Noise Management Around Airports, a view from UK Air Traffic Control

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NATS
London & Scottish: 1m km² – 11% of Europe’s airspace and 25% of traffic

Shanwick Oceanic Control Area

Shanwick

Scottish

London

Shanwick

2.2m km² – 80% of North Atlantic traffic
Management of UK Airspace

- 2.5 million flights.
- Over 250 million passengers.
- 13 of the busiest UK airports.
- World's first: environmental targets.
Context – UK’s Aviation Strategy
UK Aviation Strategy - quicker, quieter and cleaner…

- UK Government’s airspace modernisation objective to deliver quicker, quieter and cleaner journeys and more capacity
- Progressively reduce the noise of individual flights, through quieter operating procedures
- Require that noise impacts are considered through the airspace design process
- Decisions over concentration vs respite - based on local circumstances in consultation with local communities
- An Independent Commission on Civil Aircraft Noise (ICCAN) to consider how they can best support communities in engaging with the airspace change process
- Legislation giving Secretary of State the power to direct airports or air navigation service providers to take forward airspace changes for reasons other than safety or capacity (…noise)
UK Aviation Strategy – A Package of Measures on Noise

- Proposing a new objective to ‘limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise’

- A new national indicator to track the long term performance of the sector in reducing noise.
  - a noise quota? a total contour area?

- ‘Balance noise and growth’ set noise caps as part of planning approvals; provide future certainty to communities

- All major airports: plans to commits to future noise reduction, periodic review

- Improved flight path information for prospective home buyers; better informed decisions

- Statutory enforcement powers for Independent Commission on Civil Aircraft Noise or CAA

- For airspace changes causing significantly increased overflight, a new minimum threshold of an increase of 3dB LAeq, which leaves a household in the 54dB LAeq contour or above as eligible for assistance with noise insulation
Context – UK Sustainable Aviation Coalition
Sustainable Aviation
Cleaner. Quieter. Smarter.

90,095 tonnes of CO₂ saved due to more efficient flights in UK airspace since 2014

63,267 more continuous descent approaches in 2015/16 than 2014, reducing noise and CO₂

The Airbus A350-900 and Boeing 787-9 have reduced the area impacted by noise by at least 2.4km² than the aircraft they replace

12,200 fewer people in noise contour areas at 5 SA airports than in 2014 despite 13% passenger growth

UK industry has taken a key role in the development of global aviation industry carbon offset scheme

Over 140 innovation and technology projects are being supported by the UK aerospace industry, worth over £700 million to cut future aircraft emissions and noise, including development of hybrid and electric aircraft

1% of UK NOx emissions from aircraft

Disconnecting growth in UK aviation from growth in emissions and noise
Reducing ability for Aviation Industry to Control or Influence

No ability for Aviation Industry to Control or Influence

Volume of Noise Event
Duration of Noise Event
Pitch and Tone of Noise Event
Frequency of Noise Events
Time of Day
Individuals Reaction to Event
Density of Population
Level of Background Noise
Individuals Location to Event
Weather Conditions
Number of People Annoyed by Aircraft Noise
Aircraft noise…. a classic ‘externality’

Externality  [ek-ster-nal-i-tee], noun

‘the cost or benefits of a transaction to parties who do not directly participate in it; can be either positive or negative’

‘an external effect, often unforeseen or unintended, accompanying a process or activity’
UK Airspace Modernisation (PBN) – a noise opportunity…?
Performance Based Navigation
PBN – Noise Management Opportunities

- Sharing routes over a wider area with multiple PBN routes (although might increase the total number of people overflown)
- Routing aircraft accurately over urban areas where there is higher general noise levels
- Routing aircraft over rural areas where fewer people live
- Protect parks and other quiet spaces by routing aircraft over built up areas or vice versa
- Prioritise noise over CO$_2$ emissions in low level airspace; or the reverse in areas where noise has less impact
- Use multiple PBN routes to alternate flights over different areas, possibly on a planned basis to give community predictable periods of respite or temporary relief from aircraft noise
- Changing PBN routes at particular times of day to manage noise impacts
PBN – benefits…

- London City PBN SID replications led to 1.2 million fewer people being overflown below 7,000ft
- Stansted PBN departure routes on two SIDs led to a 83% and 87% reduction in overflown population
- Edinburgh offered the potential to reduce the number of people overflown by up to 46%

<table>
<thead>
<tr>
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<th>Potential % Reduction in Size of Noise Footprint per Flight at 55dB</th>
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<tbody>
<tr>
<td>Birmingham</td>
<td>10.3%</td>
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<tr>
<td>Cardiff</td>
<td>3.1%</td>
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<tr>
<td>Bristol</td>
<td>0.6%</td>
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<tr>
<td>Luton</td>
<td>27.8%</td>
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<tr>
<td>Gatwick</td>
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<tr>
<td>London City</td>
<td>70.2%</td>
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<tr>
<td>Heathrow</td>
<td>34.2%</td>
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<tr>
<td>East Midlands</td>
<td>5.2%</td>
</tr>
<tr>
<td>Stansted</td>
<td>19.3%</td>
</tr>
</tbody>
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- Possible 10-20% emissions reduction in UK airspace
All good...?
Summary

- UK’s Aviation Strategy sets out a framework for aviation to grow sustainably
- As an industry, aviation has made great strides in reducing noise at source, improving operational procedures
- In the UK noise has been disconnected from growth in traffic
- But has the noise problem gone away…?
- Airspace modernisation (PBN) is coming - and offers significant operational benefits
- Community reaction to PBN is likely to be significant a blocker to improvements
- Is this about externalities? How can we bring communities closer to the airspace modernisation debate to deliver future growth and capacity in a sustainable way
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