<u>Note by Dr Chapman on Matters Raised During the Economics Evidence</u>

24/1/2024

<u>Noise monetisation</u>

1. It was put to me during cross examination that the data shown in Mr Greer's appendices may indicate that the monetised noise estimate I produced at Table 1 of my Rebuttal (**HACAN-1-2** pg 4) is overly pessimistic. I was invited to listen to Mr Greer's evidence and review my analysis.

2. In line with the revised noise effect figures in Appendix 1 to Mr Greer's proof, I have re-modelled noise impacts assuming only half of the individuals that experience a 0.1-0.9 dB noise change see a move up or down in the TAG banding system. A commensurate adjustment is then made for the opposite case, in which an individual falls within the upper half of the band (e.g. 1.0-1.9). Impacts are then scaled to account for the weekday/weekend proportions.

3. The result is to reduce the overall Net Present Value of the monetised noise impact from **-£205m** to **-£165m**, a reduction of around 20%. The full revised Table 1 is:

Revised Table 1: WebTAG noise valuation assessment outputs, 60-year appraisal period

Impact domain	**WebTAG assessment (£, 2022 prices)**	**Sensitivity test excluding impacts below 51 dB (£, 2022 prices)***
Net present value of impact on sleep disturbance	-£24.2m	-£12.1m
Net present value of impact on amenity	-£100.8m	-£100.2
Net present value of impact on AMI	-£3.3m	-£3.3m
Net present value of impact on stroke	-£14.5m	-£14.5m
Net present value of impact on dementia	-£21.9m	-£21.9m
Net present value of change in noise	-£164.6m	-£152.0m

**note day-time impacts below 51 dB are already excluded from the core analysis as they were not provided by Mr Greer, this test relates to night-time impacts and is a standard output of the WebTAG model.*

4. There are, however, four reasons why this estimate is likely to be an under-estimate:

   a) TAG monetisation would normally monetise day-time noise impacts between 45 and 50 dB. For example, TAG values a 1 dB increase from 48-49 dB to 49-50 dB at £21 per household, per year, in lost amenity value. It is highly likely that this scheme has negative day-time noise impacts in the 45-50 dB range, but only night-time impacts in this range have been quantified. My day-time estimate is therefore likely to be optimistic.

b) Noise impacts are widely regarded to be proportionally more damaging when experienced by children, notably because of their impact on educational attainment. Children are significantly more prevalent in LBN than the national average. Given time and resource constraints, my analysis has <u>not</u> controlled for this factor.

c) Noise impacts are widely regarded to be proportionally more damaging when experienced by income-deprived households. This is because of their reduced ability to take mitigating steps. Income deprivation is significantly more prevalent in LBN than the national average. Given time and resource constraints, my analysis has <u>not</u> controlled for this factor.

d) I have not monetised ground noise impacts. While Mr Greer's analysis suggests ground noise impacts affect a significantly smaller number of individuals, the change in noise levels they experience is larger.

5. As a result, I consider the new figure to present a <u>conservative</u> monetisation of noise impacts.

Carbon Monetisation

<u>Different original estimates of carbon costs of the scheme</u>

6. I have discussed over e-mail with Ms Congdon the discrepancy identified between our respective original estimates of the carbon cost of the scheme. Ms Congdon put the carbon cost at -£167 million, for departing flights only, in Table 6.8 in **CD 1.60** pdf pg 90. I put the figure at £-491 million Table 2 of my Rebuttal Proof (**HACAN-1-2** pg 5) including inbound flights, i.e. -£246 million if comparing like-for-like with Ms Congdon on departing flights.

7. On 23/1/2024, Ms Congdon provided two tables, one setting out her original Carbon Values Calculation. This showed that the primary driver of this discrepancy is not the use of the wrong carbon values, as I had assumed and stated in the Notes in Table 2 of my Rebuttal. Instead it is caused by Ms Congdon/York Aviation's decision to start discounting from the year 2019. The "discount rate" or discount factor is set by the Green Book and is explained from paragraph 5.32 onwards (**CD 3.10.08** pgs 45-47): it is "a technique used to compare costs and benefits occurring over different periods of time on a consistent basis", reflecting "that generally people prefer to receive goods and services now rather than later". It is clear that discounting "should be applied to all <u>future costs and benefits.</u>"

8. Both Ms Congdon and I apply the 3.5% per year discount rate recommended in the Green Book. I start to apply that rate from 2024. Ms Congdon starts to apply it from 2019, with the result that, for each year from 2019-2024, Ms Congdon's analysis reduces the carbon costs

by 3.5% (so the impact is cumulative). This cuts roughly 16% off the total carbon cost in 2024, and this error is carried forward into every subsequent year in the assessment.

9. 2019 was not the correct year to start discounting. 2019 is the base year. The carbon impact (and so the carbon costs) are not anticipated to begin in the base year. This is reflected in Ms Congdon's table, which shows the With Development CO2 and the Net Carbon Emissions beginning in 2024. As seen from **CD 1.60** Section 5 and Appendix D (pdf pg 116 para 5), the forecasts apply from 2024 onwards. The carbon costs section of the Need Case CD 1.60 paragraph 6.53-6.54 directs readers to Appendix I, which also shows analysis beginning in 2024 (pdf pg 153), although this may be an error, and the reference should have been to Appendix F, which refers back to Section 5 (pdf pg 150 para 5).

10. Appendix F para 12 of the Need Case states that costs and benefits are discounted in line with HM Treasury Green Book guidance on discount rates, but that guidance is that the discounting applies to future costs and benefits, which supports applying discounting from 2024.

Appellant's Revised Carbon Cost Calculation Under 2023 TAG Unit A5.2

11. In our correspondence, Ms Congdon provided a revised carbon cost calculation. I understand that this will be provided to the Inquiry. I note the following about the table:

    a. The same error in beginning discounting in 2019 occurs, while again the additional tonnes of CO2 begin in 2024;

    b. Ms Congdon assumes 93.5% displacement of air traffic (i.e. 93.5% of planes would have flown anyway);

    c. Ms Congdon's revised analysis accepts the point made by Dr Smith that air travel from LCY is less efficient than at alternative airports, by a factor of 60%. Ms Congdon thus does accept that, even in the context of near total displacement, this means there is a carbon cost to the scheme.

12. The carbon cost calculated by Ms Congdon is significantly lower than my estimate, because of the discounting error and the assumption about displacement. In my view, it is thus not credible.

Revised cost-benefit analysis

13. In Revised Table 2 below, I have updated my assessment of the scheme's welfare-based cost-benefit analysis in light of the new TAG guidance published in November 2023 (**INQ 13**).

14. Overall, it remains the case that, when monetised noise impacts and unmitigated carbon impacts are taken into account, the majority (80%) of the scheme's welfare benefit claimed by the Appellant in the Need Case is removed. Inclusion of non-carbon impacts, in the form of a sensitivity analysis, using DESNZ's conservative 1.7x multiplier, turns the scheme's net present value to society deeply negative.

Revised Table 2: Updated welfare-based cost-benefit analysis figures

Impact	Notes	Present Values (£m)
Passenger Surface Access Time Savings	As per Appellant	£1,767
Passenger Surface Access Cost Savings	As per Appellant	£216
Passenger Air Fare Savings	As per Appellant	-£1,674
Airport Company Benefits	As per Appellant	£119
Air Passenger Duty	As per Appellant	£12
Construction Costs	As per Appellant	-£70
Noise impacts	TAG Noise Workbook output	-£165
Carbon cost	Carbon value less priced carbon	-£134
Net present value	**Central scenario**	**£71**
Sensitivity analysis		
Non-carbon cost	Assuming 1.7x multiplier	-£343
Net present value	**Sensitivity scenario 1**	**-£272**

Equity

15. During cross examination Ms Dehon discussed with Ms Congdon the issue of impact equity, and the question of whether the social benefit of air travel, and of the scheme, would be narrow or broad. HACAN East have submitted to the inquiry the CAA passenger survey data (**INQ 19**) showing that the average household income of a UK-resident leisure passenger at London City Airport was £77,000 in 2019. It also shows that the average UK-resident business passenger at London City Airport had a personal income of £103,000.

16. The UK average household income in 2019 was £61,000 (ONS Household Finances Survey). While average incomes in London are typically higher than the UK average, incomes in the Borough of Newham are significantly below the London average.

Dr Alex Chapman

24/1/2024