Mayor of London’s response to the Airports Commission recommendation for a three-runway Heathrow
October 2015

Background to this review

In July 2015, following a 2½-year process, the Airports Commission (AC) published its Final Report. It recommended a third runway at Heathrow together with a package of conditions integrally linked to the new runway’s approval. This review, undertaken on behalf of the Mayor of London, sets out why a three runway Heathrow does not meet the needs of London or the UK, nor does it even meet the commercial needs of the airlines and investors essential to its success.

The recommendation for Heathrow expansion made by the AC fails on every count. It will not deliver the additional connectivity that the UK needs and comes at huge environmental cost. The evidence presented in the AC Final Report makes a clear case for a UK hub with four runways. This can never be delivered at Heathrow without devastating impacts on the local environment and public health. However, options for a four runway hub were discarded prematurely by the AC. The Government should review the full body of evidence presented in this process and revisit potential locations for a four runway hub.

At the heart of the failure of a three runway Heathrow are two fundamental issues: aviation capacity and public health.

Aviation Capacity

In its Interim Report, the AC described an airport which is effectively full shortly after opening, well above the 70-75 per cent represented by international best practice and the level of utilisation observed at rival European hubs.

The Commission’s forecasts indicate that a new runway at Heathrow would be very well-used, with the expanded airport operating at around 80-90% of capacity by 2030 and at maximum capacity by 2050.


At 80-90 per cent capacity, a three runway Heathrow will suffer from delays and poor resilience and slots will be constrained, particularly at peak times – in short, little different from a two runway Heathrow today.

Though the AC was more careful in its choice of wording in its Final Report – focusing on the London airports system – the basic message of an expanded Heathrow being close to capacity shortly after opening remains unchanged.
Having rightly recognised the importance of a hub in its Final Report – and having demonstrated that the hub, at Heathrow, will be full even with a third runway – the AC then rules out a four runway hub at Heathrow. Taking such an approach is completely contradictory and incredibly short-termist and condemns us to another tortuous debate about new capacity before a third runway is even open.

This capacity constraint has a direct impact on the additional connectivity that is provided with a three runway Heathrow, which would have fewer connections to other UK cities than it has today and in 2030 would serve fewer long haul destinations than it does today.

Moreover, the AC deems the need for further runway capacity to sit outside its scope – although this is not necessarily consistent with the terms of reference issued to the AC by the Secretary of State for Transport.

**Public Health**

A three runway Heathrow will expose a million people to aircraft noise and will significantly increase the air pollution experienced by local communities. Studies have already pointed to increased risk of heart attack and stroke around Heathrow. The public health impact of an expanded airport is a fundamental issue that is likely to have a substantial impact on the political deliverability of the project.

The AC has rightly recognised this and has proposed a number of measures that must be in place as a condition of any future expansion. However – as this report will demonstrate – the measures identified are of limited value to local communities and present very real concerns for airlines and investors and their ability to operate and invest.
Structure of this review

This review identifies a number of themes within the Airports Commission Final Report and sets out the relevant report extracts followed by an explanation of what they mean and the implications for London and the rest of the UK. The themes that are covered in this review are:

1. Connectivity
   a. Domestic
   b. Long haul
2. Wider economic benefits
3. Noise
   a. Noise impacts
   b. Community engagement board
   c. Noise authority
   d. Noise envelope
   e. Community compensation
   f. Noise levy
   g. Respite
   h. Night flights
4. Air quality
5. Surface access
6. Finance
7. Summary
1. Connectivity
   a. Domestic connectivity

What the AC says
The AC recognises the importance of securing domestic connections. The report states that Heathrow expansion will enable increased frequency and allow new links to be established.

For nations and regions where domestic air connections to London remain crucial, such as Scotland and Northern Ireland, expansion at Heathrow will create space at the airport for increased frequencies and for new links to be established.


The AC predicts that, without Heathrow expansion, the number of domestic routes will fall to three, compared to the seven that exist today. Whilst the report does not explicitly state the number of domestic routes likely to be served by a three runway Heathrow, the data can easily be extracted from the following table and graph.

Airports Commission: Final Report (2015), Figure ES.2.
Our analysis

Over the last quarter-century, domestic routes to Heathrow have fallen from 18 to seven today, as airlines have, without sufficient spare capacity, traded routes off against each other, focusing on more profitable flights at the expense of domestic connections. Those routes that have survived have witnessed significant reductions in frequency.

The AC forecast for the number of domestic routes likely to be served from a three runway Heathrow can be extracted from the graph and table above as follows:

<table>
<thead>
<tr>
<th>Daily destinations, 3-runway Heathrow [Carbon Traded, Assessment of Need]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Shorthaul <strong>including</strong> Domestic</td>
</tr>
<tr>
<td>Shorthaul <strong>excluding</strong> Domestic</td>
</tr>
<tr>
<td><strong>Domestic destinations</strong></td>
</tr>
</tbody>
</table>

So, the AC predicts that with a third runway, the number of domestic destinations served by Heathrow does not rise, but instead falls to four. This means that, even with a third runway, not only would former domestic routes not be restored, but cities such as Aberdeen, Belfast, Leeds, Manchester and Newcastle could lose their existing route to the hub and the global access it provides. This could have serious repercussions for their regions, harming the rebalancing of the UK economy as well as efforts to create a Northern Powerhouse.

The AC’s only response to this collapse in domestic access to the hub are PSOs: Public Service Obligations. These are EU-sanctioned state aid interventions for maintaining air services – in effect, the AC is saying that only a state-sponsored domestic route network will connect a three runway Heathrow to the regions. Yet there are serious doubts as to whether use of PSOs on such routes would even be legal under EU rules. Even if they were, the PSO could only be determined at the time the runway opened; no forward commitment to the regions could be
Domestic connectivity – Summary

- The AC recognises that regional connections to the UK hub are essential.
- However, the AC predicts that the number of UK domestic destinations from a three-runway Heathrow will almost halve compared to today - just four UK cities.
- The AC identifies PSOs as the way to secure further domestic connectivity - but there are serious doubts as to their legality.

A three-runway Heathrow is predicted to serve just four UK cities – that’s just over half of those served today.
b. Long haul connectivity

What the AC says
The AC claims that increasing capacity at Heathrow via a third runway would bring significant long haul connectivity benefits. Further AC analysis is provided in the table below.

![Table](https://example.com/table.png)


Our analysis
The benefits of new airport capacity should rest on the connectivity benefits it can bring, particularly when located at a hub – and the economic growth and jobs that flow from it.

However, according to the table above a three runway Heathrow would offer at most 12 additional daily long haul destinations over the ‘Do Minimum’ scenario (where no runway is built). The AC seems oblivious to any concerns this number raises – even though it is fewer than the number of destinations the UK should be seeking to serve in China and India alone.

But the AC, in its Final Report, failed to compare its forecast with the number of long haul routes served by Heathrow today – of most interest to UK business eager for better connectivity.
Following pressure from the Mayor and others on this critical issue, Sir Howard Davies has subsequently confirmed that, according to the AC’s methodology, Heathrow today offered 61 daily long haul destinations, versus the AC forecast of 68 in 2030. This means a three runway Heathrow would offer just seven additional daily long haul destinations in 2030 over today.

This suggests that critical new routes to cities in emerging economies will never materialise and the opportunities for the UK to benefit from trade, investment and inbound tourism will be severely curtailed. Manufacturers reliant on the bellyhold freight capacity of passenger flights for their exports will face additional time and cost as they reroute overland to European hubs that already offer more extensive long-haul route networks than a three runway Heathrow can ever offer.

It may at first blush appear incredible that an increase in capacity of approximately 50 per cent does nothing for long haul connectivity. But, with capacity constrained shortly after opening, the AC’s forecasts imply that much of the new capacity will be taken up by airlines flying more frequently to already established destinations which have suppressed demand; the bulk of new routes forecast by the AC are in fact to short haul, non-domestic destinations.

**Concerns about the methodology**

By contorting the methodology to produce the right figures – underplaying Heathrow’s connectivity today and overstating its future connectivity – the AC has lost sight of the main purpose of the exercise: to determine the connectivity of most value for UK business. The main tool used by the Commission to massage down the airport’s existing connectivity is a frequency threshold. By stipulating daily routes – and then specifically routes with 361 or more flights a year – the AC has deliberately excluded:

i. **Emerging market destinations with less than daily frequencies**
   These include Manila, Hanoi, Dhaka and Chengdu and are well used by people travelling on business and provide valuable opportunities for trade and investment. Chengdu, for example, served four times a week, is a vital link for both business travellers and freight to China’s Sichuan province, which boasts a GDP of $450bn.

ii. **Business-focused destinations served daily except for a handful of days in winter**
   These include Guangzhou (359 flights per year), Raleigh/Durham (356) and Denver (354). The fact that these routes are not operated on a few days in winter is precisely a reflection of the business reliance of these routes. For example, the Heathrow to Raleigh/Durham route survived American Airlines’ closure of its hub operations at the latter in 1995 owing to the strong corporate demand from the ‘Research Triangle’, which notably includes a key US base for London-based pharmaceutical giant GSK.

The AC methodology additionally excludes direct one-stop services such as Sydney and Auckland even though UK business benefits from the only direct service from Europe to these destinations. The AC is also treating North African destinations as long haul – even though classed as short haul by most airlines and reflected in the passenger profile and airlines’ operational arrangements on these routes. Destinations such as Marrakech and Tunis may be leisure focused and just three hours flying time, but if an expanded Heathrow is predicted to offer daily flights to them, the AC seems determined to count them as new long haul services.
Long haul connectivity – Summary

- The AC recognises the importance of securing more long haul destinations to ensure future economic prosperity.

- However, according to the AC, an expanded Heathrow would offer just seven additional daily long haul destinations in 2030, when compared to today.

- A 50 per cent capacity increase does not translate into a commensurate increase in long haul routes – the bulk of new routes forecast by the AC are short haul, non-domestic destinations.

- The methodology employed by the AC for evaluating numbers of routes appears deliberately designed to underplay existing and overplay forecast connectivity – with little regard for what is of value to UK business.

A three-runway Heathrow fails to offer a step change in long haul connectivity – and the global market access that would bring
2. Wider economic benefits

What the AC says

The impact of expansion at Heathrow would be higher still with increases in GDP estimated to be in the order of 0.65-0.75% in 2050, amounting to £131 billion over the assessment period for the Extended Northern Runway and £147 billion for the Northwest Runway.

[benefits assessed over 60 years]

The view of the AC’s independent economic review panel:

This is one of the most ambitious attempts to prepare a quantified Economic Impact Assessment. There are few comparators available. While the content of the model itself has been well-tested, the same cannot be said of the front end, where an increase in capacity is converted into an increase in trip-making, trade, tourism and finally productivity. Furthermore the interpretation of the result---what exactly do they mean and is their basis transparent---is an issue. Overall, therefore, we counsel caution in attaching significant weight either to the absolute or relative results of the GDP/GVA S-CGE approach (PwC report) within the Economic Case. We would accept that there is some useful indicative material for the Strategic Case but care is required in assessing its robustness and reliability.

A Note from Expert Advisors, Prof. Peter Mackie and Mr Brian Pearce, on key issues considering the Airports Commission Economic Case (May 2015), page 7.

Our analysis

With regard to the £147 billion of economic benefits quoted by the AC, the independent review of the methodology commissioned (and published) by the AC raises serious concerns. These include the optimistic assumptions used, possible double-counting, the fact that the impact of higher aeronautical charges has not been factored into the model and the reliance on significant further infrastructure investment if this figure is to be realised.

Moreover, the model focuses on seat capacity – rather than destinations served – and the review panel raises a particular concern about the elasticity of productivity to seat capacity being high. Indeed, it would seem the economic model takes no account of the paucity of additional connectivity offered by a 3-runway Heathrow.

Overall, the review panel is clear in cautioning against significant weight being given to the £147 billion figure quoted for additional UK GDP.
Wider economic benefits – Summary

- The AC’s independent economic review panel questions the methodology used to determine the wider economic benefits of a third Heathrow runway and cautions against giving significant weight to the AC’s £147bn quoted for additional UK GDP.

- The lack of additional long haul connectivity and the reduction in domestic connectivity, does not appear to have been factored into the assessment.

The wider economic benefits of Heathrow expansion calculated by the AC are likely to have been overstated.
3. Noise
   a. Noise impacts

What the AC says

With expansion, the overall number of flights would grow, but new approach and departure paths could enable the noise impacts to be dispersed more widely, limiting the impacts on any individual community. It would be possible to ensure that noise from the airport, with either option for adding runway capacity at Heathrow, would not exceed current levels across a wide range of metrics, both during the day and at night.


Our analysis

The noise data and the underpinning assumptions that have been published by the AC are incomplete and limit the potential for proper scrutiny. The results presented by Heathrow Airport Limited (HAL) and the AC suggest the number of people exposed would actually fall; this stretches credulity.

The AC has reached this conclusion in part by optimistically assuming future technological improvements to aircraft will considerably reduce aircraft noise. The AC predicts that new and improved aircraft would make up approximately 67 per cent of aircraft at Heathrow by 2050. In reality, the 30–40 year life span of civil aircraft – and the fact that Airbus has an order book for current generation aircraft equivalent to double the current in-service fleet – means that any notable technology driven improvement in aircraft noise is unlikely to be realised at Heathrow for a number of decades.

The AC’s noise impact assessment also relies heavily on the radical recasting of flightpaths, as part of PBN (Performance Based Navigation, facilitated by new technology. However, the claim that this “could enable the noise impacts to be dispersed more widely” glosses over the fact that it will mean several communities become regularly overflown for the first time.

The AC appears not to provide information about newly overflown for the higher carbon traded, only the lower carbon capped. But the AC data suggests that – even in the scenario which seeks to minimise those newly overflown – over 150,000 people will be newly exposed to aircraft noise at 55dbLden. That’s around five times the total number of people exposed by a 4-runway airport in the Inner Thames Estuary. Under one scenario, the AC predicts over 300,000 people newly exposed by an expanded Heathrow.

Moreover, the use of PBN to disperse flights in this instance is directly contradictory to Government policy, as set out in the Aviation Policy Framework (March 2013):

“Consistent with its overall policy to limit and where possible reduce the number of people adversely affected by aircraft noise, the Government believes that, in most circumstances, it is desirable to concentrate aircraft along the fewest possible number of specified routes in the vicinity of airports and that these routes should avoid densely populated areas as far as possible... However, in certain circumstances, such as where there is intensive use of certain routes, and
following engagement with local communities, it may be appropriate to explore options for respite which share noise between communities on an equitable basis, provided this does not lead to significant numbers of people newly affected by noise.”[3.31, 3.32]

However, the AC data makes clear that significant numbers of people will be newly affected by noise – nor has there been engagement with local communities on this – and as such, the approach taken to the noise exposure of an expanded Heathrow is not compliant with policy.

There would be significant practical challenges in implementing new flightpaths and the technological improvements discussed. The AC seems to take for granted that such improvements as are technically possible should be used to enable more flights rather than to improve Londoners’ quality of life.

The noise modelling undertaken for TFL – using the same noise modelling consultants, but more credible assumptions closer to today’s operation – found a 33 per cent increase in those exposed at 55db Lden versus today – that’s a million people in total.

Moreover, it should also be noted that, even with the resources HAL has invested in seeking to reduce the number of people captured in the noise metric, a three runway Heathrow would still remain the worst airport in Europe for aircraft noise, exposing more people at 55db Lden than its five main European rivals – Paris CDG, Frankfurt, Amsterdam, Madrid and Munich – combined.

Noise impacts – Summary

- The noise data and assumptions published by the AC are incomplete and limit scrutiny.
- HAL and the AC claim that a 50% increase in aircraft could be accommodated without any increase in noise; this stretches credulity.
- To achieve this, HAL and the AC have assumed a number of optimistic assumptions about future technologies as well as a radical recasting of flightpaths. The latter – based on using PBN (Performance Based Navigation) to disperse flights – is contrary to Government policy because of the significant numbers newly exposed.
- The AC data suggests that the new flightpaths would leave over 150,000 people newly exposed to aircraft noise at 55db Lden. That’s around five times the total number exposed by an Inner Thames Estuary airport.
- Noise modelling undertaken for TFL using more credible assumptions closer to today’s operations shows Heathrow expansion will see 33 per cent more people exposed to aircraft noise at 55db Lden versus today – that’s a million people in total.

All sides accept that a three-runway Heathrow would leave several hundred thousand people exposed to noise levels over 55db Lden – and as such the airport would remain the worst in Europe, exposing more people than its five main rivals combined.
b. Community engagement board

What the AC says: the proposed condition

- A new Community Engagement Board with real influence over spending on compensation and community support and over the airport’s operations should be set up under an independent chair, drawing on the models successfully in operation at Schiphol and Frankfurt Airports.


The AC recognises that HAL already has a Community Noise Forum, but notes its limited impact to date.

Our analysis

It is not clear why the Community Engagement Board proposed will be different from any of the existing bodies already established between airport and local residents – and which, as the AC acknowledges, have not closed the trust gap.

c. Noise authority

What the AC says: the proposed condition

- An independent aviation noise authority should be established with a statutory right to be consulted on flight paths and other operating procedures. The authority should act as an impartial source of expert advice, enabling all sides to engage more meaningfully on this complex and subjective issue.


The AC recommends that the proposed noise authority has a formal role in monitoring and quality assuring all processes and functions which have an impact on aircraft noise, advising Government and the CAA on such issues. In its final report, it adds that the body should have powers to intervene – and “in extreme cases, to fine organisations”.

Our analysis
The independent aviation noise authority proposed is one whose primary role will be to advise other public bodies – without any real decision-making or enforcement powers.

Though the AC talks of powers, it does not provide any clarity on how these powers would be delegated to the authority and what sanctions they would be able to impose in what circumstances.

d. Noise envelope

What the AC says: the proposed condition

Clear noise performance targets (a noise envelope) should be agreed and Heathrow Airport Ltd must be legally bound to stay within these limits.


For this reason, the exact details and design of a noise envelope should be for local agreement.


Our analysis
The proposal for a noise envelope is of little use without stipulating how stringent that noise envelope should be or what penalties would apply. Also, noise envelopes do not specify how noise will be shared.

Many UK airports have actual or de facto noise envelopes as part of their conditions of operation – but typically each of these airports never actually gets near to these noise envelopes – because they have been drafted based on over generous assumptions.

e. Community compensation

What the AC says: the proposed condition

- Heathrow Airport Ltd’s proposal to spend more than £1 billion on community compensation, including £700 million on noise insulation is welcome. HAL should be held to this commitment.

Our analysis

Modelling undertaken for TfL estimates that around 500,000 households would be exposed at 55dBA. The AC figures reveal that barely a third of these households would benefit from support towards noise insulation.

f. Noise levy

What the AC says: the proposed condition

- The Government should introduce a noise levy or charge at major UK airports to ensure that airport users pay more to compensate local communities. A levy should not impose undue or unfair costs at any airport.

Our analysis

The token £50 million that the AC estimates would be raised every year by a Heathrow noise levy works out as support for insulating a mere 11,500 homes.
Noise mitigation – Summary

➢ The proposed Community Engagement Board will not be substantially different from those that already exist.

➢ The suggested Noise Authority will lack any real decision making or enforcement powers.

➢ A noise envelope is of little use without clarity on how stringent it should be or what penalties would apply.

➢ Barely one third of households exposed to aircraft noise at $L_{den}$ versus today will benefit from noise insulation set out in the condition on compensation.

➢ The proposed noise levy would only raise enough to support insulation for a mere 11,500 homes.

The proposed conditions do not change the fact that one million people will be exposed to unacceptable aircraft noise by an expanded Heathrow
g. Respite

What the AC says: the proposed condition

A third runway should allow periods of predictable respite to be more reliably maintained.


Although a third runway at Heathrow would reduce respite for any individual community enabled by runway alternation from roughly a half to a third of the day, the Heathrow Airport Northwest Runway proposal would enable respite from runway alternation to be more reliably maintained by improving the resilience of the airport.


How respite would operate

[The traffic day lasts from 6am until around 11.30pm – i.e. each period is around 4 hours]

Airports Commission: Final Report (2015), Figure 9.10.

Our analysis

The AC promise of more predictable respite relies entirely on the airport not being capacity constrained and therefore avoiding the tactical measures – which infringe upon runway alternation – that are used today when delays build up. However, as the AC findings show, a three runway Heathrow will be capacity constrained – so this benefit is illusory.

The AC does admit that on average the scheduled respite falls from a half to a third of the traffic day; but even this conceals the fact that, for the majority of those overflown, they will
receive respite from overflying aircraft for just a quarter of the traffic day – half of what is offered to local communities today.

**Noise respite – Summary**

- AC claims for more reliable respite rely on the airport not operating at the margins of its operational capacity – eliminating the need for tactical measures when delays build up. But as has been demonstrated, a three-runway Heathrow will be capacity constrained, rendering this benefit invalid.

- The AC admits that, on average, the scheduled respite falls from half to one-third of the operating day; but this hides the fact that, for the majority of those overflown, respite will cover just a quarter of the traffic day.

**The respite offered to local communities by a three-runway Heathrow is greatly reduced – not enhanced**
h. Night Flights

What the AC says: the proposed condition

A third runway would create the opportunity to end night flights before 6:00am. This opportunity should be taken. Following construction of a third runway at Heathrow there should be a ban on all scheduled night flights between 11:30pm and 6:00am.


The AC recognises that under current arrangements a quota system limits the number of flights that use Heathrow between 2330 and 0600. This restricts flights in this period to an average of 16 arrivals per night (scheduled between 0430 and 0600) and no departures.

The AC recognises the value in these night flights and claim a third runway at Heathrow could support around 40 additional movements per hour in this period.


AC monetised sleep disturbance data

<table>
<thead>
<tr>
<th></th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heathrow Northwest Runway</td>
<td>9.6</td>
<td>3.40</td>
<td>-25.6</td>
</tr>
<tr>
<td>Heathrow Northwest Runway no core night flights (11:30pm-6:00am)</td>
<td>-37.1</td>
<td>-35.9</td>
<td>-74.1</td>
</tr>
<tr>
<td>Heathrow Northwest Runway no night flights (11:00pm-7:00am)</td>
<td>-198.2</td>
<td>-293.3</td>
<td>-261.6</td>
</tr>
</tbody>
</table>

[Incremental difference compared to do minimum, £ million/year]


Our analysis

Though much has been made of the “night flights ban” condition, this only covers the 2330-0600 “core night period” and not the full night period, 2300-0700, which is recognised by the
WHO and a better reflection of when people are actually asleep.

The 16 flights on average currently arriving before 0600 will instead be shifted to after 0600. The AC says it cannot ban flights between 0600-0700 because there would be insufficient capacity at a three runway Heathrow to accommodate them.

Yet the AC calculation for monetised sleep disturbance shows that a full night ban (until 0700, rather than 0600) offers more than five times the benefit every year compared to the partial ban proposed. This is because, even with the proposed restriction in the period to 0600, there will, under the third runway proposals, be around 33 per cent more flights in the 2300-0700 night period than there are today. This is simply a result of the greater total throughput from three runways and the lack of any restrictions after 0600. Furthermore, the night ban will result in a very intensive period of arrivals between 0600 and 0700, with many of the arrivals being larger long haul aircraft, contributing to severe disturbance for those trying to sleep under the arrival flight path.

However, the quasi-ban on night flights could also be problematic for the airlines. According to the AC data, those 16 flights on average enable arrivals from key long-haul routes including 50 per cent or more of the seat capacity arriving from Hong Kong, Singapore, Kuala Lumpur, Riyadh and Nairobi. These timings are no accident – and delaying these flights reduces their attractiveness, particularly to business travellers, as well as creating timing issues at the other end of the route. This restriction on long haul routes could also harm freight users, while the quasi-ban also rules out any night freighter operations.

The AC has placed great stock on the role of low-cost carriers and Easyjet has signalled its intention to base several aircraft at an expanded Heathrow. However, the quasi-ban on night flights throws this into doubt. The low-cost carrier business model relies on maximising the utilisation of aircraft during the traffic day, with the first flights leaving around 0600 and the last flights returning around midnight. The quasi-ban on night flights would make this very challenging. Given the expected demand for the slots in the morning peak (including the pre-0600 flights that have to be rescheduled), low-cost carriers could struggle to secure the slots they need.

In short, the quasi-night flights ban will constrain the ability of airlines to operate commercially and local communities will have to endure a third more night flights than they do today.
Night flights – Summary

- Notwithstanding the quasi night flight ban, the AC proposals will actually lead to an increase in flights in the night time period from 2300 to 0700; this is a function of the greater total throughput from three runways and the lack of any restrictions after 0600.

- Nonetheless, the quasi night flight ban proposed will constrain airlines’ ability to operate commercially, restricting long haul flights, freighter services and future low-cost carrier routes.

The proposed quasi night flight ban for Heathrow is sub-optimal for residents and airlines alike – only in a location away from densely populated areas could the impacts on local communities be minimised while meeting the needs of airlines.
4. Air quality

**What the AC says: the proposed condition**

- Additional operations at an expanded Heathrow Airport must be contingent on acceptable performance on air quality. New capacity should only be released when it is clear that air quality at sites around the airport will not delay compliance with EU limits.


The Commission’s dispersion modelling has shown that using pessimistic assumptions and without actions to mitigate emissions, both of the Heathrow schemes would result in NO₂ concentrations on the Bath Road in 2030 which would be higher than those on the Marylebone Road. Therefore, absent mitigation, both schemes would delay compliance with the Directive and hence would not be deliverable within the legal framework.


The AC states that with mitigation, concentrations on the Bath Road for the Heathrow Northwest Runway scheme would be substantially below levels on the Marylebone Road, meaning that compliance with the Directive would not be delayed. Other mitigation measures were considered by the Commission:


**Our analysis**

Air quality has been brought into sharp focus following the Supreme Court decision in the case brought by ClientEarth on EU compliance. Without mitigation, the AC finds that Heathrow’s Bath Road would have the highest NO₂ concentration of any location in Greater London. But having quantified a set of mitigation measures, the AC is unable to demonstrate that the Bath Road can meet EU limit values or even return to the non-expansion baseline.

Instead, the AC set its sights on the much less challenging target of being better than the worst location in London. However, not only is the legality of such an approach in doubt, but it also relies on that location – the Marylebone Road – witnessing no improvement in air quality. This is highly unlikely given the existing forecast data does not incorporate a number of measures,
notably the central London ULEZ (Ultra Low Emissions Zone) agreed for implementation in 2020.

The AC has failed to demonstrate that a three runway Heathrow – even with mitigation – won’t have the worst NO₂ concentration in Greater London, so risking the compliance of the entire zone and EU fines on the UK.

The AC nonetheless recognises that there may be “more ambitious strategies” for mitigation but which would likely be “costly” and may have “fundamental implications for the nature of the scheme”. Rather than seeking to understand those costs and implications, the AC deems it appropriate not to consider them.

The failure to show that Heathrow expansion can be undertaken whilst meeting legal obligations on air quality is tacitly accepted by the AC in its condition – which would see the infrastructure built but not used until it demonstrated compliance. However, this entails a level of risk on the basis of which no investor – private or public – would ever invest.

Since the publication of the AC Final Report, Defra has published its Draft NO₂ Action Plan. It does not take account of Heathrow expansion. Its core scenario aims for Greater London compliance by 2025 though a sensitivity case included shows it could be much later, in the 2030s – while the recent VW scandal calls into question the assumptions about real world vehicle emissions. The net result is that the AC proposals must be reassessed in the most robust, comprehensive and transparent way possible, before the Government can be in a position to make an informed determination on the AC’s proposals.
## Air quality – Summary

- The AC has shown that, without mitigation, Heathrow expansion will lead to the Bath Road having the worst NO₂ concentrations in Greater London.

- The AC quantifies potential mitigations to show that the Bath Road might avoid being the worst location for NO₂ concentrations in Greater London – however, this approach is legally doubtful and in practice flawed, given schemes such as the central London ULEZ will improve air quality in other hotspots.

- As such, the AC has failed to demonstrate that a three-runway Heathrow won’t have the worst NO₂ concentrations in Greater London – risking the compliance of the zone and EU fines on the UK.

- Yet the AC eschews investigation of more ambitious strategies for mitigation – and the cost this might entail.

- Under the proposed AC condition, infrastructure could be built but not utilised until Heathrow air quality was shown compliant – but this represents a level of risk no investor would accept.

- The publication by Defra of its Draft NO₂ Action Plan and other recent developments requires that the AC proposals be robustly, comprehensively and transparently reassessed before the Government can make an informed determination on them.

**The AC has failed to demonstrate that Heathrow expansion can be consistent with legal obligations on air quality**
5. Surface access

What the AC says: the proposed condition

- A major shift in mode-share for those working at and arriving at the airport should be incentivised, through measures including new rail investments and a continuing focus on employee behaviour change. A congestion or access charge for motor vehicles should also be considered.


The AC recommends investment in surface transport including rail links, support for low emission vehicles or even access charge schemes. The report recognises that managing transport demand can shape the air quality impacts of airport expansion.

The report also recognises the forecast level of crowding on London’s rail and underground network, but claims forecast crowding on routes serving Heathrow will be a result of background demand growth and therefore down to Government to resolve.


The view of the AC’s consultants

The AC’s consultants suggest a £20 access charge on all passenger vehicles (including taxis) and a 20 per cent reduction in employee car demand “may” be enough to reduce overall 2030 airport-related traffic (with a third runway expansion) to 2013 peak levels. The consultants recognise the potential impact this could have on the rail and highway network.

Our analysis

Demand Assessment

The AC has not assessed the impact of a three runway Heathrow Airport at full utilisation. It predicts full utilisation of a three runway Heathrow to be 148mppa. However, for the purposes of surface access, it has only assessed a 2030 scenario of partial utilisation at 125.2mppa, even though it forecasts that the airport will be close to capacity again soon after opening a third runway. An appraisal of full airport utilisation is essential to understanding the full environmental impact of airport expansion and the surface access enhancements that are required to accommodate airport demand in a sustainable way in the long term. As this has not taken place, the Commission has fundamentally underestimated the environmental impact of the airport.

Heathrow expansion will lead to an increase in freight movements to and from the airport. This has not been properly included in the surface access assessment undertaken by the AC. Furthermore, new jobs will be created as businesses around the airport expand to meet new demand. Expansion will also create further catalytic jobs (offices, distribution, etc.) and the need for housing located close to the airport. This is a key aspect of the economic benefits of the proposals, but this additional activity will add a significant number of additional vehicle trips to local and strategic roads which is not factored in to the surface access assessment.

The Greater London Authority (GLA) has recently published substantially higher employment forecasts for London. These would not have been available to the Commission at the time the Final Report was published, but should now be considered to ensure travel demand is accurately captured. This will lead to higher levels of background travel demand than currently forecast.

All of these factors lead to the Commission substantially underestimating the demand for surface access arising from the proposals. This raises fundamental questions about the adequacy and deliverability of the surface access arrangements assumed by the Commission, and means that the air quality impact assessment starts off from a position of significantly under-estimating road traffic volumes.

Mode Share

The Commission has identified the need for a significant shift in the mode share of trips to and from the airport from around 40 per cent to around 53 per cent for both passengers and staff. This is a considerable shift given the large numbers of additional passengers and staff that airport expansion would bring. The AC forecasts for Heathrow assume this shift has been achieved – seemingly independent of the proposal’s surface access provision, or lack thereof.

Even if one accepts the AC’s assumptions on airport demand and mode shift, the impact of the
third runway on the highway and public transport networks is very substantial. The following table sets out the uplift in demand for car and public transport trips that will occur with expansion, taking the AC's own data and assuming the higher public transport mode share in 2030 than today. The table does not include highway trips from freight and from business expansion around the airport, both of which would increase substantially with a third runway. The highway impacts are therefore understated.

<table>
<thead>
<tr>
<th>Heathrow trips (Passengers and Employees)</th>
<th>Heathrow Today (per average day)</th>
<th>Heathrow 2030 No Expansion (per average day)</th>
<th>Heathrow 2030 With expansion (per average day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>137,000</td>
<td>143,000</td>
<td>183,000</td>
</tr>
<tr>
<td>Public transport</td>
<td>90,000</td>
<td>154,000</td>
<td>202,000</td>
</tr>
</tbody>
</table>

On the highway network, a 28% increase in demand is forecast (40,000 additional trips) compared to the 2030 Do Minimum for a network that the AC states will be at capacity despite the new infrastructure proposed. The scale of additional demand to be accommodated on the public transport network by 2030 with expansion and the higher mode share of trips by public transport is an additional 112,000 trips compared to today (+124%), or 48,000 trips compared to the Do Minimum.

The AC's consultants make clear that this increase in rail mode share will have serious implications for capacity on the existing rail network. The AC accepts that schemes such as Crossrail and the Piccadilly Line Upgrade will not offer enough spare capacity to accommodate increased airport demand post-expansion by 2030 given background growth levels in London. As such, new rail infrastructure is necessary. The Commission has included the implementation of several unfunded or partly funded public transport schemes by 2030 including Western Rail Access to Heathrow and the Piccadilly Line Upgrade. However, these schemes have not been designed with airport expansion in mind and so as a package cannot be relied upon to provide sufficient capacity for passenger and employee access the airport.

The only additional rail scheme being proposed as part of the expansion plan is a new Southern Rail Access. No detail is provided on the form this will take, the additional capacity and connections that will be provided and how this will accommodate the uplift in demand. What is acknowledged is that this connection will be operating at full capacity on the day of opening and as congested as the “busiest sections of the London Underground network are today”. This scheme could not accommodate the 48,000 additional public transport trips forecast with a third runway. With the AC admitting the public transport network is already at capacity, there is a serious risk that many of the forecast additional public transport trips will be forced instead onto the highway network.

The AC assumes a number of highway schemes will have been implemented by 2030 that provide additional capacity. These schemes include upgrades to key junctions on the M25 and M4 and are assumed to have happened by 2030. The funding of these schemes is not attributed to airport expansion.

The AC now accepts that all of these schemes will not provide sufficient spare capacity to accommodate the totality of demand in 2030 with background growth and increased airport
expansion. However, it assumes that the gap in capacity is primarily a result of background growth and places responsibility for addressing this through further infrastructure on the Government. Given the proximity of Heathrow to the rest of London it is impossible precisely to isolate demand for the airport from background demand across London as a whole, though it is clear that Heathrow expansion will be making a contribution. If all of the transport networks in the vicinity of Heathrow by 2030 are effectively full – then this is a major problem that will have to be addressed if expansion is to take place and mode share objectives are to be met. The plans identified by the AC do not address this challenge and additional capacity that hasn’t currently been identified by the AC is necessary.

The net result is that the AC underplays the surface access infrastructure requirements; work undertaken by TfL suggests the proposed £5bn cost underestimates the actual cost by £10-15bn.

Surface access – Summary

- The AC has not assessed full utilisation of the airport and has only considered a partial utilisation in 2030 – this inevitably underestimates demand.

- The AC has further underestimated demand by not taking account of the latest employment forecasts and by not fully capturing freight traffic and catalytic activity around the airport in its assessment.

- The AC has stipulated a significant increase in public transport mode share – equivalent to an increase in demand of nearly 50,000 daily trips with a third runway compared to the Do Minimum – but without the new rail infrastructure to meet this demand. The AC’s consultants make clear that significant road pricing measures will also be required.

- While the AC now accepts that existing and planned rail infrastructure will not be able to cater for airport demand, it attributes the challenge to background growth and so beyond the scope of airport expansion proposals.

- The net result of these is to underestimate the new surface access infrastructure required – TfL estimate the shortfall at £10-15bn.

The AC underestimates demand and severely underplays the infrastructure required – and the associated cost – yet without adequate surface access provision, the AC mode share targets will be unattainable, with serious consequences for air quality.
6. Finance

What the AC says:

The conclusion of this analysis is that all three schemes are considered to be both commercially viable and financeable, with each subject to different risks and opportunities.


The view of the AC’s consultants:

The AC’s consultants recognise that building a new runway will be a “major undertaking”. They state that HAL currently has £2.7bn in equity and £11.7bn in debt and that these figures may need to increase by the order of £5.5bn and £22.1bn respectively.


PwC: Cost and Commercial Viability: Funding and Financing Update (2015), page 73.
Our analysis

The AC’s consultants recognise that the appetite for an investment of this scale will crucially depend on the exact commercial and regulatory conditions. Heathrow’s shareholders, with the exception of lead investor Ferrovial, are a mix of sovereign wealth funds and pension fund investors – interested in long-term, low-risk infrastructure with steady returns. The construction of a new runway is a project with very different risk characteristics. Even accepting the AC’s underestimated and poorly allocated costs, HAL would have to assume £17.6bn of new investment plus the interest on debt and other expenditure – and to finance this on a basis that retains HAL’s single A minus credit rating (a key financial assumption by the AC’s financial advisers). Raising this quantum of finance is unprecedented and the feasibility of achieving this is unproven.

To make this scale of financial commitment and take on this level of risk, HAL would be seeking some protection from the Government. This could include substantial insulation from risk and significant financial commitments including new surface access provision. The current regulatory framework is unlikely to provide enough certainty to achieve this investment. This could require changes to the principles of economic regulation that have prevailed in the privatised quasi-monopoly utility sector since the 1990s.

The airlines are concerned about the financial burden that will fall to them and with good reason: the AC estimates a 45 per cent increase in Heathrow aeronautical charges – already amongst the highest globally – which would fall on airlines and their customers. This increase would mean Heathrow charges are three times as expensive as those at New York JFK and Amsterdam Schiphol airports. It is little wonder that Willie Walsh has warned that IAG would refuse to pay that scale of charges.

As the AC’s consultants allude to, if neither airport nor airlines have the capacity – or the willingness – to pay, it will fall on Government at a minimum to provide debt guarantees to progress this option. This has not been addressed in the Final Report, which maintains the position that taxpayer involvement can be kept to a minimum.

Finance – Summary

- Given the scale of investment required, HAL is likely to seek Government insulation from risk – including loosening of the regulatory framework.

- The burden of a 45% increase in aeronautical charges (that are already amongst the highest in the world) would fall to airlines and customers.

It will fall on the Government to provide debt guarantees to enable Heathrow expansion to proceed
7. Summary

The analysis presented by the AC which recommends a three runway Heathrow has a number of major flaws.

- The data presented by the AC report shows that a three-runway Heathrow will effectively be operating at capacity by 2030, shortly after opening - meaning Heathrow as a hub will have the same limitations as it does today – capacity constraints limiting new routes and frequencies and a lack of resilience. At the same time, though justified by the demand forecasts, the AC rules out a four runway hub.

- These constraints are reflected in data presented which shows that, despite a 50 per cent capacity increase, there will be no growth in long haul routes – with an expanded Heathrow offering six fewer daily long haul destinations in 2030 when compared to today and just one additional route by 2050. There would also be a reduction in the number of UK cities with a direct connection to Heathrow, falling from seven UK cities today to four following expansion. The additional capacity is forecast to be utilised for new European destinations and additional frequencies on existing routes.

- The AC’s independent economic review panel questions the methodology used to determine the wider economic benefits of a third Heathrow runway and cautions against giving any significant weight to the AC’s £147bn quoted for the UK GDP uplift.

- The results presented by Heathrow Airport Limited (HAL) and the AC suggest the number of people exposed to noise would actually fall; this stretches credulity. The AC has reached this conclusion by optimistically assuming future technological improvements to aircraft will considerably reduce aircraft noise. They predict that new and improved aircraft would make up approximately 67 per cent of aircraft at Heathrow by 2050 alongside a radical recasting of flightpaths. There is no way of guaranteeing this outcome.

- In spite of the proposed quasi night flight ban, the AC proposals will actually lead to an increase in flights in the officially recognised night time period from 2300 to 0700. This is a function of the greater total throughput from three runways and the lack of any restrictions after 0600. Respite from noise is reduced with a third runway – not enhanced – and the conditions and mitigations proposed do not fundamentally change the fact that one million people will be exposed to unacceptable aircraft noise.

- The AC has failed to demonstrate that a three runway Heathrow won’t have the worst NO2 in Greater London - risking the compliance of the zone and EU fines on the UK. It seeks to show that Heathrow’s Bath Road might avoid being the worst link – but this is legally unsound and does not take account of committed schemes such as ULEZ in central London. Under the proposed AC condition, infrastructure could be built but not utilised until Heathrow is compliant – this is a level of risk no investor would accept.
➢ The AC has underestimated demand by only modelling a partially utilised three-runway Heathrow, by not taking account of the latest employment forecasts and by not fully capturing freight traffic and catalytic activity around the airport in its assessment.

➢ The AC has stipulated a significant increase in public transport mode share – equivalent to an increase in demand of nearly 50,000 daily trips with a third runway compared to the Do Minimum – but without the new rail infrastructure to meet this demand. The AC’s consultants make clear that significant road pricing measures will also be required.

➢ While the AC now accepts that existing and planned rail infrastructure will not be able to cater for airport demand, it attributes the challenge to background growth and so beyond the scope of airport expansion proposals. The net result of these is to underestimate the new surface access infrastructure required – TfL estimate the shortfall at £10-15bn.

➢ Given the scale of investment required for airport expansion, HAL is likely to seek Government insulation from risk, including loosening of the regulatory regime. The burden of a 45% increase in aeronautical charges (that are already amongst the highest in the world) would fall to airlines and passengers.

The recommendation for Heathrow expansion made by the AC fails on every count. It will not deliver the additional connectivity that the UK needs and comes at huge environmental cost.

The evidence presented in the AC Final Report makes a clear case for a UK hub with four runways. This can never be delivered at Heathrow without devastating impacts on the local environment and public health. However, options for a four runway hub were discarded prematurely by the AC. The Government should review the full body of evidence presented in this process and revisit potential locations for a four runway hub.