Westerly and Easterly departure trials noise report

Presentation to the Heathrow Community Noise Forum
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May 2015 presentation showed that noise modelling is a reliable and versatile way to derive noise levels across a wide geographic area.

- Our model:
  - uses INM set-up to reflect operating characteristics of Heathrow.
  - verified using measured data at a number of locations. (see page 9 of report)
  - uses GIS to generate and visualise noise level and event data and differences specific to communities.

<table>
<thead>
<tr>
<th>Location</th>
<th>Period</th>
<th>Average noise level, dB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Modelled</td>
</tr>
<tr>
<td>Englefield Green: trial</td>
<td>13/10/2014 – 12/11/2014</td>
<td>56</td>
</tr>
<tr>
<td>Englefield Green: post trial</td>
<td>13/11/2014 – 07/12/2014</td>
<td>53</td>
</tr>
<tr>
<td>Ascot</td>
<td>24/09/2014 – 12/11/2014</td>
<td>51</td>
</tr>
<tr>
<td>Cumberland Lodge</td>
<td>25/08/2014 – 12/11/2014</td>
<td>55</td>
</tr>
<tr>
<td>NPL, Teddington</td>
<td>28/07/2014 – 12/11/2014</td>
<td>57</td>
</tr>
<tr>
<td>Feltham</td>
<td>28/07/2014 – 11/11/2014</td>
<td>65</td>
</tr>
</tbody>
</table>

Note: Only the monitor in Englefield Green was installed for periods that included the trial and outside the trial.
Today I will present some of observations and lessons learnt from the analysis and assessment of noise exposure and community response associated with the westerly and easterly departure trials.

- The full report can be found at:

- The full scale map images can be found at:

- Where I have used a figure in this presentation, I have referenced the figure number of the report. I am using these figures to demonstrate specific points and the full title of the figure and associate keys can be found in the report.
There is broad agreement that there is no single metric that adequately illustrates exposure both simply enough or in a manner that is accepted as being reflective of community experience.

- Research indicates that both noise level and number of events are key attributes. Our modelling therefore used:
  
  - **Average noise level indicator - LAeq,T** – see page 6 of report
    
    The LAeq,T is essentially the average sound pressure level over a time period T and is the standard metric used for “noise impact assessment” generally. In response to the emerging analysis, results contained within the report also consider noise levels down to 54 and 48 dB and **not just 57 dB typically assessed for aircraft noise.**

  **AND WE ALSO INCLUDED**

  - **The number of “noticeable” events – “N-above”** – see page 7 of report
    
    N65 (the number of events in a time period, T, where the maximum sound level is greater than 65 dBA) has been chosen to represent the number of noticeable events with windows open
    
    We have taken in the analysis that N65(16hr) > 20, 50 and 100 as indicators to assess the results. These values represent an average of approximately 1, 3 and 6 aircraft per hour respectively.
The Westerly Trial routes changes the pattern of tracks with some new areas experiencing consistent overflight. Significant change to contour shape.

Baseline period

Trial period

Baseline period

Average day noise contours
The Westerly Trial routes changed the pattern of aircraft overflight, aircraft generally more concentrated around each route – “concentrated dispersion”. Pattern changes with runway alternation.

Baseline period

Track dispersion through gates

Fig. 4.1 left

Trial period

Fig. 4.1 right

Fig. 4.2

Fig. 4.3
During the westerly trial, fewer people were exposed to average aircraft noise levels greater than 54 dB $L_{Aeq,16hr}$.

- Most areas where there was a substantial increase in average noise level were in areas outside those that would be considered with traditional measures for aircraft noise assessment (eg 54 dB $L_{Aeq,16hr}$).
- There were some areas that did not experience a reduction in flights by switching runways as a consequence of routes from each converging over their area.
During easterly trial the areas experiencing aircraft overflight were broadly similar to those prior to trial. Small changes to contour shape.

Baseline period

Trial period

Average day noise contours

Fig. 4.5 left

Fig. 4.5 right

Fig. 5.6
During easterly trial aircraft were more consistently concentrated.

Baseline period

Average day noise contours

Fig. 4.5 left

Trial period

Fig. 4.6 close-in gate around Teddington, further out gate around Thames Ditton

Fig. 4.6 close-in gate around Teddington, further out gate around Thames Ditton
During the easterly trial, fewer people were exposed to average aircraft noise levels greater than $54 \text{ dB } L_{A_{eq,16hr}}$. There were no areas where there was a substantial increase in average noise exposure.

<table>
<thead>
<tr>
<th>Population</th>
<th>Easterly $&gt; 48 \text{ dB}$</th>
<th>Easterly $&gt; 54 \text{ dB}$</th>
<th>Easterly $&gt; 57 \text{ dB}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>% change</td>
<td>-2%</td>
<td>-1%</td>
<td>-3%</td>
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Use of the supplementary metric N65 indicated that as a result of the increased concentration some areas experienced 50 more events over the average 16-hour day of easterly departures than before the trial.

- The change in N65 for the westerly trial is similar to that of the average noise level change.
- During easterly use of N65 change presents a different view to that presented by the average noise level change.
The use of change in average noise levels and event based metrics were valuable supplementary measures to improve understanding of noise exposure, and be useful for communication and engagement strategies.

During westerly departures most complaints came from areas outside the areas that would normally be used to define and assess noise impacts (54 or 57 dB LAeq,16hr), but were from areas that the modelling indicated a substantial increases in the noise level and/or change in number of events.

During easterly departures most complaints were from within areas that would normally be used to define and assess noise impacts (54 or 57 dB LAeq,16hr). However, there were no substantial increases in 16-hour average noise levels in these areas. Complaints were generally from areas (or adjacent to) where the modelling indicated increases in the number of events.