UK Civil Aviation Authority

Technical Note: Noise Exposure Modelling Approach

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1.1 The CAA's Environmental Research and Consultancy Department (ERCD) calculated noise exposure for each of the eight in-scope airports: Birmingham, Edinburgh, Glasgow International, London Gatwick, London Heathrow, London Luton, London Stansted, and Manchester.

1.2 Noise exposure was determined using noise maps generated by the UK Civil Aircraft Noise Contour Model (ANCON). ANCON has been developed and validated in accordance with international best-practice guidance set out in ECAC Doc 29, Report on Standard Method of Computing Noise Contours around Civil Airports.

CAP 2091 Conformance

1.3 Noise maps were produced using existing noise models held by the Environmental Research and Consultancy Department (ERCD) of the UK Civil Aviation Authority, with proportionate adjustments made to ensure consistency with the minimum standards for noise modelling defined in CAP 2091, CAA Policy on Minimum Standards for Noise Modelling, while reflecting local circumstances. CAP 2091 defines the minimum acceptable level of modelling sophistication required for the CAA to undertake certain regulatory duties.

1.4 For Glasgow International and London Luton, ERCD is not the retained noise-modelling consultant, and no suitable existing model was available. New models were therefore developed for these airports using aircraft vertical profiles and noise data from the Aircraft Noise and Performance (ANP) Database. Traffic inputs were derived from a combination of airport-supplied data and CAA datasets, with aircraft tracks informed by the Aeronautical Information Publication (AIP).

1.5 Consequently, the models developed for Glasgow and Luton do not conform to the minimum standards set out in CAP 2091. However, the approach adopted is proportionate and appropriate for the type of high-level strategic aggregate assessment required, which falls outside the CAA's regulatory duties.

Runway Operation Direction

1.6 All models were updated to reflect the latest traffic data, with a standardised long-term modal split applied to represent historic runway operating patterns. This modal split was based on the long-term average of operations at each airport, typically derived over a twenty-year period where records were available, and was applied consistently across all modelled years to minimise annual

variation. To smooth out inter-annual variability, the long-term standardised modal split from the first reported year of noise mapping (2019) was applied to all subsequent years.

Population Exposure Assessment

1.7 Population exposure was assessed within the 51 dB LAeq,16h (daytime) and 45 dB LAeq,8h (night-time) contours using two complementary approaches:

i) Year-specific population datasets, supplied by CACI Ltd, incorporating inter-census annual estimates for population distribution. These datasets are based on the Office for National Statistics Census 2011 up to assessment year 2020 and the Census 2021 from assessment year 2021 onwards.

ii) A fixed 2019 population dataset, applied consistently across all years, derived from the Census 2011, and adjusted by CACI Ltd to account for population distribution changes between 2011 and 2019. This approach provides consistency with CAP 2620, UK Aviation Environmental Review 2023 and removes variation arising from population change, thereby isolating the effects of changing noise exposure.