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

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| **Title of Airspace Change Proposal:** | Southampton Airport FASI (LTMA Cluster) | | |
| **Change Sponsor:** | Southampton Airport International Ltd | | |
| **ACP Project Ref Number:** | ACP-2019-03 | | |
| **Case study commencement date:** | 30/12/2022 | **Case study report as at:** | 03/02/2023 |

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|---|---|---|---|
| **Account Manager:** [redacted] | **Airspace Regulator (Engagement & Consultation):** [redacted] | **IFP:** [redacted] | **OGC:** [redacted] |
| **Airspace Regulator (Technical):** [redacted] | **Airspace Regulator (Environmental):** [redacted] | **Airspace Regulator (Economist):** [redacted] | **ATM (Inspector ATS Ops):** [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 |
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| 1.1 | **Are the outcomes of the Initial Options Appraisal (IOA) (Phase I) clearly outlined in the proposal?** | | ☒ ☐ ☐ ☐ |
| 1.1.1 | Has the change sponsor completed an Initial Options Appraisal? [E12] | Yes, the Initial Options Appraisal is included with the application. In addition, the Sponsor has provided a separate summary of each of the options which shows them on maps of the airport and the surrounding area. | ☒ ☐ ☐ ☐ |
| 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 | A Table in Section 2 of the IOA lists the four options under consideration, and each is described in a Table. Two additional options, the Do Nothing option and Option 2, were discounted, and hence not included in the Table. It might be clearer for consultees to include those options in the Table, and state that they are not under consideration for safety reasons.<br><br>The first section of Chapter 4 of the IOA describes the baseline scenario. It assesses each criterion with respect to that scenario. The IOA describes the baseline scenario as "Do Nothing", and refers the reader to the Stage 2A submission document for a more detailed description.<br><br>SOU is currently undergoing a runway extension project that is due completion by summer 2023. The sponsor states that this project will support an increase in the frequency of A320 southbound movements, although with an incorporated cap of 3 million passengers per annum. The do-nothing baseline includes this runway extension in operation with the implementation year of the ACP set as 2027.<br><br>The environmental impacts against which each option is assessed are: noise, tranquillity, air quality, CO2 emissions, fuel burn and biodiversity. The assessments of these are qualitative at this stage. | ☒ ☐ ☐ ☐ |

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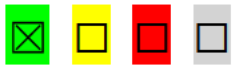
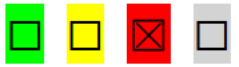
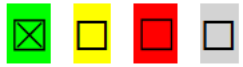
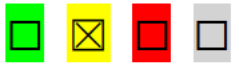
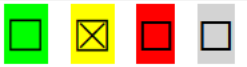
| | | Each option is assessed qualitatively against the criteria listed. All the assessments are qualitative at this stage, except for the noise impact work which is to some extent quantitative. | |
| 1.1.3 | Has the sponsor stated on what criteria the comprehensive list of viable options has been assessed? | Yes. Table 5 shows the criteria against which the options are assessed. In addition to the criteria in CAP 1616, the Sponsor has also added a criteria called 'Interdependencies, conflicts and trade-offs' to satisfy the requirements to outline potential interdependencies with other FASI-S ACPs, and 'Airspace Modernisation Strategy' to satisfy the 7 confirmed indicators that the CAA will use to assess whether this Stage 2 submission accords with the AMS including iteration 2 of the Masterplan. |  |
| 1.1.4 | Where options have been discounted as part of the IOA exercise, does the change sponsor clearly set out why? | The Sponsor had already rejected the Baseline and Option 2 for AMS and safety reasons.<br><br>Option 3 is discounted as part of the IOA exercise in the summary Table in Section 5 of the IOA. However, the explanation in that Table is not clear. |  |
| 1.1.5 | Has the change sponsor indicated their preferred option(s) as a result of the IOA (Phase I - Initial)? [E12] | No, the Sponsor has not indicated a preferred option at this stage. Options 1, 4 and 5 progress to the next stage and the Sponsor discounts Option 3.<br><br>However, the final paragraph of Section 5 indicates a preference for certain runway arrangements. |  |
| 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)? | Section 5 contains a bulleted list of the information the Sponsor plans to collect. It does not indicate how it will collect this information. |  |
| 1.1.7 | Does the plan for evidence gathering cover all reasonable impacts of the change? [E12] | The plan for evidence gathering is high level, but seems to cover all reasonable impacts of the change. Further |  |

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| | | information on the information to be gathered could usefully be provided. | |

| 2. Impacts of the proposed airspace change | | | | | | Status |
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| 2.1 | **Are there direct impacts on the following:** | | | | | ☒ ☐ ☐ ☐ |
| 2.1.1 | *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)*<br><br>The costs of IFP development, approval and maintenance have not been mentioned in the Airport/ANSP costs<br>. | | | | | |
| 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 | 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 | |
| | | X | | | | |

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| 2.1.6 | Wider society, i.e., wider economic benefits, capacity resilience | Not applicable | Qualitative | Quantified | Monetised |
| | Greenhouse gas emissions | | X | | |
| | Capacity/Resilience | | X | | |
| | Air quality | | X | | |
| 2.1.7 | Other (provide details) | Not applicable | Qualitative | Quantified | Monetised |
| | Noise impact on health and quality of life | | X | X | |
| | Interdependencies, conflicts and tradeoffs | | X | | |

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| **2.2** | **Are there direct beneficial impacts on air traffic control / management systems? Provide details.**<br>No, the impact identified on air traffic control system is an increased training requirement. The Sponsor does not specify or quantify the likely magnitude of this.<br><br>CB – while there are no financial benefits to ATC described, the sponsor has described the benefit of significantly reduced ATC workload through the introduction of SIDs and PBN arrival transitions. | ☐ ☐ ☐ ☒ |
| **2.3** | **Where impacts have been monetised, what is the overall value (expressed in net present value (NPV)) of the project?**<br><br>The sponsor has monetised no impacts of the change at this stage, though such analysis is promised for Stage 3. | |
| **2.4** | **Has the sponsor provided an accurate and proportionate assessment of the proposed airspace change impacts?**<br>The Sponsor has provided little quantification of the likely impacts of its proposal, so the question of whether such impacts seem accurate or proportionate is somewhat moot. Its assessment of the qualitative impacts seems by and large to be proportionate at this stage. The Sponsor has committed to producing further analysis in Stage 3, and, in particular, to quantifying and monetising certain of the impacts. | ☒ ☐ ☐ ☐ |

| **3. Changes in air traffic movements and projections** | | | | **Status** |
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| **3.1** | **If the proposed airspace change has an impact on the following factors, have they been addressed in the proposal?** | | | ☐ ☒ ☐ ☐ |
| | | Not applicable | Qualitative | Quantified/ Monetised |
| 3.1.1 | Number of aircraft movements | X | | |

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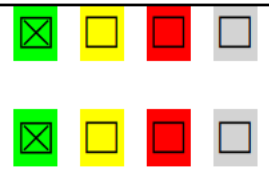
| 3.1.2 | Number of air passengers / cargo | X | | |
| 3.1.3 | Type of aircraft movements (i.e., fleet mix) | | X | |
| 3.1.4 | Distance travelled | | X | |
| 3.1.5 | Operational complexities for users of airspace | | X | |
| 3.1.6 | Flight time savings / Delays | X | | |
| 3.1.7 | Other impacts | X | | |
| | **Comments:**<br><br>The Sponsor promises quantitative analysis of the fleet mix for stage 3. The IA does not mention or address the impact on flight time savings/delays, though one can infer this from the (small) track distance changes projected. | | | |
| **3.2** | • 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]<br>• Has the sponsor explained the methodology adopted to reach its input and analysis results? [B11 and E11]<br><br>The traffic forecast provided by the sponsor extends from 2027 to 2038 (i.e. for a period of at least 10 years from the intended year of implementation). The traffic forecast has been developed from the runway extension planning application forecast with some adjustments made as a consequence of recovery from Covid-19. SOU is expected to reach its cap of 3 mppa by 2033 and therefore the forecast traffic movements are consistently at 37,443 from 2033 out to 2038. It is important to note here that the forecast increase in traffic and its associated environmental impacts are due to the runway extension project and therefore not a direct consequence of this ACP. The sponsor states that this ACP does not facilitate any future growth for the airport or offer any increased capacity and therefore has only provided a single set of traffic forecasts in line with the requirements of CAP1616 para B31-32. Along with the traffic forecast, the sponsor has provided an expected future fleet mix as of 2033, referenced again from the runway extension planning application.<br><br>In terms of the environmental assessment, the sponsor has described the methodology and assumptions used to reach its analysis outcome: heatmap baseline to depict overflight swathes of arrivals/departures, average centreline baseline of vectored tracks (based on the 2022 92-day NTK data) and PBN centreline overflight for design options, representative A320 aircraft type and profile as in ANP/AEDT, single noise event overflight contours as per CAP1498, ECAC Doc 29 and Airspace Optioneering Tool for LAmax contours, CACI population data for 2021, PointX data to |  | |

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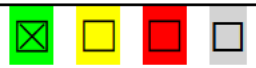
| | identify noise sensitive buildings, etc. | |
| 3.3 | **Has the sponsor developed an assessment of the following environmental aspects?**<br>The sponsor has assessed all environmental metrics required for Stage 2 with a qualitative description, supported by some quantified analysis for noise impacts:<br>Noise and tranquillity: qualitative description of the expected changes to the size and shape of the LOAEL contours as compared to the baseline scenario; overflight contours and 65 dB LAmax modelling for impacted population numbers, area and count for New Forest National Park, South Downs National Park and Isle of Wight AONB and other noise sensitive receptors<br>Air quality: identification of AQMAs in the vicinity of the airport and a qualitative assessment of whether changes to flight paths below 1,000 ft. are anticipated as a result of the different design options<br>CO2 emissions: difference between track lengths of the design route options compared to the average centreline baseline of vectored tracks along with opportunity for CCO and CDO to/from 7,000 ft.<br>Biodiversity: identification of EU Protected Sites in the vicinity and a qualitative assessment of whether changes to flight paths at or below 500 m or 1,640 ft. are likely to cause impacts upon biodiversity |  |

| | | 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 | | |

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| 3.4 | **What is the monetised impact (i.e., Net Present Value (NPV)) of 3.3? (Provide comments)**<br><br>Not provided at this stage, though promised for Stage 3. |

| 4. Economic Indicators of the ACP | Status |
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| 4.1 | **What are the qualitative / strategic impacts described in the ACP?**<br><br>Each of the four Options analysed has different impacts. In summary, Option 1 (progressed to Stage 3) will: |

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| | • Modernise Southampton's airspace by introducing PBN arrival and departure routes,<br>• Maintain LAeq noise impacts similar to the baseline,<br>• Offer an overall decrease in population overflown compared to today, however the frequency of overflight would increase for those living under the routes.<br>• Maintain similar track distances (and associated Fuel Burn and Greenhouse Gas emission impacts) to the baseline or may potentially slightly increase track distance.<br>• Require additional new CAS compared to the baseline in order to accommodate the runway 20 arrival and 02 arrival routes, possibly allowing reductions in other volumes of CAS and improved access owing to the reduced ATC workload.<br><br>Option 3 (rejected) was expected to:<br><br>• Modernise Southampton's airspace by introducing PBN arrival and departure routes,<br>• Reduce the number of population within these contours however owing to the population density of these areas potentially affected<br>• Adversely impact those communities living under the straight-ahead sections/final approach.<br>• Offer an overall decrease in population overflown compared to today, however the frequency of overflight would increase for those living under the routes.<br>• Increase the frequency of overflight and introduce overflight at lower altitudes over areas not currently overflown in the baseline, or areas that are relatively infrequently overflown in the baseline.<br>• Result in a reduction of population however large areas will newly fall into the contour area and therefore this could result in a significant change in noise environment.<br>• Significantly reduce overflight of the South Downs and New Forest National Parks.<br>• Result in an increase in track distance (and associated Fuel Burn and Greenhouse Gas emission impacts)<br>• Require a considerable amount of CAS compared to the baseline.<br><br>Option 4 (progressed) is expected to:<br><br>• Modernise Southampton's airspace by introducing PBN arrival and departure routes,<br>• slightly decrease the population within the contours to the south of the airport and possible slightly increase population to the north.<br>• Offer an overall decrease in population overflown compared to today<br>• Increase the frequency of overflight and introduce overflight at lower altitudes over areas not currently overflown in the baseline, or areas that are relatively infrequently overflown in the baseline.<br>• Remove the cumulative overflight impacts of the Winchester Orbit which also significantly reduces overflight of the South Downs National Park.<br>• Result in a reduction of population for the arrivals and an increase for the departures. Large areas of departures will newly fall into the contour area and therefore this could result in a significant change in noise environment compared to the baseline.<br>• Decrease (improve) track distance (and associated Fuel Burn and Greenhouse Gas emission impacts) and improve CCO/CDO compared to the baseline.<br>• Require a considerable amount of CAS compared to the baseline. |

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| | •<br>**Option 5 (progressed) is expected to:**<br><br>• Modernise Southampton's airspace by introducing PBN arrival and departure routes.<br>• Maintain $L_{Aeq}$ noise impacts similar to the baseline.<br>• Offer an overall decrease in population overflown compared to today, however the frequency of overflight would increase for those living under the routes.<br>• Partially remove the cumulative overflight impacts of the Winchester Orbit<br>• runway 02 departures could improve population within the 65dB contour, and the runway 20 departures could increase population within the contour.<br>• Maintain similar track distances or slightly increase track distance. This option offers the opportunity for improved CCO/CDO performance compared to the baseline.<br>• Require additional new CAS<br>• Offer opportunities for reductions in other volumes of CAS and improved access owing to the reduced ATC workload. |
| **4.2** | **What is the overall monetised and non-monetised (quantified) impact of the proposed airspace change?**<br>N/A. The Sponsor promises quantification and monetisation for Stage 3. |
| **4.3** | **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 options? [E44]**<br>N/A. The Sponsor promises quantification and monetisation for Stage 3. |
| **4.3.1** | **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]**<br>N/A. The Sponsor promises quantification and monetisation for Stage 3. |
| **4.4** | **Have the sponsors provided reasonable justification for the proportionality of analysis above?**<br>N/A. The Sponsor promises quantification and monetisation for Stage 3. ☐ ☐ ☐ ☒ |

| **5. Other aspects** | |
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| **5.1** | N/A |

**6. Summary of the Initial Options Appraisal & Conclusions**

| 6.1 | |
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| Outstanding issues | | |
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| Serial | Issue | Action required |
| 1 | No analysis of impact of change on flight/time delays | Undertake analysis on flight time/delays, or state that there is unlikely to be any such impact. Present the results of the analysis, if any.<br><br>**03/02/2023: The change sponsor has satisfactorily addressed this post Gateway action.** |
| 2 | Option 3 is discounted as part of the IOA exercise in the summary Table in Section 5 of the IOA. However, the explanation in that Table is not clear. | Clarify why Option 3 was discounted and provide a clear explanation in summary Table in Section 5 of the IOA.<br><br>**03/02/2023: The change sponsor has satisfactorily addressed this post Gateway action.** |
| 3 | Evidence collection to fill in gaps between the IOA Phase I and IOA Phase 2 explanation unclear | Clarify the evidence to be collected and the sources of that evidence.<br><br>**03/02/2023: The change sponsor has satisfactorily addressed this post Gateway action.** |

| CAA Initial Options Appraisal Completed by | Name | Signature | Date |
|---|---|---|---|
| Airspace Regulator (Economist) | [redacted] | [redacted] | 03/02/2023 |
| Airspace Regulator (Environmental) | [redacted] | [redacted] | 03/02/2023 |