

Farnborough Airport
Airspace Change Post Implementation Review
CAA Reference ACP-2013-07
Main Document

Record of Revisions

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Definitions and Abbreviations

ACP	Airspace Change Proposal
ATC	Air Traffic Control
CAA	Civil Aviation Authority
CAS	Controlled airspace
CTA, CTR	Control Area, Control Zone (subtypes of CAS)
DfT	UK Government's Department for Transport
FAB	Farnborough Airport
LoA	Letter of Agreement
NERL TC	NATS En Route Ltd, the licensed air traffic control provider for the UK's air route network. Terminal Control TC interfaces with Farnborough Radar.
PIR	Post-Implementation Review
SSR	Secondary Surveillance Radar including aircraft transponders
TMZ	Transponder Mandatory Zone

Associated annexes

Annex A	Annex A Traffic Dispersion and Environmental Overflight Diagrams (PIR items 34, 49)
Annex B	Annex B Operational Feedback Engagement (PIR items 37, 55)
Annex C	Annex C Safety and Infringements (PIR Items 19, 28)
Annex D	Annex D Stakeholder Feedback and Complaints (PIR item 58)
Annex D Appendix	Redacted emails with PIR related feedback
Annex E	Annex E General Aviation and Glider Study

Note: All annexes must be read in conjunction with this Main PIR Document.

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1 About this document

1.1 Introduction

- 1.1.1 The Farnborough Airport¹ (FAB) airspace change proposal (ACP) was approved by the Civil Aviation Authority (CAA) on 10th July 2018. It was implemented on 27th February 2020.
- 1.1.2 The CAA's website has a page dedicated to the history, progress and documentation relating to this ACP. In the electronic version of this documentation please click [this link](#), otherwise search online for 'CAA Farnborough Airport airspace change'.

1.2 Post-Implementation Review (PIR)

- 1.2.1 This document is part of a set of reports to fulfil the requirements of the CAA's Post-Implementation Review (PIR). The purpose of the PIR is for Farnborough Airport (the change sponsor) to carry out an assessment, and the CAA to evaluate, whether the anticipated impacts and benefits in the original proposal and published decision are as expected.
- 1.2.2 This ACP was conducted and approved under the CAA's previous airspace change process known as CAP725 (March 2016 edition), using the DfT's Air Navigation Guidance 2014 (known as ANG2014) as reference material. Both were superseded; the former by CAP1616 Edition 1 in 2018², the latter by a revised version in 2017 (known as ANG2017).
- 1.2.3 The PIR uses CAP1616 as its base for data requirements, adapted by the CAA to account for the preceding CAP725 process. The DfT's ANG2014 will also be part of the base reference material for the PIR as it was current at the time.
- 1.2.4 The CAA supplied a document containing tables of data analysis requirements for this PIR. See Appendix 1 – CAA PIR Data Request from page 33 for details.
- 1.2.5 The PIR is not a review of the decision on the airspace change proposal, and neither is it a re-run of the original decision process.

1.3 Impacts of COVID-19 pandemic on UK aviation

- 1.3.1 Normally, a PIR compares the pre-ACP arrangements with the post-ACP arrangements after one year of operational experience, assuming an otherwise relatively steady state of air traffic flowing through the region.
- 1.3.2 The implementation of the new airspace and flightpaths immediately preceded the UK's first COVID-19 lockdown³. The COVID-19 pandemic had significant and long-term impacts on the UK's aviation industry, in particular during 2020 and 2021.
- 1.3.3 There was an unprecedented change in air traffic due to travel restrictions. The reduction in the number of flights meant that typical air traffic flows were no longer present across the UK. This is because there was so little traffic that it was safe for flights to be given extreme shortcuts rather than fly a typical flight planned route.
- 1.3.4 Normally the data-gathering period would start the day the change was implemented. However, it would not be appropriate to compare 'lockdown' flightpath data with 'pre-lockdown' flightpath data.
- 1.3.5 The CAA discussed this situation with airspace change sponsors such as Farnborough Airport. The CAA agreed that data collection for PIRs would be suspended until it considers the aviation industry had sufficiently recovered, and that

¹ Until 2019 the airport was owned by, and operated as, TAG Farnborough Airport.

² At the time of writing, CAP1616 Edition 4, published March 2021, was in effect.

³ While there is no official definition of 'lockdown', advice on social restrictions escalated from mid-March 2020. The UK Prime Minister instructed people to stay at home on 23rd March 2020, fewer than four weeks after the airspace change was introduced.

air traffic flows were sufficiently similar to those pre-lockdown, that an appropriate comparison could be made.

1.3.6 The CAA added a page to their website ([link](#)); this was regularly updated with the CAA's opinion as to whether it was appropriate to restart data collection.

1.3.7 In February 2022 the CAA declared that data collection could recommence from late March.

1.3.8 Farnborough Airport agreed with the CAA that data collection would run from 1st April 2022 to 31st March 2023.

1.4 **Other impacts on UK aviation**

1.4.1 The conflict between Russia and Ukraine started late February 2022 and was ongoing in May 2023. Destinations and airspace volumes in the region were effectively closed or heavily restricted. This had an impact on the European air route network that filtered back to the UK during the PIR period. This is a potential contributing factor to changes in proportions of use of Farnborough's departure and arrival routes, described in Section 11.

1.5 **Timescales for the PIR process**

1.5.1 By mid-May 2023 we will have collated our reports and submitted them to the CAA. When the CAA is satisfied the reports are complete, they will publish them on their website.

1.5.2 They will then invite stakeholders to provide feedback, directly to the CAA, during a 42-day window.

1.5.3 After that window closes, the CAA will study the feedback, then prepare and publish a report on their assessment. This is expected within three months but the CAA may extend that period.

2 The format of the PIR reports and annexes

2.1.1 Throughout the documentation, we will supply evidence to satisfy the CAA's data requirements by referring to headings, paragraph numbers and table items in Appendix 1 – CAA PIR Data Request from page 33.

Evidence requirement	Ref	Evidence requirement	Ref
General Observations	16a-f	Environmental: Local Air Quality	49a-e
Safety Data	19a-d	Environmental: Noise Contours	49f-j
Service provision/ resource issues	22a-c	Environmental: Overflight and Operational Diagrams	49k-m
Utilisation of Continuous Climb Operations (CCO) & Continuous Descent Operations (CDO)	25a	Environmental: Fuel and CO ₂ Emissions	49n-q
Infringement Statistics	28a	Environmental: Tranquillity and Visual Intrusion	49r
Traffic figures (air transport movements)	31a-d	Environmental: Biodiversity	49s
Traffic dispersion comparisons	34a-c	Impact on International Obligations	52a
Operational Feedback	37a-b	Impact on Ministry of Defence operations	55a
Denied Access	40a-b	Stakeholder Feedback	58a-b
Utilisation of SIDs/STARs/IAPs	43a	Other: Transit General Aviation Traffic potentially rerouting around CTR/CTA complex	Other-a
Letters of Agreement (LoAs)	46a-b		

Table 1 Requirement headings and references

- 2.1.2 For example, evidence referring to requirement 16c falls under General Observations. The specific details of that requirement are found in the Appendix, paragraph 16 in the table beneath for item c, in this case on page 35.
- 2.1.3 As a set of documents, this Main PIR Document and the five annexes contain evidence to satisfy the requirements listed in Table 1.
- 2.1.4 We will explicitly state to which requirement number each piece of evidence refers. We will illustrate and explain how this evidence satisfies the requirement, referring to previously-published material on the CAA's [dedicated web page](#).

3 Evidence: General Observations

3.1 General Observation 16a

3.1.1 16a: An overview statement on whether, in the change sponsor's view, the original proposal met the intended objectives as described on the CAA's decision to approve the change.

3.1.2 Relevant extract from CAA decision document [CAP1678](#):

3. The objectives the Sponsor seeks to achieve through the ACP to support the above justification are:
 - a. To increase the predictability and efficiency of departure and arrival routes.
 - b. To reduce the complexity of aircraft interactions.
 - c. To establish a route structure that, as far as practicable:
 - i. Avoids towns and villages below 4,000ft; and
 - ii. Avoids major population centres between 4,000ft and 7,000ft.
 - d. To encourage the general aviation community to use the Change Sponsor's air traffic services.
4. The Sponsor has also said the ACP aims to maintain a high standard of safety, improve the overall efficiency of the airspace for all users, provide equitable access to airspace to all users and lessen the environmental impact by reducing over-flight of populated areas at low altitude where possible. Additionally, the sponsor says the procedures aim to provide an efficient routing for Farnborough departures and arrivals, connect to the southeast England en-route airspace structure and to deconflict Farnborough aircraft from the adjacent Heathrow and Gatwick operations.

In our view, the implementation of the proposal met these intended objectives listed in [CAP1678](#) paragraphs 3 and 4. Farnborough air traffic now has predictable routes with greater efficiency, reduced complexity, and avoids, where possible, towns and villages below 4,000ft, while also avoiding major population centres between 4,000ft-7,000ft. Our provision of Lower Airspace Radar Services (LARS) has continued and is highly utilised by the GA community; this is in combination with ATC facilitated access to the new controlled airspace for all airspace users. We continue to maintain a high standard of safety, and the known traffic environment created by this implementation has enhanced that safety further, for our own traffic and for others.

3.2 General Observation 16b

- 3.2.1 16b: An overview statement on whether, in the change sponsor's view, the original proposal met any conditions described on the CAA's decision to approve the change (if applicable).
- 3.2.2 First relevant extract from CAA decision document [CAP1678](#):

Summary of the draft decision made

5. The CAA does not approve the proposal to change airspace design wholly in the form proposed by the Sponsor set out in the documents listed below. However, in accordance with Direction 5(2) of the CAA Air Navigation Directions 2017, the CAA may make its approval of a proposal subject to such modifications and conditions as the CAA considers necessary. On the basis that the Sponsor will give the undertakings set out in Annexe A, the CAA has decided to approve the ACP with the modifications described in Appendix B – Figure 4. The CAA will allow the Sponsor a short period of time in which to decide whether it would rather withdraw its proposal than implement the ACP as modified which the CAA approves. The proposal as modified (“the Modified ACP”) is:

- A Class D control zone (CTR) and Class D and Class E+ transponder mandatory zone (TMZ) control areas (CTAs).
-
- The combination of Class A controlled airspace (CAS) LTMA 11 and LTMA 12 into a revised LTMA 11 with a base altitude 4500 feet and extend the southerly boundary of the revised LTMA 11 by one mile
- Within the CTR and CTAs, RNAV1 SIDs and STARs.
-
- New initial approach procedures (IAPs) at the end of the STAR to connect the en-route phase of flight to the final approach to the runway.

(An explanation of the difference between the ACP and the Modified ACP is set out below).

The CAA decided to approve the ACP under the conditions that Farnborough Airport agreed to certain undertakings regarding GA access (Annex A, see paragraph 3.2.3 below), and that the airspace design was modified from Option 38 (all CAS volumes proposed as Class D) to an amended Option 38 (two CTAs changed to Class E plus TMZ, Annex B, see paragraph 3.2.4 on page 11).

These conditions were fulfilled, and the implementation progressed with the latter design.

3.2.3 Second relevant extract from CAA decision document [CAP1678](#) Annex A:

Undertakings given by Farnborough

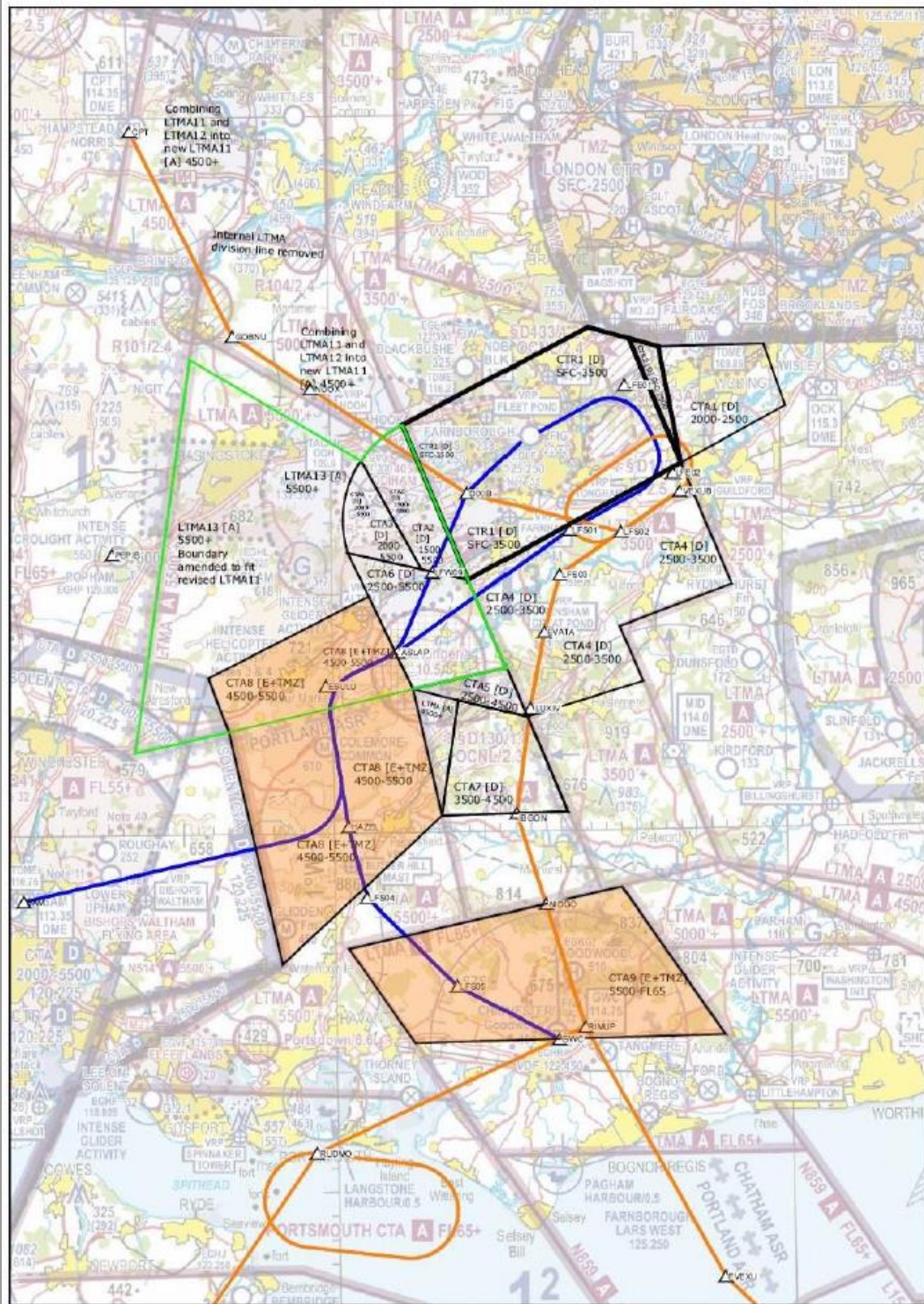
1. When electronic conspicuity devices (for example ADS-B) have advanced to a state of development that they are considered acceptable and interoperable by meeting EASA safety requirements, Farnborough undertake to implement the surveillance of such devices as another standard means for VFR traffic to gain access to Class E + conspicuity airspace
2. During the lengthy discussion about this airspace Farnborough have produced draft LoAs which if implemented, would allow special access rights for Lasham and SouthDown gliding clubs. Farnborough undertake to make these or new agreed (and improved) LoAs available in the future when these gliding clubs are minded to request them
3. Farnborough will demonstrate continued collaboration with Lasham Gliding Society and Southdown Gliding Club to agree reasonable access arrangements to CTA's 2, 3, 6, 8, and 9.
4. Noting that all flights operating in the new Class E+TMZ airspace shall carry and operate Secondary Surveillance Radar (SSR) transponders capable of operating on Modes A and C or on Mode S, unless in compliance with alternative provisions prescribed for that particular airspace by Farnborough ATC, Farnborough will consider whether specific access arrangements can be agreed for pilots who meet radio carriage and operation requirements, wishing to operate in the new Class E+TMZ airspace without serviceable transponder equipment.

The above undertakings were agreed and were satisfied as part of the implementation phase of this proposal.

1. At the time of writing, standard aircraft SSR transponders remain the only electronic conspicuity method that satisfy the Class E+TMZ requirements.
2. and 3. Farnborough Airport has collaborated with Lasham and Southdown gliding organisations, for reasonable access to CAS.
4. Non-transponder-equipped VFR aircraft, equipped with compliant radios, may request access to the Class E+TMZ volumes. They may be accommodated subject to Farnborough ATC permission.

3.2.4 Third relevant extract from CAA decision document [CAP1678](#) Annex B Figure 4:

Figure 4 - Option 38 with Class E + TMZ Farnborough proposals with revisions for the purpose of the draft decision



The orange regions labelled CTA8 and CTA9 were originally proposed as Class D. Ultimately they were implemented as Class E+TMZ as per CAA condition of approval.

3.2.5 Fourth relevant extract from CAA decision document [CAP1678](#):

14. It is a condition of the CAA's approval that the Sponsor provides data required by the CAA throughout the year following implementation to carry out that PIR. The specific data sets and analysis required, and the dates by when this information must be provided will be published on our website shortly. Together with other data, the Sponsor will be expected to provide the CAA with accurate detail on the number of requests for service and the number of refusals of service to GA aircraft that have occurred over the 12-month period. In addition, the CAA will contact GA stakeholder groups to assess the efficacy of the GA/VFR access arrangements to help determine whether the airspace change has delivered what it set out to achieve.

This PIR as a whole will satisfy these general conditions.

As part of our PIR discussions with the CAA regarding the impacts of the COVID-19 pandemic on UK aviation, the CAA agreed to remove the condition to supply interim data, and agreed the PIR data reference period to be the twelve month period from 1st April 2022-31st March 2023 (see subsection 1.3 on page 5).

3.3 General Observations 16c-16e

3.3.1 16c: Confirm that implementation occurred on the dates identified in the Decision Letter. If no implementation date was specified in the Decision, please state so.

Relevant extract from CAA decision document [CAP1678](#):

127. To enable the requisite NATS TC Sector training together with the Farnborough ATC controllers, it is anticipated that the changes will not be implemented before Winter 2019/20.

There was an anticipated window for implementation, but no stated date.

3.3.2 16d: If there was a significant delay between the planned and actual implementation date, please provide an explanation.

The CAA approval was granted on 10th July 2018. Subsequently, Lasham Gliding Society (LGS) lodged a Judicial Review (JR) with the High Court of Justice⁴. LGS acted as claimants. The CAA, as decision-makers, acted as the defendant, with Farnborough Airport as an interested party.

Until the JR process had completed, neither Farnborough nor NERL TC (our primary interface with the UK air traffic network) could identify a suitable date based on engineering and controller training requirements. Thus, implementation plans were paused.

The judgment was rendered on 5th June 2019, dismissing the claim and upholding the CAA's decision to approve.

Following the judgement, and LGS's confirmation it would not appeal, the engineering and training plans resumed, and 27th February 2020 was identified as the most appropriate implementation date.

⁴ Case number CO/3994/2018 before the Hon. Mrs Justice Thornton DBE.

- 3.3.3 16e: Identify whether any other issues of significance have occurred during the period twelve months after date of implementation.

The COVID-19 pandemic had significant and long-term impacts on UK aviation.

Sections 1.3 on page 5 and 1.4 on page 6 detail how this affected Farnborough's PIR.

3.4 General Observation 16f

- 3.4.1 16f: Other than normal promulgation activity (e.g., NOTAM, AIC etc.), identify what steps were undertaken to notify local aviation stakeholders that the airspace change was about to be implemented.

Normal aviation promulgation activity occurred, relating to AIRAC 03-20 for 27th February 2020 implementation.

The notifying AIC was published 16th Jan 2020 ([link](#) to AIC-Yellow 002/2020).

Briefing material was published on the Farnborough Airport website and remains current ([link](#) to Farnborough Airport web page containing airspace information, [direct link](#) to downloadable briefing pack for aircraft operators).

In addition, Farnborough undertook a 'roadshow' and made presentations to the following stakeholder groups:

Stakeholder	Date	Stakeholder	Date
Blackbushe EGLK operators	28/10/2019 19/01/2020 20/01/2020	Southdown Gliding Club	13/02/2020
Fairoaks EGTF operators	03/11/2019	White Waltham EGLM operators	14/01/2020
Lasham Gliding Society and 2Excel Engineering	06/11/2019	Heathrow Community Noise Forum	20/11/2019
Elstree EGTR operators	21/11/2019		

Table 2 Airspace change 'roadshow'

4 Evidence: Safety Data including Infringements

4.1 Safety Data 19a-d and Infringements 28a

- 4.1.1 19a: Data concerning any recurring instances of Instrument Flight Procedures (IAPs, SIDs, STARs, Holds) not being flown correctly.

19b: Report concerning any known Mandatory Occurrence Reports (MORs).

19c: Report concerning any known AIRPROX Reports.

19d: Report concerning any known Air Safety Reports (ASR).

28a: Data on the % change in infringements, compared on a monthly basis before and after the change.

Please see separate document titled 'Annex C Safety and Infringements'.

5 Evidence: Service provision/resource issues

5.1 Service provision 22a

5.1.1 22a: Data on refusals of service.

There were no refusals of service attributable to this ACP within the PIR period.

5.2 Service provision 22b

5.2.1 22b: Data regarding air traffic delays.

Delay to Farnborough IFR arrival traffic was captured during the ACP transition period using a specific delay attribution code. A total of 2,248 minutes of arrival delay was attributable to the ACP transition in February/March 2020.

In the remainder of 2019/20, an additional 2,721 minutes of delay was generated for Farnborough IFR arrival traffic (not associated with the ACP) giving a total of 4,969 minutes for the 12-month period 1 April 2019 – March 31 2020.

This delay is in line with expectations for a major airspace implementation and was caused by regulations managing the volume of traffic to ensure a safe transition period for controllers.

In the PIR 2022/23 period **no delay** was attributable to the airspace change, as delay resulting from the airspace change was **only** generated during the 2020 transition into service.

5.3 Service provision 22c

5.3.1 22c: Details of additional resource allocated, considering daily and seasonal traffic patterns.

Like all airports during the early part of the COVID-19 pandemic, special staffing arrangements were required to ensure the appropriate standard of operation where possible and appropriate. These arrangements varied as social restrictions were tightened and loosened in accordance with Government guidelines.

Unlike airports with scheduled commercial traffic, Farnborough Airport does not have extreme seasonal traffic variations (see Table 4 on page 15), therefore staffing levels remain standard throughout the year with minor adjustments as required on a day-to-day basis.

As part of the ACP implementation the number of staff at Farnborough was reviewed. Farnborough has increased the number of controllers in the Operational Requirement by three to meet the needs of service delivery.

The biennial Air Show requires special staffing arrangements including arrangements with adjacent Units. These are well-practised. The Air Show was cancelled in 2020 but successfully returned 18-22 July 2022 with no relevant resourcing issues recorded.

6 Evidence: Utilisation of Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO)

6.1 CCO/CDO 25a

6.1.1 25a: The % of traffic achieving CCO and/or CDO, compared monthly before and after the change (e.g. comparing the month of July before and after the change).

Not required, as this was not included in the justification detailed in the ACP.

7 Evidence: Traffic figures (Air Transport Movements ATMs)

7.1 ATMs 31a-31d

7.1.1 31a: Data on the actual vs predicted figures; and 31c: Reconfirmation that there have been no factors that would cause a material change to the traffic forecasts provided in support of the original proposal, i.e. that the original forecasts are still reasonable.

Data used in the 2014 consultation material was based on our 2019 most-likely forecast of 32,000 movements per year⁵.

2019 forecast	2019 actual	2020 actual	2021 actual	2022-23 actual
32,000	32,247	19,300	25,200	31,548
Proportion of 2019 forecast	100.8%	60.3%	78.8%	98.6%
Proportion of 2019 actual	100%	59.9%	78.1%	97.8%

Table 3 Forecast traffic for 2019 vs actual traffic for 2019, 2020, 2021 and PIR period 1 Apr 2022-31 Mar 2023

Table 3 shows that the actual traffic for 2019 was within 1% of the consultation's forecast. The impacts of the COVID-19 pandemic (see paragraph 1.3.2 on page 5) are shown in the columns above. Farnborough Airport traffic was significantly impacted with a c.40% drop in 2020 and c.22% drop in 2021 (compared with actual 2019 ATMs). However due to the nature of the operation this was not as severe as for many other airports and the recovery was also quick. Note that the biennial Farnborough International Air Show did not occur in 2020, but returned in 2022 (within this PIR period). The ATMs do not include Air Show-related movements.

Traffic recovery post-pandemic is evidenced by the PIR period 2022-23, showing that flights had returned to 2019 levels, the last full year before lockdown, and it was within 1.5% of the original 2019 forecast.

The consultation material also provided information on the maximum limit set by planning of 50,000 movements⁶ which was not expected to occur by 2019. The radar density pictures shown in the consultation were from September 2012, and there were 23,000 ATMs in 2012 (including some London Olympics traffic).

Thus 2019 and 2022's actual ATMs are c.40% and 37% more than in 2012, respectively; this remains in line with the original ACP forecast.

7.1.2 31b: Data on the % change compared monthly before and after the change.

2019	ATM	% of traffic	2022-23	ATM	% of traffic
Jan 19	2,185	6.8%	Jan 23	2,104	6.7%
Feb 19	2,289	7.1%	Feb 23	2,139	6.8%
Mar 19	2,300	7.1%	Mar 23	2,664	8.4%
Apr 19	2,278	7.1%	Apr 22	2,568	8.1%
May 19	2,889	9.0%	May 22	3,140	10.0%
Jun 19	3,418	10.6%	Jun 22	3,228	10.2%
Jul 19	3,427	10.6%	Jul 22	3,008	9.5%
Aug 19	2,652	8.2%	Aug 22	2,695	8.5%
Sep 19	3,199	9.9%	Sep 22	2,842	9.0%
Oct 19	2,871	8.9%	Oct 22	2,604	8.3%
Nov 19	2,428	7.5%	Nov 22	2,303	7.3%
Dec 19	2,311	7.2%	Dec 22	2,253	7.1%
Total	32,247	100.0%	Total	31,548	100.0%

Table 4 Movements in the calendar year 2019, and the equivalent months over the Apr 2022-Mar 2023 PIR period
NB Jan 23, Feb 23 and Mar 23 are deliberately placed in this order to allow month by month comparison with 2019

Table 4 illustrates the proportions of movements per month, in 2019 and in the PIR period 2022-23. The proportions are generally consistent and minor variations are

⁵ See Feedback Report Part B, Appendix B ([link](#))

⁶ See Consultation Document Part A, briefly discussed in paragraphs 4.20 and 8.27 ([link](#)). All the tables in the consultation material describing potential numbers of flights refer to '2019 most likely' (a proportion of the forecast 32,000 flights) and '2019 high forecast' (a proportion of the maximum limit set by planning of 50,000 movements, not expected to be achieved by 2019).

not considered attributable to the introduction of the airspace change. July 2022 saw a slight reduction in traffic compared with 2019; this is attributed to the biennial Air Show that typically causes a change in ATMs.

8 Evidence: Traffic dispersion comparisons

8.1 Traffic dispersion 34a-34c

8.1.1 34a: Density plots that show concentration and lateral dispersion.

34b: Density plots that show vertical profiles.

34c: Weather/MET impacts.

This requirement is associated with paragraph 13.3 items 49k-m and 49r on page 29.

Please see separate document titled 'Annex A Farnborough PIR Traffic Dispersion and Environmental Overflight Diagrams'.

8.1.2 34d: Any changes to operating fleet mix.

In the original ACP from 2015 ([link](#)) page 7 Table 1 we illustrated the typical composition of aircraft types using Farnborough. In summary, 95% were described as corporate aircraft comprising business jets and turboprops, with 4.4% mid-sized airliners such as Airbus A320 or Boeing 737 types. The remaining fraction were small General Aviation (GA) types.

Categories	2019		2022-23	
Business jet	29,447		29,177	
Light GA	16	97.2%	24	98.4%
Light/medium turboprop	1,870		1,835	
Mid-sized airliner	914	2.8%	512	1.6%
Total	32,247		31,548	

Table 5 Farnborough fleet mix 2019, and the Apr 2022-Mar 2023 PIR period

Table 5 shows a slight increase in the proportion of corporate aircraft and a reduction in the proportion of mid-sized airliners between 2015, 2019, and 2022-23. This is attributed to changes in the corporate air transport market using Farnborough and, partially, the change in July 2022 movements due to the Air Show; it is not attributed to the airspace change.

NB the fleet mix for 2022-23 does not include Air Show types such as widebody commercial airliner demonstrators, nor does it include military aircraft.

9 Evidence: Operational Feedback, and Impact on Ministry of Defence Operations

9.1 Operational feedback 37a-37b

9.1.1 37a: Any direct feedback from airlines/ air traffic controllers.

37b: Any additional feedback from relevant flight operation sub-committee (sub-group of airport consultative committee).

9.2 MoD Impacts 55a

9.2.1 55a: Details on any feedback from Ministry of Defence, specifically relevant to the interaction with RAF Odiham operations.

Please see separate document titled 'Annex B Operational Feedback Engagement'.

10 Evidence: Denied Access

10.1 Denied Access 40a-40b

- 10.1.1 40a: Data concerning the refusals of access (month on month/ before and after the change).
40b: Reasons for individual refusals of access.
- 10.1.2 Farnborough ATC operated in an outside-CAS environment for decades; staff were well trained and practised in GA requests to participate in air traffic services outside controlled airspace (ATSOCAS) in the area local to Farnborough.
- 10.1.3 As part of the ACP Farnborough undertook large scale simulations, some of which the CAA attended and observed. The intent was to demonstrate that the introduction of CAS would be 'business as usual', i.e., most GA aircraft would be able to transit the region in a similar manner to pre-ACP ATSOCAS without undue delay.
For additional evidence please see separate document 'Annex E General Aviation and Glider Study'.
- 10.1.4 For the reporting period, April 2022 to March 2023, the CAA confirmed that no relevant UK Airspace Access Reports (FCS1522) had been received regarding Farnborough controlled airspace.
- 10.1.5 To provide an evidence-based picture of how Farnborough controlled airspace is being used, ATC clearance data from electronic flight strips has been obtained for the period August 2022 to March 2023.
- 10.1.6 Note that, due to a data storage error in the Electronic Flight Progress Strip system EFPS, data relating to CAS clearance inputs for the period from April 2022 to July 2022 was found to be irretrievable – we apologise to the CAA for this, and storage measures have been put in place to mitigate recurrence.
- 10.1.7 Data from the remaining 8 months is considered by Subject Matter Experts (SMEs) to be sufficiently representative of the operation to provide insight into Farnborough controlled airspace usage since its introduction.
- 10.1.8 The analysis of ATC clearance data relates to providing access to Farnborough controlled airspace; before the ACP, Farnborough had none. Therefore, these clearances could not exist in the previous Farnborough operation and there can be no meaningful comparison of pre and post ACP data.
- 10.1.9 From the ATC clearance data, aircraft were identified as receiving one or more of the following clearances: JCAS (clearance to join controlled airspace), LCAS (clearance to leave controlled airspace), ROCAS (instruction to remain outside controlled airspace), and XCAS (clearance to cross controlled airspace).
- 10.1.10 For aircraft that received a ROCAS, with no subsequent JCAS or XCAS clearance, it is assumed that either; these aircraft were operating close to the edge of controlled airspace and were given a reminder instruction to remain outside to ensure the pilot was informed of the proximity, or these aircraft waited outside controlled airspace and may (or may not) have decided to proceed with their journey outside Farnborough controlled airspace, however no further details to satisfy 40b can be inferred from the dataset.

10.1.11 Analysis of 8 months of ATC clearance data (Table 6 and Figure 1) shows that around 90% of initial calls to Farnborough ATC result in either immediate (e.g. JCAS or XCAS), or near-immediate (e.g. ROCAS followed by a JCAS or XCAS) clearance through Farnborough controlled airspace; the other c.10% of calls received a ROCAS only. Overall, this varies from 7%-11% of requests.

Month	Recorded GA movement count	Timely CAS clearance issued	Proportion
Aug 2022	611	562	92%
Sep 2022	514	478	93%
Oct 2022	496	448	90%
Nov 2022	366	335	92%
Dec 2022	244	224	92%
Jan 2023	328	296	90%
Feb 2023	378	335	89%
Mar 2023	367	327	89%

Table 6 Monthly account of GA flights requesting to cross or join CAS

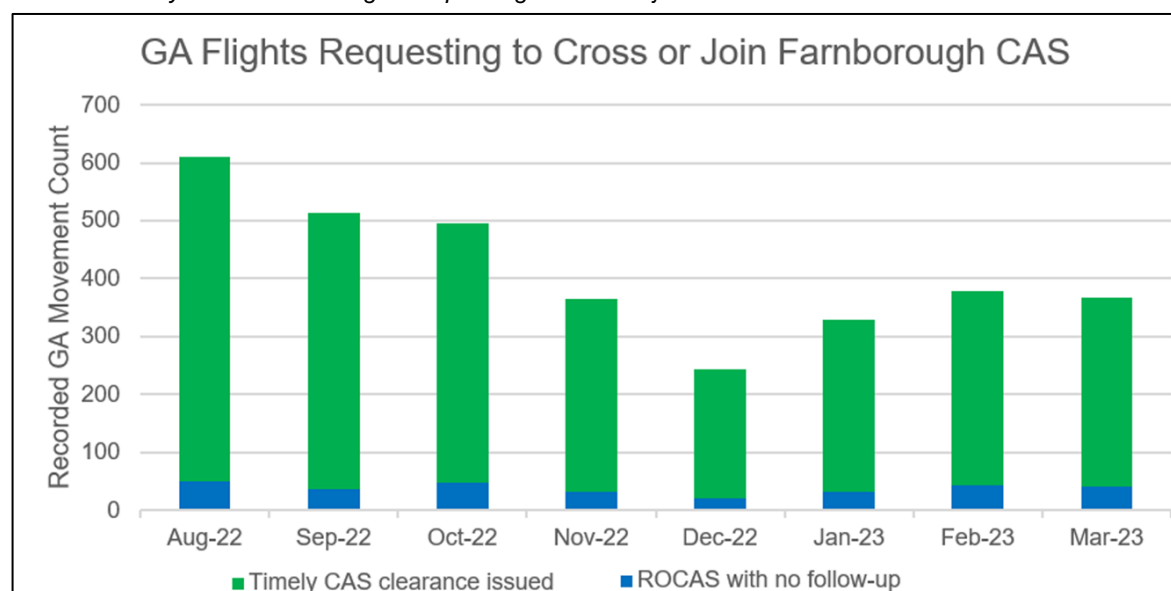


Figure 1 Monthly account of GA flights requesting to cross or join CAS

10.1.12 The data demonstrates that Farnborough controlled airspace is being serviced to enable equitable access for all participating airspace users, with controllers aiming to facilitate controlled airspace transits for the majority of the operation in a timely manner.

10.1.13 A minority of transits are unable to be immediately accommodated at the time of request (ATC may, for example, have been dealing with high workload, or the traffic scenario at the time may have meant the transit could not be accommodated, or there may have been a credible safety concern), and these aircraft were instructed to remain outside controlled airspace.

10.1.14 There is no evidence to suggest that a JCAS or XCAS would not have been issued at a more suitable time to these aircraft, only that at the time of the request immediate access to the airspace could not be accommodated and subsequently the request was cancelled – for example the pilot may have decided to take an alternate route or left the frequency.

10.1.15 Additionally, Farnborough was required to change its airspace design by the CAA in order to acquire approval; two volumes of CAS were changed from Class D to Class E with a coincident Transponder Mandatory Zone TMZ (known as Class E+). In CTA8 and CTA9, both Class E+, VFR aircraft with an operating transponder may freely roam without ATC clearance. They are, however, required to be vigilant for IFR

aircraft under a full radar control service, using the 'see and avoid' principle. No JCAS/XCAS transit clearance is required for these volumes.

10.1.16 For further information on GA/glider flight patterns in the vicinity of Farnborough please see Annex D.

11 Evidence: Utilisation of SIDs/STARs/IAPs

11.1 Utilisation of SIDs/STARs/IAPs

11.1.1 43a: Data on the % of flights that actually flew the procedure(s) vs the total number of flights (departing or arriving), compared for the relevant time periods before and after the change.

This utilisation is related to items 31a-31d in Section 7 from page 15, and the traffic flow diagrams illustrated in the separate document 'Annex A Farnborough PIR Traffic Dispersion and Environmental Overflight Diagrams'.

Until the airspace change was implemented, Farnborough's departures and arrivals were tactical. The following table compares the pre-ACP departure routes with the equivalent post-ACP SIDs, and likewise for arrival routes and STARs.

2019 Departures (tactical)			2022/23 Departures (SIDs)		
North	5,868	36.5%	HAZEL North East	6,568	41.6%
East South Southeast Southwest	9,750	60.6%	GWC South Southeast Southwest	8,751	55.4%
Other	479	3.0%	Other	473	3.0%
Total	16,097	100%	Total	15,792	100%
2019 Arrivals (tactical)			2022/23 Arrivals (STARs)		
North	6,953	43.1%	CPT North	7,468	47.4%
South Southeast	6,275	38.9%	ELDAX Southeast	5,924	37.6%
Southwest	2,095	13.0%	SOKDU/KATHY South Southwest	2,127	13.5%
Other	827	5.1%	Other	242	1.5%
Total	16,150	100%	Total	15,756	100%

Table 7 Proportions of departures and arrivals by direction, pre and post ACP

Approximately 5% of departures changed from heading generally south to heading generally north.

This is partially attributable to the airspace change, and was predicted. Departures to the east, usually via Dover, were changed at NERL's request to use the northern route (HAZEL) before turning east. In our original consultation material we expected this to be a c.10% change; see Consultation Document A ([link](#)) Figure A6 and paragraphs 8.34-8.38 on page A31. Therefore there is a c.5% difference which we contend is a combination of the generally changing destination demand since 2019 and also, potentially, influenced by airspace and destination restrictions caused by the Russia-Ukraine conflict (see paragraph 1.4.1 on page 6). Note that all departures route the same way up to c.7,000ft therefore this 5% change is not significant.

The proportions of arrivals per direction are broadly comparable pre and post ACP (minor differences of fewer than c.5%).

The purpose of this PIR item is to identify potential areas of unforeseen consequence such as a particular procedure being used more than anticipated. The procedure usage is in line with predictions, for departures and arrivals.

12 Evidence: Letters of Agreement (LoAs)

12.1 LoAs 46a-46b

12.1.1 46a: Evidence of usage of operational agreements between ANSPs and airspace users.

46b: Data concerning the activation/utilisation of LoA procedures.

The following table lists the LoA holder, a qualitative assessment of how frequently the procedures therein are used, a brief amendment history, and comments.

NB we have also engaged those LoA holders and asked for operational feedback, please see separate annex titled 'Annex B Operational Feedback Engagement'.

LoA Holder	Usage	Amendments	Comments
2Excel Engineering at Lasham aerodrome (EGHL)	Approx 2-4 times Weekly. Increased activity in winter months.	No amendments	Frequent dialogue regarding airliner maintenance movements into EGHL. Lasham are an Air Ground unit for 2Excel related flights.
Blackbushe (EGLK)	Daily	The LoA was amended to facilitate autonomous SVFR operations 01/11/2021	Part of the Wessex group airfields. Inbound traffic utilises LF STAR. Departures have an agreed departure instruction. Current LoA under review to assist aircraft extending downwind for safety.
British Balloon and Airship Club (BBAC)	Occasionally	No amendments	Predominantly flights are early morning prior to opening or later in the evening. Increased use in Summer.
Dunsfold Aerodrome (EGTD)	Weekly	No amendments	Part of the Wessex group of airfields. Inbound traffic utilises LF STAR. LoA renewed May 2023.
Fairoaks (EGTF)	Daily	Removal of 0467 intention code with agreement of Fairoaks due infringement risk being identified	Used daily as part of the Wessex group airfields. Inbound traffic utilises LF STAR. Departures have an agreed departure instruction.
Fleet and District Model Aircraft Club	Available daily, actual use uncertain due to the type of operation.	Met with Club Chairman at Farnborough to review and re-sign LoA. No amendments made	The area is segregated. Monitoring usage is not practical.
Goodwood (EGHR)	Infrequently	No amendments	Rarely used. Close cooperation annually during Goodwood events with increased helicopter activity to and from Four Seasons hotel within EGLF CTR1.
Hants Search and Rescue	Infrequently	No amendments	Rarely used.
Homestead Farm (paramotor)	Fortnightly (summer)	No amendments made. LoA has been reviewed since ACP.	More active during the summer months

LoA Holder	Usage	Amendments	Comments
Lasham Gliding Society at Lasham aerodrome (EGHL)	In progress	<p>The FUA trial was conducted in 2021. This looked at two potential areas of shared airspace during Runway 24 and Runway 06 operations respectively.</p> <p>Following a meeting with LGS at Farnborough. It was agreed that we would focus on developing the shared area during Runway 24 operations only at this stage.</p> <p>Communication requirements within Class D airspace have taken longer to resolve and a concept was presented at Farnborough on 27/04/2023.</p> <p>COVID and change management are a key factor in the delays.</p>	<p>Currently a draft LoA is being produced to facilitate a shared airspace arrangement.</p> <p>Weekly dialogue with LGS for operational reasons and safety discussions.</p> <p>LGS took part in a EGLF ATC safety day in May 2021.</p>
NERL	Daily	Various amendments post implementation including Solent/Hanky box interaction.	Monthly TCSW interface meetings to discuss issues and or potential review requirements.
QinetiQ Farnborough	Available daily, actual use uncertain due to the type of operation.	No amendments made. Review in progress	The area is segregated within EGLF ATZ and was present pre-ACP. Monitoring usage is not practical.
RAF Odiham (EGVO) and Kestrel gliders	Daily	LoA had a comprehensive amendment post ACP effective 01/04/2022. LoA review in progress to amend Kestrel section and further simplify Odiham interaction	Used each day. Kestrel generally active only at weekends with occasional requests for Friday activity.
Shoreham ATSU (EGKA)	2-3 times per week (variable)	No amendments	ATS route network joiners via GWC or MID contact LF.
Southdown Gliding	1-2 days per week between April and October	LoA due for review. Meeting at Farnborough with stakeholders with presentation from SDG 14/04/2023. No change to LoA required. Invited to a future LF ATC safety day.	Very dependent on competition or cross-country activity. More usage in Summer.

Table 8 Letters of Agreement holders and usage

13 Evidence: Impact on environmental factors (including noise)

13.1 Environmental: Local Air Quality 49a-49e

13.1.1 49a-49e describe typical data requirements regarding the assessment of local air quality.

There is no requirement to assess local air quality as there are no designated air quality management areas (AQMAS) located within an area where the change would impact aircraft below 1,000ft. Therefore it is concluded that the implementation has not led to a breach or worsening of legal air quality limits.

13.2 Environmental: Noise Contours 49f-49j

13.2.1 49f-49j describe typical data requirements regarding noise contours. For this PIR the CAA did not require noise contours and associated data because it was not supplied as part of the original proposal. This was agreed with the CAA and was described in their ACP Environmental Assessment page 4 paragraph 5.1 ([link to CAA pdf](#)).

For the separate discussion on Overflight evidence please see separate document titled 'Annex A Traffic Dispersion and Environmental Overflight Diagrams'.

- 13.2.2 However, the CAA states for this PIR that the sponsor should provide confirmation with supporting evidence that the airspace change has not had an impact upon the airport's 57dB(A) Leq 16hr contour with particular reference to the categories of data identified in Table 2.1 of CAP2091 CAA Minimum Standards for Noise Modelling.
- 13.2.3 We confirm that the 57dB(A) Leq 16hr contour has not been impacted by the airspace change, with reference to Table 2.1 of CAP2091 ([link to CAP2091](#), see page 11 of Edition 1 for Table 2.1).
- 13.2.4 The following argument refers to Figure 2 (page 25 for 2012 pre-ACP), Figure 3 (page 26 for 2019 pre-pandemic, pre-implementation), Figure 4 (page 27 for 2022 post-implementation) and Figure 5 (page 28 for 2023 prediction). These are all noise contour diagrams published⁷ on Rushmoor Borough Council's airport monitoring website ([link to RBC airport monitoring](#)).
- 13.2.5 The diagrams illustrate the airport's 55-60-65dB(A) Leq 16hr contours for the four illustrative periods. These contours are essentially a combined and time-averaged calculation of the noise energy of each aircraft type, the quantity of each type using the airport, whether they are landing or taking off, their altitude, and their position i.e., where the flightpath actually goes.
- 13.2.6 Airspace changes typically influence the latter two items (flightpath and altitude) more than the former two items (aircraft type and quantity).
- 13.2.7 Farnborough Airport's noise modelling uses a mixture of local airport data for some elements, and the ICAO dataset for the flight profiles.
- 13.2.8 Table 2.1 in CAP2091 indicates that, where ICAO datasets are used for flight profiles, the correct modelling should be described as Category D and/or E⁸.
- 13.2.9 Therefore Farnborough Airport's CAP2091 noise modelling for this PIR is consistent with Categories D and/or E.
- 13.2.10 Notes for the contour diagrams:
- There are three red contours per diagram.
 - The smallest 65dB(A) contours are where the most noise energy is concentrated, logically this is where aircraft are closest to the ground (i.e., the runway).
 - The longest 55dB(A) contours are where the noise energy has spread, logically this is where aircraft are higher and further away from the runway.
 - The longest 55dB(A) contours do not extend beyond c.1.5km of the end of either runway.
 - There is no 57dB(A) contour on any of the diagrams, but logically they must lie between the 55dB(A) and 60db(A) contours.
 - There is also a blue contour; this is the airport's planning limit 55dB(A) contour (i.e., the 55dB(A) contour must never exceed the blue area). The blue contour is not relevant for this PIR.
 - Westerly Runway 24 is always used far more often than easterly Runway 06 due to prevailing wind in southern England combined with a westerly preference at Farnborough Airport. In 2022 the proportions were 74% westerly Runway 24 and 24% easterly Runway 06, hence the 55dB(A) contours at the westerly end tend to be broader than the 55dB(A) contours at the easterly end.

⁷ The 2012 diagram was originally published by RBC and is taken from our archive; it is no longer listed on the RBC web page. The 2019, 2022 and 2023 diagrams remain available on the RBC web page at time of writing.

⁸ The requirements for Category D and Category E are the same, at time of writing.

13.2.11 Before the airspace change, arrivals to both runway ends occurred in a straight-line final approach, at a 3.5° descent slope, within the area of interest of these contours (c.1.5km from each runway end).

After the airspace change, the same final approach arrangement continued.

There was no change to the flight behaviour of arrivals on final approach within 1.5km of each runway end, therefore the contours would not be affected by the arrival elements of the airspace change, which occur further out.

13.2.12 Before the airspace change, departures from the easterly runway (Runway 06) generally climbed straight ahead until the controller instructed the pilot to turn right onto an appropriate compass heading.

After the airspace change, aircraft taking off using the easterly Runway 06 SIDs also climb straight ahead until the aircraft reaches the automatic right-turn waypoint, or until the controller instructs the pilot to turn right onto an appropriate compass heading.

There was no change to the flight behaviour of easterly departures within 1.5km of the runway end, therefore the contours would not be affected by the Runway 06 departure element of the airspace change.

13.2.13 Before the airspace change, departures from the westerly runway (Runway 24) were generally instructed by the controller to turn left after take-off onto an appropriate compass heading, with some turning right. This turn in either direction was necessary because it moves the aircraft away from RAF Odiham (fewer than 11km from Farnborough and in a direct line from the runway) . This turn did not occur at the same place every time.

After the airspace change, aircraft taking off using the westerly Runway 24 SIDs automatically start a left turn of 15° as soon as they reach the departure end of the runway, and right turns were no longer available.

Theoretically the contours *could* be affected by this element of the airspace change within 1.5km of the runway end, because the left turn happens very soon after take-off, combined with the removal of right turns, could cause a change in the flight behaviour of westerly departures. The turn was deliberately designed to guide the departure over the unpopulated army vehicle training ground at the end of Runway 24 and away from the village of Church Crookham, while also attempting to reduce the direct overflight of Ewshot.

13.2.14 Turning to the diagrams on the following pages, the 57dB(A) contour must, logically, lie between the contours of 55 and 60, however the precise contour cannot be easily estimated because decibels are not a linear scale and professional acoustic modelling would be required.

13.2.15 It would be disproportionate to commission a set of 57dB(A) Leq 16hr contours given that the published 55-60 dB(A) contour data can provide the evidence required by the CAA in paragraph 13.2.2 above.

13.2.16 In each diagram, a colour-shaded region indicates the maximum and minimum extent of the departure end of Runway 24.

- Figure 2 (page 25 for 2012 pre-ACP) shows a pink shaded region.
- Figure 3 (page 26 for 2019 pre-pandemic, pre-implementation) shows a green shaded region.
- Figure 4 (page 27 for 2022 post implementation) shows a yellow shaded region.
- Figure 5 (page 28 for 2023 prediction) shows a brown shaded region.

13.2.17 The differences between the contours in Figure 2 (2012) and Figure 3 (2019) are solely attributable to the aircraft types and quantities; there was no airspace change

- to affect the contours. The shapes are similar but Figure 3 (2019)'s green shaded area is bigger than Figure 2 (2012)'s pink shaded area. This is consistent with paragraph 13.2.6 above.
- 13.2.18 As described in paragraph 13.2.13 above, the Runway 24 SIDs are the only elements of the airspace change that theoretically *could* cause a change to the 57dB(A) contour post-implementation (2022).
- 13.2.19 However, Figure 4 (2022)'s yellow shaded area is clearly a slightly larger version of Figure 3 (2019)'s green shaded area, most likely attributable to slightly more traffic in 2022 (see Section 7 from page 15). It is essentially the same shape, consistent with paragraph 13.2.6 above.
- 13.2.20 If the airspace change could impact the contours, it would be due solely to the earlier left turns of Runway 24's departures.
- 13.2.21 There is no evidence that the contours in Figure 4 (2022) have 'turned left', neither the red lines nor the yellow shaded area (within which lies the 57dB(A) contour). The same applies to Figure 5 (2023 prediction); the brown shaded area is practically indistinguishable from Figure 4 (2022) and again there is no evidence of contours 'turning left'.
- 13.2.22 If the ACP had not been implemented and growth had been the same, the 2022 and 2023 contours (without ACP) would have been practically indistinguishable from those in Figure 4 and Figure 5.
- 13.2.23 We conclude that the influence of the airspace change on the 57dB(A) Leq 16hr contour was, and is, either nil or imperceptible.
- 13.2.24 Elsewhere this PIR also discusses potential displacement of transiting General Aviation (GA) flights such as light sports and leisure aircraft. For the avoidance of doubt, GA flights crossing the area may be audible, but they do not contribute to the airport's noise contours.

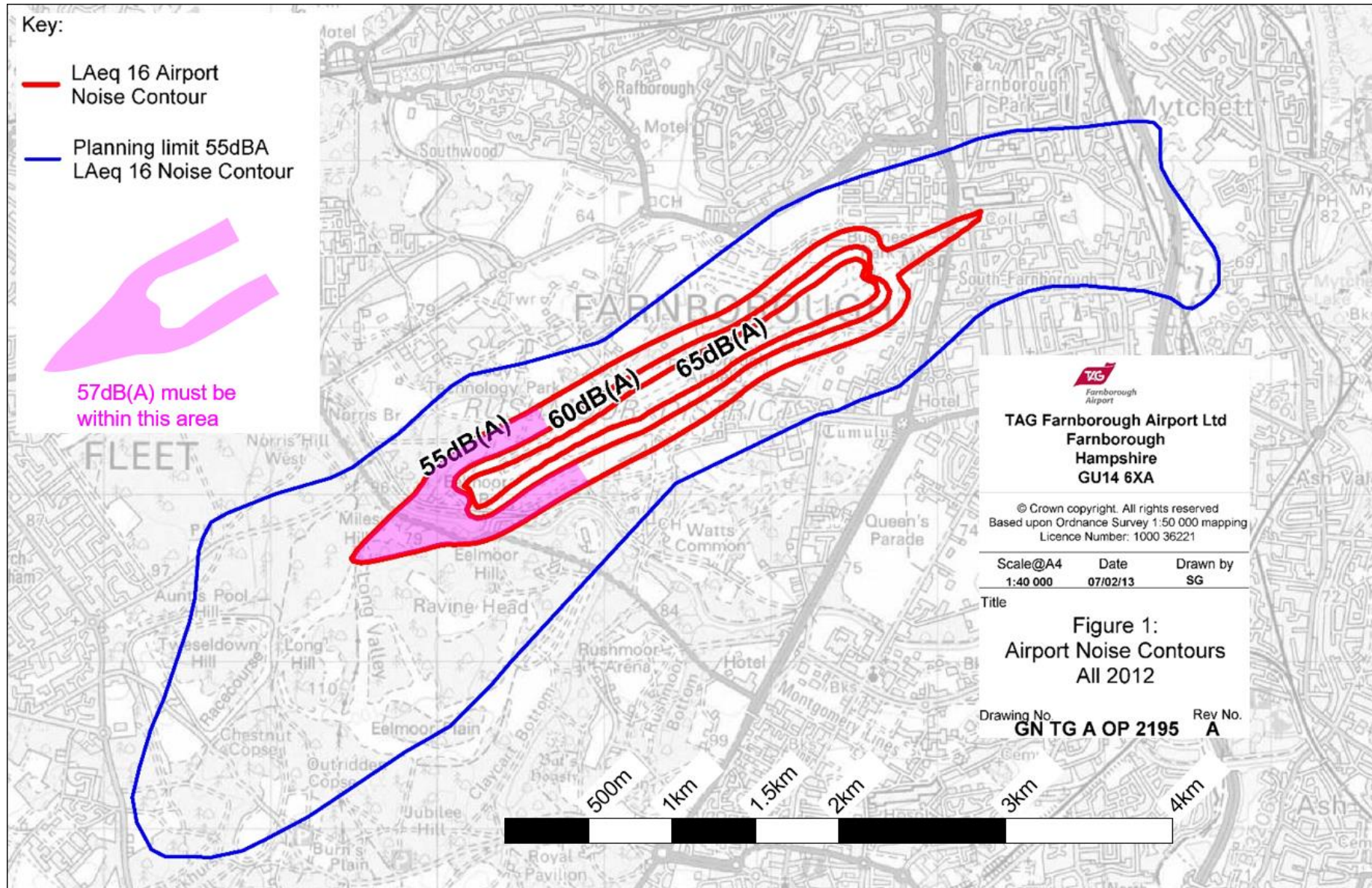


Figure 2 Extract from 2012 Rushmoor Borough Council Annual INM Airport Noise Assessment Report, Contours 55-60-65dB(A), overlaid with 57dB(A) region

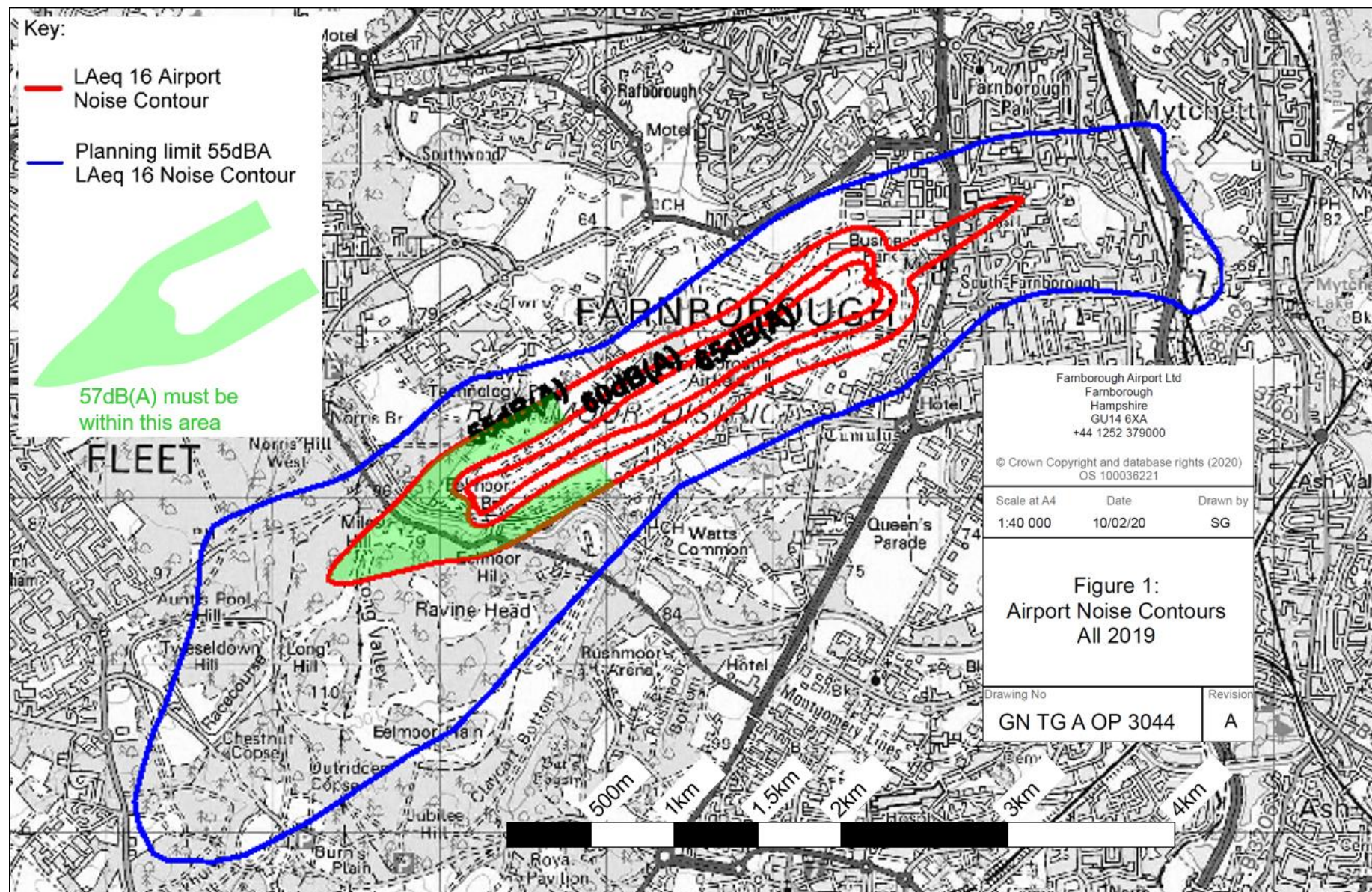


Figure 3 Extract from 2019 Rushmoor Borough Council Annual INM Airport Noise Assessment Report, Contours 55-60-65dB(A), overlaid with 57dB(A) region

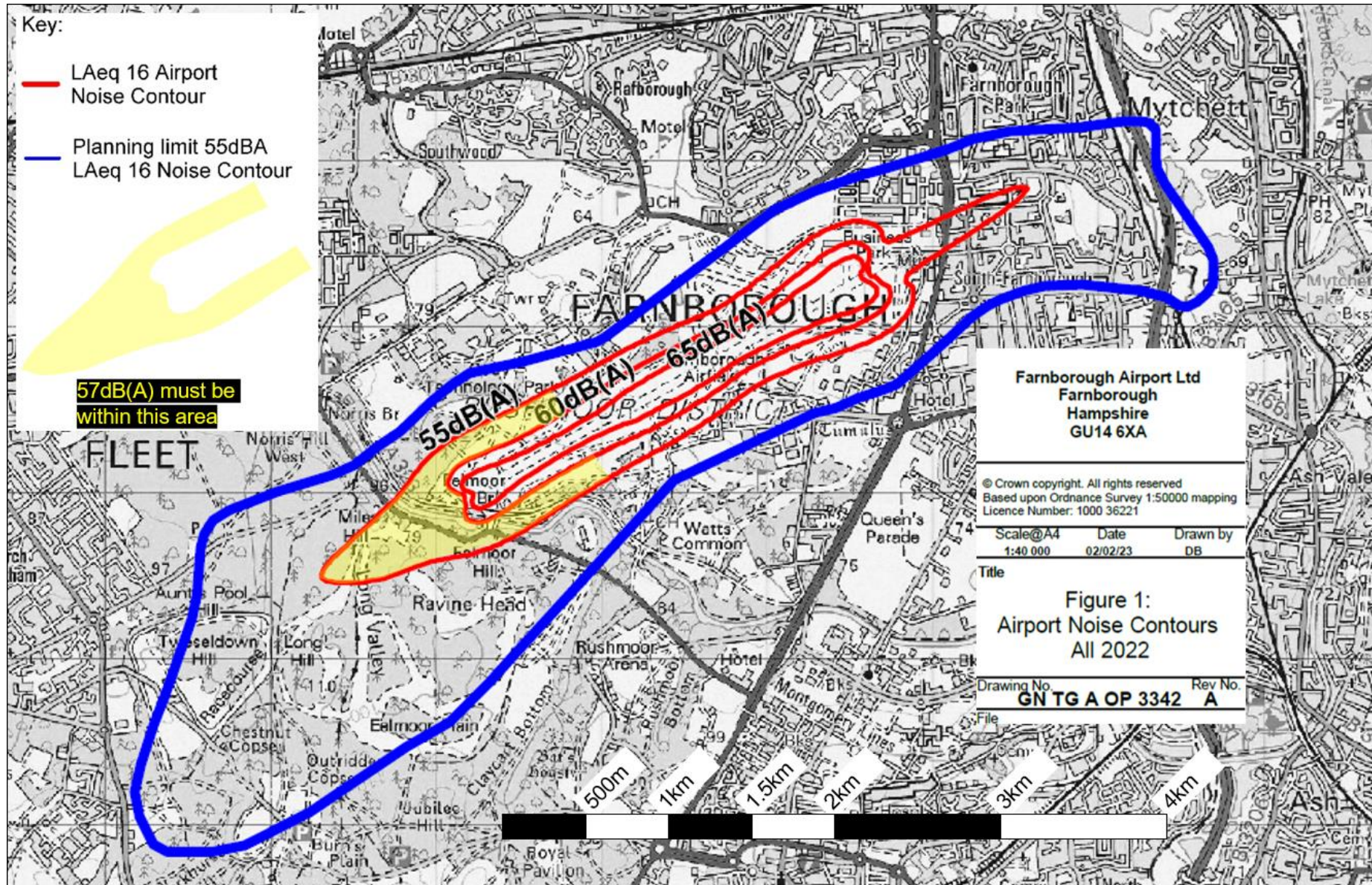


Figure 4 Extract from 2022 Rushmoor Borough Council Annual INM Airport Noise Assessment Report, Contours 55-60-65dB(A), overlaid with 57dB(A) region

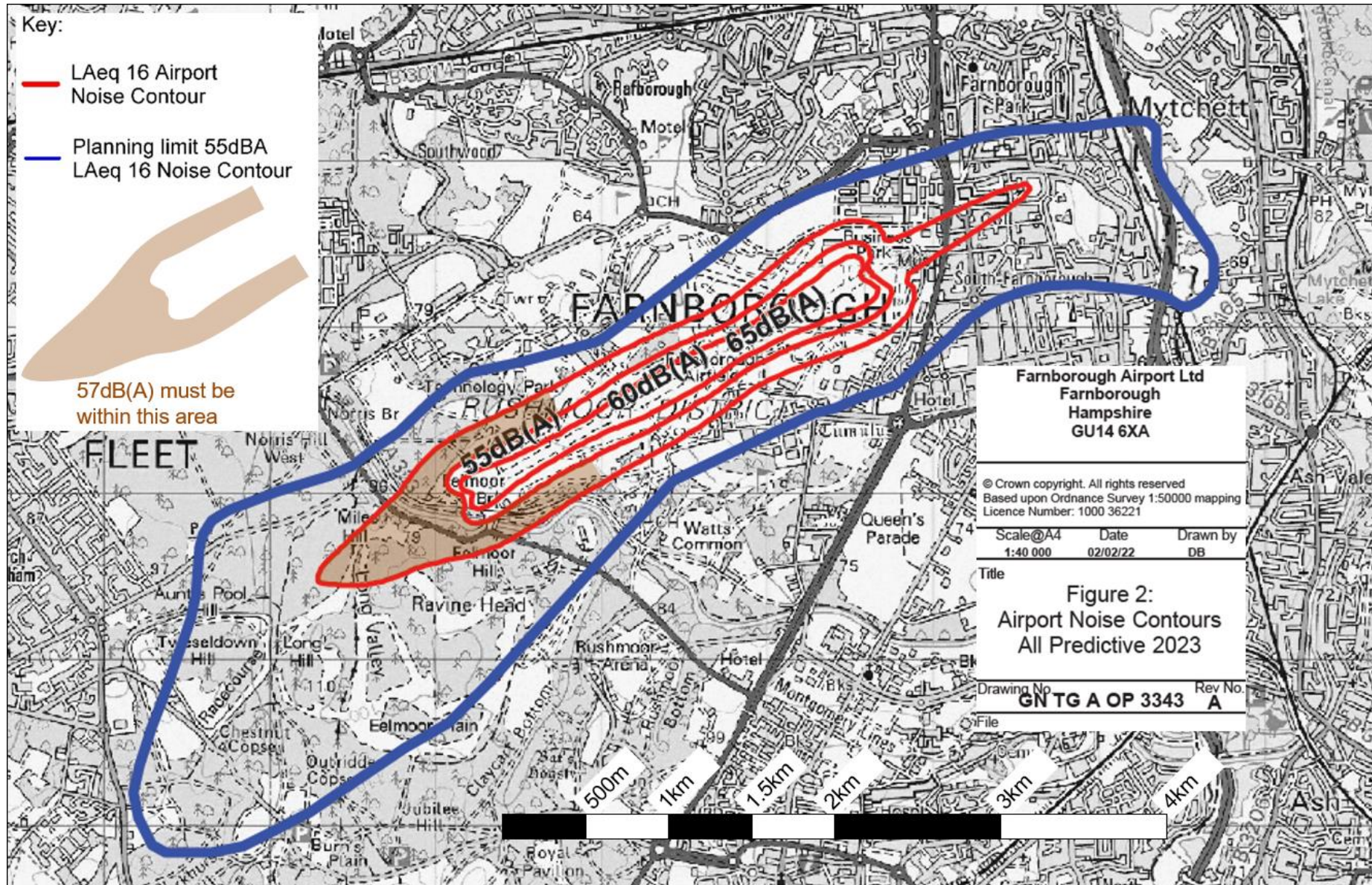


Figure 5 Extract from 2023 Rushmoor Borough Council Predicted INM Airport Noise Assessment Report, Contours 55-60-65dB(A), overlaid with 57dB(A) region

13.3 Environmental: Overflight and Operational Diagrams 49k-49m

13.3.1 49k: Operational diagrams (for example, radar track diagrams and track density diagrams) overlaid on Ordnance Survey maps or similar.

49l, 49m: Calculation of overflight

This requirement is associated with paragraph 8.1 items 34a-c on page 16.

Please see separate document titled ‘Annex A Farnborough PIR Traffic Dispersion and Environmental Overflight Diagrams’.

13.4 Environmental: Fuel and CO₂ Emissions 49n-49q⁹

13.4.1 49n, 49p, 49q: Annual fuel and CO₂ usage (tCO₂), supporting input data, description of any modelling assumptions, including details of prediction model where used.

13.4.2 49n and 49o: Annual total fuel and CO₂ calculations

	Flights	Fuel (t)	CO ₂ e (t)
Pre-ACP (2019)	30,202	12,478	39,680
PIR period (Apr 2022-Mar 2023)	31,025	13,654	43,419
Change	823 increase	1,176 increase	3,739 increase
Per flight equivalent averaged over PIR period			
		27kg/flight increase	86kg/flight increase

Table 9 Fuel and CO₂ emissions data

NB calculations are for CO₂e, a measure of overall greenhouse gas equivalence

The data calculation methodology has been significantly updated since our original ACP, meaning the two calculations cannot be directly compared. Compared to traffic data (see Section 7), environment data requires a richer dataset (aircraft type, accurate origin/destination) to be processed. This inevitably leads to some flights not being processed and slight differences in flight counts.

In addition, the 2019 dataset is based on a procedure where a pre-processing filter of SSR codes was used to remove non-civil (i.e. Military) flights. This has increased (erroneously) the number of flights removed from the dataset prior to the fuel calculations due to a Eurocontrol re-allocation of codes in May 2019.

The traffic data should be considered an accurate reflection of the traffic at Farnborough Airport. The environment data should be considered as the best reflection of this traffic, using only valid data available.

The original, less-comprehensive, ACP methodology predicted an increase of 534t fuel and 1,697t CO₂ for 2019, so the updated method produced a higher fuel/CO₂e calculation than originally predicted. Therefore, the updated calculations are consistent with the original in predicting an increase, but the overall increase is greater than expected. Analytics specialists noted that the key factor in this difference is the divergence in methodologies. However, the objectives for this ACP were to increase predictability, reduce complexity, and to reduce overflight of populated areas at low altitudes, all of which have been achieved and are described elsewhere in this PIR.

Item 49o (per flight fuel and CO₂ data) was not required, however we have supplied it here. The per-flight calculation in Table 9 was calculated using the average fuel over the PIR period minus the average fuel over the pre-ACP period. Therefore, the total

⁹ 49o (per flight fuel/CO₂ usage) was not required

change in Table 9 does not align with the total fuel change because the total fuel change includes the impact of the total increase in flights.

Another contributory factor is our lack of control over air route network level changes to traffic management. For example, the interactions between Farnborough aircraft and those from Gatwick and Heathrow often dictate the environmental performance of our traffic and are outside our area of responsibility.

Note that we have joined the southern cluster of the Future Airspace Strategy Implementation, part of the Government's Airspace Modernisation Strategy ([link](#)). This is a countrywide modernisation of the UK's route network, with airports (including Farnborough) working with each other and NERL (the UK's route network air traffic service provider) to integrate routes more effectively and holistically.

13.4.3 49p: Data Assumptions and 49q: Methodology

The following assumptions and methodology have been provided by analysts at NATS:

To comply with CAA regulatory requirements, NATS (NERL) processes all flight profiles in the UK FIR for fuel & CO₂ emissions on a daily basis using the Azure Cloud. Data from this database is to be used.

The data in the database is derived from fuel burn rates calculated for each radar return of each flight using the NATS Environmental Model (NEMo). This model is an implementation of BADA 4.2, supplemented with BADA 3.14 for aircraft that do not have a BADA version 4 model as of January 2020. The fuel burn rates at each point calculated by NEMo are then summed to get a total fuel used value per flight.

As part of the calculation the track distance flown of each flight is also populated in the database.

CO₂ is the fuel value multiplied by 3.18 (conversion factor to CO₂e).

Data is extracted for Farnborough departures and arrivals separately, then combined for a total.

The data is geographically limited to the 2.5°W to 1°E and 49.5°N to 52.5°N square region¹⁰. It is assumed that all Farnborough flights will reach a common point (equivalent position and flight level) within the wider UK network by this border.

The date range used for the pre-ACP data is 2019-01-01 to 2019-12-31.

The date range used for the post-ACP data is 2022-04-01 to 2023-03-31.

The data is therefore based on actual flight profiles and not procedures. Hence, understanding the cause of any fuel benefit/penalty is not always clear due to the impacts of weather, inconsistent flight planning and/or tactical intervention.

It is assumed that the fleet mix of Farnborough traffic is the same pre and post ACP as per PIR submission.

It is assumed that the city-pairs of Farnborough traffic are the same pre and post ACP as per PIR submission.

The Farnborough ACP is not the only change to UK airspace between the pre-ACP dataset and post-ACP dataset. This may mean there is some impact from other airspace changes, but this is assumed to be a minor factor.

A small number of flights will be excluded due to the inability to match a track to a flight plan to obtain the aircraft type.

¹⁰ This region translates to Bristol in the west, Canterbury in the east, Birmingham in the north and Guernsey in the south.

13.5 Environmental: Tranquillity and Visual Intrusion 49r

- 13.5.1 49r: Operational diagrams clearly identifying traffic over relevant AONBs and National Parks up to 7,000ft.

This requirement is associated with paragraph 8.1 items 34a-c on page 16 and also paragraph 13.3 items 49k-m above.

Please see separate annex titled 'Farnborough PIR Traffic Dispersion and Environmental Overflight Diagrams'.

13.6 Environmental: Biodiversity 49s

- 13.6.1 49s: Assessment of biodiversity factors including any specific to local circumstances identified through engagement.

- 13.6.2 As described in paragraphs 1.2.2-1.2.4 on page 5, the previous airspace change process known as CAP725 was in effect at the time of writing.

- 13.6.3 The original requirement of CAP725 states:

It is considered unlikely that airspace changes will have a direct impact on animals, livestock and biodiversity. However, Change Sponsors should remain alert to the possibility and may be required to include these topics in their environmental assessment.

- 13.6.4 The original ACP stated, in response:

We have no reason to believe that flora and fauna will be adversely affected by this proposal.

- 13.6.5 The current airspace change process CAP1616 states¹¹:

In general, airspace change proposals are unlikely to have an impact upon biodiversity because they do not involve ground-based infrastructure. As such they are unlikely to have a direct impact that would engage the Birds or Habitats legislation.

- 13.6.6 The CAA's PIR data requirement for this change states:

The ACP concluded that there are unlikely to be any impacts on biodiversity. The sponsor should provide re-confirmation with supporting evidence that the airspace change has not had an impact upon biodiversity factors identified within the ACP.

- 13.6.7 We re-confirm there are no reasons for there to have been any impacts on biodiversity due to this airspace change. There were no biodiversity factors identified within the original ACP. Consistent with paragraph 13.6.5 above, there were no ground infrastructure changes due to the implementation of this proposal, and none since that relate to this proposal¹².

14 Evidence: International Obligations

14.1 International Obligations 52a

- 14.1.1 52a: Details on any feedback from operators or neighbouring States.

Not required, as there are no international obligations associated with this airspace change.

¹¹ CAP1616 Edition 4 page 173, extract from paragraph B80.

¹² Airport ground infrastructure development has occurred in the intervening period and each was subject to its own separate environmental assessment. None relate to this airspace change.

15 Evidence: Stakeholder Feedback

15.1 Stakeholder Feedback and Locations 58a-58b

- 15.1.1 58a, 58b: Feedback/complaints received by the change sponsor and CAA in the period between implementation and post-implementation review, and details of the locations of complaints.

See separate document 'Annex D Stakeholder Feedback and Complaints'. Note that this data includes complaints received by us at the airport, it does not include complaints received by the CAA that we have not seen.

16 Evidence (Technical, Other): Transit GA traffic potentially rerouting around the CTR/CTA complex

16.1 Other information of relevance (a) from the CAA's list of PIR requirements

- 16.1.1 The topic required by the CAA in their list is:

(a) Transit GA traffic potentially rerouting around the CTR/CTA complex

A subsequent conversation with the CAA clarified the following areas of interest:

- (b) West of Farnborough: west of Blackbushe, under CTAs 3, 6 & 5, out to the line coincident with the western boundary of overlying LTMA 5500' (8 miles west of Odiham), down to the NE apex of the Solent CTA.
- (c) Under CTA 8 and across under CTA 7
- (d) East of Farnborough: traffic routeing east of CTR 2 that would have otherwise routed Bagshot, Fair Oaks, Guilford, Tongham, Frensham Pond, under CTA 4.

- 16.1.2 Please see the separate document 'Annex E General Aviation and Glider Study'.

Appendix 1 – CAA PIR Data Request

This is an extract of the contents of the CAA's formal PIR data request document, adapted for this appendix.

Introduction

1. The CAA's airspace change process is a seven-stage mechanism that is set out in detail in CAP 1616. Stage 7 of this process is a Post Implementation Review (PIR) that normally begins one year after implementation of the change. The PIR is an assessment of whether the anticipated impacts and benefits in the approved change and published decision are as expected and where there are differences, what steps (if any) the CAA requires to be taken.
2. Irrespective of whether the CAA decision to approve the change was made under the previous process (set out in CAP725), all PIRs should normally be in accordance with the process requirements of CAP1616. However, when assessing the expected impacts against the actual impacts, the methodology adopted at the time of the original CAA decision should be used.
3. Once the change sponsor's PIR data submission is published on the portal, there will be a 28-day window during which any stakeholder may provide any feedback when carrying out this review about whether the impacts of the change are those expected, 12 months on.

What does this activity entail?

4. Before the CAA can commence the PIR of an airspace change, the change sponsor must provide the CAA with a PIR submission that includes data pre-requested by the CAA. This data would normally be stipulated within the decision document at Stage 5 although this is not the case for changes pre-2018 (CAP 725). This PIR data request form sets out that list of data required in order for the CAA to complete the PIR assessment. If required, the CAA may request data additionally to the data that was requested within the regulatory decision.
5. This list is not exhaustive, and some requirements will not apply in every case. Where a data request is required, it will be clearly marked with a cross in the relevant 'Yes' field.

Data requests

6. Where the data illustrates impacts other than those anticipated, the change sponsor is to provide (and evidence) their analysis of why this is the case.
7. If certain data is unavailable or is disproportionately burdensome to provide, the CAA will consider any justifications explaining the reasons for not providing the data and the CAA may adjust the requirements on this basis. Additionally, the CAA reserves the right to follow up with additional requests for data throughout the review period.

8. Any other data that would provide evidence of other benefits or impacts should also be included in an appropriate format.

Format of data

9. The format of each data request required will be stipulated below in the associated column.
10. Where data is provided to the CAA as part of the change sponsor's PIR submission, it must be in a format that is consistent with, and comparable to, data provided as part of the original consultation and formal ACP, if possible. Scaling of the data should be consistent throughout to enable a like-for-like comparison.
11. The PIR submission must be in a suitable format for publishing onto the CAA's Airspace Portal.

Instructions for the Change Sponsors

12. The change sponsor is required to commence monitoring and gathering of data on the impacts of the change as soon as the change has been implemented¹³. On receipt of this data request form, the change sponsor should begin to collate the data required, analyse each data request (summarising the conclusions of the analysis), and submit it via email to the assigned AR Project Officer in a Post Implementation Review Submission. The date on which the CAA requires the data to be submitted is stipulated at the top of this document.
13. If for any reason, the change sponsor is unable to support this data request at the time requested by the CAA, justification as to why must be submitted to the AR Project Officer. Such requests for a delay in submitting the data must be agreed with the CAA, including an agreement of an appropriate time that this activity can take place.

¹³ Subject to the impacts of COVID-19 pandemic: [Airspace Change Proposals Post-Implementation Reviews \(PIRs\) impacted by COVID 19 - Update February 2021](#)

General Observations

14. The following general observations are to enable an overview of the effectiveness of the airspace change.
15. The change sponsor is required to submit a qualitative statement against each data request which supports the conclusion reached in each case.
16. The CAA will review the analysis of the data submitted to ensure the anticipated impacts and benefits in the approved change were as expected.

16	Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Yes <input checked="" type="checkbox"/>	Narrative.	<p>The CAA CAP1678 Decision Document did not specify the implementation date</p> <p>The impact on aviation resulting as a consequence of the Covid pandemic</p> <p>Expand on why the AIRAC 03/2020 was selected as the implementation date on 27 Feb 20.</p>
b)	Yes <input checked="" type="checkbox"/>	Narrative.	
c)	Yes <input checked="" type="checkbox"/>	Narrative.	
d)	Yes <input checked="" type="checkbox"/>	Narrative.	
e)	Yes <input checked="" type="checkbox"/>	Narrative.	
f)	Yes <input checked="" type="checkbox"/>	Narrative.	

¹⁴ CAP 1616 Part 1 The Airspace Change Process: Paragraph 270.

Safety Data

17. The following safety data is required to enable an assessment that the new airspace design is at least as safe as the original design, if not safer.
18. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
19. The CAA will review the statistics submitted concerning these events and assess whether the revised airspace design is a contributory factor in any incidents which have occurred. If there have been no reported events, the sponsor should articulate this in their PIR submission.

19		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data concerning any recurring instances of Instrument Flight Procedures (IAPs, SIDs, STARs, Holds) not being flown correctly. ¹⁵	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by data (flight data).	
b)	Report concerning any known Mandatory Occurrence Reports (MORs).	Yes <input checked="" type="checkbox"/> No	Narrative supported by copies of the original MOR Report(s).	
c)	Report concerning any known AIRPROX reports.	Yes <input checked="" type="checkbox"/> No	Narrative supported by copies of the original AIRPROX Report(s).	
d)	Report concerning any known Air Safety Reports (ASR) ¹⁶ .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative supported by copies of the original ASR Report(s).	

¹⁵ Any instances of IFPs not being flown correctly must be notified to the assigned CAA Project Officer.

¹⁶ This may include relevant reports submitted through CHIRP.

Service provision/ resource issues

20. The change sponsor will need to demonstrate that adequate resources are in place to facilitate the operation of the new airspace design, and that air traffic services are being provided as forecast in the approved change without unanticipated negative impact on other airspace users.
21. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
22. The CAA will assess whether there is adequate resource in place to support the operation comparing the change sponsor's data with the approved change.

22		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data on refusals of service.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	
b)	Data regarding air traffic delays.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	
c)	Details of additional resource allocated, considering daily and seasonal traffic patterns.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	

Utilisation of Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO)

23. Where the original change cited improvements in CCO/CDO utilisation, the change sponsor will need to provide data to demonstrate any subsequent improvement.
24. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
25. The CAA will assess whether the anticipated benefit has been delivered by comparing the change sponsor's data against the approved change.

25		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	The % of traffic achieving CCO and/or CDO, compared monthly before and after the change (e.g. comparing the month of July before and after the change).	Yes No <input checked="" type="checkbox"/>	Narrative evidenced by supporting data (flight data).	Not required as this was not included in the justification detailed in the ACP

Infringement Statistics

26. Where the revised airspace design changes the dimensions of controlled airspace, the change sponsor will need to provide an analysis of airspace infringements.
27. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
28. The CAA will assess whether the airspace design was a contributory factor in any increase in infringements¹⁷. Was an infringement risk identified in the approved change and has it been mitigated?

28		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data on the % change in infringements, compared on a monthly basis before and after the change.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	

¹⁷ A review of any relevant data from the CAA's safety intelligence database will also be conducted.

Traffic figures (air transport movements)

29. Traffic figures over the period will give a general overview of the nature of the operation following the implementation of the change. In addition, where the change was predicated on a forecast increase in traffic numbers, the change sponsor will need to confirm whether or not the increase forecast in the approved change has been realised.

30. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.

31. The CAA will consider the extent of any difference between the predicted and actual traffic figures and the extent to which the impacts of the change can be explained by those differences.

31		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data on the actual vs predicted figures.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	Covid Pandemic impact
b)	Data on the % change compared monthly before and after the change.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	
c)	Reconfirmation that there have been no factors that would cause a material change to the traffic forecasts provided in support of the original proposal, i.e. that the original forecasts are still reasonable. ¹⁸	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative.	
d)	Any changes to operating fleet mix.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by supporting data (table format).	

¹⁸ Includes the impacts of COVID-19 pandemic.

Traffic dispersion comparisons

32. It is necessary to establish whether aircraft are flying routes and/or utilising airspace forecast in the CAA's decision to approve the change. A key part of the CAA's post-implementation review will be to analyse the 'before and after' dispersal of aircraft to understand whether the new airspace design is being operated as anticipated.
33. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
34. The CAA will assess whether there have been any unforeseen or unintended operational impacts of the approved change.

34		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Density plots that show concentration and lateral dispersion.	Yes <input checked="" type="checkbox"/> No	Narrative supported by density (heat) plots showing where aircraft have concentrated within the acceptable tolerances of the procedure design.	All density plots should be overlaid on the same maps/charts as those identified within the environmental sections. The maps/charts should be suitable such that they can be understood by non-aviation stakeholders and contain sufficient detail for those affected to identify where they live in relation to any changes in traffic pattern. The individual lateral dispersion plots will be governed by the data. The vertical profile plots can be colour coded and broken down into 1000, 2000 or 3000ft swathes depending on the procedure being considered.
b)	Density plots that show vertical profiles.	Yes <input checked="" type="checkbox"/> No	Narrative supported by density (heat) plots showing height gained or lost.	
c)	Weather/MET impacts.	Yes <input checked="" type="checkbox"/> No	Significant weather events affecting the data should be identified.	

Operational Feedback

35. The change sponsor will have to present any feedback directly received by aviation stakeholders operating in, or affected by, the revised airspace design.
36. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
37. The CAA will assess whether there have been any unforeseen or unintended operational impacts of the approved change.

37	Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Any direct feedback from airlines/ air traffic controllers.	Yes <input checked="" type="checkbox"/> No	Narrative supported by a table showing the feed-back in relation to the change and explaining what the change sponsor has done to address the feed-back.
b)	Any additional feedback from relevant flight operation sub-committee (sub-group of airport consultative committee).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative supported by evidence of minutes or notes of actions from meetings.
			FACC items for discussion

Denied Access

38. This links to service provision/resources mentioned above. The change sponsor should provide data on refusals of access to the revised airspace design and any underlying factors.
39. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
40. The CAA will assess whether other airspace users are being impacted other than as anticipated as a result of the change¹⁹.

40		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data concerning the refusals of access (month on month/ before and after the change).	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by logged refusals. (table format).	
b)	Reasons for individual refusals of access.	Yes <input checked="" type="checkbox"/> No	Narrative evidenced by logged refusals. (table format).	

Utilisation of SIDs/STARs/IAPs

41. Information concerning the utilisation of the various procedures implemented as part of the change. The information may highlight areas of unforeseen consequence, for example where a particular procedure is being used more than anticipated with a subsequent impact.
42. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
43. The CAA will assess whether the utilisation data is other than expected.

43		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Data on the % of flights that actually flew the procedure(s) vs the total number of flights (departing or arriving), compared for the relevant time periods before and after the change.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	The utilisation figures must match the figures in the density, lateral and vertical plots in order to see only the aircraft that flew the new procedures; the data would be skewed by VFR departures for example.

¹⁹ A review of any relevant data from the CAA's safety intelligence database will also be conducted.

Letters of Agreement (LoAs)

44. Where a Letter of Agreement detailing specific procedures was a specific condition of the CAA approval, the change sponsor will need to evidence the level of use of that agreement.
45. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
46. The CAA will assess whether the LoA is being utilised and that it is working as expected.

46		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Evidence of usage of operational agreements between ANSPs and airspace users.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative.	Explanation of FUA Trial and expand on why there has been a delay on finalisation of LGS LoA.
b)	Data concerning the activation/ utilisation of LoA procedures.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	

Impact on environmental factors (including noise)

47. Typically, change sponsors will undertake an updated assessment of the environmental impacts that informed the approved change proposal. This updated assessment will be informed by actual flight behaviours following implementation and presented in a comparable format to that used for the change proposal. All updated assessments must be consistent with those presented in the consultation and the submission to the CAA. When using data samples to represent periods of operation, sample must be comparable with any sample periods used before the change.

Depending on the scaling level of the change, updated assessments may include:

- Local air quality
- Noise
- Overflight and operational diagrams
- Fuel and CO₂ emissions
- Tranquillity and visual intrusion
- Biodiversity

The change sponsor will have to either;

- a) Provide supporting evidence to confirm that the impacts presented in the approved airspace change proposal are as anticipated and the conclusions remain unchanged; or
- b) Undertake an updated assessment of the impacts presented in the airspace change proposal using actual data collected post-implementation.

48. Should the change sponsor be required to undertake an updated assessment, the change sponsor must collate the data requests below, analyse and submit an assessment which supports the conclusion reached in each case.

49. The CAA will review and assess the change sponsor's assessment and determine the extent to which the CAA agrees.

49	Required for the review?	Format of the data required.	Any information of relevance in support of the request.	
<p>Local Air Quality – required where:</p> <p><input type="checkbox"/> Where there is the possibility of pollutants breaching legal limits following the implementation of an airspace change, determined where:</p> <ul style="list-style-type: none"> <input type="checkbox"/> there is a change in aviation emissions (by volume or location) below 1,000 feet; and <input type="checkbox"/> the location of the emissions is within or adjacent to an identified AQMA. 				
a)	Ambient air quality limit concentrations (in µg.m-3).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative describing impact on AQMA with supporting concentration data (table format).	<p>There is no requirement to assess local air quality as there are no designated air quality management areas (AQMA) located within an area where the change would impact aircraft below 1,000ft. Therefore it is concluded that the implementation has not led to a breach or worsening of legal air quality limits.</p>
b)	DfT TAG Local Air Quality workbook outputs.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Workbook outputs (table format).	
c)	DfT TAG Air Quality Valuation Workbook outputs.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Workbook outputs (table format).	
d)	Description of prediction model and version number.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative.	
e)	Supporting input data and assumptions (for example movement logs).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative evidenced by supporting data (table format).	

49 continued	Required for the review?	Format of the data required.	Any information of relevance in support of the request.	
Noise – required where: <input type="checkbox"/> There is a change which below 7,000 feet alters lateral aircraft tracks or dispersion, or changes aircraft height, (above mean sea level) over an inhabited area.				
f)	Leq contours (down to 57 dB LAeq,16h / 45 dB LAeq,8h).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Noise contour figures overlaid on Ordnance Survey Maps (or similar).	The sponsor should provide confirmation with supporting evidence that the airspace change has not had an impact upon the airport's 57 dBA Leq contour with particular reference to the categories of data identified in Table 2.1 of CAP2091 CAA Minimum Standards for Noise Modelling
g)	Leq contour population counts (in thousands), area counts (in km ²), and noise sensitive area counts.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Table format.	
h)	Description of prediction model and version number.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative.	
i)	Description of modelling assumptions, for example forecasts, modal split, route utilisation and respite.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative evidenced by supporting data (table format).	
j)	Supporting input data (for example movement logs).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative evidenced by supporting data (table format).	

49 continued		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
Overflight and Operational Diagrams:				
k)	Operational diagrams (for example, radar track diagrams and track density diagrams).	Yes <input checked="" type="checkbox"/> No	Operational diagrams overlaid on Ordnance Survey maps (or similar).	The sponsor should provide separate assessments of any change in climb and descent performance that results from implementing the proposal. The illustration of vertical profiles as depicted in the Consultation Feedback Report (Part B) should be used. A comparison between pre-implementation and post-implementation traffic patterns, for aircraft up to 7,000ft should be made. Arrivals and departures should be portrayed separately, using comparable and representative traffic samples. Diagrams should include illustrations of the spread of traffic, plus illustrations of traffic density. Calculation of overflight population counts should use the same methodology as that used within the proposal. An additional assessment of overflight using CAA's CAP1498 Definition of Overflight may be provided.
l)	Calculation of overflight	Yes <input checked="" type="checkbox"/> No	Table format.	
m)	Supporting input data, assumptions and methodology.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	

Fuel and CO₂ emissions:				
n)	Annual fuel and CO ₂ usage (tCO ₂).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Table format.	Sponsor to provide an updated CO ₂ emissions assessment, using actual fleet mix, traffic numbers and radar data of routes flown to determine the annual impact on CO ₂ emissions. If the impact is assessed as positive, a qualitative assessment supported by explanation is adequate (narrative format).
o)	Per flight fuel and CO ₂ usage (tCO ₂).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Table format.	
p)	Supporting input data	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	
q)	Description of any modelling assumptions, including details of prediction model where used .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative.	

49 continued		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
Tranquillity and Visual Intrusion:				
r)	Operational diagrams clearly identifying traffic over relevant AONBs and National Parks up to 7,000ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative and Operational diagrams overlaid on Ordnance Survey maps (or similar).	Tranquillity and Visual Intrusion diagrams may be combined with requirement k. The ACP concluded there is unlikely to be an increase in traffic over the National Parks and AONBs identified in Figure B3 of the submission. Additionally the sponsor was expecting improvements in aircraft vertical profiles such that they will typically be higher over these areas.

Biodiversity:				
s)	Assessment of biodiversity factors including any specific to local circumstances identified through engagement.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative.	The ACP concluded that there are unlikely to be any impacts on biodiversity. The sponsor should provide re-confirmation with supporting evidence that the airspace change has not had an impact upon biodiversity factors identified within the ACP.

Impact on International obligations

50. The change sponsor will need to demonstrate that any international obligations identified at the time of the change have been discharged.

51. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.

52. The CAA assesses whether the obligations have been met.

52		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Details on any feedback from operators or neighbouring States.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Narrative.	There are no international obligations associated with this airspace change

Impact on Ministry of Defence operations

53. The change sponsor will need to demonstrate that there has been no unforeseen impact on Ministry of Defence operations.
54. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
55. The CAA assesses whether there has been any unforeseen impact on the Ministry of Defence that would need rectifying.

55		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Details on any feedback from Ministry of Defence.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative.	Specifically relevant to the interaction with RAF Odiham operations

Stakeholder feedback

56. Feedback is needed to identify any issues from a community perspective that were not anticipated as part of the approved change; monthly data over the course of a year is needed so that seasonal traffic changes are taken into account.
57. The change sponsor must collate the data requests below, analyse and submit a qualitative statement against each data request which supports the conclusion reached in each case.
58. A review is made by the CAA of the change sponsors conclusions in identifying any unforeseen or unintended impacts of the change.

58		Required for the review?	Format of the data required.	Any information of relevance in support of the request.
a)	Feedback/complaints received by the change sponsor and CAA in the period between implementation and post-implementation review.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Narrative evidenced by supporting data (table format).	Although this is self-explanatory, we would expect the sponsor to undertake regular bilateral engagement meetings with both LGS and Southdown GC to satisfy the post-decision arrangement agreed by Manager AR and President LGS in March 2020.
b)	Details of location of complaints.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ordnance Survey map identifying pinned locations.	

Other information of relevance (if appropriate)

Other	Required for the review?	Format of the data required.	Any information of relevance in support of the request.
<p>b) <i>Transit GA traffic potentially rerouting around the CTR/CTA complex</i></p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p><i>Narrative evidenced by supporting data (table format)</i></p>	<p>Subsequent conversation with CAA:</p> <ol style="list-style-type: none"> 1. West of Farnborough: west of Blackbushe, under CTAs 3, 6 & 5, out to the line coincident with the western boundary of overlying LTMA 5500' (8 miles west of Odiham), down to the NE apex of the Solent CTA. 2. Under CTA 8 and across under CTA 7 3. East of Farnborough: traffic routeing east of CTR 2 that would have otherwise routed Bagshot, Fair Oaks, Guilford, Tongham, Frensham Pond, under CTA 4.

End of document