Department for Transport

Survey of Noise Attitudes (SoNA) 2014: Aircraft Noise and Annoyance

Second Edition

Peer Review

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CONTENTS

1 Introduction

1.1 Placewise Limited (PW) and Stephen Turner Acoustics Limited (STA) have been commissioned by the Department for Transport (DfT) to carry out a peer review of this second edition of CAP 1506 – Survey of Noise Attitudes 2014 (SoNA2014): Aircraft Noise and Annoyance.

1.2 The comments set out below provide the outcome of this peer review. They should be read in conjunction with the report PW/STA3 published as CAP1506c which describes the peer review of the first edition of CAP1506, published in 2017.

1.3 The need to publish a second edition of CAP1506 (CAP1506(2)) arose from two issues. Firstly, the discovery, from a separate study carried out by Heathrow Airport Limited, the noise model (ANCON) used to predict the noise exposure for most of the respondents in SoNA2014 underestimated L_{ASmax} noise levels for several important aircraft types. The second issue concerned the realisation that, in determining average N65 and N70 values in SoNA2014, logarithmic averaging had been inadvertently used instead of arithmetic averaging.

2 Potential Consequences for SoNA2014 Analysis

2.1 Whilst it is very disappointing that these issues have occurred, The Environmental Research Consultancy Department of the Civil Aviation Authority (ERCD) should be given credit for identifying them. Furthermore, the peer reviewers concur with the observation set out at paragraph 1.7 of the Preface to CAP 1506(2) that:

> *Neither of these issues have affected the results for Leq or Lden, nor the relationships between those indicators and percentage highly annoyed (in particular the results in Table 25 remain unaffected).*

2.2 In addition, the reviewers also agree with the comment in the Preface of paragraph 1.6 of CAP1506(2) that:

> *It would be expected that although the average LASmax values would rise (due to updated model validation), the average N65 and N70 values would fall (due to the correction to arithmetic averaging). The consequence of this is a net reduction in the average N65 and N70 values, except at low values of N65 and N70, (N65 at fewer than 50 events and N70 at fewer than 25 events), where the effect of updating the modelled LASmax data is greater than the effect of correcting the averaging, and leads to increases in N65 and N70 values.*

3 Review

3.1 With regard to the use of models to predict noise exposure it is accepted that they are continually refined as the results of measurements are compared with predictions. However, the averaging error relating to the N70 and N65 values was of greater concern. The scope of the initial peer review did not extend to detailed checking of every calculation undertaken. Instead it concentrated on the robustness of the analytical methods and the face validity of the conclusions drawn.

3.2 Given the importance of the study and the possibility that further analysis and reports would be based on it, the reviewers recommended that the DfT commissioned an appropriately qualified expert to liaise with ERCD and check the various datasets and calculations undertaken.

3.3 The DfT followed the reviewers' recommendation and appointed the University of Salford's Acoustics Research Centre (Salford) to undertake that review. Their results are published in a report entitled:

USAL-SoNA1: Technical Review of Phase 1 of the Survey of Noise Attitudes (SoNA) studies[1]

3.4 PW and STA have reviewed this report and reached the following conclusions:

1. The Salford review helped to clarify that two respondents living within the same postcode area would be assigned the same noise exposure.
2. Care is needed when reading the report that all the LAmax values mentioned are, in fact, LASmax.
3. Importantly, Salford were satisfied that the calculations were robust. In particular, they stated:

> *These reviewers are confident that the analyses undertaken are accurate, reliable and robust, and meet standard practice in the field.*

3.5 Paragraph 1.7 of the Preface to CAP1506(2) helpfully directs the reader to the tables in the original report where the values have changed as a result of correcting the issues identified. The reviewers note that the greatest impact of the amendments is evident in Table 17. This shows the the r^2 values for both the N70 and N65 relationships has increased. A further data line has been included showing the N65 results for the sample excluding 18 respondents who experienced less than 1 event of at least 65 dB L_{ASmax}. In this case the r^2 value is even higher. None of the revised correlations, however, are as great as that for $L_{Aeq,16h}$. Consequently, PW and STA concur with conclusions in 5.23.

3.6 The amendments caused a change in the number of respondents experiencing more than 400 events of 70 dB(A) or more during an average summer day, reducing from 11 respondents to 3 respondents (Table 10). PW

[1] USAL-SoNA1: Technical Review of Phase 1 of the Survey of Noise Attitudes (SoNA) studies (University of Salford), December 2020

and STA agree with the decision to assign those 3 respondents to the ≥ 200 event category, given the small sample size experiencing ≥ 400 events.

3.7 Differences also occurred in Table 23 which describes the percentage of respondents indicating high annoyance for Heathrow, Gatwick and Stansted by average summer day 16h N65. Paragraph 5.42 of the first edition of CAP1506 noted that the results in Table 23 showed an increase in the percentage of respondents highly annoyed occurring between 50 – 99 and 100 -199 events.

3.8 In the revised Table 23 and Paragraph 5.42, the increase occurs between 25 - 49 and 50 – 99 events for the CAN1i question, but occurs between 50 – 99 and 100 – 199 for the CAN 34 question. The reviewers asked ERCD to comment on this different outcome compared with the original result. The reviewers agree with the response that

> *it is a consequence of the updated and corrected N65 noise data, which has changed the distribution of respondents within the N65 noise bands* (Paragraph 5.41).

4 Overall Conclusion

4.1 PW and STA have reviewed the second edition of CAP 1506. The inevitable amendments arising from the re-calculation that had to occur have been clearly set out and any changes in conclusions drawn have been properly made.

4.2 Importantly, and as indicated above, the issues that were identified and which have been addressed in the second edition do not affect the results in terms of L_{eq} and L_{den} and, in particular, the results set out in Table 25.

4.3 It is, therefore, the view of the peer reviewers that the results and conclusions from SoNA2014 as set out in this second edition can be used as a basis for the further development of Government policy in this area.

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