House of Commons
Transport Committee

Airports National Policy Statement

Third Report of Session 2017–19

Report, together with formal minutes relating to the Report

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Transport Committee

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The current staff of the Committee are Gordon Clarke (Committee Clerk), Previn Desai (Second Clerk), James Clarke (Committee Specialist), Andrew Haylen (Committee Specialist), Daniel Moeller (Senior Committee Assistant), Michelle Owens, (Committee Assistant), Estelle Currie (Senior Media Officer) and Simon Horswell (Media Officer).

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Summary

The Government has laid before Parliament a proposal for an Airports National Policy Statement (NPS) and our Committee was designated to carry out parliamentary scrutiny of the Government’s proposal. Our Report completes that process and we expect the Government to bring forward a final NPS for approval by both Houses that takes account of our recommendations. After that the NPS will be designated by the Secretary of State under the Planning Act 2008; this is an early but important step in the planning process. Votes to approve the NPS in both Houses of Parliament in effect give outline planning permission for construction of Northwest Runway (NWR) and associated developments at Heathrow Airport.

The NPS is meant to be a statement of existing policy so that in the process of issuing a development consent order, there can an objective assessment of an application and the extent to which it is compatible with the Government’s policy objectives and the outcomes it requires; it is the yardstick against which any application for development consent will be judged. We recommend that both Houses of Parliament allow the planning process to move to the next stage by approving the final NPS, provided that the concerns we have identified are addressed by the Government in the final NPS it lays before Parliament.

The case for runway expansion in the South East is broadly accepted, although a significant minority rejects the need for expansion. We accept that there is a case as set out in the Airports NPS for additional runway capacity, in particular hub capacity. This is on the premise that any expansion is sustainable, consistent with legal obligations and that suitable mitigations will be in place to offset impacts on local communities affected by noise, health and social impacts.

The Airports Commission identified the NWR scheme as having the greatest benefits (and costs) of the three schemes it examined; but it found all three schemes were viable. The Government picked Heathrow Airport Limited’s proposal for a NWR as its preferred scheme. The Government’s case is based on a NWR scheme providing more connectivity for passengers and freight, better value for money and greater strategic benefits than the other schemes.

We agree that Heathrow Airport would be the first place to look if you wanted to build another runway in the South-East. It is the UK’s only major hub airport; it is one of Europe’s leading hubs and has a reputation worldwide, especially for its transatlantic connections. Airlines are keen on expansion at Heathrow (but not at any cost) and expansion at Heathrow would consolidate existing connections; these are unrivalled at any other airport in the UK. The Government was right to look at Heathrow first and we commend it for the work it has done to bring this work to the point where both Houses of Parliament can express an opinion through a debate and vote.

We conclude that the Government is right to pursue development at Heathrow and accept the strategic arguments the Government has made in favour of its preferred scheme. The NWR scheme should offer the greatest strategic benefits, provided it can deliver the expected capacity, at the costs outlined in the NPS and on the timetable projected. The economic benefits are broadly comparable across the three schemes.
the Government has examined in its analysis. Nevertheless, the Government should ensure that the NPS reflects the weight of evidence in the supporting documents, particularly with respect to the balance of environmental, social and health impacts.

Safeguards and mitigations are needed to ensure that the interests of passengers are protected, and the adverse environmental, social and health impacts on affected communities are appropriately mitigated. We acknowledge Heathrow Airport Limited (HAL) and the Government’s efforts to mitigate the environmental and social impacts from this scheme. We also acknowledge the ambition they share that airport charges do not increase in real terms because of airport expansion.

We have recommended several additional conditions of approval to be included in the final version of the NPS on air quality, surface access, connectivity, costs and charges, noise, community impacts, resource and waste management. Sections of the draft NPS dealing with these matters should be revised before a final NPS is tabled for approval by both Houses of Parliament.

A suite of policy measures is also required if the NWR scheme is to be delivered effectively, namely with respect to airspace change, national policy on air quality and carbon budgets. The NPS is not the appropriate instrument to resolve all these issues but they should be resolved as a matter of some urgency. We recommend that Government outline its intended policy approach to delivering airspace change for its preferred scheme as a matter of priority.

The UK’s aviation sector needs reassurance that Government policy will ensure existing capacity can be maximised and aviation growth is fostered across the country in a sustainable way before additional capacity becomes available in the South-East towards 2030.
Conclusions and Recommendations

1. We accept that there is a case as set out in the Airports National Policy Statement for additional runway capacity, in particular hub capacity. This is on the premise that any expansion is sustainable, consistent with legal obligations and that suitable mitigations will be in place to offset impacts on local communities affected by noise, health and social impacts. The Government should redraft its final NPS, in line with the recommendations set out in this report, to minimise any chance of a successful legal challenge. (Paragraph 12)

2. We conclude that the Government is right to pursue development at Heathrow and accept the arguments it has made in favour of its preferred scheme. We endorse its approach of using a national policy statement and the planning process outlined in the Planning Act 2008. We conclude that there are valid concerns about the Government approach. We recommend that both Houses of Parliament allow the planning process to move to the next stage by approving the Airports National Policy Statement, provided that the concerns we have identified later in our Report are addressed by the Government in the final NPS it lays before Parliament. Without addressing the concerns the Committee has raised, we believe there is a risk of successful legal challenge. (Paragraph 16)

3. We agree with the Government that the Northwest Runway (NWR) scheme offers the greatest strategic benefits. The scheme will consolidate Heathrow’s hub status, offering a greater number and variety of long-haul connections in the short-term, with a higher frequency than the other schemes considered by the Airports Commission. The scheme would deliver passenger growth that would not be realised without expansion. We accept the Government’s analysis that the economic benefits are broadly comparable across the three schemes and that the Department for Transport’s forecasts show that the NWR scheme’s advantage is more marginal over the longer-term. However, we conclude that in its comparative analysis of the three schemes, in Chapter 3 of the NPS, the Government should give more weight to environmental, health and community impacts. If Parliament is to make an informed decision on the designation of the NPS, members need to be confident that the final NPS reflects the weight of evidence as it is presented in the supporting documents. We recommend that more detail be provided in Chapter 3 of the NPS on the evidence on environmental, health and community impacts and that the Department for Transport’s comparative analysis be expanded to reflect more accurately the balance of impact across the three schemes it compares. (Paragraph 30)

4. Sections of the draft NPS dealing with air quality should be revised before a final NPS is tabled for approval by both Houses of Parliament. We recommend that the population impact estimates be updated to reflect the air quality impacts from the increased number of aircraft movements and surface access traffic that will result from a Northwest Runway scheme. We also recommend the air quality monetisation modelling and results be published to clarify the monetised costs of poor air quality. (Paragraph 37)

5. We recommend the Government adopts a more stringent interpretation of air quality compliance than what is currently applied by the Department for Transport to support the NPS. This should include an appropriate level of headroom to manage the
inherent uncertainty of predicting future air quality compliance. The applicant for a Development Consent Order should be required to show, with a reasonable degree of confidence, that their scheme can comply. (Paragraph 39)

6. We recommend that a condition be included in the NPS to the effect that development consent will only be granted if the Secretary of State is satisfied that the proposed scheme will: avoid significant adverse impacts on health and quality of life from air quality; mitigate and minimise adverse impacts on health and quality of life from air quality; and where possible, contribute to improvements to health and quality of life. (Paragraph 40)

7. We welcome the commitment to Western Rail Access provided by the Secretary of State. We recommend a written commitment of policy support for Southern and Western Rail Access be made by the Government in the NPS, including clarity around funding and the timeline for delivery. We also recommend the Government clarify which schemes are needed to support current two-runway operations at Heathrow and which are needed to support an expanded Heathrow. As part of this, we recommend the Department for Transport’s updated surface access modelling be published so that the likely impact on road and rail congestion of a NWR scheme is known. (Paragraph 43)

8. We recommend that the surface access costs in the appraisal, and which support the NPS, be updated and included in the final NPS to reflect the indicative costs of those additional schemes required to deliver on the target of no more road traffic. We are concerned about the absence of detail on proposed changes to the M25. We recommend that the Government work with Heathrow Airport Limited to clarify the proposals and bring greater certainty to the development plans. A key part of this must be the arrangements for diversion of traffic during any works. (Paragraph 44)

9. While we recognise the intention behind the current condition on surface access in the NPS, we conclude its drafting leaves too much scope for unintended surface access impacts from this scheme. We therefore recommend a condition be included in the NPS that ensures approval only be granted if the target for no more airport related traffic can be met, or that as a condition of approval, capacity be released at the airport, after construction, only when the target is met. (Paragraph 46)

10. We recommend that the Government provide a clear definition in the NPS of what constitutes a domestic route and that the Government outlines more clearly, in paragraph 3.34, how it intends to secure 15% of new slots for domestic connections, including the policy levers it will use to achieve this target. This should also include an explanation as to how the Government intends to deliver these slots in the immediate period after the third runway opens and how it will guarantee these slots are made available at suitable times spread across the day. The Government should also outline how it will enforce Heathrow’s domestic connectivity commitments once a NWR scheme is in operation. (Paragraph 50)

11. We accept that cost accuracies will improve as the project matures, but fundamental aspects of scheme design and surface access remain undefined, creating a perception of a cost risk that is high. There is only one mention of cost in the NPS. This is not a fair reflection of the legitimate concerns of airlines and passengers, who are likely to absorb much of the risk, about the cost of expansion. Before votes in Parliament to
approve a final NPS, we would like to see evidence to demonstrate that the Northwest Runway scheme is both affordable and deliverable and that steps are being taken to address the valid concerns we heard in evidence about the high cost of the scheme and the significant risk that costs will rise. (Paragraph 54)

12. We recommend a condition be included in the NPS that airport charges be held flat in real terms but with scope for a marginal increase provided the balance of benefits is in favour of the consumer, as assessed by the Civil Aviation Authority. We recommend that the Government consider whether the CAA has the powers necessary to regulate effectively future airport charges at Heathrow. (Paragraph 59)

13. We recommend that, at an appropriate early stage of the DCO planning process, the Government’s preferred scheme be tested by the Civil Aviation Authority to ensure it is both affordable and financeable. Such a test should offer an opportunity to halt the planning process if it is evident that the proposed scheme has no realistic prospect of being built. (Paragraph 60)

14. The evidence in the NPS shows that a Northwest Runway (NWR) scheme could have a seriously damaging effect on communities living under and adjacent to flight-paths. Until actual flight paths are known the actual noise distributions resulting from the NWR scheme cannot be known. We believe that the approach taken by the Department for Transport has resulted in an analysis that tends towards the lower end of the range of possible noise impacts. It is right that Parliament and the public have a fair view of the range of possible noise impacts from a NWR scheme. We recommend the noise modelling be updated to reflect a range of possible flight-path scenarios. The results from this modelling should also be presented using a range of metrics and across the full range of thresholds recommended in the latest guidance. We believe it would be helpful if the Department for Transport published the evidence base supporting their assumptions about future fleet mix. (Paragraph 66)

15. We recommend that a condition be included in the NPS to ensure noise impacts be measured, during the DCO process, against an updated baseline that incorporates the Government’s latest guidance and assumptions. We recommend that the NPS also specify the noise metrics and thresholds upon which noise will be assessed. These must be consistent with the Government’s updated guidance. (Paragraph 67)

16. We recommend that the Government defines in the NPS what constitutes “significant adverse impacts” and define an acceptable noise limit that reflects a maximum acceptable number of people newly exposed to noise due to the scheme. (Paragraph 69)

17. We recommend that the Government set out in the final NPS how it intends to regulate any noise envelope and what options for recourse will be available against the airport and/or airlines for breaching such an envelope. (Paragraph 70)

18. We recommend the Government define a minimum acceptable level of noise respite in the NPS. (Paragraph 71)

19. We endorse a night-flight ban and believe improved and predictable night-respite is long-overdue for nearby communities. However, we believe that the Government’s proposal for a blanket ban of six and a half hours pre-empts the DCO process and the community consultation within that. We recommend that affected communities
are provided with a minimum average period of 7 hours of respite a night. The exact timing of this respite should be determined through joint working between the airport, airlines and communities. Evidence received suggest such a scheme would be achievable. A future night flight ban should not prohibit unpreventable overruns, in the event, for example, of weather delays. But we recommend a mechanism be established that provides stringent oversight of any night-flight regime to ensure that airlines and the airport are monitored and an effective enforcement regime is in place to incentivise much tighter control of overruns into the night-flight respite period where they are preventable. (Paragraph 72)

20. We support the proposed compensation measures put forward by Heathrow Airport Limited and are encouraged by their willingness to engage with communities. However, we believe it is too early in the process to specify exact sums for compensation when the detail of the scheme and its subsequent impacts remain unclear. The NPS should set the framework and principles upon which compensation will be offered, with the finer details determined during the planning process. We recommend that: the threshold for £3,000 in compensation for acoustic insulation for residential properties be revised to reflect the significant noise annoyance thresholds in the latest Government guidance; the £3,000 committed for noise insulation be independently tested during the DCO process to ensure that this is a sufficient sum of money to mitigate properly the increased noise nuisance cause by the scheme; and the 125% offered to compensate residents whose homes are compulsorily acquired be independently tested during the DCO process to ensure it is appropriate and sufficient to cover the repurchase of an equivalent standard of housing at a suitable location. We recommend that the NPS clearly outline that there is no fixed limit on the amount of compensation offered to affected communities provided it meets the criteria set within the designated NPS. We also recommend that the £50m a year figure is increased by RPI each year so that the real terms value of this remains the same for each year of the 15 years. (Paragraph 76)

21. We recommend that a condition approval be included in the NPS which requires the scheme proponent to develop a strategy outlining how it intends on supporting local communities during and in the extended periods after the planning process is finished. This should be developed in consultation with the communities affected as well as the relevant local authorities. (Paragraph 77)

22. We recommend a condition of approval be specified in an updated NPS that provides the Lakeside Energy from Waste plant with equivalent recognition as the Immigration Removal Centres and that the replacement of its facilities be accounted for in the DCO process. (Paragraph 80)

23. We recommend that Government outline its intended policy approach to delivering airspace change for its preferred scheme as a matter of priority. We acknowledge the helpful work that the Government has already done through its 2017 airspace consultation and we recommend that the Government, in coordination with the Civil Aviation Authority and NATS, develop a clear approach as soon as possible. (Paragraph 81)
24. **We recommend that the Government act immediately to identify, develop and implement the necessary policies needed to provide confidence that issues, such as airspace, air quality, surface access and noise, will be dealt with in a timely manner in anticipation of a development consent order being made.** (Paragraph 82)

25. **We recommend that the Government, in the immediate period after an NPS is designated, launch a specific policy consultation, looking at the best ways to maximise existing airport capacity across the whole of the UK. It may be prudent for the Government to consider how issues of air quality and surface access for other UK airports can be addressed in this broader strategy.** (Paragraph 83)
1 Introduction

Airport expansion in the South-East of England has been debated for decades.\(^1\) Having been endorsed by the then Labour Government in 2009, support for a previous third runway proposal at Heathrow was withdrawn by the Coalition Government following the 2010 General Election. In September 2012, the Coalition Government set up the Airports Commission to examine what was needed to maintain the UK’s position as Europe’s most important aviation hub and evaluate how the need for additional capacity should be met in the short-, medium- and long-term.\(^2\) In its final report in July 2015 it found three options were viable: a Northwest Runway at Heathrow (NWR), an extended northern runway at Heathrow (ENR) and a second runway at Gatwick Airport.\(^3\) It concluded that the proposal for a NWR was the best option, recommending “the delivery of the [NWR plan] in its entirety”. The Airports Commission urged the Government “to take an early decision to ensure that new capacity is put in place as soon as possible.”\(^4\)

The planning process

The Government announced, in October 2016, that a NWR was its preferred option for delivering additional runway capacity. It said that a National Policy Statement (NPS), under the provisions of the Planning Act 2008,\(^5\) would be the basis for planning approval ahead of a NWR’s construction (Figure 1). In this process, Parliament approves an NPS before Heathrow Airport Limited (HAL) makes an application for a development consent order (DCO).\(^6\) The application is considered by the Planning Inspectorate before the Secretary of State decides whether to grant a DCO. In short, and as the Secretary of State described, the NPS provides outline planning consent; it is Parliament deciding that, in principle, it is content that there should be a NWR at Heathrow airport.\(^7\)

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1 For more information see: Heathrow expansion, Briefing Paper No CBP1136, House of Commons Library, 22 January 2018
2 HC Deb, 2 November 2012, col 29WS [commons written ministerial statement]
4 Airports Commission, Final Report, July 2015, p11
5 As amended by the Localism Act 2011.
6 For information regarding the planning process, see: Planning for National Significant Infrastructure Projects, Briefing Paper No 06881, House of Commons Library, 17 July 2017
7 OS22
3. The DCO process considers the detailed design work, the specifications and the conditions set for any development by Government in the NPS. It is the role of the planning inspectorate to examine the application for a DCO and provide a report to the Secretary of State who will make the final decision. A DCO can cover several consents including planning permission, listed building consent, modification of regulations or planning conditions, temporary or permanent diversion of highways or creating the power to compulsorily acquire land required for the development. This combination of consents is “intended to ease bureaucracy and allow the developer to proceed more quickly.”

The Airports National Policy Statement

4. National Policy Statements (NPSs) make clear the Government’s objectives for the development of nationally significant infrastructure in a particular sector, setting out its policies and explaining the reasons for them. They are often generic but, where appropriate, can relate to specific locations to provide a clear framework for investment and planning decisions. NPSs can include any other policies or circumstances that ministers believe should be considered in decisions on infrastructure development. National Policy Statements are subject to public consultation and parliamentary scrutiny before being designated. Once designated they provide a framework within which the planning inspectorate can make recommendations to the Secretary of State.

5. The Government published its initial draft Airports NPS and accompanying consultation documents in February 2017. Because of the 2017 General Election, however, parliamentary scrutiny of the NPS, and subsequently the Government’s timeline for parliamentary approval, was delayed. The Government relaunched public consultation on a revised draft Airports NPS (NPS) in October 2017. The draft sets out:

- Government’s policy on the need for new airport capacity in the South-East of England.

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• The case for the preferred location and scheme to deliver new capacity; and

• Considerations and supporting measures relevant to a development consent application to which the Airports NPS relates.

When designated, the Airports NPS will apply to any development consent application for a new NWR at Heathrow Airport. The policies in the Airports NPS will have effect in relation to the Government's preferred scheme, having a runway length of at least 3,500m and enabling at least 260,000 additional air transport movements per annum. It will also have effect in relation to terminal infrastructure associated with the Heathrow NWR scheme and the reconfiguration of terminal facilities in the area between the two existing runways at Heathrow Airport.11 It will remain in place until it is withdrawn, amended or replaced.12

6. The Airports NPS is different to other transport-related national policy statements considered by our predecessors in that it is scheme specific; not only does it identify a specific site but it details a specific scheme. The National Policy Statement for Nuclear Power Generation (EN-6)13 is the only other one to take a site-specific approach and it makes provision for applications for sites not listed in the NPS. No NPS has so far been scheme specific. It means that instead of setting out some general tests against which any application for development consent could be judged, the Airports NPS is a mix of general requirements and some detailed specifications pertaining only to the NWR scheme.

Our inquiry

7. The 2008 Act provides for Parliamentary scrutiny of the proposed NPS by the relevant Select Committee. Having been appointed by the Liaison Committee, we launched our inquiry on the revised NPS on 1 November 2017. The terms of reference were published at the start of our inquiry14 and are in addition to those set by our predecessor Committee in February 2017.15 Our core task was to ensure that the Airports NPS could be used by the Secretary of State when judging any application for DCO. This includes ensuring that the supporting measures and approval conditions are sufficiently clear so that concerns that may emerge during the planning process can be addressed adequately.

8. We acknowledge that we have received evidence suggesting that there is a case for having an NPS that was either site specific or that was generic enough to allow applications from other airports in the South-East. We looked at the relative merits of having an Airports NPS framed in a more generic way (either as a site-specific NPS or one that covered any airport in the South-East) but, given the differences in views expressed in Committee, we found this was not a topic on which we could achieve consensus. We have looked at the Government’s policy as it is rather than consider what it might have been.

9. In conducting our inquiry, we drew on:

• The revised NPS and its supporting documents, including the Appraisal of Sustainability;16

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11 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 7
12 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 8
13 Department for Energy and Climate Change, National Policy Statements for energy infrastructure, June 2011
14 Transport Select Committee, Airports National Policy Statement inquiry launched, 1 November 2017
15 Transport Select Committee, Airports National Policy Statement inquiry launched, 22 February 2017
16 For the full list of documents produced by the Department to accompany the Airports National Policy Statement, see: Department for Transport, Heathrow Airport expansion, 24 October 2017
• The Airports Commission Final Report and Business Case and Sustainability Assessment, as well the supporting documents;\textsuperscript{17}

• Evidence submitted to our predecessor’s inquiry;\textsuperscript{18}

• Evidence submitted to our inquiry, including 87 written submissions;\textsuperscript{19} and

• The oral evidence we heard from 30 witnesses.\textsuperscript{20}

10. We are grateful to all those who took the time to make submissions and those who appeared before us and patiently answered our questions. All the evidence we have taken is listed at the end of this report and can be found on our website. Given the complex nature of the NWR scheme and the breadth of the evidence base supporting it, we have developed a series of annexes to support our report. It should be noted that the comparative analysis of the other shortlisted options was not conducted in the same level of detail as that completed for the NWR scheme but comparison has been provided where appropriate. It therefore does not follow that any criticisms or recommendations that we make about the NWR implies our approval of either of the other options.

\textsuperscript{17} For the full list of documents produced by the Airports Commission, see: Airports Commission, \textit{Our publications}, updated March 2016

\textsuperscript{18} Transport Select Committee, \textit{Airports National Policy Statement inquiry - publications}, June 2017

\textsuperscript{19} Transport Select Committee, \textit{Airports National Policy Statement (NPS) inquiry - written evidence}, March 2018

\textsuperscript{20} Transport Select Committee, \textit{Airports National Policy Statement (NPS) inquiry - oral evidence}, March 2018
2 The case for more capacity

Meeting future demand

11. Airport capacity is determined by the amount of runway capacity and the terminal facilities available to cope with aviation demand through plane and passenger movements. Aviation demand is forecast to increase significantly between now and 2050. Heathrow Airport is already full and other London airports are operating at capacity during peak times. All major airports in the South-East of England are expected to be full by the mid-2030s, with four out of five full by the mid-2020s. As airports fill up and operate at full capacity, there is little resilience to deal with any disruption, leading to delays.

12. It was broadly accepted in the evidence submitted to the Committee that there was a need for additional runway capacity, in particular hub runway capacity. We acknowledge there is opposition to this view from affected communities and environmental campaigners. An additional runway and the associated developments to support its use will allow for a step-change in airport capacity and flexibility in the South-East, although it is to be noted that projections suggest that the main increase will be in international transfer passengers, with almost no increase in business use. Not developing this additional runway capacity would result in less choice, more disruption and higher air fares for UK passengers and potential costs in terms of trade opportunities foregone through air freight. We accept that there is a case as set out in the Airports National Policy Statement for additional runway capacity, in particular hub capacity. This is on the premise that any expansion is sustainable, consistent with legal obligations and that suitable mitigations will be in place to offset impacts on local communities affected by noise, health and social impacts. The Government should redraft its final NPS, in line with the recommendations set out in this report, to minimise any chance of a successful legal challenge.

The Government’s case for a Northwest Runway

13. Maintaining the UK’s hub status in Europe is the Government’s overriding objective in developing its preference for runway expansion in the South-East of England. Heathrow is the UK’s only major hub airport and it is one of Europe’s leading hubs. It has a reputation worldwide as a transatlantic conduit. It is unrivalled in the UK in terms of the density of airlines, connections and transfer passengers. This makes it possible to sustain routes at Heathrow that would not be viable as point-to-point links. The extent of the pent-up demand at Heathrow Airport is unrivalled anywhere else in the UK. The Government believes the connectivity benefits will be greater and realised sooner by a NWR scheme than by the other schemes considered by the Airports Commission. The clear preference of the airlines is to expand at Heathrow, although not at any cost.

14. Air freight is also critically important to the UK economy. Although only a small proportion of UK trade by weight is carried by air, it is particularly important for

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21 Department for Transport, Aviation Forecasts, October 2017
22 Department for Transport, Revised Draft Airports National Policy Statement, p 23
23 There is no single definition of what constitutes a hub airport. Broadly we take the term to mean an airport that airlines use as a transfer point en route to another destination.
24 Q673
25 This is evident in the terms of reference set by the Government for the Airports Commission
26 Q139, Q577, Q578; Q586; Q587; Q593; Q632
supporting export-led growth in sectors where goods are of high value or time critical. The time-sensitive air freight industry, and those industries that use air freight, benefit from greater quantity and frequency of services, especially long haul. By providing more space for cargo, lowering costs, and by the greater frequency of services, this should in turn provide a boost to trade. Freight is the other major comparative strategic benefit that will be delivered by the NWR scheme compared with the other alternatives. All three schemes would provide increased freight capacity, but the NWR scheme would provide the greatest comparative benefits. This was based on the higher growth forecast for long-haul connectivity at an expanded Heathrow, its position in west London, the convenience of its connections to the Strategic Road Network, the opportunity to remodel and expand existing cargo facilities in a more efficient and environmentally friendly way, and the relative density of freight activity around the airport compared with Gatwick.

15. The Government said the NWR scheme “delivers the greatest strategic and economic benefits” The NPS states that the NWR scheme:

- is best placed to provide the biggest boost to the UK’s international connectivity;
- is expected to lead to additional and more frequent long-haul flights and connections to fast-growing economies;
- delivers the greatest net economic benefits to the UK;
- provides benefits to passengers and to the wider economy sooner than the other schemes;
- increases competition between airlines;
- supports economic growth in the local community;
- delivers additional jobs at the airport, through its supply chain and in the local community; and
- is a more accessible location, with more varied surface access links.

16. These strategic benefits are achievable if it is delivered on time and generates the capacity specified in the NPS. We conclude that the Government is right to pursue development at Heathrow and accept the arguments it has made in favour of its preferred scheme. We endorse its approach of using a national policy statement and the planning process outlined in the Planning Act 2008. We conclude that there are valid concerns about the Government approach. In the remainder of this report we set out how the draft NPS should be improved before Parliament is asked to approve a final NPS ahead of designation by the Secretary of State. We recommend that both Houses of Parliament allow the planning process to move to the next stage by approving the Airports National Policy Statement, provided that the concerns we have identified

27 Department for Transport, Revised Draft Airports National Policy Statement, p 14
28 Department for Transport, Revised Draft Airports National Policy Statement, p 23
29 Airports Commission, Final Report, 2015, p 4
30 Q14, Q73
31 Department for Transport, Revised Draft Airports National Policy Statement, p 32
32 Department for Transport, Revised Draft Airports National Policy Statement, p 21–32;
later in our Report are addressed by the Government in the final NPS it lays before Parliament. Without addressing the concerns the Committee has raised, we believe there is a risk of successful legal challenge.

Review of the evidence

Strategic case

17. Heathrow’s strategic importance as a hub needs to be seen in the context of the national picture and judged on the basis of the passenger growth and connectivity benefits likely to be delivered across the whole of the UK. The DfT’s forecasts indicate that the NWR scheme will facilitate a rise in passenger growth, at the UK level, of 63% between 2016 and 2050, compared with a rise of 53% without expansion. This equates to a net increase of 6% or 26 million passengers per annum (mppa) by 2050 compared with no expansion. The passenger growth delivered by a NWR scheme is broadly similar when compared for the ENR and Gatwick schemes at 61% and 62% growth respectively; though growth is forecast to occur sooner with both the Heathrow options.

18. The increase of 26 mppa in passenger growth, at the UK level, from NWR expansion includes an additional 16 mppa international-to-international (I-I) transfer passengers. Excluding the I-I transfer passengers, the NWR scheme facilitates an additional 10 mppa terminating passengers by 2050 compared with no expansion. When compared with the other options, Gatwick provides the highest growth at the UK level by 2050 (Figure 2).

Figure 2: Terminating passenger growth, by expansion option, from 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>No expansion</th>
<th>Gatwick</th>
<th>ENR</th>
<th>NWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>21%</td>
<td>22%</td>
<td>25%</td>
<td>26%</td>
</tr>
<tr>
<td>2050</td>
<td>67%</td>
<td>73%</td>
<td>70%</td>
<td>71%</td>
</tr>
</tbody>
</table>

19. The Government believes the NWR proposal will enable the growth of business travel. Business travel is forecast to increase marginally with or without any runway expansion.
capacity constraints; although induced benefits will be delivered from the wider variety and greater frequency of services deliver by an expanded NWR (discussed below). The passenger growth facilitated by a NWR scheme is accounted for almost entirely by leisure passengers (i.e. those travelling for holiday purposes or those visiting friends and relatives sometimes referred to as VFR) and international transfer passengers (Figure 3). The forecasts also show that an expanded Heathrow will accommodate three times more outbound passengers than inbound passengers. These passengers spend their money overseas and represent a “deficit” on the UK’s economic balance sheet, although there are positive economic benefits from outbound travellers as elements of several industries in the UK that exist for the primary purpose of serving outbound travellers.

Figure 3: Net passenger growth, by passenger type, NWR vs No expansion

20. The NPS states that the NWR scheme is “expected to lead to more long-haul flights and connections to fast-growing economies.” The DfT’s forecasts show that, at the UK level, the NWR scheme will offer one more destination overall to emerging and fast-growing economies when compared with no expansion. It will increase the frequency of long-haul connections to fast-growing economies against a no expansion scenario.

21. The NPS states that, when compared to the other options considered by the Airport Commission, “Heathrow Airport is best placed to provide the biggest boost to the UK’s international connectivity [and] lead to more long-haul flights.” It states that the build-up of long-haul services would be quicker at Heathrow. The DfT’s forecasts show that at

39 Department for Transport, *Aviation Forecasts*, October 2017
40 OECD, *United Kingdom: Domestic, inbound and outbound tourism: United Kingdom*, 2016
42 Department for Transport, *Aviation Forecasts*, October 2017
44 A Northwest Runway will offer 11 more flights to newly industrialised countries in 2030 and 7 in 2050 than what would have been offered without expansion.
46 Q92
the UK level, the NWR scheme will offer 12 more daily long-haul services in 2050 than would be the case without expansion, nine more than the Gatwick scheme and one more than the ENR scheme (Figure 4).

Figure 4: Number of daily long-haul services, at the UK level, by expansion option

22. In terms of the total number of flights to long-haul destinations, the NWR scheme will offer 12% or 37,000 more flights per year by 2050 than without expansion, and 20,000 and 10,000 more than the Gatwick and ENR schemes respectively. The higher frequency and number of services overall is the obvious advantage of the NWR scheme.

Economic case

23. The DfT’s appraisal shows little separates the economic cases of the three schemes. The economic benefits over the appraisal period are now marginally in Gatwick’s favour, which is forecast to deliver £74.1 billion in gross benefits; compared with a Heathrow NWR at £72.8 billion and £61.7 billion with a ENR. Once costs are considered, the net economic benefits for the NWR scheme are relatively small at a maximum of £3.3 billion over 60 years and in fact, may be negative if future demand falls. The net economic benefits for the other schemes are also relatively small. The draft NPS does not reflect the DfT’s appraisal stating simply that “… overall the Heathrow NWR scheme is considered to deliver the greatest net benefits to the UK.”

24. The balance of economic costs and benefits is sensitive to the methodologies and assumptions employed in the appraisal. The DfT and the Secretary of State insisted they

47 Department for Transport, Aviation Forecasts, October 2017
48 Department for Transport, Aviation Forecasts, October 2017
49 Department for Transport, Aviation Forecasts, October 2017
50 These figures are for the lower range presented in the DfT’s appraisal. We also recognise the point made by the ENR scheme proponents about their ability to deliver a high capacity than is assumed in the appraisal. This is addressed later in the report.
51 Department for Transport, Updated Appraisal Report—Airport Capacity in the South-East, October 2017
52 Department for Transport, Revised Draft Airports National Policy Statement, p 32
had taken a conservative approach in their appraisal.\textsuperscript{53} We have identified several factors in the appraisal that could increase the risk of a successful legal challenge at a later stage of the planning process. These should be corrected or clarified before the NPS is designated:

- The DfT assumed new capacity at a NWR would fill-up within two-years of opening in 2026. Several witnesses considered this to be a highly optimistic assumption. For example, the airlines considered the mobilisation of new aircraft and crew within that timeframe as unrealistic.\textsuperscript{54} It is also opposed to HAL’s own commercial plans.\textsuperscript{55} If the forecasts were developed according to a more realistic profile of growth, the present value passenger benefits by the scheme would be reduced.\textsuperscript{56}

- The modelling also assumes that Gatwick, even with a second runway, will continue operating as a point-to-point airport, with limited long-haul connectivity. Gatwick Airport, which had 11 daily long-haul routes in 2016, is forecast to see a decline in daily long-haul routes to 7 in 2030 with a second runway and will not recover to its 2016 levels until the end of the appraisal period. This is inconsistent with recent growth in long-haul connectivity at Gatwick with a capacity constrained single runway.\textsuperscript{57} Other UK airports expressed concern about the accuracy of the forecasts as they related to their airports.\textsuperscript{58}

- We acknowledge the concerns expressed by the proponents of the ENR scheme that the appraisal has been completed assuming a capacity lower than they believe their scheme can deliver.\textsuperscript{59} We do not have the technical expertise to make a formal judgement on whether the 740,000 movements for the ENR scheme are viable but we are concerned by what we have heard and the absence of a proper justification from the DfT.

- The NPS states that “in monetary terms, the environmental impacts of all three schemes are small when compared to the size of the benefits, or considered over the 60-year appraisal period.”\textsuperscript{60} We are concerned that this only appears to be the case because the methods used by the DfT appear to underestimate these environmental costs. The full detail of these estimates is outlined later in report and in the annexes. It is beyond the scope and capability of the Committee to estimate the precise impact this could have on the economic case. Indicatively, several billion pounds of environmental costs have been omitted from the appraisal.\textsuperscript{61}

25. The benefits and costs the NWR scheme are finely balanced. Even small changes in assumptions or methodology could mean that the monetised costs of expansion via a NWR would outweigh the benefits. There are wider economic benefits that are not monetised as part of the economic case and need to be considered; equally there are several other environmental and social costs that are not monetised and are only assessed qualitatively, including loss of community and quality of life for nearby residents.

\textsuperscript{53} Qq466–67, Qq476–77, Q488, Q500, Q503, Qq505–06, Q512, Q565, Q568, Q575
\textsuperscript{54} See Annex A for discussion.
\textsuperscript{55} Q339
\textsuperscript{56} See Annex B for discussion.
\textsuperscript{57} Department for Transport, \textit{Aviation Forecasts}, October 2017
\textsuperscript{58} Q126
\textsuperscript{59} Heathrow Hub Ltd (NPS0087)
\textsuperscript{60} Department for Transport \textit{Revised Draft Airports National Policy Statement}, p 28
\textsuperscript{61} See Annexes F, H and I for full detail on these monetised environmental costs.
26. Perhaps the greatest factor affecting the economic case is deliverability. We were told about several factors that might prevent the delivery of a NWR scheme, including:

- the scale and complexity of the scheme and associated capital expenditure and financing requirements;
- property and infrastructure acquisition and relocation on a significant scale;
- hurdles in reaching agreement on scope and funding of surface access schemes;
- the lack of a safety case and uncertainties around implementing the complex and politically challenging airspace changes; and
- potential legal challenges, particularly on the grounds of air quality compliance.\(^\text{62}\)

27. The economic case of the NWR scheme is grounded on it being delivered by 2026 and at capacity by 2028. These are essential considerations. If the NWR cannot be delivered to the capacity and timeline assumed, because of, say, airfield design pinch points or planning issues, there will be considerable knock on effects to the economic business case of the scheme.\(^\text{63}\) A two-year delay to the scheme’s delivery would result in £16.3 billion of benefits being removed from the economic case.\(^\text{64}\) Similarly, there are significant economic costs from not proceeding at this point with the NWR scheme. In making its decision, Parliament needs to consider these opportunity costs, such as additional demand moving to competitor airports in other countries.

**Environmental, health and social impacts**

28. The DfT’s comparative assessment of the schemes considered by the Airports Commission focuses on the strategic and economic business cases. Limited detail on the relative environmental, health and social impacts of the three schemes is included in Chapter 3 of the NPS. Only one paragraph in the NPS provides a side-by-side assessment of the schemes. It concludes:

> … while all three schemes are expected to have a negative effect on impacts such as air quality, noise and biodiversity, the Gatwick Second Runway scheme has a less adverse impact than either scheme at Heathrow.\(^\text{65}\)

29. This limited consideration was justified by the DfT, on the basis that the NPS was a planning document and was “not really the place to set out an extensive discussion.”\(^\text{66}\) We agree with this but the discussion in the NPS should reflect the weight of evidence, which we summarise in the table below.\(^\text{67}\) (More detail on these issues is included in the annexes to our Report). It is not clear whether the evidence base supporting the NPS fully reflects the scale of likely impacts of the NWR scheme, particularly in the way the noise impacts have been presented (see paragraph 63).\(^\text{68}\)

\(^\text{62}\) For full discussion, see Annex D
\(^\text{64}\) Department for Transport, *Further Review and Sensitivities Report*, October 2016
\(^\text{65}\) Department for Transport, *Revised Draft Airports National Policy Statement*, p 28
\(^\text{66}\) Q76
\(^\text{67}\) For full discussion, see: Annexes E, F, H and I
\(^\text{68}\) See Annex H
Table 1: Summary of the environmental, health and community impacts

<table>
<thead>
<tr>
<th>Category (indicator)</th>
<th>Heathrow NWR</th>
<th>Heathrow ENR</th>
<th>Gatwick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land capture 70 (including surface access)</td>
<td>905.9ha</td>
<td>723.8ha</td>
<td>702.2ha</td>
</tr>
<tr>
<td>Green Belt Land (including surface access)</td>
<td>694.6ha</td>
<td>521ha</td>
<td>59.6ha</td>
</tr>
<tr>
<td>Housing loss</td>
<td>783 (plus up to 289 for surface access)</td>
<td>242 (plus up to 165 for surface access)</td>
<td>167 (plus up to 37 for surface access)</td>
</tr>
<tr>
<td>Noise 71 (No. of people newly affected by noise at 54dB LAeq,16h in 2030)</td>
<td>92,700</td>
<td>27,200</td>
<td>16,200</td>
</tr>
<tr>
<td>Air quality 72 (Population exposed to increased NO2 concentrations)</td>
<td>121,377</td>
<td>100,389</td>
<td>51,326</td>
</tr>
<tr>
<td>Carbon (Additional tCO2 over 60 year appraisal period)</td>
<td>308,860,409</td>
<td>259,604,192</td>
<td>121,512,938</td>
</tr>
</tbody>
</table>

It should be noted that the table provides a high-level summary for key indicators. For several indicators, such as health, biodiversity and water quality, the impacts are more nuanced and it is difficult to make an assessment in one headline figure or statement. As such, the table should be viewed in comparison with the supplementary analysis provided in the appendices of the October 2017 Appraisal of Sustainability.

30. We agree with the Government that the Northwest Runway (NWR) scheme offers the greatest strategic benefits. The scheme will consolidate Heathrow’s hub status, offering a greater number and variety of long-haul connections in the short-term, with a higher frequency than the other schemes considered by the Airports Commission. The scheme would deliver passenger growth that would not be realised without expansion. We accept the Government’s analysis that the economic benefits are broadly comparable across the three schemes and that the Department for Transport’s forecasts show that the NWR scheme’s advantage is more marginal over the longer-term. However, we conclude that in its comparative analysis of the three schemes, in Chapter 3 of the NPS, the Government should give more weight to environmental, health and community impacts. If Parliament is to make an informed decision on the designation of the NPS, members need to be confident that the final NPS reflects the weight of evidence as it is presented in the supporting documents. We recommend that more detail be provided in Chapter 3 of the NPS on the evidence on environmental, health and community impacts and that the Department for Transport’s comparative analysis be expanded to reflect more accurately the balance of impact across the three schemes it compares.

69 Various technical papers supporting the Airports Commission and/or DfT appraisal depending on which is most up to date.
70 Jacobs, 10: Place: Assessment prepared for the Airports Commission, November 2014
71 Environmental Research and Consultancy Department, Noise Modelling for the Airports Commission: Compendium of Results, June 2015
72 Jacobs, Module 6: Air Quality Local Assessment prepared for the Airports Commission, May 2015
73 Department for Transport, Appraisal of Sustainability, October 2017
3 Improvements to the Airports National Policy Statement

31. When considering a development consent order, the Secretary of State must take into consideration a variety of conditions, outlined in either the Planning Act 2008 or the relevant National Policy Statement. We want to ensure that, through these conditions, there are sufficient high-level mitigations and safeguards in place to ensure that the NWR scheme properly addresses its likely impacts. We also want to improve the draft NPS to lessen the risk of a prolonged or successful legal challenge at a later point in the planning process. This should also help to reduce the risk that the economic case is eroded over time.

32. Chapter 5 of the NPS covers a range of issues and while we do not intend to discount the importance of all those issues, we have focused predominantly on the conditions of approval associated with air quality, surface access, connectivity, costs and charges, noise, community impacts, resource and waste management. We have carefully considered how the NPS might be improved, including changes to clarify or update the supporting evidence and strengthen or add conditions on consent for any scheme.

Air quality

33. We have recently agreed a report with three other select committees on air quality. This is a pressing issue because of the 40,000 early deaths in the UK each year that can be attributed to poor air quality. The political debate around air quality has intensified since the Airports Commission’s recommendations were initially published. We looked at the treatment of air quality issues within the NPS to understand how airport expansion could be achieved without detriment to affected communities, compromising legal compliance, or exacerbating the air quality issues London already faces.

Evidence

34. The latest figures from the air quality reanalysis show that there are 47,063 properties where annual mean NO2 concentrations are predicted to be higher with the NWR scheme, with 121,377 people affected. This figure does not incorporate scheme-level mitigations and a reasonable proportion of these people will experience worse air quality at relatively negligible levels. These figures also only apply to the “Principal Study Area”, which includes the proposed airport site and a 2km perimeter.

35. We received evidence to indicate the traffic impacts from an expanded Heathrow extend beyond this 2km radius. While airport related traffic might have a small absolute impact in terms of emissions, additional traffic on an already congested network can have a disproportionate impact in terms of creating additional congestion and additional pollution from non-airport related traffic. To only model population impacts within a

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75 WSP, 2017 Plan Update to Air Quality Re-Analysis, October 2017
76 Heathrow Strategic Planning Group, March 2017 (NPS0075); Q259
77 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, October 2017
2km area seems to be an overly rigid view of the potential population impact of worse air quality. It should be noted the local population impact have not been updated since they were estimated by the Airports Commission in May 2015. They do not account for the latest uplift in demand forecasts and air traffic movements (ATMs) and surface access movements that occur under a NWR scheme and the consequent increase in pollution this would cause. It should also be noted that the population analysis is based on a static number of residents rather than an analysis that includes the population moving through the area.\(^7\)

The transient population is exposed to significant health risks. Evidence received by our recent joint inquiry into air quality revealed that pollution can, in fact, be far worse inside a vehicle than on the street.\(^7\)

36. To reflect the health and environmental impacts of air quality, the monetised costs of air quality are estimated within the appraisal. These were initially estimated by the Airports Commission at £958 million, with the damage cost from NOx emissions at £94.2 million. This assumed a damage cost of £875/tonne sourced from Defra guidance. The guidance was updated in September 2015 and the damage cost for NOx emissions relevant to the Heathrow expansion scheme is now £64,605/tonne (in 2015 prices). Adjusting for inflation, this damage cost is around 63 times higher than that used by the Airports Commission. Indicatively, the total damage costs from NOx emissions rises to £5.9 billion, taking the total damage costs to £6.8 billion (including PM10 costs); though for several technical reasons the increase may not be as considerable as that. Nevertheless, in the DfT’s updated October 2017 appraisal, the aggregate damage costs of air quality are 90 per cent lower at £30 million for NOx. It is difficult to see how this can be the case given that the local dispersion modelling has not been updated (or published), and there has been a substantial rise in unit damage costs for NOx. We received expert evidence that cast doubt on the approach taken by the DfT.\(^8\)

37. Sections of the draft NPS dealing with air quality should be revised before a final NPS is tabled for approval by both Houses of Parliament. **We recommend that the population impact estimates be updated to reflect the air quality impacts from the increased number of aircraft movements and surface access traffic that will result from a Northwest Runway scheme.** We also recommend the air quality monetisation modelling and results be published to clarify the monetised costs of poor air quality.

**Conditions**

38. Air quality is also a matter of legal compliance. The UK’s air quality obligations, which are set out in the 2008 ambient air quality Directive (2008/50/EC), are at high-risk of being breached between 2026 and 2029. Even then, this assumes that the Government air quality measures are implemented effectively. There is very little headroom in the compliance risk that would enable a deviation away from anything but a perfect implementation of the Government’s air quality strategy. The fact that the Government’s plan has been found to be “unlawful”\(^9\) on three occasions does not fill us with confidence that its current plan can be delivered effectively to ensure the NWR “capable of taking place within legal

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78 Q494, Qq497–98
80 See Annex F for full discussion.
81 High Court Judgement, **Clientearth No 3, R (on the application of) v Secretary of State for Environment, Food and Rural Affairs & Ors**, 2018 [EWCH] 315 Admin, 21 February 2018
While we are encouraged by HAL’s commitment to improving air quality, as evidenced through its “triple-lock”, legal compliance is almost wholly dependent on measures introduced by Government at the national level.

While we are satisfied with the current conditions in the NPS with respect to legal compliance, the current interpretation supporting the NPS is that the NWR will be compliant but is deemed a “high-risk” of breaching, with very little headroom out to 2029. **We recommend the Government adopts a more stringent interpretation of air quality compliance than what is currently applied by the Department for Transport to support the NPS. This should include an appropriate level of headroom to manage the inherent uncertainty of predicting future air quality compliance. The applicant for a Development Consent Order should be required to show, with a reasonable degree of confidence, that their scheme can comply.**

The issue of legal compliance must be separated from the health impacts of air quality. A scheme may demonstrate legal compliance but may still result in outcomes that harm public health. There are no firm conditions of approval linked to the health impacts of worse air quality. There is a condition on noise approval in paragraph 5.67 of the NPS. **We recommend that a condition be included in the NPS to the effect that development consent will only be granted if the Secretary of State is satisfied that the proposed scheme will: avoid significant adverse impacts on health and quality of life from air quality; mitigate and minimise adverse impacts on health and quality of life from air quality; and where possible, contribute to improvements to health and quality of life.**

**Surface access**

Passengers, airport workers, airline staff, security personnel, freight operators and many others move on, off and around the airport everyday as an integral part of airport operations. Surface access issues are pivotal to the scheme’s business case and public health concerns arising from worse air quality. We looked at how surface access was addressed in the draft NPS because effective and efficient use of any new airport capacity will depend on good surface access. We were concerned about both the adequacy and cost of the surface access proposals; we were also keen to understand how well the draft NPS drew a distinction between the changes to surface access that were needed to support the airport now and those that would be needed by an expanded airport.

**Evidence**

The surface access schemes required to support the NWR have not yet been finalised. Several schemes are committed to, including Crossrail, HS2 and the Piccadilly Line upgrades, and several others, including enhancements to the roads network, have been assumed and are based on the work done by the Airports Commission three years ago. These will manage the increase in London’s growing population and provide more surface access options for the current two runway world. But the eventual impact of a NWR on roads congestion and rail capacity is still highly uncertain. The Airports Commission concluded that with the assumed surface access schemes, some segments of the surface access network will struggle to cope with peak demand pressures. The DfT’s latest

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83 Q176
iteration of modelling, which shows that passenger growth will increase much faster than initially expected. Such growth would place further strain on the surface access networks supporting Heathrow. Results published in the DfT’s air quality reanalysis indicate that there will be as many as 17% more cars on the road by 2030 than was previously assumed by the Airports Commission. TfL modelling shows that even with the committed and assumed schemes, there will be a significant increase of 72,000 passengers using the highways daily, resulting in “congestion and delays for both airport and non-airport users.” There has been no comprehensive surface access assessment published by the DfT to understand what the congestion impact on the road and rail network would be with this increased demand.

43. Schemes such as Southern and Western Rail Access are essential for a two-runway Heathrow, never mind a three-runway airport with an extra 50% capacity. We welcome the commitment to Western Rail Access provided by the Secretary of State when he provided oral evidence. We recommend a written commitment of policy support for Southern and Western Rail Access be made by the Government in the NPS, including clarity around funding and the timeline for delivery. We also recommend the Government clarify which schemes are needed to support current two-runway operations at Heathrow and which are needed to support an expanded Heathrow. As part of this, we recommend the Department for Transport’s updated surface access modelling be published so that the likely impact on road and rail congestion of a NWR scheme is known.

44. The DfT concedes that the eventual cost of surface access costs is uncertain; though £5 billion in surface access costs are incorporated in the appraisal. There was general agreement in the evidence we took that the proposed surface access schemes, which account for the £5 billion, will not be sufficient to cater for the step-change in passenger, airport staff and freight journeys to accompany expansion. In addition to the ambiguities around the total costs, there are uncertainties as to who is going to pay for these. The NPS is clear that HAL will pay for the full cost of M25, A4 and A3044 diversions and roadworks. However, it is vague about the contribution it expects from HAL towards the costs of Western Rail Access and Southern Rail Access, stating only that it would be “expected to make a contribution towards the cost.” We recommend that the surface access costs in the appraisal, and which support the NPS, be updated and included in the final NPS to reflect the indicative costs of those additional schemes required to deliver on the target of no more road traffic. We are concerned about the absence of detail on proposed changes to the M25. We recommend that the Government work with Heathrow Airport Limited to clarify the proposals and bring greater certainty to the development plans. A key part of this must be the arrangements for diversion of traffic during any works.

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85 While it is universally accepted by witnesses that this is an implausible eventuality, that is the planning assumption being used by the DfT and for consistency the rest of the NPS should be judged against that benchmark.
86 WSP, 2017 Plan Update to Air Quality Re-Analysis, October 2017, Appendix B
88 See Annex G for full discussion
89 Q551
90 Department for Transport, Updated Appraisal Report, October 2017, p 31–32
91 In real terms
92 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 25
Conditions

45. The NPS currently requires an applicant to take “all reasonable steps to mitigate [surface access] impacts.” It adds that “Where the proposed mitigation measures are insufficient to effectively offset or reduce the impact of expansion … on the transport network, the Secretary of State will impose requirements on the applicant to accept requirements and / or obligations to fund infrastructure or implement other measures to mitigate the adverse impacts.” Provided the applicant is willing to commit to transport planning obligations to satisfactorily mitigate transport impacts, “development consent should not be withheld on surface access grounds.”

46. While we recognise the intention behind the current condition on surface access in the NPS, we conclude its drafting leaves too much scope for unintended surface access impacts from this scheme. We therefore recommend a condition be included in the NPS that ensures approval only be granted if the target for no more airport related traffic can be met, or that as a condition of approval, capacity be released at the airport, after construction, only when the target is met. This provides a real incentive on the applicant to find innovative ways to encourage modal shift. The condition we propose is not a complete solution. If passengers and airport staff are getting out of their cars and onto the public transport network, clearly it must have sufficient capacity to cope.

Connectivity for the regions

47. An expanded Heathrow needs to deliver not just for the South-East but for the rest of the UK. The anticipated growth in connections to Heathrow is a key reason why the NWR scheme has garnered considerable support from non-London regions. We wanted to understand the extent to which the NWR scheme was likely to deliver on these objectives and whether additional conditions in the NPS were needed to provide further guarantees around connections to Heathrow.

Evidence

48. There are several uncertainties that may prevent the domestic connectivity benefits endorsed in the NPS from being realised. The Government has no real policy levers, outside of public service obligations, to allocate slots to domestic routes at Heathrow. Currently public service obligations cannot be applied at an individual airport level. The eventual domestic route offering at Heathrow will be determined by commercial considerations of the airlines that have the rights to the slots. The number of domestic routes at Heathrow has declined in recent years and it is difficult to see this trend being reversed if airport charges increase post-expansion.

49. The non-London regions value the direct international connectivity from their own regions. While direct international connectivity from the regions will continue to grow in any eventuality, the DfT’s forecasts show that direct international connectivity from the regions would be lower with a NWR than without expansion. If the NWR scheme

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93 Department for Transport Revised Draft Airports National Policy Statement, p 48
94 Qq122–23, Q131
95 See Annex A for full discussion.
96 Q72
97 That is, a direct connection from a non-London UK destination to an overseas destination.
98 Airports Commission, Strategic Fit: Forecasts, July 2015; Q70
goes ahead, there would be 74,195 fewer direct international flights per year to and from airports in the non-London regions in 2030; this increases to 161,893 by 2050 (Figure 5). While the figures at the aggregate level are accepted, individual airports are concerned that the figures for their airport do not accord with their own projections and plans.99

Figure 5: Direct international connectivity, for non-London Airports, various expansion options, annual ATMs (000s)100

<table>
<thead>
<tr>
<th></th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Expansion</td>
<td>687</td>
<td>899</td>
<td>1,169</td>
</tr>
<tr>
<td>Gatwick NWR ENR</td>
<td>667</td>
<td>795</td>
<td>989</td>
</tr>
<tr>
<td>ENR</td>
<td>613</td>
<td>763</td>
<td>1,007</td>
</tr>
<tr>
<td></td>
<td>626</td>
<td>776</td>
<td>1,037</td>
</tr>
</tbody>
</table>

Conditions

50. Given the uncertainty around the eventual domestic route offering at Heathrow, more needs to be done to reassure non-London regions that they will be offered this connectivity once a NWR scheme is delivered. The Secretary of State expressed his desire to “reserve up to about 15% of slots on the new runway for domestic connections” and that “this capacity has to be spread across the day; it cannot be loads of slots at 11 o’clock at night.”101 It is not clear how the Secretary of State intends to reserve slots for domestic connections. We recommend that the Government provide a clear definition in the NPS of what constitutes a domestic route and that the Government outlines more clearly, in paragraph 3.34, how it intends to secure 15% of new slots for domestic connections, including the policy levers it will use to achieve this target. This should also include an explanation as to how the Government intends to deliver these slots in the immediate period after the third runway opens and how it will guarantee these slots are made available at suitable times spread across the day. The Government should also outline how it will enforce Heathrow’s domestic connectivity commitments once a NWR scheme is in operation.

99 Q126
100 Department for Transport, *Aviation Forecasts*, October 2017
101 Q478
Costs, financeability and airport charges

51. The NWR business case works on the assumption that airlines would absorb any increase in airport charges and passenger demand for the airport would remain unchanged. The evidence suggests that these assumptions are unrealistic\(^\text{102}\) and the reality is that if airport charges increase significantly, as is assumed in the Airports Commission finance assessment, airline and passenger demand, and subsequent benefits, for the airport would be diluted.\(^\text{103}\)

Evidence

52. The NPS acknowledges that the Gatwick scheme “would be significantly cheaper” and require a significantly lower “level of debt and equity” than either of the schemes at Heathrow, with the Heathrow NWR the most expensive of the three schemes shortlisted by the Airports Commission.\(^\text{104}\) Beyond that, almost no mention is made in the NPS of the potential cost and investment risks associated with this scheme.

53. At this stage and in the absence of much of the scheme detail, exact costs for the NWR scheme are unknown. The DfT’s appraisal assumes costs of £17.6 billion.\(^\text{105}\) HAL has since taken steps to reduce this cost by £2.5 billion.\(^\text{106}\) Surface access costs have also been estimated at £5 billion,\(^\text{107}\) though not all this cost will be allocated to HAL. While a degree of optimism bias is already included in these estimates, there are still significant cost risks associated with this scheme, particularly with respect to the M25 reconfiguration.\(^\text{108}\) There is also considerable uncertainty as to what surface access schemes will be required to support the new runway, how much those schemes will cost and how those costs will be allocated between HAL and the public sector.\(^\text{109}\)

54. We accept that cost accuracies will improve as the project matures, but fundamental aspects of scheme design and surface access remain undefined, creating a perception of a cost risk that is high. There is only one mention of cost in the NPS. This is not a fair reflection of the legitimate concerns of airlines and passengers, who are likely to absorb much of the risk, about the cost of expansion. Before votes in Parliament to approve a final NPS, we would like to see evidence to demonstrate that the Northwest Runway scheme is both affordable and deliverable and that steps are being taken to address the valid concerns we heard in evidence about the high cost of the scheme and the significant risk that costs will rise.

55. Heathrow Airport Limited will need to raise the finance to pay for its scheme. The Airports Commission assumed that HAL would take a corporately financed cash flow approach and that it would raise the money through a combination of debt and equity.\(^\text{110}\)

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\(^\text{102}\) Correspondence from Professor Peter Mackie and Brian Pearce to Transport Select Committee, 30 January 2018
\(^\text{103}\) Q155, Q595, See Annex C for full discussion
\(^\text{104}\) Department for Transport, Revised Draft Airports National Policy Statement, p 27; See Annex C for full discussion
\(^\text{105}\) In real terms and at 2014 prices.
\(^\text{106}\) Q353
\(^\text{107}\) In real terms and at 2014 prices.
\(^\text{108}\) Q382, Q581, Q588; For more information, see: Highways England, Strategic Road Network Proposal – Validation of Costs and Delivery Assumptions, October 2016
\(^\text{109}\) See Annex G for full discussion.
\(^\text{110}\) Airports Commission, Business Case and Sustainability Assessment, July 2015
billion; and additional equity between £5.5 and £7.0 billion (both in nominal terms);\textsuperscript{111} this does not cover any contribution to surface access costs.\textsuperscript{112} Andrew Haines, Chief Executive of the Civil Aviation Authority (CAA), told us it would be “probably the largest privately financed infrastructure project anywhere ever in the world.”\textsuperscript{113}

56. The Airports Commission identified several risks that may prevent HAL from raising the debt and equity required, one being the level of charges it would be able to levy on airports users. The investors surveyed by the Airports Commission believed this risk was manageable, but this was on a presumption that airport charges increase to a potential peak charge of £31 per passenger, with some degree of pre-funding allowed.\textsuperscript{114} The other major risk was how investment of this scale would be treated by the CAA when determining the costs of capital. This effectively determines the rate of return for any prospective investor. The Airports Commission found that investor interest was there but depended on a stable regulatory structure being in place to enable such returns.\textsuperscript{115}

57. Heathrow’s airport charges are already the highest in the world.\textsuperscript{116} Both HAL and the Secretary of State expressed a desire to keep airport charges close to current levels in real terms;\textsuperscript{117} neither was willing to make it a firm condition for planning approval in the NPS. The Secretary of State said it was an issue to be dealt with by the CAA.\textsuperscript{118} CAA Chief Executive Andrew Haines indicated that “it is plausible to build the infrastructure that is currently proposed and keep costs flat”, despite it being “a bit counter-intuitive” to the historic trends in infrastructure spend and airport charges.\textsuperscript{119} He said this was down to the historic low levels of cost of capital, which “is a very significant factor in terms of the overall cost. That alone can change the cost per passenger by several pounds.”\textsuperscript{120} He cautioned that investor interest would be affected if guarantees on charges were included in the NPS.\textsuperscript{121}

58. If the NWR scheme is going to deliver the strategic benefits set out in this NPS, airport charges will need to remain broadly in line with current charges. If airport charges increase significantly, it will either make using Heathrow unaffordable for some passengers; or for those that continue to use the airport, the passenger benefits—which make up over 90% of the economic benefits—will be eroded.\textsuperscript{122} A significant rise in airport charges could limit the degree of airline competition at an expanded airport. It may also have a detrimental impact on the competitiveness of Heathrow relative to other major European hubs.\textsuperscript{123} Willie Walsh, Chief Executive of the International Airlines Group, believed that

\begin{footnotesize}
\begin{enumerate}
\item This includes a profile of scheme capex, coupled with the airport’s core capex, asset replacement, opex RAB depreciation and non-aero revenues
\item Heathrow has expressed its desire to reduce costs by £2.5 billion, this would come off the financing costs. But it has also acknowledged that it has set aside £2 billion for surface access contributions. These will broadly balance out in these figures. There are also uncertainties as to how much Heathrow will eventually have to pay out in noise insulation compensation, this is linked to the flight-paths and the subsequent noise footprint, which at this stage is unknown
\item Q634
\item Airports Commission, Business Case and Sustainability Assessment, July 2015, p 113
\item Airports Commission, Business Case and Sustainability Assessment, July 2015, p 113
\item Leigh Fisher, Review of Airport Charges, 2016
\item Heathrow Airport Ltd (NPS0055), Q522
\item There are wider issues to the effectiveness of the regulatory framework and the CAA in managing Heathrow’s costs post-expansion but this is beyond the scope of this inquiry.
\item Q635
\item Q638
\item Q645
\item Q104
\item See Annex C for full discussion.
\end{enumerate}
\end{footnotesize}
with significantly higher charges, Heathrow would “become a white elephant.”124 Clearly a 50% increase in airport charges, as was assumed by the Airports Commission, is an unacceptable outcome and would be detrimental to the business case for this scheme.

**Conditions**

59. It may not be in the interests of passengers to recommend a firm limit on the increase in airport charges at this point of the approvals process.125 Yet anything more than a marginal increase in airport charges is clearly undesirable. **We recommend a condition be included in the NPS that airport charges be held flat in real terms but with scope for a marginal increase provided the balance of benefits is in favour of the consumer, as assessed by the Civil Aviation Authority. We recommend that the Government consider whether the CAA has the powers necessary to regulate effectively future airport charges at Heathrow.**

60. The financing requirements for this scheme are considerable. While the Airports Commission considered these risks to be manageable, it assumed a 50% increase in airport charges, as well as some degree of pre-funding. This is clearly incompatible with delivery the passenger benefits endorsed as part of the business case. With a condition on charges in the NPS, HAL would be incentivised to make an early judgement as to whether it believes its scheme is financeable. Nevertheless, **we recommend that, at an appropriate early stage of the DCO planning process, the Government’s preferred scheme be tested by the Civil Aviation Authority to ensure it is both affordable and financeable. Such a test should offer an opportunity to halt the planning process if it is evident that the proposed scheme has no realistic prospect of being built.**

**Noise**

61. The impact of noise from airport expansion is a key concern for affected communities and high exposure to noise causes annoyance, can disturb sleep, and can affect people’s health.126 We wanted to ensure that the noise impacts, outlined in the evidence supporting the NPS, are a fair reflection of what’s likely to occur in practice with a NWR scheme. Noise mitigation must also be a priority and safeguards need to be in place to protected communities from unintended consequences of expansion.

**Evidence**

62. Expansion at Heathrow will lead to a rise of around 700 flights per day compared to a no expansion scenario. The NWR scheme is estimated to cause significant annoyance127 for 653,900 people in 2030, as well as 263 noise sensitive buildings.128 This is 92,700 more people than would be impacted without expansion. The NWR scheme will also result in an increase of around 20,000 people impacted by noise levels that are acknowledged by the government to contribute to premature deaths.129

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124 Q595
125 Q649
126 Department for Transport, **Revised Draft Airports National Policy Statement**, p 51
127 At the 54 dB L_{Aeq,16hr} which measures noise for a certain period of time during the day and averages that out by day over several months.
128 Schools, hospitals and religious places of worship are considered noise-sensitive buildings for the DfT appraisal; Department for Transport, **Appraisal of Sustainability**, Appendix A, A-4 Noise
129 At the 63-decibel contour level
63. These figures are taken from the DfT’s Appraisal of Sustainability that only shows the overall populations affected by noise and the net change in noise exposure at three different thresholds.\textsuperscript{130} The DfT’s approach nets out the ‘winners’ and ‘losers’ from noise changes. Yet community acceptability is often shaped much more by the ‘losers’ who have a much lower tolerance to equivalent levels of noise to people who’ve been exposed over long periods.\textsuperscript{131} The presentation of the modelling work using ‘net figures’ presents a slightly skewed picture and does not reflect the political realities of how noise changes will be received by communities. On this basis, a more revealing metric—which is not presented in the appraisal work supporting the NPS—is the gross number of people who will be newly exposed to significant levels of noise annoyance.\textsuperscript{132} The evidence suggests that over 300,000 people could be newly affected by significant noise annoyance from an expanded Heathrow (Figure 6).\textsuperscript{133}

**Figure 6: Number of people newly affected by significant noise annoyance (>54dB), by expansion option, 2030**\textsuperscript{134}

<table>
<thead>
<tr>
<th>Expansion</th>
<th>People Newly Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWR</td>
<td>323,684</td>
</tr>
<tr>
<td>ENR</td>
<td>233,899</td>
</tr>
<tr>
<td>Gatwick</td>
<td>18,987</td>
</tr>
</tbody>
</table>

64. The noise analysis in support of the NPS is reliant on averaging methods and at thresholds inconsistent with the Government’s own guidance.\textsuperscript{135} Noise thresholds used by the DfT in the draft NPS are not in-line with its own guidance that accepts the onset of annoyance at 51 dBLAeq. The analysis supporting the NPS does not show the number of people affected at this level, using only the higher threshold of 54 dBLAeq.\textsuperscript{136} As shown in Figure 7, if the threshold of annoyance was extended down to the 51dB level, an extra 539,327 people would be captured in the annoyance footprint; taking the total number of people in the noise annoyance footprint to over 1.15 million.

\textsuperscript{130} >54 dB, >63dB, >69dB Daytime Average Noise.
\textsuperscript{131} Q306
\textsuperscript{132} This is an estimate of the number of people who without a runway scheme experienced noise of less than 54dB but with expansion will experience noise greater than 54dB.
\textsuperscript{133} This is an estimate based on the latest noise modelling by the CAA of the number of people who without a runway scheme experienced noise of less than 54dB but with expansion will experience noise greater than 54dB.
\textsuperscript{134} CAA monetisation workbooks
\textsuperscript{135} Department for Transport, *UK Airspace Policy: A framework for balanced decisions: on the design and use of airspace*, February 2017
\textsuperscript{136} Department for Transport, *Guidance on airspace & noise management and environmental objectives*, 2017
65. It is impossible to know what the exact noise outcomes of a NWR will be without actual flight-paths; there are several uncertainties as to the scale of the noise impacts for people living in and around Heathrow. The impacts shown above are likely to be toward the lower end of the range of possible noise impacts from a NWR scheme. Among other factors, this is primarily because the noise impacts have been modelled using a single flight-path scenario; this does not reflect what is likely to happen in the real world. The noise results also rely on much more optimistic assumptions around the fleet mix that will be operating in and out of Heathrow in the future.\textsuperscript{138}

66. The evidence in the NPS shows that a Northwest Runway (NWR) scheme could have a seriously damaging effect on communities living under and adjacent to flight-paths. Until actual flights paths are known the actual noise distributions resulting from the NWR scheme cannot be known. We believe that the approach taken by the Department for Transport has resulted in an analysis that tends towards the lower end of the range of possible noise impacts. It is right that Parliament and the public have a fair view of the range of possible noise impacts from a NWR scheme. \textit{We recommend the noise modelling be updated to reflect a range of possible flight-path scenarios. The results from this modelling should also be presented using a range of metrics and across the full range of thresholds recommended in the latest guidance. We believe it would be helpful if the Department for Transport published the evidence base supporting their assumptions about future fleet mix.}

\textbf{Conditions}

67. The NPS recognises the Environmental Impact Assessment Regulation which requires a scheme proponent to undertake a noise assessment ahead DCO of approval. The baseline of noise for the purposes of the DCO assessment, as defined in the NPS, is the 2013 baseline for the 54 decibel LAeq, 16h noise contour assessed by the Airports

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure7.png}
\caption{Local noise population impacts, at different thresholds of noise, NWR option\textsuperscript{137}}
\end{figure}

\textsuperscript{137} CAA monetisation workbooks
\textsuperscript{138} See Annex H for full discussion
Commission. We believe that the 2013 baseline assessed by the Airports Commission may not reflect a true baseline of noise without expansion. One metric of noise, at one threshold, does not constitute a sound basis to assess noise. **We recommend that a condition be included in the NPS to ensure noise impacts be measured, during the DCO process, against an updated baseline that incorporates the Government’s latest guidance and assumptions.** **We recommend that the NPS also specify the noise metrics and thresholds upon which noise will be assessed. These must be consistent with the Government’s updated guidance.**

68. At present, the NPS “expects the applicant to make particular efforts to avoid significant adverse noise impacts and mitigate other adverse noise impacts as a result of the NWR scheme and Heathrow Airport as a whole.” Adding that:

> The Secretary of State will consider whether the mitigation measures put forward by the applicant following consultation are acceptable. The noise mitigation measures should ensure the impact of aircraft noise is limited and, where possible, reduced compared to the 2013 baseline assessed by the Airports Commission.\(^\text{139}\)

69. While we agree, in principle, with these conditions, the drafting means that there is too much ambiguity as to what “significant adverse noise impacts” might mean in practice. Without more scheme detail, it is impossible to know what the precise noise impacts of a future scheme will be. It is possible to make a judgement as to what constitutes “significant adverse impacts”. **We recommend that the Government defines in the NPS what constitutes “significant adverse impacts” and define an acceptable noise limit that reflects a maximum acceptable number of people newly exposed to noise due to the scheme.** With a population noise limit on expansion, there is a safety net for communities going into this process. By setting high-level targets, the incentive is there for the airport to develop its own package of mitigations that will either meet those targets, or seek to minimise noise below those targets.

70. The NPS requires the scheme proponent to put forward plans for a noise envelope. We support this approach and agree that the specific design of this envelope should occur in consultation with local communities and relevant stakeholders. It is important that any noise envelope is subject to periodic review to ensure they remain relevant. The NPS still needs to outline how these noise envelopes will be monitored and enforced. We recognise the role the noise commission will have in assessing noise but it does not appear to have sufficient powers to enforce such an envelope as yet; nor is it currently the CAA’s role to do so.\(^\text{140}\) **We recommend that the Government set out in the final NPS how it intends to regulate any noise envelope and what options for recourse will be available against the airport and/or airlines for breaching such an envelope.** Without an enforcement mechanism and the associated incentives, a noise envelope will be nothing more than an ambition.

71. The NPS says that a scheme proponent “should put forward plans for a runway alternation scheme that provides communities affected with predictable periods of respite.” It adds that “the timings, duration and scheduling should be defined in consultation with communities and relevant stakeholders.” It also says that “predictability should be

\(^\text{139}\) Department for Transport, *Revised Draft Airports National Policy Statement*, p 54

\(^\text{140}\) Q647
afforded to the extent that this is within the applicant’s control.” It should be noted that communities around Heathrow currently have a respite period where planes are not overhead of half the flying day, resulting from a switch in runway. The NPS acknowledges that this will reduce to one third of the day with a NWR; HAL dispute this claim. The NPS also states that respite only appears to be necessary, provided “it is within the applicant’s control”. It is not clear what this means. We recommend the Government define a minimum acceptable level of noise respite in the NPS. We appreciate that precise arrangements will be determined once a full consultation has taken place with communities and once flight-paths have been designed; but this provides some reassurance for communities that any application will need to demonstrate how it meets clear standards as it goes through the DCO process. It should then be up to the scheme proponent to design its runway and accompanying flight-paths in such a way that guarantees these minimum levels of acceptable respite.

72. The Government expects a ban on scheduled night flights for a period of six and a half hours, between the hours of 11pm and 7am, to be implemented. The NPS states that “the rules around its operation, including the exact timings of such a ban, should be defined in consultation with local communities and relevant stakeholders.” We heard from airlines and commuter groups that there are more flexible ways of dealing with respite than a blanket ban. In principle, we endorse a night-flight ban and believe improved and predictable night-respite is long-overdue for nearby communities. However, we believe that the Government’s proposal for a blanket ban of six and a half hours pre-empts the DCO process and the community consultation within that. We recommend that affected communities are provided with a minimum average period of 7 hours of respite a night. The exact timing of this respite should be determined through joint working between the airport, airlines and communities. Evidence received suggest such a scheme would be achievable. A future night flight ban should not prohibit unpreventable overruns, in the event, for example, of weather delays. But we recommend a mechanism be established that provides stringent oversight of any night-flight regime to ensure that airlines and the airport are monitored and an effective enforcement regime is in place to incentivise much tighter control of overruns into the night-flight respite period where they are preventable.

Community impacts, compensation and support

73. A NWR scheme will impact communities who will be forced to vacate their homes that will be demolished to make way for the runway. The NWR scheme is expected to result in the loss of 783 residential properties and several community facilities. This figure only includes properties within the direct boundaries of the expanded airport. Around 5,500 more lie within the Wider Property Offer Zone boundary (Figure 8) and those residents may have to move out of the area because of new and significantly adverse living conditions.
74. The NWR scheme will also affect the livelihoods of those residents left behind and living adjacent to the airport; the fabric of their communities will change irreversibly. For example, the additional traffic and increased journey times will lead to issues of severance, loss of sense of place, breakdown in community cohesion, and a reduction in the quality of amenity within the community.\footnote{Heathrow Airport Limited, \textit{Heathrow Airport expansion consultation document}, January 2018, p.49} The Health Impact Analysis supporting the NPS shows that a NWR scheme have major adverse health effects on resident, including on selected “children and young people” and “people with living in areas with poor health status”. It also found that is likely that a NWR will “further increase inequalities between a number of vulnerable groups and the general population” and that “a large number of those most affected by the expansion schemes are unlikely to benefit from the opportunities provided.”\footnote{Department for Transport, \textit{Appraisal of Sustainability: Appendix A–1 Community}, October 2017} It will also affect the lives of residents living under future flight paths who will either experience worse noise or be newly affected by noise that weren’t affected previously.

Conditions

75. We acknowledge that for many residents no amount of compensation will be sufficient to replace the homes they might lose, the communities they will be separated from or the very significant changes in lifestyle or livelihood they may experience because of expansion at Heathrow. Compensation is a fundamental component of the package of measures that accompany the NWR scheme. As outlined in the NPS, the scheme proponent “will have to provide an appropriate community compensation package, relevant to planning. This will include financial compensation to residents who will see their homes compulsorily acquired, as well as ongoing financial compensation to the local community.” HAL has publicly committed to a community compensation package comprising offers totalling up to £2.6 billion, including an offer to pay 125% of market value, plus taxes and reasonable moving costs, for all owner-occupied homes within the compulsory acquisition zone. It has also committed to paying contributions for acoustic insulation based on a property’s location within the noise contours of an expanded airport. The draft NPS also identifies a community compensation fund of £750 million (a sum of £50 million per annum over a 15-year period) to be distributed to local communities. With respect to the compensation schemes:

The Government expects to see arrangements being made for the community compensation schemes which Heathrow Airport has publicly stated would be provided, and for a community compensation fund.

76. We support the proposed compensation measures put forward by Heathrow Airport Limited and are encouraged by their willingness to engage with communities. However, we believe it is too early in the process to specify exact sums for compensation when the detail of the scheme and its subsequent impacts remain unclear. The NPS should set the framework and principles upon which compensation will be offered, with the finer details determined during the planning process. With respect to the compensation package identified in the NPS, we recommend that: the threshold for £3,000 in compensation for acoustic insulation for residential properties be revised to reflect the significant noise annoyance thresholds in the latest Government guidance; the £3,000 committed for noise insulation be independently tested during the DCO process to ensure that this is a sufficient sum of money to mitigate properly the increased noise nuisance cause by the scheme; and the 125% offered to compensate residents whose homes are compulsorily acquired be independently tested during the DCO process to ensure it is appropriate and sufficient to cover the repurchase of an equivalent standard of housing at a suitable location. We recommend that the NPS clearly outline that there is no fixed limit on the amount of compensation offered to affected communities provided it meets the criteria set within the designated NPS. We also recommend that the £50m a year figure is increased by RPI each year so that the real terms value of this remains the same for each year of the 15 years.

77. Other measures are required to support communities that must vacate their homes. For example, there will be vulnerable residents, such as the elderly, the unemployed or those with young families, who will need support above and beyond the financial compensation offered to set up their new lives. Supporting measures are also required for those that continue to live in areas adjacent to NWR to ensure those communities can prosper, or

151 Department for Transport, Revised Draft Airports National Policy Statement, p 83
152 Department for Transport, Revised Draft Airports National Policy Statement, p 83
at the very least, cope with the changes induced by an expanded Heathrow. The NPS has a condition of approval that the scheme proponent engages constructively with the community engagement board throughout the planning process which is something we fully support. But more needs to be done once the planning process is complete to engage with and support affected communities. **We recommend that a condition approval be included in the NPS which requires the scheme proponent to develop a strategy outlining how it intends on supporting local communities during and in the extended periods after the planning process is finished. This should be developed in consultation with the communities affected as well as the relevant local authorities.**

### Replacement of existing facilities

78. The NPS acknowledges that an expanded Heathrow will require the removal of existing facilities in and around the airport, notably two Immigration Removal Centres (IRCs) and the Lakeside Energy from Waste plant. With respect to the IRCs, the NPS has a condition stating that “the Secretary of State considers that replacement facilities in substitution for the affected IRCs should be provided prior to any works which may significantly interfere with the service and facilities provided by the existing IRCs.” This effectively provides for their removal and replacement by HAL as part of the DCO process. However, with respect to the Lakeside plant, the NPS only states that:

> The applicant should make reasonable endeavours to ensure that sufficient provision is made to address the reduction in waste treatment capacity caused by the loss of the Lakeside Energy from Waste plant.

79. While it acknowledges that the plant is a consideration in the process, there is no firm obligation on HAL, as a condition of approval, to remove and replace the plant. The replacement and removal of this plant was considered by the Airports Commission to be one of the main delivery risks, alongside the reconfiguration of the M25, and as such concluded that:

> Its replacement is not considered an optional component of the scheme. The planning and construction of an Energy from Waste Plant is a substantial exercise in its own right, whose timescales are not substantially shorter than the delivery of new runway infrastructure. The process of planning a provision of an alternative facility would, therefore, need to begin soon after a decision to proceed with airport expansion.

80. We see no reasons why the Lakeside plant—which is a critical piece of infrastructure for the region and underpins the successful delivery of this scheme—should not be given equivalent treatment in the NPS as the IRCs. **We recommend a condition of approval be specified in an updated NPS that provides the Lakeside Energy from Waste plant with equivalent recognition as the Immigration Removal Centres and that the replacement of its facilities be accounted for in the DCO process.**

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4  Policy gaps to support Heathrow expansion

81. Some of the risks identified in this inquiry arise from gaps in the current aviation policy framework; this is particularly applicable to the airspace risks we have identified. While airspace changes may be deliverable from a technical or safety point of view, the political reality is that substantive airspace change has been notoriously difficult to achieve and is why nothing of substance has occurred since 1974. For these changes to be delivered, and for the full benefits of the Government’s preferred scheme to be realised, substantial policy backing is required to set in place the necessary airspace change policy levers to resolve the likely community and commercial conflicts that come with this delivery. **We recommend that Government outline its intended policy approach to delivering airspace change for its preferred scheme as a matter of priority. We acknowledge the helpful work that the Government has already done through its 2017 airspace consultation and we recommend that the Government, in coordination with the Civil Aviation Authority and NATS, develop a clear approach as soon as possible.**

82. A suite of other policy measures is required if the NWR scheme is to be delivered effectively, namely with respect to air quality, carbon, surface access and noise, several of which are identified in this report. The Government must look at these and other areas of policy risk that may stop a runway in the South-East being built and delivering the additional capacity that is needed by 2030. We encourage the Government to adopt a more integrated approach to the delivery of runway capacity. The NPS may not be the appropriate instrument to resolve all these issues, but they should be resolved as a matter of priority. We cannot wait for several years of consultation on an aviation strategy to be completed without having clarity on some of these issues. **We recommend that the Government act immediately to identify, develop and implement the necessary policies needed to provide confidence that issues, such as airspace, air quality, surface access and noise, will be dealt with in a timely manner in anticipation of a development consent order being made.**

83. In a best-case scenario, a scheme is not going to be delivered until 2026. Evidence suggests that there is still room to grow, not just in London, but across the country. We cannot waste the opportunity to facilitate growth when capacity is sitting idle in other parts of the country. There is a need for Government to focus on ways to make best use of existing airport capacity to foster sustainable growth in the aviation sector between now and when new runway capacity becomes available in the South-East. The NPS acknowledges this need but provides very little by way of policy support to ensure capacity is maximised in the interim. Some viewed the current NPS as too Heathrow centric. We acknowledge the useful work Government is doing on the aviation strategy but there a considerable lag between now and it being drafted and implemented. **We recommend that the Government, in the immediate period after an NPS is designated, launch a specific policy consultation, looking at the best ways to maximise existing airport capacity across the whole of the UK. It may be prudent for the Government to consider how issues of air quality and surface access for other UK airports can be addressed in this broader strategy.**

157 Q654
158 See Annex A for discussion.
159 Department for Transport, Revised Draft Airports National Policy Statement, p 11
160 Q133, Q600
5 Conclusion

84. Echoing what our predecessor committees said repeatedly about expansion at Heathrow, it is regrettable that successive governments have failed to take the decisions needed to start the ball rolling sooner. That they have dodged and deferred this decision so often reflects the very tricky politics of airport expansion. If this was easy it would have been done before now. With some necessary changes, the Airports NPS is a suitable basis on which to move to the next stage of the planning process. The changes we have recommend are intended to improve the Airports NPS and minimise the risks of successful legal challenge and the possibility that the business case could be gradually weakened.

85. Expansion at Heathrow has been the debated for decades. It has political support across the country and much of the opposition to it comes, understandably, from the communities around Heathrow. But the Committee recognises that some of the support is conditional on improvements to Heathrow Airport’s surface access, holding cost and charges down and successful air quality mitigation schemes.

86. As we are still at a very early stage in the planning process much of the detailed of HAL’s scheme is unknown and uncertainties about certain aspects will not be reduced until much more of the jigsaw is filled in. The draft NPS relies on assumptions that may or may not be met and models that may or may not reflect what will happen on the ground. But this is to be expected at this early stage in the planning process. During the next stages, much more of the detail will need to be known and it can be more rigorously tested. Those stages will provide further safeguards on issues of noise, air pollution, cost, and deliverability beyond those we have asked the Government to include in the final NPS. Parliament should allow the process to move on to its next stage, provided that the concerns we have identified are addressed by the Government in the final NPS it lays before Parliament. Addressing the concerns set out in this report requires not only clarity of intention by Ministers but also clarity of funding and timetable. These are necessary if a successful legal challenge is to be avoided.

87. Airport expansion in the South-East will continue to demand a great deal of Government’s attention but it must equally focus on other areas of aviation policy if the conditions for growth are to be nurtured across the whole of the UK.
Annex A: The strategic case

Capacity constraints in the South East

The need for additional runway capacity was justified in the NPS on the basis that demand is likely to increase significantly in the future, and all major airports in the South East of England are expected to be full by the mid-2030s.161 Gatwick and Heathrow are already operating near their limits in terms of the number of air transport movements (ATMs). They are delivering world leading runway utilisation rates, and are respectively the busiest one and two runway airports in the world (Figure 1).

Figure 1: ATMs at Significant Airports, by number of runways, 2010162

While Heathrow’s ATMs and slots are full, Heathrow is not yet ‘full’ in terms of passenger throughput at the airport (Figure 2). This is primarily because each plane that flies in and out of Heathrow is, on average, only 76% full and is not always an aircraft with the highest passenger capacity.163

161 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 21
163 Heathrow Airport Limited, Regulatory Accounts, Year Ended 31 December 2016
Heathrow is forecast to continue to grow its passenger base by using larger aircraft, with higher occupancy of those aircraft. Because of this, even with no extra runway, passenger throughput is forecast to expand by 13% and 23% by 2030 and 2050 respectively. This forecast is consistent with the historical trend of passenger growth outstripping aircraft movements because of greater utilisation of existing capacity. In fact, ATMs have remained virtually unchanged since the early 2000s, while passenger growth has continued an upward trajectory and was only slowed by the global financial crisis in 2008–09 (Figure 3).

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**Figure 2: Forecast ATMs and passenger growth at Heathrow Airport, No Expansion, % change from 2016**

<table>
<thead>
<tr>
<th>Year</th>
<th>ATM Growth</th>
<th>Passenger Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>13%</td>
<td>23%</td>
</tr>
<tr>
<td>2040</td>
<td>2%</td>
<td>18%</td>
</tr>
<tr>
<td>2050</td>
<td>3%</td>
<td></td>
</tr>
</tbody>
</table>

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**Figure 3: Historical growth in ATMs and passengers at Heathrow, Index, Base Year 1990**

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164 Department for Transport, [UK Aviation Forecasts 2017](http://example.com), October 2017

165 The Department for Transport’s updated forecasts estimate Heathrow’s average loads will rise from around 160 passengers in 2016 to 190 in 2050 in the Do-minimum case and 180 in the NWR option; Q40; QS12

166 Department for Transport, [UK Aviation Forecasts 2017](http://example.com), October 2017
Luton and Stansted have the equivalent of around one third of a runway to spare through to 2050. This means that ATMs for the London airports are forecast to rise by 9% by 2050 without expansion. Passenger throughput is forecast to rise by 27% out to 2050 without expansion (Figure 4).

**Figure 4: Forecast ATMs and passenger growth at London Airports, No Expansion, % change from 2016**

There is greater potential to expand air traffic movements outside of London because of the available runway capacity. Better utilisation of that runway capacity means that passenger growth, without expansion, is forecast to increase by more than ATMs in the non-London regions by 2050 (Figure 5).

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**The need for hub capacity**

**Transfer passengers and route viability**

The Government’s primary argument for hub capacity is that it boosts connectivity. This is because transfer passengers support routes out of the UK that would not otherwise be viable. Transfer traffic accounts for 36% of passengers at Heathrow which, according to the Chief Executive of Heathrow, John Holland-Kaye, allows “airlines to provide services economically day in, day out throughout the year.” Heathrow identified routes to strategically important markets, such as Mexico City, Hyderabad, Luanda, Chennai, Manilla and Santiago, that are supported by transfer passengers. The airlines were also strongly supportive of the hub model on the basis of it being an enabler of route viability. Craig Kreeger, Chief Executive of Virgin Atlantic, endorsed the value of transfer traffic, saying that it was “not unusual for us to consider a route where [only] a third of the customers will be travelling just between two cities [and that it is] the opportunity to bring in connections [which] makes many new routes suddenly available.”

Richmond Heathrow Campaign believed that the use of transfer passengers to support otherwise unviable routes was “a myth.” They argued that transfer traffic simply creates higher frequencies on already dense routes rather than supporting thin routes to strategically important markets. CAA passenger survey data indicates that transfer passengers account for a higher proportion of passengers, on average, for the more densely flown routes, but still accounts for a considerable proportion of passengers across most flights out of Heathrow (Figure 6).

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169 Department for Transport, *UK Aviation Forecasts 2017*, October 2017
171 Department for Transport *Aviation Statistics*
172 Heathrow Airport Ltd (*NPS0086*)
173 Q121
174 Q386, Q324
175 Richmond Heathrow Campaign, *DFT Consultation Submission*, December 2017
Airline preference for expansion

There is considerable demand from the airlines for hub capacity at Heathrow. In their evidence to us, the airlines took a united position in that Heathrow was the obvious place to expand, provided the scheme was affordable (see Annex C for more discussion). Craig Kreeger of Virgin summed up their position:

For the UK, it seems very clear to me that if we can find a way to do this at a reasonable economic price, close to what is being suggested, it is the right call. It is not because Gatwick is a bad place, but for whatever combination of reasons it is very clear that Heathrow is preferred.

The three global airline alliances—Star Alliance, Oneworld and SkyTeam—all operate out of Heathrow. All three alliances previously expressed their desire to keep operating out of Heathrow, as opposed to moving to Gatwick, because it is generally more profitable and is used by more business passengers, who pay premium fares. Given the existing critical mass of alliances and connections, there are also fewer operational adjustments required to utilise the available capacity at Heathrow. This was acknowledged as a key consideration of the Airports Commission. Phil Graham, the former Head of Secretariat for the Airports Commission, acknowledged that over time it was possible an expanded Gatwick would become more successful in building up the long-haul aspect of its business and would do so more quickly if it could persuade an alliance to move.

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176 CAA Passenger Survey Data, 2016
177 Q139, Qq577–78; Qq586–87; Q593; Q632
178 Q586
179 “Big air alliances rule out move from Heathrow”, Financial Times, 11 August 2013
180 Q59
181 Q18
**The future of the hub model**

There is conflicting evidence as to the future importance of hub airports in sustaining connectivity. The Secretary of State told us that the hub model is not about to disappear.\(^{182}\) There was consensus among industry representatives that the hub model would remain an important model within the industry.\(^{183}\) However, evidence suggests that the industry is changing, in part due to emerging technologies, such as the development of new planes that can carry smaller numbers of passengers commercially for much longer distances (see box).\(^{184}\)

**Hub strategies of Airbus and Boeing**

When Airbus originally developed the A380 it believed that large city-pairs were going to get larger and airport capacity was going to become scarcer. Airbus believed that the hub-and-spoke network model would continue to dominate and predicted airlines will continue to fly small aircraft into big hubs to fill large aircraft. Boeing, on the other hand, did not believe as firmly in this model, with its research showing that since 1990 the number of city-pairs greater than 4,800km apart had doubled, frequencies had doubled and average aircraft size had been declining. The Boeing 787-9 was subsequently developed because it saw more growth in the number of markets and routes rather than in the size of the markets. When Airbus launched the A380 in 2000, it forecast sales of 1,200. As of April 2016, it had delivered 187. There had been speculation that the A380 would be discontinued altogether but had recently been pulled “back from the brink” with a $16 billion order from Emirates. This is in stark contrast to the Boeing 787 which, as of April 2016, had 1,154 orders. The industry appears to be making progress on this front. The A350-1000 was showcased recently by Qantas to fulfil its Project Sunrise goal of flying direct, nonstop from the east coast of Australia to both London and New York (for which Boeing is expected to offer a development of its Boeing 777-8X).

Source: D Gillen, *Aviation economics and forecasting* (2017), Chapter 2, p 38

Tim Hawkins of Manchester Airports Group observed that “advances in aircraft technology mean there are many more viable routes and opportunities for point to point”,\(^ {185}\) but remarked that “we have moved to something of a middle ground, and I do not think one or other is necessarily absolutely right.”\(^ {186}\) (Figure 7)

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182 Q512
183 Q119,120
184 Q3
185 Q118
186 Q118
Passenger growth

The Heathrow North West Runway (NWR) scheme would enable passenger growth to rise by 63% between 2016 and 2050, compared with a 53% rise without expansion. This equates to a net UK increase of 6% or 26 million passengers per annum (mppa) by 2050 compared with no expansion. The passenger growth with no expansion is facilitated by growth in non-London airports and higher utilisation of existing London airports. Projections show that passenger growth would be broadly similar across all three expansion options by 2050 (Figure 8).
It should be noted that the increase of 26 mppa in passenger demand growth at the UK level from NWR expansion includes an additional 16 mppa international-to-international (I-I) transfer passengers. Excluding the I-I transfer passengers, the NWR scheme only facilitates an additional 10 mppa terminating passengers by 2050 compared with no expansion. When compared with the other expansion options, the Gatwick option provides the most terminating passenger growth at the UK level by 2050, providing nearly 5 million more terminating passengers than the NWR scheme.

188 Department for Transport, *UK Aviation Forecasts 2017*, October 2017

189 That is, passengers who transfer via a UK airport with their origin and destination outside the UK

190 Department for Transport, *UK Aviation Forecasts 2017*, October 2017
One of the reasons the Government has endorsed the Heathrow NWR proposal is because it would accommodate the growth of business travel. Business travel is forecast to increase marginally, with or without any runway capacity constraints (Figure 10). Professor Peter Mackie and Mr Brian Pearce, former expert advisors to the Airports Commission, explained that this is because “business travel with London as origin or destination is among the least price-elastic market segments.” Dr David Metz and Professor Anne Graham also believed that there is “ample capacity to allow the growth of business travel in the absence of a new runway [ … ] since business travellers would pay a premium for the convenience of Heathrow.” Both the DfT and Heathrow have said that the demand modelling does not take account of how an expanded Heathrow might encourage and generate more travel by business passengers.

Figure 10: Growth in UK business travel, by expansion option, change from 2016 against no expansion, mppa

It can be seen in the figure below that the passenger growth facilitated by a NWR is accounted for almost entirely by leisure and international transfer passengers. The Government also believes it will be important for increasing tourism and the economic benefits associated with it. Lucy Chadwick, Director General at the Department for Transport (DfT), told us that leisure passengers “towards the back of the plane are bringing their tourist pounds into the UK as much as coming to do a variety of activity, so both ways there are potential economic benefits.” Yet outbound leisure passengers historically exceed those coming into the UK by 75%. The forecasts also show that an expanded Heathrow will accommodate more than three times more outbound passengers than inbound passengers. These passengers spend their money overseas and represent...
a “deficit” on the UK’s economic balance sheet; although there are positive economic benefits from outbound travellers as elements of several industries in the UK that exist for the primary purpose of serving outbound travellers.\textsuperscript{198}

\textbf{Figure 11: Net passenger growth, by passenger type, Northwest Runway vs No Expansion, mppa}\textsuperscript{199}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure11}
\caption{Net passenger growth, by passenger type, Northwest Runway vs No Expansion, mppa\textsuperscript{199}}
\end{figure}

\textbf{International connectivity}

The NPS states that the NWR scheme is “expected to lead to more long-haul flights and connections to fast-growing economies.” Adding that, “the broader range and greater frequency of long haul flights at Heathrow Airport [ … ] would deliver benefits for UK passengers (both business and leisure) by allowing them to travel to more destinations flexibly.”\textsuperscript{200} The data below shows that at the UK level, the NWR scheme will only offer one new destination to emerging and fast-growing economies when compared with no expansion by 2050 (Table 1). The NWR will, however, increase the frequency of existing long-haul connections against a no expansion scenario (Table 2).

\textsuperscript{198} ABTA, \textit{Driving Growth – The Economic Value of Outbound Travel}, 23 June 2015
\textsuperscript{199} Department for Transport, \textit{UK Aviation Forecasts 2017}, October 2017
Table 1: Change in total number of destinations with a NWR, at the UK level

<table>
<thead>
<tr>
<th></th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-Haul</td>
<td>-7</td>
<td>-5</td>
<td>-3</td>
</tr>
<tr>
<td>OECD</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Newly Industrialised Countries</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Least-Developed Countries</td>
<td>0</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>Long-Haul</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>International</td>
<td>-2</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>Domestic</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>-2</td>
<td>-3</td>
<td>-1</td>
</tr>
</tbody>
</table>

Table 2: Change in the number of daily destinations with a NWR, at the UK level

<table>
<thead>
<tr>
<th></th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-Haul</td>
<td>9</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>OECD</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Newly Industrialised Countries</td>
<td>11</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Least-Developed Countries</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Long-Haul</td>
<td>16</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>International</td>
<td>25</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Domestic</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

The NPS also states that, when compared to the other expansion options, “Heathrow Airport is best placed to provide the biggest boost to the UK’s international connectivity [and] lead to more long-haul flights.” It is also argued the build-up of long-haul services would be quicker at Heathrow. The Department’s forecasts show that at the UK level, the NWR scheme will offer 12 more daily long-haul services in 2050 than would be the case without expansion, nine more than the Gatwick scheme and only one more than the Extended Northern Runway (ENR) scheme (Figure 12). The build-up in long-haul services under NWR is forecast to happen quicker than under the other expansion options.
In terms of the total number of long-haul destinations served, the forecasts show that there is little difference across all the expansion scenarios, with the NWR only offering two more destinations than would occur without expansion (Figure 13). This is not consistent with evidence provided by the Department in which they claim a NWR would provide “many more” destinations than Gatwick.\footnote{Department for Transport, \textit{UK Aviation Forecasts 2017}, October 2017}

In terms of the total number of flights to long-haul destinations, Heathrow will offer 12\% or 37,000 more flights per year by 2050 than without expansion, and 20,000 and

\footnote{Q31}
\footnote{Department for Transport, \textit{UK Aviation Forecasts 2017}, October 2017}
10,000 more than the Gatwick and ENR schemes respectively (Figure 14). Again, the build-up in long-haul services with NWR is forecast to happen sooner than under the other expansion options.

**Figure 14: Forecast number of annual long-haul movements, at the UK level, by expansion option**

![Figure 14: Forecast number of annual long-haul movements, at the UK level, by expansion option](image)

It is a reasonable expectation that the NWR scheme would be able to consolidate on its incumbency as a hub to offer a greater number and variety of long-haul connections in the short-term and of greater frequency than the other schemes. Over the longer-term, the connectivity figures above show that the NWR scheme will offer the greatest long-haul connectivity benefits, but not by a significant margin when compared with the other expansion scenarios. This is not consistent with either the NPS or Department’s assessment of the connectivity benefits, in which it states there would be “very clear difference in the international connectivity.”

**Accuracy of the passenger and connectivity forecasts**

There are several shortcomings in the way the Department has produced their forecasts that make it difficult to form a proper view as to the extent and profile of the connectivity benefits delivered by the NWR scheme compared with the other expansion scenarios. For example, the Department have assumed that all the capacity will be filled within two years of an opening date in 2026. However, a range of authoritative witnesses questioned the plausibility of this assumption and told us that in reality airlines would not be able to adapt to introduce a new fleet “the size of BA” to satisfy this demand. It is also

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207 Department for Transport, *UK Aviation Forecasts 2017*, October 2017
208 Q9460–61
209 Q2, Q92
211 Q59
212 Q81
213 Q141, Q143
214 Q141, Q143
215 Q81
216 Q81
inconsistent with Heathrow’s own commercial plans of phasing expansion by 5 to 10 mppa after opening.\textsuperscript{214} This means that Heathrow would not be ‘full’ until almost ten years after opening, and that the connectivity benefits endorsed by the Government for the NWR would not be realised until later in the appraisal period.

\textbf{Figure 15: Passenger growth at Heathrow, Central vs Phased Scenarios, mppa}\textsuperscript{215}

Lucy Chadwick of the DfT said its growth assumptions are “for modelling purposes [to show the level] both airports could achieve on day one, as opposed to presuming either had any phasing plans. That is just to do the economic analysis.”\textsuperscript{216} Even if this were the logic behind the approach, it is not clear why Gatwick does not reach annual growth at any point during the projection period greater than 5.7\% given that they have experienced average annual passenger growth of 7.7\% with a single runway, capacity-constrained airport (Figure 16).\textsuperscript{217}

\begin{footnotesize}
\begin{tabular}{ll}
214 & Q339 \\
215 & Department for Transport, \textit{UK Aviation Forecasts 2017}, October 2017 \\
216 & Q487 \\
217 & Gatwick \textit{Gatwick Airport Financial Results}, March 2017
\end{tabular}
\end{footnotesize}
Further, the Department has assumed that Gatwick will largely remain a point to point airport, attracting very few transfer passengers\textsuperscript{219} and will subsequently experience virtually no growth in long-haul traffic over the appraisal period, even with an extra runway (see figure below).

Gatwick’s CFO Nick Dunn did not consider this to be a credible assumption.\textsuperscript{221} As stated above, it is also inconsistent with recent long-haul growth out of Gatwick with its capacity.
constrained single runway. With airlines operating in an environment where they have thin profit-margins, it might be reasonable to assume that at least some airlines would take up cheaper long-haul slots at Gatwick. The Airports Commission acknowledged that Gatwick could “combine point-to-point services with a hub operation, potentially of a size similar to the hubs in Rome or Copenhagen.” Professor Peter Mackie and Brian Pearce also believed that “a two-tier market with the alliances operating out of Heathrow and long-haul point-to-point services out of Gatwick seems a likely scenario. There is room for both to grow.”

The Department has also assumed that any rise in airport charges will be absorbed by the airlines and not passed on to passengers. This was disputed by Professor Peter Mackie and Brian Pearce, who commented “the assumption that the aero charges can be passed through with no effects on demand and net user benefits seems to us a very strong assumption.” The airlines suggest that routes out of Heathrow will be unaffordable at the scheme costs currently projected for a NWR. A change in this assumption would reduce the demand growth anticipated for the NWR scheme, so much so that it would reduce the present value benefits of a NWR by £16.6 billion.

The Department has also assumed passengers are insensitive to price when they make their choice of airport. This appears to be inconsistent with recent trends and the airlines acknowledge that passengers are increasingly price sensitive, particularly in an era in which online price comparison websites have become the norm. CAA data from 2012 also supports the argument that cost is an important factor when consumers consider airport choice. Other literature also shows that traffic demand is price elastic to varying degrees, particularly for short haul traffic where the airport charges would be very material indeed as a percentage of air fare. Professor Mackie and Mr Pearce believed there was “clear room for argument” with respect to this assumption and suggested the Department conduct some sensitivity analysis to test this assumption.

Is Heathrow good for the regions?

Domestic connectivity out of Heathrow

One of the other main strategic benefits endorsed by Government in the NPS is that the NWR scheme will provide considerable benefits to the non-London regions by offering new domestic routes. It is an aspect of the debate that has garnered considerable support for the NWR scheme from non-London regions. As Neil Pakey of the Regional and Business

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222 Department for Transport, UK Aviation Forecasts 2017, October 2017
223 Airports Commission, Gatwick Airport Second Runway: Business Case and Sustainability Assessment, November 2014
224 Professor Peter Mackie and Brian Pearce, Reply to Transport Select Committee letter of 16/1/2018
225 Professor Peter Mackie and Brian Pearce. “A Note from Expert Advisors, Prof. Peter Mackie and Mr Brian Pearce, on key issues considering the Airports Commission Economic Case”, May 2015
226 See Annex C for full discussion.
227 Department for Transport, Further Review and Sensitivities Report, October 2016
228 Q84
229 IATA (NPS0080)
230 CAA, Appendix F—Evidence and analysis on competitive constraints by passenger switching, CAP1135
232 Professor Peter Mackie and Brian Pearce, Reply to Transport Select Committee letter of 16/1/2018
233 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 24
Airports Group noted, “each one of [our regional member] airports have supported our position on promoting Heathrow as the solution to the south-east capacity issues.” This was based on an expectation of improved domestic connectivity out of Heathrow.234

John Holland-Kaye said that expansion “brings the opportunity for more regional connectivity to ensure that important markets in the UK, such as Inverness, Aberdeen and Belfast, maintain their connections, and that we can add connections to places such as Newquay and perhaps Liverpool.”235 Both the DfT and HAL advertised 14 potential new routes (see figure below).236

Figure 18: Heathrow Airport’s advertisement regarding domestic connectivity237

Yet the domestic route offering is forecast to be slightly lower with the NWR scheme and will only be expanded by discounting landing charges on domestic routes.238 Heathrow asserts that its commitment to domestic connectivity is demonstrated by its reduction in departing passenger charges on domestic routes by £10 in 2017 (>33% decrease vs 2016), adding that it will reduce the charge further to £15 in 2018 (>50% decrease vs 2016).239 Some of the airlines were critical of this measure, and told us that it was funded by a cross-subsidy from long-haul routes. Dale Keller of BAR UK said that HAL should “not be robbing Peter to pay Paul.”240 While HAL has proposed a £10m route development fund to support domestic routes, it is not clear whether HAL will continue this in perpetuity,241 or what level of discount would be required to provide enough of an incentive on the airlines to redirect their flights away from more profitable routes. The Secretary of State expects “that most, if not all, of those [domestic connections] will be commercially viable.”242 Many of the airlines are firmly of the view that domestic routes are not viable at the costs currently projected for the NWR.243

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234 Qq122–23, Q131
235 Q323
236 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 25
237 yourHeathrow, Twitter Post, 5 February 2018
238 Department for Transport, Aviation Forecasts, October 2017
239 Q71
240 Heathrow Airport Ltd (NPS0055)
241 Q617
242 Q337
243 Q479
244 IAG (NPS0060); LACC (NPS0043); Q139; Q625
Lucy Chadwick of the DfT said that “commercial commitments from the airport itself” would help to guarantee these domestic routes. John Holland-Kaye stated in oral evidence that “we cannot guarantee a minimum number of domestic destinations. The reason is that it is not within our gift or control. What we can do is make sure that it is economic for airlines to fly domestic routes.”

The Secretary of State expressed his desire to “reserve up to about 15% of slots on the new runway for domestic connections” and that “this capacity has to be spread across the day; it cannot be loads of slots at 11 o’clock at night.” It should be noted that the Government includes the UK Crown Dependencies, including Guernsey and Jersey, under the category of domestic connections. This would according to Chief Executive of International Airlines Group Willie Walsh, “be about 39,000 slots” which is “about doubling the amount of slots allocated to domestic capacity.” It is not clear exactly how the Secretary of State intends on reserving these slots for domestic connections. The only real option available to the Secretary of State is using public service obligations (PSOs) which are essentially a government subsidy for strategically important domestic routes.

At present, PSOs are only offered on a city-to-city basis, rather than at an airport-to-airport level and as such cannot be applied directly to Heathrow. As acknowledged by John Holland-Kaye, “the thing that is stopping the Government making those changes around PSOs, as I understand it, is that we have to comply with EU rules.” Dale Keller of BAR UK believed that the “real lever available to the Government is to get rid of the absurdity of £26 [Air Passenger Duty, or APD charge] on a domestic return journey. That is what is killing the domestic connectivity.” When questioned on whether the Government could provide further APD discounts for domestic routes, the Secretary of State conceded that “decisions about air passenger duty and how it operates sit within the Treasury [and that] the final decision sits within the budget process, so it is a matter for the Chancellor to decide what to do.”

The Secretary of State said that the Government would “make provision through the process of the NPS and the DCO (Development Consent Order) process that follows it, to ensure that there is specific reserved [slot] capacity for regional connections within the United Kingdom”. Caroline Low of the DfT also said slot allocation techniques would be a backstop to guarantee domestic routes. However, landing slots are “owned” by the airline that operates them and it is at their discretion as to how to use them, based on their own commercial considerations. As Simon McNamara of Flybe highlighted, “It has to be affordable. We will take that opportunity if it is affordable and it works for us.” The precise way in which newly available slots are distributed is complex and is governed by EU law, which in turn implements global rules drawn up by IATA, the
International Air Transport Association. In short, there are no provisions in the rules to guarantee domestic routes. The airlines urged caution in allocating slots specifically for domestic connections and said that there was a risk of slots being left empty if they were not commercially viable.

**Direct international connectivity from the regions**

The non-London regions value the direct international connectivity from their own regions. The Department's forecasts show that direct international connectivity from the regions would be lower with a NWR than without expansion. If the NWR scheme goes ahead, figures show that in 2030, there would be 74,195 fewer direct international flights per year to and from airports in the non-London regions; this increases to 161,893 by 2050 (figure below). Tim Hawkins, of Manchester Airports Group, was more optimistic and did “not think it will have a material impact on passenger volumes” and did “not see the tide going out, as it were.”

Figure 19: Direct international connectivity, for non-London Airports, various expansion options, annual ATMs (000s)

These figures imply that the premise that an expanded Heathrow means more connectivity for non-London airports is a false one. In recent years, non-London airports have had success in establishing their own international route offerings, for example Manchester Airport has recently established routes to Beijing, Hong Kong, Houston and Singapore. Tim Hawkins said that many regions had established those routes because “airlines think

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257 For more information see House of Commons Library Briefing Paper No CBP 488, Airport slots, 12 June 2017
258 Q623
259 Q72
260 That is, a direct connection from a non-London UK destination to an overseas destination.
261 Airports Commission, Strategic Fit: Forecasts, July 2015; Q70
262 Q127
263 Department for Transport, Aviation Forecasts, October 2017
they can make money by serving that catchment directly, flying to the places where people in that catchment want to go". The figures above show that these international routes will continue to grow at non-London airports but that this growth would be slowed by the NWR scheme.

**Freight**

The Airports Commission concluded that “all three schemes provide increased freight capacity,” but Heathrow would provide the greatest comparative benefits. This was based on the higher growth forecast for long-haul connectivity at an expanded Heathrow, its position in west London, the convenience of its connections to the Strategic Road Network (SRN), and the relative density of freight activity around the airport compared with Gatwick (figure below).

*Figure 20: Third-party logistics companies in the South-East of England*

The Secretary of State said that freight was “a real differentiator” between Heathrow and Gatwick. The NPS concludes that “the NWR scheme delivers the greatest support for freight (with) a doubling of freight capacity at the airport”. Some of our witnesses criticised the Airports Commission and the DfT for failing to assess future freight growth under the three expansion scenarios.

The Secretary of State also stated that there is insufficient freight infrastructure at Gatwick and that “the plans are not there for the infrastructure. There is no local plan that factors in a massive investment in freight facilities.” Gatwick Airport CFO Nick Dunn disagreed and told us that “provision is made in our expansion plans for the expansion of our cargo

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264 Q151
266 Q14; Q73
268 Q461
269 Q99
270 Q485
facility. We already have cargo facilities at the airport. Those will be expanded with a second runway.\textsuperscript{271} He also stated that sufficient facilities already exist in the region to cater for additional cargo.\textsuperscript{272}

There is the connected issue of the impact congestion on the road networks in and around Heathrow has on efficiencies of freight operators. For example, Alex Williams of Transport for London (TfL) told us that future traffic speeds in the London boroughs adjacent to Heathrow would fall by between 4% and 5% if expansion went ahead and that the “added congestion on the road network could stifle growth.”\textsuperscript{273} HAL disputed this suggestion. They said that their Blueprint for Sustainable Freight, published in October 2017, outlines measures to ensure that even as freight volumes grow with expansion, airport-related vehicles on the road will not increase in number compared to today.\textsuperscript{274}

Ultimately freight benefits are a function of the range and frequency of long-haul connectivity.\textsuperscript{275} As set out above, the long-haul connectivity benefits over the longer term are only marginally in favour of the NWR scheme over the longer term. On this basis, it is not clear how the air freight benefits for a NWR scheme would, over the longer-term and at the UK level, be substantially different from those offered by the other schemes. Nick Dunn elaborated on this, saying that “freight is not a driver of an economic outcome. It is just an output … [and] there is no special source for any particular airport. The volume or capacity is delivered by [long-haul] passenger aircraft […] so the capacity will flow with the [long-haul] traffic that comes.”\textsuperscript{276} John Holland-Kaye countered that Heathrow’s freight advantage is underpinned by the “quality of the connectivity” at Heathrow compared with the other schemes.\textsuperscript{277}

**Wider economic benefits**

The Airports Commission said that runway expansion in the South East would have wider benefits for the economy by supporting trade, enhancing productivity and strengthening business clusters around the airport\textsuperscript{278} and that it was important to “try to understand how the effect of aviation expansion might be felt as a ripple through the wider economy”.\textsuperscript{279} To do this, they commissioned PwC to model these wider benefits using a Spatial Computable General Equilibrium (S-CGE) model. This sort of approach had not been used in this context previously, having traditionally been used to assess things such as tax policy for an individual infrastructure decision in an individual part of the country.\textsuperscript{280}

The Airports Commission acknowledged that this was not a “conventional economic welfare appraisal” but was “reinterpreted and extended” based on impacts identified in DfT’s WebTAG Wider Economic Impacts guidance.\textsuperscript{281} Phil Graham, former Head of Secretariat at the Airports Commission, in his evidence explained that this approach was “quite difficult to do, but that was much more innovative than the use of the standard DfT

\textsuperscript{271} Q99
\textsuperscript{272} Q100
\textsuperscript{273} Q277
\textsuperscript{274} Heathrow Airport Limited (NPS0078)
\textsuperscript{275} Q98
\textsuperscript{276} Q99
\textsuperscript{277} Q343
\textsuperscript{278} Airports Commission, *Economy: Wider Economic Impacts Assessment*, 2015
\textsuperscript{279} Q6
\textsuperscript{280} Q29
\textsuperscript{281} Airports Commission, *Business Case and Sustainability Assessment—Heathrow Airport Northwest Runway*, July 2015
The final S-CGE analysis showed that there would be substantial positive GDP/GVA effects from a NWR scheme of around £147 billion over the 60-year appraisal period. This approach is inconsistent with the Government’s recommended WebTAG approach, which “takes a ‘welfare’ approach and aims to capture the direct economic benefits of a scheme and its environmental and infrastructure costs”. Because of this, the wider benefits were shifted from the economic to the strategic case following the Airports Commission November 2014 consultation. The Airports Commission’s expert economic advisers expressed concerns about the findings generated by the S-CGE model, including:

- that too much weight was given to the assumption that increased seat capacity would lead to wider benefits;
- that there was a likely double counting between the direct and wider impact channels in the PwC calculations; and
- that GDP impacts were more than twice the size of the direct welfare and wider economic benefit gains.

The advisors thus cautioned the Airports Commission against “attaching significant weight either to the absolute or relative results of the S-CGE approach within the Economic Case”. Eventually the Department removed the S-CGE analysis from the scheme appraisal on the grounds that “it is highly challenging to produce a single central estimate of the GDP impact of airport expansion using the S-CGE approach with the evidence currently available.” Ms. Low from the DfT also stated that “the Department was not comfortable using that form of economic modelling and presenting those numbers as part of a national policy statement.” Thus, when the Government announced its formal commitment to the NWR scheme in October 2016, it only referred to the direct economic benefits. The wider benefits are therefore excluded from the draft NPS.

However, these benefits are likely to be realised in some shape or form and are likely to be additional to those estimated in the central appraisal. What remains unclear is the scale of these benefits across the three schemes. In its appraisal, the DfT estimates wider economic benefits of between £2.0 and £3.9 billion for the NWR scheme and includes these in the economic case. These benefits reflect the increased business output from lower costs of production, and changes in tax revenue that occur from the redistribution of jobs.

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282 Q28
283 Airports Commission, Business Case and Sustainability Assessment—Heathrow Airport Northwest Runway, July 2015
285 Professor Peter Mackie and Brian Pearce, “A Note from Expert Advisors, Prof. Peter Mackie and Mr Brian Pearce, on key issues considering the Airports Commission Economic Case”, May 2015
286 Department for Transport, Further Review and Sensitivities Report—Airport Capacity in the South East, October 2016
287 Q10
288 Q10
289 Department for Transport, Updated Appraisal Report, October 2017, p 26
across areas of the country that display different levels of productivity. These benefits are almost entirely dependent on long-haul connectivity growth which, as discussed above, are only marginally in favour of the NWR scheme over the longer term.

**Jobs growth**

The NPS claims that Heathrow could generate up to 114,000 jobs. Most of these would occur during construction, with others generated by businesses drawn to the region post-expansion. HAL has also pledged to create an additional 5,000 apprenticeships. Mr Graham said that this jobs growth was particularly important for “an area of relatively high levels of deprivation for the south-east of England.”

The Department’s WebTag guidance states that the “key to any assessment of employment effects is displacement; in other words the extent to which local or sectoral employment changes are additional at the national level, gross and net impacts respectively.” This will only occur if a transport investment increases the supply of labour. In the absence of labour supply impacts, changes in the demand for labour will lead to 100% displacement of employment at the national level. Because of this, the WebTag guidance states that “the construction and operation of transport investments and any associated multiplier effects are assumed to have no net national employment impact.”

The displacement impacts have not been quantified as part of the NPS appraisal. It is therefore impossible to say what the real ‘net’ jobs increase from a new NWR would be and whether, particularly during construction, there might be a cost in terms of labour availability elsewhere in the country.

**Airline competition**

Airline competition at Heathrow is relatively limited. International Airline Group (IAG) operators currently account for more than half of the slots (figure below). Passengers seeking a direct flight from Heathrow sometimes have no choice but to fly with an IAG airline. For example, 52 short-haul routes (including to Glasgow, Dublin and Barcelona) and 21 long-haul routes (including to Bangalore, Buenos Aires and Chennai) are only operated by IAG. The remaining airlines at Heathrow are comprised of almost entirely full-service carriers. Willie Walsh told us that Heathrow has been a competitive market and that IAG’s current position was developed as a consequence of purchasing slots from other airlines over time. He said that in many instances IAG (and BA before it) was the only company interested in buying the slots.

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290 For more information see: Department for Transport, *Wider Economic Impacts Appraisal*, September 2016
291 Q60; Q99
293 It should be noted that this falls within a range down to 57,000 given the uncertainties associated with the type of airport and the size of the airport employment catchment areas
295 Q3
297 Department for Transport, *Appraisal of Sustainability*, October 2017, p 73
299 Q624
The Department states that one of the key benefits of expansion at Heathrow is that it will increase airline competition:

Expansion at Heathrow Airport would increase the availability of services, and increase competition between airlines. This would lower fares that passengers can expect to face relative to no expansion, leading to significant benefits to business and leisure passengers and the wider economy.\(^{301}\)

Professor Peter Mackie and Brian Pearce supported this view and stated that “the first effect of more capacity at Heathrow will be to permit increased competition between the alliances and other existing carriers.” They added that:

\[ \ldots \] given the once in a generation possibility of entering the Heathrow market at or above minimum efficient scale under the new entrant slot allocation rules, entry to serve a mixture of UK domestic, European capitals and sun routes is credible.\(^{302}\)

The extent of airline competition at an expanded Heathrow depends, to a large extent, on the future level of airport charges. Given the cost risks associated with this scheme, there is a reasonable chance that airport charges will increase in real terms, potentially limiting the viability of new slot opportunities to established full-service carriers. This was acknowledged as a possibility by the Airports Commission.\(^{303}\) Airport charges already prevent low-cost carriers from feasibly entering the market at Heathrow and Sophie Dekkers of EasyJet conceded that “it would be very difficult for it to work [within their business model]” were airport charges increased.\(^{304}\) Willie Walsh believed that recent history at Heathrow reflected the impact airport charges can have on airline competition:

All you have to do is look at the history of what has happened at Heathrow. Flybe used to operate at Heathrow, but it sold its slots because it could not make money there. BMI went out of business because it could not make money at Heathrow. Lots of airlines trying to operate at Heathrow have not been able to make money because the costs associated with Heathrow are too high. If they could, I have no doubt that airlines that were there in the past would still be there today.\(^{305}\)

\(^{300}\) ACL, Heathrow Airport—Summer 2017, 17 March 2017
\(^{301}\) Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 23; Q465; Q517
\(^{302}\) Professor Peter Mackie and Brian Pearce, Reply to Transport Select Committee letter of 16/1/2018
\(^{303}\) Airports Commission, Business Case and Sustainability Assessment, July 2015, p 117
\(^{304}\) Q621
\(^{305}\) Q589
A further concern is that the current EU Slot Regulation may potentially limit the scale of airline competition at an expanded Heathrow. In a December 2016 speech CAA Chief Executive Andrew Haines explained:

The EU slot rules, which require 50% of new slots to be allocated to new competitors at a particular airport, didn't foresee major new capacity being built (e.g. new runways) at a highly-congested airport like Heathrow … And the nature of these regulations act in some ways as a barrier to strong competition to the big incumbent. [Rather] it encourages a distribution of access across many players who may not have the scale or appetite to present real competition to the big home carriers.306

Even if new slots at Heathrow were to be distributed in a manner more conducive to improved airline competition, Willie Walsh opined that “what you will see going forward is that, when more slots are made available, airlines will apply for slots and the same airlines that will apply for new slots will, in time, look to sell those slots if they believe they can make an economic return on the sale.”307

**Surface access**

One of the reasons the draft NPS endorses the NWR scheme is because of its favourable position regarding surface access.308 It states that one of NWR's comparative advantages over Gatwick is that it is “a more accessible location” and has “more varied surface access links”.309 Specifically the NPS states that:

Access to Gatwick relies on the M23 and the Brighton Main Line, which means it serves London well but makes it less convenient for onward travel to the rest of the UK. It is also less resilient than Heathrow Airport. Heathrow Airport has advantages over Gatwick Airport with its greater integration into the national transport network, benefitting both passengers and freight operators.310

The Airports Commission concluded that “Heathrow’s performance against the surface access objectives is marginally stronger than Gatwick’s.” Gatwick and Heathrow currently have broadly equivalent catchment populations. The population within 30 minutes of Gatwick is 530,000 and is 25 million within three hours of it; this compares with Heathrow at 230,000 and 28 million respectively. Heathrow’s catchment population is expected to expand off the back of HS2 and Crossrail, but its advantage is also dependent on rail projects which at this stage remain uncommitted. The Airports Commission concluded that “Gatwick would see more available capacity on key transport links serving the airport by 2030,” and “congestion issues are anticipated to be more severe on the links serving Heathrow”.311 The strategic surface access arguments made by Government in favour of the NWR scheme are dependent on many other variables, particularly around the timely and appropriately costed delivery of required schemes. These elements are discussed at length in Annex F.

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306 Andrew Haines, Chief Executive, Civil Aviation Authority, GAD speech, “The future of open skies post-Brexit”, 1 December 2016
307 Q624
308 Q31
309 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 25
310 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 26
311 For full discussion, see: Airports Commission, Final Report, July 2015, p 160–166
Annex B: The economic case

When the Airports Commission published its final report in July 2015, it endorsed the NWR scheme based on its potential to deliver reported £147 billion in wider economic benefits it was expected to deliver. Even though the Commission was advised by its own economic advisors to use caution in attaching significant weight to the £147 billion figure, it was the only figure published in its announcement. The Commission also made it clear that the economic benefits delivered by a Gatwick scheme were “considerably smaller” than the NWR scheme at Heathrow. It is clear from the figure below, that very little separated the economic cases of the three schemes when the Commission completed its work and in fact, Gatwick was the economically favourable scheme under a carbon capped scenario.

Figure 22: Net Economic Benefits estimated by the Airports Commission, Central Case, £bn (2014 prices)

There still appears to be very little separating the economic cases of the NWR, ENR and Gatwick schemes. The most recent figures show that the gross economic benefits over the appraisal period are now marginally in Gatwick’s favour at £74.1 billion in benefits; compared with a Heathrow NWR at £72.8 billion (table below).

Once costs are considered, the net economic benefits of the NWR scheme are relatively small at a maximum of £3.3 billion over 60 years, and in fact may be negative depending on the demand scenario assumed in the appraisal. The ENR scheme also has a similar profile of net benefits to the NWR scheme. Gatwick’s net economic benefits are also relatively small but remain positive under all demand scenarios.

312 Professor Peter Mackie and Brian Pearce. “A Note from Expert Advisors, Prof. Peter Mackie and Mr Brian Pearce, on key issues considering the Airports Commission Economic Case”, May 2015
314 Airports Commission, Business Case and Sustainability Assessment, July 2015
It has become apparent that there are inaccuracies and inconsistencies in the way the economic case supporting the NPS has been developed. These errors, discussed below, undermine the economic case for the NWR scheme which already depended on marginal net present value benefits at a maximum of £3.3 billion over 60 years. The Government explicitly acknowledges in the NPS that “in monetary terms, the environmental impacts of all three schemes are small when compared to the size of the benefits, or considered over the 60-year appraisal period.” Upon examination, it has become apparent that there are issues with the way the environmental costs have been monetised.

**Table 3: Monetised impacts under the DfT’s central case (present value, £bn, 2014 prices)**

<table>
<thead>
<tr>
<th></th>
<th>LGW Second Runway</th>
<th>LHR Extended Northern Runway</th>
<th>LHR Northwest Runway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Passenger benefits</strong></td>
<td>69.4</td>
<td>57.2</td>
<td>67.6</td>
</tr>
<tr>
<td><strong>Government revenue</strong></td>
<td>4.6</td>
<td>2.9</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Wider economic impacts</strong></td>
<td>0.1 to 1.3</td>
<td>1.6 to 2.7</td>
<td>1.8 to 3.1</td>
</tr>
<tr>
<td><strong>Total benefits to passengers and the wider economy</strong></td>
<td>74.1 to 75.3</td>
<td>61.7 to 62.8</td>
<td>72.8 to 74.2</td>
</tr>
<tr>
<td><strong>Environmental disbenefits</strong></td>
<td>-0.9</td>
<td>-1.2</td>
<td>-1.8</td>
</tr>
<tr>
<td><strong>Airline profit loss</strong></td>
<td>-65.1</td>
<td>-46.4</td>
<td>-55.0</td>
</tr>
<tr>
<td><strong>Net social benefit</strong></td>
<td>8.1 to 9.3</td>
<td>14.1 to 15.3</td>
<td>16.2 to 17.5</td>
</tr>
<tr>
<td><strong>Surface access cost (AC forecasts)</strong></td>
<td>-0.6</td>
<td>-3.9 to -1.9</td>
<td>-3.4 to -1.4</td>
</tr>
<tr>
<td><strong>Surface access cost (AC forecasts)</strong></td>
<td>-0.6</td>
<td>-3.9 to -1.9</td>
<td>-3.4 to -1.4</td>
</tr>
<tr>
<td><strong>Net Present Value</strong></td>
<td>1.0 to 2.4</td>
<td>-1.8 to 2.7</td>
<td>-2.2 to 3.3</td>
</tr>
<tr>
<td><strong>Net public value</strong></td>
<td>72.6 to 74.4</td>
<td>56.6 to 61.7</td>
<td>67.8 to 72.6</td>
</tr>
</tbody>
</table>

**Rapid growth assumption**

The Government has stated in both the NPS and in oral evidence to the Committee that the NWR’s economic benefits would be realised sooner than in the other schemes (figure below). The DfT stated that “there is a very clear difference in the dynamic profile between the two schemes” and that “by 2030, a third runway at Heathrow would deliver three times the number of benefits that a second runway at Gatwick would deliver.” The only way this profile of benefits would be realised is if the runway is open by 2026 and at capacity after two years.

As discussed in Annex A, this is inconsistent with HAL’s own plans for phased passenger growth. If the appraisal assumed a phased approach, the monetised benefits would be lower and would not be realised until later in the appraisal period. The Department conducted sensitivity analysis assuming “a very conservative phasing over 10 years.” Under this scenario, the economic benefits are reduced by £0.5 billion, which was described by the Department as being a “very marginal difference.” However, the difference accounts for 15% of the maximum net present value benefits estimated in the economic case. The

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315 It should be noted that the appraisal methodologies were scrutinised in much more detail for the Northwest scheme, compared with the other two schemes. In some cases, these methodological issues apply across all three schemes and would proportionately impact their respective business cases.

316 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 28

317 Department for Transport, Updated Appraisal Report, October 2017, p.44

318 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 31

319 Q487

320 Q60

321 Discussed in detail in Annex A

322 Q488

323 Q499
Airports Commission previously estimated that the economic benefits of the scheme would be reduced by £1.3 billion with phasing. It is not clear how the benefit reductions are smaller under the Department’s scenario given that the demand and the subsequent benefits from the scheme are coming from a higher base. Also, the Airports Commission’s ‘assessment of need’ scenario has a smoother profile of growth when compared with that produced by the Department in its central case.324

Figure 23: Cumulative benefits to passengers and the wider economy by forecast year (present value, £bn, 2014 prices)325

Surface access costs

The Department has included £5 billion326 of surface access costs as part of their appraisal. This figure only includes those schemes deemed essential by the Airports Commission to support expansion, including Southern Rail Access, M25 tunnelling, M4 widening and other road works.327 The schemes which have already been committed and funded, including Crossrail, HS2 and Piccadilly line upgrades, are not included in this figure. The appraisal assumes that Western Rail will be delivered but its costs are not included.328

It should also be noted that these estimates have not been updated since the Airports Commission completed their work in 2015.329 The DfT’s aviation passenger demand forecasts are now higher and growth is anticipated to occur much more rapidly by 2030. This means more people will be accessing the airport and much sooner than was previously assumed. While the Department has not published a comprehensive surface access reanalysis based on updated passenger demand forecasts, the air quality reanalysis indicates that there could be as many as 17% more cars on the road than was previously assumed by the Airports Commission.330 Transport for London forecast an additional 76,000 vehicles on the road.331 If the ambition of no more road-related traffic is to be realised, additional surface access measures will be required, adding unknown costs to the

326 The overall cost of surface access is considered to total £4,962m and a spend profile is illustrated over the years 2021 to 2026.
328 Airports Commission, *Business Case and Sustainability Assessment*, July 2015, p 76
330 WSP, *2017 Plan Update to Air Quality Re-Analysis*, October 2017, Appendix B
331 Transport for London, *Heathrow third runway: Surface access analysis*, January 2018
scheme appraisal. TfL, for example, estimate that £15 billion will be required to cover the surface access and to support the background passenger growth in West London. There is also the possibility that an emissions charge of some sort may need to be introduced around the airport.\textsuperscript{332} We do not know what such a scheme might cost, how it would affect the appraisal or what impact it could have on passenger numbers. The DfT acknowledge that “surface access cost estimates remain uncertain given schemes different stages of development.”\textsuperscript{333}

The Airports Commission factored optimism bias into its estimate of surface access costs,\textsuperscript{334} but given the scale and nature of the schemes being proposed, there is a possibility that the cost increases may be greater than those assumed as part of the £5 billion. Highways England, for example, concluded that “there is significant potential for cost overruns of these large-scale proposals on the M25 and M4 J2-3 because of the high level of uncertainty over the scope of works.”\textsuperscript{335}

### Air quality costs

The Airports Commission monetised the present value costs from worse air quality in the economic appraisal. It estimated these at £835 million, including £72 million for NOx and £764 million for PM10.\textsuperscript{336} A ‘damage cost’ approach was used to calculate the costs in accordance with the cost per unit mass values (in £/tonne) specified by Defra in their guidance at the time.\textsuperscript{337} These damage costs were updated by Defra in September 2015 and are now considerably higher at £64,605/tonne (in 2015 prices), compared with £875/tonne (in 2008 prices) in the 2011 guidance. Adjusting for inflation, this damage cost is around 63 times higher than that used by the Airports Commission. On this basis, if the DfT applied the damage costs approach in its updated appraisal, the total damage costs from NOx emissions could rise to around £5.9 billion, taking the total damage costs to around £6.8 billion including PM10 costs (though for several technical reasons the increase may not be as considerable as that).\textsuperscript{338} In the updated October 2017 appraisal, the aggregate damage costs of air quality are 90% lower than this estimate, at £30 million for NOx. It is not clear how this can be the case given the substantial rise in unit damage costs for NOx. In response to questions on the plausibility of the DfT’s estimates, Professor Helen ApSimon, former expert air quality advisor for the Airports Commission, concluded “I have no idea how DfT can have calculated their value - it seems quite wrong!”.\textsuperscript{339} More detail on this is provided in Annex F.

### Carbon costs

Jacobs, on behalf of the Airports Commission, initially estimated the monetised costs of carbon for the NWR scheme at £19.2 billion, including £18.5 billion for air travel.\textsuperscript{340} In

\begin{footnotesize}
\begin{itemize}
    \item \textsuperscript{332} Q546
    \item \textsuperscript{333} Q546
    \item \textsuperscript{334} Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 104
    \item \textsuperscript{335} Highways England, \textit{Strategic Road Network Proposal—Validation of Costs and Delivery Assumptions}, October 2016
    \item \textsuperscript{336} Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 65; Present Value in 2014 prices.
    \item \textsuperscript{337} Department for Environment, Food and Rural Affairs (DEFRA), Interdepartmental Group on Costs and Benefits, \textit{Air Quality Subject Group, Air Quality Appraisal—Damage Cost Methodology}, February 2011
    \item \textsuperscript{338} See Annex F for more discussion.
    \item \textsuperscript{339} Correspondence from Professor Helen ApSimon, 3 February 2018
    \item \textsuperscript{340} Jacobs, \textit{Carbon: Further Assessment}, May 2015, p.29
\end{itemize}
\end{footnotesize}
the DfT’s latest appraisal, the damage costs of carbon from air travel are removed, and only those costs from passenger surface access, airport operations and construction are included. Based on these assumptions, the DfT’s approach assumes that the additional damage cost from carbon dioxide emissions, is completely and effectively ameliorated by effective trading within a carbon trading scheme.341

Expert evidence given to the Committee suggested that carbon trading would not work effectively or on the scale anticipated by the DfT and that it was ‘optimistic’ to not include these costs in the economic case.342 While it is impossible to know with certainty how effective carbon trading will be in the future, an assumption of a linear improvement in trading practises towards a perfect trading platform over the 60 year appraisal period, would “very indicatively” lead to between 10% and 25% residual damages (£1.8 to £4.5 billion using the Jacobs estimate of emissions and carbon price).343 More detailed on this is provided in Annex I.

Noise costs

The monetised health impact of noise is based on the population exposure over a full day, accounting for health and annoyance impacts at differing noise levels.344 The monetised costs of noise for a NWR scheme were initially estimated by the Airports Commission at £1 billion. This figure was later revised down by the DfT and estimated at around £600 million (see table below). At face value, it was not immediately clear how the costs decreased by 40% when the estimated number of air traffic movements from a NWR have increased, particularly during the early years of the appraisal.345 This would typically have resulted in a much greater noise footprint from a NWR and presumably greater monetised noise costs.

*Table 4: Cumulative monetised noise impacts by 2084/5 under DfT17 forecasts, central estimates (present value, £bn, 2014 prices)*

When the profile of noise annoyance impacts is examined, it becomes clear that the noise impacts, despite being much higher in 2030, are lower in 2040 and 2050. The monetisation is determined over a 60-year appraisal between 2025 and 2085. Costs are interpolated between zero in 2025 and the estimates for 2030, 2040 and 2050 and remain constant thereafter. Because of this, the lower population impacts, and thus the lower noise costs dominate for most of the appraisal period, even with discounting being applied. This is reflected in the steep decline in changes in the numbers of lost ‘Disability-Adjusted Life
Years’ (DALYs). This is an estimate of the potential healthy life years lost due to premature morbidity or mortality and upon which the monetisation figures are derived. In other words, the steeper the decline in the figure below, the less of an impact there will be in terms of the monetised costs of noise over the appraisal period.

**Figure 24: Estimated Changes in Total DALYs Lost Due to All Assessed Health and Amenity Effects Compared with Do Minimum (Central)**

As discussed in detail in Annex H, the lower noise footprint for the 2040, 2050 and the remainder of the appraisal period is driven almost entirely by more optimistic fleet mix and flight path assumptions.
Annex C: Expansion costs, financing and airport charges

Runway expansion costs

There are two main areas of capital costs associated with airport expansion:

1. the capital expenditure required for completion of the new runway and terminals (referred to as “scheme costs”); and

2. the capital expenditure required to ensure surface access capacity can meet the extra demand of passengers travelling to and from the expanded airport (referred to as “surface access costs”).

The NPS acknowledges that the Gatwick scheme “would be significantly cheaper” and require a significantly lower “level of debt and equity” than the two schemes at Heathrow, with the Heathrow NWR the most expensive of the three shortlisted schemes.” This finding is based on estimated scheme capex costs of £17.6 billion for a NWR (compared with £14.4 billion for the ENR) and £8.9 billion for Gatwick). Surface access costs are estimated at £5.0 billion for the NWR (compared with £5.5 billion for the ENR; and £787 million for Gatwick).

Table 5: Cost estimates by expansion option, including risk and optimism bias, £m (2014 prices)

<table>
<thead>
<tr>
<th></th>
<th>LGW 2R</th>
<th>ENR</th>
<th>NWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheme costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheme Capex</td>
<td>8,971</td>
<td>14,435</td>
<td>17,644</td>
</tr>
<tr>
<td>Other Airport Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core capex</td>
<td>3,104</td>
<td>13,394</td>
<td>13,394</td>
</tr>
<tr>
<td>Asset replacement</td>
<td>4,636</td>
<td>16,686</td>
<td>17,101</td>
</tr>
<tr>
<td>Opex</td>
<td>15,750</td>
<td>50,354</td>
<td>50,792</td>
</tr>
<tr>
<td>Surface Access Costs</td>
<td>Surface Access Costs</td>
<td>787</td>
<td>5,515</td>
</tr>
</tbody>
</table>

A degree of uncertainty is introduced to these project costs because of the risks in predicting the likely costs of additional capacity that will not be operational for over a decade. The Airports Commission reflected these risks and uncertainties by including a risk premium in its cost estimates and a further allowance for optimism bias (OB). The OB allowance reflects the project sponsor’s initial risk evaluation, and pricing tends to assume relatively positive outcomes for the project. However, in practice, the overall price may prove to be higher, particularly for a complex project such as this where several risks can interplay.

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348 There will be other cost considerations post expansion related to core capex, asset replacement and operating expenditure.

349 It should be noted that all of capital cost estimates in support of the NPS still rely on the Airports Commission work. As such, the analysis in this section of the report relies upon that used by the Airports Commission as presented in the Business Case and Sustainability Assessment.

350 The Commission’s forecasts include 15% for OB.

351 Airports Commission, Business Case and Sustainability Assessment, July 2015, p 104
As can be seen in the figure below, about half the total NWR scheme costs relate to terminal buildings and land, with the other cost sources all much smaller parts of the total.

**Figure 25: Heathrow NWR, scheme capex breakdown, £m (2014 prices)**

Almost all the scheme capital costs for the NWR will be incurred between 2018 and 2028. This assumes a scenario where the new runway will be built between 2019 and 2025. It is assumed that charges are passed on to airport users in the year in which the expenditure is incurred. The profile of capital cost incursions for the other schemes are represented below. The capital spend is much lower and smoother for the Gatwick scheme.

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HAL has proposed to cut £2.5 billion of the final scheme costs by building a smaller new terminal over existing transport and baggage infrastructure. It has also sought to manage the financial risk of the scheme by phasing its development, though the final plans for phasing remain unclear. John-Holland Kaye acknowledged in oral evidence that “we are talking only about options at this stage; we have not finalised a particular plan, and that is what we are consulting on at the moment.” The effect of a reduced scope NWR scheme was examined by the Airports Commission. The cost profile compared with the central scheme design is represented below and reflects adjustments to design of T6, the replacement of the air traffic control tower with a remote facility and scope reduction in terms of land acquisition. Cost increases are smoothed in the early part of the appraisal period, for a total cost saving of £2.35 billion.

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355 Q353
356 Q353
357 This is based upon the reduced scope scheme discussed in the Operational Efficiency: Phasing and Facilities Review report
Given that the NWR scheme design has not been finalised there are concerns over the accuracy of the current cost estimates and how they would change over the life of the project. The DfT’s updated appraisal acknowledges, in terms of scheme costs, that “it is not currently possible to identify a firm scheme cost baseline for this analysis.” Andrew Haines of the CAA also commented:

“… there is still too much uncertainty about the detailed scope, how Heathrow is going to procure it and how it will deliver it”.

Heathrow Hub, the proponents of the ENR scheme, believe that the scheme costs should be close to £30 billion on the basis that the capital cost of £17.6 billion in the current appraisal does not account for the: anticipated inflation in surface access costs; the full compensation offering of the airport; and the additional costs that will be incurred to relocate additional sites to what's included in the scheme appraisal. They believe their scheme had a considerable cost advantage and has been costed at £9.7 billion and could be built in phases, with little or no impact on passenger fees.

The LACC expressed their concern “over cost escalation across the whole project lifecycle and the abundance of project risks, many of which are unquantified.” Willie Walsh was particularly critical of the lack of cost certainty at this stage of the project:

We do not know what the budget is yet… Heathrow are saying, “Trust me; I will be able to deliver something for you for about £14 billion.” We do not
know what that something is. We do not know when it will be built. We do not know what makes up all the constituent parts. When we have asked for disclosure about that, they say, “We don’t really have it, but we will have it after you’ve given us approval to build.”

Craig Kreeger believed costs, at this point, were “a very unpredictable outcome.” Phil Graham of the Airports Commission played down the importance of costs “because in many ways the costs are being borne by the private sector, in which case, it is international investors.” The costs are being borne in the short-term by the private sector. But like any private sector investor, they expect a return on their investment. Because of this and the way costs are recouped through the current regulatory framework (see below), it will be airport users who will bear a large degree of the cost risk from this project. On this basis, costs are a material consideration.

### The Arora Proposal

One notable aspect of the revised draft NPS is the change made at paragraph 1.15 which states in this additional sentence:

> For the avoidance of doubt, the Airports NPS does not identify any statutory undertaker as the appropriate person or appropriate persons to carry out the preferred scheme.

Arora Group have developed an alternative proposal that they believe will save a minimum of £5.2bn compared to the £17.6bn costs of the HAL plans published by Jacobs. The scheme proposed will be “the same length runway in the same location, the same perimeter around the airport, the same targets for capacity increase and the same sustainability and environmental protections.” The specific points of difference between its scheme and the one currently proposed in the NPS are as follows:

- **Site area**—it reduces the overall site area and land take by 20 per cent, thereby reducing the extent of community disruption, demolition work, decanting and groundworks required.

- **Terminal 6 and Remote Pier**—it is based on a new Terminal 6 (T6) constructed to the west of Terminal 5 with a remote satellite to be located to the west of the new T6.

- **Car parking**—it retains as much as possible the existing surface car parking along the Northern Perimeter Road.

Arora also proposes separate terminal ownership to the incumbent owners. They believe that “it will lead to much greater competitiveness and efficiency in subsequent ownership and operations.”

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365 Q578; Q581
366 Q578
367 Q7; Q26
368 Q104, Q578
Heathrow are adamant that it is “the only appropriate promoter of the project”, particularly because “there would be obvious and highly challenging practical difficulties for a different promoter to apply for, construct and then operate a part of the airport.” Also, they state that the “introduction of a second operator would create complexity and uncertainty in delivering a comprehensive mitigation package.” HAL believe it would be in the public interest for the NPS to set out the criteria that any DCO applicant would have to meet in order to guard against multiple adverse impacts that could be generated by the uncoordinated promotion of the north-west runway.[1] Secretary of State also commented:

There are some people who have argued that we could somehow split Heathrow in half and build a runway, with somebody separately building a runway. I am highly cautious that that is a realistic prospect. We never rule out any option and we have to get through the process of securing a wide range of agreements on this, but Heathrow airport is already an operational airport under one management, and we want this to happen in a timely, affordable, deliverable and, ultimately, workable way. We would not naturally think that splitting this airport in half and having competition within the airport is the right way of doing things, having one runway owned by one organisation and another by another one. I am not convinced that that would be the right way forward.

Willie Walsh, Chief Executive of International Airlines Group, was supportive of the concept of intra-airport competition as a way to induce greater cost efficiencies in the delivery and operation of an additional runway:

I have argued that in the NPS we should allow for competition within the airport. We should allow for alternative providers of terminal capacity. That would force Heathrow to deliver or, if they do not do it, it would enable somebody else to do so. That power should be given to the CAA. The CAA should have the power to force competition within the airport.

I am not talking about somebody having the runway. Let’s leave the principal infrastructure of the runway and the taxiways within Heathrow, but I see no argument against introducing competition in terminal provision at the airport. That is something the CAA should be given, and it is something that this Committee should insist on being included in the NPS.

Virgin Chief Executive Craig Kreeger was more cautious about this proposal commenting “While I am very intrigued by it and supportive of the idea, there are a couple of elements I would be concerned to add to the equation, to ensure that at the end of the process there is a level playing field and the benefits of competition are shared by all who utilise the airport and not just those who might fit into a terminal that one person is managing versus another.”

Financing and investment risk

Heathrow Airport is privately owned and operated by Heathrow Airport Holdings Ltd. It is predominantly financed through the bond market, with debt at the time of the Airports
Commission report, of c. £11.7 billion made up of A- and BBB bonds. It also had £275 million of revolving credit facilities. It had equity of c. £2.7 billion in ordinary share capital.\textsuperscript{369}

The Airports Commission assumed a corporately financed cash flow approach, with the existing operator developing the scheme. In considering Heathrow’s expansion and core costs and revenues,\textsuperscript{370} the Airports Commission believed that HAL could plausibly meet its financing requirements through the issuance of bonds at a scale and structure to allow HAL to maintain its current A- credit rating.\textsuperscript{371} Where this is not possible, equity is injected. In the early stages, the scale of operations restrict the quantum of debt that can be realised, requiring greater equity injections. By contrast, at the later stages of expansion the capital expenditure is funded by a greater proportion of debt (figure below).

\textbf{Figure 28: NWR Scheme, Debt and Equity Balances vs. Capex, £m, nominal prices}\textsuperscript{372}

The Airports Commission found that HAL would require between £22.1 and £27.0 billion in debt financing and between £5.5 and £7.0 billion in additional equity. This is significant and will put HAL at the high end of the range of financing for infrastructure projects in the UK.\textsuperscript{373} Andrew Haines observed that the NWR scheme “is probably the largest privately financed infrastructure project anywhere ever in the world.”\textsuperscript{374} This assumes no surface access cost contributions from HAL.\textsuperscript{375} For comparison, the ENR scheme has lower build costs, translating into lower aero charges and financing. The costs are much lower for Gatwick, and the scale of the debt and equity requirement is lower (Table 6).

\textsuperscript{369} Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 109

\textsuperscript{370} This includes a profile of scheme capex, coupled with the airport’s core capex, asset replacement, opex RAB depreciation and non-aero revenues

\textsuperscript{371} Details of the approach used to assess this are found in the PwC, \textit{Cost and Commercial Viability: Funding and Financing Update report}, July 2015


\textsuperscript{373} Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 113

\textsuperscript{374} Q634

\textsuperscript{375} Heathrow has expressed its desire to reduce costs by £2.5 billion, this would come off the financing costs. But it has also acknowledged that it has set aside £2 billion for surface access contributions. These will broadly balance out in these figures. There are also uncertainties as to how much Heathrow will eventually have to pay out in noise insulation compensation, this is linked to the flight-paths and the subsequent noise footprint, which at this stage is unknown
Table 6: Debt and equity requirements, by expansion option, £bn (2014 prices)\(^{376}\)

<table>
<thead>
<tr>
<th></th>
<th>LGW 2R</th>
<th>NWR</th>
<th>ENR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing debt</td>
<td>£1.5</td>
<td>£11.7</td>
<td>£11.7</td>
</tr>
<tr>
<td>Existing equity</td>
<td>£0.3</td>
<td>£2.7</td>
<td>£2.7</td>
</tr>
<tr>
<td>Additional debt</td>
<td>£10</td>
<td>£27.2</td>
<td>£23.6</td>
</tr>
<tr>
<td>Additional equity</td>
<td>£2.4</td>
<td>£5.8</td>
<td>£5.7</td>
</tr>
</tbody>
</table>

Having assessed these financing requirements, the Airports Commission assessed the potential availability of debt and equity with market participants. While the Airports Commission “was content with its assumptions about the availability of finance”, it did identify risks with its assumed approach. It believed there were equity risks associated with the level of aero charges the airport would be able to apply under a future regulatory framework and within a competitive operating environment. The Airports Commission concluded that “the availability of debt and equity suggest that market participants believe this risk is manageable.” This was on a presumption that aero charges increase to a potential peak of c. £31 per passenger,\(^{377}\) and aero charge revenues increase as required in the year in which costs are incurred.\(^{378}\) The airlines were highly critical of the prospect of pre-funding.\(^{379}\)

The other major element of investment risk identified by the Airports Commission was how investment of this scale will be treated when determining the costs of capital and therefore the returns on investment, under a Regulatory Asset Base model. The Airports Commission believed that investors would command sufficient returns under any future regulatory framework to enable Heathrow to access liquidity via bonds across several different currencies. It concluded that the “the structure of the regulatory system would be a key factor in their decision-making.”\(^{380}\)

In identifying these risks, the Airports Commission identified several options available to HAL to mitigate these financing risks, including: ensuring that the revenue-generating elements of the scheme are completed as early as possible or investigating the possibility of pre-funding; taking steps to increase non-aero revenues at the airport so that they contribute a larger proportion of total scheme costs; and utilising value engineering to control the costs of construction. The Airports Commission also acknowledged the possibility of the Government to “contribute funding to some or all of the surface access requirements” in a situation where the financing or investment risks increase, noting that “commitment to do so may provide investors with a level of assurance and so reduce the price they place on the risks.”\(^{381}\)

Because the assessment of the Airports Commission is a few years old, some of the underlying assumptions of their assessment have changed, particularly around the costs of capital (i.e. the return to investors and lenders). This is evident through historically lower yields on government and corporate bonds (\(@1.92\)%); and softer expectations for

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\(^{376}\) Airports Commission, *Business Case and Sustainability Assessment*, July 2015, p 117

\(^{377}\) Airports Commission, *Business Case and Sustainability Assessment*, July 2015, p 112


\(^{379}\) Q579, Q607

\(^{380}\) Airports Commission, *Business Case and Sustainability Assessment*, July 2015, p 112

future interest rate rises. The macroeconomic and financial market environment, has meant Heathrow Airport has been recently been able to secure financing below the cost of new debt than was previously assumed. Andrew Haines, Chief Executive of the CAA, believed that the changes in changes in market conditions had changed the financing picture. He was also more optimistic about airport charges being held flat post-expansion:

[ ... ] we are facing historic low levels of cost of debt ... This will be largely new debt, so it allows Heathrow to place that debt in the market at an almost uniquely low point in time. When we look at all those factors together, and we model them and share that model with Heathrow and with the airlines, we see that it would be possible to do this project, as currently scoped, at flat prices.

Willie Walsh also believed that the Airports Commission’s assessment was not accurate and that development could occur in a way that would not require passenger charges to increase. He said this was down to the significant headroom included in the previous cost estimates and a significantly lower cost of debt today.

It is difficult at this point to know what exactly all this will mean for the NWR scheme. The CAA, who will ultimately make the judgement as to what a sufficient return is for Heathrow, are at a relatively early stage in their overall programme of price control in the next regulatory period. As part of this process, the CAA commissioned PwC to provide a view of an initial range for the weighted average cost of capital ("WACC") for the H7 period (currently defined as the 2020–2024 period). The table below provides a comparison of the assumptions between when the Airports Commission completed their work and the most recent assessment. The WACC assumptions are lower than previously anticipated due to macroeconomic changes. While the newer cost of capital assessment did not mention anything firm on airport charges, it would be reasonable to assume that, for the time being and for the costs assumed, a third runway should not require charges higher than the levels indicated in the 2015 reports.

Table 7: Heathrow WACC calculations, 2015 vs. 2017

<table>
<thead>
<tr>
<th></th>
<th>Previous estimates</th>
<th>Latest estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Cost of equity (post-tax)</td>
<td>5.68%</td>
<td>7.61%</td>
</tr>
<tr>
<td>Real cost of debt (pre-tax)</td>
<td>2.78%</td>
<td>3.45%</td>
</tr>
<tr>
<td>Vanilla WACC</td>
<td>3.94%</td>
<td>5.12%</td>
</tr>
</tbody>
</table>

382 PwC Economics, Estimating the cost of capital for H7, A report prepared for the CAA, November 2017
383 PwC Economics, Estimating the cost of capital for H7, A report prepared for the CAA, November 2017
384 QE36
385 QE17
386 PwC 2015; PwC 2017
Heathrow airport charges and economic regulation

How does Heathrow earn its revenue?

Heathrow has two main sources of income. The first being aeronautical income, which includes passenger fees, landing charges and airport parking charges. Passenger fees are based on the number of passengers on board an aircraft, and are levied in respect of all departing passengers. The level of passenger fees charged are based on route area: European, domestic and rest of the world. Transfer and transit passengers benefit from a discount. Landing charges are levied on almost all aircraft and are calculated in accordance with the certified maximum take-off weight of the aircraft and are banded into categories for aircraft weighing less than and those weighing more than sixteen tonnes, which includes nearly all commercial aircraft. These charges are adjusted, where applicable, in accordance with each aircraft’s noise-rating, its emissions and time of day, with landing charges at Heathrow being higher during peak traffic times than off-peak traffic times. Aeronautical revenue accounts for most of Heathrow’s revenue, at around 61% in 2016 (figure below).387

Heathrow’s revenue from airport charges has risen significantly over the past decade or so. In 2016, revenue from airport charges were reported at £1,699 million, up from £479 million in 2004/05. The second type is non-aeronautical income which HAL generates from a variety of sources, including concession fees from retail operators; direct income from car carks, advertising revenue and VIP products: the rental of airport premises such as aircraft hangars, warehouses, cargo storage facilities, maintenance facilities, offices and airlines lounges; the provision of facilities such as baggage handling and passenger check-in; and fare revenue from the operation of the Heathrow Express rail service.

Figure 29: Heathrow Airport revenue, by source, 2016, £m388

The 2016 Leigh Fisher Airport Performance Indicators report shows that HAL’s real revenue per passenger rose consistently between 2006 and 2016 (figure below), even following the modest reduction in the recoverable price cap on those elements of revenue that are regulated by the CAA. HAL has managed to increase its revenue from nonregulated airside services. By way of comparison, between 2006 and 2016, the real

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387 Heathrow Airport Holdings Limited, Annual report and financial statements, year ended 31 December 2016
388 Heathrow Airport Holdings Limited, Annual report and financial statements, year ended 31 December 2016
revenues of airlines operating out of Heathrow has remained mostly flat. This is because real air fares have fallen by 6% over the period, though this has been partially offset by increased airline revenue from ancillaries and other fees.389

Figure 30: Airline and airport revenue per passenger, 2006–2016390

Figure 31: Heathrow Airport, Operating Margin, %391

Economic regulation

The CAA has powers under the Civil Aviation Act 2012 to economically regulate Heathrow Airport, as it qualifies under the market power test.392 Heathrow is regulated on a

389 Correspondence between Rafael Schwartzman of IATA and Lilian Greenwood, 26 February 2018
390 Correspondence between Rafael Schwartzman of IATA and Lilian Greenwood, 26 February 2018
391 Heathrow Airport Holdings Limited, Annual report and financial statements, year ended 31 December 2016
392 CAA, Airport Market Power Assessment, accessed 12 February 2018
The sixth quinquennial review (Q6) started on 1 April 2014 for Heathrow will run until 31 December 2018. 

Airport operators typically recover their allowable revenues through three types of airport fees and traffic charges: passenger fees, based on the number of passengers on board departing aircraft; landing charges, calculated in accordance with the take-off weight of the aircraft and adjusted, where applicable, in accordance with each aircraft’s noise-rating and emissions, and the time of day; and aircraft parking charges, based on the duration of the ground stay and aircraft weight.

The RAB is essentially the asset base of the airport, with a depreciation allowance.

Heathrow Airport, Economic regulation, accessed 12 February 2018

Defined as revenue per passenger.

CAA, CAP 1383, Strategic themes for the review of Heathrow Airport Limited’s charges (“H7”), March 2016

Heathrow Airport, Airport Charges for 2018—Consultation Document, 4 August 2017
Increases in landing charges at Heathrow over the last decade have largely been driven by the extensive investment programme at the airport, which includes the construction of the new terminals 5 and 2, as well as major upgrades to terminals 3 and 4. Between 2005/06 and 2013/14 period HAL invested £10.6 billion (in 2014 prices) in the airport. HAL’s RAB has subsequently doubled over the past decade or so; though the RAB growth has slowed during Q6.

Because the current regulatory price controls on Heathrow expire on 31 December 2019, the CAA has launched a review called ‘H7’ to determine the appropriate regulatory arrangements that should be put in place after that date, including its approach to the
economic regulation of new airport capacity and any associated costs that may be incurred during Q6.402 The CAA has stated that for H7 it intends to continue with its traditional approach of remunerating HAL’s investment through its RAB and an estimate for its WACC.403 Though Andrew Haines cautioned that the CAA was still at “a relatively early stage of this process as well [and that] proposals, on which we are currently consulting, would not lead us to make a final decision on costs until the very end of 2020 or 2021 at the earliest.”404

Reflecting on the success of the regulatory framework, many of the airlines were critical of the mechanisms used to date in controlling Heathrow’s capital spend and the growth in airport charges.405 Craig Kreeger, Chief Executive of Virgin Atlantic, commented:

Through whatever combination of vehicles over the last several years, Heathrow is by a pretty significant margin the most expensive airport at which to do business. The capabilities of the existing regime, and the teeth in the existing regime, have not led to a reasonable conclusion on charges for the airlines.406

This was not necessarily a criticism of the CAA and the way they had executed their responsibilities but a critique of the powers available to them.407 Andrew Haines conceded that powers in the past were very restricted and only enabled them to “set a price cap and then [walk away].” He believed the powers available to the CAA had improved and they “now have the ability to issue a licence and to put in place controls” giving them “much more flexibility in how we oversee those costs.”408 Willie Walsh still wanted “to see the CAA having more power and delivering it more strongly.”409 With respect to proposals for the CAA to take on additional powers, Andrew Haines said he would be “nervous” about such a prospect because of the potential delay it might cause as introducing such powers would require primary legislation.410

**Airport charges post expansion**

The costs of the NWR and the way it is financed will affect how much money the airport operator will need to raise through airport charges411 to meet investor returns. The Airports Commission estimated that expansion will result in an increase from c. £20 per passenger to a weighted average charge of c. £28-30 per passenger and a potential peak of up to c. £31. This was described by the Airports Commission as a “significant increase in aero charges in a context where HAL will be competing with other airport operators.”412

402 For more information, see: CAA, *Heathrow price control review H7*, accessed 12 February 2017
403 CAP1383, Strategic themes for the review of Heathrow Airport Limited’s charges (“H7”), March 2016, p 24; For background, see: IATA, *Cost of Capital*
404 Q638
405 Q616
406 Q616
407 Q616
408 Q648
409 Q616
410 Q640
411 These revenues for the airport are charges raised against airlines operating at the airport (landing charges), but also could feed through to the costs incurred by passengers when paying for a flight (passenger charges).
412 Airports Commission, Business Case and Sustainability Assessment, July 2015, p 112
Why airport charges matter

The business case of the NWR scheme rests on the assumption that any change in airport charges would be absorbed by the airlines and not passed onto passengers. This is unlikely to happen in practice. Airport charges account for a reasonable share of airline operating costs, particularly for low-cost carriers (Table 8).

Table 8: Airport costs, as a % of operating costs for airlines, 2016

<table>
<thead>
<tr>
<th>Airline</th>
<th>% of Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Airways</td>
<td>8.80%</td>
</tr>
<tr>
<td>Virgin Atlantic</td>
<td>7.40%</td>
</tr>
<tr>
<td>Flybe</td>
<td>19.30%</td>
</tr>
<tr>
<td>American Airlines</td>
<td>5.08%</td>
</tr>
<tr>
<td>Aer Lingus</td>
<td>21.84%</td>
</tr>
<tr>
<td>Vueling</td>
<td>11.89%</td>
</tr>
</tbody>
</table>

*estimates since itemized costs not given

The airlines also operate in highly competitive and relatively thin profit-margin environment (Figure 34). This gives them less scope to absorbing airport charge increases as is assumed in the appraisal supporting the NPS.

Figure 34: International airline operating margins vs. oil prices
A marked rise in airport charges, which would be absorbed by passengers, would undermine the strategic benefits endorsed in the NPS. Such an increase will either make using Heathrow unaffordable for some passengers; or for those that continue to use the airport, the passenger benefits—which make up over 90% of the economic benefits—will be eroded and may even be burdened with additional charges to cover the spend incurred.

Excessive charges incurred by the airlines are also likely to limit the degree of airline competition at an expanded airport. As Simon McNamara of Flybe put it “we will expand if the costs work, but we will not expand if the costs do not work and we cannot access that capacity.” Willie Walsh believed many of the airlines would not be able to affordably offer the anticipated routes of Heathrow and some may even be forced out, as has happened in recent years.

Higher airport charges are likely to have a detrimental impact on the competitiveness of Heathrow with the other major European hubs. Transfer passengers, which underpin the value of hub airports, are much more sensitive to price than other segments of the market and an excessive increase in airport charges would see these passengers utilise other hubs that are more price competitive (Table 9). Rafael Schvartzman of IATA believe that “it will certainly impact a lot on the competitiveness of Heathrow compared with other hubs in the world.”

### Table 9: International passenger charges, by major European hub

<table>
<thead>
<tr>
<th>Airport</th>
<th>Charge (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heathrow</td>
<td>40.21</td>
</tr>
<tr>
<td>Charles de Gaulle</td>
<td>22.95</td>
</tr>
<tr>
<td>Amsterdam</td>
<td>21.42</td>
</tr>
<tr>
<td>Frankfurt</td>
<td>25.16</td>
</tr>
</tbody>
</table>

Willie Walsh summed up the importance of airport charges in the context of the scheme's strategic case and feasibility—“What I am saying very clearly is that, if the charges increase, you are not going to get the expansion at Heathrow that has been talked about. Therefore, the third runway will become a white elephant.” Mr Schvartzman also concluded “we still think that those numbers cannot sustain the level of charges needed to remain competitive.”

HAL are seeking to “maintain airport charges per passenger close to current levels in real terms.” When pressed on whether HAL could make a firm commitment on costs, John Holland-Kaye commented:

> At this stage I could not. We were given a challenge by the Secretary of State to deliver expansion at close to current charges. We have accepted that challenge. It would be a mistake at this stage to make any guarantee about particular costs. When we think about how much work still needs to

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[413] Heathrow Airport Limited (NPS0055)
happen, we still need to go through the development consent order process and finalise what our master plan will be like based on the consultation we are currently holding. We cannot finalise those costs yet.\footnote{Q356}

The Secretary of State also expressed his desire for landing charges not to increase in real terms:

From day one in dealing with Heathrow and with the airlines, my approach is that I want this to be a value for money exercise. It is clearly private money, but I do not want a massive hike in landing charges as a result. Nor do I want passengers paying for this new runway years in advance. I have been very clear to Heathrow that I see no reason, given the fact that the capacity of the airport is effectively increasing by around 60\%, for a material change to landing charges.\footnote{Q515}

When questioned on whether it should be a condition of the third runway that landing charges be held more or less at their real costs now, the Secretary of State believed that it was an issue to be dealt with by the CAA and not the NPS:

That is what we will be working to achieve. Effectively, we give the CAA the regulatory powers to ensure that we do not get inappropriate cost hikes. That is the real mechanism to do this. We have already given them the powers to do that. Those powers expire shortly and we are working on how we replace them, but I am very clear that we need a watchdog with teeth to ensure that this project does not end up leading to a big hike for passengers.\footnote{Q522}

The airlines were universally critical of the lack of focus on costs and airport charges in the NPS and were firmly of the view that this was an issue to be dealt with ahead of an NPS being designated.\footnote{Q579, Q581, Q585, Q593, Q613} They believed that HAL had to be better incentivised, and a cap on airport charges would be an appropriate tool to incentivise HAL to focus more on costs and efficiency in scheme delivery.\footnote{Q613} Andrew Haines believed that a strict cap on airport charges was not the right approach and may not be in the best interests of the consumer.\footnote{Q649}

Willie Walsh also wanted a milestone incorporated in the planning process for a final decision to be made as to whether HAL can “demonstrate that they can deliver what they have promised within the costs that have been identified, so that passenger charges do not go up.” He added that “if they cannot do that, or if that demand is not acceptable to them, maybe you should look at alternative proposals.”\footnote{Q591}

The other scheme proponents believe that the ambitions to keep charges at current levels was unrealistic. Heathrow Hub assert that “the NWR scheme is fundamentally incompatible with the Government’s requirement that user charges remain at current levels.”\footnote{Heathrow Hub Submission to the DfT Consultation, p 2} They believe their scheme can be delivered “with little or no impact on passenger fees.”\footnote{Heathrow Hub (NPS0087)} Gatwick also believe it is impossible to finance “the project with airport charges...
Gatwick have made a commitment they are willing to cap the airport charges that can be charged with expansion, though Commission estimates assume the weighted average passenger charge will increase from £9 to £16.

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423 Submission by Gatwick Airport to the Department for Transport’s draft Airports National Policy Statement Consultation, p 5
424 Q104
Annex D: Deliverability

Deliverability is essentially about understanding the key risks that may prevent the NWR scheme operating at the assumed capacity and on the timescale specified in the NPS. This captures planning, financing, construction, public and political deliverability and legal risks. This annex examines some of the main delivery risks posed to the NWR. These are essential considerations because if the NWR cannot be delivered to its assumed capacity, because of, say, airfield design pinch points or planning issues, there will be knock on effects on the business case of the scheme.

Scheme complexity

The proposed NWR scheme, considered by the Airports Commission and the DfT in their appraisals, includes building a third parallel runway and associated terminal facilities within the site constraints in the figure below. A technical assessment prepared for the Airports Commission considered the scheme “capable of being delivered as a full safety and security compliant airport” which would “provide capacity for substantially greater number of flights, passengers and cargo.” This finding was based on a technical assessment of the ground infrastructure associated with the airport operations. The Airports Commission also noted the well-understood nature of the scheme and did not believe there to be any particular problems associated with the procurement of specialist resource to undertake detailed design and construction.

Figure 35: Heathrow Airport NWR Master Plan

425 Airports Commission, Business Case and Sustainability Assessment, July 2015
426 Airports Commission, Business Case and Sustainability Assessment, July 2015
428 Airports Commission, Business Case and Sustainability Assessment, July 2015, p 131
While the Airports Commission considered the operations of the actual ground facilities as a relatively low-risk proposition, it believed that the largest risks to a 2026 delivery date came from the tunnelling required for the reconfiguration of the M25, as well as the relocation of the Lakeside Energy from Waste plant.\footnote{Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 125}

In terms of these ground infrastructure challenges for the \textbf{ENR scheme}, it was also considered “capable of being delivered as a full safety and security compliant airport,” which would “provide capacity for substantially greater number of flights, passengers and cargo.”\footnote{Jacobs, \textit{Appraisal Framework Module 14. Operational Efficiency: Ground Infrastructure Heathrow Airport North West Runway}, 4 November 2014} However, the Jacobs appraisal stated that:

\begin{quote}
[ … ] the concept is unconventional, has never been used elsewhere in international, EU or national regulatory instruments, standards or recommendations for safe design or operation … New regulations, recommendations and accepted industry practices, will be needed to address the physical and operational parameters of this runway concept. This may introduce a time delay to operational opening and there is a risk that unforeseen regulatory issues may arise.\footnote{Jacobs, \textit{Appraisal Framework Module 14. Operational Efficiency: Ground Infrastructure Heathrow Airport North West Runway}, 4 November 2014}
\end{quote}

The ground infrastructure challenges for the \textbf{Gatwick scheme} are simpler, with fewer risks to manage.\footnote{Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 137} The simple airport infrastructure, lack of associated planning and construction challenges, and the use of land already safeguarded all contribute to a simpler ground scheme.\footnote{Heathrow Airport Ltd (NPS0086)}

\textbf{The M25 realignment}

The proposal for the M25 is for it to be placed in sections of tunnel under the new runway. Emma Gilthorpe elaborated on HAL’s latest proposals:

\begin{quote}
[ … ] we are considering and consulting on two options for constructing the new runway over the top of the M25. The ‘tunnelled’ option referred to involves realigning the M25 circa 150m to the west of the existing carriageway and 4m lower than its current level, in order to minimise the height of the new runway above it. The ‘bridge’ option involves building across the current M25 carriageway, meaning that the runway ground level would necessarily be some 4m higher than with the tunnelled option.\footnote{Q581}
\end{quote}

Willie Walsh believed that HAL had “still not figured out how they are going to deal with the M25.”\footnote{Q588} Dale Keller also believed there was a “huge risk and uncertainty over the road realignment, betterment and M25 coverage, which we do not know.”\footnote{Q588}
The Airports Commission estimated the M25 cost at £576 million (2014 prices). HAL said indicative costs for both their options are circa £600m.\textsuperscript{438} Highways England estimated this scheme to cost between £471 and £1,101 million (2014 prices), with potential for increased scope and constraints leading to cost increases that exceed the funds set aside for optimism bias.\textsuperscript{439} In terms of costs, John Holland-Kaye commented:

I should not say that all costings are pinned down, but they are at the right level of maturity at this stage of the process. There is a lot more work that we need to do. The first thing to do will be to finalise what the plan is. We will only be able to do that once we have completed the first consultation and come down to an individual scheme. Then we will be able to do a far more detailed costing.\textsuperscript{440}

The M25 realignment is due to commence in 2020/21. This timeline was described by Highways England as “extremely challenging” because of the risk involved in the diversion of overhead power lines prior to the granting of the DCO and demolition of existing lines.\textsuperscript{441}

John Holland-Kaye in his evidence said that “what we are proposing to do with the M25 is not anything that has not been done a thousand times before and has not been done at many other airports before.”\textsuperscript{442} It is not considered by Highways England to be novel or particularly high risk in relation to required outputs. However, the interfaces between the existing roadworks, such as the A4 and M25, presents delivery risk and will “require very careful planning”,\textsuperscript{443} including the creation of scheme specific delivery teams and early involvement of construction partners. The Secretary of State expressed his ambition to “to make sure that the M25 carries on functioning normally; it cannot grind to a halt.”\textsuperscript{444}

One of the other major risks with the M25, as identified by Highways England, is that it “will potentially place resource challenges on the industry as it runs concurrently with the more than half of construction phases in the RIS programme alone.”\textsuperscript{445} This is in addition to the finding by Highways England that the wider Heathrow road network proposals will “place significant pressure on Tier 1 contractors’ resources if timescales for infrastructure projects in the UK and particularly the South of England stay the same.”\textsuperscript{446}

In summary, Highways England concluded that “the M25 diversion proposal is certainly deliverable in the timescales assumed but with a higher degree of risk than might otherwise be assigned.” It added that “the M25 works are firmly on the critical path, and as such their successful completion directly impacts on the delivery and hence benefit realisation of the entire proposal.”\textsuperscript{447}

\textsuperscript{438} Heathrow Airport Ltd (NPS0086)
\textsuperscript{439} Heathrow Airport Ltd (NPS0086) p 23
\textsuperscript{440} Q382
\textsuperscript{441} Highways England, Airports Commission Surface Access Works, Strategic Road Network Proposals, Validation of Costs and Delivery Assumptions, 25 October 2016, p 31
\textsuperscript{442} Q382
\textsuperscript{443} Highways England, Airports Commission Surface Access Works, Strategic Road Network Proposals, Validation of Costs and Delivery Assumptions, 25 October 2016, p 31
\textsuperscript{444} Q517
\textsuperscript{446} Highways England, Airports Commission Surface Access Works, Strategic Road Network Proposals, Validation of Costs and Delivery Assumptions, 25 October 2016, p 6
The strategic road network surface access proposals for the ENR scheme are generally consistent with those for the North-West Runway option, with the main exception differences in the scope of the proposed works to the M25. Heathrow Hub believe this was a critical point of difference:

The extended runway in the **ENR scheme** would be constructed much further south from the M4 junction than NWR, allowing the new portion of motorway to be built offline without complex tie-ins and allowing lanes to be easily switched with minimal disruption.448

With respect to the road proposals of the **Gatwick scheme**, Highways England concluded that:

> The Gatwick proposal, whilst being a significant construction scheme does not represent a significant risk to the existing network during construction or have unusual risk of not being delivered in the suggested timeframe. The Gatwick proposal is the lesser in terms of overall delivery risk, impact on existing network during construction and has no apparent direct impact on RIS commitments.449

**Lakeside Energy and Waste**

The NWR would require the removal and replacement of the Lakeside Energy from Waste plant which is a High Temperature Incinerator at Colnbrook near Slough. The Airports Commission concluded that:

> The plant, while not of national importance, nevertheless plays a significant role in regional and local waste management and has a valuable capability to process clinical waste and other contaminated material. Its replacement is not considered an optional component of the scheme. The planning and construction of an Energy from Waste Plant is a substantial exercise in its own right, whose timescales are not substantially shorter than the delivery of new runway infrastructure. The process of planning a provision of an alternative facility would, therefore, need to begin soon after a decision to proceed with airport expansion.450

The revised NPS recognises the “the effects of removing the Lakeside energy from waste plant”451 but only requires the scheme proponent to “make reasonable endeavours to ensure that sufficient provision is made to address the reduction in waste treatment capacity caused by the loss of the Lakeside Energy from Waste plant.”452

Lakeside Energy from Waste Ltd believe the “the draft NPS does not go far enough” and “fails to provide any explicit support for the relocation of the Lakeside EfW or the associated complex”. It subsequently recommends that the plant “be offered the same level of importance as the Immigration Removal Centres given the essential role it plays in the smooth running of the regional waste management system and the reliance upon it

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448 Heathrow Hub Ltd (NP50087)
450 Airports Commission, 16. Delivery: Risk Assessment and Mitigation, November 2014, p 21
451 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 67
452 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 67
of thirteen local authorities. Lakeside EfT Ltd also remarked that “if the plant and the waste complex as a whole were not replaced, given the lack of acceptable alternatives, the direct consequences would be disruptive and financially harmful to the local authorities that rely upon the services provided.”

The ENR scheme retains the Lakeside Energy from Waste Plant.

**Airspace change**

Substantive airspace change has been incredibly difficult to achieve in the UK and because of this, the airspace structure in the UK remains largely as it was since 1974. Given the fine margin in benefits and costs, the NWR scheme may only be economically viable if operating at or close to its maximum stated capacity of 740,000 ATMs—which is dependent on airspace changes taking place. John Holland-Kay acknowledged the risk that airspace change presents to the Heathrow scheme:

> [ … ] airspace change will need to happen, so there will be urgency to do it. We will need certainty on that. If we do not have the space in the sky to service the additional flights, we are not going to have a business case to make this work. We cannot start building. Our investors could not take on that risk. We need to sort all this out.

Andrew Haines of the CAA also believed that airspace changes were a “pretty fundamental” component to the NWR’s deliverability and said that “If we do not change the airspace, there is no economic case to build the runway. You might be able to use it for a few hours a day, but the economic case is destroyed.”

**Technical and safety concerns**

The Heathrow NWR airspace proposal, including any associated flight-path changes, is only provisional and there are no formal guarantees yet that it can be delivered safely and without having a knock-on effect on other airports in the London system. The NPS concedes that there is “ … greater uncertainty [for the NWR scheme] as to what measures may be required to ensure that the airport can operate safely.” The work done to this point has only involved “very high level” preliminary assessments, including an airspace efficiency report by NATS; a Fast Time Airspace Simulation by NATS; an airspace resilience paper by NATS; preliminary safety review by the CAA; and a ground risk analysis by Health and Safety Laboratory. The high-level findings from these assessments are presented below.

NATS, as part of their airspace efficiency report, found that “all three concepts of operation for the revised airport operations can be supported by the London TMA operation at the levels of traffic asserted, subject to the necessary safety case being approved by the CAA.” It added that “it is possible that the additional level of movements at a particular

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453 Lakeside EfW Ltd Grundon Waste Management and Viridor (NPS0005)
454 Lakeside EfW Ltd Grundon Waste Management and Viridor (NPS0005)
455 Heathrow Hub (NPS0087)
456 Q654
457 Q654
458 Q654
459 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 52
460 Q670
461 NATS, Support to the Airports Commission, Appraisal Module 14: Operational Efficiency: Airspace Efficiency Report, p 4
airport may not result in the same increase within the overall network due to potential
inter-airport airspace interactions.” With respect to the NWR scheme, it stated that “the
proximity and relative runway orientations of Heathrow airport and RAF Northolt could
have a detrimental mutual impact their respective operations.” NATS acknowledged
that “all three proposals would require the development of new operating procedures
(including Missed Approach Procedures) and potentially require additional airspace to
be provided to ensure safe and efficient operations.”462 NATS, as part of the Fast Time
Airspace Simulation, also concluded that “none of the proposals could be delivered
into [LAMP Phase 1] airspace,” and post Lamp Phase 2 “London TMA would need to be
substantially redesigned to enable an additional runway as well as the forecast growth at
the other London airfields to be efficiently supported.”463

The CAA, in their preliminary safety review, outlined a list of issues that need resolving
to guarantee that an expanded NWR can operate safely:

- The current ICAO separation for allowing independent approaches with no
  mitigations is 1525m. The existing runway separation is approximately 1450m,
  and the proposed northern runway separation is 1035m from the existing
  northern runway. Appropriate mitigations will need to be provided the design
  meets the requirements of ICAO standards for all possible modes of operation.

- There is a risk that the existing Air Traffic Control Tower may not justify a
  European Aviation Safety Agency derogation and could result in the need for
  alternative tower arrangements.

- The proposal is likely to require new procedures and mitigations to ensure safety
  of the air traffic control operation. Due to the intensive and complex nature
  of the current Heathrow operation, the development of a new 3rd runway will
  require a complete review and update of the entire operation. The CAA note that
  the operation associated with “noise respite periods 2 and 3”, where aircraft are
  departing from adjacent runways may be particularly difficult to achieve given
  the staggered position of the northern runway.

- In normal operations, RAF Northolt is likely to become dependent with the
  proposed northern runway from an ATC perspective. This may limit flexibility
  for Heathrow or RAF Northolt.

- Missed Approach Procedures for both Heathrow and RAF Northolt will need to
  be developed and assessed in detail, particularly given the different operational
  modes and the proximity to RAF Northolt. The CAA says that this “remain
  a major design issue and a major challenge to deliver a safe and operationally
effective environment due to the proximity of RAF Northolt and its runway
  axis.”

- The current airspace design is likely to require a dependency with RAF Northolt
to ensure safe separations, which could reduce capacity at either or both airports.

- Standard Instrument Departure Routes would need to be redesigned to avoid
  conflicts associated with having two runways providing departures and the issue

462 NATS, Support to the Airports Commission, Appraisal Module 14: Operational Efficiency: Airspace Efficiency Report, p 4
463 NATS, 14 Operational Efficiency - Fast Time Airspace Simulation, April 2015
of the third runway being further west; the impact on London City operations is also unclear as precise arrival and departure flight paths are unknown at this stage.

- The London Airspace Management Programme would need to be redesigned with fairly significant new procedures and knock on effects for other airports likely which could take 5-7 years (LAMP Phases 1 & 2 are expected to take 5 and 9 years respectively).464

Andrew Haines in oral evidence said that the CAA “found that there was no obvious impediment to [Heathrow] being developed but there were issues that would need to be dealt with.”465 It should be noted that some of these issues are common to all the expansion options, particularly the last point about the London Airspace Management Programme (see Table 10).

Table 10: Summary of key safety issues for the expansion options466

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Aerodrome</th>
<th>Air traffic management</th>
<th>Airspace</th>
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</thead>
<tbody>
<tr>
<td>Gatwick 2R</td>
<td>Runway separation</td>
<td>ATC procedures including missed approaches likely to be relatively straight forward, although the operation of mixed mode arrival procedure is not yet clear</td>
<td>Impacts on other airspace users yet to be determined</td>
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<tr>
<td></td>
<td>requires mitigations for</td>
<td></td>
<td>Low complexity and impact to other airspace users. Southern TMA redesign, 3-5 years.</td>
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<td></td>
<td>independent operations.</td>
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<td></td>
<td>CAA preference is for taxiways to avoid runway crossings - tbc by promoter.</td>
<td></td>
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<tr>
<td>Heathrow 3R</td>
<td>Runway separation</td>
<td>Proposed runway likely to be dependent with RAF Northolt. Worst case circa one movement lost for each movement permitted at RAF Northolt – tbc.</td>
<td>Impacts on other airspace users yet to be determined</td>
</tr>
<tr>
<td>- NW</td>
<td>requires mitigations for</td>
<td>Certain noise respite modes may be difficult to achieve due to runway stagger. Missed approach procedures and 3 runway concept of operations complex.</td>
<td>Interactions with RAF Northolt remain a challenge to resolve. Significant Inner Core TMA redesign, 5-7 years.</td>
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<tr>
<td></td>
<td>independent operations.</td>
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<td></td>
<td>The ATC Tower currently</td>
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<td></td>
<td>infringes the Obstacle</td>
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<td></td>
<td>Limitation Surfaces at</td>
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<td></td>
<td>Heathrow. New safety</td>
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<td></td>
<td>assessment required - may</td>
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<td></td>
<td>require alternative tower</td>
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<td>arrangements.</td>
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<td>End Around Taxiways</td>
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<td>welcomed.</td>
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<tr>
<td>Heathrow Hub</td>
<td>Runway separation</td>
<td>Missed approach procedures - detailed analysis on the proximity of aircraft conducting missed approaches and departures from the upwind extension including human factors assessment required. If unable to resolve capacity and/or respite opportunity maybe reduced. RAF Northolt dependency to be resolved. May further reduce capacity and flexibility.</td>
<td>Impacts on other airspace users yet to be determined</td>
</tr>
<tr>
<td></td>
<td>requires mitigations for</td>
<td></td>
<td>Interactions with RAF Northolt remain a challenge to resolve. Significant Inner Core TMA redesign, 5-7 years.</td>
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<td>independent operations.</td>
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<td>require alternative tower</td>
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<td></td>
<td>arrangements or restrictions on modes of operation. Potential ILS co-ordination issues. In-line threshold potentially inconsistent with DfT’s PSZ policy.</td>
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**Political hurdles**

Because of the conflicting interests of airports and the highly contentious issue of managing community noise concerns, substantive airspace change has not taken place for decades. The implementation of the London Airspace Management Programme (LAMP) reflects the difficulties associated with agreeing substantive airspace changes. The first phase of LAMP Phase1a was implemented in February 2016, with changes to the airspace used by London City and Stansted airports, including the introduction of performance based navigation at London City and a new standard instrument departure to allow aircraft to climb faster at Stansted. The CAA noted that:

[ … ] the original proposal for LAMP 1a was significantly more ambitious, with proposed changes also made to the departure routes at Gatwick Airport. However, Gatwick withdrew its support for the proposed changes due, as we understand, to the extent of community concerns.

The next phase, LAMP2, will require detailed change plans to be prepared, and will include more fundamental changes to the routes for Stansted, as well as for Heathrow, Gatwick and Luton airports. Given the airspace interdependencies between London’s airports (figure below), the CAA believes that the changes required under LAMP2 and a third runway requires “substantial” coordination and cooperation between individual airports which “will act to protect their own interests and will be limited in the extent to which they can cooperate in order to comply with UK competition law requirements.” Tim Hawkins, who represents Manchester Airports Group (the owner of Stansted Airport), commented:

A word of caution would be that we have to do it in a way that balances the interests of different London airports. It cannot be an issue where the Government bend over backwards to deliver one objective and compromise the interests of a whole load of other airports... We are making sure, as you would expect, that we represent our own interests in this. We are not opposed to the development of a new runway at Heathrow. We need to make sure that, as it is delivered, it is delivered in a way that does not compromise our interests.

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467 Inquiry into Airspace Modernisation, Civil Aviation Authority (ASM0033)
468 Inquiry into Airspace Modernisation, Civil Aviation Authority (ASM0033)
469 Inquiry into Airspace Modernisation, Civil Aviation Authority (ASM0033)
470 Qq160–61
The CAA recently concluded that “there needs to be a stronger system of determining how airspace is designed, how these designs are implemented and how they are enforced.” Specifically, the CAA commented that:

At present, there is no comprehensive mechanism in the airspace management architecture to compel all the necessary parties to bring forward airspace changes. Progress is dependent on the choices of competing commercial airport entities and NATS. Further, there is no mechanism for resolving trade-offs between competing commercial airport entities, but there ought to be.

Because of this, the CAA believes that Government leadership is necessary to set the case for reform and modernisation and to develop and implement the necessary policy about how trade-offs between different parties should be resolved. It added that “a clear ends, ways and means masterplan” was required from Government to set out how UK airspace as a whole should be reformed based on analysis and evidence of future growth aspirations. John Holland-Kaye acknowledged that “it is something that, if I may say, consecutive Governments have put off because it is a big thing to happen.” He added that:

The pressure needs to remain to make sure that the Government deliver on this and that it does not get kicked down the road. Whichever airport is expanded, this will need to happen. It will be needed without expansion just to cope with growth in demand. This is an opportunity to bring it forward.
The Secretary of State was “very confident” that all the airspace changes can be delivered but in terms of a future role for Government in delivering that change, he believed that “it is really going to be for the CAA and NATS to deliver it, and I am confident that they will.”

**Legal risk**

The Planning Act 2008, as amended by the Localism Act 2011, sets out the process by which Nationally Significant Infrastructure Projects can achieve permission through a Development Consent Order (DCO) issued by the relevant Secretary of State.

The Airports Commission acknowledge that there is no clear precedent for securing approval for this type of airport development and that “securing planning permission may be a lengthy process.” It also said that “it is difficult to state definitively how long the planning process will take, including the risk of delay through any legal challenge.”

The Airports Commission believed that because airport capacity is a contentious issue and the privatised UK aviation market is a competitive one, challenge or judicial review of Government decisions is likely and would not necessarily be unique to the Heathrow NWR proposal.

The Secretary of State acknowledged that someone may come forward to challenge the NPS. He commented that the Government “has worked exhaustively to try to cover all bases to make sure that we have provided all the evidence, that we have considered all the different factors in this and consulted where we need to consult.” He said he felt “confident as we go into this process that we do so on a strong base.”

Emma Gilthorpe also commented that “the process itself is there to ensure that the evidence backs up the application we are making … That is a key mechanism for reducing the legal risk.”

**Possibilities for legal challenge**

Once an NPS has been designated, there is a six-week window when legal challenges to it can be made. As this is provided for in the Planning Act 2008, such a challenge is known as a ‘statutory challenge’, in contrast to ordinary judicial review, which is a common law (i.e. non-statutory) remedy. An NPS cannot be challenged on its merits by this method (i.e. on its contents), it can only be challenged on the grounds that “the procedure leading to its designation had some legal flaw and so potential deficiencies in public consultation are likely to be subject to considerable focus.”

According to Bircham Dyson Bell:

> Once the six-week window has expired and any statutory challenges have been dealt with, the only way for an NPS to be changed is for the relevant Secretary of State to review it under s.6 of the PA 2008. It may be possible to persuade the Secretary of State to review an NPS in the light of changed...
circumstances, and it would be possible to seek a judicial review of the Secretary of State deciding not to review an NPS (or failing to decide to review it).\footnote{Bircham Dyson Bell, \textit{A Practical Guide to National Infrastructure Projects, Chapter 4}, January 2014}

The Planning Act 2008 provides for the NPS to be reviewed “whenever the Secretary of State thinks it appropriate to do so”, and all or part of an NPS may be reviewed. In reaching this decision, the Secretary of State must consider whether there have been significant changes in circumstances that were not anticipated in the NPS and would have resulted in changes to policies in the NPS. To date, no NPS has been subject to review.

Once designated the NPS will give direction to the Planning Inspectorate, which will consider specific applications submitted by the scheme promoter. It is then for the Secretary of State, taking account of the Planning Inspectorate’s recommendation, to decide whether to allow that scheme by granting a DCO. Once a decision has been issued by the Secretary of State, there is a 6-week period in which the it may be challenged through judicial review.\footnote{The Planning Inspectorate, \textit{Overview of the nationally significant infrastructure planning process for members of the public and others}, December 2016} Although DCOs are in force during such judicial review challenges, the promoters are unlikely to start implementing projects in case they get overturned. This has a delay on the implementation of projects.\footnote{Eversheds Sutherland, \textit{UK: Judicial review of energy and transport infrastructure projects—recent cases}, February 2014} Legal challenges have already been shown to take considerable amount of time for other national significant infrastructure projects: the Rookery South challenge was heard nearly a year after the event being challenged took place, the Hinkley Point C challenge nearly 10 months later; and the Preesall challenge exactly 8 months later.\footnote{Eversheds Sutherland, \textit{UK: Judicial review of energy and transport infrastructure projects—recent cases}, February 2014}

In terms of transport projects, for the Heysham to M6 link road, campaigners applied for a judicial review to challenge the decision by the Secretary of State to grant approval for the project. While the review was rejected, it took several months between the approval date and the final judgment to be resolved in November 2013. This had the impact of increasing the costs of the scheme and had an impact on the construction start date.\footnote{Eversheds Sutherland, \textit{UK: Judicial review of energy and transport infrastructure projects—recent cases}, February 2014} This was a relatively small and less controversial scheme compared with what is being proposed with the NWR scheme, and the campaigners were applying for judicial review on less controversial grounds.\footnote{The campaign group sought to argue five grounds overall, including that Lancashire County Council had failed to properly consult the public on the proposed road, that the Secretary of State had failed to properly take account of the potential impact of the project on the local otter population and had improperly taken into account National Policy Statements on other NSIP types.}

It is impossible to know the exact grounds upon which a judicial review may be launched. Judicial review could be used on a range of issues; though one of the major risks is related to Heathrow’s future air quality compliance. The Airports Commission considered legal air quality compliance as the “most complicated risk,” and because of this the “delivery of the runway in line with the Commission’s assessment of need could be compromised”.\footnote{Airports Commission, \textit{Business Case and Sustainability Assessment}, July 2015, p 134}
The robustness of the case for and evidence for the NWR scheme will clearly play a factor in minimising its risks at judicial review. The Secretary of State acknowledged this when questioned on the potential legal risks faced for this scheme:

One thing we had to take into account was that there is constantly a legal risk as we go through, and you would want and expect us to take a slightly cautious approach in our assumptions. I do not want anybody to be able to say that we have been wildly optimistic or that we have got something wrong. We will do our best, and are indeed doing our best, to make sure that the arguments we finally bring before Parliament are as resilient and robust as possible, but we will also be completely transparent with this Committee and Parliament about the evidence on which we base it all. Yes, of course I want to make sure that we are as well protected as possible against legal challenge.\textsuperscript{493}

**Phasing**

The Airports Commission acknowledged that, for an investment of this size, phasing the capital spend and the release of capacity may be used to mitigate delivery risk.\textsuperscript{494} While HAL’s exact phasing plans are not yet confirmed, it originally proposed “phased introduction of terminal capacity, with new terminal facilities and the redevelopment of existing terminals being introduced as required by growth in demand,” which the Airports Commission believed to be a credible proposition.\textsuperscript{495} This specifically involved the proposed phasing of development in six steps comprising the following stages:

- Additional aircraft stands–capacity of 80 mppa;
- Phase 1 of T6A and T6B and closure of T3–capacity of 85 mppa;
- Phase 2 of T6A and T6B–capacity of 100 mppa;
- Opening T2E and Phase 2 expansion of T2A–capacity of 110 mppa;
- Opening T2D–capacity of 120 mppa; and
- Opening T2C and Phase 3 expansion of T2A–capacity of 130 mppa.\textsuperscript{496}

John Holland-Kaye also acknowledged that because it had to privately raise all the money through its shareholders and open markets to fund the investment, capacity had to be phased, and it could not “put in all the money up front against uncertain growth”.\textsuperscript{497} He elaborated further on their phasing plans for the NWR:

We are planning to add new capacity at the airport in blocks of 5 million to 10 million passengers by building on the terminals we have today. That allows us to phase the cost of Heathrow expansion, but it also means that we are phasing our ability to take in new airlines to serve new markets.

\textsuperscript{493} Q506
\textsuperscript{494} Airports Commission, Business Case and Sustainability Assessment, July 2015, p 114
\textsuperscript{495} Airports Commission, Business Case and Sustainability Assessment, July 2015, p 123
\textsuperscript{496} Jacobs, Appraisal Framework Module 14. Operational Efficiency: Ground Infrastructure Heathrow Airport Northwest Runway, November 2014
\textsuperscript{497} Q339
We will have to finalise the exact speed at which we do that as we develop our plans with the airlines. The new capacity needs to move in sync with demand.\textsuperscript{498}

Willie Walsh also believed there was potential for phasing the development and therefore the cost of expansion, as passenger demand increases:

I do not think you could have a situation whereby if you go from 480,000 movements to 740,000 it will be done overnight. It will be phased over a number of years. If done sensibly, it can ensure that the costs do not escalate from a passenger charge point of view.\textsuperscript{499}

Heathrow Hub’s phasing plan, per the Airports Commission documents, is broadly the same as that outlined above for the NWR.\textsuperscript{500} Jock Lowe believed their scheme is “viable even at a third of the capacity growth”\textsuperscript{501} and in a follow-up submission said its “Phase 1, costed at £3.8bn, is by far the cheapest, lowest risk option for expansion, and requires no increase in airport charges.”\textsuperscript{502} Heathrow Hub believe this would deliver an additional c.70,000 ATM’s, providing early capacity for up to 95mppa.\textsuperscript{503} Heathrow Hub assert that “there are no comparable published figures for NWR, and no information on how it might be phased.” It added that, “even if phasing were possible, the costs of site clearance and enabling works alone, before any construction even takes place, would exceed the entire cost of Phase 1 of ENR.”\textsuperscript{504} Mr Lowe explained the necessity of phasing in managing scheme risks:

If any of these forecasts are wrong, on passenger numbers and the preferences for where they go, if the emission targets are not met, and particularly if the noise targets are not met—because you will make them legal limits—you have spent all the money. It is all up front with the northwest runway scheme. You do not need to take the risks to still get the same benefits, but in a controlled fashion and not in a one-off fashion.\textsuperscript{505}

The assumed phasing of development at Gatwick consists of four phases:

- Phase 1: Part of the terminal and its pier–capacity of 62 mppa;
- Phase 2: Terminal is extended, pier completed and part of the satellite–capacity of 73 mppa;
- Phase 3: Terminal and satellite further extended - capacity of 82 mppa; and
- Phase 4: Terminal and satellite completed–capacity of 95 mppa.\textsuperscript{506}

\textsuperscript{498} Q339
\textsuperscript{499} Q607
\textsuperscript{500} Jacobs, Appraisal Framework Module 14, Operational Efficiency: Ground Infrastructure Heathrow Airport Extended Northern Runway, November 2014
\textsuperscript{501} Q116
\textsuperscript{502} Heathrow Hub (NPS0087)
\textsuperscript{503} Heathrow Hub (NPS0095)
\textsuperscript{504} Heathrow Hub (NPS0095)
\textsuperscript{505} Q96
\textsuperscript{506} Jacobs, Appraisal Framework Module 14, Operational Efficiency: Ground Infrastructure Gatwick Second Runway, November 2014
Nick Dunn believed that their scheme was the “low-cost, low-risk solution” because they could phase should “traffic come at us quicker or slower than anticipated”. He elaborated:

One reason we have phased the project is that, if demand does not present itself in the way we expect, we can manage some of the key risks and maintain our financing. That might mean that if traffic is less strong than we anticipate, because there might be an economic downturn at the point in time it started, it might not change our long-term view but in the short term we can flex our scheme. Equivalently, if demand presents itself far more rapidly, we can accelerate those schemes and meet it.
Annex E: Community, health and social impacts

Land and community

The NWR scheme is expected to result in the loss of 783 residential properties and several community facilities. Specifically, Harmondsworth primary school is expected to be lost, along with Harmondsworth Community Hall, Sipson Community Centre, Heathrow Special Needs Centre in Longford, nursery schools in Longford and Sipson, the White Horse pub in Longford, and a number of recreational facilities and spaces such as Sipson Recreation Ground. Although some mitigation is provided in terms of financial compensation, the NWR will “result in a substantial loss of housing and community facilities that cannot be reversed”, with the overall effects on community viability significantly negative. At the same time, the NWR will generate demand for an additional 300 to 500 homes per local authority per year. Provision of additional housing will also require the provision of additional community facilities, including schools, health centres, primary care centres and additional parks or open spaces.

242 residential properties will need to be demolished for the ENR scheme. Within the 100m buffer around transport infrastructure, another 165 residences may also need to be demolished. The expansion could generate demand for up to 450 homes per local authority per year up to 2030. This increased demand for properties will require additional schools, two additional health centres and two primary care centres per local authority.

The Gatwick scheme will have a significant impact on the surrounding community. 168 properties are expected to be lost. Four children's nurseries or crèche's would also be lost as a result of it, as well as two places of worship, Trent care home, one charity facility, Crawley Rugby club, Public Rights of Way and part of Rowley Wood. The scheme will generate demand for 136 homes for each of the 14 neighbouring local authorities per year over 10 years, for a total of 19,000 houses. The AoS states that in a “worst-case scenario [these housing] figures are considered to be deliverable within this time frame as land availability is unlikely to be affected by issues such as greenbelt designations.”

Disruption and severance impacts

Upgrades to existing road and rail infrastructure during construction of the NWR will cause disruption and severance impacts on local communities as well as road and rail users, leading to a significant negative impact. While the provision of improved and more varied travel options is expected to improve the resilience of the travel system for a period, the long term this benefit of the NWR scheme is expected to be negated by the expansion of the airport and associated increase in passenger numbers. The additional traffic and increased journey times, according to the Appraisal of Sustainability, will lead to issues of

509 Jacobs, Place Assessment, Prepared for the Airports Commission, November 2014
510 Department for Transport, Appraisal of Sustainability: Appendix A-1 Community, October 2017
511 Department for Transport, Appraisal of Sustainability: Appendix A-1 Community, October 2017
512 Department for Transport, Appraisal of Sustainability: Appendix A-1 Community, October 2017
severance, loss of sense of place, breakdown in community cohesion, and a reduction in the quality of amenity within the community. Equivalent impacts are likely to be realised for the other two schemes.\(^{513}\)

### Jobs and the local economy

The NPS claims that the NWR scheme could generate up to 114,000 jobs.\(^{514}\) This stems from the jobs created through the construction and the attraction of businesses to the region post-development.\(^{515}\) Back Heathrow believe that this job growth will be important in dealing with youth unemployment in the region, stemming from Heathrow’s pledge to create an additional 5,000 apprenticeships.\(^{516}\)

For the ENR scheme, runway expansion could generate between 48,000 and 97,000 local jobs in 2030 and between 31,000 and 63,000 local jobs in 2050.\(^{517}\) For the Gatwick scheme, approximately 9,000 and 21,000 local job opportunities will be created in 2030 because of the expansion project, increasing to a total of between 25,000 and 60,000 local jobs in 2050.\(^{518}\)

Displacement impacts, whereby the employment generated is a transfer of workers from other areas, have not been quantified. This could mean that at a national level, local employment impact is counterbalanced by a net ‘no change’ impact if all the additional workers transfer from other jobs elsewhere.\(^{519}\)

### Noise

The introduction of new flightpaths will result in disturbance for those people living close to the airport and experiencing increases in overflight aircraft noise. Compared to no expansion, the NWR scheme is expected to result in an additional 92,700 people exposed to significant noise annoyance by 2030. The total additional disability-adjusted life years lost over a 60-year design life period have been estimated at 20,439 due to increased annoyance effects. The NWR scheme is also expected to result in increases in exposure of schools (44 in 2030) to extreme noise events.\(^{520}\)

For the ENR scheme, approximately 27,200 additional people will be exposed to noise over 54dB L.Aeq16hr by 2030; although there will be 18,200 fewer people exposed by 2050. However, exposure to noise >63 dB L.Aeq16hr is expected to increase by 41,600 people in 2030, then decline to 22,400 people by 2050.\(^{521}\) The total additional disability-adjusted life years lost over a 60-year design life period have been estimated at 9,901. The ENR scheme is also expected to result in increases in exposure of schools (20 in 2030) to extreme noise events.

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513 Department for Transport, *Appraisal of Sustainability: Appendix A-1 Community*, October 2017
515 It should be noted that this falls within a range down to 57,000 given the uncertainties associated with the type of airport and the size of the airport employment catchment areas.
516 Back Heathrow (NPS0012)
517 Department for Transport, *Appraisal of Sustainability: Appendix A-1 Quality of Life*, October 2017, p 26
519 Department for Transport, *Appraisal of Sustainability*, October 2017, p 73
For the **Gatwick scheme**, approximately 16,200 additional people will be exposed to airspace noise exceeding 54dB LAeq16 hr by 2030 and will increase to 21,300 by 2050. The total additional disability-adjusted life years lost over a 60-year design life period have been estimated at 7,579. The **Gatwick scheme** is also expected to result in increases in exposure of 12 schools in 2030 to extreme noise events.522

**Air pollution**

Existing air quality at and surrounding Heathrow is poor. Four of the adjacent local authorities to Heathrow have declared air quality management areas for exceedances of the annual mean NO2 air quality objective. The **NWR scheme** will result in increased emissions from aircraft and road traffic associated with the airport, resulting in a reversal of the baseline air quality improvements that would have been realised without the scheme. It is predicted that 121,377 people will be affected by higher NO2 concentrations (on average 0.9 μg/m3) at 47,063 properties. This will result in an adverse health effect for local residents due to an increase in mortality and morbidity as well as an increase in respiratory effects and cardiovascular risk within the study area population.523

For the **ENR scheme**, there will be a rise in annual NO2 levels will affect 100,392 people at 38,656 properties.524 For the Gatwick scheme,525 51,328 people and 20,985 properties will experience a rise in annual mean NO2 levels.526

**Health impacts**

Bringing together these and several other impacts, the DfT’s health impact analysis supporting the NPS found that the **NWR scheme** will have major adverse health effects on selected “children and young people” and “people with living in areas with poor health status” and moderately adverse health impacts upon all other groups. It also found that is likely that a NWR will “further increase inequalities between a number of vulnerable groups and the general population” and that “a large number of those most affected by the expansion schemes are unlikely to benefit from the opportunities provided.”527 In terms of the other schemes:

- Due to the densely populated urban area surrounding Heathrow, poor air quality resulting from the **ENR scheme** would affect several thousand local residents as well as sensitive receptors being affected by poorer air quality, resulting in a reversal of the baseline air quality improvements. It could potentially have major adverse health effects on selected ‘children and young people’ and ‘people with living in areas with poor health status’ and moderately adverse health impacts upon all other groups.528

- The **Gatwick scheme** was judged to have a lower detrimental impact upon health; this was in part due to it requiring fewer residential properties to be demolished. This would result in a fewer groups being subjected to moderately adverse health

523 Department for Transport, *Health Impact Analysis*, October 2017, p 84
527 Department for Transport, *Health Impact Analysis*, October 2017, p 4
effects from the risk to both their housing tenure and housing conditions. In addition, it would result in fewer older people being subjected to potential major adverse health effects, once again, from the risk to both their housing tenure and housing conditions.529

Table 11: Summary of community and health impacts, by expansion option

<table>
<thead>
<tr>
<th></th>
<th>LGW-2R</th>
<th>LHR- ENR</th>
<th>LHR-NWR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Properties lost</strong></td>
<td>168 properties</td>
<td>242 properties</td>
<td>783 properties</td>
</tr>
<tr>
<td><strong>Demand for houses</strong></td>
<td>136 per local authority per year</td>
<td>450 per local authority per year</td>
<td>300-500 per local authority per year</td>
</tr>
<tr>
<td><strong>Community losses</strong></td>
<td>4 children’s nurseries, two places of worship, care home, one charity facility, Crawley Rugby club, Public Rights of Way, Rowley Wood</td>
<td>Loss of Punch Bowl Pub and industrial and recreation land is expected</td>
<td>Harmondsworth Community Hall, Sipson Community Centre, Heathrow Special Needs Centre in Longford, nursery schools in Longford and Sipson, the White Horse pub in Longford, and recreational facilities and spaces such as Sipson Recreation Ground</td>
</tr>
<tr>
<td><strong>Jobs created</strong></td>
<td>~9,000 to 21,000 by 2030</td>
<td>~48,000 and 97,000 in 2030</td>
<td>~57,000 to 114,000 by 2030</td>
</tr>
<tr>
<td><strong>Increase in noise exposure exceeding 54dB(LAeq16 hr)</strong></td>
<td>16,200 people by 2030</td>
<td>27,200 people by 2030</td>
<td>92,700 people by 2030</td>
</tr>
<tr>
<td><strong>Increase in NO₂ levels</strong></td>
<td>51,328 people</td>
<td>100,392 people</td>
<td>121,377 people</td>
</tr>
<tr>
<td></td>
<td>20,985 properties</td>
<td>38,656 properties</td>
<td>47,063 properties</td>
</tr>
</tbody>
</table>

Source: Appraisal of Sustainability, October 2017

**Wider planning issues**

The direct impacts on local community and planning considered within the NPS, and to which a future NWR development consent order (DCO) will apply, are indicated by the ‘redline’ boundary map (see figure below). In practice, the impact of the NWR will extend well beyond the ‘redline boundary’ and be felt acutely by nearby communities and local authorities. As the Joint Boroughs of Hillingdon, Richmond, Wandsworth and Windsor and Maidenhead explain:

Development at Heathrow affects the scope for other local planning decisions … it would require thousands of new homes to be built, affecting local plans, road networks and involve siting thousands of extra new residents in areas affected by bad air quality and noise pollution.530

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529 Department for Transport, *Health Impact Analysis*, October 2017, p 150

530 London Boroughs of Hillingdon, Richmond and Wandsworth and Royal Borough of Windsor and Maidenhead, March 2017 (NPS0045)
The Heathrow Strategic Planning Group believe that:

[ … ] the draft Airports NPS fails to adequately address the full impact of an airport operating to the full parameters stated or to recognise the sub-regional scale spatial planning considerations needed to address the full scale of impacts and benefits of the airport expansion is likely to have, on for example housing and employment land and travel demand. This will reach out across a wider area administered by many local planning authorities and straddling the Greater London Authority boundary.532

On the issue of housing, one of the headline statements in the NPS in support of the Heathrow NWR scheme is that expansion of Heathrow will create 114,000 additional jobs. If these predictions are correct they will, according to Neil Spurrier, “put an intolerable burden upon the housing market.”533 The Appraisal of Sustainability reflects this sentiment, stating that “the scale of housing required will increase pressures on current local authority plans across London.”534 The latest estimates show that an additional 300 to 500 homes per local authority per year will be required.535 The London Borough of Hounslow expressed their concerns about the ability of local authorities to meet this housing need:

Local councils in areas within 30 or 40 miles of Heathrow are already struggling, in vain, to find ways to accommodate massively increased numbers of homes, as directed by government. The extra need for another

531 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, Appendix A
532 Heathrow Strategic Planning Group, March 2017 (NPS0075)
533 Teddington Action Group (NPS0006)
534 Department for Transport, Appraisal of Sustainability: Appendix A-1 Community, October 2017, p 20
535 Airports Commission, Local Economy Impacts: Assessment, 2014
3,000 to 4,000 homes cannot be achieved by the local authorities, without sacrificing standards of housing, and building on valuable green space areas.536

Paul Hodgins, Leader of Richmond Council, added in oral evidence that “in terms of the local pressures on housing, remember that at Heathrow it assumes that there will be demolition of existing houses, and those need to be replaced. There would be incredible pressure in that area, both during the time and afterwards on local infrastructure and housing.”537 HAL disagreed with this assertion and said that beyond the immediate site area it did not “envisage a significant impact on any land available for housing development, provided that any new housing is appropriately constructed and noise insulated.”538 The Appraisal of Sustainability states that “increases in noise effects may act as an additional constraint to current housing allocations or to future housing proposals, restricting the ability of the affected local authorities to meet housing delivery targets.”539

Joseph Carter, of the Heathrow Strategic Planning Group (HSPG), believed that housing and other wider planning issues are not adequately addressed in the NPS. The HSPG believed the NPS should properly consider and plan for the wider areas of impact over time and recommended that:

A clear purpose of the Airports NPS should be to set out policy to require that planning for the expansion of the airport is aligned with that of the surrounding sub-region; this is essential to ensure the sustainable development of the airport to meet its full potential and the sustainable future of the surrounding communities.540

Alex Williams of Transport for London expressed their concern that Heathrow expansion “without adequate extra infrastructure, will stifle growth.” With respect to housing, Mr Williams believed that lessons could be learnt from the experience of the Olympics in terms managing the housing demands before and after expansion.541 HAL disagreed:

[ … ] it is difficult to see how this relatively small level of additional demand would stifle growth. The Airports Commission and the Government both modelled local economic and employment effects and identified significant additional growth associated with expansion above a “do nothing” scenario. So far from stifling growth, expansion would support more growth both around the airport and across the country.542

HAL said it was working with the HSPG “to collate a shared evidence base that will consider the likely effects of expansion, and enable local councils to better plan for the housing, economic and infrastructure needs within their areas.”543

536  London Borough of Hounslow, March 2017 (NPS0069)
537  Q276
538  Heathrow Airport Ltd (NPS0078)
539  Department for Transport, Appraisal of Sustainability: Appendix A-1 Community, October 2017, p 22
540  Heathrow Strategic Planning Group, March 2017 (NPS0075)
541  Q277
542  Heathrow Airport Ltd (NPS0078)
543  Heathrow Airport Ltd (NPS0078)
Annex F: Air quality

The impact of air pollutants on human health has increased in profile over the last few years, largely due to the growing scientific evidence about the level of harm that pollutants such as nitrogen oxides (NOx) can cause. The Royal College of Physicians estimated that poor air quality is linked to approximately 40,000 premature deaths a year in the UK.

The UK’s air quality obligations are set out in the 2008 ambient air quality Directive, which has been transposed into English law by the Air Quality Standards Regulations 2010. The Directive “establishes the need to reduce pollution to levels, which minimise harmful effects on human health.” It also specifies “limits values for the protection of human health” (Annex XI) in respect of certain key pollutants, including an annual mean limit value of 40 μg/m3 for nitrogen dioxide (NO2). Compliance is assessed through measurements carried out by “receptors” placed at the high-polluting areas within a region. A region is deemed to be in breach of the Directive if receptors exceed the limit values.

The deadline for compliance was 2010 but several areas in the UK remain above the limit values, including Greater London where main roads regularly breach legal values for nitrogen dioxide. In the latest compliance report, the UK reported that the limit value for annual mean NO2 was exceeded in 37 out of the 43 zones. Where the limit values remain in breach, there is a duty to adopt measures to ensure that the limit value is achieved as soon as possible. Once limit values are achieved there is a duty to ensure that they are not exceeded again.

Recent legal and policy developments and implications for Heathrow

In April 2015, the Supreme Court ruled the Government was in breach of its obligation to bring emissions within EU limits and ordered it to publish an updated plan by which compliance would be achieved. This plan was published by the Department for Environmental, Food and Rural Affairs (DEFRA) in December 2015 and forecast compliance within London by 2025 (“2015 Plan”). The plan proposed a range of measures to achieve compliance, the primary means of which was the introduction of ‘Clean Air Zones’ in urban areas. On 2 November 2016, the Supreme Court ruled that the 2015

References:

544 For more information, see: Department of Environment Food and Rural Affairs (DEFRA), Air Pollution in the UK, 2016, September 2017
545 Royal College of Physicians, Every breath we take: the lifelong impact of air pollution, February 2016
547 DEFRA, UK and EU Air Quality Policy Context, February 2011
549 Micrograms per meter cubed.
551 For more information see: Air Quality in London, LLN-2017–0035, House of Lords Library, 28 June 2017
552 DEFRA, Air Pollution in the UK 2016—Compliance Assessment Summary, September 2017
553 Supreme Court Judgment, R (on the application of ClientEarth) (Appellant) v Secretary of State for the Environment, Food and Rural Affairs (Respondent), 29 April 2015, [2015] UKSC 28
554 DEFRA, Improving air quality in the UK—Tackling nitrogen dioxide in our towns and cities, December 2015
555 DEFRA and Department for Transport, Clean Air Zone Framework, May 2017
Plan was based on “optimistic emissions data [and] did not seek to meet the requirements of the Directive as soon as possible” and that the Government must develop a new draft plan by April 2017.\textsuperscript{556}

The revised Air Quality Plan (“2017 Plan”) was published for consultation in May 2017, with the final version published on 26 July 2017.\textsuperscript{557} The 2017 Plan for NO\textsubscript{2} was required to bring down levels of NO\textsubscript{2} to within legal limits in the shortest time possible, as well as reducing exposure as quickly as possible, and to do so in a way that meeting legal levels was not just possible but likely - as required by the High Court in 2016. On 7 November 2017 Client Earth launched further legal action on the weakness of the 2017 Plan for NO\textsubscript{2}. On 21 February 2018, for the third time, the high court ruled that the Government’s current policy on air pollution was “unlawful” and ordered changes. Mr Justice Garnham, who heard the case, said: “The history of this litigation shows that good faith, hard work and sincere promises are not enough, and it seems court must keep the pressure on to ensure compliance is actually achieved.” He noted a “real risk” from air pollution, said the government’s plans were “seriously flawed”.\textsuperscript{558}

### Air quality in the NPS and legal compliance

Air quality reanalysis has been published alongside the revised Airports NPS,\textsuperscript{559} with a detailed annex included in the Appraisal of Sustainability.\textsuperscript{560} This was done to assess the implications of the 2017 Plan,\textsuperscript{561} as well as new demand forecasts, in terms of the NWR’s compliance in relation to EU Directive.\textsuperscript{562} The air quality reanalysis supporting the NPS concluded that “with the effective implementation of the Government’s 2017 Plan measures (as represented by the PCM model projections in the 2017 Plan), increased airport capacity will not affect modelled compliance with EU limit values.” The NPS also supports the conclusion that compliance would be reached with the NWR scheme:

The result of this analysis helped inform the Government’s view that, with a suitable package of policy and mitigation measures, including the Government’s modified air quality plan, the Heathrow Northwest Runway scheme would be capable of being delivered without impacting the UK’s compliance with air quality limit values.\textsuperscript{563}

What the NPS does not state, however, is that the updated analysis found that its compliance is subject to “uncertainty”. If the NWR were to open in 2026, as is assumed by the DfT in their appraisal, “the risk is high and the option is likely to impact on compliance with limit values due to impacts in central London. The risk falls to medium in 2030.”\textsuperscript{564} Although all those road links included within the Heathrow area are predicted to be compliant by 2024,\textsuperscript{565} both Heathrow options, increase pollutant concentrations on roads across London which would impact compliance. The reanalysis discussed:

\textsuperscript{556} High Court Judgment, \textit{ClientEarth v Secretary of State for Environment, Food and Rural Affairs}, 2 November 2016, [2016] EWHC 2746 (Admin)
\textsuperscript{557} DEFRA and Department for Transport, \textit{UK plan for tackling roadside nitrogen dioxide concentrations}, July 2017
\textsuperscript{558} “Air pollution: UK government loses third court case as plans ruled ‘unlawful’”, The Guardian, 21 February 2018
\textsuperscript{559} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, October 2017
\textsuperscript{560} Department for Transport, \textit{Appraisal of Sustainability}, Appendix A, A-8 Air Quality
\textsuperscript{561} This includes associated Pollution Climate Mapping (PCM) projections.
\textsuperscript{562} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, October 2017, p 1
\textsuperscript{563} Department for Transport, \textit{Revised Draft Airports National Policy Statement}, October 2017, p 49
\textsuperscript{564} Department for Transport, \textit{Revised Draft Airports National Policy Statement}, October 2017, p 18
\textsuperscript{565} Heathrow Airport Limited (NPS0078)
Whilst this increase is small in magnitude, the opening of any option between 2026 and 2030 is coincident with the period over which the Greater London zone moves from non-compliance to compliance in the PCM model projections.\textsuperscript{566} As such, concentrations alongside some roads in central London, including the key A40 Westway, sit at or close to the limit value in all years and emissions scenarios and the small impact from airport expansion risks worsening exceedances of limit values on some routes or delaying compliance with limit values.\textsuperscript{567}

Because of this, reanalysis also concluded that “there are limited actions that the scheme promoters can take to reduce the impacts of the schemes in central London, and the mitigation of risks relies on the effective implementation of the Government’s 2017 Plan measures and RDE legislation to reduce emissions from road transport.”\textsuperscript{568}

The Secretary of State initially said in oral evidence that “mitigation measures are not [considered] in that analysis.”\textsuperscript{569} But the air quality analysis is clear that the baseline modelling is based “based on COPERT v5 emissions factors and ongoing measures to improve air quality”\textsuperscript{570} Caroline Low said that it does not take account of anything the airport might do, for example establishing a low emission zone.\textsuperscript{571} Even so, it is also clear from the reanalysis that compliance is almost entirely contingent on air quality mitigations at the national level rather than airport level mitigations:

The critical link in all years is the A40 (Westway, 70181) in central London—over 15 km away from the airport boundary. On this road, the impact of the airport is small and the risk of non-compliance is determined to a large degree by the magnitude of the PCM model projection rather than the magnitude of the airport impact.\textsuperscript{572}

The NPS states that “failure to demonstrate [compliance] will result in refusal of development consent.”\textsuperscript{573} If the Government’s performance on air quality mitigation continues its current unsuccessful trajectory, there is a very real risk that when it comes to DCO approval it may be refused on the grounds of legal air quality compliance. Even if the Secretary of State approved the scheme, there is a strong chance that the development consent would be subject to judicial review and intense scrutiny on the grounds of air quality compliance.

It should be noted that there is very little headroom in terms of compliance in the assumed baseline scenario in the NPS in which the Air Quality Plan 2017 is implemented effectively. For example, the available headroom is less than 5% for the Baseline scenario until 2029. Given the uncertainty of modelling, an underestimate of even relatively small magnitude may delay compliance. The analysis indicated that the overarching uncertainty in the air quality modelling conducted for the Plan was +/-29%.\textsuperscript{574} The air quality analysis

\textsuperscript{566} In the baseline projections, the Greater London zone is compliant by 2028 and the South East zone compliant before 2025.

\textsuperscript{567} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, October 2017, p 4

\textsuperscript{568} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, October 2017, p 4

\textsuperscript{569} Q538

\textsuperscript{570} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 11

\textsuperscript{571} Q539

\textsuperscript{572} Department for Transport, Appraisal of Sustainability, Appendix A, A-8 Air Quality, p 29

\textsuperscript{573} Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 49

\textsuperscript{574} WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 12
supplementing the Appraisal of Sustainability found that within the vicinity of Heathrow the current modelling tended to under-predict NOx concentrations to those recorded. Helen ApSimon acknowledged in oral evidence that “there were very many uncertainties” about air quality emissions and compliance and that “You can never be 100% sure in this field. Who would have predicted the Volkswagen scandal?”

The ENR scheme impacts on compliance with limit values in all 2017 Plan scenarios, for opening between 2026 and 2030, irrespective of the implementation of Government 2017 Plan actions and irrespective of the level of uncertainty applied to the PCM model projections. The reanalysis concluded that the risk of impacting on compliance is very high for the ENR scheme.

Air quality in the Gatwick area is already within legal limits and the latest analysis concluded that Gatwick was at “low risk of impacting on the UK compliance with limit values.” Additionally, it has “low vulnerability to uncertainties associated with the projection of future pollution concentrations and to the rate of growth in demand from a 2025 opening year.”

The local population impacts

The latest figures from the air quality reanalysis show that there are 47,063 properties where annual mean NO2 concentrations are predicted to be higher with the NWR scheme (on average by 0.9 μg/m3), with 121,377 people affected. These figures only apply to the “Principal Study Area”, which includes the proposed airport site and a 2km perimeter (figure below). This perimeter was based on expert advice to the Airports Commission, and reflects the dispersal of NOx emissions. It is the area that is directly affected by the airport itself. Impacts beyond that area would, according to the Secretary of State, be “non-existent or minimal”. HAL said that the extent of their airports impact on the local population was limited, and pollution from background sources and emissions from non-Heathrow-related road traffic are the most significant contributors to air quality around the Heathrow.

We received evidence to indicate the traffic impacts from an expanded Heathrow extend beyond this 2km radius (see ‘Wider Study Area’ below). While airport related traffic might have a small absolute impact in terms of emissions, additional traffic on an already congested network can have a disproportionate impact in terms of creating additional congestion and additional pollution from non-airport related traffic. The air quality reanalysis found that “modelled roadside pollutant concentrations in Greater London are elevated across a wide area” this was because of the growth in additional vehicle trips generated by the airport. To only model population impacts within a 2km area seems to be an overly rigid view of the potential population impact.

575 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 29
576 Q193
577 Q180
578 Department for Transport, Appraisal of Sustainability, Appendix A, A-8 Air Quality, p 29
579 Department for Transport, Appraisal of Sustainability, Appendix A, A-8 Air Quality, p 14
580 Q495; Q537
581 Q195
582 Q536
583 Heathrow Airport Ltd (NPS0086)
584 Heathrow Strategic Planning Group, March 2017 (NPS0075); Q259
585 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 28
It should be noted the air quality local population impacts have not been updated since they were estimated by the Airports Commission. They do not account for the latest uplift in demand forecasts and ATMs and surface access movements that would be realised with an expanded NWR and the consequent increase in pollution this would cause. It should also be noted that the population analysis is based on a static number of residents rather than an analysis including the population moving through the area.\textsuperscript{587}

**Air quality mitigations**

Road traffic is the dominant emission source causing poor local air quality near Heathrow, as it is in general across the UK.\textsuperscript{588} The Government expects a mitigation package to be put in place by HAL to ensure that wherever possible significant effects are avoided, reduced or offset (“scheme level mitigations”). The Government, as part of the 2017 Plan, has outlined a range of wider initiatives to address the air quality problems associated with road traffic (“wider mitigations”). As discussed, legal compliance is primarily dependent on the timing of the introduction of, and effectiveness of, actions in the Government’s 2017 Plan to reduce emissions from vehicles on the wider road network, together with effective Real-Driving Emissions legislation;\textsuperscript{589} rather than scheme-level mitigations.\textsuperscript{590}

**Scheme level mitigations**

Some of the additional mitigation measures proposed by either the Heathrow\textsuperscript{591} or the Commission, include:

- A high level of public transport provision and uptake;
- Improved Ultra Low Emission Vehicle infrastructure both landside and airside;

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\textsuperscript{587} Q494, Q497-98
\textsuperscript{588} Department for Transport, *Appraisal of Sustainability*, Appendix A, A-8 Air Quality, p 3
\textsuperscript{589} Real-Driving Emissions – EU legislation requiring vehicles to be subject to more stringent emissions testing procedures than at present, improving the real-world control of emissions.
\textsuperscript{590} WSP, *2017 Plan update to air quality re-analysis*, Report No 62103867–041-03, p 2
\textsuperscript{591} For more information, see: Heathrow Airport Ltd, *Our approach to air quality*, January 2018
• Introduction of an airport congestion charge for travellers or an Ultra-Low Emission Zone;
• Improved management to reduce hold times and delays / improved airport efficiency;
• Encouraging airlines to shut down an engine during taxiing;
• NOx emissions charging to encourage the cleanest aircraft; and
• Encouraging technical developments and innovations, such as alternative fuels.\textsuperscript{592}

According to the latest reanalysis, “these mitigation measures have the potential, to varying degrees, to reduce overall emissions of air pollutants with the schemes and to reduce the impacts of those emissions on pollutant concentrations” for a NWR by between 2.4 and 3.6\(\mu\)g/m\(^3\) in 2030.\textsuperscript{593}

**Wider mitigations**

Reductions in overall risk is primarily reliant on the reduction in emissions from vehicles on the public highway. Thus, the principal driver for reducing adverse air quality impacts will be the actions in the Government’s 2017 Plan, to be undertaken at local, regional and national levels. Relevant actions identified prior to but included in the 2017 Plan are:

• Low emission zones—various initiatives including increasing the proportion of ULEV\textsuperscript{s} in their fleets and providing infrastructure such as electric vehicle charging points;
• Bus Service Operators Grant—services which use low or ultra-low emission buses receive a higher rate of payment than those using diesel-powered buses;
• Green Bus Fund—\£89 million to help bus companies and local authorities in England to put over 1200 new low carbon buses on the roads;
• Retrofitting—refers to all or part of an engine being modified with pollution-reducing and/or fuel saving technologies. Since 2013, government has awarded over \£27 million to retrofit almost 3,000 of the oldest vehicles (mainly buses); and
• The UK government’s Renewable Transport Fuel Obligation—encouraging the investment in the production of biofuels, although progress has been stalled recently on improving the grant.

The additional actions proposed in the 2017 Plan include:\textsuperscript{594}

• More stringent laboratory testing requirements for type approval of new Light Duty Vehicles;
• New Real Driving Emissions regulations for light passenger and commercial vehicles;

\textsuperscript{592} Department for Transport, *Appraisal of Sustainability*, Appendix A, A-8 Air Quality, p 28
\textsuperscript{593} Department for Transport, *Appraisal of Sustainability*, Appendix A, A-8 Air Quality, p 28
\textsuperscript{594} For more detail, see: DEFRA, *UK plan for tackling roadside nitrogen dioxide concentrations*, July 2017, p22-44
- Support for low emission freight;
- Additional funding to accelerate the uptake of low emission buses;
- Additional funding to accelerate the uptake of electric taxis;

Cait Hewitt of the Aviation Environment Federation was confident that there will be some improvement in air quality because of these measures, particularly for the critical period of compliance for Heathrow in the mid-2020s. She said it was more a question of whether “we will have made sufficient progress to allow headroom below legal limit values to allow for the additional emissions associated with Heathrow expansion.” The air quality reanalysis, with reference to the latest Euro 6 vehicles and the impacts of existing RDE legislation (and the introduction of zero-emission vehicles), suggested that “that it is possible to be confident that roadside NO2 concentrations will fall in the future.” It similarly found that it is “the rate of decrease that is in question and the point in the future at which the downward trend is established.”

The air quality reanalysis work concludes that “the ability of measures presented in the Air Quality Plan to tackle poor air quality is open to challenge.” Scepticism was raised in evidence as to whether these mitigations would accelerate air quality improvements quickly enough for Heathrow’s compliance. Cait Hewitt said this scepticism was driven by the “very wide margin of uncertainty” and the fact that:

…the Government would need to be focused and very driven in terms of delivering some of these measures. They would need to be so effective that they created extra headroom to allow for the extra emissions from Heathrow. It leaves us in significant doubt that it can all come together in time for the runway opening as planned.

Reflecting on previous history of air quality compliance, Cait Hewitt commented:

It is worth remembering that 10 years ago, when Heathrow expansion was on the table, the Government’s modelling of the day said that everything would be fine by now; the runway could go ahead and there would be headroom within the limits. It turned out that we had been over-optimistic about the extent to which regulation, particularly around diesel vehicles, would be effective in bringing down air pollution.

The Mayor of London is adamant that “an expanded Heathrow can only hope to avoid breaking legal limits by relying on the air quality schemes we are introducing in London.” He added that he had “taken tough decisions to bring improved air quality and associated public health benefits [to Londoners], but these benefits will be lost to enable a third runway.”

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595 Q181
596 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 37
597 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041-03, p 13
598 Q202
599 Q173
600 Mayor of London (NPS0036)
Air quality and costs in the economic case

The monetisation of air quality, as part of the economic appraisal, attempts to capture both the health and environmental damage costs from worse air quality. This is because NOx concentrations have potential impacts on sensitive ecosystems, whilst NO2 is important in terms of potential impacts on human health.601 Sensitive ecosystems may also be affected by nitrogen deposition, which is directly related to concentrations of NO2.602

Jacobs, on behalf of the Airports Commission, used the damage cost approach to calculate the overall damage costs in accordance with the cost per unit mass values (in £/tonne) specified by Defra.603 Using this approach, the air quality damage cost estimated by Jacobs was £958 million, with the damage cost from NOx emissions at £94.2 million. The damage cost per tonne applied by Jacobs in the central estimate was £1,037/tonne which was sourced from the February 2011 Defra guidance and were uplifted to 2014 prices using a GDP deflator.604 However, as explained by Professor ApSimon, the Defra damage cost per ton of £1037 of NOx only applied to the long range secondary particle part of this and excluded the direct local NO2 effects - hence giving a small value for the damage costs of the NOx emissions compared with the primary particulate PM10 emissions. This was because at the time Defra had not determined how to quantify the health risks of the local exposure to NO2. Professor ApSimon concluded that the total damage costs estimated by Jacobs was an underestimate because of the exclusion of direct local impacts.605

Defra’s guidance recognises that a full impact pathway approach is preferred if the resulting damage costs are greater than £50 million.606 The damage cost approach was preferred over the impact pathway approach by Jacobs due to the level of detail available on future pollution concentrations607 and the difficulty predicting mortality rates of the relevant populations from 2030 to 2050 and beyond. Jacobs elaborated, in Annex G of the local assessment, that monetisation of health impacts—discrete from those that dominate the damage cost assessment—was, therefore, limited to a 2030 snapshot of morbidity impacts through the increase in respiratory and cardiovascular related hospital admissions. It was only a “partial assessment of one component of health costs” (see box for details).608

The Defra damage cost guidance was updated in September 2015.609 The damage cost, relevant to the Heathrow schemes, appears to be considerably higher than the previous guidance and are broken down by industry and location. In the latest guidance, the damage cost for NOx emissions relevant to the Heathrow expansion scheme (i.e. Transport

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601 Nitrogen dioxide also plays an important and independent role from PM2.5, in exacerbating asthma, bronchial symptoms, lung inflammation and reduced lung function, through short-term exposure.

602 Pollutant emissions are also associated with damage to built infrastructure and sensitive ecosystems. Nitrogen oxides (NOx) impacts on sensitive habitats and vegetation as it has the potential to alter nutrient availability and cause acid rain. NOx emissions are chemically transformed to NO2 in the atmosphere, which leads to increased nitrogen deposition which may affect sensitive ecosystems.

603 Jacobs, Module 6: Air Quality Local Assessment, Detailed Emissions Inventory and Dispersion Modelling, Prepared for the Airports Commission, May 2015

604 DEFRA, Air Quality Appraisal – Damage Cost Methodology, February 2011

605 Correspondence from Professor Helen ApSimon, 3 February 2018

606 DEFRA, Air Quality Economic Analysis Guidance, Updated September 2015

607 As noted by Professor ApSimon, DEFRA had not determined how to quantify the health risks of the local exposure to NO2

608 Jacobs, Module 6: Air Quality Local Assessment, Detailed Emissions Inventory and Dispersion Modelling, Prepared for the Airports Commission, May 2015

609 DEFRA, Updates in valuing changes in emissions of Oxides of Nitrogen (NOX) and concentrations of Nitrogen Dioxide (NO2), September 2015
outer London) are £64,605/tonne (in 2015 prices). Adjusting for inflation, this damage cost is around 63 times higher than that used by the Airports Commission. This higher damage cost reflects recent evidence published by the World Health Organisation that has strengthened the connection between exposure to NO2 and health impacts, including chronic effects.\(^{610}\) Other evidence supporting the health impacts associated with exposure to NO2 concentrations is outlined by Defra in their September 2015 guidance.\(^{611}\)

### Partial Impact Pathway Approach by Jacobs

In the Jacobs sensitivity analysis, it is the health impact of changes in NO2 and PM10 concentrations that were monetised, using the concentration-response coefficients provided in Defra’s guidance. These concentration-response coefficients capture the change in the number of hospital admissions from the baseline because of the change in concentrations of various pollutants and is used to quantify the effects of short term exposure. The evidence used to calculate the coefficient for nitrogen dioxide is, according to Jacobs, “considered less robust than those for the other pollutants. It is therefore suggested that the quantification of the effects of nitrogen dioxide are included for sensitivity analysis only, and that it is not used for central estimates.” These coefficients were applied to a spatial distribution of the projected 2030 population derived from CACI forecasts. These additional hospital admissions in 2030 were then valued using the Interdepartmental Group on Costs and Benefits recommended health values provided in Defra’s Impact Pathway guidance.

Applying the updated damage cost, the total damage costs from NOx emissions rises to around £5.9 billion, taking the total damage costs to around £6.8 billion (including PM10 costs). The revised damage cost was only applied to the long range secondary particle element estimated by Jacobs and excluded the direct local NO2 effects. Professor ApSimon acknowledged during oral evidence and follow-up correspondence that the updated Defra damage cost estimates are likely to be an overestimate but nevertheless should be higher.\(^{612}\) Professor ApSimon believed that the overestimation accounts for uncertainties about distinguishing effects of NO2 itself when combined with other pollutants—so called “double counting”.\(^{613}\) Professor ApSimon also noted that the dilution of airport emissions at ground level need to be considered and that it is important to distinguish airside emissions from traffic emissions associated with the airport. It is beyond the capabilities of the Committee to estimate the precise damage costs, but it should be higher than the previous Airport Commission estimates. Precise adjustments need to be made to the £5.9 billion estimate above based on the inclusion of direct local NO2 effects, to distinguish the effects of “double counting” and to adjust for dilution of airside emissions.

In the DfT’s updated October 2017 appraisal, the aggregate damage costs of air quality are now 90% lower at £30 million for NOx.\(^{614}\) It is difficult to see how this can be the case.

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611 DEFRA, *Valuing impacts on air quality: Updates in valuing changes in emissions of Oxides of Nitrogen (NOX) and concentrations of Nitrogen Dioxide (NO2)*, September 2015, p 2; Professor ApSimon also commented that recent studies by WHO (the HRAPIE and REVHAAP studies) had reviewed the epidemiological evidence and this had been used in studies for the European Environment Agency and others to estimate health impacts from NO2 exposure. Evidence provided by Mike Holland, an environmental economist, suggested that these additional health impacts could be a substantial addition for NOx emissions despite large uncertainties.

612 Q210; Correspondence from Professor Helen ApSimon, 3 February 2018

613 Correspondence from Professor Helen ApSimon, 3 February 2018

614 Department for Transport, *Updated Appraisal Report*, October 2017
given the substantial rise in unit damage costs for NOx. The DfT states that the updated aggregate costs “reflects the use of the dispersion modelling in the revised approach, which better maps the relationship between emissions and concentrations, and so provides an improved approach to identifying impacts on affected populations.”615 The DfT said they are more confident using this approach given the updated guidance from on concentration response functions, which provided more assurance around the relationship between pollutants and health impacts.616 Using this approach, the DfT has valued concentrations directly which “will lead to much lower cost estimates of air pollution.”617 The DfT said that it used dispersion modelling that was used in the sensitivity analysis of the Jacobs report.618 The DfT compares the resulting costs using this approach to those produced by Jacobs on behalf of the Airports Commission. For Heathrow, the 2030 estimate is £3.8m,619 within the range of £1.4–£5.2m found by the Airports Commission.

According to Jacobs, if the impact pathway approach were to be formally adopted—as a substitute for the damage costs approach – “a full Impact Pathway Assessment would be required and further discussion with Defra would be expected.”620 Similarly, Professor ApSimon commented that “estimates of mapped concentrations and resulting exposure” would be required to apply the revised approach referred to by the DfT; and that “a proper assessment needs a specialised model like ADMS-Airports, which is the model we used for the Airports Commission work and which is currently being used by Heathrow”. Professor ApSimon subsequently concluded that “I have no idea how DfT can have calculated their value- it seems quite wrong!”621

The local assessment, including the detailed dispersion modelling, has not been updated since that produced by Jacobs in May 2015,622 with those results still directly referenced in the latest iteration of the Appraisal of Sustainability to support the NPS.623 In the Further Review and Sensitivities Report, the DfT stated that it had updated the monetised costs “based on analysis commissioned by the department and Defra and undertaken by consultants Ricardo–AEA.”624 No such analysis had been commissioned.

In response to Committee scrutiny, the Secretary of State wrote to the Chair to clarify the Department’s approach to monetising the air quality costs.625 With the limited time available it has not been possible to fully scrutinise the Secretary of State’s explanation. At face value, it does not substantively clarify the points above. In particular, it is not clear how the Department relied solely on the sensitivity analysis in the Airports Commission appraisal when a full Impact Pathway Assessment would usually be required to estimate

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615 Department for Transport, *Updated Appraisal Report*, October 2017
619 This figure is a single year taken from the estimate of impacts over the 60 year appraisal period as set out in the *Updated Appraisal Report*
621 Correspondence from Professor Helen ApSimon, 3 February 2018
623 Department for Transport, *Appraisal of Sustainability, Appendix A, A-8 Air Quality*
625 Correspondence from the Secretary of State, 23 February 2018
the damage costs using the impact pathway approach. Further, the Airports Commission sensitivity analysis only captures one component of the health costs and does not monetise the wider environmental costs from worse air quality.
Annex G: Surface access

In addition to the road access via the M4 and M25, Heathrow Airport is currently served by the Heathrow Express to/from London Paddington, and the London Underground Piccadilly line. A host of additional surface access schemes are required to accompany the NWR scheme. The schemes proposed by the Airports Commission, and which have been retained by the DfT in their updated appraisal work are below.626 HAL have also put forth their initial plans for surface access as part of their January 2018 consultation.627

Figure 39: Improved conventional surface access to Heathrow Airport628

Heathrow will benefit from several already-committed surface transport schemes, including Crossrail and the Piccadilly line upgrades. Although Val Shawcross, Deputy Mayor of London, said that these upgrades should not be relied upon for the Heathrow scheme and were being provided because of the existing population growth and to deal with existing congestion on the network.629 Southern and Western Rail Access schemes have also been proposed. Western Rail access would provide a new rail link from the west, converting the existing rail spur from the Great Western Main Line into a loop and allowing for direct services to the airport from Reading. This would enable passengers from the West of England and Wales to reach the airport by rail without changing trains in Central London. Southern Access would be connected to Waterloo, as well as areas of West London which currently have poor public transport access to the airport.

Western or Southern Rail access have not been committed to formally. It is clear from the evidence that these schemes are essential even in a two-runway world. Phil Graham of the Airports Commission commented that “western rail access was never predicated on the airport expanding. Western rail access was a scheme that was planned well before the

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626 Department for Transport, Updated appraisal report, October 2017, p 32
627 Heathrow Airport Ltd, Our approach to developing a surface access strategy, January 2018
628 Airports Commission, Final Report, July 2015, p 155
629 Q237; Q238
Airports Commission ever came along... it was planned and expected to be put in place whether or not the airport remained at its current size or whether it grew.”

Caroline Low of the DfT said “Western rail access is a scheme that the DfT has been looking at in a two-runway world. It is a scheme that we are actively taking forward, building a business case and considering it in accordance with our normal rail policy.”

Several witnesses emphasised the need for the NPS to make a firm commitment to both the Southern and Western Rail Access schemes. Both the HSPG and the Mayor consider these schemes as “essential” in the immediate term and to be operational in time to accommodate the forecast in growth by 2030. Encouraging signs were provided from the Secretary of State during oral evidence that some of the schemes would be formally taken forward. With respect to the various schemes he commented:

- **Western Rail Access**—“I expect western rail access to begin construction in CP6 and to conclude before the opening of the runway.”
- **Southern Rail Access**—“We are currently in initial discussion with would-be private promoters of southern access. Indeed, we intend to invite proposals for private investment in southern access to Heathrow in the next couple of months. I think that there is a genuine opportunity there to lever in private financial support for that particular investment.”

But in response to whether a formal commitment should be made in the NPS, the Secretary of State said that “the commitments are more likely to be in the DCO rather than the NPS.”

Given the enhancements programme is being rolled back in CP6, there are concerns that there may be difficulties in getting either or both schemes developed and operational in time for the additional runway. When questioned on this, John Holland-Kaye said:

I think people will say that about any rail project for CP6. Money is tight and there is a lot to be done. I think anyone in Network Rail would say that it is unlikely that you will get to the top of the list of funding for CP6 without private investment, and that is what they are looking for.

Val Shawcross believed that experience should tell us that rail schemes were not always developed to complement growth at an expanded Heathrow:

> As a small piece of history, those of you who were around during the debate on terminal 5 may know that there was a lot of encouragement for the idea of an air track proposal, which would have provided a new surface line into Waterloo. That was never required and of course it never happened. There is some bad history around all of this.
Several road schemes are also required both to accommodate the construction of the runway and to mitigate the additional traffic that will be generated by expansion which could "could lead to unacceptable levels of congestion."638

Table 12: Heathrow Northwest Runway required road enhancements639

<table>
<thead>
<tr>
<th>Category</th>
<th>Location</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic road</td>
<td>M4 J3 to J4</td>
<td>Road widening</td>
</tr>
<tr>
<td></td>
<td>M4 Airport Spur</td>
<td>Road widening</td>
</tr>
<tr>
<td></td>
<td>M4 J2 to J3</td>
<td>Road widening</td>
</tr>
<tr>
<td></td>
<td>M4 J4 and J4B</td>
<td>Road widening</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>Large M4 Junction 4b replacement</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>Higher capacity @ M4 J4a</td>
</tr>
<tr>
<td></td>
<td>M4</td>
<td>Capacity improvements to existing main airport tunnel</td>
</tr>
<tr>
<td></td>
<td>M25</td>
<td>M25 tunnelling costs (south of junction 15)</td>
</tr>
<tr>
<td>Local road network</td>
<td>A4</td>
<td>Diversion of A4 road alignment, dual carriageway</td>
</tr>
<tr>
<td></td>
<td>A3044</td>
<td>Diversion of A3044 road alignment, dual carriageway</td>
</tr>
<tr>
<td></td>
<td>Airport Roads</td>
<td>Airport Way/Southern Perimeter Road Interchange, grade-separated junction and flyover/bridge structures</td>
</tr>
<tr>
<td></td>
<td>Heathrow Road Tunnel</td>
<td>Southern Road Tunnel/Southern Perimeter Road Interchange</td>
</tr>
<tr>
<td></td>
<td>Airport One Way</td>
<td>One way system for western campus</td>
</tr>
</tbody>
</table>

The ability of the proposed schemes to cater for the step change in demand

There is general agreement in the evidence that the measures outlined by the Airports Commission to support the NPS are essential.640 Many submissions, however, believe these proposals still will not be sufficient to cater for the step-change in passenger and freight traffic to accompany expansion. The Mayor and Transport for London (TfL) have pursued this point rigorously.

This argument has become even more pressing given the revised demand forecasts produced by the DfT which shows that there will be a greater increase in passenger movements with each of the expansions options than was previously forecast by the Airports Commission.641 This means that more people will be going to and from the airport by road than was initially forecast. In fact, using a revised set of surface access forecasts,642 unmitigated trip

638 Airports Commission, Final Report, July 2015, p 157; For full discussion of the road network enhancements see: Highways England,
639 Airports Commission, Final Report, July 2015, p 158
640 Q235; Q238
641 While it is universally accepted by witnesses that this is an implausible eventuality, that is the planning assumption being used by the DfT and for consistency the rest of the NPS should be judged against that benchmark.
642 A comprehensive analysis was not published to accompany the NPS and the Department did not materially reconsider the surface access requirements to support the NWR, instead deferring to the schemes and costings proposed by the Airports Commission.
generation gives 17% more growth in total highways trips than the Airports Commission’s forecast for the Heathrow NWR Option (Table 13). This new and rapid growth assumed by the DfT would place further strain on the surface access networks supporting Heathrow, bringing forward “harmful impacts on communities and the environment, including crowding on public transport and congestion on the roads.” According to the HSPG, “this underlines the need to improve surface access sooner than first anticipated to Heathrow airport.” HAL said that its “surface access strategy will provide flexibility in its delivery such that initiatives can be brought forward if growth in passenger numbers is faster than expected.” Road user charging, emissions charging and reducing levels of parking are suggested as such initiatives.

A follow-up report to the NPS by TfL concluded that “the NPS fails to provide a credible plan for how the 173,000 additional daily trips by passengers and staff to an expanded Heathrow will be accommodated on the surface transport network.” TfL modelling showed that even with the committed and assumed schemes, there will be a significant increase of 72,000 passengers using the highways daily, resulting in “congestion and delays

### Table 13: Airports Commission and New DfT (2017 High) forecasts of growth in total highway trip generation with option (trips/day)

<table>
<thead>
<tr>
<th>OPTION</th>
<th>2026</th>
<th>2030</th>
<th>RATIO*** DfT 2026 / AC 2030</th>
<th>RATIO*** DfT 2030 / AC 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AC 2017 High</td>
<td>AC 2017 High</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Growth</strong> in Total Highway Trip Generation with Option (Passenger + Employee)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2R</td>
<td>12,962</td>
<td>10,226</td>
<td>22,353</td>
<td>17,091</td>
</tr>
<tr>
<td>NWR</td>
<td>11,881</td>
<td>43,306</td>
<td>42,736</td>
<td>50,077</td>
</tr>
<tr>
<td>ENR</td>
<td>11,939</td>
<td>41,033</td>
<td>40,620</td>
<td>44,318</td>
</tr>
<tr>
<td><strong>Growth</strong> in central London Trip Generation with Option</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2R</td>
<td>866</td>
<td>681</td>
<td>1,567</td>
<td>1,250</td>
</tr>
<tr>
<td>NWR</td>
<td>1,695</td>
<td>4,862</td>
<td>6,014</td>
<td>6,412</td>
</tr>
<tr>
<td>ENR</td>
<td>1,694</td>
<td>4,842</td>
<td>5,781</td>
<td>5,795</td>
</tr>
<tr>
<td><strong>Growth</strong> in Total Employee Trip Generation with Option</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2R</td>
<td>2,963</td>
<td>1,719</td>
<td>5,292</td>
<td>2,732</td>
</tr>
<tr>
<td>NWR</td>
<td>3,811</td>
<td>12,585</td>
<td>10,860</td>
<td>12,817</td>
</tr>
<tr>
<td>ENR</td>
<td>3,820</td>
<td>11,580</td>
<td>10,274</td>
<td>11,336</td>
</tr>
</tbody>
</table>

643 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041–03, October 2017, p 19
644 Q241
645 Mayor of London (NPS0036)
646 Heathrow Strategic Planning Group (NPS0045)
647 Heathrow Airport Ltd (NPS0078)
648 Growth in Trip Generation with Option = Trip Generation with Option – Trip Generation Without Option (DM)
649 WSP, 2017 Plan update to air quality re-analysis, Report No 62103867–041–03, October 2017, Appendix B
for both airport and non-airport users.” The Secretary of State and the DfT were critical of the TfL modelling and some of the assumptions that it had made, for example, saying that “TfL assumed four instead of six Crossrail trains per hour.”

Even before the demand forecasts were updated, the Airports Commission had found that some segments of the surface access network would struggle to cope with peak demand. The Southern Rail Access link and the central sections of Crossrail were forecast to be highly congested during the morning peak, while the Piccadilly Line will also be highly congested and reaching the limits of its capacity as it approaches central London. Crossrail is also expected to be essentially operating at or beyond full capacity by 2030; though HAL are proposing to add an additional two Elizabeth line (Crossrail) services per hour to Heathrow than is currently assumed. With the exception of some sections of Crossrail, the strategic rail links serving the airport will not be as congested outside peak hours. While Heathrow’s contribution to crowding on the rail lines serving the airport is marginal, “the scale of the growth in background demand means that these impacts cannot be discounted.”

Several links on the roads network near to the airport, particularly those sections of the M4 in the closest proximity, are expected to require widening to cope with increased demand resulting from expansion. The resulting congestion on the roads network may need demand management measures, such as congestion charging, to be used. The Airports Commission acknowledged that a road user access charge may be required to mitigate road congestion in and around the airport. Modelling by TfL has come to a similar conclusion and Alex Williams in oral evidence said that, “Some form of demand management is absolutely essential to get anywhere near the aspiration of HAL of no increase in vehicular traffic.” The revised NPS notes that some form of congestion charge might be appropriate, but according to the Mayor of London “it fails to recognise that this is a necessity for an expanded Heathrow if it is to achieve a more sustainable mode share.” The Secretary of State was also supportive of such a measure.

Despite these findings, John Holland-Kaye believed that the NWR scheme “does not rely on new infrastructure that is not yet committed” and added that “just to be clear, we do not need western rail or southern rail in order to meet our mode share targets in a three-runway world.” Caroline Low of the Department also believed that “those rail schemes, while very important for access to the airport, are not necessarily essential to deliver the mode share targets.”

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652 Q551
653 Airports Commission, Final Report, July 2015, p 160
654 Heathrow Airport Ltd (NPS0078)
655 Heathrow Airport Ltd (NPS0078)
656 Heathrow Airport Ltd (NPS0078)
657 Q236
658 Department for Transport Revised Draft Airports National Policy Statement, October 2017, p 49
659 Mayor of London (NPS0036)
660 Q546
661 Q363
662 Q369
663 Q45
Uncertain costs

The DfT concedes that “surface access cost estimates remain uncertain given schemes different stages of development,”664 though it is estimated that £5 billion in capital costs would be required (table below). Caroline Low said the DfT were “confident that the £5 billion captures everything that we think will be needed.”665

Table 14: Surface access costs for various expansion options, £m (2014 prices)666

<table>
<thead>
<tr>
<th></th>
<th>Gatwick</th>
<th>ENR</th>
<th>NWR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roads</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Capex</td>
<td>510</td>
<td>2605</td>
<td>2234.5</td>
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<tr>
<td>Asset Replacement Capex</td>
<td>23.2</td>
<td>58.3</td>
<td>49.2</td>
</tr>
<tr>
<td>Opex</td>
<td>13.6</td>
<td>48.1</td>
<td>43.3</td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capex</td>
<td></td>
<td>487.5</td>
<td>487.5</td>
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<tr>
<td>Asset Replacement Cap</td>
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<td>45.5</td>
<td>45.5</td>
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<tr>
<td>Opex</td>
<td></td>
<td>514.8</td>
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<td>Optimism bias on capex</td>
<td>234.6</td>
<td>1523.6</td>
<td>1356.6</td>
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<tr>
<td>Optimism bias on opex</td>
<td>6</td>
<td>232.2</td>
<td>230.1</td>
</tr>
<tr>
<td><strong>Total capex</strong></td>
<td>767.8</td>
<td>4720</td>
<td>4173.4</td>
</tr>
<tr>
<td><strong>Total opex</strong></td>
<td>19.6</td>
<td>795.2</td>
<td>788.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>787.4</td>
<td>5,515.20</td>
<td>4,961.60</td>
</tr>
</tbody>
</table>

Transport for London said it would cost between £10 and £15 billion to build the required surface access to support a NWR;667 although the DfT does not accept that figure and their understanding is that the TfL figure “includes a lot of schemes that will potentially be necessary to deal with background growth in London.”668 The Secretary of State also firmly believed that “there is no reason for what I have described to cost anything like £15 billion.”669 Emma Gilthorpe also commented that:

I think the £10 billion to £15 billion was a number that came from TfL. It related to all of west London’s transport needs. I think we can all agree that that is not Heathrow’s responsibility.670

Emma Gilthorpe said that HAL have committed “about £2 billion in our costings for various aspects of surface access, which includes roads as well as an estimate for rail.”671 John Holland-Kaye said this “includes re-providing existing roads and the additional allowance for the M25, which I think was included in the £5 billion that the Airports Commission identified, so we have absorbed part of that, and the contribution towards rail.”672

664 Department for Transport, Updated Appraisal Report, October 2017, p 31-32
665 Q45
666 Airports Commission, Cost and commercial viability: cost and revenue identifications updates, July 2015
668 Q45
669 Q555
670 Q379
671 Q379
672 Q381
There are several outstanding issues that bring into question the accuracy of £5 billion costings and there is a real likelihood that the costings will rise above what is currently estimated as part of the NWR appraisal:

- **Western Rail** is not accounted for—the £5 billion that the Commission set out does not include Western Rail Access because the Airports Commission assumed that was a scheme the DfT was already taking forward. While Caroline Low, said this was the case, no firm commitment or business case has been put forward for WRA. HAL will inevitably have to contribute to this scheme and given this scheme is considered by many as essential for a third runway, it is not clear why the costs associated with WRA are not included in the headline costings.

- **Uncertainty over rail scheme costs**—the February 2017 version of the NPS said that Western and Southern Rail could cost between £1.4 and £2.5 billion. The Secretary of State believed the total cost of these schemes would be a little more than £1 billion, “but not massively so.” Even then he, acknowledged that “in a world of rail projects, putting an exact figure on them is probably fairly rash.” Emma Gilthorpe also said Heathrow did not yet know what the costs of these rail schemes are going to be, “so it comes with a healthy dose of risk attached to it.” TfL said the major cost risks were associated with Southern Rail Access because of the uncertainty around which scheme would be taken forward. Alex Williams said that “there are four, five or six versions of that scheme” and that there are varying costs estimates depending on which one is chosen.

- **Disagreement about what roads improvements are required**—the main contention is around how the M4 widening scheme is delivered and costed as part of package of road works to accompany the NWR. The Airports Commission originally included the £1,267 million of costs for the M4 widening scheme as part of their total surface access costs. Even then, Highways England believed this costing to be at the lower end of the range, and there was considerable risk to this element of the scheme. HAL disagreed with the Commission on this because it “felt that a widening of the key part of an arterial road that already had some air quality issues was not the right answer.”

- **M25 cost inflation**—this scheme is viewed by many as one of the high-risk elements of this scheme. The Airports Commission originally estimated these works to cost £576 million. Highways England believed there was significant potential for cost overruns because of the high level of uncertainty over the

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673 Q45
674 Q236
676 Q555
677 Q556
678 Q379
679 Q240
680 Q247
682 Q379
683 See Annex D for full discussion.
scope of works required. Highways England estimated the M25 to cost between £471 and £1,101 million, so the current costing in the DfT’s appraisal is at the lower end of the range.

- A low emissions zone charge is not accounted for—both the Airports Commission and the Secretary of State believe this to an important measure to encourage modal-shift and to adequately mitigate future air quality compliance issues. The air quality reanalysis also supports this view. An emissions charge will have direct costs in terms of its implementation, as well as indirect costs in terms of the charges levied on passengers accessing the airports. Neither of these costs have been accounted for in the appraisal.

In addition to the ambiguities around the total costs, there are uncertainties as to who is going to pay for these. The draft NPS is clear that Heathrow will pay for the full cost of M25, A4 and A3044 diversions and roadworks. However, it is vague about the contribution it expects from HAL towards the costs of Western Rail Access and Southern Rail Access, stating only that it would be “expected to make a contribution towards the cost.”

These outstanding issues around surface access costs and their attribution between the public and private sectors are vitally important both from a business case and scheme financeability point of view:

- **Business case**—if these estimates misrepresent the end costs, then the appraisal is not reflective of the balance of costs and benefits of the NWR scheme. Further, if the schemes that have been costed are insufficient to deal with the increase in passenger demand, which is quite possible, then the surface access network is likely to suffer from capacity and congestion problems, particularly during the peak periods. The ease of access to airports is the single-most important factor contributing to passenger airport choice. A disrupted journey could not only reduce the demand for the airport, but it could negate any travel-time savings that would have been realised from an expanded airport. Given passenger benefits, of which travel-time savings are included, account for over 90% of the total scheme benefits, induced delays from insufficient surface access provision could have a material impact on the business case of the scheme.

- **Scheme financeability**—the Airports Commission assessed the financeability of the NWR proposal without accounting for HAL’s eventual surface access contributions. The reasons for doing this are unclear. Even so, the Commission concluded that there were several elements of investment risk which undermine HAL’s ability to raise the debt and equity required to finance this scheme. Uncertainties around surface access costs and HAL’s eventual contribution will only serve to add investment risk to the NWR scheme.

**The suitability and enforceability of the surface access mode share targets**

HAL, as part of its formal planning application, will have to prepare an airport surface access strategy to outline how it will “maximise the proportion of journeys made to the
airport by public transport, cycling and walking to achieve a public transport mode share\textsuperscript{685} of at least 50% by 2030 and 55% by 2040.\textsuperscript{686} HAL has pledged that its landside airport-related traffic\textsuperscript{687} will be no greater than today.\textsuperscript{688} John Holland-Kaye believes that target “is very achievable with what is currently in place.”\textsuperscript{689} He pointed to HAL’s track record as evidence of its ability to meet surface access targets:

> In the last 25 years, Heathrow has pretty much doubled in the number of passengers that we have. We have increased the amount of employment we have, and yet we have had almost no more cars on the road and we have seen a 20% reduction in emissions. We have a good track record of doing this. We have done it before and we will do it again. We know exactly what interventions we need to make and we have a robust plan.\textsuperscript{690}

Recent data shows that most passengers travel to the airport by taxi or hire and has only come down slightly in the last decade, so HAL would have to make considerable inroads to what has done in recent history (figure below).

\begin{itemize}
\item \textsuperscript{685} That is, the proportion of the passengers accessing the airport by different modes of public and private transport
\item \textsuperscript{686} Department for Transport Revised Draft Airports National Policy Statement, October 2017, p 47
\item \textsuperscript{687} ‘Heathrow related traffic’ is defined as motorised vehicle movements into and out of the airport and using the public highway, whether carrying air passengers or colleagues or for the purposes of airport related freight and servicing. This includes all cars, taxis, vans, goods vehicles, buses and coaches. Airport related freight and servicing traffic relates to those trips whose origin or destination is within the Heathrow campus or a related warehouse supporting Heathrow airport.
\item \textsuperscript{688} Heathrow Airport Ltd and Department for Transport Statement of Principles, p 38
\item \textsuperscript{689} Q363
\item \textsuperscript{690} Q364
\end{itemize}
HAL said it was “making continuous incremental improvements in order to reduce car use and maintain this level whilst passenger numbers continue to grow,” but they believed achieving a step-change in mode share is likely to come with more significant transport infrastructure investments coming forward, including the Elizabeth Line and HS2.

The draft NPS does not have any formal conditions of approval in the NPS with respect to the mode-share targets and landside airport-related traffic. It simply states that “Heathrow Airport should continue to strive to meet its public pledge.” In response to whether surface access commitments should be a condition in the NPS, the Secretary of State commented that:

What we are going to look at is how we put into the various development consents requirements on surface access. I do not want to be specific today about exactly what form they will take, but we will want some conditionality in there that requires the progress on surface access. It would not be appropriate to do otherwise.

When pressed on whether their commitments should be a binding condition in the NPS, Emma Gilthorpe commented:

I think I would want to see what the planning regime was and precisely what the infrastructure was. The commitments we have made are based on our plan. The plan can change between now and then. It is absolutely appropriate to have commitments, but they would come at the stage of the DCO rather than in the planning policy, which is the NPS that we are talking about today.
The Mayor of London described these targets as “woefully unambitious” and will “result in a substantial increase in vehicle trips on the already congested networks that serve the airport.” Alex Williams elaborated in oral evidence saying that “If you just stick with the 50% NPS target, you are accepting substantial growth in vehicular traffic on the road network—between 40,000 and 60,000 vehicles a day on already congested road networks.” TFL analysis shows that for HAL’s pledges to be realised, at least 61% of passengers and staff, and as many as 69%, need to access the airport by public transport and other sustainable modes. HAL disputed these figures and believes that a scenario with 133 million passengers, which is closer to the expected capacity of Heathrow with a third runway would, based on TFL modelling, require a mode-share of 61% to achieve no additional airport traffic.

The draft NPS does not set out any detail on how the public transport target will be measured, the baseline against which it will be measured, or what sanctions will be imposed if it is not met. The Mayor of London asserts that “the NPS lacks the robust conditions to hold the airport to account, without strict enough targets or monitoring and enforcement mechanisms.” The HSPG also commented that, “there appears to be little reference on how the airport will be obligated to achieve these targets proposed in the NPS and how this may work in practice other than they ‘should be held to account’.” They subsequently recommended that “[surface access] targets be binding and failure to achieve them must result in some form of sanctions that will reduce the intensity of activity at the airport.” The London Borough of Hounslow also recommended that “targets be binding and failure to achieve them must result in some financial penalties and/or obligation to reduce intensity of activity at the airport.”

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696 Q236
697 Mayor of London (NPS0036)
698 Heathrow Airport Ltd (NPS0086)
699 Gatwick Airport, March 2017 (NPS0037); Mrs Sarah Clayton, March 2017 (NPS0056); and London Borough of Hounslow, March 2017 (NPS0069)
700 Mayor of London (NPS0036)
701 London Borough of Hounslow, March 2017 (NPS0069)
Annex H: Noise

The NPS acknowledges that noise can have a significant impact on communities, and “there is growing evidence that exposure to high levels of aircraft noise can adversely affect people’s health.”702 This is consistent with work from the University of London, prepared for the Airports Commission, which concluded that “the health effects of environmental noise are diverse, serious, and because of widespread exposure, very prevalent. For populations around airports, aircraft noise exposure can be chronic.”703

Expansion at Heathrow will lead to a rise of around 700 flights per day compared to a no expansion scenario. The NWR scheme is estimated to cause significant annoyance704 for 653,900 people in 2030, as well as 263 noise sensitive buildings.705 This is 92,700 more people than would be impacted without expansion. For comparison, the Gatwick and ENR schemes are estimated to impact an additional 16,200 and 27,200 people in 2030 (figure below). The ENR scheme is estimated to result in a net improvement in terms of the number of people captured in the noise envelope by the end of the appraisal period.706 The difference between the Heathrow and Gatwick proposals reflect the fact that Gatwick expansion is over a largely rural area. It is not unpopulated, but it is largely rural compared with the expansion at Heathrow.707

The NWR scheme will also result in an increase of around 20,000 people impacted by noise levels that are acknowledged by the government to contribute to premature deaths (figure below).709

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702 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 52
703 C Clark, “Aircraft noise effects on health”, (University of London), May 2015
704 At the 54 dB L\text{Aeq},16\text{hr} which measures noise for a certain period of time during the day and averages that out by day over several months.
705 Schools, hospitals and religious places of worship are considered noise-sensitive buildings for the DfT appraisal.
706 Department for Transport, Appraisal of Sustainability, Appendix A, A-4 Noise, p 40
707 Q110
708 Department for Transport, Appraisal of Sustainability, Appendix A, A-4 Noise
709 At the 63-decibel contour level
**Figure 42: NWR Local Airspace >63 dB Daytime Average Noise SOAE Population Exposure**

Do we have a clear picture of the noise impact?

It is, of course, impossible to know with absolute certainty what the exact noise outcomes of a NWR will be without actual flight-paths. Noise modelling has been produced to support the NPS based on indicative flight-paths. But as with any other forecasting, the outputs of the noise modelling are only as good as the assumptions fed into the modelling. The noise outputs are driven by various, and at times, uncertain assumptions around future aircraft traffic, flight-paths, aircraft noise efficiency and population densities. The noise outputs can also be represented in different ways, using different metrics and at different thresholds.

Several submissions have shone a light on the validity of key assumptions used by the DfT in developing the latest round of the noise estimates. Further investigations suggest that the noise picture portrayed by the DfT is unlikely to reflect the eventual noise impact of the scheme. The issues dealt with below can come across as overly technical but the impacts on the headline figures, which ultimately shape public perceptions and acceptability of this scheme, are profound.

**Presentation of noise impacts in the appraisal**

Appendix A-4 of the DfT’s Appraisal of Sustainability presents the latest result of the noise modelling work commissioned by the DfT to support the NPS. It has been updated using the DfT’s latest aviation demand forecasts and shows overall populations affected by noise and the net change in noise exposure at three different thresholds.

The presentation of the modelling work using ‘net figures’ presents a slightly skewed picture and does not reflect the political realities of how noise changes will be received by communities. The DfT’s approach nets out the ‘winners’ and ‘losers’ from noise changes. Yet community acceptability is often shaped much more by the ‘losers’ who have a much lower tolerance to equivalent levels of noise to people who’ve been exposed over long periods. This was explained by John Stewart of HACAN:

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712 >54 dB, >63dB, >69dB Daytime Average Noise
713 Q306
If people grew up under the flightpath or have lived with it for some time, they find it easier to live with than if they come across noise for the first time. But that, of course, is the big problem for the third runway. However much respite you get, there will be a third flightpath and that will bring people who have not had noise under it for the first time. They will undoubtedly feel more affected than people who have lived with it for quite some time.\textsuperscript{714}

On this basis, a more revealing metric—which is not presented in the appraisal work supporting the NPS—might be the gross number of people who will be newly exposed to significant levels of noise annoyance.\textsuperscript{715} The figure below shows that substantially more people will be newly affected by significant noise annoyance with the NWR scheme than the other proposals.

\textbf{Figure 43: Number of people newly affected by significant noise annoyance (>54dB), by expansion option, 2030}\textsuperscript{716}

The figure below shows the gross number of people who will be exposed to worse noise\textsuperscript{717} above the significant noise annoyance thresholds across the three schemes. That is, they are either newly affected by this level of noise or were already above this threshold and are exposed to higher levels of noise. Again, it shows that more people will be experience worse and significant noise annoyance with the NWR scheme than the other proposals.

\textsuperscript{714} Q306
\textsuperscript{715} This is an estimate of the number of people who without a runway scheme experienced noise of less than 54dB but with expansion will experience noise greater than 54dB.
\textsuperscript{716} CAA monetisation workbooks
\textsuperscript{717} The noise modelling results are only presented in the 3dB intervals, so a “worse noise” means moving from a lower interval to a higher interval.
Figure 44: Number of people exposed to worse noise, at or above the 54dB threshold, by expansion option\textsuperscript{718}

Baseline of assessment

A baseline (or ‘do-minimum’) is developed in the noise modelling to understand what the noise footprint at Heathrow would be with and without an extra runway. Any changes should reflect factors related specifically to expansion (e.g. having more ATMs, different flight-paths and operational procedures). Other factors such as industry-wide aircraft or airspace changes would usually be applied equally across the baseline and expansion options. This is to ensure expansion and no-expansion outcomes are compared on a like-for-like basis.

It is not entirely clear whether this is the case in the noise modelling used to support the NPS. As revealed in the figure below, the noise efficiency\textsuperscript{719} improvements are considerably greater in a scenario of expansion than no-expansion (figure below).\textsuperscript{720} In other words, the noise footprint is getting smaller at a much greater rate with expansion than without.

\textsuperscript{718} CAA monetisation workbooks
\textsuperscript{719} Measured by dividing the annual number of aircraft movements by the number of people exposed to noise at the 54dB threshold of noise.
\textsuperscript{720} Department for Transport, Appraisal of Sustainability, Appendix A, A-4 Noise
Transport for London believe that the current modelling approach does not provide a sound basis for comparison. Specifically, it believes the noise modelling for the NWR relies on new technology and related operational innovations which are optimistic and unrelated to expansion. Stephen Clark, Dave Gilbert and Katie Williams also criticised the lack of comparability between the baseline and expansion modelling:

[ ... ] the Do Minimum (DM) scenario is not optimised in the way the change (third runway) option is. In order to undertake a proper analysis with a level playing field, the base case should have assumed flight paths could be varied, included deeper landings into the airport and steeper descents introduced to reduce impacts, as this can occur without expansion.

Noise metrics and thresholds

Measuring noise is complex and inevitably involves a simplification of the complexity of human responses to noise in real situations. Because of this, typically a series of metrics and at different thresholds (i.e. the noise scorecard) are used to assess the scale of noise impact. This is reflected in national policy.

The revised NPS states that the “the noise scorecard [supporting the NPS] includes both conventional metrics and more innovative metrics.” It should be noted that the NPS noise analysis relies on fewer metrics and at fewer thresholds of noise than was developed
by the Airports Commission.\textsuperscript{728} Because the DfT is almost entirely reliant on the noise contour approach, it has failed to apply best practice in its noise assessment.\textsuperscript{729} The noise contour method essentially measures noise for a certain period during the day and averages that out over several months. For example, the “54 dB LAeq,16h” metric—which is the primary one used by the DfT—is the average summertime daytime/evening period of noise between 7am and 11pm. Average noise is then represented through noise contour maps that illustrate the different areas around Heathrow impacted at different thresholds (figure below).

\textbf{Figure 46: Noise contour map in 2030 as estimated by the Airports Commission—Minimise Total scenario}\textsuperscript{730}

Several witnesses argued that this \textbf{averaging approach} misrepresents the scale of people impacted by noise, particularly because it ignores areas that planes may fly over for part of the year but, when they do so, are badly hit. On days where the airport is running easterly operations, for example, places such as Teddington and Ealing are overflown intensely. Stephen Clark said that on such days Teddington suffers over 17 hours of continuous noise from 400+ flights, concentrated in early morning and very late evening.\textsuperscript{731} Yet these places fall outside the annoyance contours because non-noise days are included in the averaging method.

It is also argued that averaging noise gives too much weight to the noise of individual aircraft, which is on the whole falling, and not enough weight to the number of planes, which will rise.\textsuperscript{732} John Stewart of HACAN also said that “our members do not hear average noise.” HACAN have been arguing for some time that “a suite of metrics should be used rather than just relying exclusively on the averaging.”\textsuperscript{733} For example, metrics are available to count the number of planes that go overhead at certain decibel levels (e.g.

\textsuperscript{728} Metrics used by the Commission include LAeq,16h, LAeq,8h, Lnight, Lden (or LDEN), N70 and N60 metrics. The Department just used LAeq,16h and LAeq,8h. For more information about these metrics, see: Jacobs, \textit{Noise: Local Assessment, Prepared for the Airports Commission}, November 2014, p 3–5
\textsuperscript{729} Q84
\textsuperscript{730} Jacobs, \textit{Noise: Local Assessment, Prepared for the Airports Commission}, November 2014, p 86
\textsuperscript{731} Stephen Clark, March 2017 (NPS0018)
\textsuperscript{732} Qq303–04, No Third Runway Coalition (NPS0033)
\textsuperscript{733} Q302
‘N60’ measures many planes go overhead at 60 decibels or more). These metrics are not used in the analysis supporting the revised NPS even though it is now accepted as a core metric by the DfT.\textsuperscript{734}

**Noise thresholds** used by the DfT in the draft NPS are not in-line with its own guidance that accepts the onset of annoyance at 51 dBAeq. The analysis supporting the NPS does not publish the number of people affected at this level and only uses a higher threshold of 54 dBAeq.\textsuperscript{735} While at face value, this may not appear to look like much of a difference, a difference of even 3 dBAeq is equivalent to doubling of noise events.\textsuperscript{736} As shown in figure 47 below, if the threshold of annoyance was extended down to the 51dB level, an extra 539,327 people would be captured in the annoyance footprint.

*Figure 47: Local noise population impacts, at different thresholds of noise, NWR option*\textsuperscript{737}

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**Single set of flight paths**

The noise modelling conducted by the Airports Commission used three sets of ‘indicative’ flight path designs. Using different sets of flight-paths is a preferred approach as there are uncertainties as to how flight-paths will be designed in practice because of technical and safety feasibilities, as well as community preferences around respite, dispersal and concentration. The DfT only considered one set of flight paths that are more concentrated. This set of flight paths see fewer people overflown but much more often (first figure below). This compares with one that offers more respite by alternating flight-paths. This results in more people being affected, but for a shorter time than the set of flight-paths used by the Department. (second figure below).

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\textsuperscript{734} Department for Transport, *UK Airspace Policy: A framework for balanced decisions: on the design and use of airspace*, February 2017

\textsuperscript{735} Department for Transport, *Guidance on airspace & noise management and environmental objectives*, 2017

\textsuperscript{736} Stephen Clark (NP50007)

\textsuperscript{737} CAA monetisation workbooks
Explaining the approach taken by the DfT, Caroline Low said:

At this stage we are trying to give an overall sense of the impacts of building at Heathrow versus Gatwick. The commission ran a range of noise flightpaths. When we updated the demand analysis, we just updated one set of noise contours around one set of flightpaths in order to give a very good sense of what those demand changes did to the noise contours.\textsuperscript{740}

The flight-paths the Department has chosen to model do not appear to be consistent with the policy of respite as stated in the NPS and, in practice, are unlikely to be realised because of the political and community hurdles that come with concentrating flight-paths. John Stewart commented on community expectations with respect to flight-paths:

\[ \ldots \] we are very keen that flightpaths are not concentrated over particular communities all the time \ldots \text{we believe there should be a number of flightpaths so that during the course of the day those flightpaths can be rotated and every community can get an element of respite.}\textsuperscript{741}

\textsuperscript{738} Jacobs, \textit{Noise: Local Assessment, Prepared for the Airports Commission}, November 2014, p 78
\textsuperscript{739} Jacobs, \textit{Noise: Local Assessment, Prepared for the Airports Commission}, November 2014, p 78
\textsuperscript{740} Q572
\textsuperscript{741} Q296
Caroline Low said during oral evidence that the DfT’s analysis “was not intended to prejudge that [airspace change] process.”

By estimating only one of a possible multitude of scenarios, the DfT’s analysis has not provided people with a full view of the range of noise impacts. During oral evidence, Caroline Low said that “you can look back to the work the Airports Commission did to understand the relatively small differences in the number of people affected through using different flightpaths.” But looking at the noise modelling from the Commission, the results vary significantly and the set of flight paths chosen by the DfT (NWR-T) had significantly smaller noise footprints than some of the other scenarios assessed by the Airports Commission.

**Figure 50: Noise footprint of flight-path scenarios, change against the baseline, 2030**

Assumptions around the noise and efficiency of aircraft

The DfT’s noise forecasts appear to be considerably more optimistic about the levels of noise reduction that can be achieved over the appraisal period than the Airports Commission (figure below). These noise reductions have occurred because of the new fleet assumptions to those used by the Airports Commission. In response to whether things have changed that substantially since the Airports Commission did their work, Lucy Chadwick believed they had taken a reasonable conservative approach:

Yes, they have. The airlines are bringing on some of those newer fleets because they offer far greater fuel efficiency. The leasing models they have allow them much easier access to them. What had been historical for turnover rates we have seen increasing substantially.

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742 Q572
743 Q573
745 Department for Transport, *Update Appraisal Report*, October 2017, p34
746 Q575
The Secretary of State also endorsed this view and said that “aircraft are getting quieter all the time. The new generation of aircraft are a fraction of the noise levels of the existing ones”\textsuperscript{748} and said the Government had “still taken a conservative projection forward.”\textsuperscript{749} Andrew Haines also believed “the assumptions in the Airports Commission modelling have been bettered in reality since then. We have quite a few 787s and A350s in practice, and they are materially quieter than was predicted.”\textsuperscript{750} HAL referred to the greater use of twin-engine aircraft, including 777 series aircraft and the more recent introduction of the 787 'Dreamliner', the Airbus A350 and A320 Neo aircraft, as evidence of the noise improvements being made by new aircraft.\textsuperscript{751}

The more favourable noise assumptions used by the DfT are not insignificant and represent a doubling, or in some cases, tripling of the anticipated noise reductions from new fleets flying in and out of Heathrow, with shorter transition periods. Lord Deben believed the lack of turnover in aircraft was a major issue for the aviation sector in delivering improved environmental outcomes:

> I have forgotten the figures, but a huge proportion of the aeroplanes that have ever been in the air are still in the air. It is remarkable how long-lasting they are, so, if you want to reduce that and have more efficient aeroplanes, you will have to be pretty tough.\textsuperscript{752}

The Department chose not to update fleet assumptions as part of the February 2017 appraisal. It has also not provided any documentation to support its new assumptions.

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\textsuperscript{747} Jacobs, Noise: Local Assessment, Prepared for the Airports Commission, November 2014; Department for Transport, Appraisal of Sustainability, Appendix A, A-4 Noise

\textsuperscript{748} Q567

\textsuperscript{749} Q568

\textsuperscript{750} Q668

\textsuperscript{751} Heathrow Airport Ltd (NPS0079)

\textsuperscript{752} Q229
Given how significant these assumptions are to the headline figures and the overall impact of this scheme, it is surprising that the Department has not provided any substantive information to justify these new assumptions (see figure 52).

Figure 52: Noise improvements, First Generation Fleet Assumptions, DfT vs Airports Commission, dB

Respite, other mitigations and approval conditions

**Respite**

The NPS states that periods of respite will be offered to nearby communities but that “the timings, duration and scheduling should be defined in consultation with communities and relevant stakeholders.” Communities around Heathrow currently have a respite period of half the flying day, resulting from a switch in runway use, where planes are not overhead. The NPS states that this will reduce to one third of the day with a NWR. Were this to be the case, areas such as Richmond—which currently benefits from 8 hours of respite a day—may see their respite reduced. Stephen Clark put the anticipated change of respite into context:

People in Richmond are getting eight hours’ respite at the moment. They get flights two days in every three. For half a day it is tranquil, and for half a day they get flights. Now it is proposed that they will get 12 hours of flights with far less tranquillity. It will have a massive impact, even if you are already under flights. The point I am making is that you will get intensification. There will be new people and there will be people affected by intensification.

753 Noise modelling assumption data supplied by the CAA
754 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 54
755 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 29
756 Q306
When asked about their respite proposals John Holland-Kaye said that he did “not recognise” the statement in the NPS about a reduction in respite from a half to a third of the day.\(^\text{757}\) Emma Gilthorpe also said that it was too “premature to suggest a specific amount of time”\(^\text{758}\) and said that HAL were currently consulting on respite options.\(^\text{759}\)

According to the Joint Boroughs, “without an agreed definition of the term the concept is meaningless.”\(^\text{760}\) The Environmental Audit Committee believed the NPS lacked clarity on how predictable respite would be achieved and recommended the Government carry out further work on respite which should form part of the NPS process.\(^\text{761}\) The No Third Runway Coalition believed that “there is insufficient information in the NPS on the length of the respite period that communities will experience should a third runway become operational [and] the lack of flight path information means it is not possible to estimate how many will be affected.”\(^\text{762}\)

**Night flight plan**

There is currently five hours at night without scheduled flights is currently between 11.30 pm and 4.30 in the morning.\(^\text{763}\) A night flight ban, as defined in the NPS, “involves a ban on scheduled night flights for a period of six and a half hours [ … ] between 11pm and 7am.”\(^\text{764}\) HAL are specifically proposing to go to six and a half hours, between 11 pm and 5.30 in the morning.” (figure below)\(^\text{765}\)

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\(^757\) Q418
\(^758\) Q432
\(^759\) Q420
\(^760\) London Boroughs of Hillingdon, Richmond and Wandsworth and Royal Borough of Windsor and Maidenhead, March 2017 (NPS0045)
\(^762\) No Third Runway Coalition (NPS0033)
\(^763\) Specifically, there are no scheduled departures between 11.30 pm and 6am. Arrivals start coming in at 4.30am.
\(^764\) Department for Transport, Draft Airports National Policy Statement, p 54
\(^765\) Q425
\(^766\) Heathrow Airport Ltd, Our approach to noise, January 2018
A night-flight ban was universally accepted by community groups as a desired initiative, though it has received criticism by community groups because:

- it would last only 6½ hours, 1½ hours less than the minimum period for night time protection recommended by WHO and only one hour longer than the current 5½ hour period (23:00–04:30) of no scheduled night flights, and
- it would result in a concentration of flights into the shoulder hours of the ban that would cause a disproportionate amount of noise than other parts of the day.

HAL believe that “any proposal for a ban on night flights during the whole 8-hour night period would in our view be undeliverable at Heathrow, even with expansion.” All of the airlines expressed concern at the current respite proposals. BAR UK believed the night-flight ban would not deliver the best possible respite for local communities and undermine the NPS objectives related to UK hub connectivity and competitiveness. Rafael Schwartzman also believed a “rigid ban will limit both competitiveness and the options to deliver a more flexible and efficient use of expansion.”

Airlines UK recommend that “any changes to the night flights regime affecting airport operating hours[ … ] should not be made without a full and comprehensive consultation with those affected, and a proper understanding of the impacts of such changes.” The airline community, represented by the Heathrow Airport Scheduling Committee, have put forth an alternative proposal that follows the ICAO balanced approach and which they believe “might be able to offer seven hours and not six and a half” of respite.

HACAN put a similarly flexible proposal forth, which “could be possible for eight hours to be the norm for communities during the course of the year.” John Stewart explained the approach:

Right now, between 6 o’clock and 7 o’clock is the busiest hour of the day, when both runways are used. If you were able to move some of the flights that currently arrive between 6 and 7 to just after 7 o’clock on the extra capacity for a third runway, you could just have one runway used between 6 and 7 o’clock. If that runway was rotated each week, depending on wind direction, it would mean that two weeks out of three, each community would get no night flights until 7 o’clock in the morning.
Noise envelopes

One of the key proposals in the NPS is that a noise envelope—which is essentially a set of noise performance targets applied to an area around Heathrow—will be introduced.\(^{778}\) When questioned on the noise envelope proposition, John Holland-Kaye said that it is yet to be determined how the noise envelope will work and that it would be part of the DCO process.\(^{779}\) HAL said the development of the noise envelope will be informed by the ICAO balanced approach and its noise management strategy of quieter planes, quieter operations, land use planning (including sound insulation) and operating restrictions as well as community engagement and consultation.\(^{780}\) Andrew Haines of the CAA believed that the noise envelopes should be based on high-level targets and principles:

Rather than specifying individual characteristics, you might say that, if you had a noise envelope that gave a maximum amount of noise, it might incentivise you to use more fuel-efficient planes. It might incentivise you to do work on steeper approaches. It might incentivise you to make a trade-off between engine wear and noise that is not perhaps currently incentivised.\(^{781}\)

He hoped that the concept of the noise envelope, which would be developed in coordination with the Independent Commission on Civil Aviation Noise (ICCAN), would help manage community concerns about noise:

One of the reasons we have had such difficulties with local communities is that they do not have confidence that their interests are well looked after. There are not enough incentives, and the noise envelope is a good way of demonstrating that in a transparent way.\(^{782}\)

In response to how noise performance targets will be set and enforced, the Secretary of State said that:

This is a key purpose of setting up the independent noise regulator. The enforcer remains the CAA. The noise regulator is there to say, “You have a problem that you need to fix.”\(^{783}\)

Although when questioned on the issues of enforcement, Andrew Haines said that “a lot of people think that the CAA should be enforcing on noise, and that is not our role.”\(^{784}\) In terms of penalties, the Secretary of State said that there were “a wide-ranging financial excess. We have some reasonably tough powers at our disposal. We can always toughen them further if we think it is necessary.”\(^{785}\) The Secretary of State later confirmed via correspondence that airports, rather than the CAA, are responsible for enforcing noise penalties under the Civil Aviation Act 1982.\(^{786}\)

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\(^{779}\) Q416
\(^{780}\) For more info, see: Heathrow Airport Ltd, *Our approach to noise*, January 2018
\(^{781}\) Q670
\(^{782}\) Q670
\(^{783}\) Q570
\(^{784}\) Q647
\(^{785}\) Q571
\(^{786}\) Letter from The Secretary of State to Lilian Greenwood, 23 February 2018.
The EAC concluded that “the NPS did not clearly lay out the nature of the legally binding noise targets.”\textsuperscript{787} The HSPG recommend “the NPS must set some clear parameters with regards to what this design should look like. For example, the envelope should feature the use of noise performance targets compromising of the shorter time averaging periods that are capable of assessing significant community annoyance more effectively.”\textsuperscript{788}

### Compensation

As explained by HACAN, “high quality insulation and other mitigation measures can make a significant difference to people living, working or studying under the flight path. It is particularly true for people who cannot move for reason of income, employment or other personal circumstances.”\textsuperscript{789} The NPS states that HAL must provide compensation to nearby residents and include financial compensation to residents who will see their homes compulsorily acquired, as well as ongoing financial compensation to the local community.\textsuperscript{790}

HAL has publicly committed to a community compensation package comprising offers totalling up to £2.6 billion, including an offer to pay 125% of market value, plus taxes and reasonable moving costs, for all owner-occupied homes within the compulsory acquisition zone. It has also committed to paying contributions for acoustic insulation based on a property’s location within the noise contours of an expanded airport:

- Following a third-party assessment, to provide full acoustic insulation for residential property within the full 60dB LAeq noise contour of an expanded airport;
- Following a third-party assessment, to provide a contribution of up to £3,000 for acoustic insulation for residential properties within the full single mode easterly and westerly 57dB LAeq (16hr) or the full 55dB Lden noise contours of an expanded airport, whichever is the bigger; and
- To deliver a programme of noise insulation and ventilation for schools and community buildings within the 60dB LAeq (16 hour) contour.\textsuperscript{791}

It was initially not clear how HAL had proposed a fixed amount of money—the headline £2.6 billion figure—when they did not know flightpaths would be, how many people will be overflown and by what level of noise they are going to be impacted. Emma Gilthorpe clarified this, saying that the airport was not restricted to a fixed amount of money and noted it would adjust its offering based on the number of people eventually impacted.\textsuperscript{792}

Most submissions were supportive of compensation for nearby community, but criticised the number of people who would be eligible for noise insulation offered by HAL. This is because compensation for noise insulation will be offered based on outdated noise metrics, which are set at a higher threshold to what is recommended by best-practice noise guidance. According to the Boroughs, “the Government should be requiring Heathrow to

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\textsuperscript{788} Heathrow Strategic Planning Group (NPS0075)
\textsuperscript{789} Department for Transport Revised Draft Airports National Policy Statement, October 2017, p 82
\textsuperscript{790} Department for Transport Revised Draft Airports National Policy Statement, October 2017, p 82
\textsuperscript{791} Department for Transport Revised Draft Airports National Policy Statement, October 2017, p 82
\textsuperscript{792} Q430
provide enhanced levels of mitigation that reflect the findings of its latest studies.”\textsuperscript{793} Even then, the No Third Runway Coalition believe that “the noise mitigation package offered by Heathrow is lamentably insufficient and is not available for the majority of people who will be significantly impacted by aviation noise.”\textsuperscript{794} Others were critical of the per household amounts committed by HAL for noise insulation and whether it would be sufficient to offset the true costs on those affected. Stephen Clark said that “it will go nowhere near the cost of fully insulating most houses. It could cost £20,000 or £30,000 to do it.”\textsuperscript{795}

\textsuperscript{793} London Boroughs of Hillingdon, Richmond and Wandsworth and Royal Borough of Windsor and Maidenhead (NPS0028)
\textsuperscript{794} No Third Runway Coalition (NPS0033)
\textsuperscript{795} Q314
Annex I: Carbon

The UK’s obligations on greenhouse gas emissions are set under the 2008 Climate Change Act. Under this framework, the UK has a 2050 target to reduce its greenhouse gas emissions by at least 80% on 1990 levels and has a series of five-year carbon budgets on the way to 2050. The Committee on Climate Change (CCC) in legislating for the Fifth Carbon Budget have set a limit that UK gross aviation emissions will be no more than 2005 levels—37.5 MtCO2—in 2050.

Figure 54: Existing carbon budgets assume an emissions pathway that allows for emissions from international aviation and shipping

The carbon reduction targets set for other sectors, such as energy or industry, reflect the technical challenges of developing non-fossil fuel alternatives for aviation fuel. The economy-wide target of reducing emissions by 80% below 1990 levels could be achieved through other sectors reducing their emissions by around 85% on average. Lord Deben described this as “very generous elbow room” of the aviation sector and that is the maximum that could be allowed without compromising other sectors. The Government states in the draft NPS that Heathrow expansion can be delivered within “the UK’s climate change obligations” by implementing “a mix of policy measures and technologies.”

Work of the Airports Commission

To reflect the uncertainty over future aviation carbon policy, the Airports Commission modelled demand for aviation against two carbon policy scenarios:

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796 Committee on Climate Change, Fifth Carbon Budget, November 2015
797 Gross (absolute or actual) emissions refer to the level of emissions emitted by a country or sector. Net emissions is the level of emissions emitted, minus those emissions offset through international or cross-sectoral emissions trading and other schemes.
798 Airports Commission, Discussion Paper 03: Aviation and Climate Change, April 2013, p 14
800 Airports Commission, Final Report, July 2015, p 66
801 Q215; Q220
802 Department for Transport, Revised Draft Airports National Policy Statement, October 2017, p 30
i) The first was a carbon-capped scenario, which assumed no international action to limit aviation emissions and only UK policy action to limit emissions to the CCC’s planning assumption; and

ii) The second carbon policy was a carbon-traded scenario, which assumed the operation of the European Emissions Trading System in respect of aviation until 2030. After that it assumed a “complete liberalised global market” for carbon emissions, which would allow aviation to “buy in” credits from other sectors of the economy.\textsuperscript{803}

Aviation demand was lower under the carbon capped scenario (435 mmpa vs 369 mmpa in 2050 for a NWR).\textsuperscript{804} This is because the costs of carbon abatement were higher than the second scenario to bring emissions within the CCC’s carbon limit (the carbon price is £634 per tonne, compared with £196 per tonne). The Commission forecast runway expansion to result in increased carbon emissions, predominantly from additional international flights, rather than runway construction and operation. The Gatwick Second Runway is associated with the lowest additional emissions. At the national level, the Commission’s forecasts showed that CO2 emissions from aviation exceed the CCC’s carbon limit without expansion (at 39.9Mt) and are higher with a new runway (43.3Mt). Despite this, the Airports Commission concluded that any one of the three shortlisted schemes could be delivered within the UK’s climate change obligations,\textsuperscript{805} as well as showing that a mix of policy measures and technologies\textsuperscript{806} could be employed to meet the CCC’s targets.

**Latest carbon forecasts**

The forecasts for demand and carbon emissions have been updated by the DfT. The main difference between these forecasts and those of the Commission is that the demand for aviation will be the same no matter the carbon policy scenario. Previously, the carbon capped scenario resulted in a higher carbon price being applied to limit the growth in demand. However, the DfT have assumed that more of the carbon reductions can be met through “supply side abatement policies” without having to use a higher carbon price to reduce demand.\textsuperscript{807} In terms of the carbon forecasts, with expansion and at the individual airport level, the Gatwick scheme still has the lowest additional emissions (see table below).\textsuperscript{808}

\textsuperscript{803} Airports Commission, Final Report, July 2015, p 82
\textsuperscript{804} Airports Commission, Strategic Fit: Forecasts, July 2015
\textsuperscript{805} Airports Commission, Final Report, 2015, p 86
\textsuperscript{806} Airports Commission, Final Report, p 203
\textsuperscript{807} Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon, p 6
\textsuperscript{808} Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon, p 14
Table 15: Change carbon emissions over the appraisal period for each scheme under central demand forecast809

<table>
<thead>
<tr>
<th>AREA OF EMISSIONS</th>
<th>LGW-2R</th>
<th>LHR-ENR</th>
<th>LHR-NWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on</td>
<td>CT</td>
<td>CC</td>
<td>CT</td>
</tr>
<tr>
<td>Passenger and staff surface access</td>
<td>9.6</td>
<td>9.6</td>
<td>7.6</td>
</tr>
<tr>
<td>Airport operations (energy and fuel use)</td>
<td>1.2</td>
<td>1.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Construction of airport facilities and surface access infrastructure *</td>
<td>3.9</td>
<td>3.9</td>
<td>10.1</td>
</tr>
<tr>
<td>Total</td>
<td>14.8</td>
<td>14.8</td>
<td>19.9</td>
</tr>
<tr>
<td>Air travel at the expanded airport (not included in the monetised assessment)</td>
<td>185.7</td>
<td>177.3</td>
<td>246.4</td>
</tr>
</tbody>
</table>

* Figures for construction emissions are expressed as carbon dioxide equivalent, or MtCO\(_2\)e. All other figures are in terms of carbon, MtCO\(_2\).

Over the life of the schemes, the NWR scheme is forecast to contribute significantly more to UK emissions (figure below). The Appraisal of Sustainability concluded “overall the Gatwick scheme is judged to perform best on the objective of minimising carbon emissions in airport runway construction and operation.”810

Figure 55: Additional emissions, at the UK level, by expansion option, MtCO\(_2\)811

The latest carbon forecasts, updating those produced four years ago by the Airports Commission, show:

- total CO2 emissions from aviation by 2050 under a ‘no expansion’ scenario have reduced from 39.9 Mt in the Commission forecasts to 37 Mt now;812
- total CO2 emissions from aviation by 2050 with a NWR scheme have reduced from 43.3 Mt in the Commission forecasts to 39.9 Mt; and

809 Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon
810 Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon, p 14
811 Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon
• carbon emissions are improved under all expansion options when compared with the Airports Commission forecasts (figure below).

Figure 56: Carbon emissions from UK departing flights (MtCO2, DfT17 central forecast and Airports Commission assessment of need, carbon traded forecast)813

These improvements rely on new assumptions that enable carbon emissions from air traffic movements to decline at a greater rate than was previously thought, including:

• more efficient aircraft will enter in service much earlier than the Commission forecast, resulting in more technology benefits from 2030 onwards; and

• the number of passengers per aircraft rising from an average 117 passengers per flight (in 2050) to 141. Thus anticipated CO2 emissions per passenger are around 18% lower, falling from 110kg CO2 per passenger trip to 90kg CO2.

Carbon mitigations assumed by the Department

It is unclear at this stage whether the set of policy measures to achieve compliance with the CCC carbon limits can deliver to the extent assumed by the DfT. If these assumptions are over-optimistic, there may be implications for the business cases of the various schemes. This is because demand would have to be reduced to comply with carbon budgets if planned policy measures are ineffective. This was identified by Lord Deben when he wrote to the Secretary of State for Business, Energy and Industrial Strategy expressing concern that the business case for Heathrow expansion did not reflect the CCC’s carbon limits.814

Carbon trading

The Airports Commission and DfT considered that UK aviation emissions could continue to grow unconstrained, with compensatory reductions being made elsewhere via a carbon

813 Department for Transport, Updated Appraisal Report, October 2017, p 34
814 Committee on Climate Change, Letter from Lord Deben, Chair, to Rt Hon Greg Clark MP, Secretary of State for Business, Energy and Industrial Strategy, 22 November 2016
trading mechanism. Specifically, it was assumed that the CO2 emissions from flights departing UK airports are traded at the European level until 2030 and then as part of a global carbon market.

They identified the EU ETS in 2012,\(^{815}\) and the forthcoming Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) agreed at the International Civil Aviation Organisation (ICAO)\(^{816}\) as the means to do this. The AEF questioned how plausible this was:

> While there is a high-level agreement to implement CORSIA, much of the detail that will determine its environmental integrity is still being debated and cannot be taken as offering a guarantee of effective carbon mitigation, while the EU ETS for aviation has been scaled back to cover only intra-EU flights for the foreseeable future.\(^{817}\)

Lord Deben believed that carbon trading was not something that could be relied upon and was a very limited concept in any case.\(^{818}\) He added that:

> As we move on, nations will be doing more and more, and they will find it more and more difficult. The idea that there will be a whole lot of spare and quite cheap trading to be done seems unlikely.\(^{819}\)

**Policy and other technical measures**

The DfT now assumes that the carbon emissions from expansion can be reduced below the CCC carbon limits through supply-side policy measures and without reducing demand.\(^{820}\) Lord Deben did not completely agree that such an outcome might be effective and believed that “the more they think demand is going up, the harder they have to work at the technological answers to deliver a means of doing it.”\(^{821}\)

The DfT commissioned Ricardo Energy and Environment to assess the cost and abatement potential of a series of policy measures that could be used by the UK to unilaterally reduce UK aviation emissions:\(^{822}\)

- a) Increased R&D in more efficient engines and aircraft;
- b) Early fleet replacement with more fuel-efficient aircraft;
- c) Improvements to the ICAO CO2 emissions standard;
- d) Reduced aircraft cabin weight;
- e) Regulation of aircraft types operating from UK airports;
- f) More efficient ground movements; and
- g) Increased use of biofuels.

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815 For more information, see: European Commission, *Reducing aviation emissions from aviation*, accessed 11 December 2017
816 For more information, see: ICAO, *Carbon Offsetting and Reduction Scheme for International Aviation*, accessed 14 December 2017
817 Aviation Environment Federation (NPS0031)
818 Q225
819 Q216
821 Q222
822 Ricardo Energy & Environment, *Carbon Abatement in UK Aviation*, October 2017
Of these options, it was considered by the DfT that “increasing the uptake of renewable fuels and measures to encourage the use of single-engine taxiing” would have the greatest benefit in mitigating carbon emissions.\textsuperscript{823} With reference to the table below, it is specifically assumed by the DfT that:

- government action would be taken to incentivise the use of single-engine taxiing at UK airports that would lead to a 95% take-up rate by 2030 and beyond, and it is estimated that this measure would reduce fuel consumption by around 1% per flight on average;

- regulations would be implemented governing the fuel efficiency of aircraft such that only those meeting certain CO2 emissions standards would be able to land and take off from UK airports. This measure assumes that in order to comply with the regulations aircraft would need to increase their fuel efficiency by around 1.4% per annum up to 2050. It does not prescribe how this is to be achieved; it could be done through: improved engine and airframe design, reduced cabin weight and operational efficiencies such as more optimal cruising speeds; and

- government regulations are introduced to mandate specific renewable fuel percentages in aviation fuel supply. The percentages would need to be 9% in 2050 for the ENR and Gatwick schemes and 12% for the NWR scheme.

Table 16: Assumed carbon abatement, carbon capped scenario, by measure, UK level, MtCO\textsubscript{2}\textsuperscript{824}

<table>
<thead>
<tr>
<th>EXPANSION SCHEME</th>
<th>DEMAND SCENARIO (CENTRAL AND HIGH DEMAND)</th>
<th>2050 CARBON-TRADED BASE, NATIONAL LEVEL (\textit{E/T}CO\textsubscript{2} = 221)</th>
<th>2050 CARBON ABATED FROM MORE EFFICIENT GROUND MOVEMENTS</th>
<th>2050 CARBON ABATED FROM REGULATIONS ON AIRCRAFT TYPES</th>
<th>2050 CARBON ABATED FROM HIGHER UPTAKE OF RENEWABLE FUELS</th>
<th>% MANDATORY BIOFUEL IN 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGW-2R</td>
<td>Central</td>
<td>39.3</td>
<td>0.3</td>
<td>N/A</td>
<td>1.4</td>
<td>9%</td>
</tr>
<tr>
<td>LGW-2R</td>
<td>High</td>
<td>44.3</td>
<td>0.4</td>
<td>3.1</td>
<td>3.3</td>
<td>15%</td>
</tr>
<tr>
<td>LHR-ENR</td>
<td>Central</td>
<td>39.2</td>
<td>0.3</td>
<td>N/A</td>
<td>1.4</td>
<td>9%</td>
</tr>
<tr>
<td>LHR-ENR</td>
<td>High</td>
<td>44.0</td>
<td>0.4</td>
<td>3.1</td>
<td>3.0</td>
<td>14%</td>
</tr>
<tr>
<td>LHR-NWR</td>
<td>Central</td>
<td>39.9</td>
<td>0.3</td>
<td>N/A</td>
<td>2.3</td>
<td>12%</td>
</tr>
<tr>
<td>LHR-NWR</td>
<td>High</td>
<td>44.1</td>
<td>0.4</td>
<td>3.1</td>
<td>3.2</td>
<td>15%</td>
</tr>
</tbody>
</table>

Several points were raised in oral evidence that appear to question the validity of these assumptions, particularly for biofuels, which are assumed in the DfT’s work to account for the majority of abatement against the carbon requirements. Professor Forster believed that biofuels could not achieve all of the abatement on its own and for it to effective “you have to do a far better job with the regulatory framework around biofuels, to make sure they are sustainable and to be able to get fuels into aircraft far more efficiently than we do currently.”\textsuperscript{825} Lord Deben said “we have to be a bit careful about the assumption that there

\textsuperscript{823} Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon, p 28
\textsuperscript{824} Department for Transport, Appraisal of Sustainability, Appendix A, A-9 Carbon, p 33
\textsuperscript{825} Q218
will be sustainable biofuels available in sufficient amounts to do some of the things that are suggested.”826 With respect to the introduction of regulation to incentivise the use of more fuel efficient aircraft, Lord Deben said that in practical terms it could be achieved but historically “it has been very difficult to introduce such regulations” and that to have more efficient aeroplanes, the regulation introduced would have to be “pretty tough.”827

**Carbon emissions and costs in the economic case**

The total additional damage costs from carbon emissions from a NWR scheme were estimated by Jacobs, on behalf of the Airports Commission, at £19.2 billion, including £18.5 billion for air travel (table below). In the Airports Commission’s final Business Case, the damage costs of carbon from air travel are removed and only those costs from passenger surface access, airports operations and construction were included in the economic case and were monetised at a present value of £938 million. The DfT has maintained this methodology, with the updated damage costs of carbon at £818 million over the appraisal period.

<table>
<thead>
<tr>
<th>Area of Emissions</th>
<th>Monetised value of carbon emissions, additional £ over 60 year appraisal period</th>
<th>Monetised value of carbon emissions, total £ over 60 year appraisal period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air travel</td>
<td>£18,526,092,532</td>
<td>£85,894,020,036</td>
</tr>
<tr>
<td>Ground movements component</td>
<td>£810,517,687</td>
<td>£2,267,569,748</td>
</tr>
<tr>
<td>Passenger surface access journeys</td>
<td>£467,690,134</td>
<td>£2,169,259,232</td>
</tr>
<tr>
<td>Airport operations energy &amp; fuel use</td>
<td>£155,949,879</td>
<td>£477,376,495</td>
</tr>
<tr>
<td>Total operational CO₂ emissions</td>
<td>£19,149,732,545</td>
<td>£86,540,655,763</td>
</tr>
</tbody>
</table>

It was not clear initially as to why the carbon costs from air travel were not included in the business case of the appraisal. Professor Piers Forster clarified that the exact allocation of these costs in the economic appraisal is dependent upon the damage costs of these carbon dioxide emissions being “completely and effectively ameliorated by effective trading within a carbon trading scheme.”829 Professor Forster believed there were two reasons to seriously question the assumption that no climate related damages would occur from the projected additional increase in air travel:

Firstly, existing carbon trading under the EU emissions trading scheme (EU-ETS) has had a faltering start and the low price of carbon offsets under the scheme indicate it is far from efficient. Secondly, no current or planned trading scheme accounts for the additional climate impact of air travel beyond its emissions of greenhouse gases.830

826 Q228
827 Q229
829 Professor Piers Forster ([NPS0088](#))
830 Professor Piers Forster ([NPS0088](#))
It was assumed by the DfT that an effective international emissions trading scheme would be operational by 2030 and beyond. The closest thing to such a scheme now is the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which will begin in 2020 and covers increases in emissions from international aviation. But as explained by Professor Forster:

It is not yet clear if this will take-over from the EU-ETS from international travel with Europe, or exactly how the scheme will operate. However, experience tells us that such internationally negotiated schemes will operate imperfectly, especially in its initial stages.831

As an alternative to the current approach, Professor Forster recommended that some fraction of the carbon-traded damage is retained in the appraisal. He estimated that residual damages of between 20% and 50%832 would result if traded under the current EU-ETS. He acknowledged that as the trading platforms improve the fraction of residual damages would reduce over the 60 years of the appraisal period. Assuming a linear improvement in trading practices towards a perfect trading platform over the 60-year appraisal period, Professor Forster concluded that “these estimates would very approximately lead to between 10% and 25% residual damages—£1.8 to £4.5 Billion using the Jacob estimate of emissions and carbon price.”833

Even then, Professor Forster explained that the particularly harmful nature of emissions from aviation, which can be additional to just those effects from carbon dioxide,834 means that any carbon trading, which only considers greenhouse gas emissions from flying will not be effective at limiting climate damages from non-greenhouse gas aviation emissions. He added that:

If you wanted to account for these in planning, a working estimate could be that the cost estimate for climate damages for flying would be doubled to over £36 billion, and carbon trading would only limit less than half of this.835

He prefaced this by saying that these estimates were “very approximate” but still illustrated why “carbon trading represents a less satisfactory option than tackling the aviation emissions at source through improved technology, air traffic management, low-carbon fuels and demand management.”836

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831 Professor Piers Forster (NPS0088)
832 The optimistic 20% is taken from current leakage rates in the EU-ETS assuming other aspects of the scheme genuinely offset carbon. The 50% value is taken from the current low carbon price compared to where it needs to be, which maybe a more realistic indicator of the scheme’s efficiency.
833 Professor Piers Forster (NPS0088)
834 Flying not only emits carbon dioxide, it also emits other gases and particles and leads to the formation of contrails. In particular, contrails add significantly to the warming effect of aviation emissions over and above what can be expected from CO2 alone.
835 Professor Piers Forster (NPS0088)
836 Professor Piers Forster (NPS0088)
Monday 19 March

Members present:

Lilian Greenwood, in the Chair
Steve Double
Huw Merriman
Grahame Morris
Luke Pollard
Iain Stewart
Graham Stringer
Martin Vickers
Daniel Zeichner

Draft Report (Airports National Policy Statement), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 87 read and agreed to.
Annexes A to I read and agreed to.
Summary agreed to.

Resolved, That the Report be the Third Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Monday 26 March at 4.15pm]
Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee’s website.

Monday 4 December 2017

Philip Graham, Chief Executive, National Infrastructure Commission; Caroline Low, Director, Aviation Capacity Delivery, Department for Transport; and Dennis Morgan, Head of Aviation Capacity Economics Team, Department for Transport; and Nick Dunn, Chief Financial Officer, Gatwick Airport; and Captain Jock Lowe, Director, Heathrow Hub Ltd

Q1–78

Monday 18 December 2017

Tim Hawkins, Corporate Affairs Director, Manchester Airports Group; Neil Pakey, Chairman, Regional and Business Airports Group; and Rafael Schvartzman, Regional Vice President Europe, IATA

Professor Helen Apsimon, Professor of Air Pollution Studies, Imperial College London; The Rt Hon The Lord Deben, Chairman, Committee on Climate Change; Professor Piers Forster, Professor of Physical Climate Change, University of Leeds; and Cait Hewitt, Deputy Director, Aviation Environment Federation

Q117–166

Monday 15 January 2018

Councillor Paul Hodgins, Leader of the Council, London Borough of Richmond upon Thames; Brendon Walsh, Chairman of the Officer Group, Heathrow Strategic Planning Group; Joseph Carter, Chairman of the Transport Sub-Group, Heathrow Strategic Planning Group; Val Shawcross CBE, Deputy Mayor of London for Transport; and Alex Williams, Director of City Planning, Transport for London

Mr Parmjit Dhanda, Executive Director, Back Heathrow; John Stewart, Chair, Heathrow Association for the Control of Aircraft Noise; and Stephen Clark, No 3rd Runway Coalition

Q234–278

Monday 5 February 2018

John Holland-Kaye, Chief Executive Officer, Heathrow Airport Holdings Ltd; and Emma Gilthorpe, Executive Director Expansion, Heathrow Airport Holdings Ltd

Q322–452
**Wednesday 7 February 2018**

*Rt Hon Chris Grayling MP*, Secretary of State, Department for Transport;  
*Lucy Chadwick*, Director General of International Security & Environment, Department for Transport; and *Caroline Low*, Director of Airport Expansion and Aviation and Maritime Analysis, Department for Transport

**Tuesday 20 February 2018**

*Sophie Dekkers*, UK Director, easyJet; *Dale Keller*, Chief Executive, BAR UK;  
*Craig Kreeger*, Chief Executive, Virgin Atlantic; *Willie Walsh*, Chief Executive, IAG; and *Simon McNamara*, Director of Communications, Flybe

*Andrew Haines*, Chief Executive, Civil Aviation Authority
Published written evidence

The following written evidence was received and can be viewed on the inquiry publications page of the Committee’s website.

NPS numbers are generated by the evidence processing system and so may not be complete.

1. Airlines UK (NPS0068)
2. Airlines UK (NPS0091)
3. American Airlines, Delta Airlines and United Airlines (NPS0066)
4. Aras Global (NPS0020)
5. Arora Group (NPS0027)
6. Aviation Environment Federation (NPS0031)
7. Back Heathrow (NPS0012)
8. BAR UK Ltd (NPS0046)
9. BAR UK-supplementary written evidence (NPS0094)
10. British Chambers of Commerce (NPS0054)
11. Brunel University London (NPS0021)
12. CHATR (NPS0042)
13. Ciarán Coughlan (NPS0001)
14. Confederation of British Industry (NPS0032)
15. David Starkie (NPS0073)
16. Dr David Gilbert (NPS0022)
17. Dr David Metz (NPS0008)
18. Dr Richard Bloore (NPS0089)
19. EBSI uk limited (NPS0019)
20. EEF - the manufacturers’ organisation (NPS0034)
21. Englefield Green Action Group (EGAG) (NPS0041)
22. Enterprise M3 Local Enterprise Partnership (NPS0011)
23. Friends of the Earth (England, Wales and Northern Ireland) (NPS0057)
24. Gatwick Airport Ltd (NPS0051)
25. Green House Think Tank (NPS0030)
26. Greenpeace (NPS0048)
27. HACAN (NPS0004)
28. Hampshire Chamber of Commerce (NPS0029)
29. Harmondsworth Village Allotments and Horticultural Association (NPS0067)
30. HCUC (NPS0010)
31. Heathrow Airport Ltd (NPS0055)
32. Heathrow Airport Ltd (NPS0070)
33 Heathrow Airport Ltd (NPS0072)
34 Heathrow Airport Ltd (NPS0086)
35 Heathrow Airport Ltd (NPS0079)
36 Heathrow Airport Ltd (NPS0078)
37 Heathrow Airport Ltd (NPS0092)
38 Heathrow Hub Ltd (NPS0050)
39 Heathrow Hub Ltd and Runway Innovations Ltd (NPS0087)
40 Heathrow Hub/Runway Innovations Ltd-further written evidence (NPS0095)
41 Heathrow Southern Railway (NPS0097)
42 Heathrow Southern Railway Ltd (NPS0056)
43 Heathrow Strategic Planning Group (NPS0082)
44 Heathrow Strategic Planning Group (HSPG) (NPS0045)
45 Hillingdon Chamber of Commerce (NPS0013)
46 IATA supplementary written evidence (NPS0080)
47 International Airlines Group (IAG) (NPS0060)
48 International Airlines Group (IAG) (NPS0098)
49 Lakeside EfW Ltd, Grundon Waste Management and Viridor (NPS0005)
50 Lakeside Energy from Waste Ltd, Grundon Waste Management and Viridor (NPS0085)
51 LBs of Wandsworth, Richmond, Hillingdon and the Royal Borough of Windsor and Maidenhead (NPS0028)
52 LBs of Wandsworth, Richmond, Hillingdon and the Royal Borough of Windsor and Maidenhead (NPS0090)
53 Local Authorities’ Aircraft Noise Council (NPS0037)
54 London (Heathrow) Airline Consultative Committee (NPS0043)
55 London Biggin Hill Airport (NPS0061)
56 London Luton Airport Ltd (NPS0025)
57 MAG (NPS0047)
58 Mayor of London (NPS0036)
59 Medical Justice (NPS0084)
60 Mr Malcolm Whitlock (NPS0003)
61 Mrs Katie Williams (NPS0015)
62 No 3rd Runway Coalition (NPS0074)
63 No 3rd Runway Coalition (NPS0081)
64 No 3rd Runway Coalition (NPS0093)
65 No 3rd Runway Coalition (NPS0033)
66 No 3rd Runway Coalition (NPS0083)
67 North East England Chamber of Commerce (NPS0023)
68 Northern Ireland Chamber of Commerce and Industry (NPS0018)
69 Professor Piers Forster, Director of Priestley International Centre for Climate Change, University of Leeds (NPS0088)
70 RiverOak Strategic Partners Limited (NPS0024)
71 Royal Aeronautical Society (NPS0053)
72 Spelthorne Borough Council (NPS0038)
73 Stephen Clark (NPS0007)
74 Stone Hill Park Ltd (NPS0069)
75 Strategic Airports Special Interest Group (SASIG) (NPS0063)
76 Surrey Chamber of Commerce (NPS0062)
77 Teddington Action Group (NPS0006)
78 Thames Valley Property (NPS0009)
79 The Bedford Park Society (NPS0044)
80 The Chartered Institute of Logistics and Transport in the UK (NPS0026)
81 Tim Henderson (NPS0052)
82 UK Regional and Business Airports Group (RABA) (NPS0065)
83 University of West London (NPS0039)
84 Virgin Atlantic Airways (NPS0049)
85 West London Business (NPS0035)
86 WWF-UK (NPS0017)
List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee’s website.

The reference number of the Government’s response to each Report is printed in brackets after the HC printing number.

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