport	██████████
Ealing Aircraft Noise Action Group (EANAG)	██████████
Englefield Green Action Group (EGAG)	
Forest Hill Society	
Friends of Richmond Park (FRP)	
Harmondsworth and Sipson Residents Association (HASRA)	
Heathrow Strategic Planning Group (HSPG)	
Hertfordshire County Council	
Local Resident Walton-on-Thames, Surrey	
London Borough of Bromley	██████████ (Headland)
London Borough of Southwark	██████████ (Headland)
London Borough of Lewisham	
London Borough of Merton	
Lower Sunbury Residents' Association (LSRA)	
Molesey Residents Association (MRA)	
Mole Valley District Council	
National Trust	
Newham Council	
Plane Hill Action Southeast	
Reigate and Banstead Borough Council	
Richmond Heathrow Campaign (RHC)	
Royal Borough of Windsor and Maidenhead Council (RBWM)	
Sevenoaks District Council	
South Downs National Park Authority	
Spelthorne Borough Council	
St Albans City and District Council	
Surrey County Council	
Teddington Action Group (TAG)	
The Royal Parks	
Westbourne Park Road East Resident's Association (WPRERA)	

Throughout this note comments and questions from the 48 attendees are attributed to the organisation they represent, rather than the individual.

A slide pack was presented during the discussion and shared with stakeholders afterwards. The structure of the report reflects the agenda and order in which the slides were presented, but key discussion points have been grouped into sub-sections where appropriate.

1. Purpose of the Session
2. Initial Options Appraisal (IOA) CAP1616 Requirements
3. Heathrow's Approach to the Initial Options Appraisal (IOA)
4. Heathrow's Approach to Shortlisting Options

5. The Shortlisted Options
6. Update on Respite Concepts
7. AOB
8. Next Steps and Closing Remarks

## Notes from the Discussion:

### 1. Purpose of the Session

1.1	Heathrow	Welcomed stakeholders and set out that the purpose of the session is to: a) explain the approach taken to the Initial Options Appraisal (IOA) and the shortlisting of options, summarising the results, and b) to share an update on the work to explore respite concepts.
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### 2. Initial Options Appraisal (IOA) CAP1616 Requirements

#### *Heathrow's future arrivals mechanism*

2.1	TAG	Asked where Heathrow's arrivals stacks are going to be positioned in the future as this is a key consideration in the design of routes.
2.2	Heathrow	Explained that Heathrow's future arrivals mechanism ("holding stacks") are being re-designed by NATS (En Route) NERL as part of their own ACP.
2.3	HSPG	Asked about the use and height of holding stacks for arriving aircraft. Queried the use of Performance Based Navigation (PBN) Arrivals and Vectored Arrivals in future operations.
2.4	Heathrow	Confirmed that Heathrow's ACP is to design flight path options up to 7,000ft and NERL is responsible for designing airspace above 7,000ft, which is the base level of the holding stacks. Stated that the holding stack position is a key outstanding piece of information in this ACP. Heathrow will continue to work collaboratively with NATS and other surrounding airports to incorporate any future changes into the system options design. Heathrow is investigating options for using PBN Arrivals with Vectored Arrivals and will be able to share more on this at Stage 3.
2.5	RHC	Asked if the six network entry and exit points are consistent across all options.
2.6	Heathrow	Responded that the actual entry and exit points into/from the upper network are not known yet so assumptions were made based on the current positioning of the stacks and information received from NERL. Confirmed that all PBN Departure options and PBN Arrival options connect to the same assumed network entry and exit points.

### 3. Heathrow's Approach to the Initial Options Appraisal (IOA)

#### *IOA inputs*

3.1	RHC	Asked which census data is being used in the IOA.
3.2	CPRE Oxfordshire	Asked if weather data is used in the IOA. Asked if local authorities' local plans have been considered, to account for future increases in population.
3.3	Heathrow	Confirmed that CACI 2021 census data and historic META weather data are used as inputs in the IOA.
3.4	Forest Hill Society	Asked if Heathrow is communicating with Lewisham Council about the draft local plan.

3.5	Heathrow	Explained that Heathrow had contacted 77 local authorities, including Lewisham Council, requesting their local plans including information on proposed noise sensitive developments. At Stage 3 the local plan information will be considered in more detail and will be included in the evaluation of system options.
3.6	LSRA	Asked if the Partial Lowest Observed Adverse Effect Level (LOAEL) contour includes the flight paths of other airspace users, such as helicopters.
3.7	Heathrow	Stated that the Partial LOAEL contour includes aircraft movements to and from Heathrow Airport but does not consider helicopter movements as there are too few.

*Methodology – Noise Metrics*

3.8	RHC	Commented that there the six Standard Instrument Departures (SIDs) per PBN Departure option include horizontal dimensions. Asked if Heathrow has considered the vertical dimensions for each SID to assess height and speed. Asked if the noise modelling is based on single flights.
3.9	Heathrow	Explained that one aircraft movement for each option is compared to the baseline data for one flight on each route in 2019. The Partial LOAEL for each option is calculated based on 92-days of traffic in the summer period.
3.10	TAG	Asked how Heathrow is considering the effects of concentration and “the change effect”.
3.11	Heathrow	Responded that the IOA includes departure options (linked to Design Principle 9) that replicate today’s centrelines. This has been compared to the 2019 baseline and the N60 and N65 single noise event metrics help to illustrate the effect of concentration. Heathrow is exploring concepts to provide relief or respite from aircraft noise and the concentration of noise.
3.12	Forest Hill Society	Commented that another ACP is considering noise reduction of 1-3dB to be beneficial, but CAA has stated that this level of change is not discernible to the human ear.
3.13	Heathrow	Heathrow agreed that a 1-3dB is not discernible for a single sound event. However, Heathrow is using a $L_{Aeq}$ sound exposure metric which takes average sound levels into account.
3.14	Buckinghamshire Council	Asked for clarity around Heathrow’s consideration of communities that are not currently overflown but are still impacted by noise. Stated that CAA had informed them that they “would not be picked up by noise models”.
3.15	Heathrow	Stated that the N60 and N65 noise metrics consider those not overflown but impacted by aircraft noise. Suggested that Buckinghamshire Council submit any specific concerns in writing to the Airspace Inbox and Heathrow will provide a formal response.

*The Baseline/’Do Minimum’ options*

3.16	FRP	Asked why Heathrow has not included a ‘Do Minimum’ option as required by the CAA’s CAP1616 process.
3.17	Heathrow	Explained that the Comprehensive List of Options (CLOO) includes ‘Do-nothing’ scenarios for PBN Departures, PBN Arrivals and Vectored Arrivals for each runway end (12 in total). These options were evaluated in their own right in the DPE and discontinued as they did not meet the requirements of the Government’s airspace modernisation strategy (AMS). The ‘Do-nothing’

		<p>scenarios were retained for comparison purposes as a baseline in the IOA and future phases of appraisal.</p> <p>Explained that the CLOO includes options (e.g., DP9a) that introduce PBN but keep flight paths similar to today's operations. Clarified that these options are not termed 'Do Minimum' because the CAA has confirmed that a 'Do Minimum' option is generally used where there is no baseline of current operations against which to compare options.</p>
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#### Appendix E Dashboards

3.18	CPRE Oxfordshire	Commented that tranquillity metrics do not consider the open countryside where there are a smaller number of people but background noise levels are much lower and therefore more sensitive to noise.
3.19	Heathrow	<p>Agreed with CPRE Oxfordshire that the balance between urban and rural areas is complex. However the N65 metric measures the area affected, not just population.</p> <p>Stated that CAP1616 requires sponsors to consider Areas of Outstanding National Beauty (AONBs), National Parks or areas identified through community engagement for their tranquillity.</p>
3.20	HSPG	<p>Commented that more information in the 'Option Description' box on the dashboard would be useful, especially where an options is being taken forward for future consideration.</p> <p>Queried the 'wider society' metrics and asked if schools and hospitals had been considered.</p>
3.21	Heathrow	<p>Stated that, at this stage, a high-level option description is appropriate as the options have been developed in isolation as runway directional groupings for PBN Departure routes and individual PBN Arrival routes. When system options are designed, a more robust option description will be provided.</p> <p>Confirmed that the IOA includes data on wider society impacts, but data on schools and hospitals potentially affected will be more relevant at Stage 3</p>
3.22	Buckinghamshire Council	<p>Asked what measurement of air quality is being used in the IOA.</p> <p>Asked if Heathrow is showing the monetised health impact of noise in the IOA.</p>
3.23	Heathrow	<p>The IOA includes a qualitative assessment of air quality, looking at whether the option laterally changes flight paths below 1,000ft. This is based on the Government's ANG17 which states that air quality could be affected if flight paths are changed below 1,000ft. Air quality assessments are very detailed and it's not proportionate to undertake them for the number of options we have at Stage 2.</p> <p>Stated that the Partial LOAELs give a flavour of the potential health impacts of an option but the IOA does not include monetised noise values. This is because options are currently configured as single runway modes so values would be misleading. This work will take place at Stage 3 when we can evaluate full system options designs.</p>

#### Supplementary Metrics Dashboards

3.24	TAG	Pointed out that the World Health Organisation (WHO) 45dB is a LDEN (day, evening, night) noise exposure metric indicating the threshold above which
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		people become significantly annoyed. This is equivalent to 54dB in the UK, based on the CAA's Survey of Noise Attitudes 2014 (SoNA). Asked if the noise exposures map corresponded to the WHO threshold.
3.25	Heathrow	Noted TAG's point on the WHO threshold and confirmed that the dashboards will be uploaded to the CAA's Airspace Change Portal. These will be available to view in an A4, high-quality PDF format allowing stakeholders to zoom in and view the noise contour maps.
3.26	PHASE	Asked for clarity on the use of the Partial LOAEL and WHO thresholds.
3.27	Heathrow	Explained that the noise exposure maps show the population both above and within the LOAEL and WHO thresholds.
3.28	Reigate & Banstead Borough Council	Asked if the WHO night threshold of 40dB used in the IOA has been validated against noise monitoring data.
3.29	Heathrow	Requested that Reigate and Banstead Borough Council email this query to the Airspace inbox for the noise modelling team members to provide a formal response.
3.30	MRA	Asked if Heathrow can provide data to show the impact of noise and noise concentration for communities directly overflown. Stated the importance of understanding the rate of climb and height contour of departing and arriving aircraft at different times of day as the night period (23:00 – 07:00) is more sensitive. Requested that Heathrow consider this in system options design.
3.31	Heathrow	Explained that the supplementary metrics dashboards show the Partial LOAEL contours for the 16-hour daytime period (07:00 – 23:00) and for the 8-hour night-time period (23:00 – 07:00) for all of the options. The dashboards also include a table and map of overflight rates from rate 1 up to rate 200, compared to the baseline. The results illustrate the impact of concentration from PBN in places: for example, in the slides shown, at rates 1-20 fewer people are overflown by Option A compared to the baseline. However, from overflight rate 50 this trend reverses as more people are overflown this frequently than in the 2019 baseline. This shows the effect of aircraft not being dispersed as the model assumes all aircraft fly the centreline for the PBN option.
3.32	RHC	Asked if the noise exposure change map considers the number of flights.
3.33	Heathrow	Explained that the noise exposure change Partial LOAEL metric is based on 92-days of traffic from June to September in 2019, as per CAP1616 and CAP1616a guidelines. Every track that occurred during this period is modelled, without averaging, to give operations and geography of the baseline, and includes all dispersal that occurs at present.
3.34	Forest Hill Society	Asked if Lewisham is included in the Partial LOAEL contour map. Concerned that Lewisham is not shown on the supplementary metrics dashboard as being affected by aircraft noise as this contradicts field data.
3.35	Heathrow	Stated that some options may include Lewisham within the noise exposure Partial LOAEL contour maps, but Lewisham is not shown within that contour on the example shared in the workshops. Dashboards for all options will be made publicly available on the CAA's portal and stakeholders should let us know if they have specific comments on the results once they have seen them.

#### 4. Heathrow's Approach to Shortlisting Options



Shortlisting methodology and flowchart

4.1	TAG	Suggested that Test 1 does not consider the effect of concentration.
4.2	Heathrow	Stated that the effect of noise concentration can be seen in the Partial LOAEL data and that assessing “the change effect” and newly overflown will be key considerations at system options design.
4.3	RHC	Queried whether Heathrow is considering the impact of options up to 10,000ft.
4.4	Heathrow	Clarified that Heathrow’s ACP is responsible for the design of flight paths up to 7,000ft, but that we are looking to maintain continuous climb for departures up to 10,000ft.
4.5	HASRA	Queried ANG17 altitude-based priority ‘e’ and Test 4 which considers avoiding overflying AONBs and National Parks, asking how Heathrow is prioritising this compared to overflying people.
4.6	MRA, EGAG & Buckingham shire Council	Asked how Heathrow is defining ‘significant’ in their approach to shortlisting options.
4.7	LSRA	Asked for clarity around Test 5, commenting that more flights may have to be routed over residential areas to avoid Richmond Park.
4.8	Heathrow	Explained that an option will only progress through the tests if it passes each one in turn. For each test, a pass means that the impact of that option is not considered to be ‘significantly’ worse than today. Clarified that Test 5 will only be considered when an option had passed Tests 1 – 4. Stated that a qualitative assessment of ‘significant’ is applied to each Test, using professional judgement to decide what constitutes a significant impact in each case.

Worked Example: Tests 1 - 3

4.9	TAG	Asked if Test 2 considers the population experiencing more than one noise event per day. Asked how much fuel tankering took place in the 2019 baseline data.
4.10	Heathrow	Clarified that Test 2 considers the number of people who experience <b>at least one</b> noise event of N65 per day or N60 at night. Heathrow does not currently have information on how much fuel is being carried/tanked.
4.11	EGAG	Queried the use of rate 1 in Test 2, stating that a small minority of people are going to experience high rates of overflight and concentrated flight paths in areas close to the airport. Commented that spreading the noise is fair.
4.12	Heathrow	Recognised that with PBN there will be an impact of concentrated flight paths. This will be considered in the system options design, along with ways to mitigate the impact of noise by providing respite or relief to overflown communities.
4.13	MRA	For Test 3, stated that the baseline will be impacted by track miles and the airlines’ strategy for loading and maintaining their fleet. Asked whether Heathrow is assuming the same fleet mix as the 2019 baseline period.
4.14	Heathrow	Confirmed that the IOA assumes the same aircraft fleet mix as used during the 2019 baseline period. Explained that modelling is based on actual aircraft

		profiles. Average profiles were built for all aircraft types, specific to Heathrow's operations.
4.15	CPRE Oxfordshire & LSRA	Asked how Heathrow is considering future fleet mix and aviation technology.
4.16	Heathrow	Recognised that future aircraft are likely to be quieter due to technological enhancements, so at Stage 3 Heathrow will model anticipated changes in routes and future fleet mix.

*Worked Example: Tests 4 - 6*

4.17	RHC	Asked if Heathrow has engaged with Kew Gardens.
4.18	Heathrow	Confirmed that Kew Gardens has been invited to engagement workshops throughout the ACP, with no response received. Suggested that RHC email the Airspace Inbox with contact details for Kew Gardens if they have them.
4.19	Buckinghamshire Council	Asked if Heathrow has included Chilterns AONB in the study area for the ACP.
4.20	Heathrow	Confirmed that Chilterns AONB is included in the study area.
4.21	EGAG	Asked which AONBs and National Parks are overflowed from 4,000ft – 7,000ft by Heathrow's flight paths.
4.22	Heathrow	Commented that South Downs and Chilterns AONBs are examples of AONBs potentially overflowed by Heathrow's operations below 7,000ft. However, with continuous climb to 6,000ft we would not expect to overfly any AONBs below 7,000ft in practice.

## 5. The Shortlisted Options

*PBN Departures*

5.1	RHC	Asked which baseline is used to assess the runway 09L PBN Departures options, due to the legacy of the Cranford Agreement.
5.2	Heathrow	Confirmed that the baseline is the traffic from runway 09L in 2019 which had very few operations. Explained that because runway 09L is not generally used for departures today, the modelling of the options applied 100% of the 2019 traffic from runway 09R to the routes from runway 09L. This means all 09L departure options perform worse than the baseline. The same approach was taken to the modelling of 09R arrival options since runway 09R is not generally used for arrivals today.
5.3	RHC	Concerned that overflight, as defined by the CAA's CAP1498 document, is being used as the decision-making metric to shortlist the flight path options as it was not designed with the purpose of measuring noise impact.
5.4	Heathrow	Clarified that the IOA shortlisting methodology is not based solely on overflight. Explained that noise impact is assessed by considering numbers of people within the Partial LOAEL and people experiencing an increase in N60 and N65 noise events.
5.5	EANAG, HSPG, Reigate & Banstead Borough	Asked how the ACP has considered Heathrow's project to introduce Easterly Alternation. Asked if the Easterly Alternation project will be implemented at the same time as the Airspace Change.

	Council & FRP	
5.6	Heathrow	Explained that this project requires a successful planning application for infrastructure to enable full Easterly Alternation. Heathrow's current assumption is that Easterly Alternation will be possible by the time this ACP is implemented.
5.7	MRA	Commented that intensification of aircraft noise for a small number of people is an important consideration.
5.8	TAG	Commented that it would be useful to show the baseline overflight contours on the shortlisting maps to allow for comparison.
5.9	Heathrow	Committed to add the baseline 'Do-nothing scenario' maps to the appendix to this engagement material.

### *PBN Arrivals*

5.10	PHASE	Queried why PBN arrivals would be used in the early morning and suggested vectored arrivals could offer greater respite
5.11	Heathrow	Confirmed that vectoring of arrivals in the early morning is still an option but there might be benefits to using PBN arrivals to offer respite by varying routes on different days
5.12	RHC	Commented that some of the PBN Arrivals options have short joining points for the runway. Stated that RHC have conducted modelling on noise exposure rates for tight turns and would be happy to talk Heathrow through their findings.
5.13	Heathrow	Heathrow thanked RHC and asked them to email the Airspace inbox re their noise model.
5.14	LSRA	Asked if the PBN Arrival options assume no change in glide scope angle.
5.15	Heathrow	Stated that all PBN Arrival options assume a 3 degree descent gradient with a mixture of some using Instrument Landing System (ILS) and joining final approach at least 8 miles out, and others using only PBN technology to join final approach closer than 8 miles.
5.16	TAG	For PBN Arrivals options from runway 27R, queried how Heathrow is considering close joining points and the noise impact of tight turns. Commented that noise annoyance will be significantly increased for communities living underneath routes where aircraft must perform tight turns.
5.17	Heathrow	Took an action for the noise modelling team members to respond to TAG's query about the noise impact of tight turning aircraft offline.

### **6. Update on Respite Concepts**

6.1	MRA	Asked if a combination of respite approaches will be applied to the system options design. Suggested that vectoring should be considered for departures as well as arrivals, to avoid concentration of noise over local communities. Asked if Heathrow will provide data on the number of flights and change in noise impact of the proposed airspace design at the Public Consultation.
6.2	Heathrow	Clarified that all new departure flight path options must be designed to a PBN specification, as required by the Government's AMS. At the public consultation Heathrow will need to share detail on numbers of flights, aircraft types and changes in noise levels at a local level.
6.3	RHC	Stated that the pattern of respite is important to local communities.

		Suggested that Heathrow should consider the costs of respite as well as the benefits (i.e. more people overflown)
6.4	HSPG	Suggested that the respite definition for “worth having” needs to be considered in the night period as noise sensitivity varies.
6.5	EGAG	Stated that respite via runway alternation and relief via dispersion should not be mutually exclusive. Asked whether any respite concepts had been discontinued at this stage.
6.6	Heathrow	Stated that the respite concepts provide a high-level understanding of the potential to deliver relief or respite from aircraft noise to overflown areas. Further testing of <b>all four concepts</b> will be carried out during Stage 3 on the system options design, to understand how and where to apply different types of respite and the associated benefits and disbenefits.
6.7	PHASE	Asked if Heathrow is considering a mixture of PBN Arrivals and Vectored Arrivals for the early morning period (04:30 – 06:00).
6.8	Heathrow	Analysis will include testing the use of alternating PBN Arrivals options and Vectored Arrivals options in the less busy early morning period (04:30 – 06:00) to understand any potential impacts.
6.9	TAG	Asked when the Anderson Acoustic report will be available.
6.10	Heathrow	Stated that the Anderson Acoustic respite report has not been published but that it will be the main agenda item for the next Noise and Airspace Community Forum (NACF) meeting on 27 July 2023.
6.11	FRP	Asked what range of distances are considered in the convergence points for the concept to provide respite via the alternation of vectored arrivals.
6.12	Heathrow	Responded that 8 nautical miles is the closest point that aircraft can join the final approach, but that this ranges up to 20-22 nautical miles.

## 7. AOB

7.1	Forest Hill Society	Stated that Forest Hill Society have field measurement data that might contradict the output of Heathrow’s IOA. Asked how local communities can help to validate Heathrow’s model. Asked how Heathrow is engaging with other London airports to understand the potential cumulative impacts of the airports’ ACPs. Commented that Lewisham is overflown by Heathrow Airport and London City Airport.
7.2	Heathrow	Stated that they will consider stakeholder feedback, including fieldwork, at any point in the process. Suggested that this feedback is more applicable at Stage 3 when system options are designed and further appraisal and quantitative analysis is taking place. Stated that Heathrow will continue to collaborate at a technical level with all other airports, NERL and the Airspace Change Organising Group (ACOG) in Stage 3. ACOG is responsible for leading the assessment of cumulative impact of sponsors’ ACPs identifying interdependencies, benefits and trade-offs. Heathrow recognised the impact of multiple routes from different airports overflying communities and will consider a more joined up approach to engagement with neighbouring airports in Stage 3.
7.3	MRA	Asked how Heathrow is considering the impact of PBN flight path options on public health between 1,000 – 4,000ft. Referenced problems experienced by airports in the USA that have implemented PBN. Asked if Heathrow has considered provision of noise insulation for those most impacted by aircraft noise.

7.4	Heathrow	<p>Explained that Heathrow's ACP needs to be consistent with the government's Airspace Modernisation Strategy (AMS) and Air Navigation Guidance 2017 (ANG17). Explained that the altitude-based priorities were applied to Heathrow's shortlisting methodology to provide an initial consideration of the potential environmental and health impacts of the options.</p> <p>Acknowledged the issues experienced in the USA and explained that the IOA results give an indication of the effects of PBN concentration, and Heathrow is exploring how to mitigate these through provision of respite or relief. Stated their intention to continue working with stakeholders in Stage 3 to gather feedback as system options are designed and further respite concept testing is conducted to evaluate the impacts of PBN and ways to mitigate adverse effects.</p> <p>Stated that Heathrow's noise insulation scheme is outside of the scope of this ACP but that such measures will be considered later in the process.</p>
7.5	PHASE	Asked how Heathrow will ensure that pilots fly the designated arrival routes.
7.6	Heathrow	<p>Explained that the flight path options for departures and arrivals will be designed to a specification and that pilots must follow this procedure.</p> <p>Operational procedures such as Noise Abatement Departure Procedures (NADPs) will be considered at Stage 3.</p>

## 8. Next Steps and Closing Remarks

8.1	RHC	Asked how Heathrow is conveying the Stage 2 ACP information publicly to a wider group of stakeholders.
8.2	Heathrow	Stated that currently, engagement is by invitation only, and includes those who were engaged at Stage 1 as required by CAP1616. Heathrow will work closely with stakeholder representatives in Stage 3 to prepare for the Public Consultation where the wider public will be informed.
8.3	HASRA	Requested access to the engagement material prior to future engagement sessions and commented that in-person meetings are preferable.
8.4	Heathrow	Noted HASRA's point and explained that the slides will be circulated after all engagement sessions have concluded. Stated that Heathrow will email stakeholders to inform them when the Heathrow Stage 2 Submission documentation is publicly available on the CAA's Airspace Change Portal.
8.5	EGAG	<p>Stated that showing different rates of overflight would be useful to understand the effect of PBN concentration.</p> <p>Repeated a previous request that Heathrow upload the GIS files used to produce the CLOO maps to a publicly accessible web server for sharing with wider members of the group.</p>
8.6	Heathrow	<p>Clarified that the supplementary metrics dashboards shown on slide 19 include incremental rates of overflight from rate 1 up to rate 200 and the effect of concentration is visible. A dashboard for the day and night periods per option will be included in Heathrow's Stage 2 Submission to the CAA.</p> <p>Asked EGAG to formally submit their request regarding the GIS Shapefiles to the Airspace Inbox and Heathrow will provide a considered response.</p>
8.7	HSPG	Asked when stakeholders will be engaged on the full system options design.
8.8	Heathrow	Stated that following CAA approval of the Heathrow Stage 2 Gateway Submission, the ACP will progress to Stage 3. An initial task will be to design system options. Heathrow is still developing the engagement plan for Stage 3 but confirmed that system options will be presented at the full Public Consultation at the end of Stage 3.



8.9	Heathrow	Thanked the stakeholders and the Heathrow Team for their time. Asked stakeholders to send any comments or questions to the Airspace Inbox. Stated that Heathrow will be in contact in due course with plans for stakeholder engagement in Stage 3.
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# Step 2B Initial Options Appraisal Sessions

Report of sessions between the Heathrow Airspace Modernisation Team and industry stakeholder group representatives (3 – 5 July 2023, 4 x 1.5-hour online sessions, Microsoft Teams)

## Attendees:

Stakeholder Group / Organisation:	Heathrow Representatives:
Airspace Change Organising Group (ACOG) American Airlines Biggin Hill Airport Blackbushe Airport Ltd British Airline Pilots Association (BALPA) British Airways Delta Denham Aerodrome Fair Oaks Airport Farnborough Airport Future Aviation Industry Working Group on Airspace Integration (FAIWG-AI) Gatwick Airport Luton Airport Southampton Airport Southend Airport Stansted Airport Ministry of Defence – Defence Airspace and Air Traffic Management (MoD DAATM) National Air Traffic Services (NATS) EN-Route (NERL) RAF Northolt Virgin Atlantic	[REDACTED] [REDACTED] [REDACTED] [REDACTED]

Throughout this note comments and questions from the 33 attendees are attributed to the organisation they represent, rather than the individual.

A slide pack was presented during the discussion and shared with stakeholders afterwards. The structure of the report reflects the agenda and order in which the slides were presented, but key discussion points have been grouped into sub-sections where appropriate.

1. Purpose of the Session
2. Heathrow’s Approach to the Initial Options Appraisal (IOA)
3. Heathrow’s Approach to Shortlisting Options
4. AOB
5. Next Steps and Closing Remarks

## Notes from the Discussion:

### 1. Purpose of the Session

1.1	Heathrow	Welcomed stakeholders and set out that the purpose of the session is to: a) explain the approach taken to the Initial Options Appraisal (IOA) and the shortlisting of options, summarising the results, and b) to share an update on the work to explore respite concepts.
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### 2. Heathrow’s Approach to the Initial Options Appraisal (IOA)

#### Methodology

2.1	British Airways	Asked whether the population data in the IOA accounts for future population growth.
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2.2	FAIWG-AI	Asked whether Heathrow is considering other airspace users and future forms of aviation technology such as Advanced Air Mobility or drones.
2.3	Heathrow	<p>Stated that the CACI 2021 census data is an input to the IOA, and that Heathrow contacted 77 local authorities for their local plans and information on proposed noise sensitive developments. This data will be used to evaluate the system options design at Stage 3.</p> <p>Stated that the IOA includes a qualitative assessment using professional judgement of other airspace users and future forms of aviation technology.</p>

#### Appendix E Dashboards

2.4	Denham Aerodrome	Pointed out that Denham Aerodrome is not listed in the 'Interdependencies, Conflicts & Trade-Offs' on the second page of the Appendix E dashboard example for PBN Departure Option A for runway 27L (slide 17). Asked at what stage Denham Aerodrome's operations would be considered in Heathrow's Airspace Change Proposal (ACP).
2.5	British Airways	Asked if Heathrow is considering the vertical profile of aircraft, including Noise Abatement Departure Procedure 1 (NADP), NADP 2, and steeper climb gradients in the IOA.
2.6	American Airlines	Asked if Heathrow is considering slightly steeper approaches and how this is evaluated regarding the trade-offs with noise and greenhouse gas emissions.
2.7	BALPA	Asked why Heathrow is not considering NADP 1 and NADP 2 in Stage 2. Asked if Heathrow is engaging with other international airports, such as Charles de Gaulle (CDG) Airport who uses NADP1 as standard operation mode for aircraft.
2.8	Heathrow	<p>Stated that in Stage 2, Heathrow is considering airports that are within the Government's Future Airspace Strategy Implementation South (FASI-S) airspace change programme. In Stage 3 Heathrow will consider all airports and local airfields, including Denham Aerodrome, that its operations interact with locally within its controlled airspace. The system options design will allow consideration of the horizontal climb profile of aircraft and egress, ingress, and access for other airspace users.</p> <p>Stated that Heathrow assumed a 5.5% continuous climb gradient from the runway end to 7,000ft. For arrivals, Heathrow assumed a continuous descent operation from 7,000ft at 3 degrees. Acknowledged the need to balance stakeholder priorities between costs for airlines, increased noise, and greenhouse gas emissions. Heathrow will continue to work with stakeholders in Stage 3 to understand the potential trade-offs and how to manage these.</p> <p>Requested that American Airlines submit their query regarding slightly steeper approaches to the Airspace Inbox and Heathrow will provide a formal response.</p> <p>Stated that NADP1 and NADP2 will be applied in Stage 3 when system options have been designed. Explained that Heathrow's work has found 9 different variants of NADPs, and that Heathrow is working with the CAA to understand the pros and cons associated with each. Explained that following a community stakeholder group suggestion, Heathrow has commissioned the Chief Technical Noise Advisor at the CAA to undertake a Departures Study. Stated that the output of this research will be published by the CAA.</p>

		Stated that engagement with CDG has not taken place at Stage 2 but recognised the importance of engaging with other airports as far as practicable in Stage 3, taking account of best practice
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### 3. Heathrow's Approach to Shortlisting Options

3.1	Blackbushe Airport	Asked how Heathrow is considering newly overflowed communities in their approach to shortlisting options.
3.2	Heathrow	Stated that at Stage 2, the options are appraised and shortlisted in single mode as groups of PBN Departure routes or individual PBN Arrivals options. The IOA has shown, at a high-level, an early indication of the effects of PBN routes and concentration. The respite concepts work has explored the potential to provide respite or relief to mitigate adverse impacts of aircraft noise, although this may increase the number of people newly overflowed. At Stage 3, when system options are designed Heathrow will consider the impact on newly overflowed communities and how to provide respite or relief from aircraft noise.

3.3	American Airlines	Asked for clarity around the future use of runway 09L for departures, as per the plan for Heathrow's Easterly Alternation project.
3.4	Heathrow	Confirmed that runway 09L is not generally used for departures today due to the Cranford Agreement. Explained that runway 09L is used for departures on rare occasions when 09R is out of operation in single runway mode, for example during the Covid-19 pandemic. Heathrow's Easterly Alternation project requires a successful planning application to grant the building of the taxiway infrastructure to enable full Easterly Alternation. Heathrow's assumption is that this ACP will help to enable Easterly Alternation to enable maximum use of runway alternation for Heathrow arrivals and departures.

### 4. AOB

4.1	BALPA	Asked whether Heathrow's ACP will need to be reconsidered if the rumoured Third Runway planning application goes ahead.
4.2	Heathrow	Confirmed that work remains paused on the application for planning consent for Heathrow expansion. Stated that this ACP is for Heathrow's existing two runways with 480,000 air traffic movements (ATMs) per year, as per the government's cap.

4.3	American Airlines	Asked at what Stage the CAA will provide comments on Heathrow's ACP designs.
4.4	Heathrow	Explained that at the Stage 2 Gateway the CAA will assess Heathrow's Submission documentation and supporting evidence against a defined set of criteria on a pass/fail basis. The CAA will begin to make judgements on Heathrow's proposed airspace designs later in the process when these are in system options configuration and the level of analysis is detailed.

### 5. Next Steps and Closing Remarks

5.1	American Airlines	Asked if the presentation will be shared after the session.
5.2	Heathrow	Thanked the stakeholders and the Heathrow Team for their time. Stated that the engagement material would be shared with stakeholders following

		completion of all the session on 5 July. Asked stakeholders to send any comments or questions to the Airspace Inbox.
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