

Newcastle International Airport Ltd RNAV SIDs Post Implementation Review (PIR)

CAP 1984



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Executive Summary

1. The CAA's airspace change process is a seven-stage mechanism that is set out in detail in CAP 1616. Prior to 1 January 2018, the process followed the guidance of CAP 725. In April 2014, under the CAP 725 airspace change process Newcastle International Airport Ltd (NIAL) submitted a proposal to the CAA to introduce three precision area navigation (P-RNAV) Standard Instrument Departures (SIDs). The final stage of the airspace change process is a Post Implementation Review (PIR) which normally commences one year after implementation of the change, under either CAP 725 or CAP 1616. The CAA commenced the PIR of its decision to approve the three SIDs on 13 December 2019. The review has taken much longer than anticipated due to the time that has elapsed since the implementation of the SIDs, the COVID-19 crisis and the requirement for further clarity regarding some of the data that was initially presented. In order to ensure stakeholders were able to review the updated data, there were three, 28-day feed-back periods. The content and outcome of the review process by the CAA is discussed in detail in this report including its annexes.
2. Whilst the CAA's decision to approve the change was made under the previous process (set out in CAP 725), we have endeavoured, so far as it has been practical to do so, conduct this PIR in accordance with the process requirements of CAP1616. When assessing the expected impacts against the actual impacts the CAA has applied the methodology in place at the time of the original CAA decision.
3. During the review process the CAA considered, safety data, traffic figures, traffic dispersion, traffic density, utilisation and feedback from operational stakeholders and non-aviation stakeholders. This information was requested from NIAL in a letter¹, which is published on the CAA website.

Following our review, the CAA has reached the following conclusions:

4. The CAA is content that the GIRLI 1T, GIRLI 1Y and GIRLI 3X RNAV1 SIDs are meeting the intent of the [ACP](#). The intent was to replicate the way suitably equipped departing aircraft were routed by Air Traffic Control, anticipating that this would lead to the aircraft being concentrated. Following the PIR, the CAA makes one formal recommendation set out below.

Recommendation: NIAL should brief Dash 8 operators, that fly the GIRLI 3X SID, to avoid overflight of Heddon-on-the Wall.

¹ [Letter to NIAL, Post Implementation Requirements, 22 Aug 19](#)

5. This report, and its annexes, provide a summary of the information the CAA has reviewed and considered before reaching these conclusions.
6. All the information which the CAA has reviewed and considered as part of this PIR, has already been published on our website.

Scope and Background of the PIR

What is a Post Implementation Review?

7. The CAA's approach to decision-making in relation to this proposal and to approve the NIAL SIDs is explained in Guidance on the Application of the Airspace Change Process, CAP 725(link). CAP 725 has now been replaced by CAP 1616. The current CAP document now provides guidance on the seventh and last stage of the process which is a review of the implementation of the decision, particularly from an operational perspective, known as a Post Implementation Review.
8. The guidance in CAP 1616² states that "*The CAA reviews how the airspace change has performed, including whether anticipated impacts and benefits in the original proposal and decision have been delivered.*"
9. If the impacts are not as predicted, the CAA will require the change sponsor to investigate why and consider possible mitigations or modifications for impacts that vary from those which were anticipated to meet the terms of the original decision. Full details on the possible outcomes can be found in para 286 CAP1616.
10. A PIR is therefore focused on the effects of a particular airspace change proposal. It is not a review of the decision on the airspace change proposal, and neither is it a re-run of the original decision process.

Background to our conclusions in this PIR Decision

11. The NIAL ACP was submitted to the CAA, for a decision, on the 18 April 2014. Given the lack of any quantifiable details regarding the potential impacts of implementing the SIDs within the ACP, this PIR has focused on the primary purpose of the implementation of the SIDs.

² Stage 7 Post Implementation Review summary, CAP1616 page 81.

12. The ACP set out that the proposed SIDs must replicate the departure profiles of what was being flown by suitably equipped aircraft at Newcastle, at the time of the submission: *'...that these proposed SIDs replicate our existing departure routes.'* (page 4 ACP). The ACP also made it clear that there would be *'...a tighter spread and more accurate flying...'* (page 4 ACP).
- 'To cause minimum noise disruption Newcastle International Airport set a requirement that the SIDs must replicate the tracks that departing aircraft fly now. Particular attention was paid to route between the noise sensitive areas of Heddon on the Wall and Throckley for aircraft departing Runway 25.'* (ACP Document p26 and the Consultation Document)
13. The SIDs were designed to be precision area navigation compliant which means that suitably equipped aircraft should fly along the SIDs accurately (RNAV1, +/- 1 nautical mile of the nominal track of the SID for 95% of the time); the following is the statement from the proposal:
- 'Because P-RNAV is so accurate, it will mean that the spread of aircraft on departure will be reduced. The increased accuracy will result in known environments for aircraft movements and therefore provide communities with a greater understanding of where aircraft should operate. As previously stated, aircraft will not be operating in any new areas.'* (Para 1.5.1 Consultation Leaflet).
14. At the end of 2014 the CAA approved two of the proposed SIDs, submitted in the ACP; the GIRLI 1Y³ (to the west, avoiding Currock Hill Glider Site) and the GIRLI 1T⁴ (to the east). These two SIDs were implemented on the 8th January 2015. Due to a number of issues with different iterations, the proposed GIRLI 1X (to the west) was not immediately approved. It was amended and initially implemented as the GIRLI 1X on 29th January 2016. It was then subsequently withdrawn and replaced by another redesigned SID, which was approved for use as the GIRLI 3X⁵ in Apr 2017.
15. The reason the first iteration of the GIRLI 1X was not accepted by the CAA was because, *'Although it was acknowledged that traffic on this proposed SID would continue to be tactically positioned where it flies today, this was inconsistent with Consultation material and therefore, could not be supported by the CAA'* (CAA decision letter). It was considered vital that the design should reflect what had been stated in the consultation and that the SID should not just be used for flight planning purposes. At this time the CAA's own Instrument Flight Procedure (IFP) designers could be contracted to design procedures, such as SIDs, for airports. The CAA did ensure that these designers were not involved with the approval

³ [GIRLI 1Y](#)

⁴ [GIRLI 1T](#)

⁵ [GIRLI 3X](#)

process. The CAA IFP team redesigned a SID which was considered would ensure, if flown as expected, suitably equipped aircraft would continue to avoid the noise sensitive areas of Throckley and Heddon-on-the-Wall.

16. An amended GIRLI 1X was implemented on the 29th January 2016, and was considered, by NIAL, as the primary cause of the increase in noise complaints from the Heddon-on-the-Wall area. The data (noise monitoring equipment derived) provided to the CAA (via email 10 March 2016) appears to show a number of departing aircraft, from different airlines, flying along the nominal track of the GIRLI 1X SID directly overhead Heddon-on-the-Wall, see Annex A. The decision was taken to suspend the GIRLI 1X during noise sensitive times and ask the CAA to re-design the GIRLI 1X again.
17. As a result of this information the CAA re-designed the SID to become the GIRLI 3X which is still flown today by suitably equipped aircraft. Due to staffing constraints in 2016/2017 the CAA re-design process, which included scrutiny of the relevance of the consultation, took longer than anticipated. The main differences between the GIRLI 3X and the GIRLI 1X are an earlier first waypoint (NTW02 at 1.5 nm). This waypoint became a 'fly-over' waypoint rather than a 'fly-by'. The current GIRLI 3X was not implemented until 27 Apr 2017. The CAA, at the time, accepted responsibly for this delay.
18. The GIRLI 1Y, GIRLI 1T and GIRLI 3X SIDs were all approved under the CAP 725 airspace change process and therefore, in accordance with the process and conventions of the time, the CAA decision letters and sponsor ACP submission documents were not publicised. However, as part of this PIR, the documents now held, have been published for referencing purposes. There was no GIRLI 3X decision letter.

Conditions attached to the CAA's decision to approve the change

19. The CAA did not attach any conditions to the implementation of the GIRLI 3X SID, however, there were two conditions attached to the implementation of the GIRLI 1Y and GIRLI 1X SIDs:
 - a) The GIRLI 1Y should only be used if Currock Hill Gliding site was notified as active.
 - b) The final leg of the GIRLI 1X SID between waypoints NTS15 and GIRLI shall not be flown except for reasons of operational flight safety such as separation or weather avoidance.

20. There is no evidence to suggest that either of these conditions have not been met since implementation.

Relevant events since change (if any)

21. There have been no further changes to the NIAL SIDs since the GIRLI 3X implementation.

Data collected for the purpose of the PIR

22. The [letter sent to NIAL](#) on the 22nd August 2019, stipulated the data required. NIAL were given 4 months to collate and publish the requested information in order to provide evidence that the SIDs have been and continue to be flown as expected. NIAL were given extra time to collate and provide the data due to the elapsed time between the PIR and the implementation of the SIDs (the General Election and Christmas Holidays also protracted the process). The first feedback window closed 27th Jan 20. Some of the data, as originally presented was difficult to understand and did not provide the level of detail required. Therefore, clarification was sort from NIAL which resulted in some data updates. The vertical data, for example, was not clearly presented for the GIRLI 3X and NIAL were afforded the opportunity to improve the data presentation, which they did. Stakeholders were then given a further 28 days until 18 Mar 20. A third feedback opportunity, which finished 4 Sep 20, was afforded due to date errors and confirmation regarding the aircraft types considered for the PIR.
23. NIAL were asked to provide any information on feedback that they have received. They referred the CAA to the Aircraft Noise Action Group (ANAG) website. ANAG are a group of local people that act as the focal point for noise complaints regarding NIAL.
24. All the feedback has been reviewed in the feed-back analysis (Annex D).
25. NIAL also supplied a link on slide 18 of their 'Stakeholder Feedback' [presentation](#) to their noise monitoring webpage (Webtrak). This offers some historical data (4 months) on noise monitoring stations around Newcastle Airport and shows departures/arrivals with available data.

Objectives and Anticipated Impacts

The original proposal and its objectives

26. The original objective was, ‘...from the outset, it was NIAL’s intention that the SIDs and OMNIs should align with the existing Noise Preferential Routes (NPRs) and continue to follow the same track over the ground. Consequently, the SIDs have been designed to PRNAV specification, emulating these tracks.’ (Decision letter dated 15 Sep 14)

Anticipated Impacts

27. The impacts that were mentioned in the ACP as potential benefits included Operational (Air Traffic Control, IFR/GAT/OAT and GA Community), Economic and Climatic (page 5 ACP document). There were no anticipated negative impacts presented in the ACP and any detail provided was very limited and qualitative, such as reduction in the complexity for ATC. The CAA Operational Assessments confirmed that there were no anticipated impacts as a result of implementing the [GIRLI 1T, 1Y](#) and [GIRLI 1X](#) SIDs.
28. There was no separate Operational Assessment carried out for the GIRLI 3X.
29. NIAL stated that there was no requirement for an assessment with regard to noise impacts, as the intent was to maintain the status quo and not facilitate an increase in aircraft movements. However, the [CAA Environmental Assessment](#) did state that the ACP did not make it clear that concentrating aircraft could result in an increase in noise below the track concentration area.
30. In summary, the SIDs element of the ACP was expected to replicate, in terms of impacts, how vectored departures towards GIRLI were being flown at NIAL prior to the SIDs being implemented. The CAA is therefore reviewing if the SIDs have met the intent as stated and it is not possible to review if any of the qualitative impacts or benefits stated, such as more efficient fuel burn, have materialised.

CAA Assessment

Operational Assessment

31. As well as the summary below the CAA have compiled a comprehensive track analysis report [Annex B], to place in context how the 5 most prevalent RNAV

equipped aircraft, flying out of Newcastle, have flown the SIDs given the SIDs design. The following is a summary of the CAA's conclusions.

Safety

- a) There have been no reported safety incidents related to the introduction of these SIDs.

Operational Feedback

- b) There has only been one piece of direct feed-back from an airline that utilises Newcastle Airport. KLM (Royal Dutch Airlines) provided a track plot over a map (7 Feb 20 via email) that showed ground track for the 'last 100' KLM aircraft to depart Newcastle on the GIRLI 3X and GIRLI 1Y SIDs. The diagram [Annex C] shows the KLM aircraft flew between Throckly and Heddon-on-the-Wall. No other Airline feed-back has been received.

NIAL have also provided slides showing how aircraft from different airlines fly the SIDs in [Airline Plots v2](#). It would be expected that aircraft being flown by different airlines might fly a SID slightly differently due to the way in which a procedure, such as a SID, can be interpreted by an aircraft's flight management system (FMS).

Air Navigation Service provision

- c) No evidence of feed-back was provided. The slides presented as part of the PIR state that there were positive outcomes as a result of the introduction of the SIDs.

Utilisation

- d) The SID utilisation slides presented by NIAL for the PIR can be found [here](#). They show that between 95% and 96% of the time, the SIDs are flown by suitably equipped aircraft, departing via P18, which is the 'airway' routeing south from Newcastle. The ACP does provide details of figures for 2013: '*In 2013 Newcastle International had 24,591 departing IFR flights, 16486 of these were routing airway P18 south. This means that approximately 67% of all IFR departures from Newcastle will be potentially flying one of the SID's (subject to aircraft/crew compatibility with P-RNAV departures).*' The Utilisation Slides show that there was an increase in departures using the NPRs in 2014, to around 95%, which compares favourably to the post SID figures rather than the 2013 estimate.

Traffic

- e) There was no intent on the part of NIAL to increase the overall number of aircraft movements as a result of implementing the SIDs. The total aircraft [movement graphs](#) show a steady decline in aircraft numbers from 2008 until

2015, when there is a slight increase in 2016 and then 2017, before dropping to the lowest level in 2018.

Letter of agreement (LoA)

- f) On slide 7 of the Utilisation presentation, presented by NIAL, they reference the LoA between NIAL and Currock Hill glider site. Part of this LoA is that NIAL will use the GIRLI 1Y SID whenever the gliding site is active. NIAL have reported no issues with the use of GIRLI 1Y SID as part of the LoA.

Track Keeping Analysis

- g) The new SIDs have been compared to the vectoring swathes prior to their implementation. The full text of the CAA's review is contained in the track analysis Annex B. Annex B provides a detailed account of how the 5 main types of suitably equipped aircraft have flown the SIDs. The analysis concludes that the SIDs have afforded far greater track keeping and have concentrated the majority of aircraft along the expected routes, in accordance with the SID designs. This outcome was the key, quantifiable intent of the ACP.

Environmental Assessment

- 32. The Change Sponsor did not provide any quantified detail in the ACP on possible environmental impacts, only a qualitative reference to climate benefits, as the SIDs were intended to be, ...' *a formalisation of current routes...*' There was no additional evidence to support the lack of environmental assessment, but NIAL's submission stated that impacts in relation to noise, CO₂ emissions and local air quality were not anticipated or 'highly unlikely'; which the CAA accepted. The ACP did provide passenger figures for 2013, and anticipated growth in the number of passengers by 6 million in 2019, but not because of the introduction of the SIDs.
- 33. The CAA environmental assessment did point out that the ACP did not make it clear enough that the result of concentration could increase noise under the area of aircraft concentration. However, the ACP did state that aircraft would be concentrated.
- 34. The CAA's conclusion in this PIR is that without a baseline of the environmental impacts prior to the implementation of the SIDs to use as a comparison, because the CAA accepted NIAL's statement that noise, CO₂ emissions and local air quality were not anticipated or 'highly unlikely', it is not possible to assess whether or not there are environmental impacts, following the introduction of the SIDs.

Stakeholder Feedback

35. The CAA afforded stakeholders three, 28-day, feed-back periods in order for review and consideration of the data provided by NIAL. During these time periods the CAA received 10 emails from local stakeholders, (ANAG) and one email from an operator (KLM Airlines).
36. A full analysis of the feedback can be found at Annex D to this report. Given the relatively low number of responses and the focus being on noise complaints, the CAA can conclude that those impacted by noise may not all relate to the introduction to the SIDs. However, some of the feedback received comes from the villages/towns that were already under the departure routes where the SIDs now track. These areas were always likely to continue to experience aircraft noise. The CAA acknowledges the lack of detail regarding noise impacts in the original airspace change proposal and recognises that a concentration of aircraft can result in greater noise impacts to those under the area of concentration. It is, however, not possible to assess if the noise is now greater than pre-SID levels.

International Obligations

37. There are no international obligations with regard to this PIR.

Ministry of Defence Operations

38. There were no impacts to MoD operations as result of the implementation of the SIDs at NIAL.

Conclusion and recommendation(s)

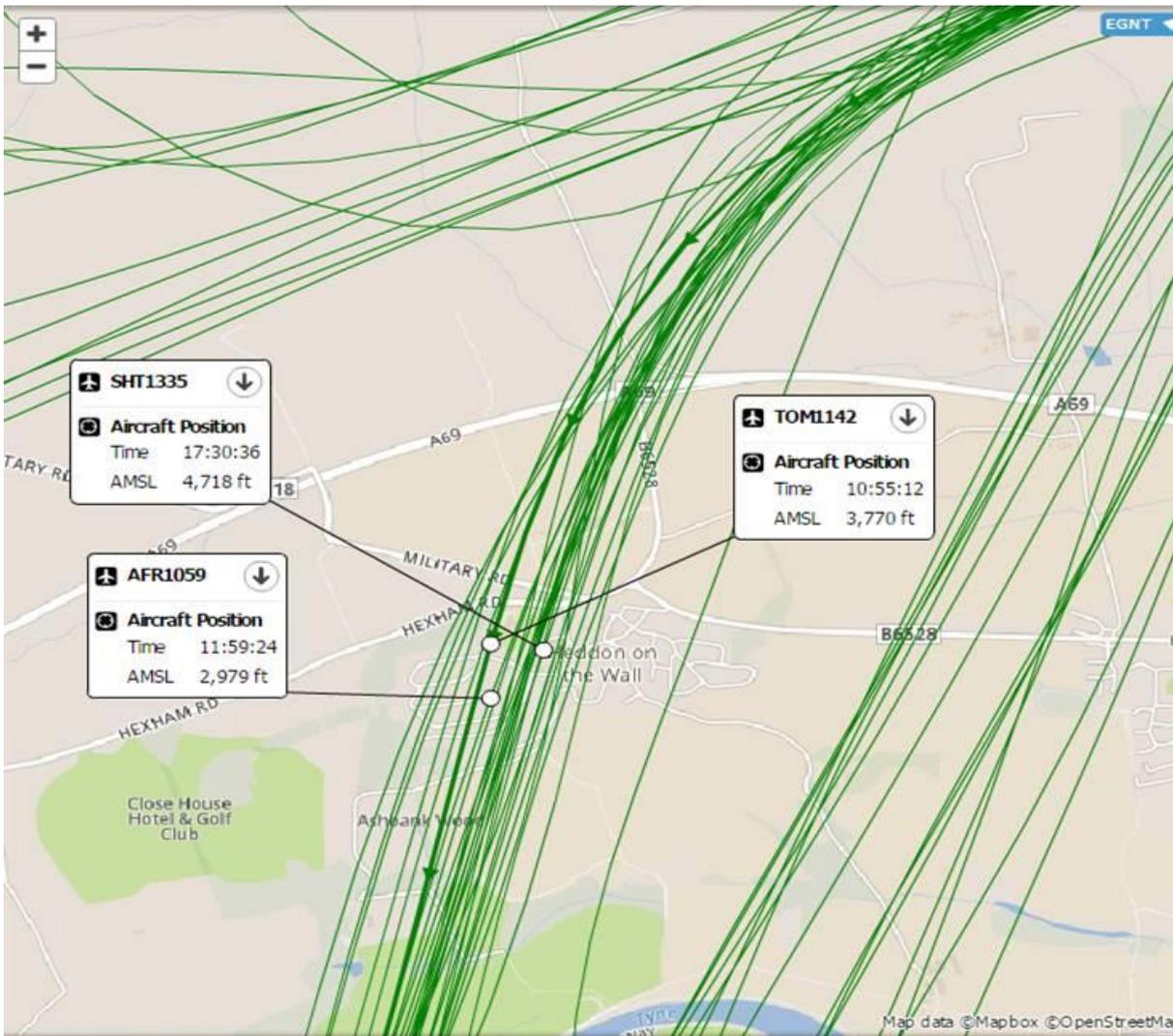
39. The CAA concludes that the SIDs at NIAL are performing satisfactorily and achieve the intent of the ACP as submitted to the CAA in April 2014. The data provided shows that they provide a safe method for suitably equipped aircraft to depart from NIAL. The majority of aircraft, presented in the data, flew the SIDs within acceptable tolerances; however, there are examples in the data where an aircraft does not fly a SID as expected in that they are beyond acceptable tolerances. These are mostly Dash 8 aircraft flying the GIRLI 3X.
40. The CAA recommends that NIAL should brief Dash 8 operators, that fly the GIRLI 3X SID, to avoid overflight of Heddon-on-the Wall.

Note on plain language

41. The CAA has attempted to write this report as clearly as possible. Our approach has been to include all the relevant technical material but also to provide a summary and of the conclusions the CAA has reached in reliance on it in as understandable a way as possible. Nevertheless, when summarising a technical subject there is always a risk that explaining it in more accessible terms can alter the meaning. For that reason, the definitive version of our assessment and conclusions are in the attached technical report Annex B.

APPENDIX A

Track data plots for Newcastle Airport departures on 4 Mar 16



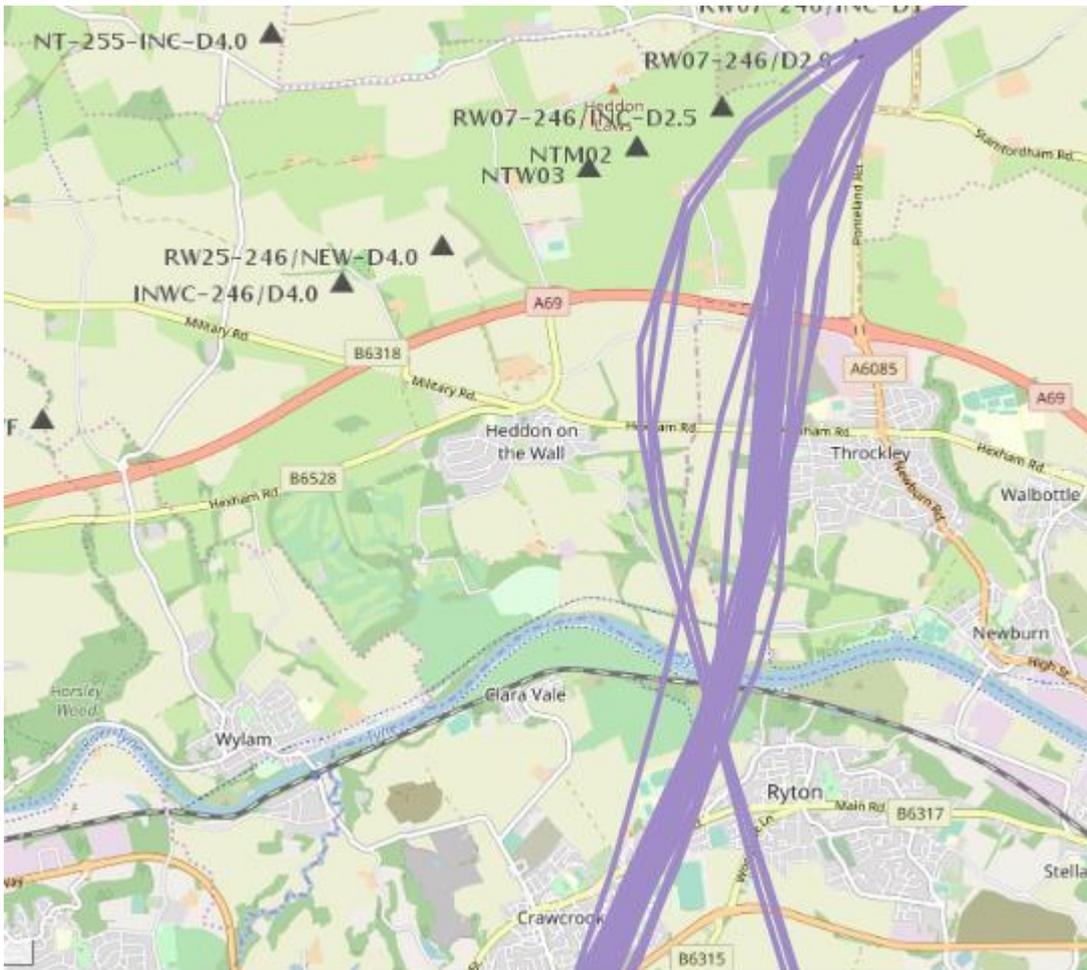
APPENDIX B

Track analysis document

This has been published as a separate document: www.caa.co.uk/CAP1984B

APPENDIX C

Graphic from KLM dated 7 Feb 20, showing the last 100 KLM aircraft to fly the GIRLI 3X or GIRLI 1Y SID



APPENDIX D

Feedback Analysis

This has been published as a separate document: www.caa.co.uk/CAP1984D