

Heathrow Airport Response to APPG Airport Noise Questions 4 September 2014

A.1	<p>By what margin - in terms of the number of people affected - does the present noise from Heathrow's existing flight paths exceed the World Health Organisation's community noise guideline values in the day/evening period (0700-2300) and in the night period (2300-0700)? How does this compare with other airports within the UK and the EU?</p>	<p>It is not clear which WHO guideline value the question relates and perhaps worth noting that some of their guideline values relate to internal noise levels which have the potential to be mitigated against through effective noise insulation schemes.</p> <p>The WHO guideline value for outdoor noise in the day is 55dB (16 hour) and at night it is 40dB (8 hour). However the WHO recognises that its night-time limit is not feasible in the short-term and has therefore set an interim target of 55dB (8 hour night from 2300 to 0700). The daytime value is not one that is routinely measured in the UK but we do have 2012 measurements for the summer day 16 hour contours which show that around 586,000 people are within the 54dB contour and about 237,000 in the 57dB contour.</p> <p>While this is more than other European hubs, it is comparable to big US airports like New York JFK, Los Angeles and Chicago.</p> <p>It is important to put the WHO community noise guidelines into context. They do not apply specifically to aircraft noise and the population affected at these levels from other sources such as road and rail will be very much higher. Indeed the WHO itself recognises that around 40% of the European Union's population is exposed to road noise in excess of the guideline values. It also recognises that its night-time limit is not feasible in the short-term. Consequently it should be noted that many areas in London experience noise levels in excess of the WHO guidelines when there is no overflight of aircraft as a result of general suburban noise sources including road and rail.</p> <p>For example, based on the 2011 round of strategic noise mapping for London published by DEFRA showed that around 2.3 million Londoners are exposed to road noise above 55dB Lden (the EU and Mayor's preferred measure and not the same as the WHO 55dB (16 hour) measure) and 1.6 million to levels above 50dB at night. For Heathrow (including people affected by aircraft noise living outside London) the figures are around 765,000 for the 55dB Lden and 200,000 for 50dB Lnight.</p> <p>Consequently, if Heathrow shut tomorrow, around 50% of people in the airport's noise footprint would still be exposed to noise levels above "55dB Lden" as a result of traffic noise (based on a review of noise maps from defra.gov.uk).</p>
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<p>A.2</p>	<p>Does the Environmental Noise Directive (END) enable the UK to meet fully the criticisms that were made in the Heathrow Terminal Five Public Inquiry Report that the 57 decibel noise contour was by itself an inadequate measure for assessing the full impact of air traffic noise?</p>	<p>There is no one perfect measure to assess or describe the impact of noise and each measure can be useful provided that its purpose is understood.</p> <p>Within the Aviation Policy Framework the Government states that it will continue to treat the 57dB LAeq 16 hour contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance. However, it also notes that this does not mean that all people within this contour will experience significant adverse effects from aircraft noise. Nor does it mean that no-one outside of this contour will consider themselves annoyed by aircraft noise.</p> <p>The preferred metric of the Environmental Noise Directive END (and the London Mayor) is the Lden which, although covering the full 24 hour period for a full year, is still a derivative of the other long term average measure the LAeq which is the basis of “57 decibel contour”. The same can be said of Lnight, Lday and Leve also used by the END. Broadly speaking they each describe an average noise level over a period of time.</p> <p>That is why we voluntarily publish a range of different noise measures. These include the measures used in the Environmental Noise Directive and the long-standing day and night measures used by the UK Government.</p> <p>All average noise contours show that fewer people are affected by noise from Heathrow than in the past. Using the UK Government’s preferred measure, since the early 1970s, the number of people in Heathrow’s noise footprint has fallen nearly tenfold even as the number of flights has nearly doubled. Similarly as can be seen from the tables below both the Lden and Lnight contours show reductions in area, population and households between their adoption in 2006 and 2012 according to the CAA annual report (ERCD REPORT 1305). Population encroachment and new development over the same time period means that the reductions in population and households would have been greater. This is important context when considering these numbers as it illustrates that developers have continued to seek opportunities to develop and people continue to choose to live close to Heathrow.</p>
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Table D1 Heathrow L_{den} area, population and household cumulative estimates for years 2006 and 2012

L_{den} contour (dBA)	2006	2012	Change	% Change
	Area (km²)			
> 55	244.7	216.9	-27.8	-11%
> 60	92.7	80.4	-12.3	-13%
> 65	37.1	31.8	-5.3	-14%
> 70	13.7	10.9	-2.8	-20%
> 75	5.0	3.9	-1.1	-22%
	Population (x1000)			
> 55	756.1	725.0	-31.1	-4%
> 60	194.6	179.3	-15.3	-8%
> 65	54.3	44.2	-10.1	-19%
> 70	9.6	5.5	-4.1	-43%
> 75	0.7	0.1	-0.6	-86%
	Households (x1000)			
> 55	338.5	312.5	-26.0	-8%
> 60	81.6	74.5	-7.1	-9%
> 65	21.4	17.3	-4.1	-19%
> 70	3.5	2.0	-1.5	-43%
> 75	0.3	< 0.1	-0.3	-100%

Table D4 Heathrow L_{night} area, population and household cumulative estimates for years 2006 and 2012

L _{night} contour (dBA)	2006	2012	Change	% Change
Area (km²)				
> 50	84.4	73.7	-10.7	-13%
> 55	34.2	27.3	-6.9	-20%
> 60	11.9	9.1	-2.8	-24%
> 65	4.5	3.2	-1.3	-29%
> 70	1.8	1.4	-0.4	-22%
Population (x1000)				
> 50	207.2	197.0	-10.2	-5%
> 55	62.0	59.8	-2.2	-4%
> 60	16.3	12.3	-4.0	-25%
> 65	1.7	1.6	-0.1	-6%
> 70	0.0	0.0	0.0	(n/a)
Households (x1000)				
> 50	88.9	82.2	-6.7	-8%
> 55	24.1	23.0	-1.1	-5%
> 60	6.0	4.4	-1.6	-27%
> 65	0.6	0.5	-0.1	-17%
> 70	0.0	0.0	0.0	(n/a)

We recognise the need to supplement average noise contours with other measures. Over the past few years we have worked with a range of stakeholders to help identify potential supplementary metrics. This has included making a joint submission to the DfT with HACAN.

Indeed our submission to the Airports Commission includes measures such as the N70 (number of noise events above 70 dBA) and also other measures which our community engagement has identified as more accessible. These included for example measures of respite and days of over-flight.

New A.2

How is Heathrow addressing the criticisms that were made in the Heathrow Terminal Five Public Inquiry Report that the 57 decibel noise contour was by itself an inadequate measure for assessing the full impact of air traffic noise?

Noise measures are the subject of some debate and it is widely recognised that a range of measures is required to more fully characterise the impacts of aircraft noise.

In our response to the Airports Commission discussion paper on noise (see enclosed document) and the draft sustainability appraisal framework (Airports Commission 2014), Heathrow acknowledged the limitations in relying on the 57 dB LAeq_{16 hour}

		<p>contour alone in seeking to characterise the impacts of aircraft noise. We note that HACAN, British Airways and NATS expressed similar views in their responses to the Airports Commission DP05 consultation.</p> <p>This is consistent with previous dialogue between this group of stakeholders in 2011 which sought to share views on opportunities to improve the management and communication of aircraft noise. In relation to noise contours the group recognised that average noise contours are an important tool in noise measurement and management, but equally that average noise contours do not reflect the totality of community concerns around noise and should be supplemented by other metrics.</p> <p>The Airports Commission final sustainability appraisal framework sets out a range of primary and supplementary noise measures in the form of a noise scorecard. This includes LAeq_{16 hour} contours and supplementary metrics such as the N70 and N60. We support that approach and in our submission for the Heathrow third runway scheme (June 2014) present results for the full range of measures described in the Airports Commission noise scorecard.</p>
A.3	<p>What are the prospects for significantly less noisy aircraft at Heathrow over the next ten years and are the prospects in any way dependent on the development of the proposed third runway? To what extent is there a conflict between the optimum reduction of aircraft noise and carbon emissions?</p>	<p>We believe the prospects are good. Over the coming decade we expect to see the introduction of A350s and new variants of A320 and B777s for example. Heathrow's status as an important hub means that airlines tend to deploy their newest and quietest aircraft on Heathrow routes, a feature of strong competition on premium routes. We also provide a strong financial incentive for airlines to use the quietest planes through our variable landing charges (which are currently the only landing charges in the UK that split the current quietest standard – Chapter 4). We continue to look at how we can incentivise the early adoption of new aircraft at Heathrow and are committed in our Noise Action Plan to regularly reviewing our charging structure.</p> <p>As a result, over 98% of aircraft at Heathrow meet the quietest current international noise standard. More airlines use the latest Airbus A380 “Superjumbo” and Boeing 787 “Dreamliner” than at any other European hub. Nevertheless there is more we can do and the introduction of a new noise category (Chapter 14) in 2017 will allow further differentiation as part of our variable landing charges. In addition a third runway offers opportunities to further incentivise less noisy aircraft, for example through “green slots” where only the quietest category of aircraft are allocated new slots.</p>

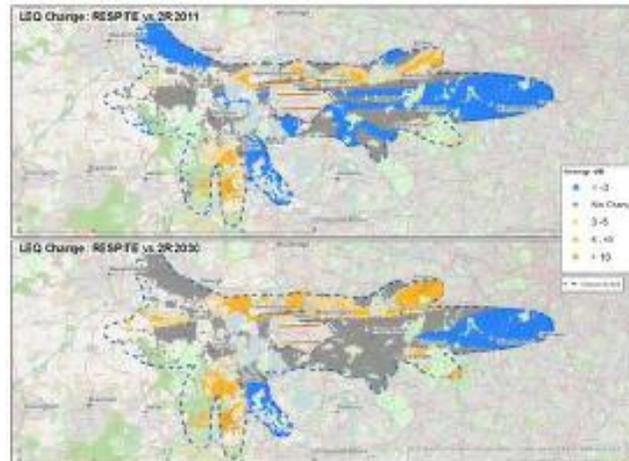
		<p>There are interdependencies between noise and carbon emissions. These are complex and require careful evaluation prior to regulatory, operational or design decisions. However aircraft manufacturers are confident that new generations of aircraft will be more fuel efficient AND quieter than today's equivalents.</p>
A.4	<p>Are there additional operational procedures for noise reduction and respite at Heathrow that could be introduced within the next ten years; or are any such noise improvements being held back for the development of a third runway?</p>	<p>We are committed to employing smarter operating procedures to reduce noise impacts on residents.</p> <p>We are actively pursuing a number of initiatives aimed at reducing noise impacts which all involve close engagement with NATS, CAA, airlines and importantly local community representatives. We have listened to residents' concerns and sought to develop our approach in response to that. For example, we have used the opportunity that the modernisation of airspace in Europe and the UK over the next five years offers to explore the concept of providing predictable respite from noise. We are currently trialling options for both arrivals and departures and working with local communities to identify changes that could benefit them. The results of these trials will be used to inform and shape a wide public consultation as part of the London Airspace Management Programme (LAMP) expected in 2016.</p> <p>We are also committed to trialling steeper approaches, meaning that planes are higher and quieter when they approach the airport. We currently have plans to run trials from September 2015.</p> <p>One change that we are not planning for the existing two runway airport is "displaced thresholds" as this requires a significant infrastructure alteration (e.g. the runway exit taxiways would all need to be realigned) and is not economically viable without growth to support the investment.</p>
B.1	<p>Over what areas will the arrival and departure flight paths for the proposed third runway be routed, and which of those areas are not currently overflowed by Heathrow air traffic, either at all or only</p>	<p>It is too early to say with certainty where future flight paths would be routed and we have been clear in our submission that we see that being the subject of further work and a full public consultation. However, in order to illustrate how the noise climate could change with a third runway we developed and published indicative flight paths based on three potential policy options in relation to people overflowed by flight paths</p>

occasionally?

for a three runway Heathrow:

1. Minimising the **total** number of people overflown
2. Minimising the number of **new** people overflown
3. Maximising **respite** by providing periods of relief for all communities overflown

Depending on the policy option chosen, there would be different impacts for different communities. This will include a few areas that are only occasionally overflown today being overflown more frequently as a result of a third runway. Within our submission we have produced a range of change diagrams which give an indication of the areas that would see a relative change as a result of a third runway. The example below is taken from Figure 6.7 on page 56 of our air and ground noise assessment and shows the change in Leq levels within an “area of interest” defined by the composite boundary of a range of current and future measures selected by the Airports Commission. The blue areas indicate postcode locations with a reduction in Leq of more than 3dB and the yellow those with an increase of more than 3dB.



Our community consultation indicated a strong preference for periods of respite from noise. Our option to maximise respite provides around 95% of those overflown with respite for at least 50% of the time.

<p>B.2</p>	<p>Would the flight paths for the third runway cause any alteration to the present routing of the flight paths for the existing runways; and if so, to what extent?</p>	<p>A new runway at either Heathrow or Gatwick would need existing flight paths to be altered. However there is likely to be some degree of change to these over the coming decade anyway.</p> <p>The UK's airspace was designed over 40 years ago and is based on old technology and ground based navigation systems. This is the case throughout Europe. Through the Single European Sky project there is a move to simplify and harmonise the way airspace and air traffic control is used. In the UK, the Government is achieving this through the Future Airspace Strategy (FAS) which sets out a plan to modernise UK airspace by 2020. For the London Airports (including Heathrow and Gatwick) this is being delivered through the London Airspace Management Programme (LAMP).</p> <p>For Heathrow these changes are some years off, however the trials we are currently undertaking will help ensure that the public consultation is as well informed as possible and enable innovative noise management concepts to be tested.</p> <p>In order to illustrate how the noise climate could change (relative to today's flight paths) with a third runway we developed and published indicative flight paths based on three potential policy options in relation to people overflown for a three runway Heathrow. How much change a third runway at Heathrow would cause would depend on the policy option chosen:</p> <ol style="list-style-type: none">1. Minimising the total number of people overflown2. Minimising the number of new people overflown3. Maximising respite by providing periods of relief for all communities overflown. <p>Depending on the policy option chosen, there would be different impacts for different communities. For example in our maximising respite option we have developed alternating arrival and departure routes to illustrate how the concept of westerly arrival alternation could be extended to both arrivals and departures. Within our submission we have produced a range of change diagrams which give an indication of the areas that would see a relative change as a result of a third runway. Our community consultation indicated a strong preference for periods of respite from noise. Our option to maximise respite provides around 94% of those overflown with respite for at least 50% of the time.</p>
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B.3	How would the proposed segregated mode respite periods operate with three runways, compared with the existing runway alternation arrangements (between 0700-2300 and 2300-0700)?	<p>There are four operating modes for the runways which can be rotated to provide periods of respite for all communities living closest to the airport. But having three runways instead of two would obviously mean that we cannot offer runway alternation in exactly the same way as today, with a 50/50 split of landings between two runways. However we can still provide periods of respite without noise for all communities. In our publication in July we showed one way that runway alternation could work and were really clear that more consultation is needed with local communities to identify the most effective way of doing this.</p> <p>We are not proposing any extra night flights before 0600. Because we would rotate the use of runways at night, based on the current pattern of night time alternation residents under existing flight-paths would have night flights at most every third week and potentially only one week in six. This means that areas such as Richmond would experience fewer night flights with a third runway than today.</p>
B.4	Would the third runway enable Heathrow to operate without flights in the night period (2300-0700)?	<p>Night flights are an important part of operations at a hub airport but we recognise they are also a significant concern for local residents. Consequently we are not proposing any extra night flights before 0600. Because we would rotate the use of runways at night, based on the current pattern of night time alternation, residents under existing flight-paths would have night flights at most every third week and potentially only one week in six. This means that areas such as Richmond would experience fewer night flights with a third runway than today. Future operational procedures (such as steeper approaches and with a third runway displaced thresholds) and new aircraft technology would also mean that these flights would be significantly quieter than today.</p>
New B.5	How quickly would Heathrow with the proposed third runway reach its stated capacity of 740 000 aircraft movements (ATMs) per year? In view of the resilience difficulties at Heathrow with 480 000 ATMs (a problem not identified at the Terminal Five Public Inquiry), how much resilience would there be with 740 000	<p>After the third runway opens in 2025 we believe that the most likely scenario is an initial growth rate of 5% pa taking us to 570,000 movements in 2030 and then 2.5% p.a. thereafter, reaching 740,000 movements by 2040. Through our work with NATS (Heathrow) we have determined 740,000 movements per annum as the practical limit for operating three runways in modes designed to retain the principle of runway alternation (and therefore periods of relief from over-flight for local communities), whilst providing an appropriately resilient operation.</p>

	<p>ATMs? If the desired resilience can only be achieved with fewer than 740,000 ATMs what would be this lesser number of ATMs and in what year is that expected to be reached?</p>	<p>As air traffic management improves (e.g. GBAS and Time Based Separation) and ground traffic management continues to improve and become more efficient (e.g. ACDM, APOC and other real-time decision making processes), resilience to the impact of adverse weather on the operation will improve, the number of “red” days will diminish and our ability to recover from disruption will also be enhanced.</p> <p>For all these reasons we believe (and NATS endorse) that 740,000 movements is a robust planning assumption for an appropriately resilient operation.</p>
<p>B.6</p>	<p>Would the proposed third runway hasten or delay the date by which the air traffic noise levels at Heathrow would not exceed the World Health Organization’s guideline values on community noise?</p>	<p>It is not clear which WHO guideline value the question relates to and perhaps worth noting that some of their guideline values relate to internal noise levels which have the potential to be mitigated against through effective noise insulation schemes. In our submission we have set out a commitment to a £550 million mitigation and compensation package. We are currently publicly consulting on the principles that such a scheme should employ.</p> <p>It is also important to put the WHO community noise guidelines into context and note that there is no date by which these values are required to be met. They do not apply specifically to aircraft noise and the population affected at these levels from other sources such as road and rail will be very much higher. Indeed the WHO itself recognises that around 40% of the European Unions population is exposed to road noise in excess of the guideline values. It also recognises that its night-time limit is not feasible in the short-term. Consequently it should be noted that many areas in London experience noise levels in excess of the WHO guidelines when there is no overflight of aircraft as a result of general suburban noise sources including road and rail.</p> <p>For example based on the 2011 round of strategic noise mapping for London, around 2.3 million Londoners are exposed to road noise above 55dB Lden (the EU and Mayors preferred measure) and 1.6 million to levels above 50dB at night. For Heathrow (including those outside of London) the figures are around 765,000 for the 55dB Lden and 200,000 for 50dB Lnight.</p> <p>Consequently If Heathrow shut tomorrow, around 50% of people in the airport’s noise footprint would still be exposed to noise levels above 55dB Lden as a result of traffic noise (based on a review of noise maps from defra.gov.uk).</p>

		<p>Another point of interest is the extent to which new development and population encroachment has and is expected to continue to occur within the noise contours for Heathrow. It is unlikely that planning authorities would seek or want to prevent developers or residents choosing to locate inside the contours indicated by the WHO guidelines given the demand and desire to do so.</p> <p>We do not have data for WHO guidelines; however using the 54dB (summer day) LAeq_{16hour} measure we estimate that a two runway Heathrow in 2040 would have around 322,000 people within it. For a three runway Heathrow in 2040 the equivalent figure would be between 346,000 and 458,000 people depending on how flight paths are designed and used.</p>
B.7	<p>HAL have stated that the flight paths following construction of a third runway are still unknown. Will HAL confirm that details of the new flight paths will be made available before a decision is taken to proceed with the project?</p>	<p>While the decision regarding final flight paths is a matter of UK Government aviation policy and would be the subject of significant public consultation before introduction, Heathrow will publish its flight path assumptions as part of the statutory planning process in the event that the third runway receives policy approval.</p> <p>Our submission for the Heathrow third runway scheme presents flight path options that meet the policy objectives of the Aviation Policy Framework and the Airports Commission Sustainability Appraisal Framework. We explain the basis for our approach in the answer to question B1 and B2.</p>
C.1	<p>Given that Heathrow have said they do not rule out a 4th runway when would a 4th runway need to be operational given the answer to question 9 as to when a three runway airport is expected to be full after providing for resilience?</p>	<p>We are confident for the reasons stated in our response to Question 9 that three runways will be sufficient at least until 2040. Beyond this point, forecasts of overall aviation traffic demand and the ability to predict the nature of future aviation market trends are inevitably far less certain. For this reason one cannot say with certainty that a fourth runway would ever be required at Heathrow. If in future more demand did arise than can be accommodated within 740,000 movements, this need would have to be weighed against the environmental impacts as they appeared at the time as well as considering the most appropriate location for any new capacity.</p>
C.2	<p>How would a 4th runway impact the answers given in Section B on a 3rd runway?</p>	<p>In Heathrow's July 2013 submission of options to the Airports Commission, we included some information based on preliminary modelling of a fourth runway. Although at a very indicative stage, the findings suggest it would be possible to have</p>

		<p>four runways at Heathrow, while still reducing the total number of people within Heathrow's noise footprint compared to today. Four-runway options have the intrinsic characteristic of delivering respite for 50% of the time. This is similar to the respite provided today by runway alternation during westerly operations.</p>
D.1	<p>Can the analysis separate out the impact of less noisy aircraft and their fleet replacement from route and other operational changes in both the 2 runway case and the 3 runway case and then apply sensitivity analysis to demonstrate the impact of less noisy aircraft?</p>	<p>Heathrow has assessed the third runway option in accordance with the policy objectives of the Aviation Policy Framework and the Airports Commission Sustainability Appraisal Framework.</p> <p>While the timescales for submission did not allow us to conduct this analysis, it could be undertaken as part of our detailed environmental assessment in the event that additional runway capacity receives policy approval.</p> <p>We note the Airports Commission is undertaking further analysis of the shortlisted runway options and is expected to go out to public consultation on this information in the Autumn of 2014.</p>
D.2	<p>Does HAL see value in a new survey of noise annoyance (compared to the last one published in the 1980s)?</p>	<p>Heathrow would welcome additional research towards improving society's understanding of the relationship between aircraft noise exposure and its impacts. In particular the relative contributions of acoustic and non-acoustic factors in influencing responses. Robust findings from such research would assist in describing, managing and mitigating aircraft noise impacts.</p> <p>We note that considerable research into aircraft noise annoyance has been undertaken in the UK and Europe since the 1980s. Also that the Government's Aviation Policy Framework currently describes the 57 dB LAeq_{16 hour} contour as marking the approximate onset of significant community annoyance from aircraft noise.</p> <p>In our response to the Airports Commission discussion paper on noise (see enclosed document) and the draft sustainability appraisal framework (Airports Commission 2014), Heathrow acknowledged the limitations in relying on the 57 dB LAeq_{16 hour} contour alone in seeking to characterise the impacts of aircraft noise.</p> <p>The Airports Commission final sustainability appraisal framework sets out a range of</p>

		<p>primary and supplementary noise measures in the form of a noise scorecard. This includes LAeq_{16 hour} contours and supplementary metrics such as the N70 and N60. We support that approach and in our submission for the Heathrow third runway scheme (June 2014) present results for the full range of measures described in the Airports Commission noise scorecard.</p> <p>The approach underpinning our submission illustrates how the noise climate could change based on three potential policy options in relation to people overflowed by flight paths for a three runway Heathrow:</p> <ol style="list-style-type: none">1. Minimising the total number of people overflowed2. Minimising the number of new people overflowed3. Maximising respite by providing periods of relief for all communities overflowed <p>In relation to the 57 dB LAeq_{16 hour} contour, our analysis indicates that in 2030 even with a third runway there will be around 22-28% fewer people within this contour than today based on these policy options.</p>
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