LONDON LUTON AIRPORT

A11060-N71-DC

18 August 2022

NOISE CONTOURING METHODOLOGY – OVERVIEW

1.0 INTRODUCTION

LADACAN have made a series of requests for information. Some of these relate to the methodology and information used in the production of the noise contours in the ES and ES addendum.

This note gives an overview of contour methodology in Section 2.0, with further details of specific elements in Section 3.0. Additional information is also available in earlier BAP notes[1].

2.0 METHODOLOGY OVERVIEW

The methodology involved developing a model for the airport in the INM software, version 7.0d. This model includes physical details of the area around the airport and contains representative routes for the airport operations, and representative noise data and profiles for the aircraft types that operate there.

Noise contours can then be produced by entering the number of movements by aircraft type for each route and profile. This can either be for actual operations or forecast operations. While in theory you could model actual contours using the individual routes flown, this would need robust data to be available for every movement which does not occur in practice. Standard practice is to use representative routes in accordance with relevant legislation[2].

3.0 METHODOLOGY COMPONENTS

3.1 Physical

The model contours local terrain data. This allows the model to account for the airport being in a relatively elevated location compared to much of the surrounding area. This reduces the predicted noise levels in some locations relatively close to the airport, such as Park Town and parts of Capability Green.

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[1] A11060 N67 DR_2.0 Section 73 Addendum Noise Contouring Methodology & A11060 N69 DR_1.0 Processing of NMT Results

[2] EU Directive 2015/996 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015L0996&from=PT as implemented by The Environmental Noise (England) Regulations 2006: https://www.legislation.gov.uk/uksi/2006/2238/contents

The model also contains a database of dwellings and populations by postcode. This comprises a location for each postcode with a corresponding number of dwellings and population. The model predicts the noise level at each of the postcode locations and this noise level is assigned to all dwellings and people within that postcode.

3.2 Runway Spilt

The runway split refers to how many of the flights operate from each end of the runway. For actual contours (i.e. those based on historic activity) the actual runway used by each movement can be modelled. For future contours a long-term average of the runway split is applied.

3.3 Routes

Routes for arrivals and departures are derived from published information, such as the AIP entry for the airport[3], and radar information where available. The modelled routes in use at Luton Airport are not reviewed on a regular basis, but are updated when there is a significant change. For example, a change was made to incorporate the Brookmans Park RNAV route which was implemented in 2015 following an airspace change process.

Although details of specific flight tracks are not routinely provided to BAP, information is provided within the quarterly reports to NTS-C and also details of any airspace changes, which would trigger a review of the modelled routes.

The initial noise model for the airport was that developed by Bureau Veritas. This contained a set of routes. When BAP took over the modelling we undertook a review, including of the routes. This involved comparison with radar data which found the routes in the model were representative.

Since that time the runway 26 departure routes were updated to allow for the drift in magnetic north.

For the introduction of the RNAV route, track density plots were used to inform the modelled route.

3.4 Profiles

These comprise the operational details for arrivals and departures. They include details on the engine thrust settings, the flap settings, and rates of climb in the case of departures, and the altitude or speeds at which they change.

The model contains default profiles for each aircraft type. For larger aircraft, such as the main types operating at Luton Airport, a series of profiles are included which correspond to different

[3] https://www.aurora.nats.co.uk/htmlAIP/Publications/2022-08-11-AIRAC/html/index-en-GB.html

weights of departure. These are associated with destination distance which is known as the stage length in the software.

In the modelling of departures, the individual flights are analysed so the profile for the appropriate stage length can be applied to each.

For key aircraft types, the profiles in the software data have been revised. This followed receipt of airline operational details.

3.5 Validation

The validation exercise is to provide a check on the profiles and noise data contained in the INM database. It involves:

- processing the results from the fixed noise monitors to remove unreliable data (see A11060 N69)
- comparing the average result from the remaining data with the predicted noise levels by aircraft type and operation (separately for arrivals and departures)
- where significant differences occur, looking at adjustments that could be made to reduce the difference across the monitors, while limiting the difference at any one monitor. For the quieter types less weight is applied to the results at NMT3 due to the nearby presence of the M1 which means only the loudest measured events are correlated
- This results in movement factors (as detailed in A11060 N67 2.0) which are applied to the raw number of movements. These are determined by the computation of the $L_{Aeq,T}$ metric.

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