



## CAA CAP 1616 Options Appraisal Assessment (Phase I Initial)

|   |   |                                 |                            |
|---|---|---------------------------------|----------------------------|
| <b>Title of Airspace Change Proposal:</b> | Heathrow Airport R2 FASI (LTMA Cluster) |                                 |                            |
| <b>Change Sponsor:</b>                    | Heathrow Airport Ltd                    |                                 |                            |
| <b>ACP Project Ref Number:</b>            | ACP-2021-056                            |                                 |                            |
| <b>Case study commencement date:</b>      | <a href="#">07/06/2024</a>              | <b>Case study report as at:</b> | <a href="#">03/07/2024</a> |

|  |            |  |            |  |            |   |            |
|--|------------|--|------------|--|------------|---|------------|
| <b>Account Manager:</b><br>[REDACTED]                | [REDACTED] | <b>Airspace Regulator (Engagement &amp; Consultation):</b><br>[REDACTED] | [REDACTED] | <b>IFP:</b><br>[REDACTED]                            | [REDACTED] | <b>OGC:</b><br>[REDACTED]                     | [REDACTED] |
| <b>Airspace Regulator (Technical):</b><br>[REDACTED] | [REDACTED] | <b>Airspace Regulator (Environmental):</b><br>[REDACTED]                 | [REDACTED] | <b>Airspace Regulator (Economist):</b><br>[REDACTED] | [REDACTED] | <b>ATM (Inspector ATS Ops):</b><br>[REDACTED] | [REDACTED] |

**Instructions**

To aid the SARG project leader's efficient project management, please highlight the "status" cell for each question using one of the four colours to illustrate if it is:

Resolved - GREEN    
 Not Resolved – AMBER    
 Not Compliant – RED    
 Not Applicable - GREY

**Guidance**

The broad principle of economic impact analysis is **proportionality**; is the level of analysis involved proportionate to the likely impact from that ACP. There are three broad levels of economic analysis; qualitative discussion, quantified through metrics, and monetised in £ terms. The more significant the impact, the greater should be the effort by sponsors to quantify and monetise the impact.

| 1. Background – Identifying the impact of the options (including Do Nothing (DN) / Do Minimum (DM)) |   | Status  |
|---|---|---|
| 1.1   | <b>Are the outcomes of the Initial Options Appraisal (IOA) (Phase I) clearly outlined in the proposal?</b>  |   |
| 1.1.1   | Has the change sponsor completed an Initial Options Appraisal? [E12]  | Yes, the Sponsor has submitted a 107-page Initial Options Appraisal with its application. There are several hundred pages of tables in addition in which the Sponsor assesses the options individually.   |
| 1.1.2   | Does the Initial Options Appraisal include:<br>- a comprehensive list of viable options;<br>- a clear description of the baseline scenario;<br>- an indication of the environmental impacts;<br>- a high-level assessment of costs and benefit involved | <p>The sponsor developed a comprehensive list of options (not explicitly only viable options) for Stage 2A. Its Comprehensive List of Options (CLOO) consists of 181 options. These are split into 40 groups of Performance Based Navigation (PBN) Departure options. The 181 options identified include 12 baseline 'Do Nothing' options (for PBN Departures, PBN Arrivals and Vectored Arrivals to/from each of Heathrow's four runways – runways 27L, 27R, 09L and 09R). The baseline is defined in Section 3.2 of the IOA.</p> <p>There is no explicit list of viable options in the IOA. However, Heathrow has then shortlisted 151 of those 181 options on the basis of government policy and CAP1616. It describes its shortlisting methodology in Section 5.3 of the IOA and provides a worked example in Section 5.4. It sets out the results of the shortlisting process in Section 5.5.</p> <p>The baseline for the initial options appraisal has been clearly defined based on the NTK data from the 92-day summer period in 2019 (except for 09L departures which use 2020 data due to Single Runway Operations, and operations between 0430-0600 for PBN Arrivals). Additional elements related to the local urban and geographical features, flight patterns and runway usage have also been provided.</p> |

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|-------|--|--|--|
|       |  | Each option, including its associated baseline, has been subjected to a partial environmental assessment which includes impacts from noise, fuel burn and associated CO2 emissions, air quality, tranquillity, and biodiversity.   |  |
| 1.1.3 | Has the sponsor stated on what criteria the comprehensive list of viable options has been assessed?  | Yes. Section 3.6 lists the criteria on which the options are assessed, as developed from the design principles and CAP1616.  | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 1.1.4 | Where options have been discounted as part of the IOA exercise, does the change sponsor clearly set out why?   | Yes, the tables in Section 5.5 indicate why options have been discounted, or 'discontinued' as Heathrow refers to it.  | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 1.1.5 | Has the change sponsor indicated their preferred option(s) as a result of the IOA (Phase I - Initial)? [E12]   | No. Section 5.6 of the IOA states that "As the options are still currently in runway direction groupings, Heathrow does not have a preferred option at this stage."  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> |
| 1.1.6 | Does the IOA (Phase I - Initial) detail what evidence the change sponsor will collect, and how, to fill in any evidence gaps and how this will be used to develop the Options Appraisal (Phase II - Full)? | Yes, paragraph 7.2.2 indicates the evidence that Heathrow intends to collect as it moves into Stage 3. The use of the word "includes" in that paragraph suggests that the list is not exhaustive.  | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 1.1.7 | Does the plan for evidence gathering cover all reasonable impacts of the change? [E12]   | The plan for evidence gathering covers: <ul style="list-style-type: none"> <li>- Noise</li> <li>- Biodiversity</li> <li>- ANS costs</li> <li>- Fleet mix</li> <li>- Network effects</li> <li>- CO2 emissions</li> </ul> It could also usefully cover economic impacts on airlines and the wider economy, if any. | <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

| 2. Impacts of the proposed airspace change |   | Status                              |                          |                          |                          |
|--|---|-------------------------------------|--------------------------|--------------------------|--------------------------|
| 2.1  | Are there direct impacts on the following:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.1                                      | <i>Examples of costs considered (please add costs that have been discussed, and any reasonable costs that the Airspace Regulator (Technical) feels have NOT been addressed)</i> |                                     |                          |                          |                          |
| 2.1.2                                      | Airport/ANSPs   | Not applicable                      | Qualitative              | Quantified               | Monetised                |

|       |  |                |  |            |           |
|-------|--|----------------|--|------------|-----------|
|       | - Infrastructure   |                | X  |            |           |
|       | - Operation  |                | X  |            |           |
|       | - Deployment   |                | X  |            |           |
|       | - Other(s)   | X              |  |            |           |
| 2.1.3 | Commercial Airlines/General Aviation   | Not applicable | Qualitative  | Quantified | Monetised |
|       | - Training   |                | X  |            |           |
|       | - Economic impact from increased effective capacity  |                | X  |            |           |
|       | - Fuel burn  |                |  | X          |           |
|       | - Other(s)   |                | X  |            |           |
| 2.1.4 | General Aviation   | Not applicable | Qualitative  | Quantified | Monetised |
|       | - Access   |                | X  |            |           |
| 2.1.5 | Military   | Not applicable | Qualitative  | Quantified | Monetised |
|       |  |                |  |            |           |
| 2.1.6 | Wider society, i.e., wider economic benefits, capacity resilience  | Not applicable | Qualitative  | Quantified | Monetised |
|       | - Capacity/resilience  |                | X  |            |           |
| 2.1.7 | Other (provide details)  |                |  |            |           |
|       |  |                |  |            |           |
| 2.2   | <p><b>Are there direct beneficial impacts on air traffic control / management systems? Provide details.</b></p> <p>None identified.</p>  |                | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |            |           |
| 2.3   | <p><b>Where impacts have been monetised, what is the overall value (expressed in net present value (NPV)) of the project?</b></p> <p>The Sponsor has undertaken no such analysis at this stage of the ACP.</p>                           |                |  |            |           |
| 2.4   | <p><b>Has the sponsor provided an accurate and proportionate assessment of the proposed airspace change impacts?</b></p> <p>The assessment seems proportionate at this stage. Further quantitative analysis is promised for Stage 3.</p> |                | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |            |           |

| 3. Changes in air traffic movements and projections |   |                |             | Status   |
|---|---|----------------|-------------|--|
| 3.1   | If the proposed airspace change has an impact on the following factors, have they been addressed in the proposal?   |                |             | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
|   |   | Not applicable | Qualitative | Quantified/<br>Monetised   |
| 3.1.1   | Number of aircraft movements  |                | X           |  |
| 3.1.2   | Number of air passengers / cargo  | X              |             |  |
| 3.1.3   | Type of aircraft movements (i.e., fleet mix)  | X              |             |  |
| 3.1.4   | Distance travelled  | X              |             |  |
| 3.1.5   | Operational complexities for users of airspace  |                | X           |  |
| 3.1.6   | Flight time savings / Delays  | X              |             |  |
| 3.1.7   | Other impacts   |                |             |  |
|   | <b>Comments:</b><br>The Sponsor states that the 480k ATM cap means that it is difficult to envisage much change on many of the above metrics.   |                |             |  |
| 3.2   | <ul style="list-style-type: none"> <li>Has the sponsor used the most up-to-date, credible, and clearly referenced source of data to develop the 10 years traffic forecast and considered the available guidelines (i.e., the Green Book and TAG models) in a proportionate and accurate manner? [B11 and E11]</li> </ul> The sponsor forecasts ATMs for seven years ahead limited by its 480k cap. It says that: "The forecast currently remains in line with the 480,000-movement cap, which is comparable with the baseline". |                |             | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
|   | <ul style="list-style-type: none"> <li>Has the sponsor explained the methodology adopted to reach its input and analysis results? [B11 and E11]</li> </ul> Section 3.2 describes the methodology used to derive its traffic forecasts.  |                |             |  |
|   | The environmental assessment uses well referenced sources of data and modelling has been undertaken using AEDT. The methodology followed for the quantified assessments is well explained and all assumptions are clearly stated.   |                |             |  |
| 3.3   | Has the sponsor developed an assessment of the following environmental aspects?   |                |             | <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

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|-------|---|----------------|-------------|------------|-----------|
|       | <p>The sponsor has assessed the following metrics for individual route options in their initial options appraisal:</p> <ul style="list-style-type: none"> <li>Noise: population overflown below 7,000 ft.; population experiencing N65 and N60 events; population above LOAEL; population above WHO recommended guideline values; population experiencing 1 dB changes in LOAEL</li> <li>CO2 (not performed for vectored arrivals): track miles and fuel burn as proxy</li> <li>LAQ: qualitative assessment whether design options have potential to change track distribution within an AQMA below 1,000 ft.</li> <li>Tranquillity: area of AONB, National Parks, and others overflown under 7,000 ft. and experiencing at least one N65 event per day</li> <li>Biodiversity: number of EU Protected sites experiencing a change in location overflown between 0 – 1,640 ft., 0 – 3,000 ft.</li> </ul> |                |             |            |           |
|       |   | Not applicable | Qualitative | Quantified | Monetised |
| 3.3.1 | Noise   |                | X           | X          |           |
| 3.3.2 | Operational diagrams  |                | X           |            |           |
| 3.3.3 | Overflight  |                | X           | X          |           |
| 3.3.4 | CO2 emissions   |                | X           |            |           |
| 3.3.5 | Local air quality   |                | X           |            |           |
| 3.3.6 | Tranquillity  |                | X           | X          |           |
| 3.3.7 | Biodiversity  |                | X           | X          |           |
| 3.4   | <p><b>What is the monetised impact (i.e., Net Present Value (NPV)) of 3.3? (Provide comments)</b><br/>                     The sponsor has not undertaken any monetisation of 3.3.</p>  |                |             |            |           |

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| <b>4. Economic Indicators of the ACP</b> |   |
| 4.1                                      | <p><b>What are the qualitative / strategic impacts described in the ACP?</b><br/>                     The Sponsor has studied 169 options and shortlisted 151. The qualitative impacts are too numerous and complicated for a simple summary. However, they are centred around ANSP and AMS impacts, as well as safety.</p> |
| 4.2                                      | <p><b>What is the overall monetised and non-monetised (quantified) impact of the proposed airspace change?</b><br/>                     No preferred option is identified, so no proposed impact is assessed.</p>   |
| 4.3                                      | <p><b>What is the Net Present Value of the proposed options? Has the sponsor used this information to progress/discount options? Has the sponsor provided the benefits-costs ratio (BCR) of the proposed options and used it to support the choice of the preferred</b></p>   |

|       |   |
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|       | <b>options? [E44]</b><br>The Sponsor has not undertaken any NPV analysis at this stage, though this will be completed in Stage 3.   |
| 4.3.1 | <b>If the preferred option does not have the highest NPV or BCR, then has the sponsor justified the reasons to progress this option? [B50 and E23]</b><br>N/A   |
| 4.4   | Have the sponsors provided reasonable justification for the proportionality of analysis above? <span style="float: right;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </span> |

|                         |     |
|-------------------------|-----|
| <b>5. Other aspects</b> |     |
| 5.1                     | N/A |

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|--|---|
| <b>6. Summary of the Initial Options Appraisal &amp; Conclusions</b> |   |
| 6.1  | Overall, the analysis contained in the IOA seems proportionate given there are so many shortlisted options. It would be extremely demanding and likely disproportionate to require the Sponsor to undertake detailed quantitative and monetised analysis on each. However, it will be necessary to undertake this once this stage has been completed. |

| CAA Initial Options Appraisal Completed by | Name       | Signature  | Date       |
|--|------------|------------|------------|
| Airspace Regulator (Economist)             | [REDACTED] | [REDACTED] | 03/07/2024 |
| Airspace Regulator (Environmental)         | [REDACTED] | [REDACTED] | 03/07/2024 |