

Noise Mapping Uncertainty

The ANCON footprint data has not been previously compared with EDI noise monitor data to check the validity of the noise maps produced for EDI.

Therefore the EANAB subgroup set out to make a preliminary comparison. This report is a summary of that investigation.

Noise monitor data was provided by EAL.

The coordinates detailing the location of the noise monitors were also provided by EAL.

Noise Terms and what they mean

L_{max} represents the peak noise observed on the ground when a plane flies overhead

SEL represents both the peak and how long an event lasts

L_{eq} is an average of all events over a period of time

L_{den} is an average with different weighting given to day and night exposure

ANCON “Footprint” data was prepared by the ERCD department of the CAA and supplied to EDNAB by EAL.

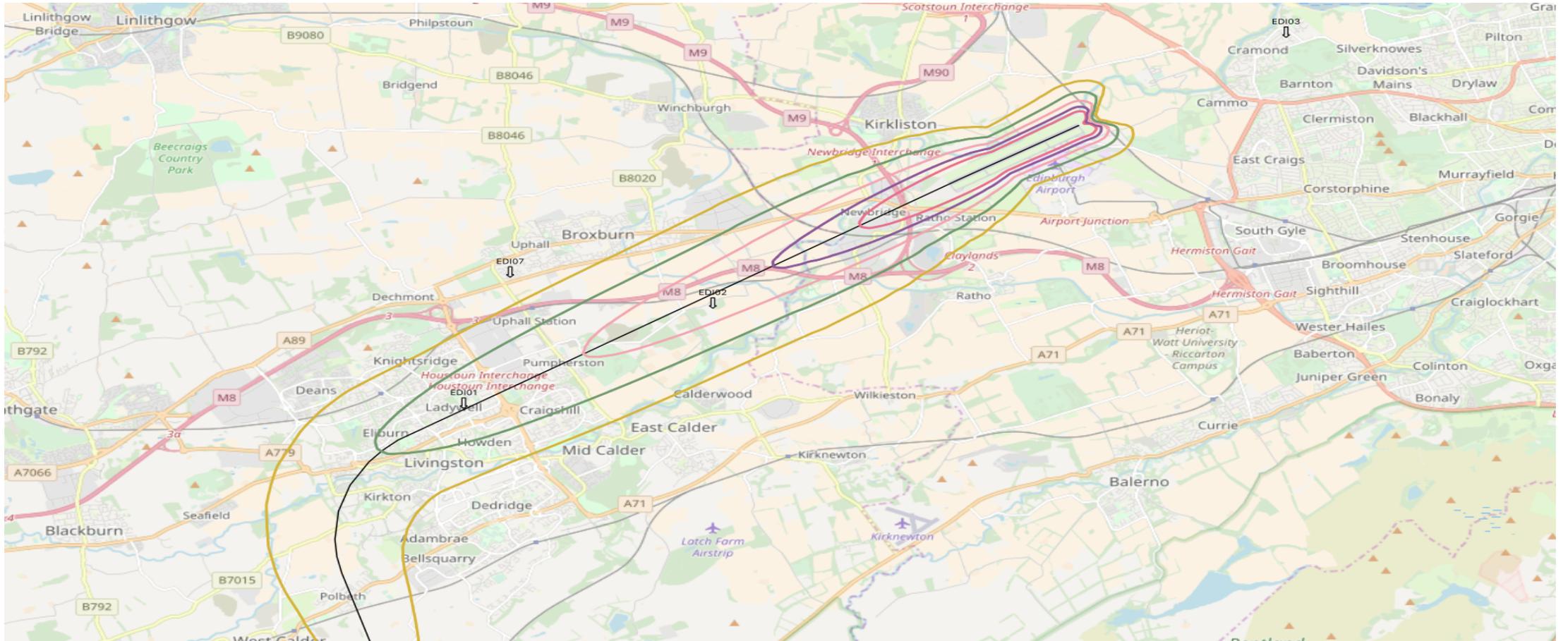
The footprint data supplied shows both grid and contour Lmax and SEL noise levels predicted by the ANCON noise modelling software for various aircraft type based on assumed vertical profiles (LGW 2015) and assuming that all aircraft follow the nominal SID track. Preliminary checks illustrated were done using grids of A319 aircraft

Lmax and SEL information are the building block for all average noise maps (Leq and Lden) produced by ERCD and used by EAL in its Airspace Change proposals

If the basic building blocks are uncertain, all maps built on them are uncertain

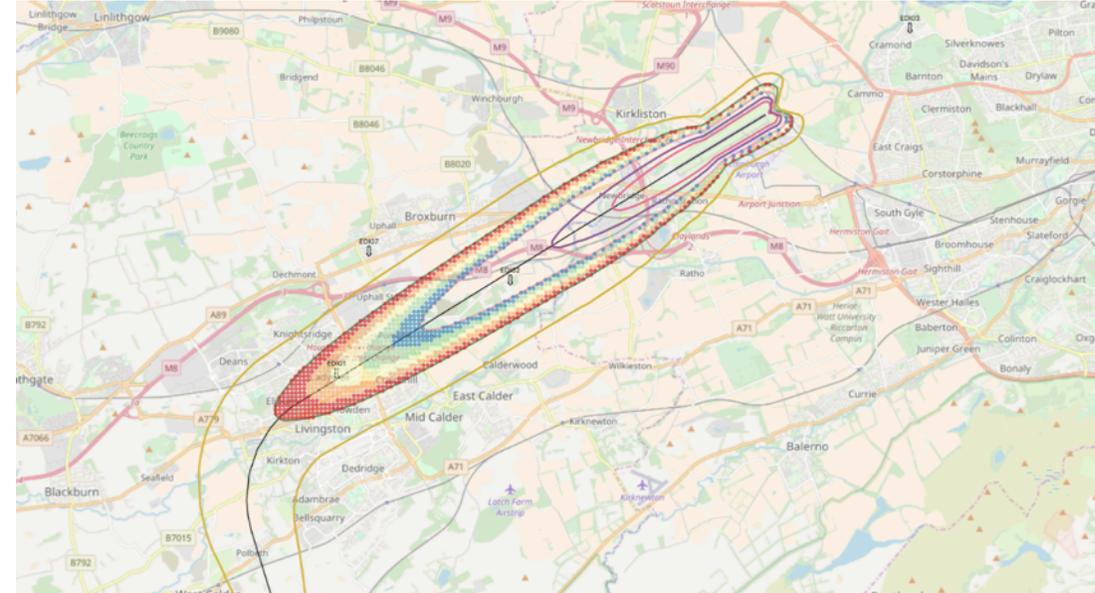
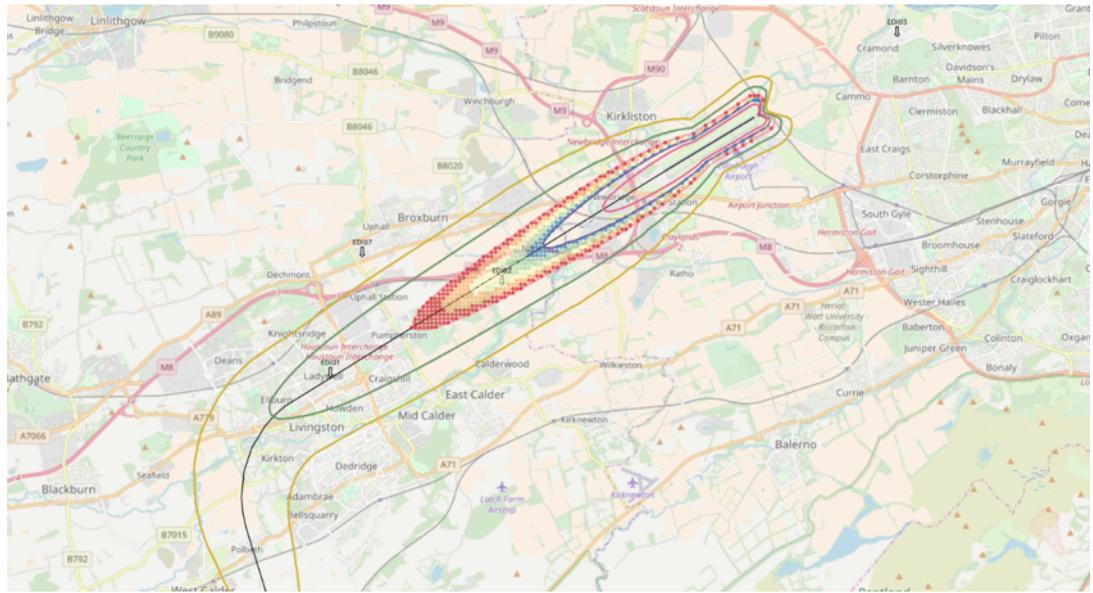
A319 on TAL24

60-80 dBA Lmax footprint contour map



A319 on TAL24
70-75 dBA Lmax xy grid data

65-70 dBA Lmax xy grid data



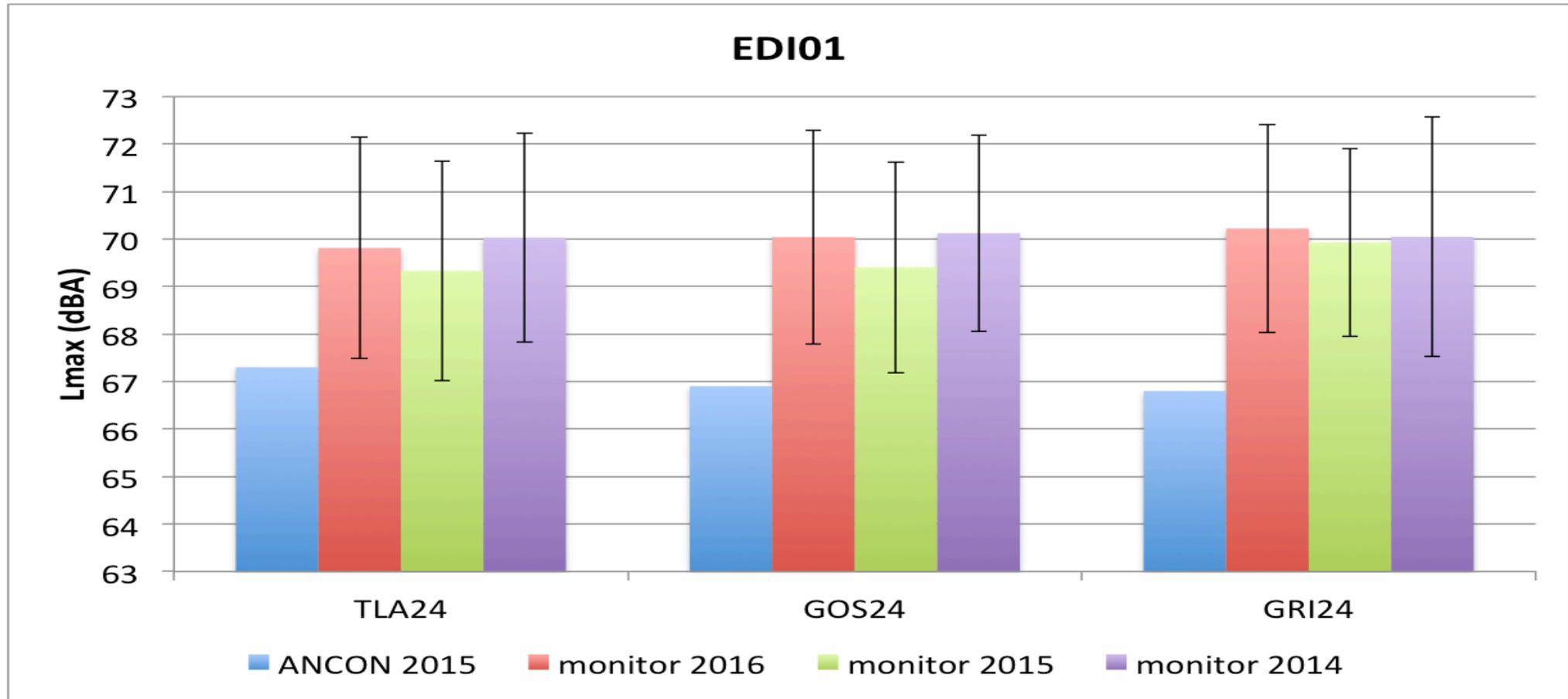
Results

In each of the following charts the coloured columns represent the mean noise level, the black bars represent the standard deviations for each.

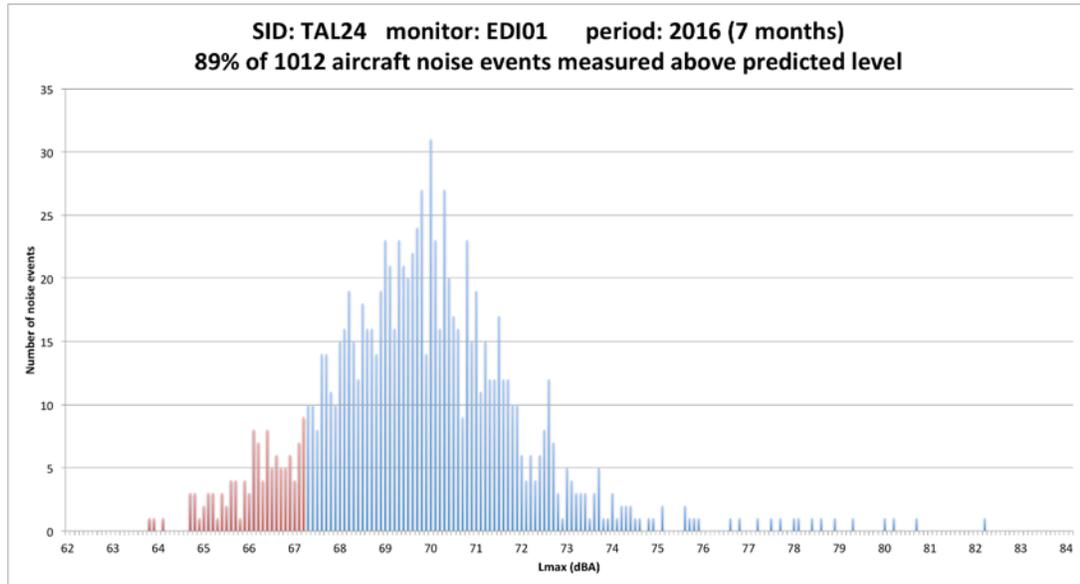
The ANCON model was not supplied with standard deviations.

Histograms: red = below model, blue = above modelled noise level

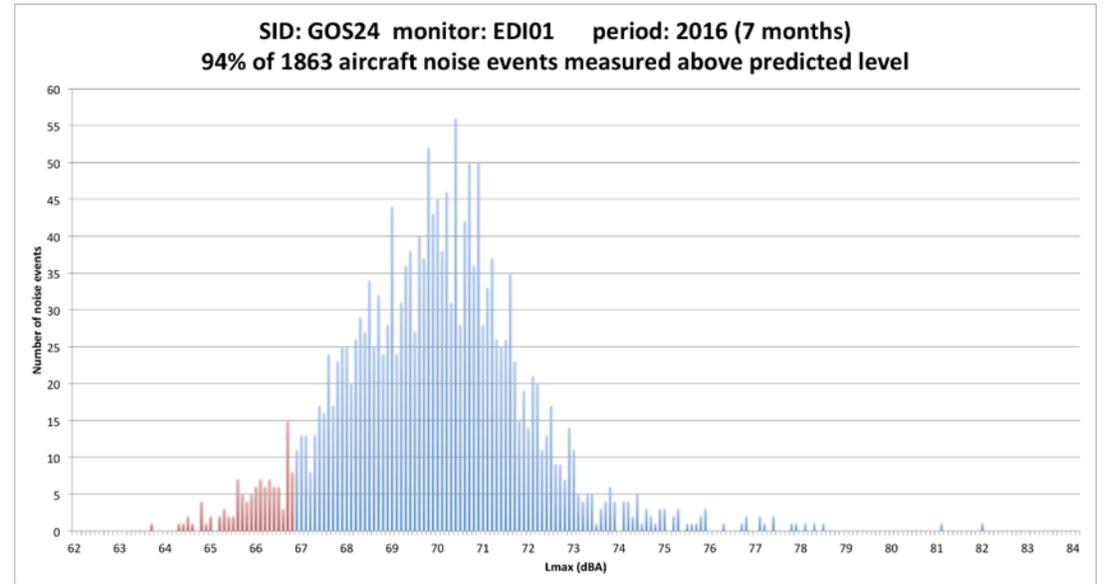
ANCON Predicted vs measured Lmax A319 at EDI01 location (Livingston)



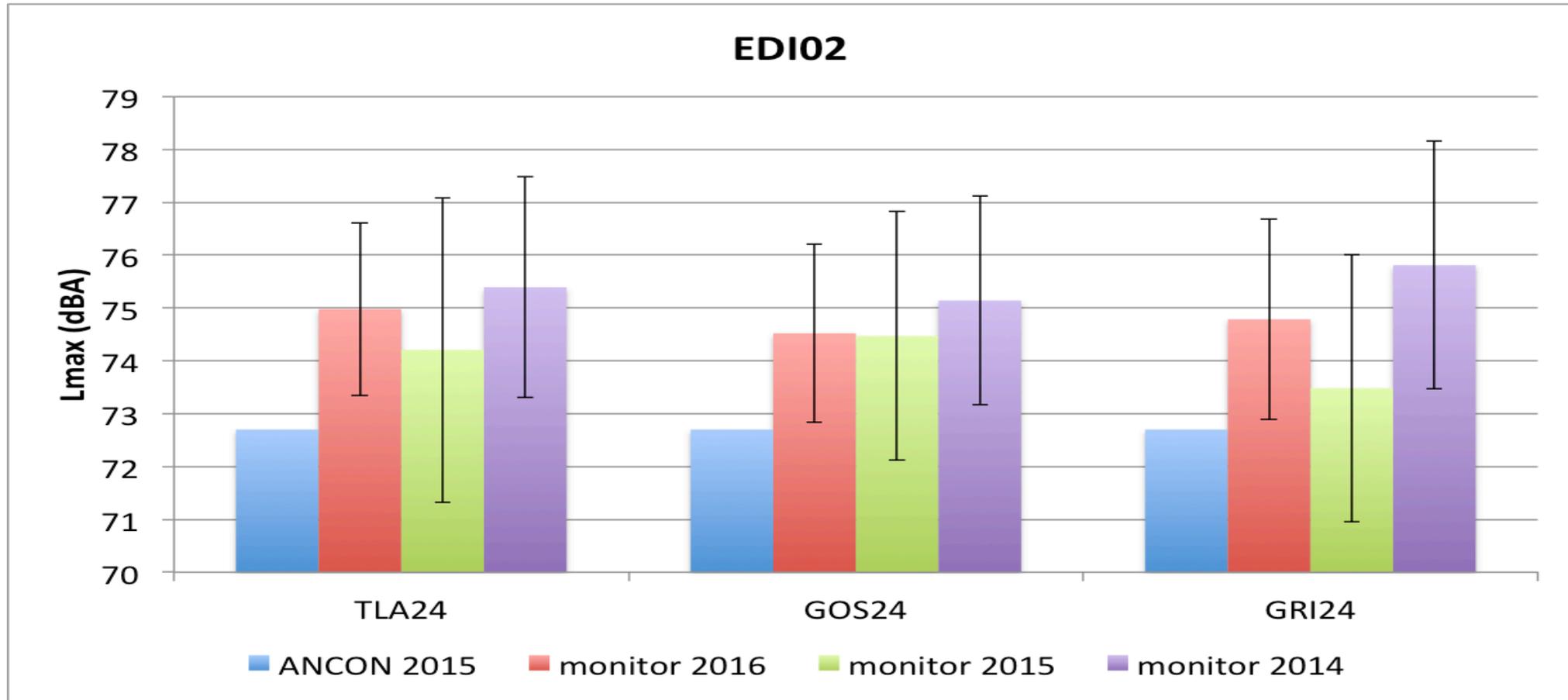
A319 on TLA24 at EDI01



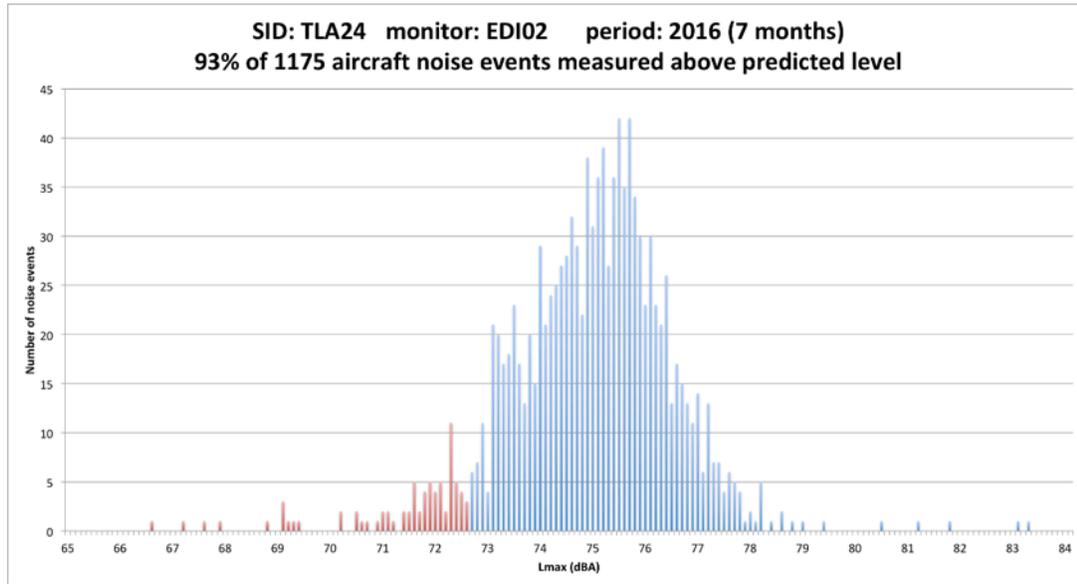
A319 on GOS24 at EDI01



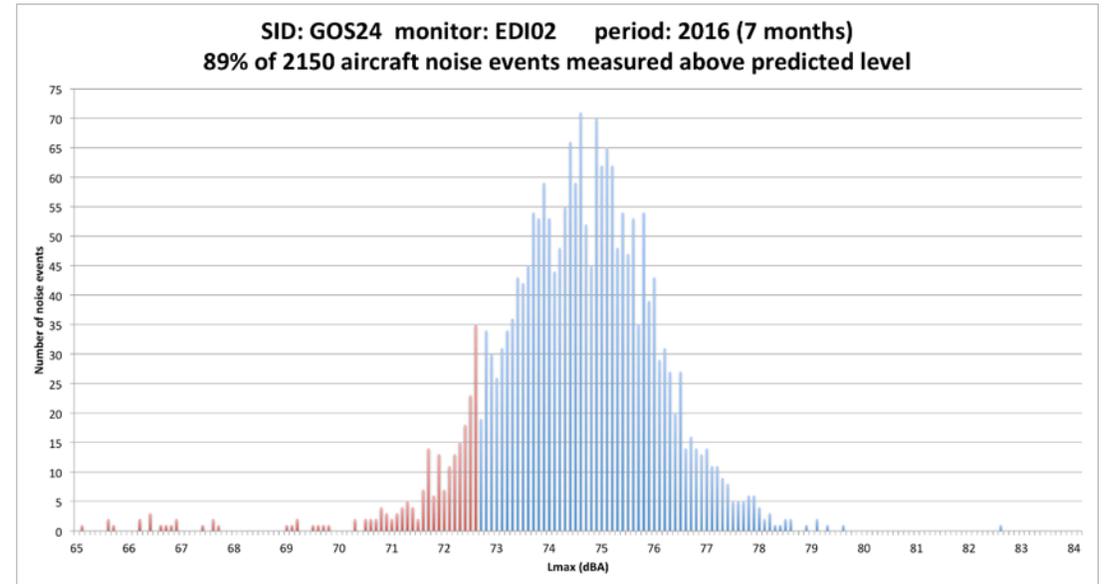
Predicted vs measured Lmax A319 at EDI02 location (Broxburn)



A319 on TLA24 at EDI02

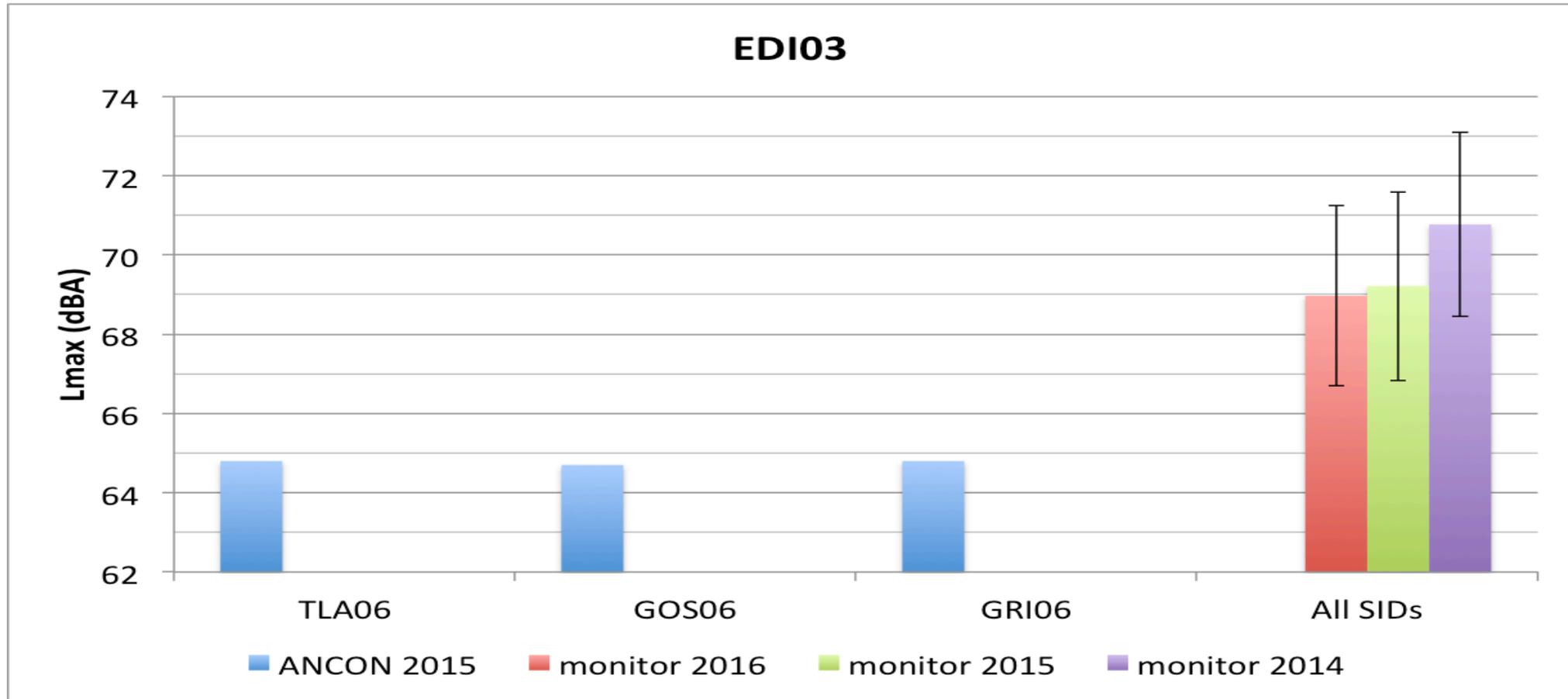


A319 on GOS24 at EDI02

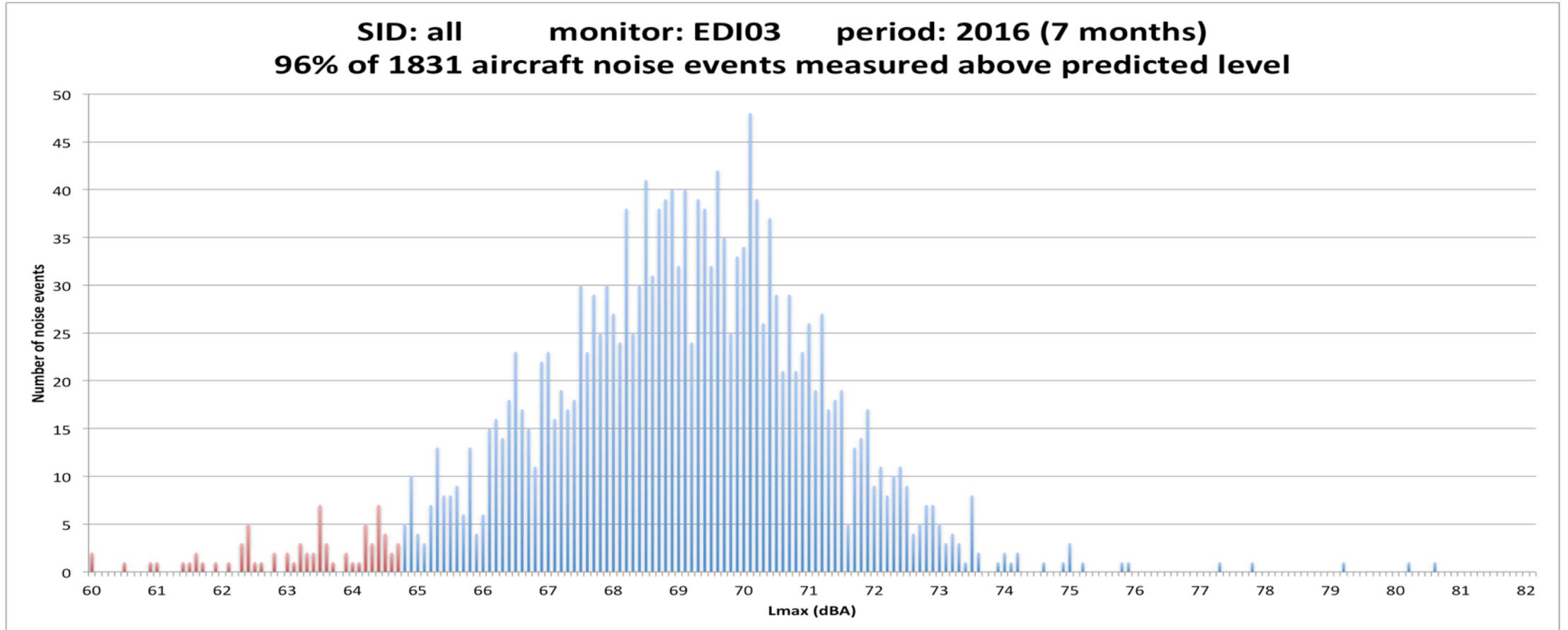


Predicted vs measured Lmax A319 at EDI03 location (Crammond)

note: data supplied did not allow sorting by SID for RWY06 departures



A319 on RWY06 SIDs at EDI03

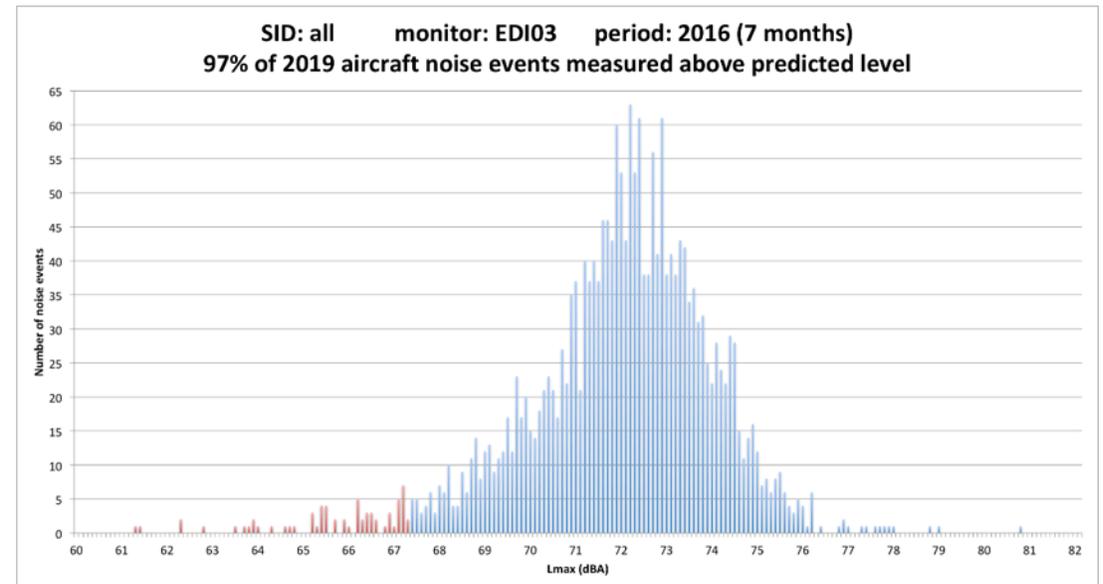
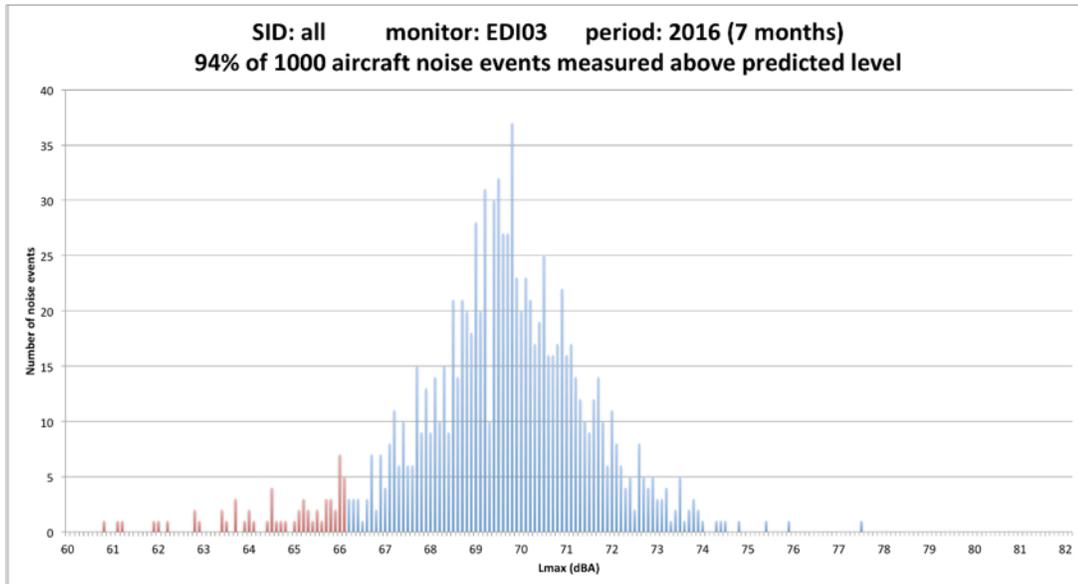


The Lmax values for A319s measured at the permanent monitor locations (EDI01, EDI02 and EDI03) are well above the predicted level for that aircraft type.

It is also the case for another two dominant jet aircraft types A320 and B738.

A320 on RWY06 SIDs at EDI03

B738 on RWY06 SIDs at EDI03



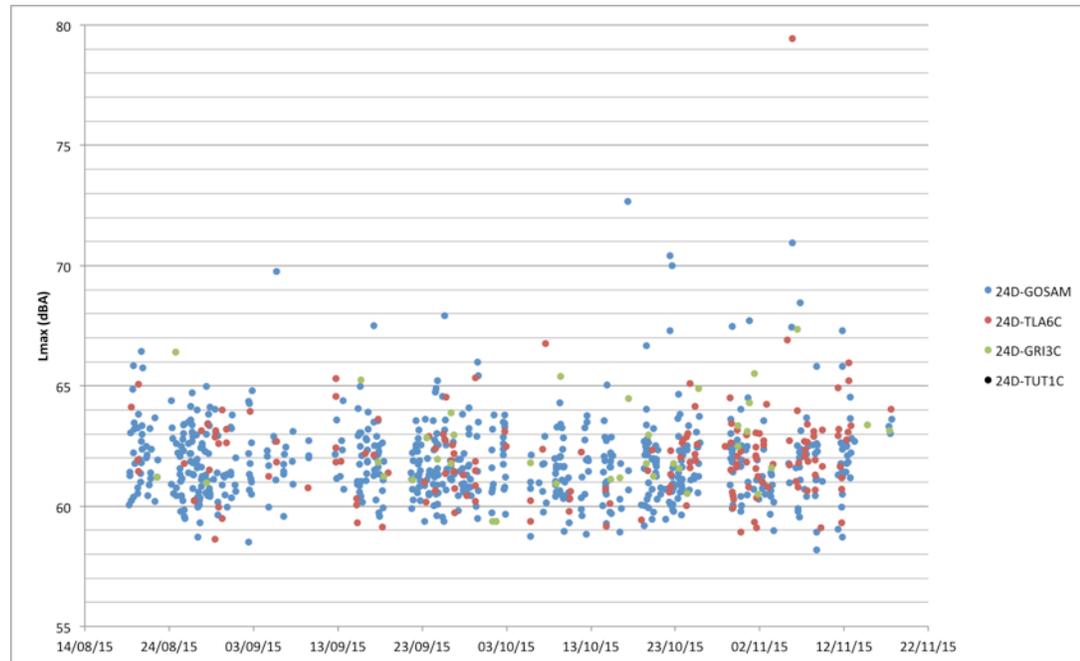
A temporary monitor (EDI07) was installed by EAL during the TUTUR trial in 2015. Its precise location is uncertain but it was reported by EAL to be in the vicinity of Forrest Walk , Uphall.

No footprint data is available for TUTUR but it is possible to compare the measured Lmax of TUTUR aircraft noise events to that for other SIDs. Since this location is outside the 59dBA minimum contour of the Lmax footprint map the measured value at the monitor should be below 59dBA.

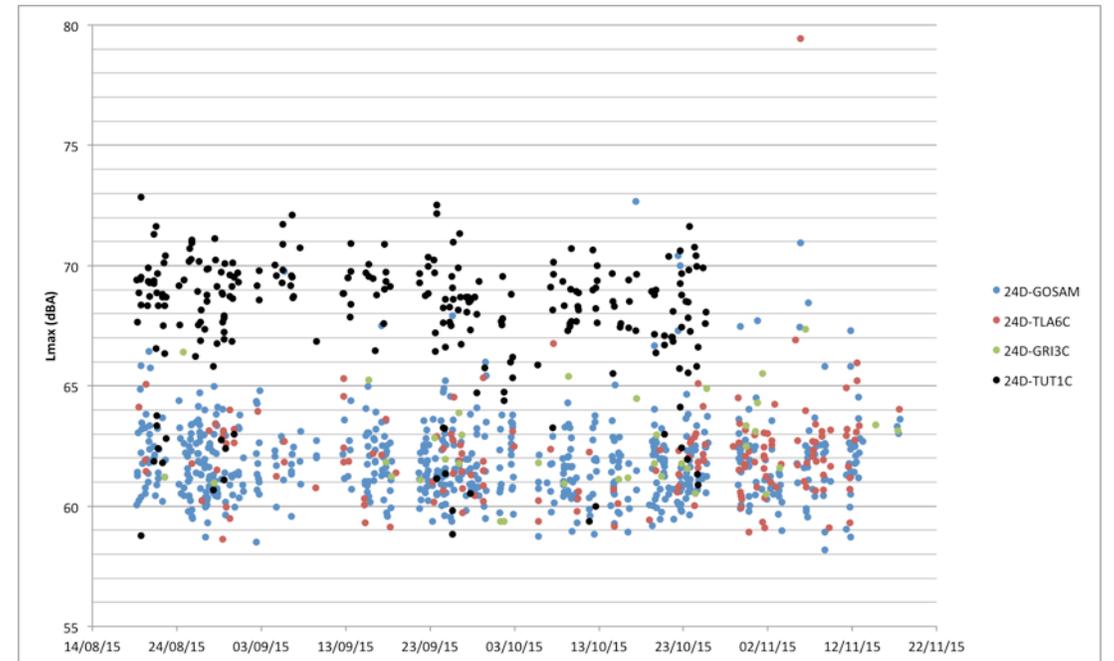
Most readings are well above this predicted level

Lmax of A319 noise events at EDI07

RWY24 SIDs TALLA, GRICE, GOSAM



RWY24 SIDs TALLA, GRICE, GOSAM and TUTUR

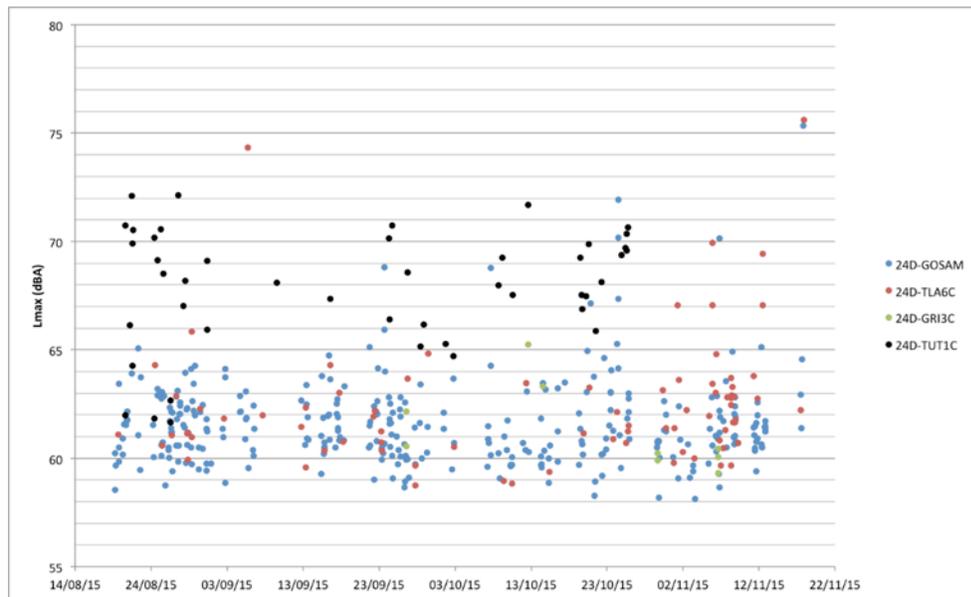


For A319s, the measured Lmax values at EDI07 location for TUTUR aircraft noise events are as expected much higher than for other SIDs.

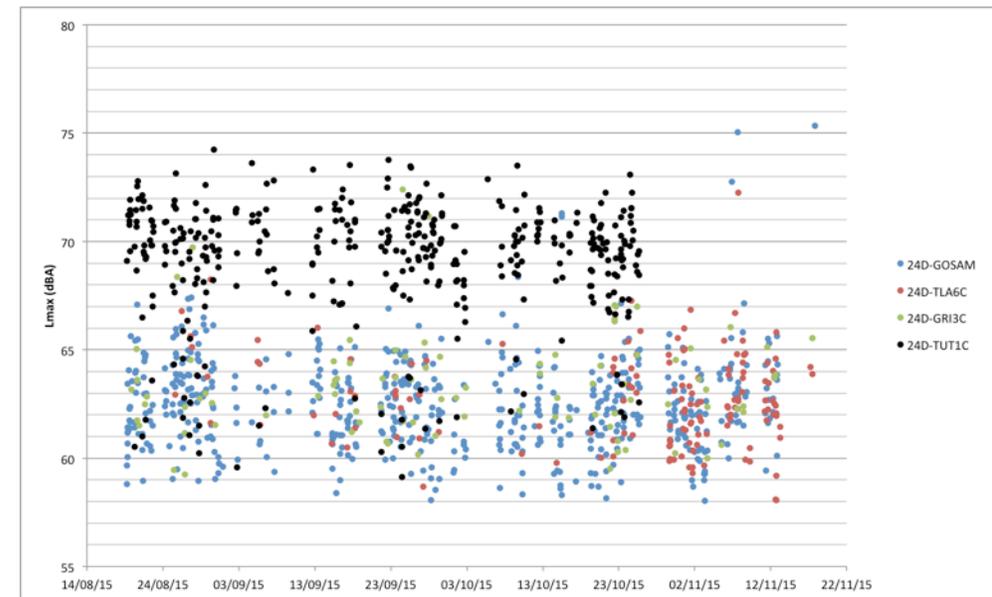
SID RWY24	Mean Lmax (dBA)
TALLA	62.1
GOSAM	61.8
GRICE	62.6
TUTUR	68.0

The same trends were observed in the measured Lmax values at EDI07 for other dominant aircraft types (A320 and B738).

A320 at EDI07



B738 at EDI07



The analysis carried out also highlighted how TUTUR significantly increased noise level over certain populated areas.

These findings appear to call into question the validity of:

- the 2016 strategic noise maps for EDI supplied to the Scottish government
- the noise and footprint maps which were presented to the public during the ACP consultation for the existing SID and the proposed SIDs.
- the population impact analyses carried out by the CAA for the ACP looking at the number of people exposed to various aircraft noise levels