



Department  
for Transport

# Night Flying Restrictions at Heathrow, Gatwick and Stansted Stage 1 Consultation

January 2013

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# 1. Executive Summary

- 1.1** The aviation sector is a major contributor to economic prosperity by providing the international connectivity needed to support economic growth. The Government supports the growth of the sector within a framework which maintains a balance between these economic benefits and its costs, which include the impact of noise on local communities around airports.
- 1.2** Despite the significant improvements in aircraft technology in recent years and the associated noise reduction benefits, noise from aircraft operations at night remains widely regarded as the least acceptable aspect of aviation noise and government has long recognised this. If airport capacity is allowed to grow, it is essential that the aviation industry continues to tackle its noise impact in order that the benefits are shared between airports and local communities.
- 1.3** At the three airports at which it has the power to set noise controls - Heathrow, Gatwick and Stansted - the Government has historically set restrictions on the operation of aircraft at night. When it is setting restrictions, the Government's existing high-level policy objective on aircraft noise is to limit and, where possible, to reduce the number of people in the UK significantly affected by aircraft noise.
- 1.4** The restrictions, collectively known as the 'night flying regime', have been based on:
- setting a limit on the overall number of night flights;
  - placing restrictions on the noisiest aircraft types; and
  - setting noise quotas which cap the amount of noise energy which can be emitted at night over the course of the regime. This takes account of the noise emitted by aircraft type - the noisier the aircraft, the fewer that can be operated within the cap, thereby also providing a built-in incentive for airlines to use less noisy aircraft where practicable.
- 1.5** On 26 March 2012, the Government announced that it would extend the existing night flying regime at the three airports for a period of two years until October 2014<sup>1</sup>. At this stage the Government has taken no decisions on its preferences for the next regime, but the regime will need to be consistent with the high level noise policy which the

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<sup>1</sup> <https://www.gov.uk/government/speeches/night-flying-restrictions-at-heathrow-gatwick-and-stansted-airports>.

Government will set out in spring 2013 when we publish our Aviation Policy Framework document.

- 1.6 Recognising the importance of aviation to the UK's future, in September 2012 the Government announced the setting up of an independent Airports Commission, chaired by Sir Howard Davies, to examine the scale and timing of any requirement for additional capacity to maintain the UK's position as Europe's most important aviation hub, and it will identify and evaluate how any need for additional capacity should be met in the short, medium and long term. As night flying restrictions may be relevant to questions of airport capacity, we will want to be able to take account of relevant recommendations which may emerge from the Airports Commission during the process to set the next night flights regime. Equally, the Commission may want to make use of the evidence gathered from this consultation.
- 1.7 As a first step to setting the next night flights regime we therefore want to gather evidence now which we would like to inform both our development of options for the next regime, and also the work of the Airports Commission.
- 1.8 This first step is an open call for evidence and we are seeking views on options which have not been considered in the past. Some options may prove to be more costly or difficult to implement, while others may not realistically be achievable until later in the period covered by the next regime, or even until a future regime. Nevertheless we want to gather evidence now to help us assess the relative feasibility of each option.
- 1.9 We are aware of the economic arguments for operating night flights. So, as well as looking at options for reducing the noise impact of night flights, this consultation is also an opportunity for interested parties to make the case for night flights and how they can contribute to economic growth.
- 1.10 Specific proposals for the next regime, such as the number of permitted night flights, will form the second stage consultation. These proposals, which will be informed by the evidence we receive from this first stage consultation, will need to strike a fair balance between the interests of those affected by the noise disturbance and those of the airports, passengers and the UK economy, taking account also of our obligations under EU law. We will produce a full impact assessment of our specific proposals in the second stage consultation, but for now we are seeking evidence on the high-level costs and benefits of the possible options. We are also consulting on our proposed framework for appraising the policy options for the next regime.
- 1.11 This consultation is structured as follows:

**Chapter 2 - Policy and legal landscape.** This explains the policy context in which we are conducting this work, and the legal requirements which we must take into account.

**Chapter 3 - Factual information.** This provides relevant information for stakeholders about current night operations and noise objectives and performance at each of the airports.

**Chapter 4 - Structure of the current night noise regime.** Here we explain the components of the current regime, including the length of the night quota period, the quota count system, length of the next regime, rules on dispensations and carry-over rules. It invites views on whether any of these arrangements should change.

**Chapter 5 - Exploration of options for the next night noise regime.** This Chapter considers future developments at the three airports and options for the next regime. It sets out our initial assessment on the operation of the current restrictions and invites views on how these might change in the next regime. It also seeks evidence on the feasibility, costs and benefits of further options to reduce noise. These options include:

- operational procedures, including increasing the angle of descent on approach; introducing a night-time easterly preference at Heathrow and extending the use of displaced landing thresholds;
- changing the existing scheduling or operating bans which affect the noisiest aircraft types;
- guaranteed respite periods;
- trade-offs which could include an increase in the number of permitted flights in the night quota period.

**Chapter 6 – Night flights evidence review.** This Chapter reviews current evidence on the costs of night flights, particularly noise, and the benefits of these flights. It sets out our thinking on how we would expect to appraise the policy options for the next night flights regime and seeks views on our approach. The proposals reflect our review of relevant recent studies and incorporate the methodology proposed by the Civil Aviation Authority for estimating the cost of sleep disturbance from aircraft noise.

## **Chapter 7 - Summary of Questions**

### How to respond

The consultation process is being run as a two stage process to ensure we have a robust evidence base to inform the development of options for the next regime. We anticipate this consultation will be of most interest to the aviation sector and local authorities as well as residents living under or near the flight paths to Heathrow, Gatwick and Stansted airports. The consultation document has been sent to relevant organisations for which we have contact details, including representative organisations which have been asked to disseminate the document to their members. This document has been published on the Department's website and can be found at <https://www.gov.uk/government/publications>.

The deadline for responses to this consultation is 22 April 2013. We are allowing a 13 week consultation period to ensure that Airport Consultative Committees, which normally meet quarterly, are able to discuss their responses. Response forms are available on the Department for Transport website. Any enquiries should be sent to **night.noise@dft.gsi.gov.uk** or

### Night noise consultation

Department for Transport  
Great Minster House (1/26)  
33 Horseferry Road  
London SW1P 4DR

Please note that we will make every effort to ensure that late responses and responses that fall outside the scope of this consultation are read, but these responses may not be taken into account in the publication of any results and the publication of the second stage consultation.

### **Data protection and freedom of information**

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), the Data Protection Act 1998 (DPA) and the Environmental Information Regulations 2004).

If you want information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Department will process your personal data in accordance with the DPA and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties.

The Department however intends to share responses submitted to this consultation with the Airports Commission because they may usefully inform the work they have been asked to undertake by the Government. If you do not want the Department to share your response with the Airports Commission, please clearly indicate this on the response form.

## Consultation principles

The consultation is being conducted in line with the Government's key consultation principles which are that:

- departments will follow a range of timescales rather than defaulting to a 12-week period, particularly where extensive engagement has occurred before;
- departments will need to give more thought to how they engage with and consult with those who are affected;
- consultation should be 'digital by default', but other forms should be used where these are needed to reach the groups affected by a policy; and
- the principles of the Compact between government and the voluntary and community sector will continue to be respected.

Further information is available on the Better Regulation Executive website at <https://update.cabinetoffice.gov.uk/resource-library/consultation-principles-guidance>

If you have any comments about the consultation process please contact:

Consultation Co-ordinator  
Department for Transport  
Zone 1/14 Great Minster House  
London SW1P 4DR  
Email [consultation@dft.gsi.gov.uk](mailto:consultation@dft.gsi.gov.uk)

## What happens next?

Following the end of this consultation period we will analyse the responses and use the evidence gathered to inform proposals for the next regime. We intend to consult on these proposals later this year and to announce the new regime by spring 2014.





## 2. Policy and Legal Landscape

- 2.1** The three largest London airports - Heathrow, Gatwick and Stansted - are designated in law for the purpose of noise regulation. The Government has for many years set noise controls at these airports, including restrictions on aircraft movements at night.
- 2.2** The current regime governing night restrictions at these airports was announced in June 2006 and came into force on 30 October 2006. It was due to end on 28 October 2012 at the end of the summer season. On 26 March 2012, the Government announced that it would extend the existing night flying regime at the three airports for a period of two years until October 2014. This was to ensure that proposals to replace the current regime would take account of the Aviation Policy Framework (“APF”) which the Government has committed to have in place by spring 2013, and which will include the framework for managing noise.

### Structure of Consultation

- 2.3** We announced in March 2012 that the next night flights regime would be consulted on in two stages. This is consistent with the approach taken in 2004-5 to set the current regime. This document is the first stage consultation and will:
- Make clear the information which must, in so far as it is appropriate and possible to do so, be considered in taking decisions on night time operating restrictions;
  - Set out the facts on how the current regime has operated;
  - Call for detailed evidence on the effectiveness of the current regime, analysing its usage and seeking comments on our analysis;
  - Seek views on the structure of the next regime;
  - Set out possible options for the next regime and seek views on their feasibility, their respective costs and benefits and evidence of airlines’ fleet replacement plans; and
  - Review the current evidence on the costs of night flights, particularly noise, and the benefits of these flights, and seek views on how we should go about assessing these costs and benefits when drawing up an impact assessment for our proposals in the second stage consultation.

- 2.4** The second stage consultation, which we expect to launch later this year, will set out the Government's proposals for the night flight restrictions for the next regime taking account of the responses and evidence received from the first stage consultation, the results of the Heathrow Operational Freedoms trial and policies adopted in the Aviation Policy Framework. Consistent with the Government's announcement on 26 March 2012 (see above), it will also take account of the freeze in the noise quota limits during the extension period.

**Q1: Are there any other matters that you think we should cover in the second stage consultation?**

## Aviation Policy Framework

- 2.5** In March 2011, the Government launched a scoping exercise towards developing a new sustainable policy framework for UK aviation.
- 2.6** The Government's draft sustainable framework for UK aviation (referred to as the draft Aviation Policy Framework) was informed by the over 600 responses we received to our scoping document. Published in July 2012<sup>2</sup>, it set out our proposed overall objectives for aviation, considered how existing policies and additional policy options could achieve those objectives and sought responses to specific policy questions, including a number on noise. The consultation closed on 31 October 2012 and responses are currently being analysed.
- 2.7** The final Aviation Policy Framework will be a high-level strategy that sets out our overall objectives for aviation and the policies we will use to achieve those objectives. It will replace the 2003 Air Transport White Paper and associated guidance.

## Airports Commission

- 2.8** On 7 September 2012, the Government announced the setting up of an independent Airports Commission. Its membership and terms of reference were subsequently announced on 2 November<sup>3</sup>. The Commission's remit includes the production of an interim report by the end of 2013 which sets out recommendations for immediate actions to improve the use of existing capacity in the next five years. To the extent that night restrictions may be relevant to its report, we expect that the Commission would want to make use of the evidence gathered from this consultation to feed into the process. We will also want to take account of any relevant recommendations which emerge from the Commission during the process for setting the next night noise regime.

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<sup>2</sup> <https://www.gov.uk/government/consultations/draft-aviation-policy-framework>.

<sup>3</sup> <https://www.gov.uk/government/speeches/membership-and-terms-of-reference-of-the-airports-commission>.

## South East Airports Taskforce - Heathrow Airport Operational Freedoms Trial

- 2.9** In July 2011, the Minister of State for Transport announced a phased trial of operational freedoms at Heathrow Airport alongside the conclusions of the Government's South East Airports Taskforce. The purpose of the trial is to explore the benefits and impacts of the greater use of tactical measures in defined and limited circumstances to anticipate, prevent and mitigate disruption and to facilitate recovery.
- 2.10** The Operational Freedoms trial is being undertaken in two phases to enable evidence to be gathered for both winter and summer operations. The first phase of the trial ran from 1 November 2011 to 29 February 2012. The second phase was due to take place between July and September 2012, but was extended by six months earlier in the year and will now run until March 2013.
- 2.11** The trial is being undertaken by Heathrow Airport Ltd, the airport operator, under the supervision of the Civil Aviation Authority (CAA), the UK's independent aviation regulator. Further details of the trial can be found in Chapter 5 and on the airport's website<sup>4</sup>.
- 2.12** The results of the trial will form the basis for a consultation with local communities which will in due course inform the Government in deciding whether an operational freedoms regime should be adopted at the airport. The Chancellor's Autumn Statement on 5 December announced that the Government would bring forward the timetable for public consultation and final decisions on making these measures permanent, subject to successful completion of the trial.

## The Regulatory Framework

- 2.13** There is a well established regulatory framework set at an international and European level within which UK Government aviation noise policy operates. Most relevant to night flight restrictions at airports is the International Civil Aviation Organisation (ICAO) Assembly "balanced approach to noise management".
- 2.14** The balanced approach consists of identifying the noise problem at an airport and then assessing the cost-effectiveness of the various measures available to reduce noise through the exploration of four principle elements which are:
- Reduction at source (quieter aircraft);
  - land-use planning and management;

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<sup>4</sup> <http://www.heathrowairport.com/noise/noise-in-your-area/operational-freedoms-trial>.

- noise abatement operational procedures (optimising how aircraft are flown and the routes they follow to limit the noise impacts); and
  - operating restrictions (preventing certain (noisier) types of aircraft from flying either at all or at certain times).
- 2.15** ICAO encourages States to consider operating restrictions only after the benefits from other elements of the balanced approach have been taken into account.
- 2.16** The balanced approach is given effect in European law through Directive 2002/30/EC which establishes rules and procedures with regard to the introduction of noise-related operating restrictions at the busiest EU airports (commonly known as the ‘Balanced Approach Directive’). The rules and procedures apply to restrictions of a partial nature including night flying restrictions. The Directive has been implemented into UK legislation by The Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003<sup>5</sup>. At Heathrow, Gatwick and Stansted, the Secretary of State is responsible for setting their environmental noise objectives and the night flight rules. Changes to the current night restrictions will therefore need to be assessed in accordance with this legislation.
- 2.17** Information that must be taken into account - in so far as it is appropriate and possible to do so - when making decisions on operating restrictions at an airport is set out in Schedule 2 to the Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003. For ease of reference, we have reproduced this Schedule at Annex A and indicated where the required information can be found in this consultation.
- 2.18** Paragraph 4.1 of Schedule 2 to SI 2003/1742 states that when and where noise maps or action plans have been prepared under the terms of the Environmental Noise Directive, these will be used for providing the information required in this Schedule.
- 2.19** On 1 December 2011 the European Commission launched the Better Airports Package which includes a proposal for an EU regulation on noise which would repeal the current Directive and further harmonise and strengthen EU rules on aircraft noise management and assessment. A general approach on the proposal was agreed by European Transport Ministers in June 2012 and the European Parliament adopted the proposal with further amendments on 12 December 2012. Negotiations will follow this year under the co-decision process. At this stage we cannot predict the final outcome. However, we do not expect the new regulation to enter into force before mid-2014 and therefore the process to decide any new night flight restrictions is likely to remain subject to the 2002 Directive.

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<sup>5</sup> SI 2003 No.1742.

## Noise Action Plans

**2.20** Airports covered by the European Environmental Noise Directive 2002/49 (END) must prepare noise action plans, based on previously generated noise maps (contours), and submit these for formal adoption by the Government. Heathrow, Gatwick and Stansted had their noise action plans approved by the Government in May 2011. These action plans were based on noise maps using aircraft movements in the year 2006. The plans set out the airports' noise mitigation policy and describe their actions to manage noise issues and effects arising from aircraft using their airport, including noise reduction if necessary. Links to each noise action plan can be found in Chapter 3. In accordance with END, noise maps for Heathrow, Gatwick and Stansted based on aircraft movements in the year 2011 have recently been submitted to the Government and the airports will be reviewing their action plans in 2013. Where relevant to the night period, these maps are included in this consultation (Annex B).



## 3. Factual Information

- 3.1** This Chapter refers to terms relating to the structure and operation of the night noise regime. These are explained in Chapter 4. It contains much of the information to be taken into account under the Aerodromes (Noise Restrictions)(Rules and Procedures) Regulations 2003 (see Annex A).

### Current inventory

- 3.2** Noise Action Plans required under the Environmental Noise Directive for Heathrow, Gatwick and Stansted were approved by the Secretary of State for Transport and the Secretary of State for the Environment, Food and Rural Affairs in 2011. They contain much of the current inventory and set out the airport's approach to managing noise. Copies of the approved action plans can be found on the airport's website at the following links.

<http://www.heathrowairport.com/noise/>

<http://www.gatwickairport.com/business/corporate-responsibility/sustainability-reports/>

<http://www.stanstedairport.com/about-us/local-environmental-impacts/noise>

- 3.3** Details of aircraft noise abatement procedures, including at night, for Heathrow, Gatwick and Stansted are also published in the UK AIP (Aeronautical Information Publication)<sup>6</sup>.
- 3.4** Annex B includes the most recent 2011 noise exposure contours prepared for the  $L_{den}$  (24 hour) and  $L_{night}$  (8 hour) periods in accordance with the Environmental Noise Directive, along with  $L_{night}$  6.5 hour contours which show the noise impact during the period 2330-0600.

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<sup>6</sup> <http://www.nats-uk.ead-it.com/>.



## Heathrow

**3.5** The airport has two main runways, five passenger terminals<sup>7</sup> and two cargo terminals. The airport is located approximately 13 miles (21km) west of London City Centre and is surrounded by: suburban housing, business premises and mixed use open land to the north and south; suburban housing and business premises to the east; and three large reservoirs, mixed use open land, housing and business premises to the west. Under Terminal 5 planning conditions, the number of air transport movements at the airport shall be limited to 480 000 each year.

**Table 1: Heathrow Key Statistics**

Heathrow	2006	2007	2008	2009	2010	2011
<b>Air Transport Movements</b> (thousands)	471	476	473	460	449	476
<b>Passengers</b> (Millions)	67.3	67.9	66.9	65.9	65.7	69.4
<b>Freight</b> (Thousand tonnes)	1,263	1,311	1,397	1,278	1,473	1,484

Source - Civil Aviation Authority<sup>8</sup>

### Characteristics of operations in the night quota period

**3.6** In winter 2011/12 and summer 2012, there were an average of 15 movements per night (excluding exempt movements and dispensations - see paragraphs 4.11 and 4.21). Over the course of the current regime, the average number of movements has fluctuated slightly between summer and winter seasons.

**3.7** Most movements are scheduled services arriving after 0430, with most movements taking place after 0500. These are mainly long-haul passenger services, particularly from the Far East. There are a small number of unscheduled late running departures after 2330. In the night quota period in summer 2011 and winter 2011/12, approximately 50% of aircraft movements were B747-400s and services operated by British Airways.

<sup>7</sup> Terminal 5 opened in 2008 and the airport is now in the process of redevelopment work that will see the replacement of both Terminals 1 and 2 (Terminal 2 is currently closed).

<sup>8</sup> <http://webarchive.nationalarchives.gov.uk/20120926034718/http://assets.dft.gov.uk/statistics/tables/avi0102.xls>.

## Gatwick

**3.8** The airport has two runways, only one of which can be operated at any given time and two terminals. It is situated in mostly lightly-populated countryside (though between the towns of Crawley and Horley) about 28 miles (45km) to the south of London and about 2 miles (3km) north of Crawley.

**Table 2: Gatwick Key Statistics**

Gatwick	2006	2007	2008	2009	2010	2011
<b>Air Transport Movements</b> (thousands)	254	259	256	245	234	245
<b>Passengers</b> (Millions)	34.1	35.2	34.2	32.4	31.3	33.6
<b>Freight</b> (Thousand tonnes)	212	171	108	75	104	88

Source - Civil Aviation Authority<sup>9</sup>

### Characteristics of operations in the night quota period

**3.9** In winter 2011/12 and summer 2012, there were an average of 31 movements per night (excluding dispensations and exempt movements). However, since the start of the regime, there has been considerable variation between the seasons, with fewer actual movements in the winter seasons (approximately between 1,400 and 3,000) than in the summer (approximately between 9,100 and 10,600). The vast majority of movements (around 90%) are arrivals.

**3.10** The traffic type is predominantly a mix of passenger scheduled and passenger charter serving short haul routes. There has been a gradual increase in passenger scheduled services between summer seasons over the regime.

**3.11** In summer 2011, approximately one third of movements were made by easyJet and one third by Thomson/Thomas Cook. The fleet is comprised mainly of narrow body twin-engine jet aircraft, such as the Airbus A319, A320 and Boeing 737.

<sup>9</sup>

<http://webarchive.nationalarchives.gov.uk/20120926034718/http://assets.dft.gov.uk/statistics/tables/avi0102.xls>.

## Stansted

**3.12** The airport has one runway and one terminal. It is situated 35 miles (56km) north east of London and is surrounded by countryside and small villages to the north south and east and the town of Bishop's Stortford to the west. Current planning conditions restrict passengers to 35 million passengers per year, a limit of air transport movements to 264 000 per year and the area within the 57 dB, LAeq noise contour to 33.9 square kilometres.

**Table 3; Stansted Key Statistics**

Stansted	2006	2007	2008	2009	2010	2011
<b>Air Transport Movements (thousands)</b>	190	192	177	156	143	137
<b>Passengers (Millions)</b>	23.7	23.8	22.3	19.9	18.6	18
<b>Freight (Thousand tonnes)</b>	224	204	198	183	202	203

Source - Civil Aviation Authority<sup>10</sup>

### Characteristics of operations in the night quota period

**3.13** In winter 2011/12 and summer 2012, there were an average of 22 movements per night (excluding dispensations and exempt movements). There are more movements in the summer seasons than the winter seasons, though the difference is less stark than at Gatwick. The number of actual summer movements has fluctuated between approximately 5,800-7,300. Over the course of the regime, actual winter movements have declined (starting at just under 3,751 in 2006/07 and ending at 2,298 in 2011/12). Whilst arrivals still make up the majority of night movements, Stansted has a greater proportion of departures at night than the other two airports (between 28-35% in 2011-12).

**3.14** In both winters and summers, scheduled operations have been mainly short-haul passenger services and cargo movements. The passenger fleet is relatively modern, the cargo fleet less modern. Stansted is the only one of the three airports with dedicated night cargo services.

<sup>10</sup>

<http://webarchive.nationalarchives.gov.uk/20120926034718/http://assets.dft.gov.uk/statistics/tables/avi0102.xls>.

## Environmental and Noise Abatement Objectives

- 3.15** The Balanced Approach Directive requires competent authorities in Member States to formulate environmental objectives at the level of individual airports before adopting operating restrictions. It states that measures or a combination of measures taken under the Directive shall not be more restrictive than necessary in order to achieve the environmental objective established for a specific airport.
- 3.16** Under the UK implementing regulations, the Secretary of State is the competent authority for Heathrow, Gatwick and Stansted airports<sup>11</sup>. “Environmental objective”, in relation to an airport, means “an objective set by a competent authority in support of one or more of the following objectives – the promotion of the development of airport capacity in harmony with the environment, facilitating any specific noise abatement objectives at that airport, achieving maximum environment benefit in the most cost effective manner, limiting or reducing the number of people significantly affected by aircraft noise.”
- 3.17** The current environmental objectives were consulted on and set as part of the existing night noise regime and framed with a view to the longer term evolution of the airports up to a time horizon of thirty years or so.
- 3.18** Noise abatement objectives were also consulted on and set as part of the existing night noise regime. The current noise abatement objectives were set for the period of the current regime.
- 3.19** The tables below refer to the current environmental and noise abatement objectives at each airport and our provisional assessment of the extent to which they have been met.

**Table 4: Environmental Objective**

Environmental Objective	Airport	Assessment
Progressively to encourage the use of quieter aircraft by day and night	Heathrow & Gatwick	For the purpose of this consultation we are only assessing the night element of this objective.  Met  At Heathrow the average QC per movement in winter 2005/06 was 1.63 and in summer 2006 it was 1.71. Whilst in winter 2011/12 it was 1.31 and in summer 2012 it was 1.38.  At Gatwick the average QC per

<sup>11</sup> Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003 (SI 2003/1742).

		movement in winter 2005/06 was 0.82 and in summer 2006 it was 0.71 Whilst in winter 2011/12 it was 0.65 and in summer 2012 it was 0.51.
To avoid allowing the overall noise from aircraft during the night quota period to increase above 2002-03 levels	Heathrow & Gatwick	Met  At Heathrow in 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 41.1 km <sup>2</sup> . In 2002-2003 it was 53.9 km <sup>2</sup>  At Gatwick in 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 34.1 km <sup>2</sup>  In 2002-2003 it was 41.3 km <sup>2</sup>
To meet noise abatement objectives as adopted from time to time	Heathrow, Gatwick & Stansted	See below. No additional objectives have been adopted.
Progressively to encourage the use of quieter aircraft at night whilst allowing overall growth of the airport as envisaged by the White paper	Stansted	Met  At Stansted the average QC per movement in winter 2005/06 was 0.83 and in summer 2006 it was 0.70 Whilst in winter 2011/12 it was 0.71 and in summer 2012 it was 0.62
To limit the overall noise from aircraft during the night quota period close to existing levels while permitting expansion of the airport's overall traffic in line with White Paper objectives	Stansted	At Stansted in 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 29.3 km <sup>2</sup>  In 2002-2003 it was 30.4 km <sup>2</sup>  When adopted, the Aviation Policy Framework, in conjunction with relevant policies will fully replace the 2003 Air Transport White Paper and its associated guidance documents.

**Table 5: Noise Abatement Objectives**

Noise Abatement Objectives for Heathrow, Gatwick & Stansted	Assessment
To minimise sleep disturbance resulting from overflight of the noisiest types of aircraft.	<p>At all three airports the average QC rating per aircraft has fallen over the last 10 years, which indicates that quieter aircraft are being used.</p> <p>The number of QC/4 aircraft operating in the night quota period has generally fallen at all three airports over the course of the current regime. See table 13 in Chapter 5.</p>
To mitigate the effects of noise (in particular, sleep disturbance effects) by encouraging the adoption by the airports of appropriate night-noise related criteria, for domestic and other noise-sensitive premises, to determine which residents should be offered sound insulation to be paid for or contributed to by the airport.	See paragraphs 5.82-83 which set out the Secretary of State's decision in 2006 on the specific criteria on night noise insulation that should be adopted by each airport to help meet this objective. We have asked for evidence on how this was met.

**Table 6: Night Noise Abatement Objectives**

Airport Specific Night Noise Abatement Objectives	Assessment
At Heathrow, to limit the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) to 55km <sup>2</sup> by 2011-2012	Met – In 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 41.1 km <sup>2</sup>
At Gatwick, to limit the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) to 47km <sup>2</sup> by 2011-2012	Met - In 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 34.1 km <sup>2</sup>
At Stansted, to limit the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) to 38km <sup>2</sup> by 2011-2012	Met - In 2011/2012 the 6.5 hour 48dBA Leq contour (for the winter and summer seasons combined) was 29.3 km <sup>2</sup>

**3.20** In 2006 an additional objective was set for Heathrow to support the principal daytime noise abatement objective as set out in the “The Future of Air Transport White Paper” namely that if a third runway is built the 57dBA daytime noise contour should not exceed its area in 2002 (127km<sup>2</sup>).

**3.21** The Government set out in “The Coalition: our programme” (May 2010) that it would cancel the previous Government’s commitments to build a third runway at Heathrow airport and refuse permission for additional runways at Gatwick and Stansted airports. The Government has established the Airports Commission, chaired by Sir Howard Davies, to examine the UK’s airport capacity needs in the short, medium and long term.

### **Future Objectives**

**3.22** Environmental objectives, and noise abatement objectives if appropriate, will be proposed in stage 2 of the consultation. These will be consistent with the high level noise objectives adopted in the Aviation Policy Framework.

**Q2: Do you have any comments on our assessment of the extent to which the current objectives have been met?**

**Q3: Do you have any views on how these objectives should change in the next night noise regime?**



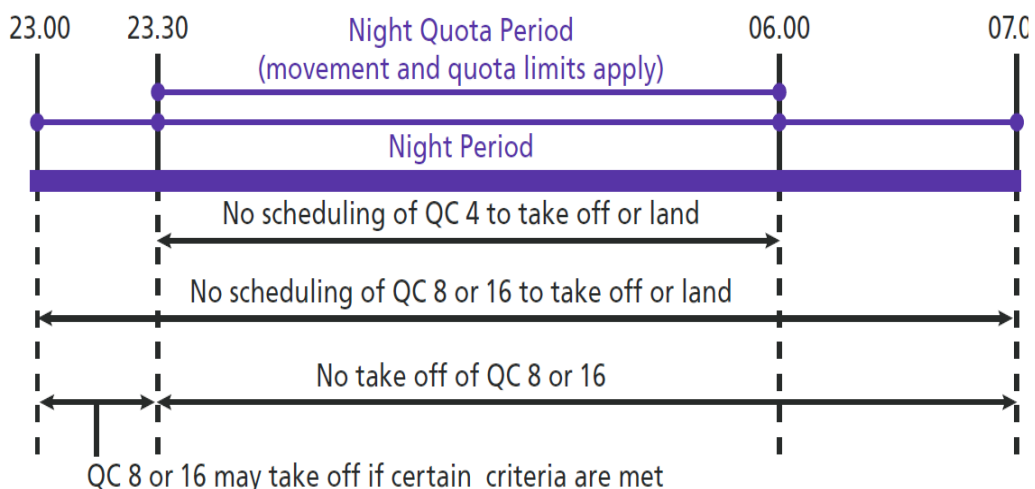


# 4. Structure of the Current Night Noise Regime

## Duration of the night and night quota periods

- 4.1** The night period is the 8 hour period from 2300 to 0700 local time, and the night quota period is the 6.5 hour period from 2330 to 0600 local time. The hours of the night period before and after the night quota period (2300-2330 and 0600-0700) are commonly known as the shoulder period. Separate quotas are set for both the summer and winter seasons which change with the clocks.
- 4.2** During the night period, the noisiest aircraft (as defined by Quota Count (QC) classification) may not be scheduled to land or take off. During the night quota period, aircraft movements are restricted by numerical movement limits and also by noise quotas which are set for each summer and winter season.

**Fig 1: The current structure of the night noise regime**



Source: graphic courtesy of Heathrow Airport Ltd

An explanation of the Quota Count system is contained in 4.5 below.

- 4.3** Changes to the duration of the night quota period were discussed as part of the consultation process for the current regime but after

consideration, the then Secretary of State decided to retain the existing duration of the night and night quota periods<sup>12</sup>.

**Q4: Do you have any views on whether noise quotas and movement limits should apply only to the existing night quota period or to a different time period?**

**Central European Time**

- 4.4** It is recognised that any future change to Central European Time (CET) (permanently moving the clocks forward by one hour) would have a significant impact on the night noise regime. The Government has made clear that any change would need the support of all parts of the UK.

## Quota Count System – classification of aircraft

- 4.5** Aircraft are classified separately for landing and taking off according to the Quota Count (QC) classification system which was specially designed for the night restrictions at Heathrow, Gatwick and Stansted and introduced in 1993.
- 4.6** The QC classification system is based on official noise certification data derived from measurements made on actual aircraft and conducted in accordance with the conditions and standards of the International Civil Aviation Organisation (ICAO) certification process<sup>13</sup>, with adjustments to take account of differences in noise measurement points<sup>14</sup>. Using the agreed ICAO standards and conditions for measuring aircraft noise is a requirement made under Article 4.4 of the Balanced Approach Directive which states that ‘performance-based operating restrictions shall be based on the noise performance of the aircraft as determined by the certification procedure’.
- 4.7** Aircraft are classified on the basis of their noise data (adjusted as appropriate) into seven QC bands<sup>15</sup>. The bands are illustrated in table 7 below.

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<sup>12</sup> Night flying restrictions at Heathrow, Gatwick and Stansted, June 2006.

<sup>13</sup> Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume I, Aircraft Noise, International Civil Aviation Organisation (ICAO).

<sup>14</sup> The noise classification of aircraft into 3 EPNdB wide QC categories are based on certificated Effective Perceived Noise Level (EPNL) as follows:

Arrival = EPNL at approach certification point minus 9 EPNdB (to put on an equivalent basis to departure certification points. Further details given in CAA report ref. ERCD 0205

Departure = (Sideline EPNL + Flyover EPNL)/2 if certificated under Chapter 3 or Chapter 4 of 2 Annex 16

Departure = (Sideline EPNL + Flyover EPNL) / 2 plus 1.75 if certificated under Chapter 2 (to allow for difference in sideline certification point).

<sup>15</sup> Propeller aircraft with maximum take-off weight (MTOW) not exceeding 5700 kg (i.e. those not subject to such criteria) and older propeller aircraft also not subject to these criteria are classified according to assumptions based on available noise data.

**Table 7: Aircraft noise classifications**

Noise Classification (EPNdB) <sup>16</sup>	Quota Count
More than 101.9	16
99 - 101.9	8
96 - 98.9	4
93 - 95.9	2
90 - 92.9	1
87 - 89.9	0.5
84 - 86.9	0.25

**4.8** Under the QC system, each aircraft type, including different versions of the same model, is assigned a Quota Count according to its noise performance, separately for arrival and departure, as determined by the ICAO noise certification process. For example, a Boeing 737-800 is classified as QC/0.5 on arrival and as QC/0.5 or QC/1 on departure (depending on its maximum certificated take-off weight), whereas a much larger and older Boeing 747-200 will vary between QC/2 and QC/8 on arrival, and between QC/4 and QC/16 on departure, depending on engine fit and MTOW. The individual classification of each type of aircraft is set out in Part 2 of the Schedule to the Notice which is published each season (in a supplement to the UK Aeronautical Information Publication (UKAIP)) to give effect to the night restrictions.

**4.9** The QC system allows each night flight to be individually counted against an overall noise quota (or noise budget) for an airport according to the QC rating (i.e. the noisiness) of the aircraft used. The noisier the aircraft used the higher its QC rating and the fewer that can be operated within any given quota, thereby also providing an incentive for airlines to use less noisy aircraft. Airlines are allowed to decide which aircraft to use according to their operational needs, but whether they use for example, 5x QC/2s or 10x QC/1s or 20x QC/0.5s, or a combination of these, the sum of the noise energy permitted by the quota remains the same.

**4.10** For the long haul sector of the market, the London QC/2 limit has effectively become the de facto world-wide noise standard on departure, since it is more stringent than the Chapter 4 standard agreed by ICAO. Several new aircraft, including the Airbus A380 and Boeing 747-8 have been designed to meet QC/2 on departure.

**4.11** The lowest QC band is currently QC/0.25. This was introduced in the current night noise regime and applies to aircraft classified between 84-86.9 EPNdB. Aircraft classified below 84 EPNdB are exempt and do not count towards the noise quota or the movements limits. The numbers of movements of such exempt aircraft in the night quota

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<sup>16</sup> Effective Perceived Noise Decibels, a specialised noise unit used for aircraft noise certification tests. Figures based on average of flyover and sideline for departures, and after 9 EPNdB subtraction from approach value.

period are listed at Annex D. Since summer 2008 there would have been enough spare movement capacity in every season to also cover the numbers of exempt operations at each airport, the exceptions being winter 2006-07 at Heathrow, winter 2007-08 at Heathrow, and summer 2007 at Stansted.

## **QC classification and operational noise levels**

**4.12** The previous consultation on Night Flying Restrictions (at Stage 1, July 2004)<sup>17</sup> identified that most aircraft have operational noise levels that accord with their QC classification. This finding was based on the results of a large-scale noise monitoring study, published by the CAA's Environmental Research and Consultancy Department (ERCD) in ERCD Report 0205<sup>18</sup>. However, it also noted that some types are noisier than their classification, and some quieter. It is to be expected that some differences will exist between operational and certification noise and experts examining the ICAO noise certification requirements concluded that, despite some differences between certification noise and operational noise at some airports, there is no compelling need to change the certification scheme<sup>19</sup>. As noted above, Article 4.4 of EU Directive 2002/30/EC, implemented by Regulation 5(3) of 2003 Regulations require performance-based operating restrictions to be based on the noise performance of the aircraft as determined by the ICAO certification procedure.

## **Airbus A380 operations at Heathrow**

**4.13** Since ERCD Report 0205 in 2003, further data has been collected by the CAA to examine arrivals noise for several new aircraft types that have commenced operation at Heathrow Airport, including the double-deck Airbus A380 which is now in regular use by airlines during the night quota period. Some of these new aircraft types appear slightly noisier in operation than their QC classification (A380 with Rolls-Royce Trent 900 engines), and some appear quieter (A340-500 and -600 with Rolls-Royce Trent 500). The figure below shows this new data, which has been analysed using the methods described in ERCD Report 0205.

**4.14** Rolls-Royce is supporting CAA in understanding the relatively high A380/Trent 900 monitored noise levels. However there is clear evidence that more modern aircraft are significantly quieter than the incumbent aircraft that they replace, and in particular ERCD Report

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<http://webarchive.nationalarchives.gov.uk/20070205224734/http://www.dft.gov.uk/consultations/archive/2004/nfrheahgtatst/?version=1>. See paragraph 7.6.

<sup>18</sup> ERCD Report 0205 Quota Count Validation Study: Noise Measurement and Analysis (April 2003).

<sup>19</sup> Report of the Committee on Aviation Environmental Protection, Seventh Meeting Montréal, 5 – 16 February 2007 (Doc 9886, CAEP/7).

1106<sup>20</sup> noted that A380 departure and arrivals noise is lower than the B747-400, which is one of the key aircraft it replaces.

**4.15** Overall, we are not aware of new evidence which would suggest a need to reconsider the QC system. We would nevertheless welcome views on this.

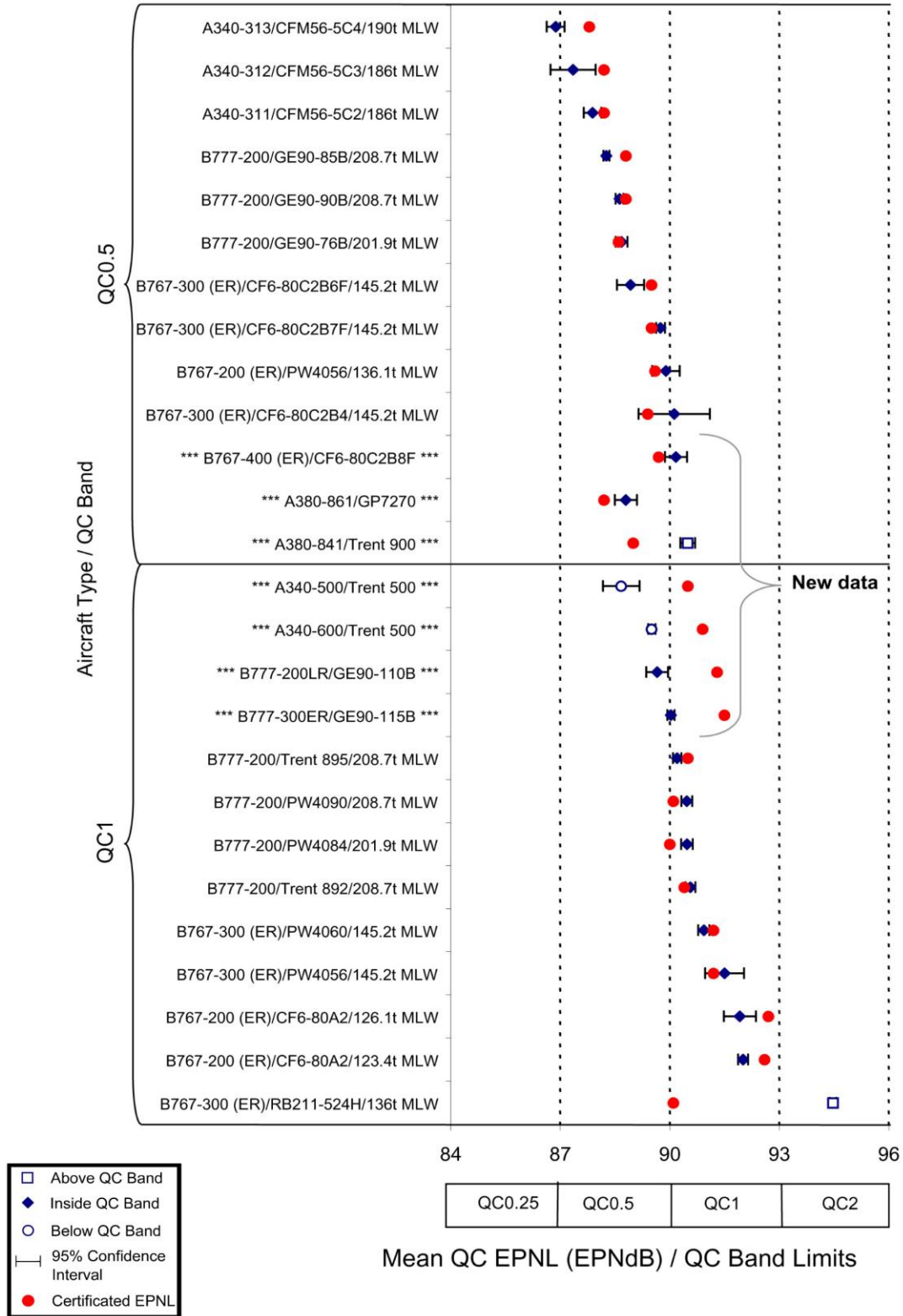
**Q5: Do you have any new evidence to suggest we should amend or move away from the current QC classification system?**

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<sup>20</sup> ERCD Report 1106 Noise Data for the First Three Years of Scheduled Airbus A380 Operations at London Heathrow Airport (February 2012).

**Fig 2: Measured approach EPNLs for new QC/0.5 and QC/1 aircraft at Heathrow**

**Measured approach EPNLs for new QC/0.5 and QC/1 aircraft at Heathrow**  
(existing data taken from ERCD Report 0205)



**4.16** In the figure above, the certificated EPNL values (adjusted by -9 EPNdB) are indicated by red circles and are compared with the measured results. Measured EPNL data are shown in blue, with the extremities of the horizontal lines indicating the 95% confidence interval for the measured data. The mean point is shown as a blue diamond if the value falls within the appropriate QC band, as an open blue circle if the mean value falls in a lower QC band than the certificated value, and as an open blue box if the mean value falls in a higher QC band than the certificated value. The 95% confidence interval has to be clear of the band limit for the result to be considered above or below the QC band.

## Length of next regime

**4.17** Previous practice has been to review the night restrictions at Heathrow, Gatwick and Stansted every five or six years. This enables us to take account of technological improvements (e.g. quieter aircraft), the findings of sleep research and related matters.

**4.18** A shorter regime would introduce uncertainty both in terms for airlines and for local communities, making it very difficult to secure either economic benefits or worthwhile improvements in the night noise climate. Whilst a much longer regime, although administratively attractive, could fossilise the arrangements and we would not be able to review whether an appropriate balance continued to be struck between the various interests at stake.

**4.19** Reviewing the regime every five years aligns with the cycle for reviewing Noise Action Plans. Setting the regime for five years until the end of summer 2019, would enable us to take account of noise mapping required by the European Environmental Noise Directive at the end of 2017 and any revision to Noise Action Plans required in 2018.

**4.20** We are aware that the work of the Airports Commission may also be a relevant factor when considering the length of the next regime. This is because we will want to ensure that we are able to take account of any recommendations relevant to night flying restrictions in the Airports Commission's interim report.

**Q6: Do you have any views on the optimum length of the next regime and how this should align with the work of the Airports Commission?**

## Dispensations from the night noise regime

**4.21** The Secretary of State has powers under Section 78 of the Civil Aviation Act 1982 to: i) specify circumstances in which movements may be disregarded from the night restrictions by the airport managers; and

ii) authorise specific flights to be disregarded, for example, VIP flights or cargo flights intended for emergency relief.

**4.22** The Government has published guidelines to clarify the rules on flights that may be given a dispensation and disregarded against movement and quota limits. The latest guidelines, a copy of which are at Annex E, were issued in 1999 by the Department for the Environment, Transport and the Regions.

**Table 8: Dispensation Figures for the Airports**

D = Delays, G = Government, E = Emergency

Year	Heathrow			Gatwick			Stansted		
	D	G	E	D	G	E	D	G	E
Winter 06/07	311	0	20	0	0	0	0	0	0
Summer 2007	170	15	9	0	2	0	1	8	0
Winter 07/08	178	6	44	0	0	12	0	0	0
Summer 2008	116	3	12	0	7	0	0	3	0
Winter 08/09	26	4	32	0	0	0	0	0	0
Summer 2009	45	3	7	0	2	0	0	0	0
Winter 09/10	302	3	21	0	0	0	0	0	0
Summer 2010	56	134	9	0	46	0	0	0	2
Winter 10/11	185	160	37	33	0	0	0	0	0
Summer 2011	75	1	25	0	0	0	0	0	0
Winter 11/12	71	0	73	0	0	0	0	0	0
Summer 2012	118	11	26	0	0	0	0	0	0

**4.23** In summer 2010 for Heathrow and Gatwick, Government authorised dispensations were primarily made up of dispensations given as a result of the Volcanic Ash crisis and in winter 2010/11 as a result of the severe winter weather in December 2010. These events could have been given dispensation by the airport manager under delays, but because of the magnitude of the delays the Government agreed to provide a blanket dispensation for these periods to allow the airport to



recover. In other years, the Government dispensations were mainly given for VIPs.

- 4.24 Government dispensations would also be required to facilitate the operation of any future trials which test the feasibility and acceptability of trade-offs involving additional flights in the night quota period. Such a use of dispensations would represent a departure from the existing guidelines. The Government believes this would be justified in light of the benefits that would arise from such trials, such as providing evidence on whether the anticipated outcomes are realised...
- 4.25 Emergencies would include medical reasons (where immediate danger to life), diversion and low visibility. At Heathrow the vast majority were a result of low visibility. In these circumstances there is a need to have greater separation time between aircraft for safety reasons, causing delay and moving flights into the night quota period.
- 4.26 Movements may be disregarded in the case of delays arising from severe air traffic problems or leading to serious airport congestion.
- 4.27 Heathrow has many more exemptions for delays because it operates at close to full capacity. In considering the future need for dispensations of this nature, we will want to take account of the results of the Operational Freedoms trial, which has the potential to bring benefits to passengers by providing a more punctual service; to the local community through less late-running flights (particularly unscheduled night flights); and to the environment, by reducing aircraft stacking times.

**Q7: Do you have any views on how dispensations have been used?**

**Q8: Do the dispensation guidelines still adequately reflect current operational issues?**

**Q9: Would you favour adding greater contingency to the seasonal movement limits (within any overall movement cap for the airport) in order to avoid large numbers of dispensations?**

## Carry-over rules

### Carry-over and overrun arrangements

- 4.28 Carry-over and overrun arrangements give the airport flexibility to defer or bring forward movements and quota allowance from one season to the next. Under the current regime the following carry-over and overrun provisions apply for movements and noise quota limits:

- If required, a shortfall in use of the movements limits and/or noise quota in one season of up to 10% may be carried over to the next season;
- Conversely, up to 10% of an overrun in movements and/or noise quota usage in one season (not being covered by carryover from the previous season) will be deducted from the corresponding allocation in the following season;
- An overrun of more than 10% will result in a deduction of 10% plus twice the amount of the excess over 10% from the corresponding allocation in the following season; and
- The absolute maximum overrun is 20% of the original limit in each case.

**4.29** Annex C shows the graphs of limits against actual usage for movements and noise quota points for the 3 airports over the past 6 years. These indicate that whilst Stansted and Gatwick always come well within their movement and noise quota limits, Heathrow will often rely on carry-over from the summer period for use in the winter period where actual movement and noise quota usage are above the limits. In the Stage 2 consultation we will be consulting on proposed movement and noise quota limits for each airport for the next regime.

**4.30** However we wish to raise here the principles of the carry-over and overrun arrangements. For example, if it were possible to correlate the limits more closely to the usage for each season (especially at Heathrow) then there may be no need for these arrangements. However, this would require a more precise estimate of the likely seasonal usage and would reduce airlines' flexibility to respond to seasonal demand.

**Q10: Do you consider there is still a need to retain the principles of carry-over and overrun?**

**Q11: If we retain the principles do you think we should change the percentage of movements and noise quota which can be carried over or overrun?**



## 5. Exploration of Options for the Next Night Noise Regime

- 5.1** In order to inform its proposals for the next night noise regime, the Government wishes to use this first stage consultation to gather evidence on options for avoiding, limiting or mitigating noise from aircraft at night. In doing so we will want to gather evidence of the costs and benefits of these options, taking account of the impacts highlighted in Chapter 6 and any trade-offs between them. Some options may prove to be more costly or difficult to implement, while others may not realistically be achievable until later in the period covered by the next regime, or even until a future regime. Nevertheless we want to gather evidence now to help us understand the relative feasibility of new or different options for tackling noise, particularly when assessing potential trade-offs which share benefits between airports and local communities.
- 5.2** The Balanced Approach Directive and SI 1742/2003 require certain information to be taken into account when considering operating restrictions at the noise designated airports (see Chapter 2 and Annex A). Amongst other things, we need to have an understanding of future developments at these airports, including the projected future traffic mix and estimated growth. This will set the context against which we will be assessing the need for changing the current operating restrictions.
- 5.3** In line with the ICAO balanced approach, before proposing new or amended operating restrictions we will therefore want to understand the expected contribution of noise reduction at source, through the introduction of quieter aircraft, any changes to operational procedures which will have an impact on noise, and the impact of land use planning in the next regime period.

### Latest DfT traffic forecasts

- 5.4** The assessment of options for the next regime will be informed by the DfT's latest published aviation forecasts. The DfT produces forecasts of activity at UK airports, and associated CO<sub>2</sub> emissions to inform long-term strategic aviation policy. The DfT's latest forecasts were published as a technical report – UK Aviation Forecasts - in 2011, which also includes details of the methods and assumptions used to produce the forecasts. We expect to publish updated forecasts shortly.

- 5.5** The forecasts represent the DfT's assessment of how UK aviation activity is likely to change into the future, given existing policy commitments. To reflect the inherent uncertainty involved in forecasting, the DfT publish a range of forecasts. While the primary objective is to produce UK level forecasts to inform long-term strategic policy, the DfT also publish forecasts of the level of activity at individual UK airports, including Heathrow, Gatwick and Stansted, to 2050.
- 5.6** Annex F presents the DfT's latest air passenger forecasts at Heathrow, Gatwick and Stansted to 2025, published in 2011. The forecasts relate to the total annual level of activity at each airport; the models used to produce the forecasts do not distinguish between flights at day and night. We are considering how to translate the forecasts of annual activity into forecasts of growth in activity at night.

## Reduction at source: current and expected fleet mix changes

- 5.7** Most reduction in noise occurs through improvements in aircraft technology (both engine and airframe). We therefore wish to understand the expected changes in airlines' fleet during the next night noise regime period.
- 5.8** Current fleet mix information can be found in Chapter 3. For more detailed information, see annex G.

### Expected fleet mix changes

- 5.9** Data on aircraft orders, placed several years in advance, and options for orders are available publicly. New aircraft now entering or due to enter fleets soon include the A380, the A350, the B787 ("Dreamliner") and the B777-300. These aircraft are quieter than those they are replacing.
- 5.10** There is little published information on future intentions of airlines to operate particular aircraft on particular routes. This is not generally known until the season's schedule is published some six months in advance.
- 5.11** Data on planned retirements of aircraft is also not publicly available. Airlines base their decisions to retire aircraft on various factors (i.e. age, availability of suitable replacements). Based on past industry practice it is reasonable to assume that airlines will operate aircraft until they are around 25 years old, although for airlines flying to and from the UK this is closer to 22 years. Average retirement age for aircraft operating at Stansted and Heathrow is lower still.
- 5.12** The Boeing 747-400 is the noisiest aircraft currently used for scheduled operations at any of the three airports, rated QC/2 on arrival and QC/4

on departure. It is the noise dominant aircraft in the night quota period at Heathrow. Many B747-400 aircraft are expected to retire in the next decade, based on an average 25 year life span. These will not be phased out completely however and may remain in the fleet for some airlines. A review of a QC/4 operational ban, which would affect the B747-400, is covered later in this Chapter.

**Q12: Do you have any comments on our analysis of fleet and operational trends?**

**Q13: In the absence of any new restrictions, what changes in operations and fleet mix do you expect in the period between now and 2020 (and beyond 2020 if possible)?**

## Land use planning

**5.13** The National Planning Policy Framework says that planning policies and decisions should aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development, and mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions. It also states that the planning system should prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution. Consistent with this framework, local planning authorities therefore have a responsibility to ensure that this element of the balanced approach is implemented in the context of their local plan policies, including any on noise. Although there is no specific policy on noise at night, the impacts of night noise should form part of the consideration.

**5.14** Where land around an airport may be required for future airport development, this should already be protected against incompatible development through safeguarding maps prepared and maintained by airports<sup>21</sup>.

**Q14: Please set out how you expect local land use planning policies to impact upon the numbers of people exposed to night noise in the next regime. Please give details of any housing developments planned to take place within the current night noise contours (see annex B).**

## Operational procedures

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<sup>21</sup> Further information on aerodrome safeguarding is at:  
<http://www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=576>.

**5.15** Operational procedures can make a significant difference to the way in which noise is distributed, including at night. We therefore need to understand whether it would be feasible by the next regime to change operational procedures at the noise designated airports which would have an impact upon night noise.

### **Increased angle of descent**

**5.16** Because of its noise benefits, the use of the continuous descent approach (CDA) is recommended as industry best practice and is also mandated by Government as a noise abatement procedure at the three designated airports under the AIP (see Chapter 3). Currently 3 degrees is the standard angle of descent, although in exceptional circumstances this can be increased. The Government is aware that there have been trials using a higher angle of descent than 3 degrees. Though a number of technical and practical issues would first need to be addressed before a steeper angle can be introduced, the noise benefits of steeper approaches would be potentially significant.

**Q15: Please provide any information on the feasibility of increasing the angle of descent into Heathrow, Gatwick or Stansted, particularly within the next seven years.**

### **Night-time easterly preference at Heathrow**

**5.17** A westerly preference is operated at Heathrow in the daytime. This means that during periods of light easterly winds (up to 5 knots), aircraft will often continue to land in a westerly direction making their final approach over London.

**5.18** The westerly preference was introduced in the 1960s to reduce numbers of aircraft taking off in an easterly direction over London, which is the most heavily populated side of the airport.

**5.19** During the night quota period, there are no scheduled departures and the noise is predominantly from arriving aircraft. Until the first scheduled departing aircraft after 0600, it is therefore possible to make more flexible use of runways and to provide respite for local residents affected by arriving aircraft on final approach. In 2001, the then current system of westerly preference was replaced, at night, by a weekly rotation between westerly and easterly arrival operations whenever weather conditions permit. The Civil Aviation Authority's Environmental Research and Consultancy Department (ERCD) has prepared an analysis of this system (see annex H).

**5.20** The new arrangements were expected to produce a more even split between westerly and easterly operations at night. In fact, the CAA's analysis shows that Heathrow's runways were used in a westerly direction approximately 72% of the time. CAA has concluded that removing the current runway alternation scheme for night-time arrivals

and replacing it with an easterly preference scheme (i.e. landing from the west when the wind is up to 5 knots from the west) would result in a re-distribution of noise exposure to the west of the airport under the easterly arrival flight paths. During the night quota period, when there are no departures, whilst more than 15,000 people are predicted to experience more noise, on average, under an easterly preference scheme, nearly 110,000 people are predicted to experience less noise overall as a result of respite from arrivals noise.

**Q16: What are your views on the analysis and conclusions in annex H? Would you favour changing the current pattern of alternation in favour of an easterly preference during the night quota period?**

**5.21** At Gatwick and Stansted there are fewer differences in population density to the east and west of the airport. There are also some scheduled departures during the night quota period. For these reasons, we do not consider that a night-time runway preference scheme at Gatwick or Stansted is likely to have any great noise benefits.

**Q17: Do you have any views on the costs and benefits of a night-time runway direction preference scheme at Gatwick or Stansted?**

**Displaced landing threshold**

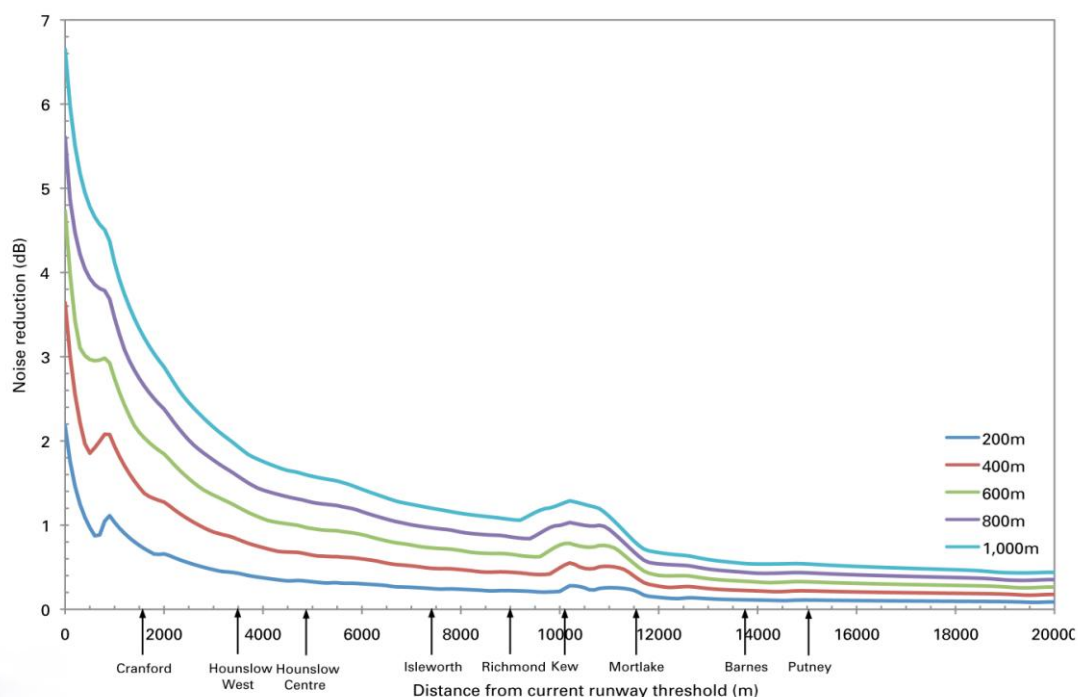
**5.22** Displaced landing thresholds, which move the point of touchdown further from the end of a runway, are generally used for safety or operational reasons (e.g. obstacle clearance or to help reduce runway occupancy times). However, they can also provide noise benefits, particularly for those living closest to the airport.

**5.23** At Gatwick, the landing thresholds at both ends of the runway are displaced, as are the thresholds for runway 04 at Stansted (arrivals from the south west) and runways 09L and 09R at Heathrow (arrivals from the west).

**5.24** Currently displaced landing thresholds are not used at Heathrow for westerly operations when aircraft land from the east over London (runways 27L and 27R), nor for Stansted when aircraft arrive from the north east (runway 22).



**Fig 3: predicted noise benefits of displacing landing thresholds for westerly arrivals (from the east) at Heathrow for a range of distances from 200m to 1,000m.**



Source: CAA

**5.25** Annex H provides further information assessing the impact of displaced landing thresholds for westerly arrivals at Heathrow.

**5.26** For operational and safety reasons it is not possible to use different landing thresholds at different times of the day, so any changes would affect both day and night noise. Because this could affect night noise, we need to understand whether it is feasible to extend the use of displaced thresholds where they are not currently used at Heathrow and at Stansted. What is clear, however, is that any changes to current thresholds would need to satisfy safety and operational requirements and may also require significant re-engineering work.

**Q18: Please provide any information about the feasibility of using displaced landing thresholds in the next seven years for arrivals from the east at Heathrow and from the north east at Stansted.**

### Other airspace changes

*LAMP (London Airspace Management Programme)<sup>22</sup>*

<sup>22</sup> <http://www.nats.co.uk/environment/energy/airspace/>.

**5.27** The airspace route network above the UK has developed piecemeal over the past 50 years. It is now considered necessary to introduce a fundamental reshaping of UK airspace so modern aircraft can perform efficiently and to ensure that airspace can be better managed. The initial programme of work is centred on London where traffic levels are highest, route interactions most complex, and the impact on flight efficiency is greatest. NATS is therefore leading work on the London Airspace Management Programme (LAMP) to develop a modernised airspace around London.

*Alternate joining points and P-RNAV*

**5.28** The route aircraft take to join the final approach for landing is determined by air traffic control. The point where aircraft join the final approach varies with the aim of achieving the correct spacing between arriving aircraft to ensure the smooth flow of traffic and maintain air safety. There may be scope to limit the joining points to specified areas during certain parts of the day (i.e. during the night quota period) to provide a system of alternation similar to that of runway alternation. This respite could, for example, be given to residents in areas to the north and south of the final approach paths.

**5.29** P-RNAV (performance based navigation) is being implemented in the London Terminal Control Area, in which air traffic below 24,500 feet travelling to/from London airports operates, as a means of benefiting from the increased operating capability of aircraft and from the environmental improvements which can arise from route flexibility. P-RNAV technology enables aircraft to follow pre-determined flight paths more accurately and consistently than current navigational systems allow. As a result, the lateral dispersion of aircraft either side of a flight path will be less and the concentration of aircraft beneath the flight path will be greater. This may result in higher noise levels on the ground in a smaller area beneath the flight paths.

**5.30** Gatwick Airport has recently consulted on making permanent a trial of P-RNAV departure routes. Heathrow Airport began a trial on 5 November whose aim is to give residents in specific areas relief from early morning aircraft noise by introducing zones which will be avoided by aircraft between 0430 and 0600. This Early Morning Noise Respite Trial<sup>23</sup> will explore whether the flights – particularly at the beginning of their approach into Heathrow - can be routed in a more defined way, offering more predictability for residents. The trial is due to end in March 2013.

**Q19: Please provide any information about airspace changes or other operational procedures which could mitigate the impact of night noise in the next regime period.**

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<sup>23</sup> <http://www.heathrowairport.com/noise/noise-in-your-area/early-morning-trial>.

## Movement limits

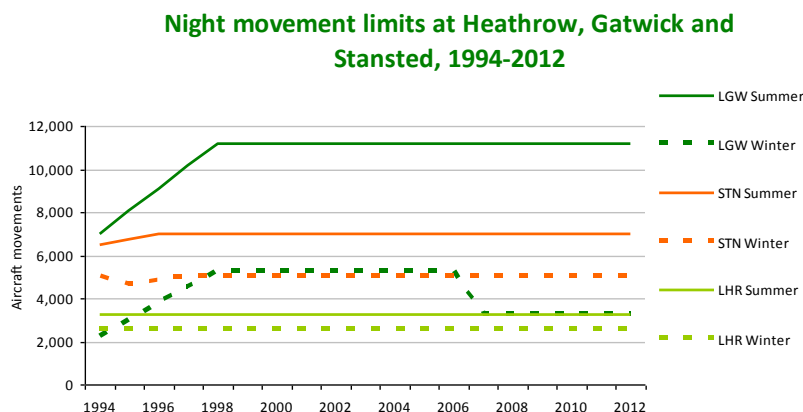
The table below shows the night movement quotas for the current regime (2006-2012). Annex C includes bar charts comparing actual and limit by season and airport.

**Table 9: Night movement quotas for current regime (2006-2012)**

	Heathrow		Gatwick		Stansted	
	Movement Limit	Movement Actual	Movement Limit	Movement Actual	Movement Limit	Movement Actual
Winter 2006/07	2,550	2,659	3,250	2,734	5,000	3,751
Winter 2007/08	2,550	2,710	3,250	2,929	5,000	3,612
Winter 2008/09	2,550	2,715	3,250	2,145	5,000	3,196
Winter 2009/10	2,550	2,686	3,250	2,199	5,000	3,426
Winter 2010/11	2,550	2,577	3,250	2,160	5,000	2,595
Winter 2011/12	2,550	2,583	3,250	1,411	5,000	2,298
Summer 2007	3,250	3,053	11,200	10,173	7,000	7,307
Summer 2008	3,250	2,922	11,200	10,618	7,000	6,498
Summer 2009	3,250	2,848	11,200	9,099	7,000	5,979
Summer 2010	3,250	3,033	11,200	9,875	7,000	6,081
Summer 2011	3,250	2,958	11,200	9,859	7,000	6,004
Summer 2012	3,250	2,853	11,200	9,837	7,000	5,837

- 5.31** The graph below shows that, as well as remaining constant over the course of the current regime, movement limits have not changed since 1996 with the exception of Gatwick.
- 5.32** At Heathrow airport, actual movements have remained consistent (below the limit in summer and above in winter) in this regime.
- 5.33** At Gatwick airport, actual movements have remained below the limit throughout this regime. The number of actual movements has fallen in the winter and, to a lesser extent, in summer.
- 5.34** With the exception of summer 2007, actual movements at Stansted airport remained below the limit and have fallen during this regime.

**Fig 4: Night movement limits at Heathrow, Gatwick and Stansted (1994-2012)**



**5.35** When setting out our proposals for the movement limits in the next regime, we will need to consider carefully the costs and benefits of changing movement limits, bearing in mind a number of factors, including future airport growth and health and disturbance impacts.

**Q20: Do you have any comments to make on the figures relating to movement limits and usage?**

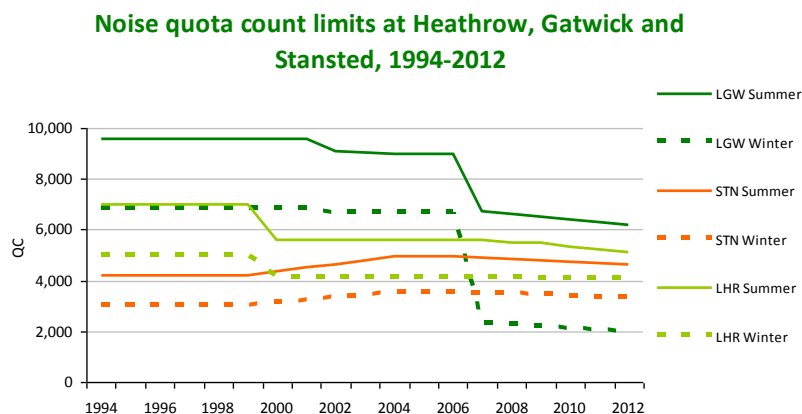
**Q21. In the absence of any new restrictions, how do you expect demand for movements in the night quota period over the course of the next regime to change?**

## Setting noise quotas for each year of the next regime

**5.36** Noise quotas cap the amount of noise energy which can be emitted at night over the course of the regime. This takes account of the noise emitted by aircraft type - the noisier the aircraft, the fewer that can be operated within the cap, thereby also providing a built-in incentive for airlines to use less noisy aircraft where practicable.

**5.37** As fig. 5 below shows, previous regimes have generally tightened the noise quota. At Heathrow and Gatwick, noise quota limits have seen downward step changes. These changes have been designed to reflect the possibility of introducing quieter aircraft.

**Fig 5: Noise quota count limit at Heathrow, Gatwick and Stansted (1994-2012)**



**5.38** Noise quotas have also shown a declining trend over the course of the current regime. As the graph above shows, this trend has been steady in the case of Gatwick and Stansted, and stepped in the case of Heathrow.

**Table 10: Heathrow noise quotas against usage for the current regime.**

<b>HEATHROW</b>			
<b>Season</b>	<b>Noise Quota (points)</b>	<b>Noise quota used</b>	<b>% of noise quota used</b>
<b>Winter 2006/07</b>	4,140	4,266	103.0%
<b>Summer 2007</b>	5,610	5,236	93.3%
<b>Winter 2007/08</b>	4,140	4,100	99.0%
<b>Summer 2008</b>	5,460	4,634	84.9%
<b>Winter 2008/09</b>	4,110	3,948	96.0%
<b>Summer 2009</b>	5,460	4,429	81.1%
<b>Winter 2009/10</b>	4,110	3,863	94.0%
<b>Summer 2010</b>	5,340	4,505	84.4%
<b>Winter 2010/11</b>	4,110	3,735	90.9%
<b>Summer 2011</b>	5,220	4,491	86.0%
<b>Winter 2011/12</b>	4,080	3,377	82.8%
<b>Summer 2012</b>	5,100	3,946	77.4%

**Table 11: Gatwick noise quotas against usage for the current regime**

<b>GATWICK</b>			
<b>Season</b>	<b>Noise Quota (points)</b>	<b>Noise quota used</b>	<b>% of noise quota used</b>
Winter 2006/07	2,300	1,355	58.9%
Summer 2007	6,700	5,329	79.5%
Winter 2007/08	2,240	1,542	68.9%
Summer 2008	6,600	5,660	85.8%
Winter 2008/09	2,180	1,169	53.6%
Summer 2009	6,500	4,787	73.6%
Winter 2009/10	2,120	1,237	58.3%
Summer 2010	6,400	4,824	75.4%
Winter 2010/11	2,060	1,281	62.2%
Summer 2011	6,300	4,999	79.3%
Winter 2011/12	2,000	920	46.0%
Summer 2012	6,200	4,994	80.5%

**Table 12: Stansted noise quotas against usage for the current regime**

<b>STANSTED</b>			
<b>Season</b>	<b>Noise Quota (points)</b>	<b>Noise quota used</b>	<b>% of noise quota used</b>
Winter 2006/07	3,510	2,514	71.6%
Summer 2007	4,900	4,400	89.8%
Winter 2007/08	3,470	2,428	70.0%
Summer 2008	4,850	3,931	81.1%
Winter 2008/09	3,430	2,137	62.3%
Summer 2009	4,800	3,538	73.7%
Winter 2009/10	3,390	2,343	69.1%
Summer 2010	4,750	3,454	72.7%
Winter 2010/11	3,350	1,766	52.7%

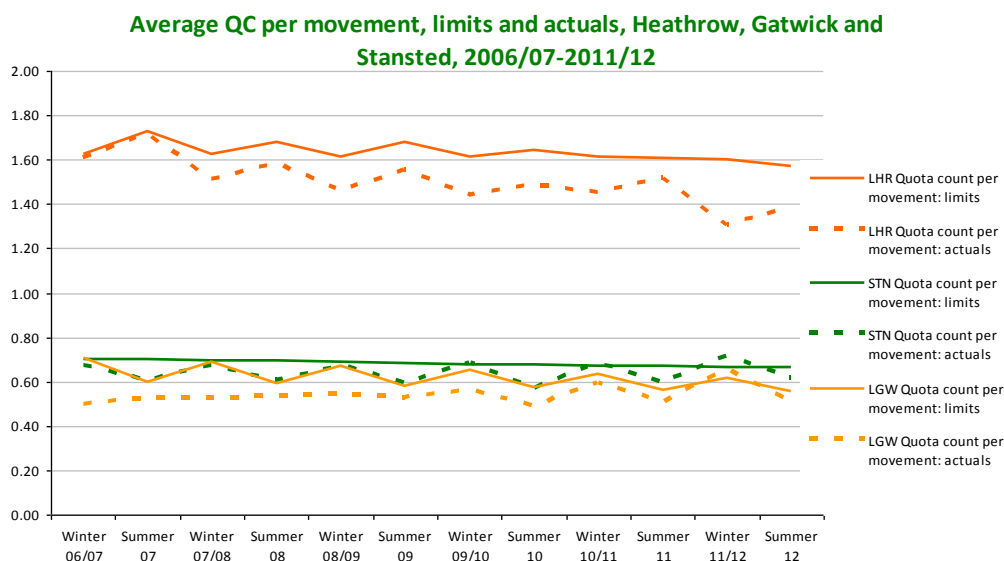
Summer 2011	4,700	3,552	75.6%
Winter 2011/12	3,310	1,632	49.3%
Summer 2012	4,650	3,604	77.5%

**5.39** Set against a constant number of overall movements, the effect of reducing the noise quota is that the average QC per aircraft movement will reduce over time, through technological improvements, thereby reducing the total amount of aircraft noise emitted during the night quota period.

**5.40** Reducing the noise quota was therefore the main way of achieving the current environmental noise objective at the three airports “progressively to encourage the use of quieter aircraft” (see Chapter 3 of the document).

**5.41** Fig. 6 below shows the average QC per aircraft permitted under the current regime assuming full use of movements, and the average actual QC per movement.

**Fig. 6: Average QC per movement, limits and actuals, Heathrow, Gatwick and Stansted (2006/7-2011/12)**



**5.42** The trends in this graph show that the objective has largely been met, though both Gatwick and Stansted’s most recent winter seasons showed a slight increase in the average QC based on actual aircraft movements (due mainly to a reduction in the proportion of quieter aircraft types at each airport). A reduction in the average QC per aircraft has also played a large part in meeting each airport’s specific noise abatement objective to reduce the size of the 6.5 hour 48dBA Leq noise contour.

**5.43** The scope to reduce the average QC per movement still further will depend to a large extent on the availability of newer, quieter aircraft to

replace noisier types. The best example of this is the replacement of B747-400 aircraft with the Airbus A380, the latter being QC/0.5 on arrival and QC/2 on departure, compared to the former's QC/2 and QC/4 respectively. Since the B747-400 is currently the predominant aircraft in use in the night quota period at Heathrow, its replacement with the A380 would considerably reduce the average QC per movement. As discussed at paragraph 5.9, these kind of fleet changes are already underway and we expect them to continue throughout the next regime.

**5.44** As well as fleet changes, we will also want to understand any planned or expected changes in the nature of operations at the three airports in the next regime, since this will determine the types of aircraft in use. For example, a shift from short haul to long haul services or vice versa. As set out in the Written Ministerial Statement of 26 March 2012 (see Chapter 2), we will also want to take into account the freeze in quota limits during the extension period when setting the next regime.

**5.45** The table above shows that actual use of the noise quotas has varied considerably across the three airports. This has ranged from over 90% to under 50%. In general, there is a reasonably close correlation between changes in the usage of movement limits and usage of the noise quota, so a large under-use of the noise quota is explained by the fact that there were considerably fewer movements than permitted. However, there are some discrepancies (e.g. Gatwick winter 2006-07). This is illustrated in the tables in Annex B which provide data comparing movement and noise quota limits.

**Q22: Do you have any comments to make on the figures relating to noise quota limits and usage?**

**5.46** We will be consulting on specific noise quota limits in the stage 2 consultation. This will be closely linked to the number of movement limits proposed. Based on the usage in the current regime, our initial assessment is that the greatest scope for reducing the noise quota at minimum cost to airlines is where the percentage of noise quota used is already much lower than the percentage of movement limits used and where this trend has been over the longer term, irrespective of temporary economic circumstances. Largely, there has been a consistent pattern in recent years of lower noise quota usage than movement limits. The exception is Stansted's most recent winter seasons and winter 2011/12 at Gatwick.

**Q23: Do you agree with our initial assessment of the scope for reducing the noise quota in the next regime without imposing additional costs?**

**Q24: Do you have any views on the relative disturbance caused by the noise of an individual aircraft movement against the overall number of movements in the night quota period?**



## Ban on scheduling or operating the noisiest aircraft

- 5.47** The prohibition of certain classifications of aircraft according to noise performance is one means of achieving noise objectives. As well as contributing to the overall improvement in the noise climate around an airport, a ban on the noisiest types of aircraft will also mean that local residents experience fewer individual noise events above a certain level of decibels.
- 5.48** The night noise regime has historically included a prohibition of the noisiest aircraft types. The restrictions have generally taken effect at a time when the number of such aircraft has diminished to a point where the economic cost of such a ban is small and where quieter alternative aircraft are available. When the QC system was introduced in 1993, the noisiest aircraft classified QC/16 on arrival or departure could not be scheduled to land or take off between 2300 and 0700. Those in the next noisiest category, QC/8, could not be scheduled to take off or land between 2300 and 0600. In 1999 the restrictions on aircraft classified as QC/8 were extended to match those for QC/16.
- 5.49** For the current regime, a scheduling ban of QC/4 aircraft during the night quota period (2330 to 0600) was introduced for the first time. A scheduling ban is less strict than an operating ban as it means that QC/4 aircraft can still operate during this period, but only where they are scheduled to operate before 2330 and have been delayed.
- 5.50** The current structure of the night noise restrictions which illustrates the effect of the current bans is shown at the beginning of Chapter 4.

### QC/8 and QC/16 aircraft

- 5.51** Any aircraft which has a quota count of 8 or 16 may not take off in the night period, except in the period 2300-2330 in circumstances where;
- it was scheduled to take off prior to 2300;
  - the take-off was delayed for reasons beyond the control of the aircraft operator; and
  - the airport authority has not given notice to the aircraft operator precluding take-off.
- 5.52** During 2010 there were three QC/8 departures (all cargo flights) at Heathrow and no QC/8 movements at Gatwick or Stansted. During 2011 there were four QC/8 departures (one cargo and three passenger flights) at Heathrow, one QC/8 departure (cargo) at Stansted, and no QC/8 movements at Gatwick. During 2012, there were two QC/8 departures (one cargo and one passenger flight) at Heathrow, one QC/8 departure at Stansted (passenger), and no QC/8 movements at

Gatwick. There were no QC/16 movements at any of the three airports between 2010 and 2012.<sup>24</sup>

- 5.53** Given the small number of aircraft of this type still using the three airports, it would appear potentially feasible to extend the scope of the current ban to encompass a complete operational ban in the night period. This would mean that aircraft classified as QC/8 or QC/16 could not operate at all between 2300 and 0700 unless a specific exemption was given (see Chapter 4) and would give residents a guarantee that they will not experience noise in the future from these noisier aircraft types.
- 5.54** Although unscheduled arrivals of QC/8 or QC/16 aircraft in the night are not currently prohibited, an aircraft noisy enough on arrival such that it could only meet QC/8 or QC/16 would in practice usually mean that it was an older Chapter 2 aircraft. Such aircraft were phased out in 2002 and it is now very unlikely that there are any aircraft in operation that do not meet at least the QC/4 standard on arrival. Nevertheless, for clarity and certainty, we would consider it helpful to make clear that any operational ban of QC/8 or QC/16 aircraft in the night period should apply to both arrivals and departures.

**Q25: What are your views on the feasibility of a QC/8 and QC/16 operational ban in the night period? Please set out the likely implications of such a ban and, where possible, the associated costs and benefits.**

#### **QC/4 operational ban during night quota period**

- 5.55** The consultation for the current regime considered the proposal to ban the operating of QC/4 aircraft in the current night quota period.
- 5.56** The Secretary of State decided in 2006 on a scheduling ban rather than a full operational ban with the assurance that this would be reviewed at the end of the regime in 2012. We wish to look at this now.

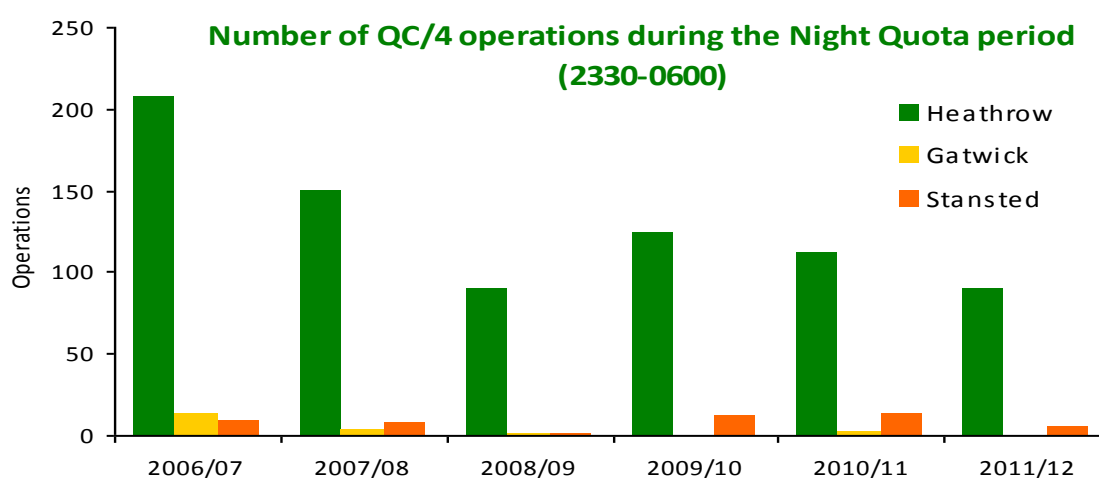
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<sup>24</sup> For operations that take place during the night quota period, NTK database entries are linked to actual certificated noise levels by the airport operator to ensure that individual aircraft are classified correctly. Arrival and departure times in the NTK system are also checked against ATC runway logs to confirm that an operation did occur during the night quota period and not, for example, just before 2330 or just after 0600. The QC classifications for operations that take place during the night-time shoulder periods on the other hand are not generally subject to the same scrutiny. Therefore, whilst every effort has been made to ensure the operations shown here have been classified correctly, some uncertainty still remains.

**Table 13: Number of QC/4 operations at each of the three designated airports during the night quota period.**

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Heathrow	207	150	90	123	112	89
Gatwick	14	4	1	0	2	0
Stansted	8	7	1	12	14	5

**Fig. 7: Number of QC/4 operations during the Night Quota period (2330-0600)**



**5.57** At Stansted and Gatwick, QC/4 operations account for less than 0.2% of night time operations for the combined Summer 2011 and Winter 2011/12 seasons. At Heathrow, the proportion of QC/4 operations was higher at 1.4%, and comprised entirely of late-running B747-400 departures.

**5.58** The graph and data above show that there is a downward trend at Heathrow. While there doesn't appear to be such a trend at the other two airports, there are relatively few of these aircraft in operation.

**Q26: How many QC/4 aircraft do you expect to be in operation over the next seven years during the night quota period? Is the downward trend at Heathrow expected to continue?**

**Q27: What are your views on the feasibility of a QC/4 operational ban in the night quota period at any or all of the three airports? Please set out the likely implications of such a ban and, where possible, the associated costs and benefits.**

**Q28: Are there more cost-effective alternative measures (such as penalties) to reduce the number of unscheduled QC/4 operations during the night quota period?**

## Ban on operation of QC/4 aircraft in shoulder period

**5.59** In consulting on the current regime, the then Secretary of State considered whether QC/4 aircraft should still be allowed to operate during the shoulder periods (2300 to 2330 and 0600 to 0700). In announcing the current regime in 2006, it was decided that the environmental benefits of an operating ban were insufficient to justify it, when balanced against the effects of prohibiting movements in cases of delay. We wish to raise this again now.

**Table 14: Noise and Track Keeping monitoring systems (NTK) system QC/4 operations (2011)<sup>25</sup>:**

	2300-2330	0600-0700
Heathrow	261	3 <sup>26</sup>
Gatwick	1	0
Stansted	5	12

**5.60** At Heathrow, the 261 QC/4 departures between 2300-2330 were all B747-400s. Given these numbers and the continuing pressure on Heathrow's operations at the end of the day, our initial view is that the economic costs are likely to remain high in comparison to the benefits and would make this option difficult at Heathrow.

**5.61** At Stansted, four of the five QC/4 departures between 2300-2330 have since been replaced with QC/2 aircraft. Also, eight of the twelve QC/4 departures between 0600-0700 have since been replaced with QC/2 aircraft.

**Q29: What are your views on the feasibility of an operational ban of QC/4 aircraft at any or all of the three airports during the shoulder periods? Please set out the likely implications of such a ban and, where possible, the associated costs and benefits.**

**5.62** We would also note here that any decisions on the operation of QC/4 aircraft will influence the setting of any new night departure noise limits at the three airports, since the current limits were set at a level which allowed the normal operation of QC/4 aircraft during the night.

### QC/2 aircraft

**5.63** In setting the current night noise regime, in 2006 the Government decided not to introduce new restrictions on QC/2 aircraft, as some stakeholders had suggested. There are still large numbers of these aircraft in operation. During the night quota periods for the most recent

<sup>25</sup> See previous footnote.

<sup>26</sup> Based on assumption that one of the three (CX Freighter) operations is a QC/4.

summer and winter seasons, almost 50% of movements at Heathrow were QC/2, approximately 5% of movements at Gatwick were QC/2 and approximately 7% of movements at Stansted were QC/2. Given these statistics, we would not be minded to pursue this option as the economic costs would remain considerable.

## Guaranteed respite period

- 5.64** The restrictions on night movements during the night quota period (2330-0600) set by the Government do not specify when the movements may take place during this period. However, Heathrow Airport has for many years had in place a voluntary curfew between 2330 and 0430. This derives from a voluntary agreement between the airport and the airlines. During this time, no aircraft may be scheduled to arrive or take off, though unscheduled movements do take place, particularly where aircraft depart late. On average there are around two such movements per night, most of which take place before 0100.
- 5.65** Gatwick and Stansted Airports have no such voluntary curfew and scheduled movements take place throughout the night. At Gatwick, average movements reduce to less than three per hour between 0200 and 0500. Similarly average movements are less than three per hour between 0200 and 0600 at Stansted.
- 5.66** The table below illustrates the pattern of movements during the night quota period at the three airports.

**Table 15: Breakdown by hour of movements during the Night Quota Period**

Average daily number of movements during Summer 2011 and Winter 2011/12 seasons									
A = arrivals and D = departures									
	Heathrow			Gatwick			Stansted		
Period	A	D	A +D	A	D	A +D	A	D	A +D
<b>2330-0000</b>	0.3	0.6	0.9	4.8	0.6	5.5	5.8	1.1	6.9
<b>0000-0100</b>	0.2	0.4	0.6	7.4	0.7	8.1	4.7	2.4	7.1
<b>0100-0200</b>	0.1	0.1	0.2	5.4	0.3	5.7	2.4	1.7	4.1
<b>0200-0300</b>	0.0	0.1	0.1	2.4	0.2	2.5	0.9	0.3	1.2
<b>0300-0400</b>	0.1	0.0	0.1	1.7	0.1	1.8	2.3	0.2	2.5
<b>0400-0500</b>	4.5	0.0	4.5	1.6	0.1	1.7	0.9	0.3	1.2
<b>0500-0600</b>	9.2	0.1	9.3	3.6	2.4	6.1	0.5	0.7	1.2
<b>Total</b>	14.4	1.3	15.7	26.9	4.5	31.4	17.5	6.7	24.2

Source: Airport Noise and Track Keeping system. Figures include exempt flights.

- 5.67** We are aware of calls from residents around the airports for a guaranteed respite period during the night. Such respite periods exist at certain other international airports including Frankfurt<sup>27</sup>, Zurich<sup>28</sup> and Sydney<sup>29</sup>, where curfews have been legally mandated, and at London City where the restriction is a planning condition<sup>30</sup>.
- 5.68** In terms of sleep disturbance, we are not aware of any conclusive evidence on the benefits of differing durations or timings of respite at night. See sections 3 and 4 of CAA's report on assessment of current literature on aviation night noise health impacts for more information on this<sup>31</sup>.
- 5.69** Estimation of the overall benefit provided by a respite period would need to consider any increased disturbance either side of the period if rescheduling increases the concentration of flights at these times.
- 5.70** We are also aware of economic arguments for retaining the ability to operate services throughout the night. These include the timing of express freight services to fit within a complex international distribution network, the cost of delaying late running scheduled services until the end of a curfew period, and the ability of airlines to operate multiple short haul rotations each day.
- 5.71** The feasibility and cost of a guaranteed respite period would therefore depend on the type of services operating, and whether or not they could be rescheduled outside of this period.
- 5.72** Since each airport has the infrastructure capacity to operate more services during the night quota period, it would be possible in theory to concentrate existing (and even additional) night quota movements into a shorter period.

**Q30: What is the rationale for operating services at precise times during the night quota period (as they do now)?**

**Q31: What is the scope for introducing a respite period at Gatwick or Stansted? Please set out the associated costs and benefits.**

**Q32: What is the feasibility of making Heathrow's voluntary curfew mandatory?**

**Q33: If you favour a guaranteed respite period, what would be the minimum period which you would consider to be worthwhile?**

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<sup>27</sup> A curfew from 0000-0500 was put in place following a court judgement in 2012.

<sup>28</sup> The curfew applies 2330-0600.

<sup>29</sup> The curfew applies 2300-0600 and longer at weekends. Certain quieter aircraft are exempt.

<sup>30</sup> No flights are permitted to land or take off before 0630 or after 2230. There is also a 24 hour curfew at the weekend starting at 12.30 on Saturdays.

<sup>31</sup> <http://www.caa.co.uk/ercdreport1208>.

**Q34: What are your views on the principle of trading off a complete restriction on movements in one part of the current night quota period against an increase in flights in another part of the night quota period?**

#### **Heathrow specific considerations**

- 5.73** At Heathrow, where the airport is effectively operating at full capacity outside the night quota period, any change to the existing curfew period would be expected to have a direct impact on the resilience of operations before 2330 or after 0600.
- 5.74** The second phase of the operational freedoms trial at Heathrow started on 1 July 2012 and runs until 31st March 2013. The trial includes two elements which could have a bearing on night movements. One of the measures being trialled allows an increase in 'out of alternation' arrivals during the daytime with the expected benefits including reductions in stack-holding times leading to a reduction in emissions, and possible improvements in punctuality to help Heathrow recover more quickly during periods of delay and disruption. Improving recovery from delay and disruption during the day may result in a reduction in the need for unscheduled night movements. Another measure being trialled allows for aircraft on certain departure routes to be re-directed earlier than usual, reducing the time between successive departures with expected benefits including reductions in runway holding delay and which has the potential consequently to reduce unscheduled night movements.
- 5.75** The trial ends in March 2013 and we will want to have regard to the results in the development of our proposals for the next night regime period. The Government will also be undertaking a separate consultation on the results of the operational freedoms trial before taking a decision on whether the measures should be adopted more permanently at the airport. The Chancellor's Autumn Statement on 5 December announced that the Government would bring forward the timetable for public consultation and final decisions on making these measures permanent, subject to successful completion of the trial.
- 5.76** Implementing operational freedoms during the day is expected to reduce unscheduled night movements, but is also likely to reduce daytime respite, i.e. the scheduled periods without substantial overflight during the day time. Although the trial is still ongoing, in this first stage consultation we would nevertheless be interested in views on the principle of trade-offs between night flights and daytime respite.

**Q35: What are your views on the possibility of fewer unscheduled night flights arising from an increase in daytime arrivals 'out of alternation' or vice versa?**

**Q36: What value do you place on day time respite compared with relief from noise in the night quota period?**



## Making better use of economic incentives

### Landing charges

- 5.77** The Department has asked the CAA to investigate the use of differential landing fees in order to ensure that airports and airlines are better incentivised to use aircraft that are best in class, and to ensure that the cost of noise disturbance, particularly at night, is sufficiently reflected in these fees. Initial findings from this study indicate that the monetary incentives designed to encourage airlines to use the quietest aircraft are not strong. Charging levels appear to be influenced by airlines following improvements in aircraft technology rather than being used to drive the improvements.
- 5.78** A review of the night element of the charging structures at the London airports over the last decade has been carried out. It has identified that at Stansted there is no differentiation between charges for daytime and night-time arrivals. At Gatwick there is a peak rate charge which appears to be intended to apply during the summer<sup>32</sup> at certain times during the daytime period only.
- 5.79** At Heathrow, since 2007, the charges for arrivals between 0100 and 0429 local time during the summer have been 2.5 times the normal charges. Prior to this, there were peak rate charges for certain daytime hours during the summer and at night between 0000 and 0559 local time throughout the year. These were about 2.4 times the normal 'off-peak' charges. Between 0100 and 0429 local time an additional charge of 1.5 times the peak rate applied. There was also a set of charges which applied to a 'shoulder period' between 0600 and 0759 local time during the summer.
- 5.80** At airports whose charges are capped by the CAA under the economic regulation regime, it is acknowledged that there is limited scope to raise the noise related element of landing charges because of the overall cap on charges. There may, however, be scope for changing the balance between daytime and night time related charges at airports, for instance to incentivise the use of quieter aircraft during the night period, whilst not exceeding an airport's cap. All three airports designated for noise purposes are currently also designated for economic regulation purposes.

**Q37: Do you have any views on the extent to which landing fees can be used to incentivise the use of quieter aircraft during the night period?**

### Departure noise limits and fines

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<sup>32</sup> Airports use the period from 1 April to 31 October to define their summer charging period. This does not coincide with the clock change and hence with the summer/winter flying seasons where the change usually occurs a few days prior to 31 October and prior to 1 April.

**5.81** At present there are different noise limits applicable to the night quota period, shoulder period and daytime period. These are for departure noise and are set at 87dBA (night quota), 89dBA (shoulder period), and 94dBA (daytime), as measured at noise monitors based 6.5 km from the start of the roll point on the runway. As noted in the draft Aviation Policy Framework, the Department's Aircraft Noise Management Advisory Committee (ANMAC) has begun to look at the long-standing noise abatement procedures at the noise designated airports. This includes a review of the departure noise limits and the incentives which they create. This review is expected to last at least a year and any proposals to change the limits would be subject to a separate consultation. It is recognised that the scope for lowering these limits at night depends on whether a complete ban on take-offs by aircraft classified as QC/4 were to be implemented in the night quota period. Therefore departure noise limits need to be compatible with future decisions on such operating bans.

### **Compensation and insulation schemes**

**5.82** In confirming the current night noise regime in 2006, the Secretary of State decided that the following criteria should define a noise insulation scheme in respect of night noise:

- the policy would be implemented on a voluntary basis initially. If necessary, the Government would give statutory force to these acoustic insulation arrangements under Sections 79-80 of the 1982 Civil Aviation Act; and
- the boundary of the scheme was based on a noise footprint of the noisiest aircraft regularly operating at each airport as follows:
  - – at Heathrow, the arrival footprint of the 95th percentile of the noisiest variant of the Boeing 747-400 90dBA SEL footprint;
  - – at Gatwick, the envelope of the 90dBA SEL footprints for Airbus A300 departures and Boeing 747-400 arrivals; and
  - – at Stansted, the 90dBA SEL departure footprint for the MD-11 departures. The arrival footprint for Stansted was not included as it was already taken into account in the airport's existing noise insulation scheme.

**5.83** The then Secretary of State also decided that the following criteria should apply to the administration of the scheme:

- the scheme would apply to bedrooms, or bed sitting rooms (which are used as bedrooms on most days of the year) of residential properties only;
- properties which have benefited from a previous noise insulation scheme administered by the airport within 10 years of the launch of the scheme would not be eligible; and
- the Secretary of State expected a scheme to be in place so that eligible residents can apply for noise insulation early in 2007.

**Q38: Please provide comments and evidence on the extent to which the noise insulation scheme criteria have been met. Where possible please include figures for numbers of properties insulated under the scheme and numbers which are still potentially eligible.**

**5.84** We are aware that some of the aircraft types mentioned in the scheme's criteria are now much less frequently used.

**Q39. Do you have any suggestions for changes to current compensation schemes or for new compensation schemes that might be introduced to help offset the impact of night noise on those exposed to it? For new schemes, please explain the parameters that you would suggest for the scheme and the rationale for choosing those parameters.**

**5.85** The consultation on the draft Aviation Policy Framework asked a question about airports' compensation schemes and any new proposals for night noise insulation schemes will take account of the final Aviation Policy Framework.

**Q40. Do you have any proposals for new or improved economic incentives that could be deployed to incentivise the use of quieter aircraft during the night period?**



# 6. Night Flights Evidence Review

## Purpose of review

- 6.1** The purpose of this Chapter is to review the types of costs and benefits associated with night flights. We are also using this consultation as an opportunity to share our thinking and invite views on how we would expect to appraise policy options for the next night flights regime. This consultation does not include any appraisal of policy options for the next regime. We will publish a full assessment of alternative policy options as part of the second stage consultation.
- 6.2** The structure of this Chapter is as follows:
- What are the impacts of night flights?
  - Assessing the impacts of changes to the night flights regime

## What are the impacts of night flights?

- 6.3** Night flights impact society in a variety of ways, yielding a mixture of costs and benefits. The main impacts of night flights are on:
- Air transport users
  - Airline and airport profits
  - Noise (and health effects resulting from noise)
  - Air quality (resulting from aircraft emissions)
  - Climate Change (resulting from aircraft emissions)
  - Public accounts (including air passenger duty receipts)
  - Wider economy (such as on tourism, trade and productivity)

### **Air transport users**

- 6.4** Night flights benefit air transport users (i.e. air passengers and air freight service users) in various ways, including by<sup>33</sup>:
- Enhancing air transport user choice (or flight frequency)
  - Reducing air transport user costs
  - Reducing air passenger travel time

#### *User choice*

- 6.5** There are different ways in which night flights affect air transport users' choice. One is by increasing the range of flight departure/arrival times available for a given route, including the option to use the night for travel time and free up the day for other activities. Another is by potentially increasing the range of destinations served.

#### *User costs*

- 6.6** It is possible that overall air transport users' costs are lower due to night flights. In a competitive market, like the market for air travel, reducing restrictions on the supply of a particular good or service tends to reduce the market price for it. Since airlines' ability to operate night flights reduces the restrictions on the overall supply of flights, this is likely to mean that the current price of air travel (and air freight services) is lower than it would be in the absence of night flights.

#### *Travel time*

- 6.7** In some instances night flights can reduce travel times. For example, by enabling a wider range of destinations to be served direct from the UK, night flights could reduce travel times where passengers would otherwise only be able to reach their destination by flying indirectly, perhaps by flying via an overseas hub airport. Since people negatively value time spent travelling, reduced journey times benefit air passengers.
- 6.8** While users of air freight services would not benefit from any reduction in their own travel times as a result of night flights, they may benefit from any reductions in air freight service journey times. This is most likely in cases where the arrival of a particular freight service is time of day-critical.

### **Airline and airport profits**

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<sup>33</sup> These are benefits which occur at the collective user level and not necessarily in each individual user's case.

**6.9** Night flights provide an additional source of potential profits to airlines<sup>34</sup> and airports<sup>35</sup>.

## Noise

**6.10** Flights produce aircraft noise, which has an especially pronounced impact during the night. The negative impacts associated with exposure to night noise are:

- Annoyance or other ‘amenity’ effects, including sleep disturbance
- Health effects
- Productivity effects

### *Annoyance effects of night noise*

**6.11** Noise can result in acute, short-term and chronic annoyance for the people exposed to it. Impairment of leisure activities and general disturbance can contribute to annoyance. At night time the most obvious cause for noise-related annoyance is sleep disturbance, which can result in awakenings, difficulties falling asleep or a reduction in sleep quality.

### *Health effects of night noise*

**6.12** There is evidence to suggest that long term exposure to noise at night can result in adverse health effects, such as hypertension, and cardiovascular disease including myocardial infarction<sup>36</sup>. The exact causal pathways by which these occur are not fully understood but it is possible that there are associations between stress responses and sleep disturbance.

### *Productivity effects of night noise*

**6.13** Next-day effects of sleep disturbance can include fatigue and sleepiness, which may impact on productivity. This is a secondary effect of sleep disturbance and the next-day impacts of aircraft-specific night noise on sleepiness and cognitive performance have not been widely reported.

## Air quality

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<sup>34</sup> In this report we define airlines to include airfreight carriers.

<sup>35</sup> While night flights may not be profitable individually, we wouldn’t expect an airline to operate a night flight if it didn’t have a positive impact on its profits across its network as a whole. Similarly, we wouldn’t expect an airport to open for night flights if it didn’t expect it to have a positive impact on its profits.

<sup>36</sup> See ERCD (2012b) Report 1209, "Proposed methodology for estimating the cost of sleep disturbance from aircraft noise" for a summary of the available evidence.

**6.14** Aircraft fuel emissions from all flights, including night flights, cause a negative impact on air quality. This in turn can have negative impacts on human health, as well as on the natural and man-made environment. The key pollutants emitted by aircraft and affecting local air quality are particulate matter (PM<sub>10</sub>) and oxides of nitrogen (NO<sub>x</sub>). In general terms, the atmosphere is more stable at night which means that pollutants are dispersed less easily and thus air pollution emission at night can have a greater impact on local air quality.

## **Climate change**

**6.15** The aircraft emissions from all flights, including night flights, contribute to climate change. Aviation's most significant contribution to climate change in the longer term is through emissions of carbon dioxide (CO<sub>2</sub>). However, the total climate change impacts of aviation are greater than those from its CO<sub>2</sub> emissions alone.

**6.16** The impact on climate change of non-CO<sub>2</sub> greenhouse gas emissions from aviation is complex and under ongoing review. Key emissions are oxides of nitrogen, water vapour, oxides of sulphur, soot and, indirectly, formation of condensation trails and cirrus cloudiness. In conjunction, these emissions can have both cooling and warming effects on the climate, with a likely overall warming impact on the atmosphere.

## **Public accounts**

**6.17** Night flights have direct and indirect impacts on the public accounts.

### *Direct public accounts impact*

**6.18** The direct impact is in terms of the impact on tax receipts from taxes directly levied on aviation activity, principally Air Passenger Duty (APD). APD is levied on airlines for each passenger departing the UK (excluding passengers who transfer at UK hubs and who do not start or end their journey in the UK<sup>37</sup>). The rate of APD depends on the distance of the passengers' final destination from London and the class of travel.<sup>38</sup> While the APD receipts from night flights represent a small proportion of overall APD receipts, they are nonetheless significant.<sup>39</sup>

### *Indirect public accounts impacts*

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<sup>37</sup> For example, passengers travelling from New York to Heathrow and transferring to a flight to Singapore are exempt from APD.

<sup>38</sup> There are eight APD bands in total; four destination bands and two class bands.

<sup>39</sup> According to HMRC, APD generated a total of £2.5bn in tax revenues in 2011. Oxford Economics (2011, p. 14) presents an estimate (on page 14) suggesting that night flights at Heathrow Airport contributed £38m to this total. It is important to note that the latter figure is an estimate when comparing it to total APD receipts.



**6.19** Night flights have a number of indirect impacts on the public accounts. For example, if night flights result in UK residents diverting expenditure from goods and services across the rest of the economy, this can have a negative impact on indirect taxation receipts. If night flights lead to additional jobs, this could boost tax receipts from employee-related taxes such as income tax and National Insurance contributions (NICs). Night flights could also boost economic activity in other sectors, such as the airport retail sector, with knock on effects on both business- and employee-related tax receipts from the sector.

### **Wider economic impacts**

**6.20** Night flights have wider impacts on the UK economy. The nature of these impacts is not clear-cut and is a source of debate<sup>40</sup>. For example, Oxford Economics' (2011) identify a range of ways in which night flights benefit the wider economy including: opening up markets and fostering international trade; encouraging investment in the UK by domestic and foreign investors; improving business efficiency and raising productivity; and spurring growth in the tourism economy<sup>41</sup>. Night flights also affect employment levels, both directly, through changes in employment by airlines, airports and other companies operating at the airport, and indirectly, via the impact on companies in the supply chain (e.g. aircraft parts/equipment by airlines) and the wider economy.

## **Assessing the impacts of options for the next night flights regime**

**6.21** The Department will produce an assessment of the impacts associated with each option identified following this first stage consultation. This impact assessment will be published alongside proposals for the next regime as part of the second stage consultation. While it is not yet possible to perform the appraisal, we have begun to consider how we might assess the impacts of any changes to the night flights regime. This Chapter summarises our current thinking, and highlights areas where we would particularly like consultation responses to express views or to highlight relevant evidence.

### *The DfT's Aviation Appraisal (webTAG) Guidance*

**6.22** Our starting point in considering how to assess the impacts of different policy options for the next night flights regime has been the DfT's

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<sup>40</sup> See the various attempts to define the wider economic impacts of night flights in CE Delft (2011), Oxford Economics (2011), Optimal Economics (2011) and York Aviation (2011).

<sup>41</sup> Optimal Economics describes the wider economic impacts of night flights in the following terms: (i) influencing where companies invest; (ii) supporting international trade; (iii) supporting tourism; and (iv) supporting business efficiency. York Aviation identifies similar concepts as Oxford Economics and Optimal Economics while also identifying the impact of night flights in helping to retain existing companies in the local area and securing these companies' expansion in the face of competition.

Aviation Appraisal Guidance<sup>42</sup>. The Aviation Appraisal Guidance, part of the DfT's wider suite of Transport Analysis Guidance (TAG), outlines a set of guiding principles for the DfT's appraisal of government interventions in the aviation industry. One of the key objectives of the guidance is to provide transparency to stakeholders on the approach the DfT employs in appraising aviation policy interventions.

**6.23** While the principles set out in the Aviation Appraisal Guidance should be applicable for any aviation intervention, the specific methods used must be tailored according to the nature of the intervention being appraised. For example, any appraisal should be proportionate to the scale of the likely impacts. In addition, the Aviation Appraisal Guidance has never before been used in appraising potential changes to the night flights regime. So we are carefully considering how to apply the principles set out in the Guidance to assess the impacts associated with changes in the regime. We are also considering whether there is any need to amend or extend the existing webTAG guidance. To inform our thinking we have reviewed the methods used in recent research studies, which have attempted to assess the costs and/or benefits of night flights in the UK.

**6.24** The Aviation Appraisal Guidance, as per the DfT's TAG guidance in general, is kept under constant review by the DfT and updated periodically. The version of the Aviation Appraisal Guidance used as the starting point for this Review is the version published on the DfT's public website in August 2012.

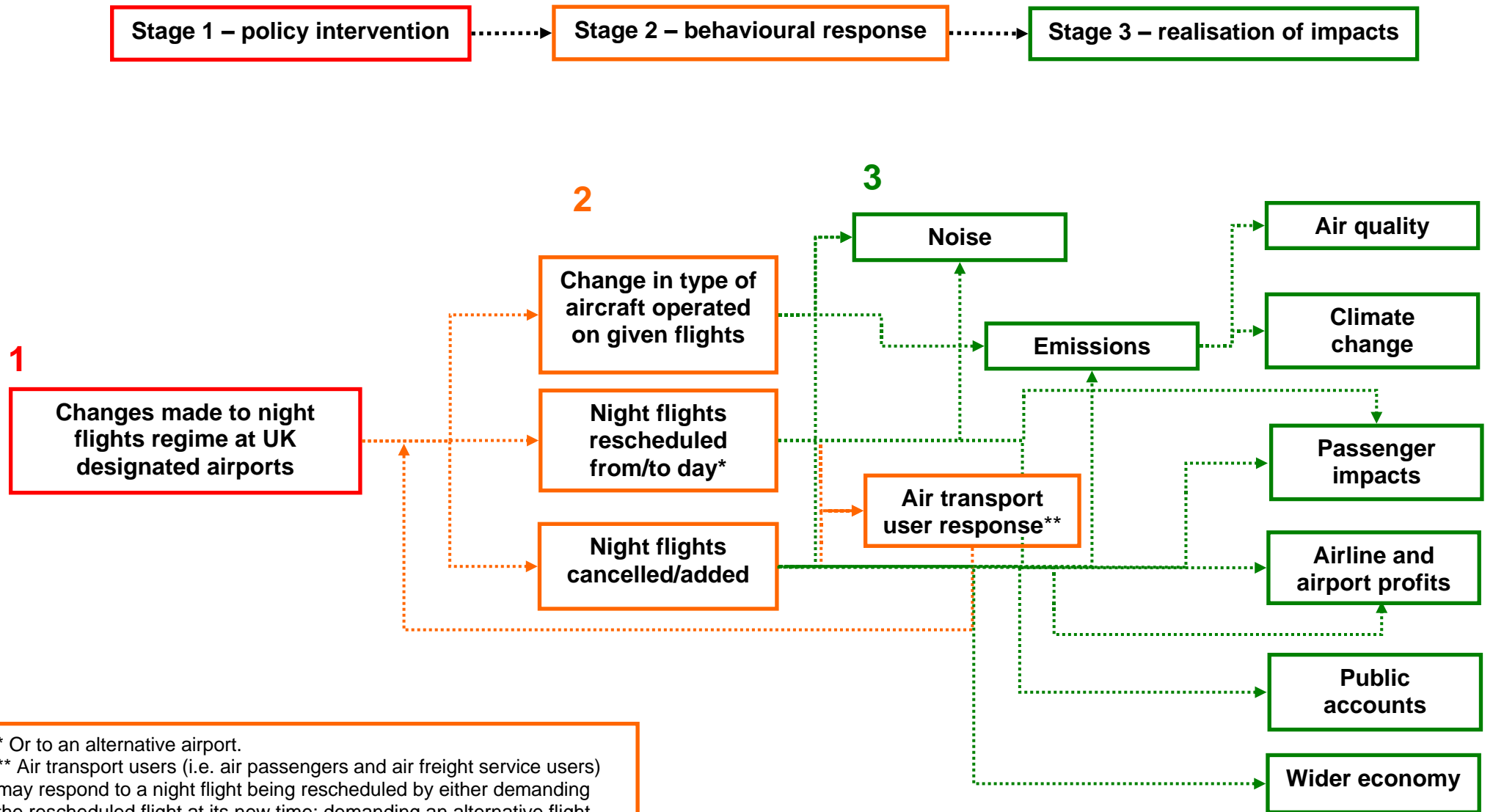
### **What would be the impacts of a new night flights regime?**

**6.25** Figure 8 below illustrates the way in which changes to the current night flights regime could be expected to impact the rest of society.

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<sup>42</sup> DfT (2012a) TAG Unit 18: Aviation Appraisal.

Figure 8: The impact of changes to the night flights regime



\* Or to an alternative airport.

\*\* Air transport users (i.e. air passengers and air freight service users) may respond to a night flight being rescheduled by either demanding the rescheduled flight at its new time; demanding an alternative flight (potentially at an alternative airport); or choosing to no longer fly. Air transport users may respond to a night flight being cancelled by either demanding an alternative flight; or choosing to no longer fly.

## **Assessing airlines' and air transport users' response to changes to the night flights regime**

**6.26** As Figure 8 shows, the nature and scale of the impacts will depend to a large extent on the behavioural response of airlines and air transport users to any changes to the night flights regime. Assessing this behavioural response is therefore a critical step in assessing the impacts of any changes to the night flights regime. As well as being critical, it is one of the most challenging aspects of the analysis. For example, an airline's decision to operate a night flight on a given route is influenced by a broad range of factors, many of which are not easy to quantify (e.g. strategic fit with their existing network). Inevitably, therefore, any attempt to predict airlines' behaviour will only be able to capture a subset of these factors.

### **The DfT's aviation model**

**6.27** The DfT maintains a suite of models to forecast activity at UK airports, and the associated CO<sub>2</sub> emissions, and to assess the impacts of potential policy interventions. Having originally been developed to assess the effects of changes in UK airport capacity, the models have been gradually developed in recent years to assess the effects of a broader range of potential Government policy interventions. The models were used most recently to inform the Government's response to the Committee on Climate Change Report on Reducing CO<sub>2</sub> emissions from UK aviation to 2050, DfT (2011a).

**6.28** At the heart of the aviation models, lie a series of relationships which represent the way airlines and air passengers respond to changes in a range of key drivers (e.g. the way passengers respond to changes in income levels or air fares). These relationships have been estimated using statistical techniques to best explain and reproduce air passengers' and airlines' behaviour in the recent past. Further information about how the aviation models work can be found in the Department's UK Aviation Forecasts 2011, DfT (2011b).

**6.29** Unfortunately, the Department's aviation models are likely to be of limited use in assessing the impact of changes to the night flights regime. This is because the models do not differentiate between night and day flights, instead focussing on changes in annual passenger numbers and aircraft movements. So, while there may be scope to use the aviation model to assess the impacts of a change in the night flights regime, in so far as the policy options change the total annual capacity of the noise designated airports to accommodate aircraft movements or passenger numbers, it is likely that some 'off-model' analysis will also be necessary in order to assess impacts associated with changes in the airports' ability to accommodate flights at particular times of the day or night.

**6.30** We are currently considering what form this 'off-model' analysis might take. Annex I summarises the approach taken to assessing the behavioural response of airlines and or air transport users in recent

studies, which have attempted to assess the costs and/or benefits of night flights in the UK.

**6.31** All the studies we have reviewed consider the impacts associated with banning night flights at one of the noise designated airports. This should not be interpreted as implying anything about the Government's intentions for the next night flights regime. Instead, our interest in these studies is solely in the approach they have taken to assessing the impacts of a change in the night flights regime, rather than the specific change they consider. In practice, while it may be possible to draw on some of the assumptions used by other studies in our assessment of the behavioural response of airlines and air transport users to a change in the night flights regime, our approach will need to be tailored to the specific policy options considered.

**Q41: Is there any other evidence we should consider in assessing the response of airlines and air transport users to changes in the night flights regime?**

### **Assessing the individual impacts of night flights regime policy options**

**6.32** In the remainder of this Chapter, for each of the key impacts of night flights, we summarise the approach to assessing the impact set out in the Aviation Appraisal Guidance before drawing on our review of other studies to consider how to assess the impacts of any change to the night flights regime.

#### **Air transport users**

**6.33** Paragraphs 6.4-6.8 explain how night flights provide benefits to air transport users that are additional to those provided by flights during the daytime. Accordingly, any changes to the current night flights regime would impact on air transport users by altering the overall level of benefits provided to them by air transport. Specifically, any changes which result in less (more) availability of night flights would likely reduce (increase) the overall benefits to air transport users. There may also be impacts on air transport users resulting from any changes to the types of aircraft operated on night flights, to the extent that such changes altered the costs to airlines of operating these flights and that any change in costs was reflected in changes to the price of air passenger/freight services. Importantly, this treats air transport users in the collective sense; the impact on individual users of a change to the current night flights regime would differ depending on their individual circumstances.

**6.34** The Department's Aviation Appraisal Guidance sets out a method for estimating the impact of a policy intervention on air passengers. The calculation draws on estimates of the impacts of the policy on air fares and on passenger numbers at affected airports. It is a well established approach and consistent with the approach the Department uses to assess the impact on transport users of all transport interventions.

**6.35** The Aviation Appraisal Guidance does not currently set out a method for estimating the impact of policy intervention on air freight service users.

### **Proposed approach to assessment**

**6.36** We see no reason why the method for assessing impacts on air passengers set out in the Aviation Appraisal Guidance is not applicable here. In so far as the policy proposals equate to changes in the annual capacity of airports to accommodate flights, we would expect to use the Department's aviation models. The appraisal module of the models calculates the impact on air passengers in a way consistent with the Aviation Appraisal Guidance. However, we recognise that this approach would not capture the impacts on air passengers associated with flights being rescheduled between day and night and may, therefore, need to be complemented by off-model analysis.

### **Q42: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing air passenger impacts?**

**6.37** Given that we would not be able to use the DfT aviation models to estimate the impacts associated with flights being rescheduled between day and night, we are considering how we could estimate the impacts of such changes on air passengers in a way that is consistent with the methods in the Aviation Appraisal Guidance, without relying on DfT's aviation models.

**6.38** We see some merit in the approach to assessing the impacts on air passengers associated with changes in flight arrival/departure times set out in CE Delft (2011). The approach taken to assessing air passenger impacts in CE Delft, and the critique of the approach presented in Oxford Economics (2011) is summarised in Annex J. In broad terms the approach involves valuing the impact on passengers' ability to arrive<sup>43</sup> at their preferred arrival times.

**6.39** In order to follow this approach, we would need to make assumptions about passengers preferred arrival and departure times. We think it is reasonable to assume, as CE Delft do, that, in general, business and transfer passengers who choose to fly on night flights prefer to arrive at night to allow for early morning meetings, and transfers. In contrast, we share Oxford Economics' concern that the evidence underpinning CE Delft's assumption that terminating leisure passengers prefer to arrive in the afternoon looks to be weak<sup>44</sup> and particularly questionable at Heathrow, given the number of flights arriving from Asia and Africa, where arriving in the afternoon would involve passengers travelling in daylight hours for most of a long flight.

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<sup>43</sup> CE Delft only consider changes in the night flights regime with respect to restrictions at Heathrow, where there are no scheduled departures during the night quota period, and so only consider arrivals. However the same logic could be applied in relation to departing passengers.

<sup>44</sup> It is based on a single survey of 188 Dutch respondents in relation to a single route (Amsterdam to New York), Lijesen 2006.

- 6.40** If we were to employ this approach we would also need to consider what to assume about passengers preferred arrival and departure times at Gatwick and Stansted. We would welcome any further evidence that could help to inform any assumptions about passengers preferred arrival and departure times at these airports.
- 6.41** In relation to the values CE Delft place on hourly deviations from passengers' desired arrival times, we note that the use of values relating to surface transport, in the absence of any aviation specific values, is consistent with the Aviation Appraisal Guidance. We will consider, however, whether the European aviation values highlighted by Oxford Economics would be more appropriate<sup>45</sup>.
- 6.42** We agree with Oxford Economics that where a change in the night flights regime results in passengers no longer flying / or additional passengers flying from a given airport, the costs / benefits to such passengers could be material to the overall balance of costs and benefits. This is not to say that we think CE Delft's justification for not attempting to place a value on these impacts - that there is insufficient evidence - is invalid. Rather it means that we are keen to identify evidence that would enable us to estimate the value of these impacts.
- 6.43** We note that the approach employed in CE Delft does not consider the impacts on foreign passengers. In line with the DfT's Aviation Appraisal Guidance we intend to include impacts to non-UK residents and firms<sup>46</sup> but will attempt to identify and quantify these impacts separately, where it is feasible to do so.

**Q43: What are your views on how we should assess the impacts on air passengers associated with a change in night flights regime, if we are unable to use the Department's aviation models?**

**Q44: Do you think there is merit in applying the approach employed by CE Delft? If so, do you agree that it is reasonable to assume that business passengers and transfer passengers prefer to arrive on a night flight, if they choose to do so when one is available? What are your views on what we should assume about terminating passengers' preferred arrival times and about passengers' preferred departure times?**

**Q45: Do you agree that the impacts on passengers who decide not to travel (or become able to travel) as a result of the change in night flights regime could be critical to the balance of costs and benefits?**

**Q46: Are you aware of any evidence that we could use to value the impacts on passengers who decide not to travel or (become able to travel) as a result of any change in the night flights regime?**

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<sup>45</sup> See Annex J for more details.

<sup>46</sup> The reasons for taking this approach are set out in paragraph 3.2.5 of DfT (2012a).

**6.44** In the absence of relevant webTAG guidance we are considering how we could assess the impacts of a change in the night flights regime on air freight service users.

**6.45** As indicated in paragraph 6.90-91, we are considering the possibility of using Oxford Economics' estimated relationship between business usage of aviation and productivity as a way of assessing the wider economic impacts of a change in the current night flights regime. Given Oxford Economics' definition of business usage of aviation includes cargo, we believe the impact on air freight service users of a change in the current night flights regime would be accounted for in this approach. We are also mindful however, given that the definition of business usage of aviation also includes business passengers, of the risk of double-counting the impacts on business air passengers, were we to employ this approach.

**Q47: Do you think that the method used by Oxford Economics (2011) to assess the impacts on productivity of changes in business usage of aviation (the approach is described in paragraph J22-23 of Annex J) would adequately take account of the impact on air freight service users of changes in the current night flights regime?**

**Q48: Do you think that, were we to employ the method used by Oxford Economics (2011) to assess the impacts of changes in business usage of aviation on UK productivity (the approach is described in paragraph J22-23 of Annex J), we would need to isolate the impact on business air passengers in our assessment of air passenger impacts in order to avoid double-counting of business air passenger impacts?**

**Q49: Is there any other evidence or information that we should consider in assessing the impact on air freight service users of a change in the night flights regime?**

### **Airline and airport profits**

**6.46** Paragraph 6.9 explains that night flights potentially provide airlines and airports with an additional source of profits. Any changes to the current night flights regime which enabled airlines to operate less (more) night flights would therefore likely reduce (increase) the profits of airlines and airports. Moreover, any changes to the types of aircraft currently operated on night flights brought about by a change in the night flights regime may also impact on airline and airport profits to the extent that it altered airlines' operating costs, and the change in costs wasn't passed on to air transport users as a change in user service costs.

**6.47** The Department's Aviation Appraisal Guidance sets out a method for estimating the impact of a policy option on airlines and airports<sup>47</sup> associated with a change in passenger numbers. The calculation draws on estimates of the profits received by airports and airlines per

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<sup>47</sup> These are referred to collectively as producer benefits in the Aviation Appraisal Guidance.



passenger, and the number of passengers at affected airports before and after the change in regime. As with the method for assessing air passenger benefits, it is a well established approach, consistent with the approach the Department uses to assess the impact on transport users of all transport interventions, and is incorporated into the appraisal module of the Department's aviation models.

- 6.48** The Aviation Appraisal Guidance also highlights a need to assess the impact on airlines and airports associated with changes in freight volumes. The guidance does not, however, provide any method for doing so.

*Proposed approach to assessment*

- 6.49** For the same reasons given in the air transport users' section (paragraph 6.34), we are keen to ensure consistency with the Aviation Appraisal Guidance for assessing producer impacts. If possible, we would again expect to use the Department's aviation models. However, as for air passengers' impacts, we are considering how we could estimate the impacts of such changes on profits in a way that is consistent with the methods in the Aviation Appraisal Guidance but without relying on the DfT's aviation models.

**Q50: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing airline and airport impacts?**

- 6.50** We think there could be some merit in employing the same methodology employed in Oxford Economics (2011) to estimate the value of the impact on airline profits of a change in night flights regime. This is described in Annex J and essentially involves estimating the average amount of profit airlines receive per passenger (or 100kg of freight) and then combining this with an estimate of the impact of the change in night flights regime on passenger numbers and freight tonnage.

- 6.51** This approach would be very similar to that employed in CE Delft (2011), also summarised in Annex J. Like the approach taken by CE Delft, it would represent a simplified application of the Aviation Appraisal Guidance in not taking account of the impact of a change in regime on airport profits, or on the average profits airlines earn per passenger. However, this approach would go further than the Aviation Appraisal Guidance in valuing the impact of any change in the quantity of freight transported as a result of a change in the night flights regime.

- 6.52** If we were to apply the Oxford Economics methodology for estimating the change in profits, we would also need to consider further the applicability of the profits information available to night flights at Heathrow, Gatwick and Stansted. For example, in their analysis Oxford Economics do not reflect the profitability of low cost airlines in assessing the average profitability of flights, on the basis that low cost services don't operate at Heathrow. This approach would not be appropriate at Gatwick or

Stansted, where low cost carriers operate a significant proportion of night flights.

**Q51: What are your views on how we should assess the impacts on profits, if we are unable to use the Department's aviation models?**

**Q52: Do you agree that there is merit in our applying a similar approach to that employed by Oxford Economics to estimate the economic value of night flights at Heathrow? What factors should we consider in assessing the applicability of the available profits data to night flights at the designated airports?**

**Q53: Is there any other evidence we should consider in assessing the impacts of a change in the night flights regime on airlines and airports?**

## Noise

- 6.53** All flights produce aircraft noise, which has an especially pronounced impact on local residents during the night. Any change in the night flights regime and in the number of movements during the night may have a significant impact on the noise exposure of local residents.
- 6.54** WebTAG Aviation Appraisal Guidance (TAG Unit 3.18) requires any appraisal of aviation schemes to take into account the impact on noise where these impacts are likely to be significant and points to the methodology laid out in webTAG noise guidance (TAG Unit 3.3.2)<sup>48</sup>. The methodology in the guidance is based on well established procedures for assessing the impact on people caused by road and rail traffic-related noise and vibration and has been developed from surveys of the impacts of noise from transport on people, including dissatisfaction, annoyance and disturbance.
- 6.55** Monetary values have been derived for the impact of road and rail daytime noise levels on amenity value and quality of life. WebTAG requires the use of these and they are treated as transferable to daytime aviation noise. However, webTAG does not provide any guidance on how to assess the specific impact of changes in night noise.
- 6.56** Since this represented an important evidence gap, we commissioned the CAA to undertake a literature review regarding the effects of night time aircraft noise on local residents.
- 6.57** The resulting literature review 'Aircraft noise, sleep disturbance and health effects'<sup>49</sup>, which is being published alongside this consultation, has shown that night time aircraft noise can have significant health effects on the local population and that several health impacts can be quantified and monetised. In particular:

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<sup>48</sup> Available at [www.dft.gov.uk/webtag/documents/expert/unit3.3.2.php](http://www.dft.gov.uk/webtag/documents/expert/unit3.3.2.php).

<sup>49</sup> CAA ERCD Report 1208 – Aircraft Noise, Sleep Disturbance and Health Effects: A Review.

- it is possible to estimate the proportion of the population likely to report being highly sleep disturbed for a given noise exposure, and chronic sleep disturbance is regarded as a health effect in its own right with a measurable impact on quality of life, which can be expressed as years lost due to disability (YLD);
- for impact on cardiovascular health, there is evidence that noise exposure above 55 dB L<sub>night</sub> results in increased risk of myocardial infarctions (heart attacks);
- there is evidence for a link between noise exposure and hypertension and there is probably sufficient evidence in order to value the impacts in terms of hypertension leading to a stroke or dementia;
- for stress and mental health effects, the evidence is inconclusive or limited, showing a possible link to mental health symptoms (eg depression, anxiety) but not to more severe problems such as clinically defined psychiatric disorder;
- for next day effects, there is consensus that environmental (night) noise has an effect on heart rate, subjective sleep quality and mood the next day, but there is no consistent scientific evidence of chronic objective effects on stress hormone levels, immune system or performance the next day; and
- in relation to the impact on children, the evidence is inconclusive. Daytime noise exposure may have cognitive effects (particularly on reading) and chronic noise may affect children's stress levels, blood pressure and mental health.

#### *Proposed approach to assessment*

- 6.58** Following our review of webTAG and the CAA's literature review, we have concluded that any changes to the impact that night noise currently has on the local population need to be assessed, even though webTAG does not provide any methodology for this.
- 6.59** Following their literature review, the CAA have also developed a methodology paper "Proposed methodology for estimating the cost of sleep disturbance", which is being published alongside this consultation and which proposes that we should quantify and monetise the following health impacts associated with aircraft night noise:
- The value of sleep disturbance.
  - The increased risk of myocardial infarctions (heart attacks).
  - The increased incidence of hypertension (including secondary effects of stroke and dementia).
- 6.60** The approach recommended by the CAA is consistent with the methodology recommended by the Interdepartmental Group on Costs

and Benefits (IGCB)<sup>50</sup>. Therefore, depending on the responses to this consultation, we propose to use the methodology developed by the CAA to assess the impacts of any change in the night flights regime on sleep disturbance, the risk of myocardial infarctions and hypertension.

- 6.61** Any change to the night flights regime would only have an impact on daytime noise, if flights were displaced from the night to the day. Subject to the policy proposals under consideration, we will consider whether it would be proportionate to assess the impacts associated with changes in daytime noise levels, following the existing webTAG noise guidance.

**Q54: Do you agree that the approach proposed by the Civil Aviation Authority (CAA) for estimating the cost of sleep disturbance from aircraft noise reflects the available evidence? If not, how do you think it should be changed?**

**Q55: Is there any other evidence, not considered by the CAA in their literature review, which we should consider in assessing the noise impacts of a change in the night flights regime?**

## **Air quality**

- 6.62** A change in the night flights regime may lead to more (fewer) flights being operated out of an airport, which in turn will lead to a larger (smaller) amount of pollutants being emitted from the combustion of aircraft fuel. Moreover, to the extent that any changes to the current night flights regime bring about changes to the types of aircraft used, the next night flight regime might also have an impact on pollutants being emitted and on air quality. The key pollutants to consider here are oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM<sub>10</sub>).
- 6.63** The Department's webTAG guidance provides guidance on assessing air quality impacts of transport interventions depending on whether the air quality impact is local or regional in nature (TAG unit 3.3.3). The Aviation Appraisal Guidance advises that the standard webTAG guidance on assessing air quality be followed in appraising interventions in the aviation sector in the absence of any aviation-specific evidence.
- 6.64** The two webTAG elements are complementary and are concerned with the following impacts:
- Local - requires an assessment of changes to NO<sub>2</sub> and PM<sub>10</sub> concentrations at household level and monetisation of the PM<sub>10</sub> impact.

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<sup>50</sup> The Interdepartmental Group on Costs and Benefits (IGCB) is a Defra-led group of government analysts that provides analysis and advice relating to the quantification and valuation of local environmental impacts.

- Regional - requires an assessment of changes to NOx emissions and monetisation of the impact.<sup>51</sup>

**6.65** In practice, proportionality is also a consideration and the Department has taken different approaches, consistent with webTAG, to assessing air quality impacts of interventions in the aviation sector. DfT (2011c), which assessed the effectiveness of different policy levers in reducing CO<sub>2</sub> emissions, provided a relatively simple qualitative assessment of air quality impacts. In contrast to this, the impact assessment produced to accompany the previous Government's decision to support a third runway at Heathrow Airport<sup>52</sup> involved a very thorough assessment of local air quality impacts was performed, which took account of road transport (i.e. ground access to the airport) as well as aircraft sources of emissions. It also included an estimate of value on these impacts. In the case of the latter study, large scale changes in airport capacity were being considered, which would have resulted in an increase of over 220,000 air transport movements per year at Heathrow, and hence air quality impacts were expected to be significant.

#### *Proposed approach to assessment*

- 6.66** In assessing the air quality impacts of changes in the night flights regime, we intend to follow the webTAG guidance on the Air Quality Sub-Objective (TAG Unit 3.3.3).
- 6.67** In line with this guidance, we propose to estimate, as a minimum, the change in NOx emissions caused by changes to the night flights regime and monetise this impact (the regional assessment). Assessing the impacts on NO<sub>2</sub> and PM<sub>10</sub> concentrations at household level and monetisation of the PM<sub>10</sub> impact (the webTAG local assessment) is a significantly more costly exercise. We will therefore need to consider whether such an approach would be proportionate, in light of the policy options identified.
- 6.68** To estimate the change in NOx emissions, we would have to look at the change in the number of overall landing and take off events, which aircraft types are involved, and what the average landing and take-off emissions are for those aircraft. This information is available for NOx emissions based on engine certification data.
- 6.69** Bearing in mind the principle of proportionality, the methods we employ will depend on the scale of the expected impacts of the policy options considered. For example, we expect any change to the night flights regime to affect air quality significantly less than a third runway at

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<sup>51</sup> NO<sub>2</sub> concentrations have health impacts on local residents, while NOx emissions are the source of NO<sub>2</sub> concentrations and also have wider environmental impacts at a regional level. WebTAG 3.3.3: "Values for NO<sub>2</sub> concentrations are not currently published by the IGCB (AQ), and therefore values for NOx emissions are used as a proxy at the economic valuation stage in the air quality assessment."

<sup>52</sup> The impact assessment produced to accompany the previous Government's decision to support a third runway at Heathrow Airport can be accessed at: <http://webarchive.nationalarchives.gov.uk/20100513085202/http://www.dft.gov.uk/pgr/aviation/heathrowconsultations/heathrowdecision/impactassessment/ia.pdf>.

Heathrow would. Therefore, it is unlikely that the approach employed for the impact assessment for the Heathrow third runway would be proportionate.

**6.70** Regarding NO<sub>x</sub> damage cost, IGCB has adopted “Air Pollution – Action in a Changing Climate”, which recommends the use of abatement cost values rather than damage cost values for NO<sub>x</sub> emissions from transport due to legal constraints on NO<sub>x</sub> emission levels. We are currently considering how to reflect this development in our webTAG appraisal guidance.

**6.71** As part of the assessment of the impacts on compliance with legal NO<sub>x</sub> limit values, a notable complicating factor is that the impacts vary depending on whether they are emitted during the day or at night. We are aware of this difference and will consider whether it is possible to take this into account when quantifying impacts.

**Q56: Do you agree that we should ensure that the method used to assess air quality impacts should be proportionate to the proposals under consideration?**

**Q57: Is there any other evidence we should consider in assessing the air quality impacts of changes in the night flights regime?**

## Climate change

**6.72** Any changes to the current night flights regime which result in fewer (more) flights would likely reduce (increase) the overall impact on climate change. To the extent that any changes to the current night flights regime brought about changes to the types of aircraft operated, this would also have an impact on climate change to the extent that the new aircraft had differing emissions.

**6.73** The Department’s Aviation Appraisal Guidance notes that the aviation sector’s inclusion in the EU Emissions Trading System<sup>53</sup> (ETS) means that airlines operating flights to and from the UK will be required to surrender allowances and credits to cover their annual CO<sub>2</sub> emissions<sup>54</sup>. This means that there is now a cost associated with each additional tonne of CO<sub>2</sub> emitted. The cost of purchasing allowances is taken into account as part of airline costs in the methods for assessing the impacts

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<sup>53</sup> The EU ETS puts a limit on the total amount of certain greenhouse gases that can be emitted by the factories, power plants and other installations in the system. Within this cap, companies receive emission allowances which they can sell to or buy from one another as needed. The limit on the total number of allowances available determines their value. Further information about the EU ETS can be found at: [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm).

<sup>54</sup> The European Commission has proposed to “stop the clock” for one year, so that only aircraft operators of flights within the EU, EEA and “closely connected areas with a shared commitment to tackle climate change” would face enforcement for failing to surrender allowances for their 2012 emissions. The Commission has stated that if sufficient progress can be made towards tackling aviation emissions at a global level, it will propose further changes to the EU ETS legislation in due course. This is clearly an important development, but, unless further proposals are forthcoming, does not affect the way the EU ETS will operate during the period from October 2014, when the new night flights regime is expected to be in place.

on air transport users and airlines and airports set out in the Aviation Appraisal Guidance. Following from this, it would not be appropriate to value the CO<sub>2</sub> emissions impact of aviation policy interventions separately, as to do so would double count the carbon impact. This approach is consistent with that taken by other sources, including CE Delft (2011) and Optimal Economics (2011).

- 6.74** For non-CO<sub>2</sub> impacts, the Aviation Appraisal Guidance states that due to scientific uncertainties either a qualitative assessment of the impact should be made or a quantitative assessment can be made as a sensitivity test. For undertaking a quantitative assessment, the guidance states that non-CO<sub>2</sub> impacts should be quantified in terms of their CO<sub>2</sub> emissions-equivalence using the latest research in this area and then valued using standard (traded) greenhouse gas values.<sup>55</sup>
- 6.75** In DfT (2011c), which presents an assessment of the effectiveness of different policy levers in reducing UK Aviation CO<sub>2</sub> emissions, a qualitative approach was taken following expert advice regarding the strength of the latest evidence on non-CO<sub>2</sub> emissions.

#### *Proposed approach to assessment*

- 6.76** In line with the Aviation Appraisal Guidance, and the approach taken by other recent studies, we intend to take account of the impact of the policy options on airline's demand for EU ETS allowances as part of our assessment of the impacts on 'air transport users' and 'airlines' and airports' profits'.
- 6.77** For non-CO<sub>2</sub> climate change impacts we will consider the strength of the latest scientific evidence in deciding whether or not non-CO<sub>2</sub> climate change impacts should be estimated as a sensitivity test. In the event that a non-CO<sub>2</sub> emissions-equivalence factor is used, the change in CO<sub>2</sub> emissions associated with the change in regime will be estimated using estimates of the carbon emitted by different aircraft consistent with that used in the Department's aviation models<sup>56</sup>.

**Q58: Do you agree with our proposed approach? Is there any evidence on non-CO<sub>2</sub> climate change impacts we should consider?**

#### **Public accounts impacts**

- 6.78** Paragraphs 6.17-6.19 describe how night flights affect the public accounts. This is both directly, by increasing air passenger duty receipts; and indirectly, by supporting economic activity in other sectors, which generate both business- and employee-related tax receipts, and by causing expenditure to be diverted from expenditure on goods and services across the rest of the economy.

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<sup>55</sup> These values are published by the Department for Energy and Climate Change and reproduced in TAG Unit 3.3.5 The Greenhouse Gases Sub-Objective of webTAG.

<sup>56</sup> See Chapter 3 of DfT(2011b) or UK Aviation Forecasts, 2011 for further details.

**6.79** The Department's Aviation Appraisal Guidance sets out a method for estimating the impact of policy options on taxation receipts. This takes account of the direct impact of changes in passenger numbers on air passenger duty receipts, as well as the indirect impact on (indirect) taxation revenue associated with aviation leisure passengers diverting expenditure to/from elsewhere in the economy from/to aviation. This approach draws on estimates of passenger numbers, with and without the policy, and estimates of the impact of the policy on total spending on air fares by leisure passengers, and passenger numbers.

*Proposed approach to assessment*

**6.80** For the same reasons given in the air passengers and airlines and airport profits sections above, we are keen to ensure consistency with the Aviation Appraisal Guidance for assessing producer impacts. If possible, we would also expect to use the Department's aviation models. However, for the reasons given in the Sections on air passenger and profit impacts, we are considering how we could estimate the impacts of such changes on the public accounts in a way that is consistent with the methods in the Aviation Appraisal Guidance, but without relying on the DfT's aviation models.

**Q59: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing public accounts impacts?**

**6.81** In order to assess the impact on APD revenues we would need to assess the impact of the regime on the number of passengers departing the UK, falling into each of the APD bands.<sup>57</sup> This requires us to not only estimate the impact of the regime on the total number of passengers departing UK airports but to do so by world region and class of travel. In the absence of any further evidence, we could employ the same assumptions on class of travel employed by Oxford Economics (2011) in assessing the impact of a change in the current night flights regime on APD receipts. Paragraphs J17-20 of Annex J summarises the approach taken to assessing impacts on the public accounts in Oxford Economics (2011).

**6.82** To assess the impact of a change in regime on indirect taxation revenues elsewhere in the economy, we need to assess the change in aviation expenditure by UK passengers. This will require us to make assumptions about the impact of the change in regime on the number of passengers travelling to each world region and by class of travel, as well as about the fares they face.

**6.83** In keeping with the Aviation Appraisal Guidance for assessing public accounts impacts, and in contrast to Oxford Economics, we propose not to account separately for the impacts on corporation tax and employment tax receipts.

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<sup>57</sup> There are eight APD bands in total; four destination bands and two class bands.



- 6.84** Generally, when appraising aviation policies we do not strip out the corporation tax impacts from our assessment of the impacts on airline and airport profits. In order to strip out corporation tax we would need to consider the different tax statuses of the airlines operating out of the designated airports.
- 6.85** The reason for not taking account of the impacts on employment taxes is that any impacts of the next night flights regime on employment levels in the aviation sector or other related sectors will not necessarily imply any impact on the level of employment across the UK as a whole (and therefore any impact on employment taxes). This is because in a well functioning labour market changes in employment in one sector of the economy tend to be offset by changes in employment in other sectors of the economy, unless there are specific reasons to suggest there would be an impact on the overall labour supply. Insofar as there is reason to believe there would be an impact on labour supply of a change in the current night flights regime, we would take account of these impacts as part of our assessment of the wider economic impacts (discussed below).

**Q60: What are your views on how we should assess the impacts on the public accounts, if we are unable to use the Department's aviation models?**

**Q61: Do you agree that there is merit in our applying a similar approach to that employed by Oxford Economics to estimate the impact on APD revenues?**

**Q62: Do you agree that the impact of any change in the night flights regime is unlikely to have a significant impact on employment (see next section), and therefore any impact on employment taxes will be minimal?**

**Q63: Is there any further evidence we should consider in attempting to assess the indirect impact of a change in the night flights regime on indirect taxation revenue across the rest of the economy?**

### **Wider economic impacts**

- 6.86** Paragraph 6.20 identifies a range of wider economic impacts of night flights. Any change to the current night flights regime could, therefore, have a range of impacts on the wider economy including impacts on:
- The labour supply and employment;
  - The number of foreign in-bound tourists to the UK;
  - Business efficiency and productivity;
  - The volume of UK international trade; and
  - The level of foreign in-bound and domestic investment in the UK.
- 6.87** The Aviation Appraisal Guidance does not provide detailed guidance for assessing the wider economic impacts of government interventions in the aviation sector. Instead it states that the impacts identified in the DfT

webTAG guidance on wider impacts and regeneration<sup>58</sup>, developed for domestic transport schemes (i.e. road and rail), could in principle apply to international transport schemes (i.e. including aviation). These impacts include<sup>59</sup>:

- Agglomeration Impacts;
- Output changes in imperfectly competitive markets;
- Labour supply impacts; and
- Movements to more or less productive jobs

**6.88** The Aviation Appraisal Guidance also references NERA (2010) – a report commissioned by the Department to consider whether impacts related to international business were adequately reflected in existing webTAG appraisal guidance. This included considering whether any “wider impacts”, including but not limited to those considered for domestic schemes, might be material in appraising international transport schemes.

**6.89** The NERA study concluded that some of the wider impacts considered by the DfT in appraising domestic schemes would be less relevant (e.g. agglomeration impacts) for international schemes, while others (e.g. impacts on structural employment) could be material. The study also concluded that “...there are good reasons to suppose wider impacts exist in an international context...in the form of increased productivity for individual firms brought about by increased exposure to international business.”<sup>60</sup> NERA set out a conceptual framework for assessing the wider international impacts but did not apply it, citing a lack of data. NERA ultimately concluded that the nature of these wider impacts, including even their sign, could differ depending on the specific scheme being considered.

### *Proposed approach to assessment*

**6.90** In the absence of detailed, aviation-specific webTAG guidance, we are considering how to assess the wider economic impacts of changes to the night flights regime. In so doing we have reviewed the approaches taken in other sources to estimating the wider economics impacts of changes to the night flights regime, summarised in Annex J.

### **Productivity impacts**

**6.91** We could potentially employ a similar approach to that used in Oxford Economics (2011) and Optimal Economics (2011) to estimate the impact

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<sup>58</sup> TAG Unit 2.8 Wider Impacts and Regeneration.

<sup>59</sup> See TAG Unit 2.8 Wider Impacts and Regeneration for further details.

<sup>60</sup> See page i of NERA (2010).

of a change to the night flights regime on UK productivity. Both studies draw on the historic relationship, presented in Oxford Economics (2006), between productivity in the UK and ‘business usage of aviation’<sup>61</sup>. Such an approach is attractive in so far as it would provide a means for assessing the likely magnitude of what many studies, including NERA (2010), have identified as being the most significant wider economic impact resulting from international transport policy interventions.

**6.92** Our main concern with this approach is to ensure that the relationship estimated by Oxford Economics is robust. A wide range of factors influence productivity, such that it is not a straightforward task to isolate the impact of changes in individual factors. Furthermore, it is difficult to establish a causal link between changes in business use of aviation and productivity because while greater business use of aviation may increase productivity and therefore growth in the economy, economic growth is also a key driver of business use of aviation. We are therefore interested in understanding more about previous attempts to estimate the relationship between air travel and productivity. We will also consider the case for undertaking further research and performing further analysis in this area.

**6.93** We are also mindful, as noted in our discussion of air transport user impacts, of the need to avoid duplication with the estimated benefits to business passengers and air freight service users, assessed as part of air transport user’ impacts (see paragraphs 6.33-6.45 above).

**Q64: What are your views on our employing a similar approach to that employed by Oxford Economics and Optimal Economics in assessing the impact of a change in the regime on UK productivity? Do you agree that if we were to employ this approach we would need to make adjustments to avoid double counting the benefits to business passengers and freight service users?**

**Q65: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK productivity?**

### **Tourism impacts**

**6.94** In terms of assessing the impact of changes in the night flights regime on UK tourism, we note and agree with Oxford Economics’ criticism of the approach employed in CE Delft (2011). CE Delft assessed the impact on tourism in terms of the change in the economic contribution of the aviation sector (measured as ‘gross value added’). Gross value added is not a measure of economic welfare, and so should not be used in transport appraisals or cost benefit analyses, which assess impacts in terms of economic welfare. For the same reasons, it would be inappropriate to follow the approach employed in Optimal Economics

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<sup>61</sup> ‘Business usage of aviation’ is defined to include business passengers and cargo.

(2011), where the impact on tourists is also assessed in terms of gross value added<sup>62</sup>.

**6.95** More fundamentally, we are concerned with the assumption underpinning all of these estimates that average spend per passenger is unaffected by changes in the number of flights. The way in which tourists respond to changes in the cost or availability of air travel is not fully understood. Whilst there is clear evidence that when air fares increase, there are fewer trips, it is likely that some people choose to take fewer but longer holidays abroad (increasing the average spend per trip). Therefore, in the absence of further evidence we propose to assess the impacts on tourism qualitatively, taking account of both the impacts on foreign in-bound tourists to the UK and on UK out-bound tourists.

**Q66: Do you agree with our proposal to assess the impact on tourism of a change in the night flights regime qualitatively? If not, why not, and what would you suggest as an alternative?**

**Q67: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK productivity?**

### **Employment impacts**

**6.96** While we acknowledge that changes in night flights could have impacts on employment levels in the aviation or other related sectors, this does not necessarily imply any impact on the level of employment across the UK as a whole (and therefore any impact on employment taxes). As noted by CE Delft (2011), in a well functioning labour market, changes in employment in one sector of the economy tend to be offset by changes in employment in other sectors of the economy. This is reflected in the Department's Transport Appraisal Guidance<sup>63</sup>, which states that employment effects need only be considered if there are specific reasons to suggest there would be an impact on the overall labour supply.

**6.97** We will consider, once a range of policy options for changing the night flights regime have been identified, whether there are likely to be material changes to the labour supply, and therefore whether it would be proportionate to apply the webTAG guidance on assessing labour supply impacts.

**Q68: Do you agree with our proposed approach to considering the potential impact of a change in the night flights regime on UK employment? If not, why not, and what would you suggest as an alternative?**

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<sup>62</sup> We note, however, that Optimal Economics' use of gross value added is consistent with the focus of their study – to estimate the economic value of night flights at Gatwick.

<sup>63</sup> See TAG Unit 2.8 Wider Impacts and Regeneration for further details.

**Q69: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK employment?**

**Q70: Are there any other impacts, not considered above, that we should consider in assessing the impacts of a change in the night flights regime (e.g. impacts related to the way people travel to and from the airport)? If so, what evidence should we consider in assessing these impacts?**

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# 7. Summary of Questions

## **Policy and legal landscape**

Q1: Are there any other matters that you think we should cover in the second stage consultation?

## **Factual Information**

Q2: Do you have any comments on our assessment of the extent to which the current objectives have been met?

Q3: Do you have any views on how these objectives should change in the next night noise regime?

## **Structure of the Current Night Noise Regime**

Q4: Do you have any views on whether noise quotas and movement limits should apply only to the existing night quota period or to a different time period?

Q5: Do you have any new evidence to suggest we should amend or move away from the current QC classification system?

Q6: Do you have any views on the optimum length of the next regime and how this should align with the work of the Airports Commission?

Q7: Do you have any views on how dispensations have been used?

Q8: Do the dispensation guidelines still adequately reflect current operational issues?

Q9: Would you favour adding greater contingency to the seasonal movement limits (within any overall movement cap for the airport) in order to avoid large numbers of dispensations?

Q10: Do you consider there is still a need to retain the principles of carry-over and overrun? If so, please give reasons why.

Q11: If we retain the principles do you think we should change the percentage of movements and noise quota which can be carried over or overrun?

## **Exploration of Options for the Next Night Noise Regime**

Q12: Do you have any comments on our analysis of fleet and operational trends?

Q13: In the absence of any new restrictions, what changes in operations and fleet mix do you expect in the period between now and 2020 (and beyond 2020 if possible)?

Q14: Please set out how you expect local land use planning policies to impact upon the numbers of people exposed to night noise in the next regime. Please give details of any housing developments planned to take place within the current night noise contours (see Annex B).

Q15: Please provide any information on the feasibility of increasing the angle of descent into Heathrow, Gatwick or Stansted, particularly within the next seven years.

Q16: What are your views on the analysis and conclusions in annex H? Would you favour changing the current pattern of alternation in favour of an easterly preference during the night quota period?

Q17: Do you have any views on the costs and benefits of a night-time runway direction preference scheme at Gatwick or Stansted?

Q18: Please provide any information about the feasibility of using displaced landing thresholds in the next seven years for arrivals from the east at Heathrow and from the north east at Stansted.

Q19: Please provide any information about airspace changes or other operational procedures which could mitigate the impact of night noise in the next regime period

Q20: Do you have any comments to make on the figures relating to movement limits and usage?

Q21. In the absence of any new restrictions, how do you expect demand for movements in the night quota period over the course of the next regime to change?

Q22: Do you have any comments to make on the figures relating to noise quota limits and usage?

Q23: Do you agree with our initial assessment of the scope for reducing the noise quota in the next regime without imposing additional costs?

Q24: Do you have any views on the relative disturbance caused by the noise of an individual aircraft movement against the overall number of movements in the night quota period?

Q25: What are your views on the feasibility of a QC/8 and QC/16 operational ban in the night period? Please set out the likely implications of such a ban and the associated costs and benefits.

Q26: How many QC/4 aircraft do you expect to be in operation over the next seven years during the night quota period? Is the downward trend at Heathrow expected to continue?

Q27: What are your views on the feasibility of a QC/4 operational ban in the night quota period at any or all of the three airports? Please set out the likely implications of such a ban and the associated costs and benefits.

Q28: Are there more cost-effective alternative measures (such as penalties) to reduce the number of unscheduled QC/4 operations during the night quota period?

Q29: What are your views on the feasibility of an operational ban of QC/4 aircraft at any or all of the three airports during the shoulder periods? Please set out the likely implications of such a ban and the associated costs and benefits.

Q30: What is the rationale for operating services at precise times during the night quota period (as they do now)?

Q31: What is the scope for introducing a respite period at Gatwick or Stansted? Please set out the associated costs and benefits.

Q32: What is the feasibility of making Heathrow's voluntary curfew mandatory?

Q33: If you favour a guaranteed respite period, what would be the minimum period which you would consider to be worthwhile?

Q34: What are your views on the principle of trading off a complete restriction on movements in one part of the current night quota period against an increase in flights in another part of the night quota period?

Q35: What are your views on the possibility of fewer unscheduled night flights arising from an increase in daytime arrivals 'out of alternation' or vice versa?

Q36: What value do you place on day time respite compared with relief from noise in the night quota period?

Q37: Do you have any views on the extent to which landing fees can be used to incentivise the use of quieter aircraft during the night period?

Q38: Please provide comments and evidence on the extent to which the noise insulation scheme criteria have been met. Where possible please include figures for numbers of properties insulated under the scheme and numbers which are still potentially eligible.

Q39. Do you have any suggestions for changes to current compensation schemes or for new compensation schemes that might be introduced to help offset the impact of night noise on those exposed to it? For new schemes, please explain the parameters that you would suggest for the scheme and the rationale for choosing those parameters

Q40. Do you have any proposals for new or improved economic incentives that could be deployed to incentivise the use of quieter aircraft during the night period?

## **Night flights Evidence Review**

Q41: Is there any other evidence we should consider in assessing the response of airlines and air transport users to changes in the night flights regime?

Q42: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing air passenger impacts?

Q43: What are your views on how we should assess the impacts on air passengers associated with a change in night flights regime, if we are unable to use the Department's aviation models?

Q44: Do you think there is merit in applying the approach employed by CE Delft? If so, do you agree that it is reasonable to assume that business passengers and transfer passengers prefer to arrive on a night flight, if they would choose to do so if one were available? What are your views on what we should assume about terminating passengers' preferred arrival times and about passengers' preferred departure times?

Q45: Do you agree that the impacts on passengers who decide not to travel (or become able to travel) as a result of the change in night flights regime could be critical to the balance of costs and benefits?

Q46: Are you aware of any evidence that we could use to value the impacts on passengers who decide not to travel or (become able to travel) as a result of the change in night flights regime?

Q47: Do you think that the method used by Oxford Economics (2011) to assess the impacts on productivity of changes in business usage of aviation (the approach is described in paragraphs J22-23 of Annex J) would adequately take account of the impact on air freight service users of changes in the current night flights regime?

Q48: Do you think that, were we to employ the method used by Oxford Economics (2011) to assess the impacts of changes in business usage of aviation on UK productivity (the approach is described in paragraphs J22-23 of Annex J), we would need to isolate the impact on business air passengers in our assessment of air passenger impacts in order to avoid double-counting of business air passenger impacts?

Q49: Is there any other evidence or information that we should consider in assessing the impact on air freight service users of a change in the night flights regime?

Q50: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing airline and airport impacts?

Q51: What are your views on how we should assess the impacts on profits, if we are unable to use the Department's aviation models?

Q52: Do you agree that there is merit in our applying a similar approach to that employed by Oxford Economics to estimate the economic value of night flights at Heathrow? If so, are you able to provide any evidence of how much freight is carried on night flights at the designated airports? What factors should we consider in assessing the applicability of the available profits data to night flights at the designated airports?

Q53: Is there any other evidence we should consider in assessing the impacts of a change in the night flights regime on airlines and airports?

Q54: Do you agree that the approach proposed by the Civil Aviation Authority (CAA) for estimating the cost of sleep disturbance from aircraft noise reflects the available evidence? If not, how do you think it should be changed?

Q55: Is there any other evidence, not considered by the CAA in their literature review, which we should consider in assessing the noise impacts of a change in the night flights regime?

Q56: Do you agree that we should ensure that the method used to assess air quality impacts should be proportionate to the proposals under consideration?

Q57: Is there any other evidence we should consider in assessing the air quality impacts of changes in the night flights regime?

Q58: Do you agree with our proposed approach? Is there any evidence on non-CO<sub>2</sub> climate change impacts we should consider?

Q59: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing public accounts impacts?

Q60: What are your views on how we should assess the impacts on the public accounts, if we are unable to use the Department's aviation models?

Q61: Do you agree that there is merit in our applying a similar approach to that employed by Oxford Economics to estimate the impact on APD revenues?

Q62: Do you agree that the impact of any change in the night flights regime is unlikely to have a significant impact on employment, and therefore any impact on employment taxes will be minimal?

Q63: Is there any further evidence we should consider in attempting to assess the indirect impact of a change in the night flights regime on indirect taxation revenue across the rest of the economy?

Q64: What are your views on our employing a similar approach to that employed by Oxford Economics and Optimal Economics in assessing the impact of a change in the regime on UK productivity? Do you agree that if we were to employ this approach there would need to make adjustments to avoid double counting the benefits to business passengers and freight service users?

Q65: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK productivity?

Q66: Do you agree with our proposal to assess the impact of a change in the night flights regime qualitatively? If not, why not, and what would you suggest as an alternative?

Q67: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK productivity?

Q68: Do you agree with our proposed approach to considering the potential impact of a change in the night flights regime on UK employment? If not, why not, and what would you suggest as an alternative?

Q69: Is there any further evidence we should consider in attempting to assess the impact of a change in the night flights regime on UK employment?

Q70: Are there any other impacts, not considered above, that we should consider in assessing the impacts of a change in the night flights regime (e.g. impacts related to the way people travel to and from the airport)? If so, what evidence should we consider in assessing these impacts?