Department for Transport

Survey of Noise Attitudes (SoNA) 2014: Sleep – Further Analysis

Peer Review

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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 CAP 2251 Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance, Further Analysis.

1.2 The comments set out below provide the outcome of this peer review. They should be read in conjunction with the following reports:

- PW/STA/03 published as CAP 1506c which describes the peer review of the first edition of CAP 1506, published in 2017;
- PW/STA/04 published as CAP 1506c which describes the peer review of the second edition of CAP 1506, published in 2021; and
- PW/STA/05 published as CAP 2161a, which describes the peer review of CAP 2161, published in 2021

1.3 As previously noted (PW/STA/05), one key issue for this analysis is that the design and sampling of the SoNA2014 was aimed at understanding the impact of aircraft noise during the day. Therefore, the data analysis regarding the impact on sleep disturbance could be no more than exploratory and great care is needed when drawing any conclusions from that analysis.

1.4 Having said that, it was noted that some interesting results did arise and that it was possible to identify some recommendations for any future study into Aircraft Noise and Sleep Disturbance.

1.5 The aims of the further analysis are set out in Paragraph 1.4 of CAP 2251

2. Review

2.1 The peer review process followed broadly the same approach as that which occurred for CAP 1506, CAP 2161 and CAP 2250. The reviewers were presented with a draft of the report and this was examined to determine

- if the analytical process was robust;
- if the analysis properly addressed the aims;
- if the outcome accurately reflected the analysis; and
- if the presentation was clear.

2.2 The peer reviewers raised a number of issues with the authors, but these were mainly related to the clarity of presentation, the detail included and typographical issues.

2.3 As previously observed (PW/STA/05), the reviewers agreed with the proposed scope of this analysis, confining it to respondents affected by operations at Heathrow, Gatwick and Stansted. They also agreed that the impact of the aircraft should be quantified through the responses to question CAN1vii.

2.4 Furthermore, the reviewers suggested in their previous peer review (PW/STA/05) that the more recent work on using the probability of noise induced awakenings as a measure of sleep disturbance was included in any analysis. The reviewers note that work on this aspect is to be found in Chapter 4 of CAP 2251.

2.5 In that analysis, the reviewers observed that some of the higher number of additional aircraft noise-induced awakenings at higher exposures may be an over-estimate. This is because at higher noise exposures, some respondents may shut their windows to mitigate the aircraft noise. Furthermore, some may have specific sound insulation treatment to enable them to shut their windows. In both cases, the internal L_{ASmax} levels will be lower than is

assumed in the results presented in Figure 5 of CAP 2251. An observation to this effect is to be found in CAP 2251.

2.6 The result shown in Figure 7 of CAP2251 is interesting insofar as it aligns with the first objective of the German Aerospace Centre's noise protection concept presented by Basner and Samel. In that report, the authors state that 'On average, there should be less than one additional awakening induced by aircraft noise' which is clarified elsewhere to mean 'per night'.[1]

3 Overall Conclusion

3.1 PW and STA have reviewed the report CAP 2251 Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance, Further Analysis.

3.2 As previously mentioned, given that the original SoNA2014 study was designed to understand the impact of aircraft noise during the daytime, there were unavoidable limitations on what analysis could be undertaken.

3.3 Having said that, a range of issues have been explored as part of this further analysis. The reviewers are satisfied that the report presents what is possible to obtain from the source data and that the work is robust.

3.4 Some interesting results emerged, but as indicated above, they must still be treated with caution and probably used only as issues that should be explored in any future aircraft night noise disturbance study.

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[1] Basner M, Samel A and Isermann U, "Aircraft noise effects on sleep: Application of the results of a large polysomnographic field study", Journal of Acoustical Society of America, 119 (5), May 2006.