

Draft Aviation Policy Framework

Department for Transport

This is an *Engineering the Future* response to the Department for Transport's consultation on the draft sustainable framework for UK aviation.

This response has been developed by:

- **The Institution of Mechanical Engineers**

The response is supported by

- The Chartered Institution of Water and Environmental Management
- The Institution of Chemical Engineers
- The Institution of Engineering and Technology
- The Royal Academy of Engineering

29 October 2012

For further information please contact:

Thomas Man, Manager Engineering Policy, Professional Engineering Forum

thomas.man@raeng.org.uk 020 7766 0654

Engineering the Future is a broad alliance of engineering institutions and bodies which represent the UK's 450,000 professional engineers.

We provide independent expert advice and promote understanding of the contribution that engineering makes to the economy, society and to the development and delivery of national policy.

General comments:

It is estimated that by 2050 global aviation traffic will stand at around 16 billion passengers annually compared with 2.5 billion in 2011¹. In order to address this challenge the Government needs to ensure that aviation policy is long term and demonstrates integration between all transport modes, where such integration provides an optimal way to achieve policy objectives. Such an aviation policy should fit into a wider transport strategy which is developed by utilising a systems thinking approach.

A balanced aviation strategy needs to allow businesses and customers across the whole of the UK to connect to the most dynamic and fastest growing markets. With a growing amount of international trade companies do not need to have their entire manufacturing, financing and operational headquarters in one place. Apple's iPhone, for example, is a product designed in California with the chip designed in Cambridge (UK), components purchased from South Korea, Japan and Germany with final assembly in China.

The conclusions reached in paragraph 2.95 of the consultation do not appear to be consistent with the content of the document. There is little in the document that would constitute a strategy for the development and enhancement of the air transport infrastructure of the UK, but the paragraph claims that the document identifies a 'strategy of practical measures'. The document sets out a series of policy measures to fill the capacity gap in the short term, with long term capacity issues being addressed by a separate inquiry into aviation capacity.

Government needs to review how existing infrastructure at our regional airports can help in the short, medium and long term. The future success of the British economy depends on a series of airports supporting UK cities. These cities need airports than can offer the option of a point-to-point connectivity or the option of a transfer through a UK hub to these new markets.

Government and other regulations should encourage greater use of Collaborative Decision Making at airports (interlinking of the various stakeholder systems to enable dynamic allocation of resources) as this has been shown to offer extensive savings in, for example, taxiing times and fuel consumption.

The consensus from the members of the alliance suggests that we need to make the best use of infrastructure already in place along with a long term strategy that takes an equal view across all transport modes. Noise and air pollution from ground surface transport (both on the airfield and those linking to the airport) needs to be reviewed alongside that from aviation to maximise the opportunity to reduce these.

The document does not state whether the scope is to include military aviation as well as civil aviation. The Impact Assessment clearly lays out the Framework's objectives as "... [to] help make better use of existing infrastructure at London's congested airports of Gatwick,

¹ Flightpath 2050 – Europe's vision of aviation, Advisory Council for Aeronautics Research in Europe (ACARE), September 2012

Stansted and Luton". This would seem to support our assumption that military aviation is out of scope of this document.

Additionally, to address the negative effects of aviation, there will need to be global coordination and diplomatic efforts from not just the Department for Transport but other Government departments such as the Foreign and Commonwealth Office, Department for Energy and Climate Change and Treasury.

Chapter 2: The benefits of aviation

Connectivity

We need to have the right services at the right airport. There is a great deal of point to point traffic passing through Heathrow, yet it currently has limited connectivity to cities other than London. The need to improve multi-modal connections between Heathrow and the UK's major cities, and to introduce more point to point connections from other airports, must be considered.

One option is to introduce a number of 'mini hubs' in the regions running alongside a main hub, which would enable better use of capacity. This would also improve resilience in the case of extreme weather or other unforeseen incidents affecting a hub airport. This would also make better use of the newer medium size long-range aircraft such as the Boeing 787, as these aircraft are designed for efficient long distance travel. Planes such as these can be most effective operating long-haul flights to and from regional hubs, but are less efficient at airports such as Heathrow where the number of flights is already at its maximum capacity.

Effective ground transportation links between different hubs are also required to provide improved transport resilience in the event of unforeseen incidents.

- 1. Do you agree with our analysis of the meaning and value of connectivity, set out in Chapter 2?*

Connectivity, both regionally and internationally is extremely important to the UK. There are capacity constraints at Heathrow which are having a negative impact. The option of using regional mini hubs would improve capacity and connectivity in UK cities other than London. They would also ease congestion at major South East airports, where there is currently a lot of traffic passing through from the regions. These mini hubs may be helpful in allowing for seasonal and economic fluctuation in demand which can affect point to point connections. Given that there are no direct air or direct rail links from, for example, Birmingham International to London Heathrow, Gatwick or Stansted, the creation of regional hubs could be considered or the provision of better rail links provided to existing hubs.

There needs to be a long term vision of what the UK's business focuses will be over the next 50 years, to ensure that we have the right aviation policy for the entire UK as well as the South East.

The integration of transport links is only mentioned in the document with respect to the medium to long term. However, if we want to ensure that the UK remains competitive we need to improve the network of our infrastructure in the short term too.

2. Fifth freedoms:

The alliance supports the idea of extending the fifth freedom policy in order to expand airport capacity. This should include a discussion of the option of having mini hubs that would fly to some key destinations along with a central main hub.

If bilateral agreements are to be formed there needs to be a clear definition of how the partnerships are going to work. Government must ensure that these partnerships are equivalent and provide reciprocal rights where this is useful for Britain's competitiveness and to maximise connectivity.

It should be considered whether better slot management technology could be used to encourage the best use of flight slots, in order to maximise airport capacity at the hubs. However, this may need to be done through collaboration with the ICAO and the EU.

Airport security places major demands on airport infrastructure, and causes congestion that is highly unpopular with travellers. The Government should consider using improvements in scanning and information technology to decouple security screening from airports, for example by introducing screening and baggage check-in off site, perhaps at rail or road transport hubs.

Chapter 3: Climate change impacts

Europe is the global leader in the implementation of aviation international standards covering interoperability, energy, security, safety and the environment this leads to the UK being a key strategic advisory country on the global regulatory system.

3. Do you have any further ideas on how the Government could incentivise the aviation and aerospace sectors to improve the performance of aircraft with the aim of reducing emissions?

The Department for Transport supports the work that is being conducted under the Emissions Trading Scheme in Europe but it must continue to play a leading role to meet the needs of the ICAO through being proactive and making use of the technical support and experts in this field.

Notwithstanding the objectives behind Air Passenger Duty, the application of a unilateral tax of this nature distorts the long distance aviation market while doing little to incentive airlines to utilise greener aircraft or to increase passenger load numbers on flights, as the tax is effectively passed on to the passenger. A tax on fuel usage could be a better approach as this would encourage airlines to use more fuel efficient aircraft across their fleet and to

maximise overall load factors, thus incentivising emissions reductions, while also bringing aircraft used for freight into the scheme.

While taxation of aviation fuel is favoured by the European Commission, an attempt to introduce this through ICAO (which would require a worldwide agreement to overturn provisions in the 1944 Chicago Convention) was rejected at the ICAO level. As a compromise, Directive 2003/96/EC allowed EU Member States to tax aviation fuel for domestic flights and through agreements on a case by case basis with other EU member states, which could be an option to explore alongside withdrawing APD for certain destinations.

There are two aspects to reducing emissions from aircraft; these are process optimisation and improvements of the air traffic system and technological advances in aircraft design.

In terms of process improvement, there can be a reduction in fuel burn from aircraft while on the ground through the use of more fuel efficient taxiing methods and from moves to reduce air traffic delays (“stacking”) whilst waiting to land through the implement of measures such as Continuous Descent Approach. Improving the processes both on the ground and with air traffic management is an important step in reducing fuel use.

Technological improvements also play a part in reducing fuel burn. These efficiencies come through improvements not only in engine design but also through innovations in materials and airframe configuration.

The UK Government cannot directly incentivise aircraft manufacturers but any work they can do to support research and development must continue in order to support the development of energy efficient aircraft.

A recent report estimates that by 2050 technologies and improvements in processes will have allowed for a 75% reduction in CO₂ emissions per passenger kilometre and a 90% reduction in NOx emissions². Perceived noise emission will be reduced by 65% compared to figures from 2000 so there is scope for further improvement for aircraft and engine manufacturers.

The advances in the development of biofuels could also be an important consideration. For a sector that is completely reliant on a portable liquid fuel as an energy source, the development of sustainable alternatives must be prioritized for aviation. At present, there are RTFC incentives to drive biofuel feedstock and supply into the road transport sector, but not into aviation. Government policy must be put in place to govern the allocation of feedstock and resource across all transport modes and other sectors that could exploit biofuels, such as energy-intensive industrial processes. This should be carried out in consideration of other government policies such as implementation of low carbon vehicles such as hybrid and electric vehicles.

² Flightpath 2050 – Europe’s vision of aviation, Advisory Council for Aeronautics Research in Europe (ACARE), September 2012

A key challenge in the development of biofuels is the issues of business risk. At present investors are hesitant to invest due to lack of an overall business case, poor integration and assurance within the value chain and product maturity. This is inhibiting the development of biofuel refineries and jeopardizing the future of this technology.

4. *Do you have any other comments on the approach and evidence set out in Chapter 3?*

Currently there is no evidence to suggest that teleconferencing is a substitute to air travel but may actually lead to more travel, by encouraging international working.

Chapter 4: Noise and other local environmental impacts

5. *Do you agree that the Government should continue to designate the three largest London airports for noise management purposes? If not, please provide reasons.*

Government should continue with their noise management approach at major airports such as Heathrow. As aircraft technology has improved there has been a reduction in aircraft noise. However, as the total number of flights has increased, it is not clear whether there has been an overall net noise reduction. Improvements in navigation aids, and the use of Route Navigation Performance restrictions can allow flight paths to be varied to avoid noise nuisance. However, there is a need for more research into what constitutes a noise nuisance, taking into account volume and frequency. For example, night frequency may be more important than amplitude of individual aircraft.

6. *Do you agree with the Government's overall objective on aviation noise?*

All airports should be monitored for the noise in the surrounding areas to ensure that people living near the airport still have a good standard of living. These should be measurable quantities, maintained and audited regularly.

Careful consideration should be given to attempting to reduce noise while understanding the potential impact this may have on other aspects of the design of an aircraft. For example, it is possible to design aircraft that produce less noise. There maybe the unintended consequence of increasing environmental impact during flight. Manufacturers are aware of this trade off and working on solutions.

7. *Do you agree that the Government should retain the 57 dB LAeq, 16h contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance?*

Annex D of the draft policy contains a good breakdown of choices and in addition it is worth noting that the World Health Organisation's guidelines on community noise exposure recommend against daytime noise in excess of 55 dBA LAeq (16 hour) preventing high levels of annoyance. At present there are no EU-wide noise limits for airports instead; airport noise is regulated by member states through local operational measures.

8. *Do you think that the Government should map noise exposure around the noise designated airports to a lower level than 57 dBA?*

The alliance believes that Government should map the noise envelope around the designated airports. This has been done at Sydney Airport where the Australian Government developed a system that tells an individual resident:

- The aircraft altitude over their property
- The average daily number of movements on a flight path (and range between quietest and busiest days)
- The number of days when there are no flights, any 'quiet periods' for example night curfews
- The number of events over a given threshold for example 70 dBA
- Seasonal, daily or hourly distributions

This data can give a real life picture to the residents that can be easily understood – most noise models are capable of providing this information.

9. *If so, which level would be appropriate?*

Further work needs to be undertaken to measure noise nuisance levels. This needs to take into account the noise of the aircraft and also the surrounding ground transport noise. The noise level should then be set to a level less than that which constitutes a noise nuisance.

10. *Do you agree with the proposed principles to which the Government would have regard when setting a noise envelope at any new national hub airport or any other airport development which is a nationally significant infrastructure project?*

No comment

11. *Do you agree that noise should be given particular weight when balanced against other environmental factors affecting communities living near airports?*

There will be a trade-off between noise reduction and carbon emissions because making aircraft quieter can sometimes involve making them heavier, hence they could use more fuel and produce more emissions. Therefore, while it is important to bring noise below the threshold at which it constitutes a nuisance, once noise has been reduced sufficiently limiting carbon emissions should become the priority.

12. *What factors should the Government consider when deciding how to balance the benefits of respite with other environmental benefits?*

Government should continue working with the regulatory bodies for example CAA, ICAO and others along with discussions with the local communities on ways to improve their lifestyle /

health and wellbeing when living in the surrounding areas of the airport. ICAO has four principle elements to consider:

- Reduction at the source (quieter aircraft)
- Land-use planning and management
- Noise abatement operational procedures and operating restrictions
- With a goal of addressing the noise problem in a more cost effective manner

13. Do you agree with the Government's proposals in paragraph 4.68 on noise limits, monitoring and penalties?

The alliance agrees with the Government's proposals. At present those affected gain no benefit from a fine being levied. Consideration could be made to link noise incident fines to improvements in the affected community.

14. In what circumstances would it be appropriate for the Government to direct noise designated airports to establish and maintain a penalty scheme?

No comment

15. In what circumstances would it be appropriate for the Government to make an order requiring designated airports to maintain and operate noise monitors and produce noise measurement reports?

No comment

16. How could differential landing fees be better utilised to improve the noise environment around airports, particularly at night?

No comment

17. Do you think airport compensation schemes are reasonable and proportionate?

No comment

18. Do you agree with the approach to the management of noise from general aviation and helicopters, in particular to the use of the section 5 power?

No comment

19. What other measures might be considered that would improve the management of noise from these sources?

No comment

20. Do you have any further ideas on how the Government could incentivise the aviation and aerospace sector to deliver quieter planes?

Government can help the aviation sector by providing further support for Research and development in aircraft design.

21. Do you believe that the regime for the regulation of other local environmental impacts at airports is effective?

Regulatory approaches – the development of airspace management technology, which forms the basis of the CAA's Future Airspace Strategy and the European Single European Sky initiative creates a window of opportunity for the framework to define policy on the issue of concentration versus dispersion. Approaches that can be taken include:

- Trend towards concentration – new navigation technologies – enable the aircraft to keep to the centre line of existing flight paths would lead to a continuation of concentration of Noise Preferential Routes (NPR)
- Full dispersion – spread the burden of noise across the population with defined periods of relief but this could impact on complexity and affect capacity
- Dispersion within each route – use of NPR to designated multiple flight paths and
- Alternation of airspace system – flight paths are concentrated within each configuration but local residents benefit from predictable periods of relief from noise disturbance – used in Australia with Sydney airport

22. Do you think that noise regulation should be integrated into a broader regulatory framework which tackles the local environmental impacts from airports?

Any changes to noise regulation should take account of the impact of such changes and ensure that any exclusions or exemptions are clearly documented, for example the exclusion of military aviation facilities and OEM airport and test facilities. There is an opportunity here to address the environmental impact of the ground based transport and equipment used at airports.