

# NIGHT FLYING RESTRICTIONS AT HEATHROW, GATWICK AND STANSTED

## STAGE 1 CONSULTATION

### Richmond Heathrow Campaign Response

April 2013

This document is the response of the Richmond Heathrow Campaign to the questions in the Department for Transport consultation document *Night Flying Restrictions at Heathrow, Gatwick and Stansted: Stage 1 Consultation*. The specifics of our response relate mainly to Heathrow. We do not consider that the contents of this submission are confidential and we have no objection to its publication.

The Richmond Heathrow Campaign represents three amenity groups in the London Borough of Richmond upon Thames: The Richmond Society, The Friends of Richmond Green, and the Kew Society, which together have over 2000 members. The members of our amenity groups are adversely affected by noise from Heathrow Airport's flight paths, particularly at night.

Despite a succession of Government restrictions on night flights at Heathrow over the last fifty years, more people around Heathrow than around any other European Union airport are exposed to levels of aircraft noise at night that exceed the World Health Organisation's guideline limit values on community noise. We therefore favour a ban in stages on scheduled air traffic at night at Heathrow. We believe this accelerated reduction in noise at the most damaging times is the only way to achieve the WHO limits in the near future.

We recognise the importance of air transport for London, but we consider that passengers from the small number of destinations that are currently served by Heathrow at night could be accommodated during the day and evening periods without any great personal inconvenience or damage to the local or national economy. According to the two economic studies cited in the stage one consultation document, there is a potentially significant cost to banning night flights. But the recent DfT long term passenger demand forecasts identify substantial suppressed demand at Heathrow, and this suppressed demand would substitute any lost demand from a night flight ban.

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## Policy and Legal Landscape (Question 1)

*Question 1: Are there any other matters that you think we should cover in the second stage consultation?*

The second stage consultation should seek views on the inter-play between the proposals for the next night restrictions regime and: (a) any proposals for a daytime operational freedom regime at Heathrow; (b) the recommendations from the Airports Commission for making the best use of existing capacity at Heathrow in the short and medium term; (c) the Department's most recent UK Aviation Forecasts (January 2013); (d) the Aviation Policy Framework (March 2013).

We are concerned that the first stage consultation document gave no indication of when Heathrow (or Gatwick and Stansted) would achieve compliance with the World Health Organisation limits on community noise. The options for achieving compliance (including a ban on night flights) and the timescales for each option should be included in the second stage consultation.

We are concerned also about the narrow scope of the assessment of air traffic noise at night at Heathrow in the stage one consultation document. No attempt was made to analyse the long term trend for the quota period (2330-0600) and no consideration was given to the full night period (2300-0700), particularly the shoulder periods (2300-2330 and 0600-0700). The second stage consultation should therefore include a more wide ranging noise assessment. Our own assessment in Annex 1 to this response suggests that fifty years after night flying restrictions were first introduced at Heathrow in 1962:

- More people are exposed to high levels of air traffic noise at night at Heathrow than at any other European Union airport, despite the fact that night flying restrictions may have applied longer at Heathrow than at many other EU airports.
- Aircraft movements in the night quota period are twice as loud at Heathrow than at Gatwick and Stansted and affect many more people at Heathrow than at Gatwick and Stansted, despite the fact that night flying restrictions have applied longer at Heathrow than at Gatwick and Stansted.
- Air traffic noise in the full night period (2300-0700) is likely to have worsened at Heathrow over the last twenty years due to the increase in the number of movements (i.e. individual noise events), particularly in the early morning shoulder period (0600-0700).
- There has been a small reduction in the number of noise quota points overall and in the number of noise quota points per movement in the Heathrow night quota period over the last twenty years, but the number of movements (i.e. individual noise events) has increased and the movements are twice as loud at Heathrow than at Gatwick and Stansted. We estimate on the basis of the trend since 1993 that it will take 52 and 110 years respectively before noise per movement at Heathrow in the winter and summer seasons drops to the present levels at Gatwick and Stansted.

### Factual Information (Questions 2 and 3)

*Question 2: Do you have any comments on our assessment of the extent to which the current objectives have been met?*

The current objectives have been met but they need to be set within the context of the long term trend in night noise across the full night period (2300-0700). A comparison of one current data set with one past data set is unduly superficial, particularly if either or both data sets are unrepresentative of the long term trend. We note the headroom between quota and use and that the limit has little restraint but follows the gradual decrease in noise energy. See also our comments in response to Question 1 and the assessment in Annex 1 to this response.

*Question 3: Do you have any views on how these objectives should change in the next night noise regime?*

The objectives should include a commitment that operations at Heathrow Airport will move towards compliance with the World Health Organisation's limits on noise (individual noise level and average noise level) in each hour of the night period (2300-0700). Such a commitment is long overdue, bearing in mind that noise from air traffic at night is still a major disruption for many people living within audible distance of Heathrow's flight paths, despite night flying restrictions having been in operation at Heathrow for fifty years.

## Structure of the Current Night Noise Regime (Questions 4 to 11)

*Question 4: 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?*

In order to move towards compliance with the World Health Organisation's limits, the new noise quota points and movement limits at Heathrow should ensure that within one year of the new restrictions coming into force no scheduled movements should be permitted between 2300-0530; that within two years no scheduled movements should be permitted between 2300-0060; and that within five years there should be a reduction in the number of scheduled movements between 0600-0630. Further reductions between 0600-0700 would then be a matter for the subsequent restrictions regime.

We have reached this view because our assessment in Annex 1 to this response is that at the rate of progress since 1993 it will take another fifty two years and one hundred and ten years respectively before the noise per movement in the winter and summer seasons at Heathrow drop to the current levels at Gatwick and Stansted. Given that the current levels at Gatwick and Stansted are still excessive, the rate of progress at all three airports under the existing restrictions has been derisory.

The tables in Annex 2 to this response set out Heathrow's daily runway scheduling limits for movements per hour for each winter season from 2000-01 to 2011-12 and each summer season from 2001 to 2012. The comments below the tables calculate that if the largest scheduling limit per individual hour were applied across every hour in the day and evening period (0700-2300) Heathrow would be able to handle its legal limit of 480 000 air transport movements per year, together with 6 000 non-air transport movements and a contingency reserve of more than five per cent.

On the basis of the analysis in Annex 2, we consider that Heathrow has the capacity to enable movements that are currently scheduled between 2300-0700 to be re-scheduled between 0700-2300. Our proposed ban on movements 2300-0700 would therefore mean that Heathrow would still be able to handle its legal maximum of 480 000 movements per year, albeit only in the day and evening periods (0700-2300); that the airlines holding slots between 2300-0700 would retain those slots, albeit re-distributed 0700-2300; and that passengers who currently use scheduled services 2300-0700 would be able to access Heathrow 0700-2300 as well as other passengers.

We recognise that re-scheduling all existing services from between 2300-0700 to between 0700-2300 would involve a significant re-ordering of what is already a busy post-0700 schedule. For that reason we have suggested that the ban on night flights should be introduced in stages, beginning with the small number of movements pre-0600 which should be capable of rescheduling post-0700 with relatively little disruption to the existing post-0700 slot holders.

In our response to Question 30 we consider whether there are any reasons why scheduled movements should continue in the night period, notwithstanding the availability of sufficient capacity to re-schedule services between 0700-2300.

*Question 5: Do you have any new evidence to suggest we should amend or move away from the current QC classification system?*

No comment.

*Question 6: 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?*

We consider that the next regime should apply for not less than five years. Given that the Airports Commission is due to make its short term report in the autumn, we think it best to delay the second stage consultation on the next night flights regime until the short term report has been published.

We do not favour aligning the end of the next regime with the review of Heathrow's Noise Action Plan. Reviewing the night restrictions regime and introducing a new regime is a process that in the past has taken at least two years to complete, which would delay finalisation of the new Noise Action Plan.

*Question 7: Do you have any views on how dispensations have been used?*

We are not pressing for changes to the dispensation arrangements.

*Question 8: Do the dispensation guidelines still adequately reflect current operational issues?*

No comment

*Question 9: 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?*

No. The headroom designed into the system to cater for dispensations would allow for greater concentration of movements and disturbance than the current system.

*Question 10: Do you consider there is still a need to retain the principles of carry-over and overrun? If so please give reasons why.*

No comment at this stage

*Question 11: 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?*

No comment at this stage.

## Exploration of Options for the Next Night Noise Regime (Questions 12 to 40)

### *Question 12: Do you have any comments on our analysis of fleet and operational trends?*

We have no comment on the detail, but we note that paragraph B.9 on page 9 of the annexes to the consultation document states that Terminal 5 and the re-development of Terminals 1 and 2 will increase terminal capacity above 90 million passengers, allowing more passengers per year to be flown in, mainly through an increase in the average size of aircraft in the Heathrow fleet.

With Heathrow currently operating close to the legal limit of 480 000 air transport movements per year, carrying more passengers per movement is the only way that the additional terminal capacity can be used. But the rate at which the average number of passengers per movement is increasing may be slower than was envisaged at the Terminal Five Public Inquiry, which forecast that Heathrow would be handling 90 million passengers in 480 000 movements per year by 2016.

### *Question 13: 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)?*

See our response to Question 12 concerning the need to increase the average capacity per aircraft in order to increase the average number of passengers per movement.

### *Question 14: 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).*

We understand that local authorities generally apply the WHO guideline limits on noise to land based noise sources but their efforts are undermined by the higher noise levels experienced from aircraft overhead, which insulation cannot reduce to background noise levels or lower. Population growth and scarce land resources in the southeast mean that it is impossible to avoid new development in areas that would not meet the WHO limits on noise. We argue that night flights are an optional extra that should not deter or prevent essential land use under the flight paths.

### *Question 15: Please provide any information on the feasibility of increasing the angle of descent into Heathrow Gatwick or Stansted particularly within the next seven years.*

No comment on operational feasibility but as residents we would not want any consequential increase in noise at points along the descent route (for example, should the angle of descent need change near touch down), particularly in areas closer to Heathrow that already suffer from higher noise levels than do areas that are likely to benefit most from this proposal. It is not clear whether an increased angle of descent would apply to all flights (i.e. day and night and large and small aircraft) and when the operations might change - we would not favour uncertain benefit being taken into account now if it were to commence a long time in the future. See also our response on allocation of noise in Question 16.

### *Question 16: 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?*

Our approach generally is to secure an overall reduction in night noise. We do not favour a simple redistribution of noise between communities even when more people would benefit than would lose out. We therefore support noise reduction benefits being allocated in proportion to the level of noise in any particular community. So if a package of benefits were achieved from other initiatives and mixed with losses from redistribution such as easterly preference, so that no community experienced a net loss, we would support easterly preference.

*Question 17: Do you have any views on the costs and benefits of a night-time runway direction preference scheme at Gatwick or Stansted?*

No comment.

*Question 18: 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.*

No comment on feasibility but we support displacement if it reduces the noise impact overall and does not simply shift the noise from one inhabited area to another. It is not clear whether a displaced landing would apply to all flights (i.e. day and night and large and small aircraft) and when the operations might change - we would not favour uncertain benefit being taken into account now were it to commence a long time in the future. See also our response on allocation of noise in Question 16.

*Question 19: Please provide any information about airspace changes or other operational procedures which could mitigate the impact of night noise in the next regime period*

No comment.

*Question 20: Do you have any comments to make on the figures relating to movement limits and usage?*

The noise from air traffic at night to which residents living within audible distance of the flight paths are exposed is a reflection of the number of movements that take place, not the limit on the number of movements that are permitted. As argued more fully in Annex 1 to this response, the number of movements permitted per season has decreased since 1993, but the number of actual movements per season has increased.

The movement numbers indicate the frequency with which noise disturbance occurs. But this metric does not take account of the benefit from a period of silence at night. Moreover, the movement that first disturbs has a disproportionate impact.

*Question 21. 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?*

Demand in the night quota period at Heathrow is for long-haul flights and we would expect long haul passenger numbers to increase in line with forecasts made by the DfT (2013). Given that Heathrow is currently operating close to the 480 000 limit on the number of air transport movements permitted per year, more passengers will have to be carried per movement in future than is the case at present (see our responses to Question 12).

We are not aware of the aviation industry's current projections, but its evidence to the Terminal Five Public Inquiry was that the number of movements in the night quota period had been stable over twenty years and that the opening of Terminal Five would not result in more movements in the night quota period. The fact that Heathrow is currently operating close to the 480 000 limit on the number of air transport movements permitted per year at Heathrow means that any additional movements in the night period would be possible (if permitted) only if there is a corresponding reduction in the number of movements in the day period.

*Question 22: Do you have any comments to make on the figures relating to noise quota limits and usage?*

We note the headroom between quota and use and that the limit has little restraint but follows the gradual decrease in noise energy. Our view is that the noise energy is far too high and the rate of decrease too slow hence the need for a flight ban. Also, while the energy may be reducing the numbers of people impacted are growing. Furthermore, the metric and associated contour size does not take account of the importance

of length of silence (respite) at night. The impact of the first plane in waking up people has a hugely disproportionate impact to the average energy impact. We do not agree that the under-usage of quota points at Heathrow is due to fewer movements.

***Question 23: Do you agree with our initial assessment of the scope for reducing the noise quota in the next regime without imposing additional costs?***

The trend towards less noisy aircraft in both the day and night periods should mean that fewer noise quota points are needed to enable the existing number of permitted movements to take place in the noise quota period. There should therefore be scope for reducing the permitted number of quota points without reducing the permitted number of movements. But the noise levels are still likely to exceed the World Health Organisation limits for noise at night even with a reduced noise quota. For that reason we have proposed in response to Question 4 that movements in the night period should be phased out in stages.

***Question 24: 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?***

There are about sixteen scheduled movements at Heathrow in the seventy minute period between 0450 and 0600 (in practice some of the movements start to arrive ahead of schedule from 0430). Given the relatively low number of movements and the intervals between movements, it is not possible to say which is worse, the noise from individual movements or the average noise from all the movements. But people hear a succession of individual noise events between quiet intervals, not a uniform average noise level between 0450-0600. See also our response to Question 20.

***Question 25: 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.***

In response to Question 4, we have proposed a ban on all movements between 2300-0700, to be introduced in stages. In response to questions 25 and 27, we make suggestions for restrictions on the noisiest classes of aircraft in the next regime during the stages in which we have proposed that the ban should be introduced.

Scheduled and operational movements by QC/16 and QC/8 aircraft are currently banned 2300-0700 except for operational reasons 2300-2330. We propose that this exception is removed and that all movements by QC/16 and QC/8 aircraft are banned 2300-0700.

***Question 26: 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?***

No comment.

***Question 27: 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.***

Scheduled movements by QC/4 aircraft are currently banned 2300-0600 but operational movements are permitted. We propose that all movements by QC/4 aircraft should be banned 2300-0700.

Scheduled and operational movements by QC/2 aircraft are currently permitted 2300-0700. We propose a ban on scheduled QC/2 movements 2300-0700 and an operational ban 2330-0600.



*Question 28: Are there more cost-effective alternative measures (such as penalties) to reduce the number of unscheduled QC/4 operations during the night quota period?*

We are not opposed to penalties in principle, but we doubt that economic incentives such as penalties would have much effect. The number of movements in the night quota period accounts for approximately one per cent of all movements per year at Heathrow. The fleet composition is therefore more likely to be influenced by the needs of the many movements in the day than by the relatively few movements at night. Regardless of economic incentives, there may not be the scope for reserving sub-QC/4 aircraft for use on a limited number of night routes if QC/4 aircraft are in widespread use for the many more day routes.

*Question 29: 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.*

In our response to Question 27 we have proposed that an operational ban of QC/4 aircraft should apply 2300-0700.

*Question 30: What is the rationale for operating services at precise times during the night quota period (as they do now)?*

The Department has never justified permitting movements in the night quota period due to a lack of capacity in the day and evening periods. The aviation industry has never claimed that movements in the night quota period are necessary due to a lack of capacity at Heathrow in the day and evening periods. In our response to Question 4 we have gone further than the Department and the industry and argued that there is sufficient spare capacity at Heathrow 0700-2300 to accommodate all the movements that are currently scheduled in the full night period (2300-0700), including in the night quota period. The rationale for operating services in the night quota period cannot therefore be a lack of capacity at Heathrow outside the night quota period. There has to be another explanation.

The tables in Annex 3 to this response set out data about the scheduled movements pre-0600 in the winter season 2011-12 at Heathrow. We have selected the pre-0600 period for detailed analysis because in our view: (a) it is the period of the night where the introduction of complete respite from air traffic noise is most urgent; and (b) re-scheduling the relatively small number of pre-0600 movements to the daytime should be possible without the need for a major re-structuring of the existing daytime schedule, and could therefore be achieved within our recommended two-year timetable. We have additionally focussed on the winter season because there are more scheduled movements per day in the winter season than in the summer season.

#### **Number of destinations served pre-0600**

Table 1 in Annex 3 shows that Heathrow handled air traffic from 211 destinations in 2011, of which 192 carried more than 2 000 passengers over the year (arrivals and departures combined) and 19 carried less than 2 000 passengers. Table 2 shows that pre-0600 air traffic in the winter season 2011-12 served 13 destinations, approximately 7 per cent of Heathrow's destinations carrying 2 000 or more passengers per year (arrivals and departures combined). Table 3 shows that twelve of the destinations with pre-0600 services also had post-0600 services <sup>1</sup>. The analysis of these data does not explain why 13 destinations require pre-0600 services whereas 179 destinations <sup>2</sup> do not.

#### **Arrivals and departures**

Table 2 in Annex 3 shows that the pre-0600 services are all arrivals. Air traffic requires a matching number of movements in both directions, so it is not clear why pre-0600 traffic should be so lop-sided in favour of arrivals to the exclusion of any departures. But if Heathrow can function without pre-0600 departures just how necessary are pre-0600 arrivals?

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<sup>1</sup> The one exception is Melbourne. The pre-0600 arrival is routed via Singapore. The website shows that Melbourne can access Heathrow 0600-2300 by transfer flights at other airports in the Far East and Near East. Presumably there is insufficient passenger demand to sustain direct services to Heathrow.

<sup>2</sup> 192 less 13 destinations carrying fewer than 2 000 passengers per year.

### **Regional analysis**

It is sometimes stated that pre-0600 services are essential for the Far East, particularly for departure times that avoid the night curfew periods at some airports. But the data offer only limited support for this explanation, with many contradictions. For example, the Far East accounts for only six of the thirteen pre-0600 destinations listed in Table 2 in Annex 3, with the seven other destinations in Africa (4), the Near East (1) and North America (2). The Far East time zone argument therefore does not explain the need for the majority of the pre-0600 services. But the data also raise questions about the need even for the Far East services:

- Table 1 shows that Heathrow served 30 destinations in the Far East in 2011: why do only six of them need pre-0600 access to Heathrow?
- Table 3 shows that - with the exception of Melbourne <sup>3</sup> - the Far East destinations have post-0600 arrivals at Heathrow so the pre-0600 arrivals are not the only Heathrow options for these destinations.
- Table 4 and Table 5 show that other Far East destinations in similar time zones can access Heathrow without the need for pre-0600 services.

### **Individual destination analysis**

Table 6 in Annex 3 sets out the number of movements and passengers between Heathrow and the thirteen destinations with pre-0600 services. Four of the thirteen destinations - Boston, Chicago, Hong Kong and Singapore - each carry over one million passengers per year, making them among Heathrow's most heavily subscribed long distance routes. But other popular long distance routes carrying more than one million passengers per year - such as New York, Los Angeles, Delhi and Dubai - do not operate pre-0600 services. Two of the thirteen destinations - Accra and Riyadh - are among the least heavily subscribed of Heathrow's long distance destinations. The other seven of the thirteen destinations vary between being closer to the most popular or closer to the least popular long distance destinations. The data does not reveal any obvious explanation of why these particular 13 destinations need pre-0600 services and the other 179 destinations do not.

### **Duplicated services**

Table 2 in Annex 3 shows that within a sixty-five minute period (0450-0555) services from the following five destinations were duplicated:

- Hong Kong four arrivals every night, two at 0450 (one from Sydney en route to Heathrow) and two at 0500.
- Nairobi two arrivals every night except Saturday, one at 0530 and one at 0545.
- Riyadh two arrivals on Thursday and Sunday, one at 0520 and one at 0555.
- Singapore four arrivals every night, one at 0450, one at 0510 (from Melbourne en route to Heathrow), one at 0520 (from Sydney en route to Heathrow), and one at 0555.
- Sydney two arrivals every night, one at 0450 via Hong Kong and one at 0520 via Singapore.

Duplicated pre-0600 services may indicate that the destinations have not been able to secure post-0600 slots at Heathrow. But Table 3 in Annex 3 shows that, with the exception of Melbourne, the other twelve destinations - including all five destinations with more than one pre-0600 service - operate at least one post-0600 service, and the majority of the thirteen destinations operate more than one post-0600 service.

### **Timing of pre-0600 arrivals**

Table 2 in Annex 3 shows that the average seventeen arrivals pre-0600 (see comment at the bottom of Table 3) are scheduled to arrive in a sixty-five minute period between 0450 and 0555, with a five minute interval (0555-0600) before the night quota period ends. The number of movements between 0700-2300 approach or exceed eighty per hour (split between arrivals and departures, with arrivals exceeding departures in some hours and departures exceeding arrivals in other hours). It is not clear why the seventeen pre-0600 arrivals (with no departures competing for use of the runways) could not be scheduled more closely 0530-0600. This bunching would worsen the noise in that half hour (which is why we have

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<sup>3</sup> See footnote 1 above.

recommended it only as an interim measure to ending all movements pre-0600) but it would extend the current period of respite from air traffic from 0450 to 0530.

#### **Conclusion**

The pre-0600 services operate because the Department permits them to operate. There does not seem to be any other explanation that is supported by the data that we have examined.

*Question 31: What is the scope for introducing a respite period at Gatwick or Stansted? Please set out the associated costs and benefits.*

No comment.

*Question 32: What is the feasibility of making Heathrow's voluntary curfew mandatory?*

It is not clear why this is necessary as an isolated exercise unless the Department has concerns (which we would share) that the industry intends to disregard the voluntary agreement; or that the Department intends to extend the curfew which we would support.

*Question 33: If you favour a guaranteed respite period, what would be the minimum period which you would consider to be worthwhile?*

Respite from scheduled movements is necessary across the full night period (2300-0700) in order to meet World Health Organisation limits on community noise at night. In our response to Questions 3 and 4 we have suggested how a ban could be introduced in stages in the next night flying restrictions regime.

*Question 34: 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?*

We would favour this only as an interim measure towards compliance in stages with the WHO limits. See our response to Questions 3 and 4.

*Question 35: 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?*

What evidence is there that "out of alternation" would prevent any unscheduled night flights; or that the absence of "out of alternation" is responsible for all unscheduled night flights? Were daytime de-alternation to reduce the number of unscheduled night flights it is essential that noise impact be considered as well and as far as residents are concerned the trade-off would be high risk and very unlikely to benefit them and as a result the trade-off would be opposed.

*Question 36: What value do you place on day time respite compared with relief from noise in the night quota period?*

The air traffic noise levels at Heathrow exceed the WHO limits on community noise in the day and night periods. Noise reduction should therefore continue in the future in both periods. Our proposal for a night flight ban recognises that the flights would be replaced by daytime flights along with a transfer of the associated noise but we place great value on there being a period of silence at night. See also our response to Question 54.

*Question 37: 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?*

In principle we support incentives, but it is our understanding that landing fees must be based on the cost-recovery of the airport operator. It is not clear how the noise level can add to or detract from the airport

operator's costs. For the reasons set out in response to Questions 28 and 40, we doubt whether economic incentives can influence the fleet composition at Heathrow in the night period.

*Question 38: 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.*

A problem of the system is that planning authorities oppose its use for Listed buildings of which there are many in Richmond and the scheme is confined to a single supplier whose product is not generally suitable for listed buildings.

*Question 39: 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?*

No comment at this stage.

*Question 40: 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?*

The number of movements 2330-0600 accounts for approximately one per cent of all movements per year at Heathrow (nearly 480 000 movements per year). The composition of the fleet is therefore likely to be determined predominantly by the needs of the daytime movements, with little scope for varying the fleet to cater specifically for night movements. For example, the noise-dominant aircraft in the day and night at Heathrow at present is the Boeing 747-400. Over the last couple of years the number of 747-400s has decreased at Heathrow, with consequential benefits in noise reduction in the day and night periods. But it is unlikely that this reduction in 747-400s was influenced predominantly by concern for the levels of noise at night. See also our response to Question 28.

## Night Flights Evidence Review (Questions 41 to 70)

*Question 41: 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?*

Air transport users. Paragraphs 6.4 to 6.8 of the consultation document list a number of issues and suggest that night flights enhance user choice (e.g. frequency of flight times and number of destinations), user costs are lower because night capacity adds to restricted airport resources, and there is a reduction in travel time for passengers and freight. Airlines. Paragraph 6.9 says “Night flights provide an additional source of potential profits to airlines and airports”. Benefits. Paragraphs 6.4 to 6.9 seem to give bias to the benefits of night flights without supporting evidence and to a greater extent than concluded by the CE Delft Report (2011) covering the night quota period 2330- 0600.

We broadly support the CE Delft Report in the weighting it gives to these issues and the evidence it provides. The Report recognises the absence of some types of evidence and the need in some cases to apply qualitative judgement. In spite of this, we believe the conclusions supporting a ban on flights in the night quota period are well supported and adequately take account of the quality of the evidence and assumptions. We go a stage further and regard the case for a ban as being even stronger and that it should extend to the shoulder periods 2300-2330 and 0600-0700. We consider that the benefit of night flights is overstated and the negative impact of the noise is understated. We deal with the benefit of night flights next and with the noise in our response to Question 54.

The debate between CE Delft and Oxford Economics on the incremental value/cost of a ban depends significantly on two assumptions: (a) the amount of daytime capacity that is available to replace night time capacity: and (b) the proportion of night passengers that would switch to the daytime.

On the first assumption, it is widely conceded that there is airport and airline daytime capacity to take some or all of the night flight passenger demand using additional daytime runway slots and/or increased passenger loads on existing flights. We have commented on this in our response to Question 4. The evidence suggests there is sufficient daytime capacity to serve, in approximate annual terms, all of the 1.5 million passengers currently in the night quota period 2330-0600 and the 2.6 million passengers in the period 0600-0700. The evidence suggests that CE Delft and Oxford Economics are too cautious on the availability of daytime capacity.

On the second assumption, the DfT Long Term Demand Forecasts (2013) estimate, in approximate annual terms, that there is 3.3 million suppressed passenger demand at Heathrow in 2014 rising to 9.7 million in 2019 (the period of the next night flight regime). This suppressed demand is unlikely to match exactly the type of any night flight demand that is lost through a ban but in terms of total numbers it far exceeds the night flight demand by 2019. In consequence, it seems entirely reasonable to assume that there would be no reduction in total passenger numbers as a result of a ban. The airlines and Heathrow would lose little if any revenue. We comment on costs and hence profits in our response to Question 51. Any loss of choice by night flight passengers would be compensated for by increased choice of daytime flights available to the suppressed demand passengers.

It should be pointed out that the 5500 air transport movements in the noise quota period are approximately 1 per cent of total movements annually and the 22 000 movements in the night shoulder periods are 4.5 per cent, so that a night flight ban represents a small proportion of flights as far as passengers, the airlines and Heathrow are concerned. Conversely, night noise has a large impact on residents, as discussed below and in Annex 1 to this response.

Transferring the night-time business to the daytime removes the downside uncertainty in the CE Delft Report where the results from a ban in the night quota period 2330-0600 range between a net benefit to the UK economy of £860 million and a net cost of £35 million over a ten year period. We have not been able to locate on the web a copy of the Oxford Economics Report 2011 but from the details in this DfT consultation document we believe taking account of the suppressed demand at Heathrow would substantially, if not entirely, remove the negative impact of a ban concluded by Oxford Economics.

Should there be a night flight ban, then the airlines and Heathrow have good reason to replace, in approximate annual terms, the 5500 movements in the night quota period 2330-0600 and the 22000 movements in the shoulder period 0600-0700 with a similar number of daytime runway slots so as to operate up to the planning limit.

***Question 42: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing air passenger impacts?***

Paragraphs 6.21 to 6.31 deal with approach and method including that in the DfT's Appraisal TAGs 1.1, 2.5 and 3.18 and associated TAGs 3.3.2 on noise, 3.3.4 on air quality, 3.3.5 on greenhouse gases, 3.16 and 3.5.9 on surface transport and the DfT demand forecasting model and associated models. Some of these go beyond air passenger impacts as does our response to this question but we also refer to them in answer to later questions on the specific topics. It has not been possible for us to study the Aviation Appraisal approach in detail but broadly it seems reasonable. We comment as follows on five issues relevant to this question.

**Transfers**

In our view there needs to be a detailed review of transfer passengers and in turn the airport hub concept both in the night flight and wider context. Our evidence suggests that taking account of benefits and costs, transfers and in turn the hub concept, are over-valued and that the future of UK aviation is being promoted on an increasingly outdated premise concerning the value of transfers. The output from this analysis could usefully be entered into the DfT models.

**Connectivity**

We do not believe Heathrow connectivity (in terms of number of destinations and frequency of service) is materially enhanced by the night flights and by replacing all the night flight runway slots with daytime slots there could be scope to add new destinations. We think that the DfT models could deal with this situation.

**Freight**

We note the value of freight handled by Heathrow is much less than at other airports and that at night even less so, with all freight being carried in the holds of passenger aircraft. While we acknowledge the importance of freight generally, we believe the time critical element of some freight is not so rigid as not to allow transport a few hours earlier or a few hours later. Already freight transport has to fit in with air transport movement schedules for destination and timing and night flights with cargo in the hold represent only a very small part of the overall number of Heathrow flights. Moreover, we have suggested in our response to Question 41 that an equivalent number of flights lost at night can be created in the day so the freight capacity should not change. We would expect a relatively simple model to be adequate.

**Logic of analytical framework**

The economic value-benefit approach used by the models and which focusses on the UK as a whole we believe is valid; but it is hard for the public to follow and lacks transparency. A more straight forward accounting approach used by business in project appraisal could be usefully used as the starting point with adjustments then made to produce an appraisal of the UK economic value. This has the added advantage of more clearly presenting the values to individual stakeholders and seeing how they might respond in their own interests. For example, the airport and airline sectors might well treat the night flight period as a profit centre and examine the impact of combining it with their daytime profit centre. In accounting terms this is not difficult to do.

It is essential to appraise the incremental impact of the options compared to the status quo, which the appraisal process apparently does. But too often we hear night flight supporters claiming a loss of absolute value of night flights without offsetting the value of alternatives. We are concerned that the incremental appraisal process should not focus on the increment alone but on a comparison of absolute value derived for each option. For example a rate of return based on an increment alone can produce highly misleading results. Business financial decisions usually start with revenue and then work down through the costs to the resulting profit and return on capital for each option separately rather than comparing the options incrementally line by line (e.g. passengers revenue).

**Absent data**

For better understanding by the public we think it necessary to set out some key passenger statistics - for example, the number of scheduled flights divided into four periods: the night quota period, each of the two shoulder periods, and combined day and evening periods. To this we recommend adding the number of passengers, analysed by purpose of travel (business/leisure), residency (UK/foreign) and destination (domestic/short haul/long haul) and transfers (domestic/international and international/international). Also, the air transport movements should be divided between foreign and UK airlines. Aircraft fleet mix details need to be provided. Ticket prices and resulting revenue in these categories also should be provided. Very little of this night-time information is provided in the consultation or the annexes thereto or by the CAA and other potential sources in a way the data can be comprehensively modelled or

understood by the public; for the most part is not available at all. We realise some of the information may become available in the second stage consultation but its absence in the first stage has hampered our response.

*Question 43: 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?*

Paragraphs 6.37 to 6.47 raise issues about modelling passenger's value of time and the opportunity cost of not being able to travel at night. Our proposal stated in our response to Question 41 for using suppressed demand to replace night flight demand would seem to reduce or remove the significance of these issues. We suggest therefore that the DfT Long Term Passenger Demand model might be used without the need for "off-model" analysis.

*Question 44: Do you think that 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 chose 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?*

Please see our response to Questions 41 and 43.

*Question 45: 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?*

No, as we have explained in Question 41 there is suppressed demand that can substitute lost night flight demand.

*Question 46: 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?*

No, as we have explained in Question 41 there is suppressed demand that can substitute lost night flight demand.

*Question 47: 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?*

We have not been able to find the Oxford Economics Report on the web and J22-J23 of Annex J provides no detail of how productivity is related to business usage, so we are unable to comment.

*Question 48: 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?*

We have not been able to find the Oxford Economics Report on the web and J22-J23 of Annex J provides no detail of how business and other passengers impacts inter-relate, so we are unable to comment.

*Question 49: 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?*

Please see our response to Question 43.

*Question 50: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing airline and airport impacts?*

Please see our response to Question 42.

*Question 51: What are your views on how we should assess the impacts on profits if we are unable to use the Department's aviation models?*

We have commented on the impact of a ban on passengers numbers in Question 41 where we say that in our view suppressed daytime demand will substitute night flight demand so that airline and airport throughput should not change. In practice there may be some change to the purpose of travel (e.g. business/leisure mix) and to the distance (domestic/short haul/long haul mix) and hence the ticket price but broadly we believe the revenue of the airlines and Heathrow should not change materially. Our very approximate guess is that ticket sales of £768 million per annum for the night quota period 2330-0600 and £413 million for the shoulder period 0600-0700 would be rolled into the £19 billion of daytime revenue. Heathrow's aeronautical revenue is approximately £1,000 million per annum and other revenue of similar amount and we do not see this changing materially following a night flight ban.

Profits of course equal revenues less costs. On the supply side of any night flight appraisal the fact is that the airline and airport sectors are capital intensive and one only has to compare their low sales/asset ratios with other sectors to see this is the case. This means that a substantial proportion of the costs are sunk costs in aircraft, runways, terminals etc and any ban on night flights will have no economic or accounting impact on these and hence profits.

There are indirect operating costs - overheads, etc which are unlikely to vary either. Some direct operating costs are time variable and others are dependent on numbers of passenger or air transport movements. We have not examined in detail the extent to which the cost structure and costs themselves would be varied by a ban but given that we suggest the numbers of passengers and movements will not change materially then we would not expect there to be a significant negative impact on profits and there could be a positive impact as discussed below. In broad terms the difference will be about reducing the operating hours of the airport and concentrating the same volume and type of activity into the daytime. There could be incremental benefits in terms of heat and light savings, more opportunity to undertake uninterrupted runway and other repairs at night and increased aircraft loads and efficiency. We expect that the night time operation of Heathrow is relatively inefficient compared to the daytime because of higher unit costs and the relatively low passenger and movement through-puts. Reduced employment and unit labour costs caused by a ban should be positive in so far as efficiency and therefore profit is improved .

Our conclusion is that the airline and airport profits should be no less with a ban and possibly could be improved.

Paragraphs 6.50 to 6.52 discuss the Oxford Economics approach to assessing the impact of a ban on profits by using an average profit rate. We are not in favour of this and recommend standard marginal accounting treatment that examines each cost and the extent to which it is variable or fixed along the lines discussed above. The approach is simple and reliable and almost invariably used by companies for project appraisal and managing their businesses. We believe in this case that the outcome of the average approach may not differ significantly from that of the marginal approach but we still recommend the marginal approach to estimating profits.



*Question 52: 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?*

We have not been able to find the Oxford Economics Report on the web and Annex J does not provide sufficient detail to enable us to comment.

*Question 53: Is there any other evidence we should consider in assessing the impacts of a change in the night flights regime on airlines and airports?*

No comment.

*Question 54: 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?*

We have examined DfT Tags 3.18 and 3.3.2 on Noise, ERCD Report 1208 dated 2013 (“Aircraft noise, sleep disturbance and health effects: A Review”), ERCD Report 1209 dated 2013 (“Proposed methodology for estimating the cost of sleep disturbance from aircraft noise”), WHO Report dated 2009 (Night Noise Guidance for Europe) and WHO Report dated 2012 (Methodological guidance for estimating the burden of disease from environmental noise). Broadly we note the approach for estimating the cost of noise impact and we have comments on the following topics:

#### **Noise Exposure Values: General**

CE Delft base their assessment of the number of people affected by air traffic noise at night at Heathrow on the > 50 decibel  $L_{night}$  ( $L_{Aeq}$ ) noise exposure contour, prescribed for the strategic noise mapping of inter alia major airports by Directive 2002/49/EC on the assessment and management of environmental noise. We recognise that the strategic noise maps give a more comprehensive assessment of air traffic noise exposure during the night period (2300-0700) at Heathrow than anything that has been published previously by the UK authorities. But the 50 decibel  $L_{night}$  contour falls short of assessing the number of people who are exposed to noise levels at night that exceed the guideline levels recommended by the World Health Organisation (WHO) in *Guidelines on Community Noise*<sup>1</sup>. WHO’s *Night noise guidelines for Europe (6)* (2009) present new evidence of the health damage of night-time exposure to noise and recommend threshold values that, if breached at night, would threaten health. These include an annual average night-time exposure to noise not exceeding 40 decibel (dB) outdoors.

#### **Noise Exposure Values: Noise Quota Period**

Contours at different noise levels make a significant difference to the size of the area and number of people affected. We note that Fig 7 Annex B of the stage one consultation document plots the 48 dBA  $L_{night}$  (6.5 hour) contour for the noise quota period and that Table 3 shows the exposed area to be 41.1 km<sup>2</sup> with 132 400 people as opposed to 64 900 people within the 51 dBA contour. ERCD Report 1209 at paragraph 2.2.7 says: *Because of the potentially significant effect that the lower threshold may have on the overall results, it is proposed to report costs down to both a 45 and a 48 dBA  $L_{night}$ (6.5 hour) lower threshold.* This we fully support. We can only guess but the population affected at 45 dBA would be substantially greater than at 50 dBA used in the CE Delft study and the cost of noise impact would be significantly higher. We strongly recommend that the 45 dBA  $L_{night}$ (6.5 hour) contour be plotted and the results taken into the cost analysis prior to the second stage consultation.

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<sup>1</sup> The WHO indoor guideline values inside the bedroom for avoiding sleep disturbance (the main impact of night flights) are 30 dB  $L_{Aeq}$  for continuous noise and 45 dB  $L_{Amax}$  for single sound events (45 dB  $L_{Aeq}$  and 60 dB  $L_{Amax}$  respectively when measured outside the bedroom window). Assessment of the air traffic noise exposure at night at Heathrow against the WHO guideline values would therefore require strategic maps at > 45 dB  $L_{night}$  ( $L_{Aeq}$ ) over the period 2300-0700, supplemented by indications of the number of single noise events (i.e. individual aircraft movements) at > 60 dB  $L_{Amax}$  over the same period. The need for the supplementary indicators - permitted by Directive 2002/49/EC at the discretion of Member States - is particularly important given the pattern of movements in the night period at Heathrow, which is characterised by a limited number of movements 2300-2400, more frequent movements 0430-0600, and intense movements 0600-0700. Indeed, prior to the adoption of Directive 2002/49/EC, the UK Government decided not to produce night contours because the concentration of movements at either end of the night period made it questionable to use the averaging techniques inherent in  $L_{Aeq}$  (see *Night Restrictions at Heathrow, Gatwick and Stansted: First Stage Consultation* (February 1998), Annex 5, paragraph 18).

### **Noise Exposure Values: Full Night Period**

The WHO guidelines apply 45 dBA for L<sub>night</sub> (8 hour) (2300-0700) which we believe should also be provided as part of the cost/benefit assessment. The number of people affected must surely be still greater and also reflect the noise extended to the shoulder periods 2300-2330 and 0600-0700. Even this is only partial recognition of the noise since the WHO 40 dBA guideline limit would result in even greater noise impact being recognised.

### **Noise Exposure Values: Night Shoulder Periods**

The shoulder periods experience a substantial increase in the population affected. As mentioned above, Table 3 of Annex B of the Consultation shows there are 132 400 people affected within the 48 dBA L<sub>night</sub> (6.5 hour) contour and Table 3 shows that within the 50 dBA L<sub>night</sub> (8 hour) contour 211 400 people are affected (there is not a matching 48 dBA 8 hour contour). Presumably this is due mainly to the increased number of air transport movements in the morning shoulder period but the size and noise of individual aircraft in the respective periods could make a difference also.

### **Local Authorities and WHO Guidelines**

Local authorities generally work to the WHO guidelines in managing noise in their communities. The British Standard is applied to air conditioners, extractors and other sources of land based noise but the environment created is then over-ridden by much higher noise levels from aircraft. Furthermore, insulation for new developments designed and required to satisfy these WHO levels through local planning policies is less than effective in dealing with the higher levels of aircraft noise. The higher noise levels undermine the essential efforts of local authorities in addressing noise issues in the community.

### **Vulnerable Groups**

We question how effective the cost approach is in reflecting the cost to the most vulnerable people. Not only do people differ in their sensitivity to noise (some are light sleepers for example) but also the noise can have widely differing impact depending on life style and vulnerability which together give rise to a variety of consequences. Children, the chronically ill and the elderly are particularly vulnerable. The concept of minimising the impact on the more vulnerable is accepted in the management of health and pollution. It should also be accepted for noise management.

### **Eight Hours' Sleep**

The night time is a valuable resource for residents in that it provides peace and quiet which facilitates relaxation and sleep. WHO guidelines say the sleep period should be at least 8 hours for most people. We believe that the value of un-interrupted silence (the assessment of which the CE Delft Report calls the Stated preference or willingness-to-pay approach) is likely to exceed the cost of the health impact over the long term. Moreover, the marginal value of extending the period of peace from 2300 to 0700 is likely to be high. That is not to say the average cost from the impact of the first and subsequent noise incidents is less important. In fact the marginal cost of the first aircraft is probably high since it awakens people. The CE Delft Report focuses on the cost in the period of noise rather than the value of the period of silence. We regard the cost approach by CE Delft as a sound basis but expect a value approach to demonstrate an even greater negative impact from night flight noise.

### **Beyond Pricing**

People probably accept that aviation is an important and necessary activity which benefits the UK and themselves indirectly and if they travel or they work in the aviation industry then it benefits them directly as well. Therefore most people probably accept that there needs to be a balance between noise impact and aviation benefit during the daytime. But the night time is a valuable asset of peace and quiet to residents which currently is devalued by aviation night noise. Night time aviation provides little benefit to the great majority of residents either directly or indirectly, with the exception of employees in the aviation sector.

Crudely put, around 4000 people a night have the opportunity to sleep on their flight but expose 132 400 people in the noise quota period 2330-0600 to the risk of noise above 48 dBA and loss of sleep and related harm. In the shoulder period 0600-0700 an additional 7 000 people arrive having had the opportunity to sleep but in doing so expose 211 400 people to noise above 48 DBA and the loss of sleep and related harm. Applying the WHO 40 dBA guideline would substantially increase the number of people at risk. Furthermore, as we have commented in response to earlier questions, the night time aviation can be accommodated in the daytime at no incremental net cost.

But even were there to be a cost of a night flight ban there is no justification in avoiding it by placing the burden on residents. There is no balance to be struck and the proportionality test in the CAA

methodology is inappropriate. We do not believe this contradicts the ICAO balanced approach principle to aircraft noise management, because other solutions are not sufficient.

*Question 55: 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?*

No comment.

*Question 56: Do you agree that we should ensure that the method used to assess air quality impacts should be proportionate to the proposals under consideration?*

Yes, broadly speaking but for particulates any pollution is generally accepted as being too high and as such there is no acceptable balance.

*Question 57: Is there any other evidence we should consider in assessing the air quality impacts of changes in the night flights regime?*

No comment.

*Question 58: Do you agree with our proposed approach? Is there any evidence on nonCO2 climate change impacts we should consider?*

No comment.

*Question 59: Is there any reason why we should not seek to ensure consistency with the Aviation Appraisal Guidance approach to assessing public accounts impacts?*

No comment.

*Question 60: 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?*

No comment.

*Question 61: 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?*

We have not been able to find the Oxford Economics Report on the web, so we are unable to comment.

*Question 62: 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?*

Yes.

*Question 63: 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?*

No comment

*Question 64: 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?*

We have not been able to find the Oxford Economics Report on the web and J22-J23 of Annex J provides no detail of how productivity is related to business usage, so we are unable to comment.

*Question 65: 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?*

No comment

*Question 66: 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?*

No, as we have explained in Q41 there is suppressed demand that can substitute lost night flight demand so that tourism should not be affected.

*Question 67: 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?*

No, as we have explained in Q41 there is suppressed demand that can substitute lost night flight demand so that broadly speaking productivity should not be effected although there may be some efficiencies gained in concentrating the night flight business in the daytime.

*Question 68: 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?*

No, as we have explained in Q41 there is suppressed demand that can substitute lost night flight demand so that employment in the UK economy should not be effected. There may be some reduction in Heathrow employment but agree with CE Delft that there are substitute employment opportunities.

*Question 69: 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?*

No comment.

*Question 70: 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?*

We do believe the importance of surface transport sometimes is lost in the aviation debate. Passenger experience is important and Heathrow access is far from ideal. Passengers arriving at night may have difficulties in transportation and accessing hotels early in the morning.

## PART ONE: COMPARATIVE ASSESSMENT OF HEATHROW NIGHT NOISE AT PRESENT

### (i) Heathrow and other European Union Airports

Directive 2002/49/EC on the assessment and management of environmental noise requires Member States of the European Union to publish noise maps and supporting data for all major airports within their territory, using the matrices prescribed in the Directive. The main purpose of the Directive is to help with the assessment and management of aircraft noise situation at each major airport within the European Union. But the noise maps and supporting data generated in accordance with the Directive also provide a reliable basis for comparing the aircraft noise situation at those airports, regardless of their country of location <sup>4</sup>.

We do not know if the noise maps and data that have been published to date <sup>5</sup> have been analysed for the relative noise climates at the major European Union airports in the eight-hour night period (2300-0700). But a report by the European Commission published in 2005 found that more people are exposed to high levels of air traffic noise at night at Heathrow than at any other major European Union airport.

If the more recent noise maps and data confirm the findings in the 2005 study that night noise exposure is worse at Heathrow than at any other major European Union airport, it is a deplorable situation that successive UK Governments have permitted to develop, particularly bearing in mind that night noise restrictions have applied at Heathrow since 1962, which we understand is longer than at most other major European Union airports.

We have not been able to obtain information about the night noise situation at other major European Union airports in 2006 and 2011 (as required to be reported by Directive 2002/49/EC) in time for the deadline for responding to the stage one consultation document.

### (ii) Heathrow, Gatwick and Stansted

The Department for Transport's stage one consultation document on night flying restrictions at Heathrow, Gatwick and Stansted Airports includes separate noise data for air traffic at night at each of the three airports but makes no specific comparison between the night noise situations at the three airports.

Tables 1-3 below have been compiled from data in the stage one consultation document in order to compare the noise impact of air traffic at night at the three airports. They show that, despite the fact that night restrictions have applied at Heathrow for longer than at Gatwick and Stansted, many more people at Heathrow than at Gatwick and Stansted are exposed to high levels of noise; and that noise levels are higher at Heathrow than at Gatwick and Stansted.

The implied acceptance in the stage one consultation document that the noise levels are still excessive in the night quota period at Gatwick and Stansted (which we do not dispute) is a useful indication (which the stage one consultation document does not acknowledge) of just how much the worse the night noise situation is at Heathrow.

Table 1: Lnight (8-hour) - 50 decibels

	<i>Contour size</i> (km <sup>2</sup> )	%	<i>Contour population</i> (000s)	%
Heathrow	74.6	100.0	211.3	100.0
Gatwick	44.6	59.8	4.3	2.0
Stansted	36.0	48.3	3.5	1.7

Source: Stage One Consultation Document, Annex B, Table 2, pp. 7, 8.

<sup>4</sup> Prior to the adoption of Directive 2002/49/EC the noise measurement practices varied between countries and even between airports, which hindered comparisons of noise climates at different airports.

<sup>5</sup> Member States were required to publish noise maps and supporting data for the years 2006 and 2011

Table 1 shows the size of and the number of people living within the 50 decibel noise contour <sup>6</sup> at Heathrow, Gatwick and Stansted in 2011. The size of the Heathrow contour was approximately 60 per cent larger than the Gatwick contour and more than 200 per cent larger than the Stansted contour. The table also shows that the gap between the number of people living within the Heathrow contour (in absolute numbers and in numbers per square kilometre) and the contours for Gatwick and Stansted was proportionately greater than the difference in the respective contour sizes. This reflects the densely populated urban areas over which Heathrow's flight paths are routed compared with the more rural areas around much of Gatwick and Stansted.

**Table 2: Lnight (6.5-hour) - 48 decibels**

	<i>Contour size</i> <i>(km<sup>2</sup>)</i>	<i>%</i>	<i>Contour population</i> <i>(000s)</i>	<i>%</i>
Heathrow	41.1	100.0	132.4	100.0
Gatwick	34.1	83.0	4.2	3.2
Stansted	29.3	71.3	3.1	2.3

Source: Stage One Consultation Document, Annex B, Table 2, pp. 8, 9.

Table 2 shows the size of and the number of people living within the 48 decibel noise contour <sup>7</sup> at Heathrow, Gatwick and Stansted in the winter season October 2011 to March 2012 and the summer season March to October 2012. The populations in the 48 decibel contours dropped at all three airports compared with the 50 decibel contours (see Table 1). The larger drop at Heathrow (35 per cent drop) than at Gatwick (2.5 per cent drop) and Stansted (10 per cent drop) reflects the densely populated urban areas over which Heathrow's flight paths are routed compared with Gatwick and Stansted. The smaller size of the 48 decibel contours compared with the 50 decibel contours (see Table 1) reflects the proportionately larger number of movements in the shoulder hours (2300-2330 and 0600-0700) at all three airports that are included in the 8-hour 50 decibel contours but not in the 6.5-hour 48 decibel contours <sup>8</sup>.

**Table 3: Noise quota points per aircraft**

	<i>Winter season October 2011-March 2012</i>		<i>Summer season March - October 2012</i>	
	<i>Points per aircraft</i>	<i>%</i>	<i>Points per aircraft</i>	<i>%</i>
Heathrow	1.31	100.0	1.38	100.0
Gatwick	0.65	49.6	0.51	37.0
Stansted	0.71	54.2	0.62	44.9

Source: Stage One Consultation Document, Table 4, pp. 20, 21.

Table 3 shows the average number of noise quota points per aircraft movement <sup>9</sup> at Heathrow, Gatwick and Stansted in the night quota period (2330-0600) in the winter season October 2011 to March 2012 and the summer season March to October 2012. The basic premise in the stage one consultation document is that the larger the number of quota points are per movement the louder are the aircraft individually and collectively. The table shows that aircraft at Heathrow in both the winter and summer seasons used approximately twice the number of noise quota points per movement than did the movements at Gatwick and Stansted.

<sup>6</sup> 50 or more decibels of air traffic noise, averaged over an eight-hour night period (2300-0700) in the calendar year 2011.

<sup>7</sup> 48 or more decibels of air traffic noise, averaged over a six and one half-hour night period (2330-0600) between March 2011 and March 2012.

<sup>8</sup> If the number of movements were the same in each hour between 2300-0700, the size of 48 decibel contour would be larger than the 50 decibel contour because it is a lower value.

<sup>9</sup> Derived by dividing the number of noise quota points used in a season by the number of movements in the season.

**PART TWO: LONG TERM ASSESSMENT OF NOISE IN HEATHROW NIGHT PERIOD  
(2300-0700)**

The stage one consultation document says very little about the noise situation in either the full night period (2300-0700) or the night shoulder periods (2300-2300 and 0600-0700). The Department for Transport's most recent assessment of those periods was in the review in 1998 of the night flying restriction that had operated since October 1993. The review concluded that there had probably been a deterioration in the full night period due to an increase in the number of movements in the early morning shoulder period:

*Since the introduction of the present night restrictions regime in October 1993 there has also been an improvement in the noise climate around Heathrow during the night quota period between 11.30 pm and 6.00 am. This assessment is based on the total of the quota count (QC) ratings of aircraft counted against the noise quota: see Appendices B and C/1. However, there has probably been deterioration over the full night period between 11.00 pm and 7.00 am as a result of the growth in traffic between 6.00 am and 7.00 am.<sup>10</sup>*

Directive 2002/49/EC on the assessment and management of environmental noise requires the publication of noise maps and data for an eight-hour night period at all major European Union airports. Tables 4-6 below set out the data for Heathrow (number of aircraft movements and size of the noise contours caused by the movements) for a number of years between 2001 and 2011 for: (a) the full night period (2300-0700); (b) the night quota period (2330-0600); and (c) the night shoulder periods (2300-2330 and 0600-0700). Although the data do not cover all years since the Department's assessment of the full night period between 1993 and 1998, they do permit some analysis of the trend since 2001.

There are two main trends across all three tables: (i) the number of movements increased by approximately 13 per cent between 2001 and 2010; and (ii) the size of the noise contour decreased by approximately 17 percent between 2001 and 2011<sup>11</sup>. Given the Department's assessment in 1998 that noise across the full night period had probably deteriorated since 1993 due to the increase in the number of movements in the early morning shoulder period (0600-0700), the increase in the number of movements since 2001 (mainly but not exclusively in the early morning shoulder period) suggests that there has been a further deterioration since 1998, a deterioration that may have been continuous over more than twenty years<sup>12</sup>.

To set these trends in context, the corresponding changes for the day and evening periods (0700-2300) were an approximate 2 per cent increase in the number of movements between 2001 and 2010; and an approximate 7 per cent decrease in the size of the 57 decibel noise contour between 2001 and 2011. It is not apparent why the ratio between more movements and smaller contour size was wider in the day and evening period (2 : 7) than in the night period (13 : 17). But it may be a further indication that the noise climate in the full night period and the shoulder periods is worse now than it was twenty years ago. Analysis of the night quota period trends is set out in more detail in the part three of this annex.

**Table 4: Lnight (8-hour)**

Years	average number of movements		size of 50 dBA contour	
		%	Km <sup>2</sup>	%
2001	66.39	100.0	89.6	100.0
2003	68.84	103.7	92.3	103.0
2006	75.40	113.6	84.4	94.2
2009	74.65	112.4	77.3	86.3
2010	74.93	112.9	79.3	88.5
2011	?	?	74.6	83.3

**Source:** Data published as part of strategic noise maps at Heathrow (in all cases prepared by the Civil Aviation Authority for the Department of the Environment, Food and Rural Affairs, or the Department for Transport or Heathrow). Dashes in the table indicate that the relevant data do not exist. Question marks in the table indicate that the data have not yet been published.

<sup>10</sup> Department of the Environment, Transport and the Regions, *Night Flying Restrictions at Heathrow, Gatwick and Stansted: Second Stage Consultation*, (Nov 1998), paragraph 1.29.

<sup>11</sup> On the assumption that the trends in both cases were reflected in the years for which the data are not available.

<sup>12</sup> The Terminal Five Public Inquiry heard that the number of movements between 0600-0700 had increased by 63 per cent between 1991 and 1996 and that there would be further increases if Terminal Five was built. (Vandermeer, page 17, paragraph 1.3.18). The period of deterioration therefore appears to have begun in 1991.

Table 4 sets out the average number of aircraft movements per eight-hour night period (2300-0700) and the corresponding size of the 50 decibel noise contour <sup>13</sup> at Heathrow for the calendar years since 2001 for which the data have been published <sup>14</sup>. Between 2001 and 2010 the number of movements increased by 8.54 per night (12.9 per cent increase); and the size of the 50 decibel contour decreased by 10.3 km<sup>2</sup> (11.5 per cent decrease), with a further decrease by 4.7 km<sup>2</sup> (5.2 per cent decrease) in 2011.

Table 5: Lnight (6.5-hour)

<i>Years</i>	<i>average number of movements</i>		<i>size of 48 dBA contour</i>	
		<i>%</i>	<i>km<sup>2</sup></i>	<i>%</i>
2001	-	-	-	-
2002-03	16.95	100.0	53.9	100.0
2003	-	-	-	-
2006	17.94	105.8	56.4	104.6
2009	16.64	98.2	47.1	87.4
2010	18.05	106.5	53.1	98.5
2011	?	?	?	?
2011-12	?	?	41.1	76.2

**Source:** See source notes for Table 4. Dashes in the table indicate that the relevant data do not exist. Question marks in the table indicate that the data have not yet been published.

Table 5 shows the average number of aircraft movements per six-and-one-half-hour night period (2330-0600) and the corresponding size of the 48 decibel noise contour <sup>15</sup> at Heathrow for the twelve month periods since March 2002-March 2003 for which the data have been published <sup>16</sup>. Between 2002-03 and 2010 the number of movements increased by 1.1 per night (6.5 per cent increase); and the size of the 48 decibel contour decreased by 0.8 km<sup>2</sup> (1.5 per cent decrease), with a further decrease by 12.0 km<sup>2</sup> (22.3 per cent decrease) in 2011-12.

Table 6: Night shoulder periods (1.5-hour)

<i>Years</i>	<i>average number of movements</i>		<i>size of contour</i>	
		<i>%</i>	<i>Km<sup>2</sup></i>	<i>%</i>
2001	-	-	-	-
2002-03	52.74	100.0	-	-
2003	-	-	-	-
2006	57.46	108.9	-	-
2009	58.01	110.0	-	-
2010	56.88	107.8	-	-
2011	?	?	-	-
2011-12	?	?	-	-

**Source:** See source notes for Table 4. Dashes in the table indicate that the relevant data do not exist. Question marks in the table indicate that the data have not yet been published.

Table 6 shows the average number of aircraft movements per night in the night shoulder periods (2300-2330 and 0600-0700) at Heathrow for the twelve month periods since March 2002 - March 2003 for which the data have been published. Between 2002-03 and 2010 the average number of movements increased by 4.14 per night (7.3 per cent increase). This number was calculated by deducting the movements between 2330-0600 shown in Table 5 from the movements between 2300-0700 shown in Table 4. No data have been published about the noise levels in the shoulder periods.

<sup>13</sup> 50 or more decibels of air traffic noise, averaged over an eight-hour night period (2300-0700) over a calendar year.

<sup>14</sup> The stage one consultation document included the contour size in 2011 but not the number of movements.

<sup>15</sup> 48 or more decibels of air traffic noise, averaged over a six-and-one-half-hour night quota period (2330-0600) over a twelve month period March-March or January-December.

<sup>16</sup> The stage one consultation document included the contour size for March 2011- March 2012 but not the number of movements; nor the contour size or number of movements for the calendar year 2011.



**PART THREE: LONG TERM ASSESSMENT OF HEATHROW NOISE IN NIGHT QUOTA PERIOD (2330-0600)**

The stage one consultation document sets out extensive noise data since the current night flying restrictions regime in the night quota period (2330-0600) came into force at Heathrow in October 2006. While these data are useful in themselves, they need to be set in the context of the trend since October 1993, when the system of setting quota point restrictions was first introduced at Heathrow. The Department for Transport often refers to the decrease over the last twenty years in the size of the Heathrow day and evening (0700-2300) noise contour. The absence of a long term perspective of the night quota period is therefore all the more surprising and regrettable.

Table 7 below sets out the average noise data (number of aircraft movements that took place, number of noise quota points that were used, and number of noise quota points per aircraft movement) for the winter and summer seasons in each of the three restrictions regimes at Heathrow since October 1993 (Oct. 1993 to Oct. 1999, Oct. 1999 to Oct. 2006, and Oct. 2006 to Oct. 2012).

The actual number of movements and noise quota points have been analysed rather than the limits on the number of movements and noise quota points because the actual numbers constitute the noise data. The averages for the seasons within each regime have been analysed because the data per season fluctuate so much that trends are difficult to discern (see Table 8 and Table 9 below for the data for each season).

The analysis based on the number of movements and noise quota points is distinct from the analysis in Table 5 of this Annex of the number of movements and the size of the noise contours because the data for movements and quota points are spread across seasons that do not permit easy comparison with the calendar year contours; because the data for movements and quota points go back to 1993 whereas the earliest contour is 2002-03; and because the numbers and quota use data are complete between seasons whereas there are gaps in some contour years. For all these reasons, the analysis of movements and quota points is likely to be more reliable than the analysis of contours.

**Table 7: Average number of aircraft movements and noise quota use per restrictions regime**

<i>Regimes</i>	<i>Movements</i>		<i>Quota points</i>		<i>Points per movement</i>	
		<i>%</i>		<i>%</i>		<i>%</i>
<i>Winter seasons</i>						
1. 1993 - 1999	2 572	100.0	4 391	100.0	1.71	100.0
2. 1999 - 2006	2 627	102.1	4 258	97.0	1.62	94.7
3. 2006 - 2012	2 655	103.2	3 881	88.4	1.46	85.4
<i>Summer seasons</i>						
1. 1993 - 1999	2 860	100.0	4 816	100.0	1.68	100.0
2. 1999 - 2006	2 973	104.0	5 079	105.5	1.71	101.8
3. 2006 - 2012	2 945	103.0	4 540	94.3	1.54	91.7

Source: As for Table 8 and Table 9 below.

Table 7 shows the following trends:

- The number of movements (i.e. individual noise events) increased in the second and third regimes in both the winter and summer seasons by approximately 3 per cent compared with the first regime.
- The number of noise quota points and noise quota points per movement (i.e. level of individual noise events) decreased in the second and third regimes in the winter seasons by approximately 15 per cent compared with the first regime. The summer season decrease was approximately 8 per cent in the third regime, having increased by approximately 2 per cent in the second regime.
- With the number of movements increasing by similar percentages in the summer and winter seasons, it is not clear why the decrease in quota point use was larger and more consistent in winter than summer. The summer season is longer (214 days) than the winter season (151 days) and in the more noise-sensitive period because residents are more likely to sleep with open windows.

The stage one consultation document regards the number of noise quota points per movement as the key noise indicator for the night quota period. The number of points per movement has decreased by approximately 15 per cent in winters and 8 per cent in summers in the nineteen years since 1993. This compares with an approximately 40 per cent reduction since 1993 in the key noise indicator for the day and evening period (0700-2300) at Heathrow<sup>17</sup>. It is not clear why, according to the Department's preferred indicators, the noise climate should have improved over nineteen years at an apparently much faster rate in the day and evening than in the more noise-sensitive night time with its restrictions.

Table 3 in this Annex shows that, in the most recent winter (October 2011 to March 2012) and summer (March to October 2012) for which data are available, Heathrow used approximately twice the number of noise quota points per movement as Gatwick and Stansted in the winter and more than twice the number of quota points per movement in the summer.

If the past rate of reduction in the number of quota points per movement at Heathrow continues in future it will be approximately 52 years and 110 years respectively before the Heathrow points per movement for the winter and summer seasons match those at Gatwick and Stansted at present (assuming no further reduction at Gatwick and Stansted). The fact that present noise levels at Gatwick and Stansted exceed the World Health Organisation's recommended limits is an indication of how many more decades will pass, given the rate of noise reduction in the past, before Heathrow meets the WHO limits.

Table 8: Winter Seasons - Number of aircraft movements and noise quota use

Season	Number of aircraft movements		Number of noise quota points used			
		%	total points used	%	points used per movement	%
1993-94	2 352	100.0	4 384	100.0	1.86	100.0
1994-95	<b>2 668</b>	<b>113.4</b>	<b>5 020</b>	<b>114.5</b>	<b>1.88</b>	<b>101.1</b>
1995-96	2 751	<b>117.0</b>	4 760	108.6	1.73	93.0
1996-97	2 525	107.4	3 901	89.0	1.54	82.8
1997-98	2 446	104.0	3 858	88.0	<b>1.58</b>	<b>85.0</b>
1998-99	<b>2 688</b>	<b>114.3</b>	<b>4 423</b>	<b>100.9</b>	<b>1.65</b>	<b>88.7</b>
1999-00	2 529	107.5	3 972	90.6	1.57	84.4
2000-01	2 615	<b>111.2</b>	4 118	<b>93.9</b>	1.57	84.4
2001-02	<b>2 684</b>	<b>114.1</b>	<b>4 257</b>	<b>97.1</b>	<b>1.59</b>	<b>85.5</b>
2002-03	2 620	111.4	4 316	<b>98.5</b>	<b>1.65</b>	<b>88.7</b>
2003-04	<b>2 683</b>	<b>114.1</b>	<b>4 425</b>	<b>100.9</b>	1.65	88.7
2004-05	2 591	110.2	4 361	99.5	<b>1.68</b>	<b>90.3</b>
2005-06	<b>2 669</b>	<b>113.5</b>	4 355	99.3	1.63	87.6
2006-07	2 659	113.1	4 266	97.3	1.60	86.0
2007-08	<b>2 710</b>	<b>115.2</b>	4 100	93.5	1.52	81.7
2008-09	<b>2 715</b>	<b>115.4</b>	3 948	90.0	1.45	78.0
2009-10	2 686	114.2	3 863	88.1	1.44	77.4
2010-11	2 577	109.6	3 735	85.2	<b>1.45</b>	<b>78.0</b>
2011-12	<b>2 583</b>	<b>109.8</b>	<b>3 377</b>	77.0	1.31	70.4

Sources: Department of Transport and Heathrow for the number of aircraft movements and noise quota points used, from which the number of quota points per movement has been calculated.

Table 8 sets out for the winter seasons since 1993-94: (a) the number of aircraft movements that took place; (b) the number of noise quota points that were used; and (c) the average number of noise quota points per aircraft movement in each season. The percentage columns take winter 1993-94 as the base season for indexing the subsequent changes. The numbers marked in bold indicate an increase compared with the previous season.

#### Aircraft movements

The number of aircraft movements in winter 1993-94 increased in all of the subsequent eighteen winters. The rates of increase were by more than 10 per cent in thirteen of those winters; and by less than 10 per cent in the other five winters. The largest and smallest number of movements in any winter were

<sup>17</sup> The 57-decibel noise contour, which decreased in size from 182.3 km<sup>2</sup> in 1993 to 108.8 km<sup>2</sup> in 2011.

respectively 2 751 (1995-96) and 2 352 (1993-94). The overall pattern was an increase in absolute terms in the number of movements since 1993-94, but subject to decreases between some winters (none of which were as low as the number of movements in 1993-94).

#### Noise quota points

The number of noise quota points used in winter 1993-94 increased in four of the subsequent eighteen winters and decreased in the other fourteen winters. Compared with 1993-94, the largest increase was by 8.6 per cent in 1995-96 and the largest decrease was by 14.8 per cent in 2010-11. The largest and smallest number of quota points used in any winter were respectively 5 020 (1994-95) and 3 377 (2011-12). The overall pattern was a decrease in absolute terms in the number of noise quota points used since 1993-94, but subject to increases between some winters (none since 2003-04).

#### Noise quota points per aircraft movement

The average number of noise quota points per aircraft movement in winter 1993-94 increased in one of the subsequent eighteen winters (1994-95, an increase of 1.1 per cent) and decreased in the other seventeen winters. The largest and smallest number of points per movement in any winter were respectively 1.88 (1994-95) and 1.31 (2011-12). The overall pattern was a decrease in absolute terms in the number of quota points per movement since 1993-94, but subject to increases between some winters (none of which were as high as 1993-94 or 1994-95).

Table 9: Summer Seasons - Number of aircraft movements and noise quota use

Season	Number of aircraft movements		Number of noise quota points used			
		%	total points used		points used per movement	
				%		%
1994	2 905	100.0	5 109	100.0	1.76	100.0
1995	<b>2 968</b>	<b>102.2</b>	5 159	<b>101.0</b>	1.74	98.9
1996	2 566	88.3	4 340	85.0	1.69	96.0
1997	<b>2 757</b>	<b>94.9</b>	4 276	<b>83.7</b>	1.55	88.1
1998	<b>2 828</b>	<b>97.4</b>	<b>4 668</b>	<b>91.4</b>	<b>1.65</b>	<b>93.8</b>
1999	<b>3 138</b>	<b>108.0</b>	5 342	<b>104.6</b>	<b>1.70</b>	<b>96.6</b>
2000	3 028	104.2	4 967	97.2	1.64	93.2
2001	2 939	101.2	4 694	91.9	1.60	90.9
2002	2 937	101.1	<b>5 051</b>	<b>98.9</b>	<b>1.72</b>	<b>97.7</b>
2003	2 899	99.8	<b>5 165</b>	<b>101.1</b>	<b>1.78</b>	<b>101.1</b>
2004	<b>2 993</b>	<b>103.0</b>	5 218	<b>102.1</b>	1.74	98.9
2005	2 956	101.8	5 225	<b>102.3</b>	1.77	<b>100.6</b>
2006	<b>3 059</b>	<b>105.3</b>	5 232	<b>102.4</b>	1.71	97.2
2007	3 053	105.1	<b>5 235</b>	<b>102.5</b>	<b>1.72</b>	<b>97.7</b>
2008	2 922	100.6	4 634	90.7	1.59	90.3
2009	2 848	98.0	4 429	86.7	1.56	88.6
2010	<b>3 033</b>	<b>104.4</b>	<b>4 504</b>	86.2	1.49	84.7
2011	2 958	101.8	4 491	87.9	<b>1.52</b>	<b>86.4</b>
2012	2 853	98.2	3 946	77.2	1.38	78.4

Sources: Department of Transport and Heathrow for the number of aircraft movements and noise quota points used, from which the number of quota points per movement has been calculated.

Table 9 sets out for the summer seasons since 1994: (a) the number of aircraft movements that took place; (b) the number of noise quota points that were used; and (c) the average number of noise quota points per aircraft movement in each season. The percentage columns take winter summer 1994 as the base seasons for indexing the subsequent changes. The numbers marked in bold indicate an increase compared with the previous season.

#### Aircraft movements

The number of movements in summer 1994 increased in eleven of the subsequent eighteen summers and decreased in the other seven summers. The rates of increase were less than 10 per cent in all eleven summers; and less than 5 per cent in eight of the eleven summers. The largest and smallest number of movements in any summer were respectively 3 138 (1999) and 2 566 (1996). The overall pattern was an

increase in absolute terms in the number of movements since 1994, but at a lower rate of increase than in winters. The fluctuations between summers were wider than between winters.

Noise quota points

The number of noise quota points used in summer 1994 increased in seven of the subsequent eighteen summer seasons and decreased in the other eleven summers. Compared with 1994, the largest increase was by 4.6 per cent in 1999 and the largest decrease was by 16.3 per cent in 1997. The largest and smallest number of quota points used in any summer were respectively 5 342 (1999) and 3 946 (2012). The overall pattern was a decrease in absolute terms in the number of noise quota points used since 1994, but subject to more increases between some summers (most recently in 2007) than between winters.

Noise quota points per aircraft movement

The average number of noise quota points per aircraft movement in summer 1994 increased in only two of the subsequent eighteen summers (2003 and 2005, with increases of 1.1 per cent and 0.6 per cent respectively) and decreased in the other sixteen summers. The largest and smallest number of points per movement in any summer were respectively 1.78 (2003) and 1.38 (2012). The overall pattern was a decrease in absolute terms in the number of quota points per movement since 1994, but subject to increases between some summers (none of which were as high as 1994, 2003 or 2005).

## ANNEX 2

## Heathrow: Runway scheduling limits - Movements per hour: Winter season totals (arrivals and departures combined)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
0600-	61	61	61	61	61	61	61	62	64	65	65	64
0700-	78	78	78	78	78	77	77	77	76	76	76	78
0800-	78	78	78	78	78	76	76	76	74	75	76	77
0900-	78	78	78	80	80	80	80	80	81	83	83	84
1000-	82	82	82	83	83	85	83	83	83	82	82	81
1100-	82	82	82	81	81	80	80	80	80	79	79	78
1200-	83	83	83	83	83	84	85	86	88	87	87	87
1300-	79	78	78	78	78	78	80	81	80	79	79	81
1400-	74	79	79	77	80	80	80	81	80	82	81	83
1500-	83	85	85	86	86	86	87	87	87	87	87	86
1600-	85	86	86	86	87	89	89	89	90	90	90	88
1700-	83	82	82	84	85	85	86	85	85	85	85	84
1800-	82	84	84	85	84	84	84	82	82	82	82	82
1900-	81	82	82	80	80	81	82	82	83	82	82	82
2000-	80	80	80	79	79	79	78	78	78	78	78	78
2100-	74	73	73	71	73	75	77	77	76	76	77	78
2200-	35	37	37	40	41	42	41	41	41	43	43	43
Daily total	1 298	1 308	1 308	1 310	1 317	1 322	1 326	1 327	1 328	1 331	1 332	1 334
Hourly average	76.3	76.9	76.9	77.1	77.5	77.8	78.0	78.1	78.1	78.3	78.3	78.5

**Source:** Airport Co-ordination Ltd (ACL), Heathrow Airport seasonal reports, unnumbered tables entitled “Runway Scheduling Limits - Movements per Hour”, from which daily total and hourly averages have been calculated.

**Notes:** The table shows the scheduling limits for the number of movements per hour at Heathrow between 0600-2300 in each winter season since 2000-01 (arrivals and departures combined). The table does not include the permitted number of scheduled movements in the night quota period (2330-0600), which is currently 2 550 in the winter season (approximately 16.9 per night), with usage slightly below the permitted number.

**Comment:** The largest scheduling limit in any hour was 90 movements (arrivals and departures) in the winter seasons 2008-09, 2009-2010, and 2010-11. Averaging 90 movements across every hour of a 16-hour day (0700-2300) across 365 days sums to 526 000 movements. A deduction of 26 000 slots (5 per cent) for resilience contingency gives a net total of 500 000 movements across 365 days, with no scheduled movements 2300-0700. The legal limit of 480 000 air transport movements (ATMs) per year leaves 20 000 slots available for 6 000 non-ATMs and 14 000 additional contingencies.

## Heathrow: Runway scheduling limits - Movements per hour: Summer season totals (arrivals and departures combined)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0600-	63	63	63	63	63	63	63	65	64	63	63	63
0700-	83	83	83	82	82	83	83	82	83	85	85	85
0800-	82	82	82	82	82	80	80	80	79	80	80	81
0900-	81	81	80	80	80	81	81	81	82	83	83	83
1000-	80	80	81	82	82	80	79	79	80	81	81	81
1100-	83	83	84	84	84	84	84	84	83	83	83	83
1200-	80	80	80	79	80	81	81	81	81	80	80	80
1300-	83	84	85	85	85	86	86	86	86	86	86	86
1400-	78	80	80	80	80	80	82	85	85	85	85	86
1500-	80	82	83	86	86	87	<b>88</b>	87	86	85	85	85
1600-	85	86	87	87	86	86	86	86	86	85	85	84
1700-	83	84	85	85	85	85	85	85	86	86	86	86
1800-	84	86	86	86	86	87	87	<b>88</b>	<b>88</b>	<b>88</b>	<b>88</b>	<b>88</b>
1900-	85	85	84	84	85	86	87	86	86	87	87	87
2000-	81	81	79	79	78	78	78	77	77	76	76	76
2100-	85	86	84	83	83	83	83	84	84	82	82	81
2200-	51	51	51	51	51	51	51	50	52	52	52	52
Daily total	1 347	1 357	1 357	1 358	1 358	1 361	1 364	1 366	1 367	1 367	1 367	1 367
Hourly average	79.2	79.8	79.8	79.9	79.9	80.1	80.3	80.4	80.4	80.4	80.4	80.4

**Source:** Airport Co-ordination Ltd (ACL), Heathrow Airport seasonal reports, unnumbered tables entitled "Runway Scheduling Limits - Movements per Hour", from which daily total and hourly averages have been calculated.

**Notes:** The table shows the scheduling limits for the number of movements per hour at Heathrow between 0600-2300 in each summer season since 2001 (arrivals and departures combined). The table does not include the permitted number of scheduled movements in the night quota period (2330-0600), which is currently 3250 in the summer season (approximately 15.2 per night), with usage slightly below the permitted number.

**Comment:** The largest scheduling limit in any hour was 88 movements (arrivals and departures) in each of the summer seasons 2007-2012. Averaging 88 movements across every hour of a 16-hour day (0700-2300) across 365 days sums to 514 000 movements. A deduction of 26 000 slots (5 per cent) for resilience contingency gives a net total of 488 000 movements across 365 days, with no scheduled movements 2300-0700. The legal limit of 480 000 air transport movements (ATMs) per year leaves 8 000 slots available for 6 000 non-ATMs and 2 000 additional contingencies.

Table 1: Number of destinations at Heathrow in 2011

<i>Region</i>	<i>All destinations</i>	<i>More than 2 000 passengers</i>	<i>Less than 2 000 passengers</i>
United Kingdom	11	7	4
Western Europe	35	29	6
Central Europe	35	32	3
Eastern Europe	21	21	-
Near East	15	14	1
Africa	23	23	-
Far East	30	30	-
Americas	41	36	5
<b>Totals</b>	<b>211</b>	<b>192</b>	<b>19</b>

**Source:** Civil Aviation Authority, *Aviation Statistics*, Table 12.1 (International Air Passenger Traffic to and from Reporting Airports) and Table 12.2 (Domestic Air Passenger Traffic to and from Reporting Airports)

**Notes:** The table sets out the number of destinations in each region that had air traffic with Heathrow in 2011. The first column is the total number of destinations. The second column is the number of destinations to which 2 000 or more passengers (arrivals and departures combined) were transported. The third column is the number of destinations to which less than 2 000 passengers (arrivals and departures combined) were transported.

Table 2: Sequence and number of pre-0600 arrivals at Heathrow

Arrival time	Originating destination	Days of the week
0450	Hong Kong (China)	Monday - Sunday
0450	Singapore (Singapore)	Monday - Sunday
0450	Sydney (Australia) via Hong Kong (China)	Monday - Sunday
0500	Hong Kong (China)	Monday - Sunday
0500	Hong Kong (China)	Monday - Sunday
0500	Lagos (Nigeria)	Monday - Sunday
0510	Melbourne (Australia) via Singapore (Singapore)	Monday - Sunday
0515	Boston (United States)	Monday - Thursday, Saturday, Sunday
0515	Johannesburg (South Africa)	Monday - Sunday
0520	Riyadh (Saudi Arabia)	Monday - Sunday
0520	Sydney (Australia) via Singapore (Singapore)	Monday - Sunday
0525	Accra (Ghana)	Monday - Sunday
0525	Kuala Lumpur (Malaysia)	Monday - Sunday
0530	Nairobi (Kenya)	Monday - Sunday
0545	Nairobi (Kenya)	Monday - Friday, Sunday
0555	Bangkok (Thailand)	Friday
0555	Chicago (United States)	Monday - Sunday
0555	Riyadh (Saudi Arabia)	Thursday, Sunday
0555	Singapore (Singapore)	Monday - Sunday

Source: Heathrow Airport website: Flight Information/Flight Timetables (Winter Season 2012-13)

**Note:** The table shows the scheduled air traffic at Heathrow pre-0600 (all arrivals) in the winter season 2012-13. The arrival times are the scheduled times of arrival. In practice some flights begin arriving ahead of schedule from 0430.

**Comment:** There were no scheduled pre-0600 departures. There were nineteen scheduled pre-0600 arrivals from thirteen destinations (i.e. there was more than one arrival from some destinations). Fifteen of the arrival times were scheduled for every day of the week, with two arrival times scheduled on six days (Boston 0515 and Nairobi 0545), one arrival time scheduled on two days (Riyadh 0555), and one arrival time scheduled on one day (Bangkok 0555). There were in total, 120 scheduled arrivals from Monday to Sunday, averaging just over seventeen per day for the winter season 2012-13.

There were no scheduled pre-0600 departures at Heathrow in the summer season 2012. The average number of scheduled pre-0600 arrivals in the summer season 2012 was just over thirteen per day.



Table 3: Timetables for destinations with pre-0600 arrivals at Heathrow

<b>Accra</b>			<b>Kuala Lumpur</b>		
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
We	0825	1520	Mo-Su	1045	1615
Tu	1045	1740	Mo-Su	2355	<b>0525</b>
Fr	1100	1755			
Mo, Sa	1105	1800	<b>Lagos</b>		
Mo-Su	2240	<b>0525</b>	<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
			Mo-Su	1100	1655
			Tu, Fr, Su	1110	1655
<b>Bangkok</b>			We	1205	1750
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	Mo	1240	1825
Fr	0005	<b>0555</b>	We	1245	1830
Mo-Su	0015	0620	Sa	1305	1850
Mo-Th, Sa, Su	0030	0620	Mo-Su	2330	<b>0500</b>
Mo-Su	1310	1910			
Mo-Su	1330	1935			
			<b>Melbourne</b>		
<b>Boston</b>			<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	Mo-Su	1640	<b>0510</b>
Mo-Th, Sa, Su	1755	<b>0515</b>			
Fr-Su	1830	0635	<b>Nairobi</b>		
Mo-Th	1840	0635	<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
Fr	1915	0635	Mo-Su	2340	<b>0530</b>
Mo-Su	1920	0705	Mo-Fr, Su	2350	<b>0545</b>
Mo-Su	1950	0720	Sa	2359	0625
Mo-Su	2110	0825			
			<b>Riyadh</b>		
<b>Chicago</b>			<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	Mo-Su	0045	<b>0520</b>
Mo-Su	0845	2240	Th, Su	0140	<b>0555</b>
Mo-Su	1550	<b>0555</b>	Fr	0210	0625
Mo-Su	1705	0645	Tu	0935	1350
Mo-Su	1750	0755	We	1200	1615
Mo-Su	1800	0745	Mo	1240	1655
Mo-Su	2030	1010	Sa	1250	1705
Mo-Su	2100	1105			
Mo-Su	2135	1135	<b>Singapore</b>		
			<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
<b>Hong Kong</b>			Mo-Su	0115	0720
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	Mo-Su	0900	1510
Mo-Su	0110	0620	Mo-Su	1255	1905
Tu, We, Fr-Su	0905	1445	Mo-Su	2255	<b>0450</b>
Mo-Su	0950	1500	Mo-Su	2255	<b>0510</b>
Mo-Su	1505	2010	Mo-Su	2315	<b>0520</b>
Mo-Su	2325	<b>0450</b>	Mo-Su	2345	<b>0555</b>
Mo-Su	2330	<b>0450</b>	Mo-Su	2359	0620
Mo-Su	2345	<b>0500</b>			
Mo-Su	2355	<b>0500</b>	<b>Sydney</b>		
			<i>Days</i>	<i>Depart</i>	<i>Arrive</i>
<b>Johannesburg</b>			Mo-Su	1545	<b>0450</b>
<i>Days</i>	<i>Depart</i>	<i>Arrive</i>	Mo-Su	1625	<b>0520</b>
Mo-Su	2015	<b>0515</b>	Mo-Su	1720	0620
Mo-Th	2040	0625			
Fr-Su	2055	0625			
Mo-Su	2155	0650			
Mo-Su	2135	0720			
Mo-Su	2140	0645			

Source: Heathrow Airport website: Flight Information/Flight Timetables (Winter Season 2012-13)

**Notes:** The departure and arrival columns refer to the scheduled local times of departure from the destination and of arrival at Heathrow. The arrival from Melbourne was via Singapore. Two of the three arrivals from Sydney were via Hong Kong, with the third arrival via Singapore.

**Comment:** Twelve of the thirteen destinations with pre-0600 arrivals also have post-0600 arrivals. The one exception is Melbourne. Nairobi has only a Saturday arrival post-0600. Accra, Kuala Lumpur, Riyadh and Sydney have only one daily post-0600 arrival. The other seven destinations have four or more post-0600 arrivals, the majority of which operate seven days a week.

Table 4: Arrivals at Heathrow from Far East destinations for winter season 2012-2013

	Arrival times			
	<i>before 0600</i>	<i>0600-0700</i>	<i>after 0700</i>	<i>per 24 hours</i>
Hong Kong (China) <sup>18</sup>	4	1	3	8
Kuala Lumpur (Malaysia)	1	-	1	2
Melbourne (Australia) <sup>19</sup>	1	-	-	1
Singapore (Singapore) <sup>20</sup>	4	1	3	8
Sydney (Australia) <sup>21</sup>	2	1	-	3
Auckland (New Zealand)	-	-	2	2
Bangkok (Thailand) <sup>22</sup>	-	2	2	4
Beijing (China)	-	-	2	2
Seoul (South Korea)	-	-	5	5
Shanghai (China)	-	-	3	3
Tokyo (Narita) (Japan)	-	-	5	5

Source: Heathrow Airport website: Flight Information/Flight Timetables (Winter Season 2012-13)

**Comment:** The first five destinations all have scheduled arrivals at Heathrow pre-0600 on every day of the week (see Tables 2 and 3). Four of the five destinations have arrivals post-0600, with Melbourne as the one exception. The last six destinations are important business centres within similar time zones to the first five destinations but do not have any services to Heathrow pre-0600 (except for Bangkok on Friday - see Tables 2 and 3).

Table 5: Air traffic in calendar year 2011 for destinations shown in Table 4

	Number of Movements		Number of Passengers		
	<i>per year</i>	<i>per 24 hours</i>	<i>passengers</i>	<i>per movement</i>	<i>transfers (%)</i>
Hong Kong (China)	4 375	12.0	1 412 749	322.9	28
Kuala Lumpur (Malaysia)	1 459	4.0	433 198	296.9	23
Melbourne (Australia)	1 409	3.9	403 827	286.6	51
Singapore (Singapore)	2 901	7.9	1 069 706	368.7	31
Sydney (Australia)	3 553	9.7	698 036	196.5	34
Auckland (New Zealand)	1 330	3.6	257 504	193.6	29
Bangkok (Thailand)	1 437	3.9	579 002	402.9	22
Beijing (China)	1 410	3.9	310 758	220.4	15
Seoul (South Korea)	1 240	3.4	311 093	250.9	24
Shanghai (China)	1 746	4.8	351 933	201.6	22
Tokyo (Narita) (Japan)	2 865	7.8	604 045	210.8	31

Source: Civil Aviation Authority, *Aviation Statistics*, Table 12.1 (International Air Passenger Traffic to and from Reporting Airports) and Table 12.2 (Domestic Air Passenger Traffic to and from Reporting Airports), supplemented with information from the Department for Transport

**Note:** The difference in the number of movements per 24 hours for destinations in Table 4 compared with Table 5 is due to the fact that the Table 4 data are for the five-month winter season 2012-13 whereas the Table 5 data are for the full calendar year 2011.

<sup>18</sup> Including an interline arrival pre-0600 from Melbourne en route to Heathrow.

<sup>19</sup> No direct arrivals from Melbourne. Interline arrival pre-0600 via Singapore. Transfer options post-0600.

<sup>20</sup> Including interline arrivals pre-0600 from Melbourne and Sydney and 0600-0700 from Sydney en route to Heathrow.

<sup>21</sup> No direct arrivals from Sydney. Interline arrivals pre-0600 and 0600-0700 via Singapore. Transfer options post-0600

<sup>22</sup> On Friday, one arrival at 0555 and one arrival 0600-0700.

Table 6: Air traffic at Heathrow in 2011

	Number of air transport movements		Number of passengers		
	<i>Per year</i>	<i>Per 24 hours</i>	<i>Per year</i>	<i>Per movement</i>	<i>Transfers (%)</i>
Accra	1 069	2.9	159 641	149.3	39%
Boston	5 522	15.1	1 030 867	186.7	53%
Chicago	6 382	17.5	1 207 424	189.2	44%
Hong Kong	4 375	12.0	1 412 749	322.9	28%
Johannesburg	3 540	9.7	886 146	250.3	43%
Kuala Lumpur	1 459	4.0	433 198	296.9	23%
Lagos	2 180	6.0	453 694	208.1	33%
Melbourne	1 409	3.9	403 827	286.6	51%
Nairobi	2 352	6.4	469 345	199.5	45%
Riyadh	1 028	3.0	180 855	175.9	41%
Singapore	2 901	7.9	1 069 706	368.7	31%
Sydney	3 553	9.7	698 036	196.5	34 %

**Sources:** [Heathrow website](#) (live flight information) for the destinations from which arrivals at Heathrow are scheduled pre-0600. [Department for Transport](#) for the number of movements per destination in 2011 (arrivals and departures combined), from which the average number of movements per 24 hours (arrivals and departures combined) have been calculated. [Civil Aviation Authority website](#) for the number of passengers per year per destination in 2011 (arrivals and departures combined), from which the average number of passengers per movement (arrivals and departures combined) have been calculated. [Department for Transport](#) for the average number of transfer passengers per destination in 2010, expressed as a percentage of the total number of passengers per destination.

**Note:** The data represent the total number of movements and passengers between the listed destinations and Heathrow in 2011 (i.e. the data includes but is not limited to the data for pre-0600 arrivals). Bangkok (Thailand) is not included because it has only one flight per week arriving at Heathrow pre-0600.

**Comment:** Approximately one passenger at three at Heathrow is a transfer. The percentage of transfers shows that apart from Kuala Lumpur (23 per cent), Honk Kong (28 per cent) and Singapore (31 per cent), the other nine routes carry an above-average number of transfers. We have not been able to identify the percentage of transfers on the pre-0600 arrivals.