

Sections 106 and 299A Town and Country Planning Act 1990

Interim INM7 Noise Assessment 2025 Predictive Contours July to December 2025

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INTRODUCTION

1.1 In compliance with the requirements of paragraph 2.5 a), c), d) and e) of the Section 106/299A Town and Country Planning Act 1990 agreement, between Rushmoor Borough Council (RBC) and TAG Farnborough Airport (TFA), this report provides details of the outcome of the latest Integrated Noise Model Study run for business aviation operations at Farnborough.

This report covers the first half of 2025 and includes predictive contours for the second half of 2025 based on current forecasting. The INM modelling process was conducted by Bickerdike Allen Partners (BAP), compliance with paragraph 2.5e validation on the model is generally only carried out on the annual assessment.

- 1.2 Paragraph 2.5 of the planning agreement states:
 - a) At the end of the 2nd quarter in each successive year the INM model will be used to produce noise contours based on the preceding 6 months' actual movements and a second set of theoretical contours for the next 6 months
 - c) These sets of contours shall be supplied to the council no later than 6 weeks after the model has been used.
 - d) For paragraphs 2.5 a) and c) the INM model shall use a simplified departure track representation and such simplified departure track representations shall be made after inspection of the spread of actual aircraft tracks on site.
 - e) For paragraphs 2.5 a) and c) the INM model shall include terrain information and at the end of each year the results shall be compared between the individual INM predicted levels with the measured levels determined by the fixed and mobile monitoring points in and around the site.

This report is intended to address the requirements of paragraph 2.5, a), c), d) and e).

- 1.3 The use of the INM model, to produce noise contours relating to business aircraft movements at Farnborough, assess the noise impact on the surrounding area under existing conditions and the potential impact of the predicted growth of the Airport as permitted by the Planning Agreement.
- 1.4 Civil operations at Farnborough are restricted to 'daytime' hours only (as defined by PPG 24 "Planning and Noise"). The Airport is open from 07:00 to 22:00 hours on weekdays and 08:00 to 20:00 hours at weekends. The modelling process uses representative tracks produced from inspection of real track data, to construct contours that represent the time-averaged noise of operations.
- 1.5 In compliance with clause 2.7 of the Planning Agreement, BAP were selected to conduct the annual noise assessment in January and the interim noise assessment in July. The next annual assessment will be undertaken in January 2026 and will be the annual noise assessment.
- 1.6 For this report modelling was completed for the period January to June 2025, using version 7.0d of the FAA's Integrated Noise Model (INM).
- 1.7 As in previous reports, the contours displayed within this report are referenced against the work commissioned by RBC from Acoustic Technology Ltd during the consideration of the original Airport planning application (2009). The outcome of this work established contours that are referred to in paragraph 2.1a of the Agreement, annotated as the "control contours" within this document.

- 1.8 In accordance with clause 12.1 of the planning agreement, a further reduction in area of the control contours has been applied. The reductions are as follows:
 - a 72.5% reduction of the land area within the 55dB(A) L_{Aeq,16h} contour
 - a 60.0% reduction of the land area within the 60dB(A) L_{Aeq,16h} contour

The resultant effect on the land area within the control contours is displayed in Table 1.

1.9 The period of operation on which this report is based is the period January to June 2025. Aircraft operations during this period consisted of 14,236 movements of the categories required to be included under the Planning Agreement.

2 METHODOLOGY

- 2.1 In accordance with advice from independent acoustic consultants and with the agreement of RBC, INM 7.0d has been used for the noise contour modelling procedure. This is the most recent version of the software and allows helicopter movements to be integrated into the modelling process together with consideration of surrounding terrain.
- 2.2 The core stages of the contour methodology are as follows:
 - Preparation of an INM study using relevant data from the latest edition of the UK Aeronautical Information Package, including the dimensions and positioning of the runway.
 - Creation of user defined arrival profiles to reflect the steeper 3.5-degree approach in operation at Farnborough Airport.
 - Production of simplified departure and arrival track representations following inspection of actual track data from the Brüel and Kjær Track Monitoring System. Representations include designation of Noise Abatement Procedure tracks and procedure cancellation tracks. Dispersion is applied to these tracks to reflect the variations in routes flown and observed in the actual track data.
 - Determination of the split of traffic in terms of runway and operation (06 / 24 and departure / arrival) and the split of departure operations on each of the identified routes. This is achieved from analysis of the Air Traffic Control Movement Logs.
 - Summarising the actual movement by aircraft type and then the application of representative INM aircraft types using a substitutions list for those types where noise data is not included within the model.
 - Running of the contour model from an INM input using actual data to provide movement numbers for the modelled flight tracks.

Preparation of input files

- 2.3 Flight data used in this study was taken from radar tracks processed by Farnborough's Brüel and Kjær Noise and Track Monitoring System (NTMS). The raw data has been inspected and used to produce representative tracks which are in turn used by the model in the prediction of the noise contours.
- 2.4 INM is primarily designed to deal with commercial air traffic rather than the specialist business aircraft types operating at Farnborough. Aircraft types in operation at Farnborough Airport, if not available within the standard model profiles, are represented by the closest available substitutes on the INM Substitutions List. Where aircraft are not adequately represented by aircraft on the INM Substitutions List, appropriate substitutions are made by reference to engine types. All substitutions used by BAP in this assessment are detailed in Appendix 1.

Predicted Contours

2.5 The predicted contours for the period July to December 2025 have been generated using movement data from the preceding six months (representative tracks and aircraft type mix). The predicted number of movements for this period is 15,714 based on forecast information.

3 RESULTS

- 3.1 The INM 7.0d contours produced for this reporting period are shown together with the RBC 1997 Planning Contours in Figure 1. Predicted contours using the January to June 2025 fleet and movement mix, are shown in Figure 2. Both contours allow for helicopter movements which are assumed to show the same increase in numbers from the first to the second half of the year. When examining the contours there are several important points to note:
 - The planning agreement refers only to 55 and 60dB(A) L_{Aeq,16h} however a third 65dB(A) L_{Aeq,16h} contour has been added for information purposes.
 - The contour areas for this reporting period are within the planning permission control contour areas, as amended through clause 12.1 of the planning agreement.
 - The predicted contour areas for this reporting period are within the planning permission control contour areas, as amended through clause 12.1 of the planning agreement.
 - The contours are based on the assumptions and data inputs as described within this report.
 - The contours should be regarded as indicative only and represent time averaged noise levels expressed as dB(A) L_{Aeq,16h}. This measure represents the sound energy released as noise varies over time, expressed as an average for the relative time period.
 - Control contours included as part of the planning agreement between RBC were theoretical
 in that they used conceptual aircraft tracks. The contours attached to this document are
 generated using representative tracks created through inspection of actual radar flight track
 data.
 - Helicopter movements are included in the modelling process of this report, following the use of INM7.0d and advice from independent noise specialists.
 - The steeper than standard angle of approach used at Farnborough (3.5 as opposed to 3 degrees) has been allowed for; increasing the modelled height of arriving aircraft.
 - The INM modelling process for this report has not been subjected to validation against
 measured noise levels at the Airport's Noise Monitoring Terminals (NMTs). As
 demonstrated by the exercise reported at the Public Inquiry in 2010, some of the INM
 standard aircraft substitutions used older aircraft types which typically overestimate the
 noise levels of the more modern types operating at Farnborough.

Comparison of total land area within each Noise Contour

3.2 Tables 1 and 2 compare the total land area within each contour for both the "control contours" and the most recently produced actual and predicted contours.

Table 1: Predicted noise contour areas, 20,000 movements at 1997 mix (Control Contours)

| dB(A) L _{Aeq,16h} | Predicted 20,000 movements 1997 mix (km²) | Amended Control Contour Areas as per clause 12.1 of the S106 (29/10/2010) (km²) |
|-------------------------------|---|---|
| 55 | 9.07 | 6.58 |
| 60 | 4.03 | 2.42 |
| 65 | 1.70 | n/a |

Table 2: Contour areas: Actual Jan - Jun 2025 and Predicted Jul - Dec 2025

| dB(A) L _{Aeq,16h} | Actual contour areas Jan to Jun 2025 (km²) | Predicted contour areas, Jul to Dec 2025 (km²) |
|-------------------------------|--|--|
| 55 | 2.22 | 2.38 |
| 60 | 0.96 | 1.01 |
| 65 | 0.46 | 0.49 |

4. CONCLUSION

4.1 Contours and predicted contours for this reporting period are within the planning permission area limit. Their size is within the planning consent contours, reflecting the change in aircraft operations on which the modelling process is based, and the allowance for the steeper approaches used.

5.0 SUMMARY

Noise contours for Farnborough Airport have been produced for the first half of 2025, based on the actual movements, and for the second half of 2025, based on the latest forecast. These were produced using the same methodology as that used to produce the actual annual 2024 and forecast annual 2025 noise contours. The areas of the contours are within the planning permission limits.

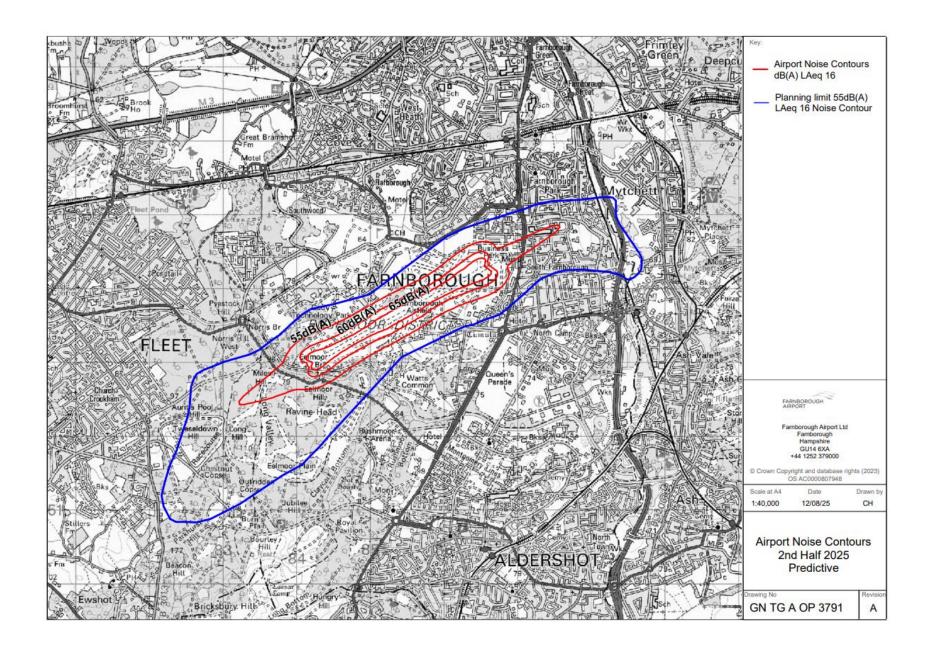
| Ajan Mohanaranjan | Duncan Rogers | David Charles |
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| for Bickerdike Allen Partners LLP | Senior Acoustic Consultant | Partner |

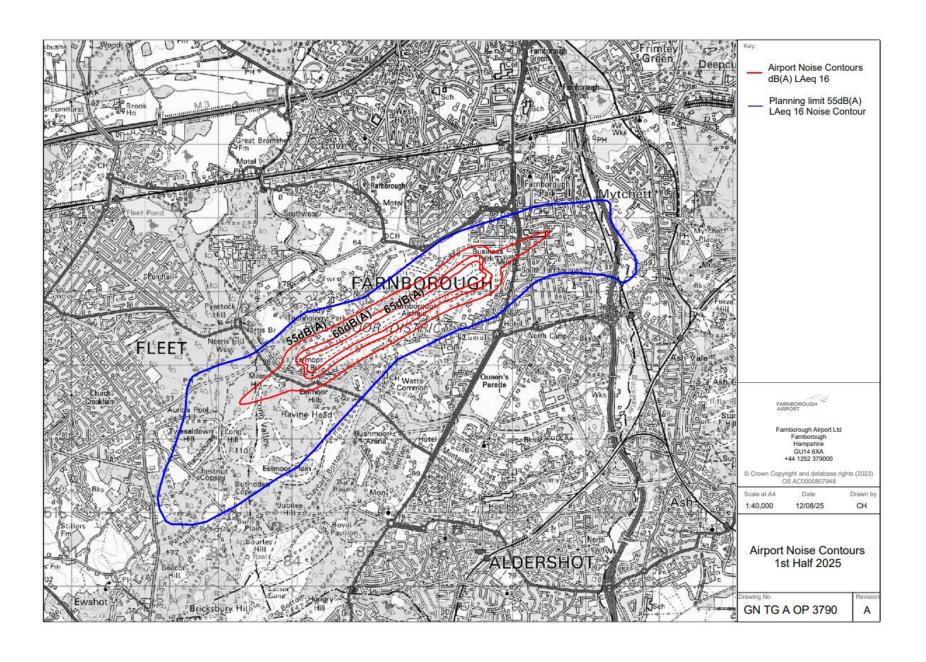
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Appendix 1

INM 7.0d Substitution List

Key:

Aircraft Operational Code: Operational ATC aircraft type identification (aircraft type code in

log)

INM code: Equivalent aircraft code as used by INM programme

Notes:

Operational codes do not necessarily reflect correct ICAO codes.

 The 20 most common aircraft types have been part of the validation exercise, and have been denoted "Validated". See Appendix 2 for details.

| Operational Code | INM Code | Operational Code | INM Code |
|------------------|-----------|------------------|-----------|
| A19N | A319-131 | CL850 | Validated |
| A220 | 737700 | CRJ2 | Validated |
| A318 | A319-131 | CX30 | CNA208 |
| A319 | A319-131 | DA42 | BEC58P |
| A320 | A320-211 | E135 | EMB145 |
| ASTR | IA1125 | E135N | EMB145 |
| AT72 | DO328 | E145 | EMB145 |
| AT76 | DO328 | E170 | EMB170 |
| B190 | 1900D | E190 | EMB190 |
| B250 | Validated | E35L | Validated |
| B350 | CNA441 | E50P | CNA510 |
| B733 | 737300 | E545 | CNA55B |
| B734 | 737400 | E550 | CNA55B |
| B737 | 737700 | E55P | CNA510 |
| B738 | 737800 | F2LX | Validated |
| BE20 | Validated | F2TH | Validated |
| BE30 | CNA441 | F900 | F10062 |
| BE40 | MU3001 | F9LX | F10062 |
| C25A | CNA525C | FA6X | GV |
| C25B | CNA525C | FA7X | F10062 |
| C25C | CNA525C | FA8X | Validated |
| C25M | CNA525C | G200 | CL600 |
| C510 | CNA510 | G280 | CL601 |
| C525 | CNA525C | G450 | GIV |
| C52A | CNA525C | G5 | Validated |
| C52B | CNA525C | G550 | Validated |
| C550 | CNA500 | G650 | Validated |
| C56X | Validated | G650ER | Validated |
| C650 | CIT3 | GA5C | GV |
| C670 | CIT3 | GA6C | Validated |
| C680 | CNA680 | GA7C | GV |
| C680A | Validated | GALX | CL600 |
| C68A | Validated | GL5T | Validated |
| C700 | CNA680 | GL6T | Validated |
| C750 | CNA750 | GL7T | Validated |
| CL30 | CL601 | GLEX | Validated |
| CL35 | Validated | GLF4 | GIV |
| CL60 | Validated | GLF5 | Validated |
| CL604 | Validated | GLF6 | Validated |
| CL605 | Validated | H25B | LEAR35 |
| CL65 | Validated | H25C | LEAR35 |

| Operational Code | INM Code | |
|------------------|-----------|--|
| H750 | LEAR35 | |
| HA4T | CL600 | |
| HDJT | CNA510 | |
| L545 | CNA55B | |
| L550 | CNA55B | |
| LJ35 | LEAR35 | |
| LJ40 | LEAR35 | |
| LJ45 | LEAR35 | |
| LJ55 | LEAR35 | |
| LJ60 | CNA55B | |
| LJ75 | LEAR35 | |
| P180 | SD330 | |
| P28A | PA28 | |
| P46T | GASEPV | |
| PC121 | Validated | |
| PC24 | Validated | |
| PRM1 | LEAR35 | |
| SF34 | SF340 | |
| TBM7 | CNA208 | |

Helicopters

| Operational Code | INM Code |
|------------------|----------|
| A109 | A109 |
| A109A | A109 |
| A119 | A109 |
| A139 | SA330J |
| AS35 | SA355F |
| AS50 | SA355F |
| AS55 | SA355F |
| AW169 | S76 |
| B429 | B429 |
| EC30 | EC130 |
| EC35 | EC130 |
| EC45 | B429 |
| H145 | B429 |
| S76 | S76 |
| S92 | \$70 |
| SK76 | S76 |

Appendix 2

Validation Adjustments

For each validated aircraft type, the measured noise levels obtained from the airport's permanent noise monitors located at Farnborough College and Tweseldown Racecourse have been compared with the default modelled noise levels at the same locations.

For each aircraft type, an INM aircraft type has been selected along with a multiplier to the number of aircraft movements. This multiplier serves to modify the LAeq noise level, for example a multiplier of 2 will add approximately 3 dB to the noise level for that aircraft type. All the validated types have been modelled at stage length 1. The selections have been based on minimising the difference between the predicted and measured results at the noise monitors.

The table below shows, for each validated aircraft type, the resulting INM type and multiplier used.

| Operational | Arriva | als | Departu | ıres |
|-------------|----------|------------|----------|------------|
| Code | INM Code | Multiplier | INM Code | Multiplier |
| BE20 | CNA441 | 3.60 | CNA441 | 1.70 |
| C56X | CNA560XL | 0.60 | CNA560XL | 0.40 |
| C68A | CNA680 | 0.75 | CNA750 | 0.30 |
| CL35 | CL601 | 0.75 | CNA560XL | 0.45 |
| CL60 | CL600 | 1.40 | CNA560XL | 0.40 |
| CRJ2 | CL601 | 1.80 | CNA560XL | 0.80 |
| E35L | EMB145 | 0.85 | F10062 | 0.35 |
| E550 | CNA55B | 0.50 | CNA55B | 0.35 |
| E55P | CNA510 | 1.55 | CNA560XL | 0.55 |
| F2TH | CL600 | 0.90 | F10065 | 0.15 |
| FA7X | F10062 | 0.65 | F10065 | 0.50 |
| FA8X | F10062 | 0.55 | F10065 | 0.40 |
| GA6C | GV | 0.55 | F10065 | 0.20 |
| GL5T | GV | 0.65 | F10065 | 0.45 |
| GL7T | GV | 0.90 | F10065 | 0.35 |
| GLEX | GV | 0.70 | F10065 | 0.50 |
| GLF5 | GV | 0.60 | F10065 | 0.40 |
| GLF6 | GV | 0.65 | F10065 | 0.40 |
| PC12 | CNA208 | 0.90 | CNA208 | 0.35 |
| PC24 | CNA55B | 0.70 | CNA55B | 0.55 |