Safety and Airspace Regulation Group

UK Civil Aviation Authority

Reclassification of Glasgow CTA – Post Implementation Review

CAP 1957

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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 725/CAP1616. Under this process NATS submitted proposals to the CAA to change the classification of an airspace block known as the "Glasgow CTA" from airspace Class E to airspace Class D. Stage 7 of this process is a Post Implementation Review (PIR) that normally begins one year after implementation of the change. The classification change was formally implemented on 5th April 2012, having previously been implemented as a temporary measure on 16th September 2011. CAA approval of the formal and permanent change was given on 17th February 2012.

2. Competing priorities for the allocation of resources resulted in a delay to us starting this particular review. The CAA commenced the PIR of the impact of its decision and the implemented change on 16th March 2020. The sponsor had previously provided information to the CAA in its own PIR report in February 2014, in accordance with CAP 725 – the process then in in place. The content and outcome of the review process by the CAA is discussed in detail in this report including its annexes. Given the delay between the implementation of this airspace change and the start of this PIR, there have been a number of developments in the aviation world. However, this PIR is solely concerned with the effectiveness of the airspace change in achieving its aims as set out in 2011-2012.

3. On 2 January 2018 the CAA introduced a new process for making a decision whether or not to approve proposals to change airspace design. Irrespective of whether the CAA decision to approve the change was made under the previous process (set out in CAP 725), we will conduct all Post Implementation Reviews in accordance with the process requirements of CAP1616. However, when assessing the expected impacts against the actual impacts we will use the methodology adopted at the time of the original CAA decision in order to do so. We have also taken into consideration the interval since implementation when conducting this assessment.

4. During the review process, the CAA considered the formal response from the Sponsor which is contained in the Sponsor's document "Reclassification of Glasgow CTA – Post Implementation Review, version 2.0". A redacted version of this document is available on the CAA website. This was supplemented by additional diagrams which are included within this CAA document.

5. As a result, the CAA has reached the following conclusion:

The CAA is satisfied that the reclassification of the Glasgow CTA airspace to Class D satisfactorily achieved the objective stated in the CAA's decision document, and the change is confirmed.

6. This report provides a summary of the information the CAA has reviewed and taken into account before reaching these conclusions. However, all the information the CAA has taken into account will be 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 proposals to approve changes to airspace is explained in its Guidance on the Application of the Airspace Change Process, CAP [725/1616]. This detailed Guidance provides that the seventh and last stage of the process is a review of the implementation of the decision, particularly from an operational perspective, known as a Post Implementation Review (PIR).

8. The Guidance states that the purpose of a PIR "is for the change sponsor to carry out a rigorous assessment, and the CAA to evaluate, whether the anticipated impacts and benefits in the original proposal and published decision are as expected, and where there are differences, what steps (if any) are required to be taken".

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.

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. On the 17th February 2012 the CAA approved the Reclassification of the Glasgow Control Area (CTA). In our Decision document of the same date, we provided factual information and background to the change. The Decision document can be found at https://www.caa.co.uk/WorkArea/DownloadAsset.aspx?id=4294977706.

12. This Decision was formally implemented on 5th April 2012. However, due to urgent safety concerns raised during the development of the proposal, the change was

initially implemented on a temporary basis on 16th September 2011, following discussions between the Sponsor and the CAA.

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

13. No conditions were attached to the CAA Stage 5 decision.

Relevant events since change (if any)

14. The global COVID-19 pandemic has caused a significant reduction in commercial air transport flights during the first quarter of 2020. The Sponsor both implemented the airspace change and produced their PIR Report some years before the COVID-19 outbreak. Additional information on traffic patterns was collected from August 2019. This PIR therefore takes no account of the impact of COVID-19 on flight numbers when assessing the outcome of this airspace change.

Data collected for the purpose of the PIR

Sources of Information

Change Sponsor

15. The Sponsor (NATS, formerly National Air Traffic Services) provided version 2.0 of its own Performance Implementation Review document in February 2014, in accordance with the requirements of CAP 725 and the CAA's PIR Policy Statement then in force. This document includes data from the 22 month period September 2011 to June 2013. A redacted version of this document is published on the CAA website.

16. The information contained within the Sponsor's document covers: key objectives; safety, capacity, operational impact, stakeholders' experiences, environmental impact, and traffic data.

17. All diagrams included within this document were provided by the Sponsor, although in some cases the outline of the Glasgow CTA has been highlighted by the CAA. Figures 1-3 were provided as part of the original ACP material. Figures 4-7 were provided during the development of this PIR Report to help illustrate particular points, including those showing post-implementation traffic/utilisation patterns – data samples from August 2019 were used for this purpose.

18. Safety information on reported AIRPROX incidents was cross-checked against the UK AIRPROX Board's own information.

19. Given the nature of this airspace change and the information already provided by the Sponsor, the CAA concluded that it was not necessary to seek other sources of information in order to conduct this review.

Objectives and anticipated impacts

The original proposal and its objectives

20. The objective for the reclassification of the airspace block known as the "Glasgow CTA", to the East of Glasgow Airport, was to improve safety by introducing a "known traffic environment" and thus reduce the risk of a mid-air collision between an airliner and another aircraft which might legitimately not be talking to the relevant air traffic control agencies. This objective was achieved by changing the airspace classification of the Glasgow CTA from Class E (which permits unknown traffic) to Class D (which does not).

21. Following an AIRPROX (AIRcraft PROXimity incident) in July 2011, while the formal proposal documentation was being developed, the classification change was implemented as a temporary measure in September 2011, before being made permanent in April 2012.

Anticipated Impacts

22. The anticipated impacts were:

- to replace the "unknown traffic environment" of Class E airspace with the "known traffic environment" of Class D airspace;
- to reduce the risk of serious incidents within the Glasgow CTA, thus improving safety;
- to ensure that air traffic controller capacity is managed; and
- to ensure that access to the airspace for VFR flights is maintained.

23. It was acknowledged that the change from Class E to Class D would also have the impact of restricting non-radio aircraft access to the CTA. This is an inevitable part of producing the "known traffic environment" and was accepted by the CAA at the time as being necessary to reduce an identified and explicit safety risk. A mitigation for this was to raise the base of the CTA to allow non-radio aircraft more room to pass underneath it.

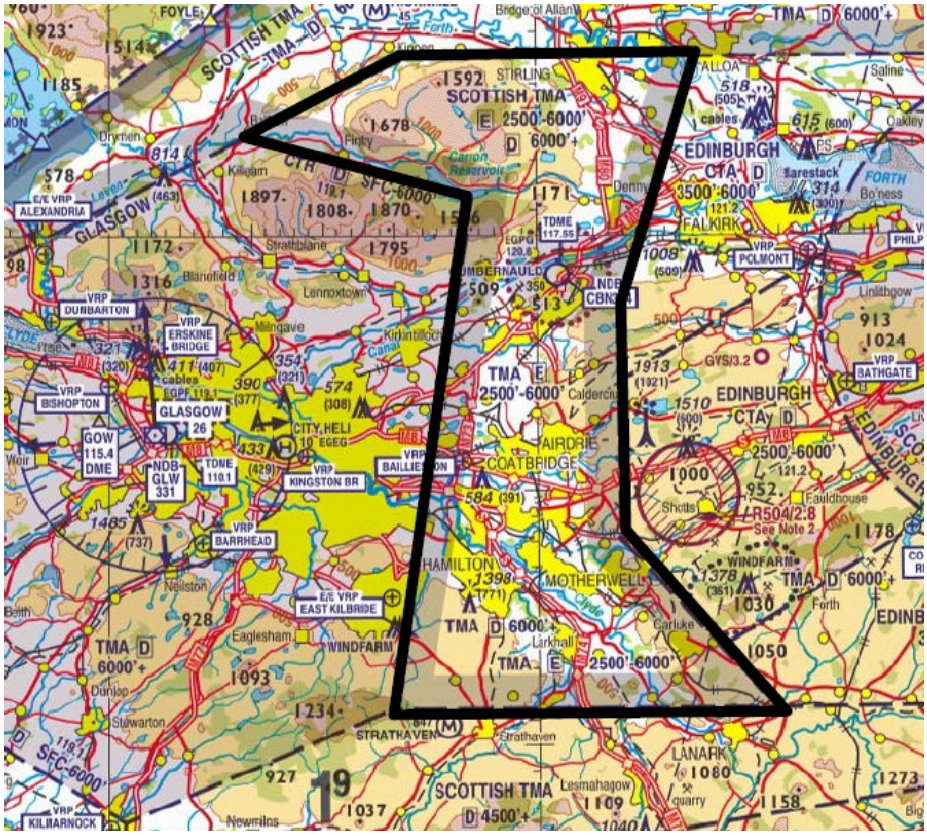

Figure 1: Original Suggestion (classification change only)

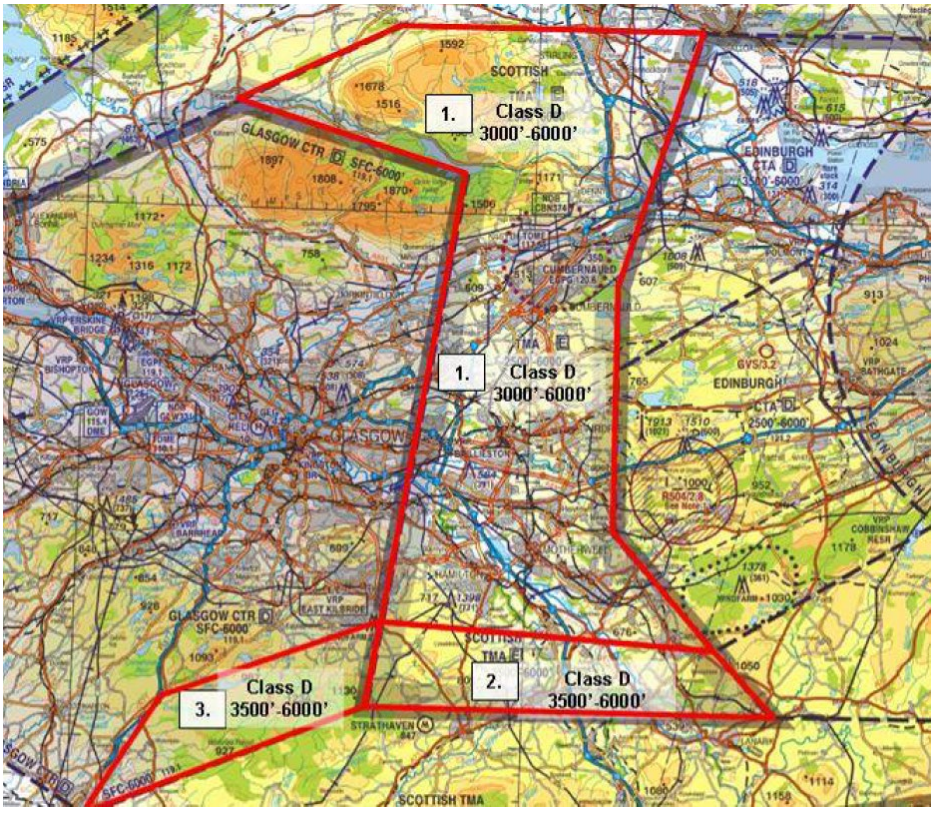

Figure 2: Submitted Change (raised base levels)

24. The original suggestion, as shown in Figure 1, was purely to change the classification of the Glasgow CTA airspace (black outline – mislabelled on the original source map as “Scottish TMA”) from Class E to Class D. This had the benefit of simplicity but was identified as having a potentially significant adverse impact on some local VFR operations.

25. Following discussions with stakeholders, the submitted change proposal included the following amendments:

- Raising the base level of the majority of the existing Glasgow CTA from 2500ft to 3000ft. (Area 1 on Figure 2.)
- Raising the base level of the southernmost portion of the Glasgow CTA from 2500ft to 3500ft. (Area 2 on Figure 2.)
- Raising the base level of the southeasternmost part of the Glasgow CTR from ground level (shown as SFC [surface] on the map) to 3500ft and changing its designation from the Glasgow CTR to the Glasgow CTA. (Area 3 on Figure 2.)

26. These changes to the original plan have increased the amount of airspace available for aircraft not wishing/able to contact ATC to fly underneath the CTA.

27. The conversion of “Area 3” from the Glasgow CTR to the Glasgow CTA means that the CTA proposal as submitted (red outline on Figure 2) is a different shape from that previously in existence (black outline on Figure 1), although the raised base levels mean that overall less airspace is now designated as “controlled” than before the change.

CAA assessment

28. We have taken into consideration the interval since implementation and the seriousness of the incident which caused the airspace classification change to implemented early on a temporary basis when conducting this assessment.

Operational Assessment

Safety

29. The Sponsor reports that there were 3 infringements of the Glasgow CTA in the study period. These were "spotted early and caused few problems". Additionally, there were "several instances of controllers preventing infringements by contacting controlling agencies to warn them of aircraft under their control threatening to enter the CTA". Since any infringement potentially introduces a safety risk, the early detection, or better still prevention, of infringements constitutes a safety improvement.

30. The Sponsor does not report any AIRPROX incidents within the Glasgow CTA during the study period. This is supported by analysis of the data provided by the UK AIRPROX Board[1], which shows no AIRPROX incidents within the Glasgow CTA from implementation of Class D as a temporary measure in September 2011 until the end of 2019.

Operational Feedback

31. The Sponsor reports that no feedback has been received relating to unforeseen or unintended operational impacts of the change, as at three years after the implementation of the change. (The potential adverse operational impacts to some stakeholders were recognised at the time as being an inevitable consequence of making the change and were thus not "unforeseen" or "unintended".)

32. The Sponsor's report contains quotes from a number of operational stakeholders. These confirm that, as would be expected, there has been an adverse impact on some light non-radio-equipped aircraft who are unable to enter the Class D airspace. However, the requirement for aircraft entering the Glasgow CTA to be routinely equipped with radios is an intrinsic part of the justification for the Sponsor's proposal to change the classification of the airspace to Class D, so as to create a "known traffic environment". This adverse impact was therefore arguably totally foreseeable at the time of the CAA Decision, and was thus taken into account in the deliberations leading to that Decision.

[1] https://www.airproxboard.org.uk/Reports-and-analysis/Monthly-summaries/Monthly-Airprox-reviews/

33. In contrast, some other general aviation stakeholders indicate that the change has caused them no particular issues, in part because the raising of the base level of the CTA, allowing non-radio VFR flights to take place underneath the CTA.

34. Airline and military stakeholders report no issues with the change.

35. Overall, the Sponsor reports contacting 53 organisations or individuals for comment following the change. 43 did not reply, 8 supported the change and 2 raised objections (these are described in paragraph 32). The response to the change is therefore firmly positive, with no new or unexpected issues raised.

Air Navigation Service Provision

36. The Sponsor reports no adverse impacts in terms of air navigation service provision. Similarly, Edinburgh ATC, who operate the airspace directly to the East of the Glasgow CTA, report no issues.

Utilisation

37. The main use of the airspace known as the Glasgow CTA was for commercial air transport flights inbound to Glasgow Airport. Aircraft would typically arrive from the South-East, and then turn line up to land in a South-Westerly direction. Additionally, some aircraft would arrive from the North-West and thus arrive in a more or less straight line with the runway.

38. Figure 3 shows a sample of radar tracks within the Glasgow CTA from 2011 with blue/purple tracks changing to green/yellow as they descend towards the runway (off the map to the left).

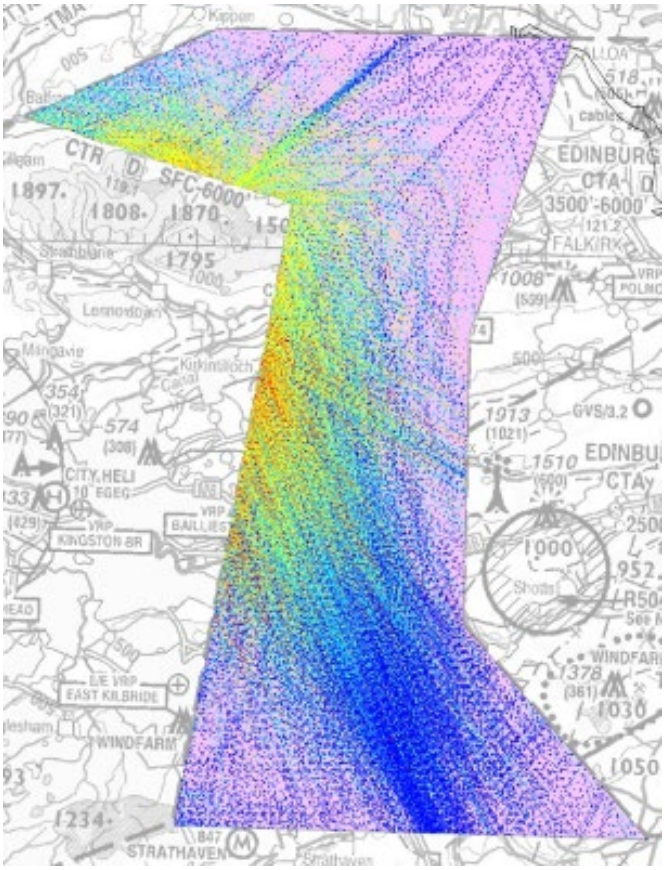

Figure3– Utilisation of the Glasgow CTA (2011 data sample)

39. Figure 4 shows a sample of radar tracks from one week in August 2019 (coloured by type rather than altitude), again showing the main swathe of arrivals from the South-East turning to land towards the South-West. Additionally, the new extension of the Glasgow CTA to the South-West means that it is also used by some flights arriving from the South-East which will land on the other end of the runway, heading North-East.

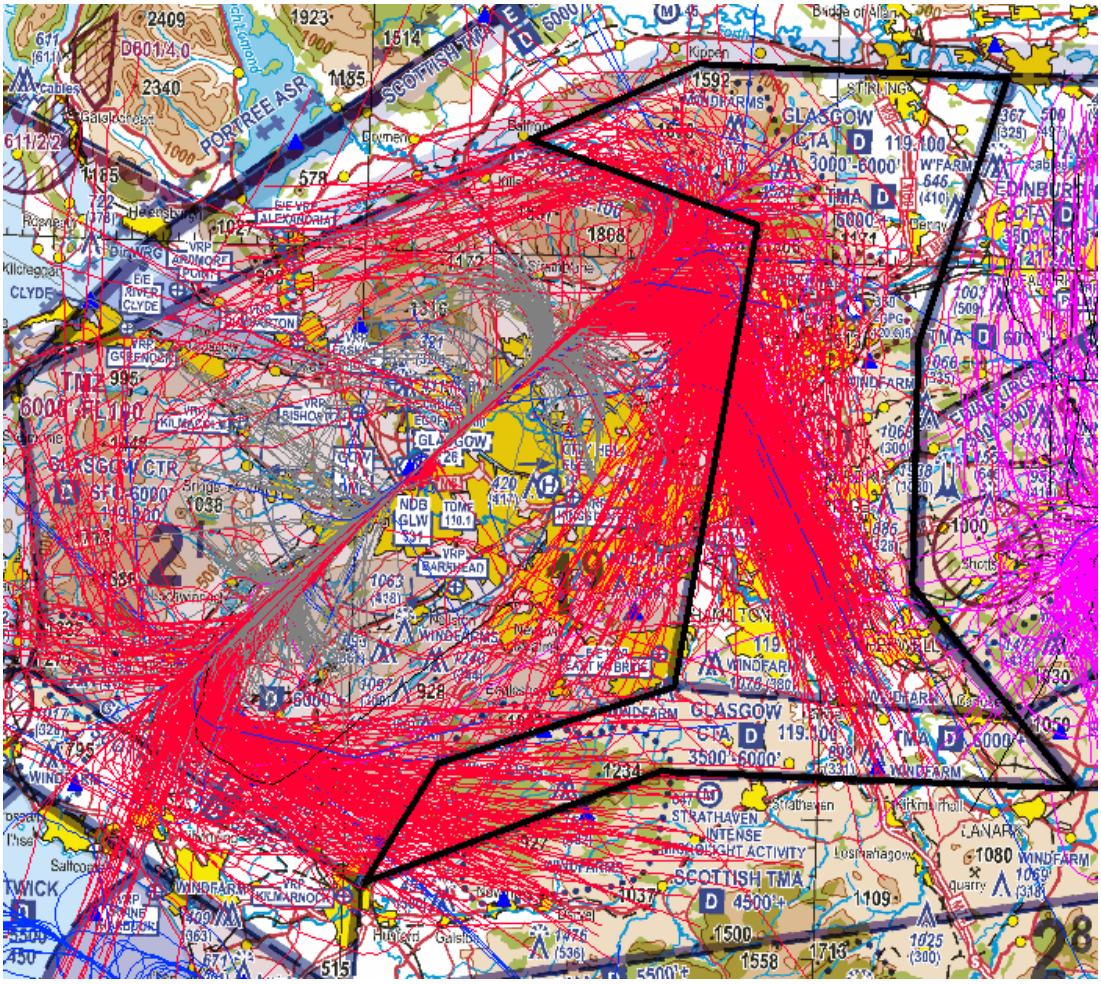

Figure 4 – Utilisation of the Glasgow CTA by Flight Type (2019 sample)

Notes:

Red tracks are commercial flights inbound to Glasgow Airport.

Brown tracks are commercial flights outbound from Glasgow Airport.

Purple tracks are commercial flights inbound to Edinburgh Airport.

Blue tracks are non-commercial flights.

Following changes to the design during the airspace change process, the Glasgow CTA was extended to the South-West, hence the shape does not exactly match that in Figure 3)

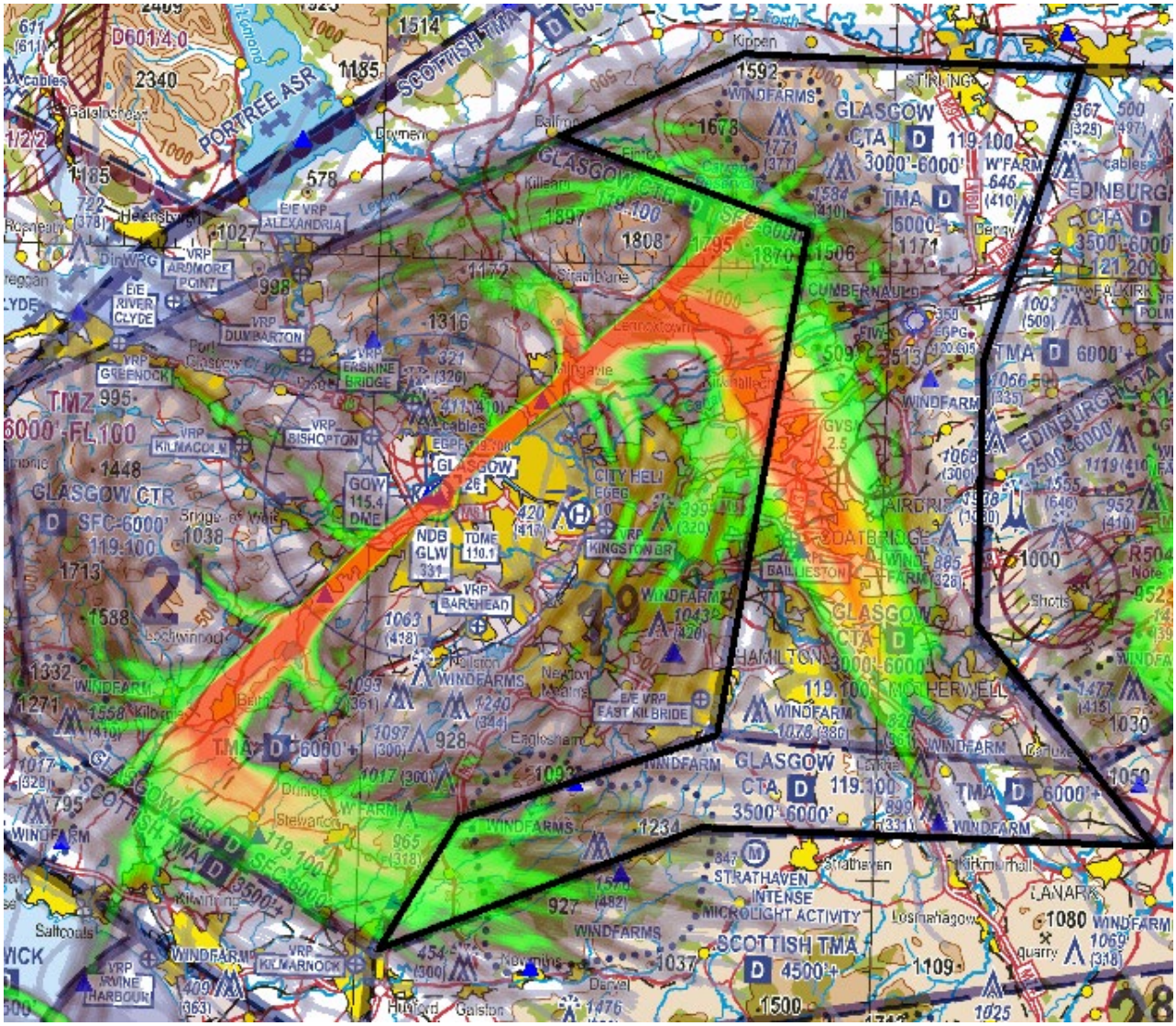

Figure 5 – Utilisation of the Glasgow CTA by Track Density (2019 sample)

Notes:

Over 50 aircraft tracks using the same path - red.

Over 25 aircraft tracks using the same path – yellow.

Over 10 aircraft tracks using the same path – green.

10 or fewer aircraft track using the same path - grey.

40. The concentration of tracks shown in Figure 5 demonstrates that the Glasgow CTA is mainly utilised by aircraft arriving at / departing from Glasgow Airport.

Traffic

41. The Sponsor's PIR study reports that during the 22 month study period, an average of approximately 2.7 non-public transport flights per day used the Glasgow CTA. However, as public transport flight information was not collected for the same period, this does not allow for any comparison of relative traffic levels.

42. A separate comparison was therefore performed on the one week traffic sample from August 2019 shown in Figures 4 and 5. The below figures demonstrate the difference in traffic levels between public transport flights (Figure 6) and non-public transport flights (Figure 7).

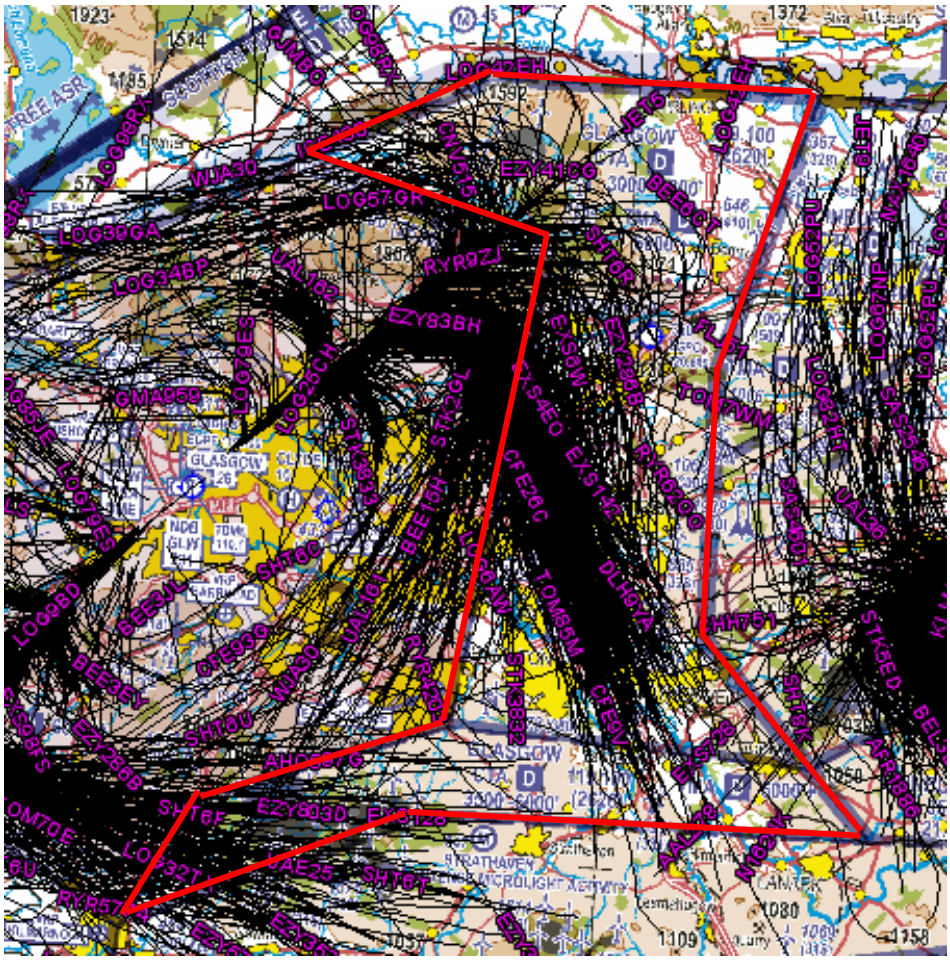

Figure 6 – Glasgow CTA Public Transport Flight Traffic (2019 sample)

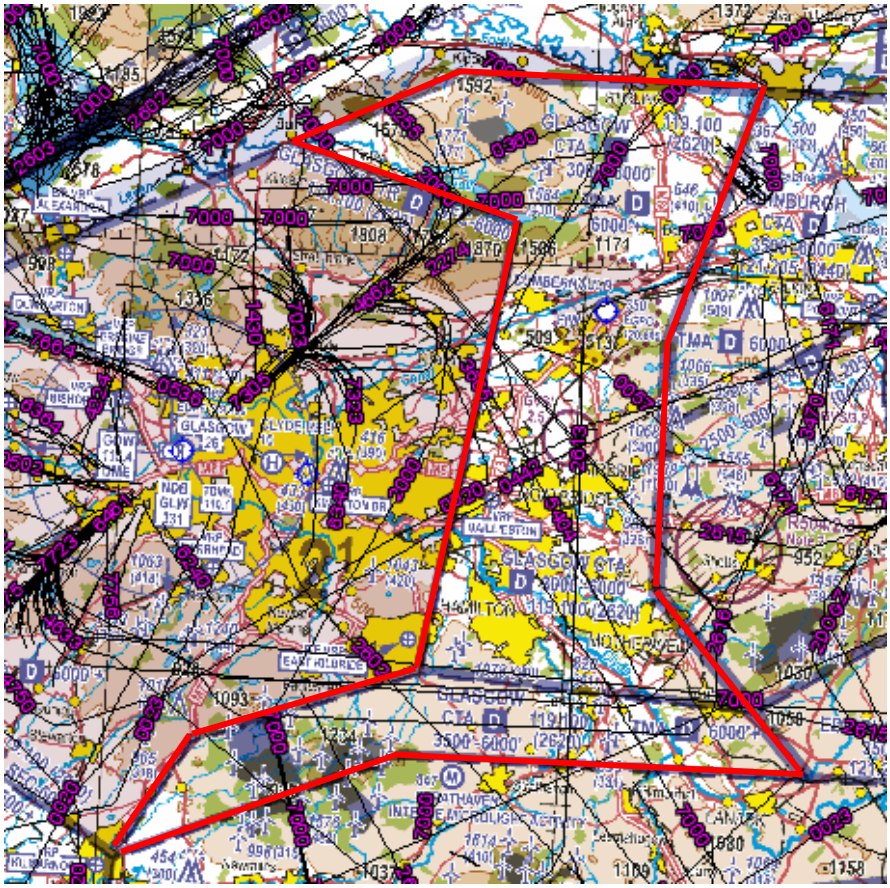

Figure 7 – Glasgow CTA Non-Public Transport Flight Traffic (2019 sample)

43. Comparing Figure 6 with Figure 7 demonstrates that the traffic using the Glasgow CTA primarily consists of public transport services.

Infringements and Denied Access

44. The Sponsor reports that there were 3 infringements of the Glasgow CTA in the study period. These were “spotted early and caused few problems”. Additionally, there were “several instances of controllers preventing infringements by contacting controlling agencies to warn them of aircraft under their control threatening to enter the CTA”. Since any infringement potentially introduces a safety risk, the early detection, or better still prevention, of infringements constitutes a safety improvement.

45. By definition, the allocation of Class D restricts the access of non-radio-equipped aircraft to an airspace block. While not accepting routine access by non-radio-equipped aircraft (as this would defeat the purpose of changing the classification), the Sponsor offered to work with General Aviation organisations to facilitate special events such as “competitions, rallies or record breaking attempts on an individual case basis”. The Sponsor reports that for the 22 month study period they “have

been unable to find evidence of any requests from pilots to operate non-radio within the CTA", and therefore concludes that there have been no denied transits.

Letters of Agreement

46. The Sponsor reports that there are Letters of Agreement with the British Gliding Club (allowing glider transits along a "corridor" inside Class D airspace) and Strathaven Airfield and considers them to be working successfully.

47. The Sponsor also reports that a further Letter of Agreement is being developed with Cumbernauld Airport to formalise arrangements, over and above the procedures specified in the Glasgow MATS Part 2[2]. However, the Sponsor considers that the current arrangements are working well.

Environmental Assessment

48. The Sponsor's formal ACP submission stated that:

"The changes proposed within this ACP involve a reclassification of the class of airspace from Class E to Class D within the Glasgow CTA, plus the raising of the base levels of controlled airspace as shown in Figure 5[3]. No new routes are proposed. There will be no changes to where Glasgow IFR aircraft are flying as a result of the proposed change i.e. no change to routes, flight paths, concentration or dispersal of aircraft. People living and working beneath the airspace should not experience any difference in the over-flying air traffic.

The only impact on IFR aircraft trajectories will be a reduction in the use of avoiding action and vectoring around unknown traffic and the subsequent disruption to approach sequencing as described in paragraph 8.3. It is not possible to predict the uptake of VFR access requests to the proposed Class D CTA airspace versus those who choose to fly alternative routings.

As discussed and agreed with the CAA at the 18th August 2008 framework briefing this change proposal is motivated on grounds of safety improvements. It is not a capacity or environmental issue, and is not intended to facilitate traffic growth or claim any environmental benefit. Thus analysis of noise impact, tranquillity, visual intrusion, and local air quality has not been undertaken."

49. The CAA's formal decision letter states that:

"It is likely that reclassification of the CTA will lead to some VFR traffic (expected to be principally recreational General Aviation) that operated through the relevant airspace when Class E no longer doing so either because they are not radio-

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[2] MATS is the Manual of Air Traffic Services (ATS). MATS Part 1 is a UK-wide document which applies to all ATS units. Each ATS Unit then has its own, local, MATS Part 2.

[3] Figure 2 in this document.

equipped, choose not to, or are not given clearance by ATC to do so. Class D airspace, in its own right, does not prohibit access for suitably equipped aircraft and this should further mitigate against displacement of traffic. It is not possible to predict - or model - the number of aircraft that may be affected in these ways; therefore it not possible to predict or model the environmental impact with any certainty. Monitoring by the local ATC agencies suggests that utilisation of this airspace by VFR traffic is extremely low.

The increased CTA base will require Glasgow arrivals routeing via the CTA to remain slightly higher for longer, however trial procedures have revealed minimal change to actual tracks flown by arriving aircraft (the interim arrangements introduced in September 2011 were predicated on a 3000 ft amsl CTA base).

En-route operations are not affected by this proposal and as a direct consequence my assessment is that there will be little or no environmental change as a consequence of this proposal. Maintaining the ability of commercial air transport aircraft to route direct from TALLA to the left base position for runway 23 minimises the overflight of more densely populated areas and keeps the number of track miles flown to a minimum; it also avoids the potential requirement for 2 large (more than 90 degree) turns."

50. The Sponsor's PIR Report states that:

"Environmental issues were not a primary consideration within this airspace change, however, it was deemed appropriate that NATS monitor any change in the distribution of noise complaints to the airport operating company, Glasgow Airport Ltd. (GAL) as a result of it. Having consulted with the individual responsible for monitoring noise complaints for GAL, I can state that there have been no reports from areas within the Glasgow CTA. GAL reports this as normal and shows no change from previous years.

The reduction in the occurrences of avoiding action (as described in paragraph 3) brings a small benefit in CO2 emissions and fuel burn, though this is not quantifiable."

51. The CAA therefore accepts that no meaningful quantifiable assessment of CO2 emissions or fuel burn changes can be undertaken.

52. The CAA also notes that the Sponsor reports that there have been no noise complaints during the study period.

Community Stakeholder observations

53. As noted above, the Sponsor reports that there have been no reports from the ground community stakeholders within the Glasgow CTA area.

54. Local community operational stakeholder observations have been captured under "Operational Feedback", above.

International Obligations

55. Not applicable as this airspace change is wholly contained within the Scottish FIR and does not reach any international borders.

Ministry of Defence Operations

56. The Sponsor reports that the MoD have confirmed that the reclassification of the Glasgow CTA has had no impact on MOD aircraft operations.

Any other impacts

57. None reported.

Conclusion

58. The CAA is satisfied that the reclassification of the Glasgow CTA airspace (ACP 12-01) to Class D satisfactorily achieved the objective stated in the CAA's decision document (17th February 2012), and the change is confirmed.

Note on plain language

59. 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.