Transport for London

Airports Commission consultation: shortlisted options

Mayor of London's response

February 2015

Key findings

- **The Airports Commission's** three **shortlisted options**
  None of the three options is without serious adverse effects. A new runway at Heathrow will expose several hundred thousand people to potentially harmful levels of noise. Gatwick remains the option with significantly lower noise impacts; but as a non-hub solution, it also offers much lower level of economic benefit.

  The Business Case and Sustainability Assessments for all three shortlisted schemes include only a partially completed matrix of benefits, and the costs and the benefits have not been assessed on a consistent basis. For example some of the benefits have been presented under a 'Carbon Traded' (more demand) scenario, whilst some of the costs are presented for a 'Carbon Capped' scheme.

- **The Airports Commission's process**
  In the time provided, the Airports Commission has made a welcome attempt to assess and present major new infrastructure options. However, the manner of the consultation and the presentation of the material is not easily accessible for members of the public, local businesses or key stakeholder organisations. Of particular concern has been the release of a substantial quantity of new and very detailed data throughout the consultation period.

- **Key issues by assessment criteria**
  There remain substantial gaps in the appraisal undertaken by the Commission, which precludes a definitive determination of the relative merits of the shortlisted schemes. This risks undermining any future recommendation for an option to take forward as well as hampering the subsequent preparation of a National Policy Statement.

- **Alternatives to the Commission's three shortlisted options**
  The Commission's work must be seen in the context of the alternatives to expanding Heathrow and Gatwick. If its recommendations are to inform the Government's ultimate decision, the Commission must make clear in its final report the basis on which options have been ruled out, particularly when very different assumptions have been used.

Key recommendations for further work

- **Undertake consistent and comparative analysis, and business case assessment**
  The Commission must undertake, and present to government, a consistent and comparative assessment of the impacts all of the available options for achieving additional aviation capacity in the south east. The scale of the magnitude of impacts should be determined and positive and negative impacts should not be assumed to balance without due cause. The Commission should place the shortlisted options in the context of the benefits and dis-benefits of all options available for any future government to consider.

- **Carry out long-term assessment across all appraisal modules**
  Impacts must be assessed in the long-term (2050+) in order to assess the positive and negative impact of achieving the full utilisation of additional capacity across all assessment modules. The Commission must not accept long-term benefits without assessing the associated long-term dis-benefits.

- **Present a comprehensive and transparent appraisal**
  Review and address the gaps identified in the evidence currently presented. Provide a transparent explanation of all assumptions used to assess impacts; identify their limitations and the sensitivity of the overall results to them in order to ensure that a fully informed and credible recommendation can be reached in Summer 2015.

- **Highlight the risks and limitations across the range of scenarios**
  The scenarios assessed by the Commission result in significantly different demand forecasts. Due consideration must be given to the benefits and dis-benefits across the range of demand scenarios and both the likelihood and resulting impacts of each scenario must be fully considered. The commission should assess benefits and dis-benefits using consistent assumptions and should not maximise benefits and minimise impacts through selective use of scenarios.

- **Further stakeholder engagement**
  Continue to work with key stakeholders to identify how the requirements of airport expansion can be accommodated in the context of long-term growth challenges in London and the South East.

1. Purpose and structure of paper

1.1. In November 2014, the Airports Commission published its consultation on its three shortlisted options for new airport capacity:

- **Heathrow northwest runway (NWR)**
- **Heathrow extended northern runway (ENR)**
- **Gatwick second runway**

1.2. The Commission's consultation material comprises an introductory document, one report per option and sixteen sets of technical reports corresponding to sixteen topic areas as per the Phase 2 appraisal modules identified by the Commission. Together, these reports set out to make a detailed appraisal of each of the three aviation capacity options.

1.3. The Commission has asked eight questions regarding their assessment, which fall into four categories:

- Views and conclusions on the three shortlisted options
- Questions on the Commission's overall approach
- Questions on the specific areas of the Commission's appraisal
- Other comments

1.4. This report constitutes the response of the Mayor of London to the consultation. It has been prepared by Transport for London, with input from the Greater London Authority and London boroughs. It reflects the full range of the Mayor's statutory interests, obligations and objectives in relation to key strategic issues such as economic and spatial development, transport, public health and the environment.

1.5. Each of the three shortlisted options would have important implications for all London and the southeast – not just those living in the vicinity of the airport – and as such it is particularly important for the Mayor to ensure that the interests of London as a whole are represented.

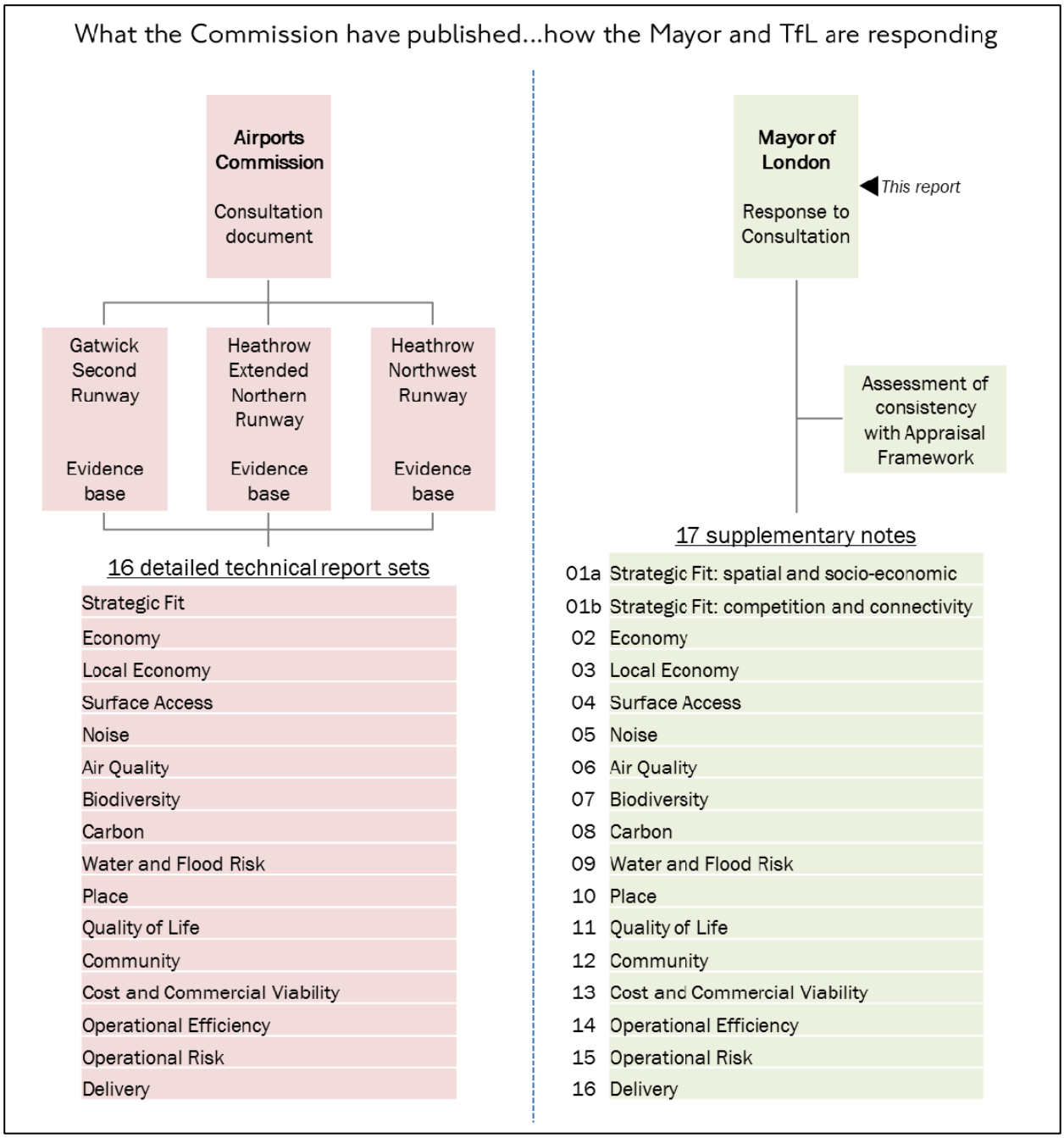
1.6. This report reviews the Commission's appraisal, considering the methodology followed and assumptions applied as well as the conclusions that can be drawn about the potential options. The review has also been undertaken in a way that addresses the Commission's eight consultation questions, without being limited to them. How the questions are addressed is set out in Appendix 1.

1.7. The report also includes recommendations for assessment that still needs to be undertaken by the Commission before a credible, informed recommendation can be

made. This is essential if the results are to underpin key decisions.

1.8. This document forms the heart of the Mayor's response to the consultation; it is underpinned by seventeen accompanying technical supplementary notes, corresponding to the sixteen topic areas used by the Commission for its appraisal (strategic planning is covered by two technical notes). The structures of both are set out below.

Figure 1: Structure of the Commission documents and Mayoral response



1.9. The structure of this paper is as follows:

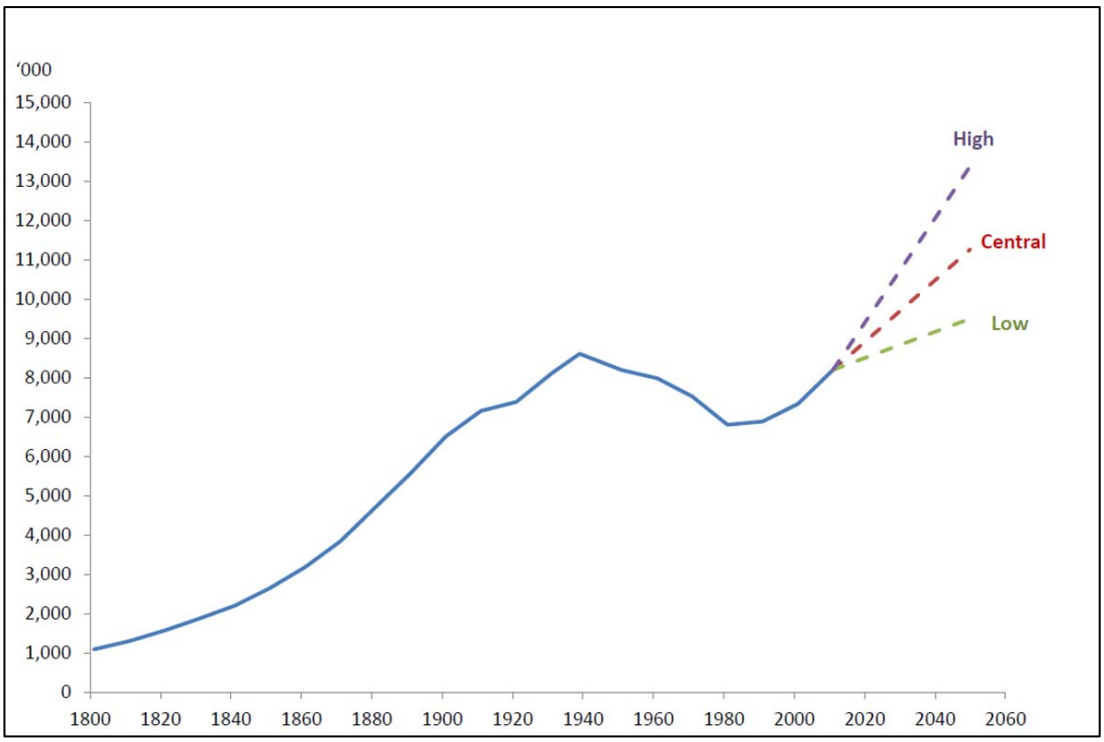
- **Context: the growth of London's population** – a reminder of the wider background context that should form the foundation for any assessment
- **Conclusions on the shortlisted schemes** – in so far as the Commission appraisal allows for a proper consideration of the options, the key conclusions to be drawn about each of the three options
- **Observations upon the Commission approach** – how a robust appraisal process should be approached – and where the Commission's efforts fall short
- **Summary of issues by assessment topic** – the key findings from the seventeen topic area review papers, highlighting issues from the detailed appraisal.

2. Context: the growth of London's population

2.1. No runway can be delivered in a vacuum. As the Commission rightly recognises through the breadth of its assessment, plans for new airport capacity touch almost every area of public policy: the economy, housing, the environment, health, tourism and transport. Spatial planning has a key role in pulling together these different strands.

2.2. Layered on top of this is the population growth challenge that London faces, of a scale not witnessed in the post-war era. From 8.2m in 2011, London is expected to grow by an amount approximately equivalent to the population of Birmingham in the space of a decade, to 9.2m. By 2031, London is forecast to have a population of 9.84m and it should pass the 10 million mark by 2034.

Figure 2: Long-term trend of London population growth



2.3. This must be the starting point for any assessment of additional development. This growth has important implications for several aspects of the assessment:

- **Aviation demand** – The increased population of London will directly influence the demand for air travel from London's airports. This would seem to have been taken account by the Commission through the aviation demand forecasts used.
- **Availability of land** – The London Plan has already identified the future requirements for London to meet background growth, in terms of housing and

employment. The requirements of housing and economic activity that result from airport expansion will be on top of this. The assessment's approach suggests that it is counting on land use and population density changes already earmarked to meet background growth and so has likely understated the impacts.

- **People affect by environmental impacts** – Future population growth will be underpinned by increased housing densities in several areas. This will likely result in a great number of people exposed to environmental impacts, notably noise. The noise modelling undertaken by the Commission appears only partially to take account of the likely scale of growth.

- **Surface access demand** – London's growth presents a significant challenge for transport networks that needs to be addressed by a number of planned schemes. The surface access demands of increased runway capacity will be on top of this. The Commission seems to reply on existing schemes and very limited additional infrastructure to meet airport demand – risking severe congestion.

2.4. It is imperative that these issues are fully taken into account before the Commission issues any recommendation, if it is to seek to not only address London's aviation connectivity needs but also align with plans to meet its population challenge.

3. Conclusions on the shortlisted schemes

3.1. As will become clear from the discussion about the Commission approach below, there remain substantial gaps in the appraisal undertaken which preclude a definitive determination of the relative merits of the shortlisted schemes.

3.2. The *Business Case and Sustainability Assessments* for all three shortlisted schemes include only a partially completed matrix of benefits, and the costs and the benefits have not been assessed on a consistent basis for example. The benefits (e.g. Transport Economic Efficiency) have been presented under a Carbon Traded scenario whilst costs (e.g. noise) are presented for a carbon capped scheme. Whilst an explanation is provided for why wider economic benefits have not been assessed under a carbon capped forecast, no such reason is provided for not assessing 'costs' under a carbon traded scenario.

3.3. In so far as the appraisal allows for a proper consideration of the shortlisted options, it is clear that each will have significant impacts and face significant challenges.

Heathrow northwest runway (NWR)

3.4. Though a number of noise scenarios have been tested – with a very wide range of results – it is impossible to escape the conclusion that a three runway Heathrow will expose several hundred thousands of people to noise – 20-30 times more people than exposed by an expanded Gatwick in 2050.

3.5. Heathrow's noise strategy has historically been very poor compared to major European rivals. According to the CAA, between 2007 and 2011, just €0.11 per Heathrow passenger was spent on noise mitigation measures compared to €0.51 and €0.58 at Frankfurt and Amsterdam respectively. One day before the consultation closed, Heathrow Airport Limited has offered a welcome improvement in compensation, as well as recognising the relevance of $55db_{Lden}$; however, this will only be forthcoming if a new runway is approved and they propose to wait nine years before rolling out mitigation measures. Such an increase in the scope of compensation serves as a reminder of the severity and extent of Heathrow's noise impacts.

3.6. With regards to air quality, notwithstanding the serious gaps in the analysis undertaken, the Commission concludes that the impact of expansion is likely to be 'significantly adverse'. The Commission is forecasting a 38% increase in harmful Nitrogen Oxides (NOx) emissions up to 2050 and has done no testing of any potential mitigation measures.

3.7. This option performs substantially better than Gatwick in terms of economic benefit, reflecting Heathrow's role as a hub, albeit imperfect and constrained, circumstances which would continue even with a third runway – given that it would be full shortly

after opening. The expansion of Heathrow will likely be of limited value for the growth corridors in east and northeast London – key spatial planning priorities for accommodating population and employment growth and rebalancing the distribution of development in London, as articulated by the London's long-term spatial planning strategy – the London Plan. Notwithstanding this, the economic impetus from Heathrow's expansion will be felt beyond the narrow confines of the local boroughs assessed by the Commission. Significant housing pressures will be exacerbated across the wider region and there is no certainty provided by the Commission as to how such problems will be addressed.

3.8. The Commission highlights the surface access challenge facing Heathrow. Without expansion, key strategic and local highway links as well as sections of the Piccadilly Line (post upgrade) and Crossrail will be nearing capacity by 2030. Highly optimistic mode share assumptions notwithstanding, only with further significant additional investment in transport infrastructure will the surface access networks be able to accommodate the increased demand from expansion and avoid severe negative impacts on non-airport related movements.

3.9. TfL's analysis indicates that the cost of the new infrastructure required to support a fully utilised three runway Heathrow, or two runway Gatwick in a way which fully meets the Airports Commission's surface access objectives could be more than £10 billion[1] higher than the figures which the Airports Commission currently identify. Crucially, any such funding shortfalls would have to be met by the public purse.

3.10. There remains strong and unambiguous political opposition to expansion at Heathrow and this fundamental risk is not one the assessment fully grapples with. London Plan Policy 6.6 is clear in its opposition to future expansion and this is mirrored in local planning policies.

3.11. A number of detailed observations have been made on the Commission's approach. The approach to calculating aircraft stand capacity for example risks underestimating the land-take that will be required.

Heathrow extended northern runway (ENR)

3.12. In general, the issues facing the Heathrow ENR option are comparable in scale to – if not somewhat worse than – the Heathrow NWR option, including noise, air quality and surface access provision. The economic benefit, though substantial, is also generally lower than that for the Heathrow NWR option.

3.13. What sets the Heathrow ENR option apart from other airport configurations are its

[1] The makeup of this £10bn figure assumes the inclusion of planned public transport schemes such as Western Rail Access to Heathrow (for Heathrow options), brand new rail connections to key airport trip generators across London and the South East, an optimal level of service for all users, additional motorway and major road enhancements, and ongoing maintenance and operating costs.

two runways placed end-to-end; the Commission acknowledges that this will require full safety approval. However the CAA's preliminary safety assessment suggests that this cannot be taken for granted – and that even if approved, this might be with significant operational constraints which could limit the capacity available.

Gatwick second runway

3.14. Gatwick remains the option with the fewest environmental impacts – and in particular, would expose a notably smaller number of people to potentially harmful levels of noise.

3.15. Gatwick is the option with the fewest economic benefits – with its contribution to GDP growth and additional jobs substantially lower than the two Heathrow options. In part, this reflects the likelihood that Gatwick is unlikely to develop a competing hub operation, something which the Commission's published report admits. The Commission's assessment considers six scenarios for Gatwick, with a competing hub operation deemed the least likely.

3.16. Gatwick expansion is envisaged to be of limited benefit for the key growth corridors in east and northeast London – though Croydon and other south London locations will likely experience some regeneration and development benefits. With this will come substantial housing pressures, particularly along the main transport corridors such as the Brighton Main Line and the M23/A23. There is no indication in the consultation material of how these pressures might be addressed given the context of London and the southeast 's wider housing challenge.

3.17. However, there is also a significant surface access challenge facing Gatwick: without expansion, key strategic and local highway links as well as sections of the Brighton Main Line will be nearing capacity by 2030. The Commission are reliant on mode share assumptions that we believe could prove overly optimistic. They are assuming a significant mode shift from private cars onto rail and buses, as compared to today. Only with significant investment in public transport infrastructure will the surface access networks likely be able to accommodate the increased demand from expansion, without severely impacting background traffic.

3.18. The Commission has challenged Gatwick Airport's construction phasing; the build-out has been re-phased, to avoid very extensive bussing of passengers between existing terminals and aircraft in the first phase – and bussing of passengers between new terminal and rail/coach station in the second phase. This is sensible - although no attempt has been made to attach a cost to this change or what its implications are for the viability of the scheme.

The Options: Conclusions

3.19. With regard to Heathrow Airport's proposals for a third, northwest, runway, the key

conclusion is perhaps no surprise – however much one employs different operational measures to seek to lower noise impacts, the airport will always expose several hundred thousand people to noise – and, as measured by $55db_{Lden}$, will remain the worst in Europe, by some margin. This is an inescapable result of flying aircraft over large densely-populated areas, as Heathrow's geography makes inevitable.

3.20. Gatwick remains the option with significantly lower noise impacts; but as a non-hub solution, it also offers much lower economic benefit. Moreover, for it to be taken forward, a phasing reformulation would need to be agreed that addressed the concerns raised by the Commission whilst still sufficiently viable for the promoter.

3.21. The Heathrow ENR option fares poorly compared to the Heathrow NWR option. In part the result of the Commission's heavy reliance on the promoters for much of the assessment, it is perhaps unsurprising that the promoter with the shallowest pockets should be behind the least developed option. Nowhere is this more obvious than noise; whereas Heathrow Airport Limited has spent considerable resource finessing flight paths so as to reduce the numbers exposed, Heathrow Hub Limited has not undertaken such an exercise and the results are much higher numbers exposed (and broadly in line with TfL's previous noise modelling exercise, which identified that a third runway at Heathrow will result in a significant increase in the number of people exposed to potentially harmful levels of noise, compared to today[2]). Taken together with the operational risks which loom large, it remains difficult to understand why the option was retained except possibly to serve as a 'lightning conductor' for the seemingly 'preferred' Heathrow option.

3.22. Notwithstanding the above, it is very difficult to draw any firm conclusions from the Commission's assessment at this stage. This is made more difficult by the number and breadth of issues that we have identified with regard to the Commission's approach.

[2] Available online at: http://www.tfl.gov.uk/cdn/static/cms/documents/t-aviation-noise-modelling-heathrow-options.pdf

4. Observations upon the Commission's approach

The Commission's consultation process

4.1. The Mayor is concerned that the Airports Commission consultation is not easily accessible, whether for members of the public, local businesses or key stakeholder organisations. The consultation material runs to over 5,000 pages; it is highly technical in its approach and difficult to navigate, often not at all clear about the critical assumptions used or conclusions to be inferred. The multiple noise scenarios modelled for Heathrow is a case in point.

4.2. The material is also heavily reliant on readers transferring knowledge between the different reports published. For example, one can only fully understand the cumulative impacts of each of the shortlisted options on the local community if one reads the dedicated Community Impact Assessment together with other assessments including noise, employment and air quality – some of which have over 700 pages of information.

4.3. Efforts to grasp the consultation material are further complicated by the Commission's publication of new and amended documentation subsequent to the launch of the consultation. New and significant technical documents were being supplied as late as January 22, less than two weeks before the close of the consultation ("Research and analysis: Additional airport capacity: cost and commercial viability analysis").

4.4. The events organised by the Airports Commission to support the consultation have done little to allay these fears. Just two discussion sessions – one each at Heathrow and Gatwick – have been held, with restricted panel representation and limited ticket-only access for the public. In addition to these, two 'drop-in' sessions were offered, each two hours in length. The publicity surrounding these sessions was limited. This level of engagement with local communities on key issues can be described at as cursory, at best.

4.5. It is also unfortunate that, with the exception of an invite-only primarily business stakeholder event, the Commission's consultation activities have not sought to engage with people beyond the local area surrounding the airports. Both the positive and negative impacts of aviation capacity expansion will be keenly felt by many across London and beyond, all of whom also deserve active engagement on the issues.

4.6. Taken together, such basic weaknesses in the consultation process means it falls short of what one could reasonably expect in relation to a key recommendation decision that will have profound impacts. This undermines the credibility of the whole process and could have repercussions for any recommendation and the preparation of a National Policy Statement.

The Commission's appraisal

4.7. If the appraisal of airport options is to be robust and fit for purpose, it must entail a complete assessment:

- This must be sufficiently broad in scope (e.g. time period, geography)
- All the relevant modelling that can feasibly be done at this stage should be undertaken to determine key impacts, both in absolute and relative terms
- When there are a range of assumptions, the worst case scenario should be tested; where multiple scenarios are tested, the assumptions – and their relative merits – should be made clear
- A meaningful evaluation of the risks is required
- The net/cumulative impacts should be assessed where appropriate, particularly when they cut across different topic areas

4.8. The soundness of the appraisal also requires that a consistent approach is followed. As a minimum, this means consistency across the shortlisted options and an appraisal which is fully aligned with the Appraisal Framework published by the Airports Commission for this purpose in April 2014.

4.9. Moreover, it is healthy for the approach to be aligned with best practice for large infrastructure projects and with HM Treasury Green Book guidance. It is also important that the appraisal is consistent with work done as part of previous Airports Commission iterations – if doubt is not to be cast on the whole option selection process.

4.10. However, having reviewed the appraisal material, **there are serious concerns as to whether such an approach has been followed by the Commission**. TfL has tested the seventeen topic areas against the above criteria; the results are set out in a table in each technical note – and summarised in the table below.

4.11. The Commission's appraisal falls short on each of the above criteria – and as such does not offer a truly complete assessment and is subject to a wide array of inconsistencies. If the purpose of the appraisal is to underpin a recommendation which can secure buy-in and prepare the groundwork for a future National Policy Statement, the risk is that both objectives will be undermined.

Table 1: Does the Airports Commission's assessment constitute a robust approach?

	Strategic Fit: spatial and socio-economic	Strategic Fit: competitton and connectivity	Economy	Local Economy	Surface Access	Noise	Air Quality	Biodiversity	Carbon	Water and Flood Risk	Place	Quality of Life	Community	Cost and Commercial Viability	Operational Efficiency	Operational Risk	Delivery
Approach to Assessment																	
Aligned with Airports Commission Appraisal Framework?	p	N	p	p	p	p	N	p	p	p	p	N	p	p	p	N	p
Consistent approach to assessment: · Between options? · With previously considered options? · With best practice/Green Book?	p	N	p	p	p	N	N	p	Y	p	p	p	p	p	p	Y	p
Assessment complete (evidence gaps addressed, suitable geographic/temporal scope)?	N	N	N	N	N	N	N	N	p	N	p	N	N	p	N	N	N
Assumptions																	
When multiple scenario/assumption sets used, has the most appropriate been identified – or worst case scenario tested?	N	p	N	N	n/a	N	N	n/a	p	n/a	n/a	n/a	n/a	n/a	p	n/a	n/a
Analysis: impacts and conclusions																	
Risks fully stated and impact reflected in conclusions?	N	N	N	N	N	N	N	N	N	N	p	N	p	p	N	N	N
Understanding of net/cumulative impacts?	N	p	p	N	N	p	N	n/a	p	N	p	N	N	n/a	N	n/a	n/a

Y = Yes · p = partial · N = No
n/a = not applicable

[This is an analysis of the Commission's assessment approach, for each of the Commission's technical areas ; the detailed reasoning behind each of the categorisations assigned in the table are explained in the 17 supplementary notes which accompany this document.]

5. Summary of issues by assessment criteria

5.1. Set out below is a snapshot of the key findings from the seventeen topic area review papers, highlighting the key issues and observations arising from the review of the detailed appraisal undertaken by the Commission. Some concern the relative merits of the three shortlisted options; others relate to concerns about the approach to assessment and analysis or the assumptions used. In some cases, this includes inconsistencies in the approach the Commission has taken, whether between the three options or with their consideration of options to date.

5.2. This summary does not seek to be comprehensive – the issues and observations are more fully set out in the seventeen technical review papers which accompany this response.

Strategic Fit: spatial and socio economic

5.3. The Commission's assessment looks at existing strategies but is selective in the policies it examines; for example the majority of environmental protection policies are overlooked. Insufficient account has been taken of the ability of airport expansion to help meet wider spatial, regeneration and environmental objectives and the extent to which each of the shortlisted options may help or hinder meeting them. Additionally, no consideration has been given to future challenges such as relating to projected changes in population, housing supply and employment demand.

5.4. The Heathrow options offer the greater potential for increased economic activity than a Gatwick option – but these are not necessarily aligned with the strategic London Plan objectives, nor are they supportive of long-term growth opportunities. All the options present challenges for land availability and it is not at all clear how the additional housing and jobs – which are above what is planned for in existing spatial strategies – can be accommodated.

5.5. Neither Heathrow nor Gatwick are as well placed as some of the non-shortlisted options for supporting rebalancing of the London economy – specifically the key housing and employment growth and regeneration areas to the east and northeast of London that are identified in the London Plan.

Strategic Fit: competition and connectivity

5.6. The assessment utilised the scenarios first presented in the Commission's Interim Report and – in so far that it was required to evaluate these - the analysis presents a number of sound observations. It recognises that Gatwick's development as a second, competing hub is the least likely scenario – and that a single hub will deliver greater connectivity – for passengers and freight – than any attempt at a 2-hub system.

5.7. However, some of the flawed thinking from the Interim Report remains. Given the analysis of Heathrow is premised on spare capacity made available, it is a fundamental weakness that the assessment neglects to address the issue of a 3-runway Heathrow being full shortly after opening.

5.8. Moreover, the report also overstates the potential for low-cost carriers at an expanded Gatwick to provide competition to a hub at Heathrow.

5.9. Taken together, this allows the Commission's assessment to be wholly equivocal on the question of which expansion option delivers greater consumer benefits.

Economy

5.10. All three options, assessed over a 60 year period, would likely have significant economic impacts, with the effect of expansion at Heathrow likely greater given its hub status. However, without any clarity on the likely aviation demand scenario and limitations with the Commission's assessment, the scale of such impacts remains uncertain. Furthermore, if the same approach were applied to the previously discarded options, it is likely that these benefits would, in turn, be outweighed by the benefits from alternative options, such as a brand new 4-runway hub airport.

5.11. There are substantial concerns about the methodology used, including confused treatment of delays and double-counting of effects such as tourism benefits – in several instances, at odds with Government WebTAG guidelines.

5.12. There is also particular concern that the impact of freight has largely been overlooked, despite its importance to the aviation and the wider economy – the latter quantified in the new report "Implications for the Air Freight Sector of Different Airport Capacity Options" prepared for the Freight Transport Association and TfL.

Local Economy

5.13. All three shortlisted options would have significant employment and housing impacts, with the effect of expansion at Heathrow likely greater given its hub status.

5.14. There is little certainty as to the full scale of local impacts, with employment assessed in 'net' rather than 'gross' terms, catalytic employment not being disaggregated to the local level and no consideration of additional housing impacts arising from catalytic growth.

5.15. Contrary to the Commission's assessment, the spatial implications of airport-related growth will extend far beyond its narrowly defined local assessment areas (LAAs). Given land supply and other development constraints in London – coupled with background growth – the Commission's view that development can be easily accommodated appears overly optimistic and the risk to delivery understated.

Surface Access

5.16. Potential surface access implications are only assessed up to 2030. This understates the potential impacts of the shortlisted options. It does not allow for the full scale of potential demand from the expanded airports at full capacity to be identified, nor the impacts on background demand in the medium to long term to be understood, as the network becomes more constrained,. The Commission's modelling of road and rail impacts has been limited and in parts is based on older forecasts.

5.17. The Commission indicates that it believes little new surface access infrastructure is required – and yet, it assumes significant mode shifts from road to rail. For several planned transport schemes, the Commission assumes their benefits, but does not account for their costs.

5.18. In the absence of the assessment confirming the contrary, there is a very real concern that the road and rail networks serving Heathrow and Gatwick will struggle to accommodate the increased airport demand – alongside background growth – should expansion proceed with the minimal surface access interventions the Commission envisages.

5.19. TfL analysis estimates that if Government were to ensure that a fully utilised three runway Heathrow or two runway Gatwick could fully meet the Airports Commission's surface access objectives, the transport network alone could require more than £10 billion of investment above what the Airports Commission currently identifies. Currently, any such funding shortfalls would have to be met by the public purse.

Noise

5.20. According to the Commission assessment, both Heathrow options will expose several hundred thousands of people to noise, 20-30 times more people than exposed by an expanded Gatwick in 2050.

5.21. There is a worrying lack of consistency in the assumptions underpinning the different scenarios. In particular, Heathrow Airport Limited have invested substantial resource in fine tuning flight routings to try to minimise numbers exposed. With the Commission reliant on what the promoters have provided, this means the data for Heathrow NWR is not consistent with that for Gatwick or for Heathrow ENR, nor is it aligned with how the airport operates today.

5.22. The achievability of such optimisation measures as have been used for the Heathrow NWR modelling is not certain; moreover, given many of these measures are largely independent of a third runway, it is not at all clear that they should have been assumed. Furthermore, with several scenarios having been tested – and results that vary widely – the Commission gives no guidance as to which is the likeliest scenario.

Air quality

5.23. The assessment is incomplete and represents stage one of a two-stage process. No dispersion modelling has been undertaken, nor have surface access emissions been captured using a dynamic traffic model.

5.24. The Commission acknowledges the need for further assessment but have not indicated the timeframe for completing the assessment. Without this, it is not possible to gain a full understanding of the impacts of any of the options.

5.25. This notwithstanding, the Commission has concluded that the Heathrow options are 'significantly adverse' in terms of air quality, while Gatwick is 'adverse'. It is asserted that these impacts can be substantially improved with mitigation; though without a proper evaluation of local air quality or of the mitigations put forward by promoters, it is unclear how effective the proposed mitigation will be.

Biodiversity

5.26. The assessment is inadequate; for all three options, there remains significant uncertainties as to the impact on protected species.

5.27. The conclusion that bird strike risks "arising from outside the airport property may be impossible for the airport to control" points to the inadequacy of the approach.

5.28. Furthermore, the effect of bird strike management at Heathrow on Special Protection Areas nearby is deemed to "require appropriate assessment". Yet there is no consideration of 'IROPI' or alternatives – as per the requirements of the Habitats Directive – nor does this appear to have been taken into account in the Business Case and Sustainability Assessment. This is notably at odds with the comprehensive investigation undertaken with regards to the Inner Thames Estuary option.

Carbon

5.29. The assessment of carbon is relatively robust. A notable gap, acknowledged by the Commission, is the assessment of carbon emissions impacts of departure and arrival routes – though it is not clear why this was not omitted when the data was available for the Commission's noise analysis. As is recommended, this should be pursued.

5.30. The impact classification used places all three options in the 'adverse' category. However, this masks the fact that Gatwick has by a considerable margin the least adverse impact of the three shortlisted options.

Water & flood risk

5.31. The analysis concludes that each option will have significant impacts on the water environment – though the robustness of the analysis is undermined by the differing

levels of detailed offered in relation to each option.

5.32. Mitigation measures are proposed to ameliorate the impacts, however, the level of design has not sufficiently progressed to draw conclusions about their effectiveness.

Place

5.33. Notwithstanding some weaknesses in the baseline used – for example not including extant planning applications – the assessment is generally sound.

5.34. The assessed impacts of each option are deemed to be similar; this seems to be underpinned by a low weighting for housing loss. The Heathrow NWR options entails the loss of over 1,000 residential units – yet is seemingly balanced by the mitigation of the landscape, townscape, waterscape and heritage impacts. By contrast, the Heathrow ENR option entails 75% fewer residential units being lost – and yet is also assessed as 'adverse'.

Quality of life

5.35. While the Commission can be commended for its consideration of quality of life as a standalone issue, the analysis is incomplete, limited and does not take account of the full range of factors on a consistent basis. The approach is too simplistic, without distinguishing between different geographical localities or phases (construction, operation…) of the weighting of each impact. The conclusions are, as a result, crude and unsubstantiated.

5.36. The Commission concludes that the overall impact on quality of life at the local level for both airport options is 'neutral' assuming that adverse and supportive impacts will balance out. However, it is far from clear that the impacts can be netted off against each other in this way, particularly for Heathrow, where the substantial benefits to the local economy are deemed to cancel out the 'highly adverse' noise impacts.

5.37. As the analysis is set out, a reader is required to have a full understanding of hundreds of pages of technical analysis from other technical modules to reach an informed view of the quality of life issues. There is a heavy reliance on compensation to mitigate community effects, though no proper evaluation of this is offered.

Community

5.38. The assessment does not allow for the scale or significance of the community impacts to be fully understood at this stage. Of particular concern is the inability to conclude that the proposals would not have a disproportionate impact on any specific community group.

5.39. The geographical scope is limited to those areas "into which and close to which the extended airports will physically encroach" – excluding swathes of the airports'

immediate hinterland. The cumulative impacts have not been evaluated. In addition, the appropriateness and deliverability of the mitigation is also insufficiently considered.

5.40. The Commission deems the Heathrow NWR option to have the greatest impact, while the Heathrow ENR option is marginally worse than the Gatwick option. However, given the very severe limitations of the assessment, very little weight can credibly be given to these findings at this stage.

Cost and commercial viability

5.41. Though the overall approach taken is sensible, there are a number of omissions which undermine the usefulness of the assessment. In particular, it does not appear that the full range of financing risks or the long term impact on public expenditure have been fully assessed. Heavily reliant on promoter inputs, there are also very substantial variations in unit costs between options.

5.42. Furthermore, aeronautical charges are expected to be higher for each of the shortlisted options than was calculated by their promoters. It is not clear what the impact of these higher charges may be on airport demand and on competitiveness relative to other European hubs.

5.43. The assessment raises important questions about each of the options, in terms of risks to their viability; further work is required if the uncertainty is to be better understood and the analysis is to be deemed credible.

Operational efficiency

5.44. The assessment of ground infrastructure and safety is generally sound, though there are inconsistencies in the approach to airspace. All three shortlisted options have issues raised but the Commission assert that each can be mitigated.

5.45. With regards to airspace, potential conflicts are identified and then dismissed as being capable of being mitigated. This is in stark contrast to previous advice from NATS which indicated that conflicts could only be fully understood following fast-time simulation modelling.

5.46. The somewhat carefree approach to airspace is also in marked contrast to the airspace conflicts claimed for Stansted and the Inner Estuary; the latter is a case in point, with potential conflicts with London City having been raised; though Heathrow is closer (and on similar alignment), the issue is not even touched upon in the assessment of airspace (though flagged in the safety review).

5.47. The safety review also flags the particular challenges of the Heathrow ENR configuration; it is clear that the operational safety case is still to be made.

Operational risk

5.48. The overall approach to assessment is fair; its findings do not distinguish between the three options. The analysis is, however, qualitative and there is no evidence that the achievability or cost of the mitigations have been analysed. The findings are, as a result, inconclusive.

Delivery

5.49. All three options entail risks to their delivery – and the Commission has not sought to distinguish between the options; indeed, the scale of risk is broadly comparable to the options previously discarded.

5.50. The Commission would seem not to follow the basics of risk assessment, which would have required correctly defining the risk, likely causes and mitigations. Instead, it has assumed all required mitigations can be delivered in the appropriate timeframe, yet there is insufficient evidence presented as to either the effectiveness or the costs of the requisite mitigations. The report is, as a result, inconclusive.

5.51. There has been no consideration of to what extent planned capacity will be achieved in light of possible planning and operational constraints. The Commission has also declined to take the opportunity to consider delivery risks beyond 2030, despite acknowledging the need for further capacity to meet future growth.

6. Alternatives to the shortlisted options

6.1. There are a number of alternatives to the three options which the Airports Commission has shortlisted. More than 50 proposals were considered by the Commission as part of their initial phase of work. Some of those options might be more difficult to deliver, and more expensive than the three shortlisted schemes, but it must be noted that a number are much better able to meet certain long-term, strategic objectives.

6.2. The Commission's Final Report will make a recommendation to Government. The Government are not obliged to take the Commission's recommendation forward, and indeed, may wish to take some time to weigh up the merits of options which the Commission has discounted during their process.

6.3. Therefore, it is important that the Government are made aware of all of the options that are available to it. As they do this, we would expect the Commission to be clear about why they have decided to rule out certain options. We would expect, for example, the Commission's final report to be clear about this. This would aid the expected subsequent phase of work, in which the Government prepares an Airports National Policy Statement.

6.4. Below are summarised a number of key observations about how the Commission have developed and assessed their shortlisted options, and how they have developed and assessed the alternative options, such as expansion of regional airports, and the last option to be discarded, a new hub airport in the Inner Thames Estuary (ITE).

Table 2: A high-level comparison of the differing Commission approach to options

Issue	The Commission's treatment of its three shortlisted options	The Commission's treatment of the alternative options
The Commission's overarching objectives	The Commission's shortlisted options best meet the objective for 'one new runway to 2030'	The advantages of alternative options, better able to meet long-term needs, and more than one net new runway, have not been appropriately valued.
The Commission's treatment of risk and uncertainty	The Commission is keen to point out that key risks (such as the construction of a new runway over the M25 – at Heathrow), are surmountable.	The Commission decided not to shortlist a new ITE hub airport in no small part due to the overall number of risks, each of which is actually surmountable.

The Commission's approach to developing a safe and workable airspace management solution	The Commission recognises that significant additional work needs to be done to find a satisfactory airspace solution. This includes demonstrating that the runway configuration proposed by the Heathrow Hub scheme can meet its safety case.	The Commission has been keen to place a cap on the potential ultimate size of any one airport (circa 800k movements) [Inner Thames Estuary option: Decision Report, Sept 2014] The Commission was keen to play up the airspace challenges of expansion at Stansted, in light of a potential interaction with Luton Airport [Interim Report, December 2013].
The Commission's approach to infrastructure costs – and implications for airport charges	The Commission has identified that a new runway at Heathrow will increase the per passenger charge to around £30.	The Commission has stated that a new hub airport would result in a near untenable level of airline charges [Interim report, December 2013]. This is despite TfL's assessment concluding that a figure of around £30 per passenger could enable a viable new hub airport. [The Mayor's outline option submissions, May 2013].

6.5. The Commission's three shortlisted options each have merits, but also significant negative impacts. The evidence presented by the Commission in its Final Report needs to be seen by decision-makers in the context of the alternative options and schemes available to them.

APPENDIX 1

How and where the Mayor's submission has addressed the eight consultation questions posed by the Commission

The Commission's 8 questions	How / where responded to
Q1: What conclusions, if any, do you draw in respect of the three short-listed options? In answering this question please take into account the Commission's consultation documents and any other information you consider relevant. The options are described in section three.	*i. Summary document, sections 1 and 4* *ii. Key observations in each of the 17 supplementary papers*
Q2: Do you have any suggestions for how the short-listed options could be improved, i.e. their benefits enhanced or negative impacts mitigated? The options and their impacts are summarised in section three.	
Q3: Do you have any comments on how the Commission has carried out its appraisal? The appraisal process is summarised in section two.	*i. Summary document, sections 1, 5, 6 and 7* *ii. Key observations, and 'Does the Commission's assessment constitute a robust approach?' tables, in each of the 17 supplementary papers*
Q4: In your view, are there any relevant factors that have not been fully addressed by the Commission to date?	
Q5: Do you have any comments on how the Commission has carried out its appraisal of specific topics (as defined by the Commission's 16 appraisal modules), including methodology and results?	
Q6: Do you have any comments on the Commission's sustainability assessments, including methodology and results?	
Q7: Do you have any comments on the Commission's business cases, including methodology and results?	
Q8: Do you have any other comments?	*i. Summary document, section 3* *ii. A series of recommendations are made, where relevant, in each of the 17 supplementary papers*