



A Second Runway for Gatwick

Response to Airports Commission Consultation

3 February 2015

Airports Commission: London Gatwick 180

YOUR LONDON AIRPORT
Gatwick

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Question 1:

Conclusions in respect of the short listed options

Q1: What conclusions, if any, do you draw in respect of the three short-listed options?

Key points

- 1.1 The Consultation Document supports our view that Gatwick is the best overall choice for the site of new runway capacity in the South East. It shows that Gatwick is the most cost effective proposition to meet future demand for air travel and to provide the connectivity that London, the South East, and the UK needs, and we remain of the view that Gatwick can meet those needs sooner than any of the other schemes.
- 1.2 Nonetheless, the Commission's assessment of the schemes would be even more favourable to the Gatwick proposal if a number of issues were corrected.
- 1.3 In the case of Gatwick, one key issue is that the forecast level and rate of growth in air traffic at the airport does not reflect either existing or emerging industry trends, with consequential effects on the assessed economic benefits that a second runway at Gatwick would generate.
- 1.4 There are also a number of flaws in the Commission's assessment of the Heathrow schemes. In particular, the additional runway capacity postulated by the proposers has not been subject to necessary critical review and little substantive work has been done on downside risks, with the consequence that the benefits of these schemes have been substantially overestimated.
- 1.5 Our conclusions are set out in detailed answers to the Commission's questions in its Consultation Document, and are summarised in an Executive Summary which is set out on the following pages.

Executive Summary: A second runway for Gatwick

1. The Commission has a very important task

- a) The UK is the best connected country in Europe, and London is the best connected city in the world.
- b) This has been achieved through making the most of our geographical advantages in serving the world's major aviation trunk routes, particularly the Trans-Atlantic market; through the enterprise and abilities of our aviation sector; and through consistent Government policies favouring liberalisation and competition.
- c) These policies have meant that, for more than thirty years, the UK has led the way on the liberalisation of air transport.
- d) Our efforts on liberalisation led, within the EU, to the growth of Low Cost Carriers (LCCs), to greater competition and to lower fares; and then to more competitive world markets, through the gradual development of liberalised EU air service agreements with other major regions, such as the USA, though the benefits to consumers on US routes has been restricted through the granting of anti-trust immunity to the three main airline alliances.
- e) In the airports sector, the break-up of the BAA monopoly and its replacement by a London airports system under a variety of owners has led the way towards competition between London's airports and more generally to the enhancement of competition in the air transport market through multiple airline/airport combinations.
- f) Passengers are already seeing the benefits of this change through a wider range of airline business models, routes, fares and other innovations from London's airports as well as having a choice of airports outside of London for flights to many destinations, thus continuously improving air connectivity for London and the rest of the UK.
- g) Greater operational efficiency and lower airport charges should continue to flow from this competitive dynamic.
- h) But the achievement of the full range of benefits is constrained by the long-standing difficulty in the UK context of securing approval to increase runway capacity and by the continued dominance of Heathrow in the London market, particularly for long haul traffic.
- i) The Commission has the very important task of easing these constraints in ways which support economic growth. At the same time, as the Commission has recognised, the UK is one of the most environmentally responsible countries in the world, as is manifested in UK Government policies and in our comprehensive planning system. Striking the right balance between Economy and Environment is a crucial part of the Commission's task, and it is clear that any additional airport capacity will have to meet demanding environmental standards, particularly in respect of noise and air quality. Only one of the shortlisted schemes – a second runway at Gatwick – is clearly able to achieve this.

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2. All previous attempts to add a third runway at Heathrow have failed

- a) In 2000, after a five-year Public Inquiry, the Inspector, Roy Vandermeer Q.C., made a recommendation, accepted by the Government of the day, that Heathrow Terminal 5 be built, and it was built.
- b) Vandermeer also stated that a third runway at Heathrow would have “such severe and widespread impacts on the environment as to be totally unacceptable”.
- c) It should not be surprising therefore that, except for a brief period in 2009/10, every strategic assessment of airports policy before and since the Inspector’s conclusion – the Third London Airport Inquiries (1981-83), the ‘Airports Policy’ White Paper (1985), RUCATSE (1993), the ‘Future of Air Transport’ White Paper (2003) and its Progress Report (2006) has reached the same conclusion, and looked for and identified viable alternatives to an unacceptable and undeliverable third runway at Heathrow.
- d) In many ways the environmental challenges of Heathrow expansion are the same today, but one thing that has changed is that Gatwick (under separate ownership) is now a viable alternative for expansion.
- e) The Commission now has the opportunity finally to propose a Gatwick alternative which is not just viable but better, and can actually happen.

3. The Commission’s opportunity

- a) The Commission’s terms of reference require it to make recommendations for the optimum approach to meeting the UK’s international connectivity needs, including their economic, social and environmental impacts.
- b) The Commission therefore has the opportunity in its final report to recommend how to inject further capacity into the market in a manner which stimulates competition, consumer choice and resilience. No recommendation can appeal to all scheme promoters, airlines or other concerned groups. But the Commission can make a recommendation that cements the benefits of aviation liberalisation for years to come, while having proper regard to the industry’s environmental impacts. To do this, the Commission will have to complete a thorough, balanced, fair and well-evidenced assessment of the schemes on its short-list.

4. The case for Gatwick – real competition in the London airports system

- a) Last May, we proposed adding a second runway at Gatwick as the best means of fulfilling the Commission’s remit – a solution that can be delivered at an affordable economic cost, and at a fraction of the environmental cost of the Heathrow schemes.
- b) With a second runway, Gatwick would:
 - serve all airline business models;

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- engender more competition; and
 - deliver a network that will be robust to future market changes, rather than assuming that the future of our aviation market will be the same as its Heathrow-dominated past, only bigger.
- c) Furthermore, putting two world class airports at the heart of the London system would enhance the position of London as a true global city, ensuring the connectivity of the UK and its capital to the rest of the world develops in a way that offers the best aviation future for the whole country.
- d) Adding a second runway at Gatwick delivers more Origin and Destination (O+D) passengers, more business passengers, more inbound travel and more passengers to and from regional airports, both directly to foreign destinations and indirectly, via London's airports, than do the Heathrow schemes.
- e) Adding a second runway at Gatwick would better complement regional aviation than would expansion at Heathrow, as more passengers would fly directly to and from regional airports, while preserving London system capacity for UK passengers who wish to transfer onto international routes not served by their local airport.
- f) Adding a second runway at Gatwick is also the only way to ensure competition on an equal footing between London's two largest airports.
- g) In contrast, an expansion at Heathrow would further entrench that airport's dominant position, especially in long-haul markets. It would also constrain the growth of services operated from other airports outside of London.
- h) According to the Commission's analysis, a second runway at Gatwick provides at least the same connectivity in the UK as would be achieved through further expansion of Heathrow, but with much greater operational resilience and much lower environmental impacts.
- i) Our own analysis goes further by assessing the impact of the airport charges and, more importantly, the air fares which would be generated by a Gatwick expansion through a greater boost to competition. Taking into account these critical factors, we demonstrate that Gatwick expansion will generate more passengers and better connectivity both for London and the UK regions.

5. Our comments on the Commission's assessment

- a) The Commission has done a huge amount of work, in a relatively compressed time, to assess three different short-listed schemes against a comprehensive set of criteria. We recognise the strength and ambition of the Commission's appraisal framework and the work which the Commission has done to date.
- b) And we are pleased that the Commission's assessments generally support the case that Gatwick made in May.
- c) The Appraisal Framework provides the basis for a thorough assessment of the short-listed schemes. However the assessments must be balanced, fair and well-evidenced if they are to provide a robust basis for the Commission's conclusions.

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- d) The Commission makes clear in its Consultation documents that it has further work to complete. We have a significant number of comments and suggestions to make on the work to date, which are covered in our answers to the Consultation document questions.
- e) Our focus in this Executive Summary is on a smaller number of key issues that need particular attention so as to ensure that the Commission's final recommendations are fair to all of the promoters and have a firm, robust and defensible foundation.

6. Traffic forecasts are key to the assessments, so must be robust

National Demand

- a) Many of the UK-level forecasts produced by the Commission support the arguments we made in our May submission by confirming that:
 - Gatwick expansion can meet the air traffic needs of the country;
 - it can, in particular, best meet the needs of the short haul traffic flows that comprise more than 70% of flights and the needs of the LCCs that will in the main be operating these flights; and
 - the Gatwick scheme does this while also allowing for more flights to new and existing long haul destinations through Gatwick, Heathrow and the other airports in the London system, as well as from the rest of the UK.
- b) All of the Commission scenarios also show the same total O+D traffic at the UK level, irrespective of where the next runway is built – which implies that the UK-wide economic benefits of all the schemes should be broadly the same, though in the case of Gatwick more dispersed throughout the UK. (For that and many other reasons, the experimental PwC economic analysis which reaches dramatically different conclusions cannot be relied upon).
- c) The Commission's own analysis also confirms the continuing predominance of European and short haul traffic. It also takes account of the growth of LCCs and new emergent carriers, as well as the significance of the growth in traffic through the Middle East and from the Far East.
- d) It also recognises the aircraft technology changes that support these market trends, in particular the future dominance of the “hub-busting” Boeing 787 and Airbus A350 aircraft.
- e) All these points, together with the unstoppable shift in hub activity towards the Middle and Far East, are shown to be leading to a gradual decrease in the importance of transfer traffic in London and in Europe more generally.
- f) The traffic modelling used to generate the Commission's analysis therefore appears to be an acceptable tool for assessing overall aggregate national demand.

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Forecasts by Airport

- g) Nonetheless, the modelling is seriously flawed when it attempts to allocate future passenger growth to individual airports. It has a persistent tendency to over-forecast Heathrow and other airports; and to under-forecast Gatwick. This is illustrated in Tables 1.1 and 1.2 below. This structural bias leads to consistent and large errors in both these directions, rendering the model unsuitable as the basis for a decision on the location of future growth as between Heathrow and Gatwick.

TABLE 1.1: DFT WHITE PAPER FORECASTS (NO NEW RUNWAYS), PUBLISHED DECEMBER 2003

	2002 Actual	2015 Forecast	Forecast Growth	2014 Outturn	Actual Growth	2015 Forecast versus 2014 Outturn	
						Difference	% Difference
Gatwick	29.5m	33.5m	4.0m	38.1m	8.6m	(4.6m)	(12%)
Heathrow	63.0m	79.9m	16.9m	73.4m	10.3m	6.5m	9%
Stansted	16.0m	32.8m	16.8m	19.9m	3.9m	12.9m	65%
Luton	6.5m	25.5m	19.0m	10.5m	4.0m	15.0m	143%
London City	1.6m	2.9m	1.3m	3.6m	2.0m	(0.7m)	(21%)
	116.7m	174.6m	57.9m	145.5m	28.9m	29.1m	20%

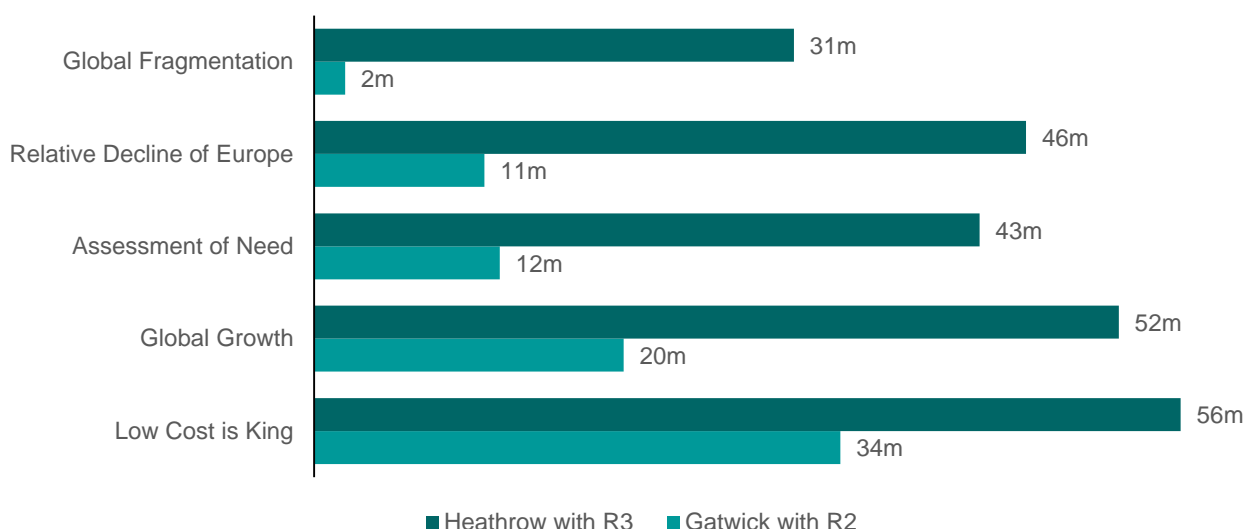
TABLE 1.2: DFT UK AIR PASSENGER DEMAND AND CO2 FORECASTS, (STANSTED NEW RUNWAY) PUBLISHED JANUARY 2009

	2008 Actual	2015 Forecast	Forecast Growth	2014 Outturn	Actual Growth	2015 Forecast versus 2014 Outturn	
						Difference	% Difference
Gatwick	34.2m	35.0m	0.8m	38.1m	3.9m	(3.1m)	(8%)
Heathrow	66.9m	80.0m	13.1m	73.4m	6.5m	6.6m	9%
Stansted	22.3m	35.0m	12.7m	19.9m	(2.4m)	15.1m	76%
Luton	10.2m	15.0m	4.8m	10.5m	0.3m	4.5m	43%
London City	3.3m	4.0m	0.7m	3.6m	0.4m	0.4m	10%
	136.8m	169.0m	32.2m	145.5m	8.7m	23.5m	16%

- h) The forecasts presented in the Commission's consultation document appear to suffer the same inherent bias against Gatwick.
- i) Figure 1.1 clearly shows, under most scenarios, unreasonably low growth at Gatwick - even with a second runway. Conversely, the forecasts for Heathrow with a third runway are unrealistically high, both in absolute terms and in the rate of growth.

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FIGURE 1.1: THE SAME INHERENT BIAS AGAINST GATWICK, AND IN FAVOUR OF HEATHROW, IS EVIDENT IN THE COMMISSION'S FORECASTS BASED ON THE DFT MODEL



Commentary on modelling approaches

- j) In order for the modelling work to be made sufficiently robust to serve as a basis for the Commission's final recommendation, the following important issues need to be addressed:
- k) In relation to traffic modelling:
- correcting the under-allocation of demand to Gatwick in DfT's allocation model;
 - correcting the overly pessimistic rate of traffic growth at Gatwick, especially in early years;
 - correcting over optimistic assumptions for Heathrow on LCC entry which suggest that Heathrow will outperform Gatwick, despite it never having served independent LCCs and being unlikely ever to be suitable for traditional LCC operations on a significant scale; and Gatwick's status as Europe's leading LCC airport.
- l) And, in relation to capacity assessment:
- correcting implausible assumptions on Heathrow issues such as ATM capacity, passengers per ATM, technical and operational limitations, and the assumed absence of planning and environmental constraints at that airport.
 - correcting claims by Heathrow that it could deliver 740,000 movements per year and 132-149 million passengers per year. Work undertaken by independent experts suggests that the incremental capacity generated by a third runway at Heathrow is likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow. The complex dependencies of integrating a three runway Heathrow into the London airspace system mean that a more realistic estimate would be only 645,000 movements and 118 million passengers.

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Next steps on traffic modelling

- m) We have independent advice to support these points and, in our detailed response, provide some recommendations that can readily be introduced by the Commission to help address these shortcomings.
- n) This is a matter of such fundamental importance to the decision on where to site a new runway that we believe it will have to be further reviewed by the Government when it comes to take a decision on the Commission's recommendations.

7. Competition benefits should be taken fully into account

- a) The Commission has acknowledged the importance of competition in increasing connectivity and passenger choice, but has yet to quantify fully the significance of generating more competition in the market.
- b) The Commission's analysis to date suffers from being based on air traffic forecasts that have the shortcomings identified above, as well as excluding the effects of competition.
- c) And it does not yet fully recognise the consumer benefits that competition can deliver through the introduction of a greater choice of routes in the market, lower fares, improved customer service and other innovations.
- d) The work done by the International Transport forum (ITF) and SEO Economic Research (SEO) for the Commission rightly assesses that expansion at Gatwick "is likely to have the strongest positive impacts on competition", but is wrong to conclude that competition between hubs is likely to be the most beneficial form of competition.
- e) Our view, supported by independent evidence provided in Appendix 2, is that:
 - LCCs bring a significant impact to the markets in which they operate;
 - competing airlines, especially LCCs, operating at different airports generate more benefits than when airlines operate and compete with each other at the same airport;
 - all this can add up to fares that are 60% lower than they otherwise would be;
 - in contrast, network carriers competing at the same airport generate only limited competition benefits. This is a particular issue on the important US routes which are dominated by the three anti-trust immunised airline groups principally operating at Heathrow and accounting for 97% of that market in 2014.
- f) Addressing these points will enable proper quantification of the benefits that would flow to the UK through the further enhancement of competition across the aviation sector at London airports.

8. Economic assessments should use sound methodologies

- a) The work undertaken by the Commission staff in their Transport Economic Efficiency (TEE) analysis shows the Heathrow schemes as providing greater welfare benefits than Gatwick expansion in all but one of the Commission's scenarios. Correcting the traffic forecasts would reverse this conclusion.
- b) We consider that the Commission should follow the DfT's WebTAG guidelines and present costs (including all surface access costs), as well as economic benefits, in the assessment. When this is done, it is clear that Gatwick expansion delivers much better net benefits and better value for money than Heathrow in each of the Commission's scenarios, even using the Commission's traffic forecast.
- c) The economic analysis should be updated to reflect our earlier comments on traffic forecasts and on the benefits of competition. Once this is done, the advantages to the UK of pursuing a policy of competition across the whole aviation sector through choosing the Gatwick scheme, would become clearer still. Independent advice suggests that the quantified direct benefits of competition are around £10-14 billion; and that indirect benefits could be just as large.
- d) Subject to these points, and to addressing the Traffic and Competition issues mentioned above, the Commission's economic analysis is sound.
- e) In contrast, the PwC analysis of wider impacts, which is separate from the TEE analysis, uses experimental methodologies. The Commission has pointed out that this analysis should be interpreted with caution. We have sense-checked the PwC analysis against previous transport assessments, which show wider economic benefits averaging around 25% of user benefits, while PwC's modelling shows proportions up to 961%. Conclusions based on work that produces anomalies of this kind, and has a number of identifiable modelling flaws, would not be robust. In consequence we believe that the PwC work is so fundamentally flawed that it cannot be relied upon by the Commission.

9. Costs and Commercial Viability favour Gatwick

Cost, risk and delivery

- a) Gatwick is rightly recognised by the Commission as the lowest cost and lowest risk project.
- b) According to the Commission's analysis Gatwick can deliver the required capacity at half the cost of the Heathrow North West Runway scheme. We remain confident that the Gatwick scheme can be delivered for around £8 billion.
- c) In part, this is driven by a mature risk management framework that has been tested by highly experienced expert consultants, as we have assembled our proposals.
- d) However, this also reflects the fact that the Gatwick scheme is inherently a much lower risk project that can be built on non-operational land, with much simpler political, planning and construction challenges.

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- e) In addition, we have developed a revised phasing approach – in full consultation with our airline customers, including extensive engagement with easyJet - which offers a better blend of cost efficiency and operational performance for the project.
- f) The first phase, which will deliver upgraded surface access, a fully operational new runway, and a state of the art new terminal, people-mover and associated facilities would cost only £3 billion, a fraction of the cost up to opening of Heathrow's new runway. All of this would be financed by Gatwick privately with no recourse to taxpayer funding.
- g) Finally, we would note that the Heathrow North West Runway proposals omit – either by accident or design – some very substantial costs (necessary expansion of Terminal 2, further works on the Eastern Campus, and a southern road tunnel). These would add a further £6 billion to the cost of the Heathrow scheme. In addition, the Commission has itself identified a further £5.7 billion of surface access costs at Heathrow.

Airport charges

- h) For all these reasons, we remain confident that the Gatwick Second Runway scheme can be delivered and financed at a charge range of £12-15; and we are prepared to commit to a firm price limit of £15 per passenger at today's prices. This is in stark contrast to charges which we estimate will be around £40 per passenger at Heathrow.

Funding and financing

- i) The combination of lower costs and risks – and our phased approach to the development – ensures that the Gatwick scheme can be fully privately financed, without reliance on public sector funding, which may give rise to challenges of unlawful State Aid.
- j) Gatwick's financing requirement to deliver the first phase is substantially lower than that required for the schemes at Heathrow – debt raising of less than c. £2 billion for Gatwick as compared to more than c £20 billion for Heathrow. There will be ample liquidity in the financing market to cover Gatwick's needs, whereas the scale of Heathrow's funding requirement is unprecedented and involves much greater market capacity risk.

Gatwick Second Runway Contracts and Commitments

- k) Gatwick is prepared to assume risks of delivery of the project through appropriate arrangements with Government and the CAA, which would ensure both provision of the capacity and long term price certainty for users.
- l) In this way, Gatwick will be assuming the majority of the risk associated with the new runway – consistent with the CAA's principles on how a new runway might be financed.
- m) Such an approach would deliver benefits to the Government, airlines and users – in relation to the certainty of delivery of the project; and to our shareholders – in relation to a proper understanding of the risk/reward commitments they would be taking on.
- n) This proposal gives certainty for airlines, passengers, regulators and the Government early in the process – in contrast to a traditional Regulated Asset Base (RAB) based approach which would leave open the risk of cost overruns or traffic shortfalls leading to substantial price increases for users, or possibly even putting the whole project at risk.

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- o) We are making an initial proposal along these lines to the Government, and we have set out our high level ideas on our Commitments in our response to Module 13 within Questions 4 & 5. We believe that the Commission should take this into account in its analysis and we invite the Commission to clarify any issues arising with us.
- p) Given the importance of these issues, we believe that the Commission should fully assess the costs and delivery risks of all the schemes submitted so as to be able to make a meaningful direct comparison between them. This should include all scheme costs; risks and the appropriateness of optimism bias for each scheme; scheme phasing; and a full funding and financing analysis, with an emphasis on the financing “readiness” and feasibility of each scheme.

10. Heathrow’s environmental impacts are orders of magnitude greater than Gatwick’s

- a) Concerns relating to a wide range of environmental issues have rightly become increasingly important elements in evaluating major infrastructure developments.
- b) This is a particularly relevant concern in the case of aviation which generates a number of environmental concerns, not least in relation to noise, air quality and carbon emissions.
- c) The current environmental performance of Heathrow and Gatwick is a clear indicator of the relative challenge in adding a runway’s worth of capacity at either site. Today, some 3,200 people are significantly affected by aircraft noise around Gatwick; the comparable figure for Heathrow is 240,000, 75 times the Gatwick figure. Similarly, Gatwick does not breach legal air quality limits, while in the Heathrow area such breaches are daily occurrences – indeed, from some reports, air quality around Heathrow appears to be deteriorating currently – and traffic congestion increasing. A step-change in traffic will have major air quality consequences on the ground as a result of more air traffic and more airport related surface traffic in addition to background surface traffic growth.

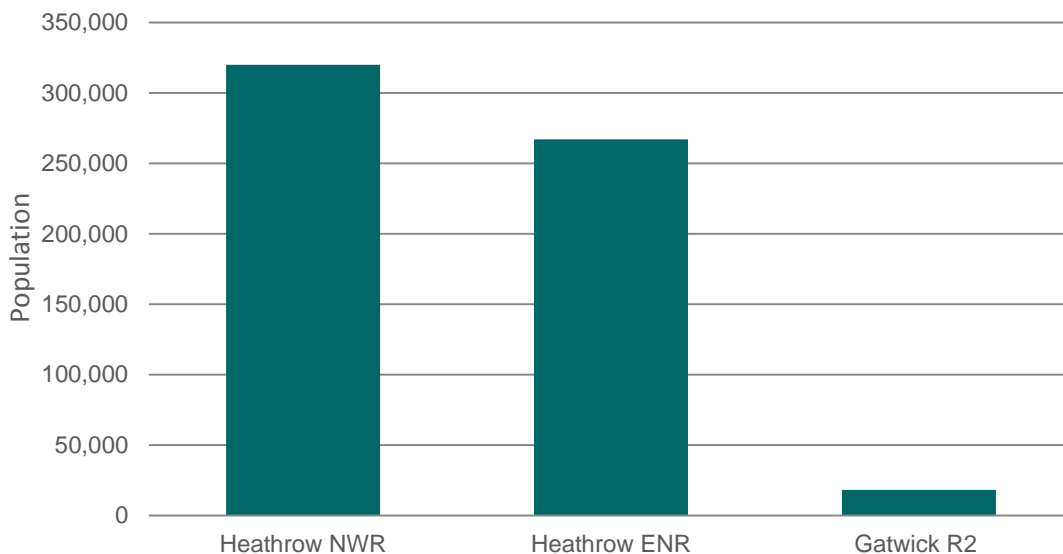
Noise

- d) Noise has long been the prime concern of local residents in relation to aviation operations and growth and it remains today a very difficult issue to manage.
- e) Recent experience of trials of new airspace routes and procedures at both Gatwick and Heathrow has demonstrated very clearly that local residents remain understandably very sensitive to changes in the spread of aircraft noise and that, in particular, people newly exposed to significant levels of noise are the most sensitive of all. The affected population encompasses large swathes of London, as well as the local area around the airport.
- f) For that reason, the Commission must ensure that the analysis of noise impacts is conducted in a transparent and even handed way for all three schemes.
- g) Full weight should be given to the very significant difference in the numbers of people exposed to significant noise by the different schemes. The fact that the Commission’s assessment demonstrates that around 300,000 people would be exposed to significant noise for the first time by either Heathrow scheme, with a comparable number for Gatwick

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of 18,000 people, should be given full weight in the Commission's final recommendation. Figure 1.1 below clearly illustrates this point.

FIGURE 1.2: GRAPH COMPARING NUMBER OF PEOPLE 'NEWLY AFFECTED' BY THE HEATHROW¹ AND GATWICK SCHEMES WITHIN THE LDEN55DB CONTOURS (BASED ON THE COMMISSION'S CARBON CAPPED FORECASTS FOR 2050)



- h) Moreover, the Commission's current analysis of noise at Heathrow ascribes many of the likely benefits that will arise in any event from operational and technical improvements to the provision of new runway capacity. In practice, these should be attributed to the two runway 'baseline' case, reflecting best practice planning. The Commission must show the impact of a new runway compared with a base case of no expansion at all.
- i) The consequence of this and other features in the Commission's current approach is to understate significantly the increase in local and national noise impacts of the Heathrow expansion schemes and, correspondingly, to exaggerate significantly the national noise impacts of the Gatwick scheme. A consistent approach is required which examines the impact on a non-expanded 'baseline' case of expansion at each airport, so that the impact of that expansion can be understood clearly.
- j) The weaknesses that we have identified must be remedied if the Commission's noise assessment is to be fair, balanced and robust.
- k) In assessing the deliverability of the schemes, the Commission will also need to take into account the difficulty in obtaining development consent faced by a scheme with noise impacts on the scale that would result from either of the Heathrow schemes. Even assuming that such consent could be granted, the Commission must take account of the onerous and restrictive conditions that are likely to be required, including a movements cap,

¹ Heathrow NWR Option T

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particularly in view of the very substantial numbers of people who would be “newly affected” by significant levels of noise.

Air Quality

- l) The air quality implications of the Heathrow schemes are even more challenging than those presented by the consideration of noise impacts:
- Air quality is subject to legal limits that are derived from the impact on human health and mortality caused by air pollutants. The Commission is rightly now undertaking detailed modelling of these impacts. The only basis upon which a scheme can be allowed to come forward is if it is demonstrated that, with the forecast level of operations, air quality limits would be met and that compliance with them would not be delayed.
 - Given that air quality limits are not being complied with today at and around Heathrow, it seems highly unlikely that the addition of more aviation activity and associated additional surface traffic will result in air quality limits being met, or in any event that this would not delay the attainment of these limits in the Heathrow area. The prospect of adding yet more aviation activity at Heathrow – and the inevitable consequential attraction of more surface traffic to an already congested and polluted area – renders compliance with air quality limits by either Heathrow scheme highly uncertain at best. Further, and in any event, it seems highly likely that, even if compliance could eventually be secured in the Heathrow area, either Heathrow scheme would delay this compared to the position if a Heathrow scheme did not come forward at all.
 - In addition, the compliance problem for Heathrow would be compounded by the emissions associated with the construction of the runway, terminal and associated infrastructure over a period which is likely to exceed 10 years.
- m) The Heathrow claim that it would be possible to meet air quality limits there is founded upon a large number of assumptions. All are questionable and none is supported by compelling evidence that demonstrates that those assumptions are valid. Negative factors such as the impact of inevitably more congested roads resulting from a busier Heathrow, and growth in background traffic on the busiest part of the UK’s road system, are not considered in Heathrow’s proposals. Nor is the prospect of tightened air quality limits as legislators adapt to lower emission road vehicles and other developments.
- n) The Commission’s detailed air quality modelling that is now underway must cover the initial main construction phase, as well as the early and mature operational phases of Heathrow schemes, to establish whether – even with mitigation – these are likely to breach or delay compliance with legal air quality limits.
- o) The only scheme before the Commission that can demonstrate that its proposals would meet legal air quality limits, and would not delay attainment of those limits, is that put forward by Gatwick. This clearly provides a compelling reason for preferring development at Gatwick.

11. Gatwick is deliverable, Heathrow faces significant risks

- a) Any recommendation from the Commission, no matter how robust the analysis or how compelling the argument, would be worthless if it cannot be delivered.
- b) Governments have made a number of efforts over the past 30 years to identify a site for further runway development in South East England. None has been successful, which demonstrates the inherent political and planning difficulties of taking forward such proposals. Expansion at Gatwick has not been properly tested in this period as it has been the subject of a legal prohibition for the last 36 years.
- c) The much less challenging nature of the Gatwick scheme should be a key factor in the Commission's assessment. The fact that a Gatwick second runway and associated works can be built on a largely greenfield, safeguarded, site means that it is the only scheme that can be delivered by 2025, a point recognised in the Commission's assessment. Recent growth patterns suggest that the earlier opening of a new runway would bring forward significant economic and consumer benefits.
- d) In contrast, both Heathrow schemes face major challenges at the planning, site preparation and construction stages. These three stages of the Heathrow project have to occur sequentially; and all are subject to significant risk with consequential knock-on effects on subsequent work. The cumulative effect of these challenges is such that we do not believe there is any credible prospect of an additional runway being open at Heathrow until at least 2029/30 – some 4/5 years later than the date when a Gatwick second runway could be operational. There is clearly also a risk that a third runway at Heathrow might never be delivered.

Planning

- e) In relation to the planning process, it is clear that the complexity and local sensitivity of the Heathrow schemes are of a different order of magnitude to those of the Gatwick scheme. Any Development Consent Order application or Hybrid Bill will have to resolve a range of environmental issues such as noise, air quality, green belt, disruption to strategic and local roads, landfill, the relocation of a major Waste to Energy plant, and how to introduce a local congestion charge. This means that the planning process for Heathrow is likely to take significantly longer and carry a much higher risk of failure than for Gatwick.
- f) Even if ultimately successful, the Heathrow planning process is likely to impose severe constraints on the operation of the new capacity, in a similar way to the constraints placed on the current two runway operation.

Construction

- g) Similarly, while the construction of a second runway at Gatwick would constitute a major civil engineering project, Heathrow must manage a much higher degree of construction risk related to the need for:
 - enabling works, such as the diversion and tunnelling of the M25, the re-provision of the Waste to Energy plant;
 - wholesale redesign of airspace;

Executive Summary

- significant culverting of rivers; and
 - remediation of an estimated 9 million cubic metres of landfill of which, landfill records suggest, up to 1 million cubic metres is hazardous and would likely need to be removed and disposed of offsite;
 - not to mention the interface with a busy operational airport and the busiest part of Europe's road network.
- h) Added to these risks, the expenditure profiles at Heathrow (annual maxima of £2.3-£2.4 billion for each scheme) reach levels that have never been achieved at a single UK site before, and have only been achieved during the Olympics on multiple sites without the constraints that would be imposed by the need to build around an operational airport and on a single site, located within the busiest part of the UK's road network. These are promoter scheme estimates – if the Commission's analysis of Heathrow is taken, and all ongoing capital expenditure is included, then the peak annual expenditure is over £6 billion.
- i) This compares with realistic and manageable annual expenditure profiles at Gatwick, spread over a 24 year period and peaking at £0.5 billion, leading to construction and financing challenges that are on a much smaller scale for Gatwick than for Heathrow.
- j) We note that these issues have not been fully scrutinised in the work of the Commission to date.

Overall viability of the schemes

- k) These Planning and Construction risks are of such dimensions that they lead to the conclusion that neither Heathrow scheme is likely to deliver a new runway before 2029 at the earliest.
- l) More broadly, the risks of Cost over-runs and the Financing risks of the Heathrow schemes, added to the Planning and Construction risks, indicate that the Heathrow schemes are very high risk indeed. Yet, in contrast to Gatwick's proposal to bear most of its business risks, the risks of the Heathrow schemes would rest with users – the airlines and passengers, and in the case of surface access costs, with Government.
- m) In addition, we note that the comparative safety of the schemes has so far received little attention. We believe that a full risk analysis of the safety and security risks inherent in putting a significant volume of additional traffic over the large populations of central London as compared with over less populous areas should be undertaken as an integral part of the Commission's recommendations. While aviation's good safety record shows that safety risks are low, they are not zero and this is a factor which the Commission should not ignore.
- n) While the Commission's consultation documents provide several brief analyses of risk, these risk analyses do not yet have much depth and they are spread around different parts of the documentation. In many cases, they do not flow through to the core quantitative analysis. We therefore consider that a detailed and comprehensive assessment and comparison of risks must be undertaken by the Commission if it is to have a robust basis for its eventual recommendations.

Executive Summary

- o) A detailed Quantitative Risk Assessment produced for Gatwick shows that all of the risk considerations militate strongly in favour of the Gatwick scheme. In each and every element, Gatwick is the lower risk scheme.
- p) On this basis the Commission faces a choice between a Heathrow runway that is likely to be delayed - and might never be built - and a Gatwick runway that can be delivered, and in a timely manner.

12. Gatwick is ready to develop its proposals further

- a) In our detailed responses to the questions set by the Commission in its Consultation document, we have demonstrated where the Commission's analysis supports our view that developing a second runway at Gatwick provides the best overall solution for the UK. Indeed, the Commission's analysis in the Consultation documents shows that on all key criteria – strategic fit, economy, environment, cost, deliverability – Gatwick is the best scheme. The sole exception is the economic analysis undertaken by PwC, which the Commission has said should be interpreted with caution, and on which we submit no material reliance can be placed.
- b) We stand ready to engage with the Commission as it reviews the responses it receives to its Consultation document and prepares its final recommendations to Government. In particular, we have included in our consultation response a number of technical source documents which support and supplement our case, and on which we would welcome discussion.
- c) We are taking the opportunity to present our revised phasing plan which delivers similar benefits to the Commission's adjustments to our original May 2014 proposal. Our revised proposal is in close alignment with the Commission's assumptions, and has been thoroughly costed.
- d) Gatwick will be further developing its proposals for a contract with the Government and for Contracts and Commitments-based airport charges. We consider that the Commission should take this important aspect into account in developing its recommendations.

13. Conclusion

- a) The work done to date by the Commission needs to be supplemented by the actions we propose in relation to the following key areas if it is to achieve a thorough, balanced, fair, evidentially sound and therefore robust assessment of the schemes in its final report:
- **Traffic forecasts**, where Gatwick traffic has been understated, and capacity and traffic at Heathrow overstated;
 - **Competition**, which has not been taken into account;
 - **Economic assessments**, which inherit errors in traffic modelling, capacity assessment and the impact of competition and which use a flawed methodology for an assessment of wider benefits which should not be relied upon;
 - **Cost and Financing**, where a more in-depth assessment of the comparative costs, financing proposals and risks needs to be undertaken. This should reflect the comparative risks and benefits of Gatwick's Commitments approach with proposals from other promoters;
 - **Air Quality and Noise**, where the challenges facing Heathrow have been understated, and where greater transparency is necessary to enable people affected to understand the impacts more clearly;
 - **Delivery**, where Gatwick's materially lower risk compared to Heathrow's has been understated, and a detailed comparative assessment of risk is needed - including Safety and Security, which have not yet been taken into account sufficiently.
- b) Once this work has been done, and after taking account of the improvements we have made to our proposals, including our low proposed passenger charges, we believe that the Commission will find that Gatwick is clearly the best choice for a new runway in the South East.

Question 2:

Suggestions for how the shortlisted options could be improved

Q2: Do you have any suggestions for how the short-listed options could be improved, i.e. their benefits enhanced or negative impacts mitigated?

Key points

- 2.1 With over £1 billion of investment since 2009 under its new ownership, Gatwick is being transformed. Passengers are enjoying a higher level of service than ever before. We are carrying this approach through to our proposals for a second runway by making further improvements to our scheme in the following ways:

Revised phasing

- 2.2 The revised phasing proposals bring forward the first phase of a third terminal and its associated Automated People Mover (APM) while maintaining an opening date of 2025. This revised phasing approach offers a better blend of cost efficiency and operational performance for the project. The first phase, which will deliver upgraded surface access, a fully operational new runway, and a state of the art new terminal, people-mover and associated facilities would cost only £3 billion: a fraction of the cost up to opening of Heathrow's new runway. All of this would be financed by Gatwick privately with no recourse to taxpayer funding.

Rail station capacity improvement project

- 2.3 A rail station upgrade project, which builds on the Commission's short and medium term proposals, has been agreed with DfT and Network Rail. This project will provide a new station concourse, double the size of the existing concourse, which will be open by 2020, with or without Gatwick proceeding with a second runway. It will increase the capacity of the station to 50 million passengers per year.

Alternate use of the runways

- 2.4 We propose to alternate use of the runways for early morning arrivals and see no need to increase night flying when the new runway first opens. This will limit the night time impact of the airport.

Economic regulation

- 2.5 Gatwick is prepared to assume the risk of the delivery of the project through appropriate arrangements with the Government and the CAA, which would ensure both provision of the capacity and adequate assurance about long term level of return for the provider. In this way, Gatwick will be assuming the majority of the risk associated with the new runway – consistent with the CAA's principles on how a new runway might be financed. We anticipate that the charge would be £12-15 per passenger at today's prices, in stark contrast to charges

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which we estimate will be £40 or more per passenger at Heathrow. This proposal gives certainty for airlines, passengers, regulators and the Government early in the process – in contrast to a traditional RAB based approach which would leave open the risk of cost overruns or traffic shortfalls leading to substantial price increases for users, or possibly even putting the whole project at risk.

Other improvements

- 2.6 Other improvements to the Gatwick scheme include development of a Project Execution Plan, boundary changes to reduce impacts on neighbouring areas, announcement of community pledges and development of a landscape and habitat management plan.

Heathrow's inherent difficulties

- 2.7 The Heathrow schemes cannot overcome the inherent difficulties of site and location, inefficient taxiway system, multiple terminal configuration, need for significant airspace redesign and complex runway dependencies, all of which will reduce capacity below the level assumed in the Commission's assessment.
- 2.8 Heathrow is also likely to continue to be capacity constrained for local environmental reasons, as it is today. For these reasons a lower capacity should be assumed at Heathrow.
- 2.9 Not only is the overall cost of the Heathrow schemes high, but the cost of the first phase is very high due, amongst other factors, to the cost of enabling works and re-provision of affected facilities. Consequently there is little opportunity to manage risk through phasing the development.
- 2.10 Finally, because of the scale and nature of the environmental effects of the Heathrow schemes, it seems unlikely that Heathrow could match Gatwick's pledges to mitigate impacts and compensate people affected by noise.

- 2.11 This response should be read in conjunction with Appendix 29 – Bechtel Project Execution Plan Appendix 35 – GAL Pledges to the Local Community, Appendix 36 – GAL Report of Consultation, Appendix 37 – GAL Further Information on Revised Phasing Strategy.

Gatwick master plan and revised phasing

Master Plan

- 2.12 In our May 2014 submission we set out how our two-runway master plan builds on Gatwick's strong foundation. Uniquely amongst the schemes, the airfield will continue to be highly efficient for airlines while passengers will continue to enjoy high standards of service as they journey to and through the airport. Our master plan has been improved further by the agreement to deliver a much improved railway station; we are grateful to the Commission for its role in initiating this project. What is more, the environmental effects of our scheme have been minimised, the scheme is highly flexible and intensified airport and airline competition will continue to drive innovation.
- 2.13 The Commission recognised in its Consultation document many of the benefits of the Gatwick scheme and agreed with Gatwick's views on the following points:

Response to Question 2

- the scheme provides capacity of up to 560,000 air transport movement and 95 million passengers per annum;
- delivery risk is relatively low;
- the scheme can be delivered in phases;
- a second runway would improve resilience in the London system;
- sufficient road and rail capacity;
- airport and airline competition would be enhanced and there would be downward pressure on air fares compared with expansion at Heathrow;
- although there would be an increase in the number of people affected by noise the effects would be fraction of those at Heathrow;
- there would be no reduction in capacity at other commercial airports in London and the South East as a result of developing the Gatwick scheme.

2.14 Gatwick's scheme possesses a series of extremely important attributes that cannot be matched by the other schemes:

- It can be delivered by 2025 which we estimate is at least 4-5 years earlier than either of the Heathrow schemes. We set out in our response to Module 16 (Delivery), why we disagree with the Commission that the Heathrow schemes can be delivered by 2026 – we consider that this is simply implausible;
- The cost is less than half of the Heathrow North West scheme and the value for money of the Gatwick scheme exceeds that of the Heathrow schemes on the basis of Net Present Value and Benefits to Cost Ratio analysis, even using the Commission's figures. (see our response to Question 7);
- Gatwick's scheme can be phased to a significant degree, whereas Heathrow's much higher cost scheme offers little opportunity to phase;
- There is significantly less risk inherent in the Gatwick scheme, and no need for public subsidy.

Phasing option bringing forward new terminal capacity

2.15 Gatwick's phasing included in our May submission was based on the following elements:

- **2025 Runway opening phase.** This included the new runway, a remote midfield apron and pier and a partial diversion of the A23. The additional passengers generated by the second runway would be processed through South Terminal with approximately half of these bussed to the remote pier to access their aircraft. Certain elements of the South Terminal infrastructure would be expanded to facilitate the processing of the additional passengers.
- **2030 First phase.** This included the first stage of the new terminal, partially fitted out, and the provision of the landside Automated People Mover (APM) to connect the new terminal with the Gatwick Gateway transport interchange.

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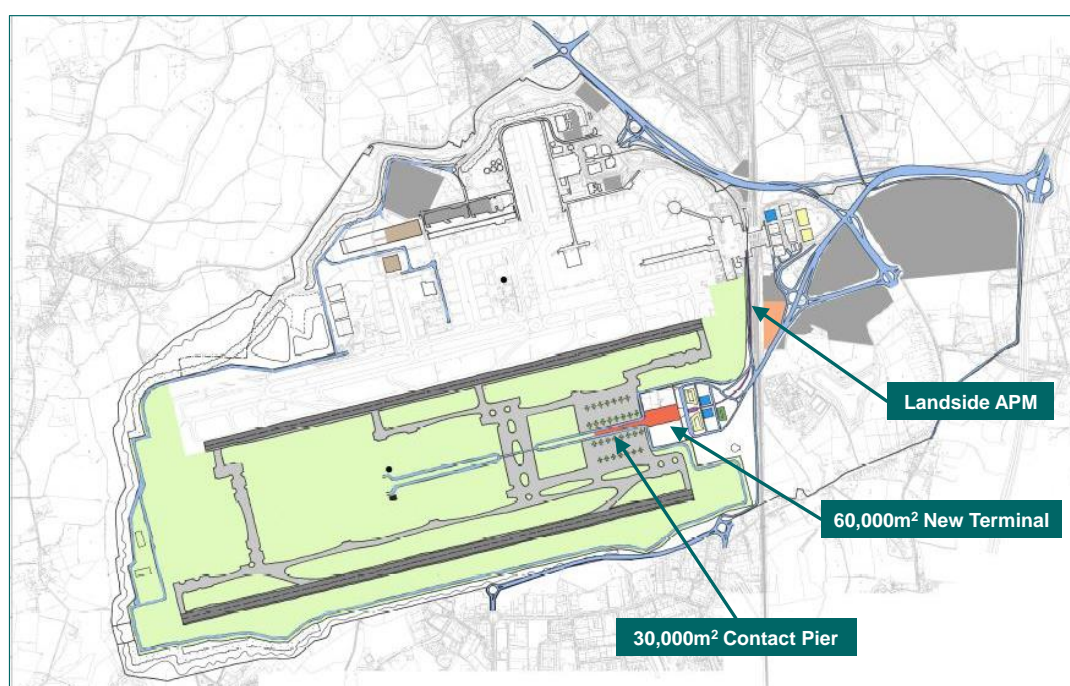
- **2035 Second phase.** This included the opening of the remainder of the new terminal built in the first phase and further apron and pier construction.
 - **2040 Final phase.** This saw the completion of the entire Gatwick second runway infrastructure including the remote satellite pier and airside APM.
- 2.16 Following consideration of issues raised by airlines and the Commission, we have now developed a revised phasing strategy which brings forward the first phase of the new terminal and the associated APM to the runway opening day. The first phase can be delivered by 2025, some 4-5 years earlier than any other scheme. The first phase (as well as the entire scheme) can be delivered for considerably less cost than any other scheme and affords much greater flexibility with regard to subsequent phasing decisions. We ask the Commission to recognise these improvements and advantages when formulating its recommendations to Government.
- 2.17 The new phasing approach retains four separate phases of construction, but brings forward elements of new terminal, pier and APM construction as follows:
- **2025 First phase.** This includes the new runway, the landside APM, the first phase of the new terminal, pier and apron and the partial diversion of the A23.
 - **2030 Second phase.** This includes the expansion of the new terminal, its pier system and apron and the completion of the A23 diversion.
 - **2035 Third phase.** This includes further expansion of the new terminal, its pier system and apron.
 - **2040 Fourth phase.** This sees the completion of the entire Gatwick second runway scheme infrastructure.
- 2.18 The initial phase of the new terminal and pier system will open in 2025, at the same time as the new runway. The landside people mover system connecting the new terminal to South Terminal and the railway station will also open in 2025.
- 2.19 These changes will bring benefits for passengers and airlines by delivering key elements of new support infrastructure on runway opening day, thereby providing more certainty on the service levels and resilience of our proposals. Details of each phase are as follows.

Response to Question 2

Phase 1 – opening 2025

- 2.20 The first phase includes the opening of the new full-length southern runway. It now also includes the opening of the new terminal and the landside APM connection to South Terminal.
- 2.21 On opening the new terminal will have 60,000m² of floor space – which will give a capacity of circa 12-15mppa. In the early years of operation the new terminal will be used by short haul services and we have optimised the design of this opening phase accordingly. The terminal will be supported by the first phase of the contact pier which will have 16 gates configured for fast-turnaround short haul operations. There will be a total 30 Code C stands, of which 16 will be contact stands and 14 will be remote. The actual stand provision can be easily modified to match the demand that arises once the runway is open.
- 2.22 The terminal will be connected to South Terminal and the Gatwick Gateway transport interchange by landside APM. The terminal will have its own multi storey car parks and will be connected to the M23 motorway by a new access road bridging the railway.
- 2.23 The construction of the new runway will require the partial realignment of a section of the A23 south of the existing airport. This will be reconnected to the existing carriageway at a point close to City Place.
- 2.24 During this phase we will also grow the passenger throughput through South Terminal to around 22-25mppa, comparable to levels that the South Terminal has handled previously although further physical and process improvements are also planned.
- 2.25 In combination, the new terminal and the additional South Terminal throughput will enable Gatwick to accommodate the first five years of traffic growth following the opening of the second runway which will deliver 63mppa in total in 2029.

FIGURE 2.1: PHASE 1 LAYOUT PLAN

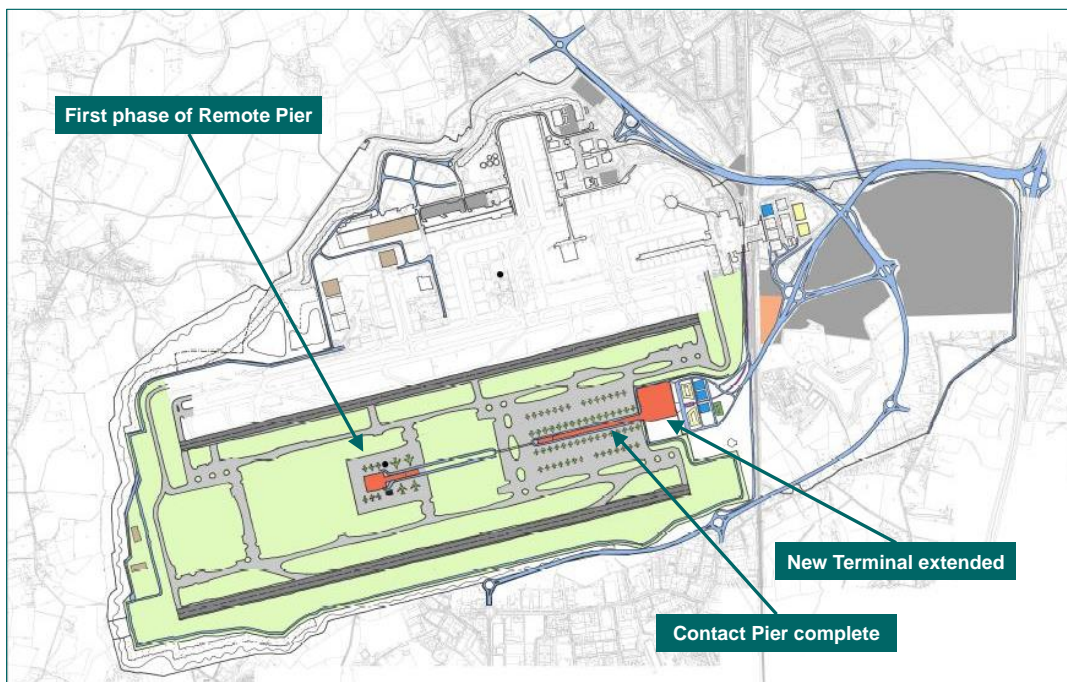


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Phase 2 – opening 2030

- 2.26 Phase 2 will see the extension of the new terminal, taking its overall floor space to 126,000m². This will be sufficient to process 28mppa. The contact pier will be completed (51,400m²) and the first stage of the remote pier will open (50,000m²). The total number of new stands will increase to 70 of which 66 will be Code C.
- 2.27 The full diversion of the A23 to the east of the railway would be completed. At this point the current A23 corridor running between South Terminal would become an on-airport, non-public road. Demand at the airport is forecast to increase to approximately 73mppa in total by 2034.

FIGURE 2.2: PHASE 2 LAYOUT PLAN

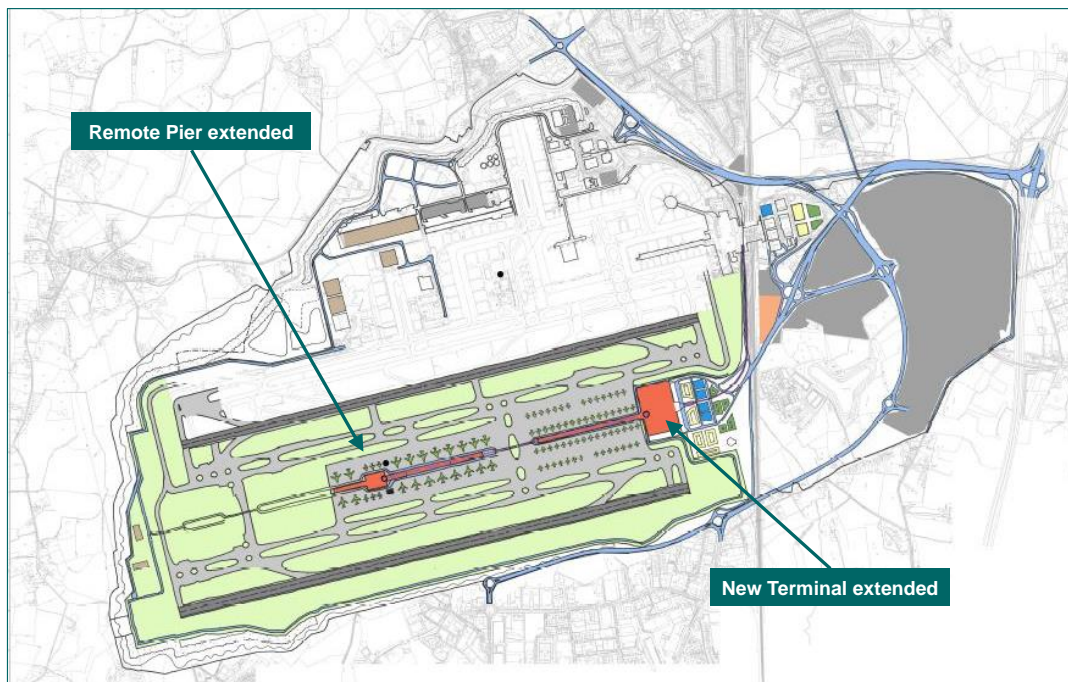


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Phase 3 – opening 2035

- 2.29 Phase 3 will see the extension of the new terminal, taking its overall floor space to 181,000m². This will be sufficient to process 37mppa. The remote pier will be extended to 83,000m². In total the mid-field apron will provide 85 stands, of which 17 will be able to accommodate Code E and 2 will accommodate Code F aircraft. Demand at the airport is forecast to increase to approximately 82mppa in total by 2039.

FIGURE 2.3: PHASE 3 LAYOUT PLAN

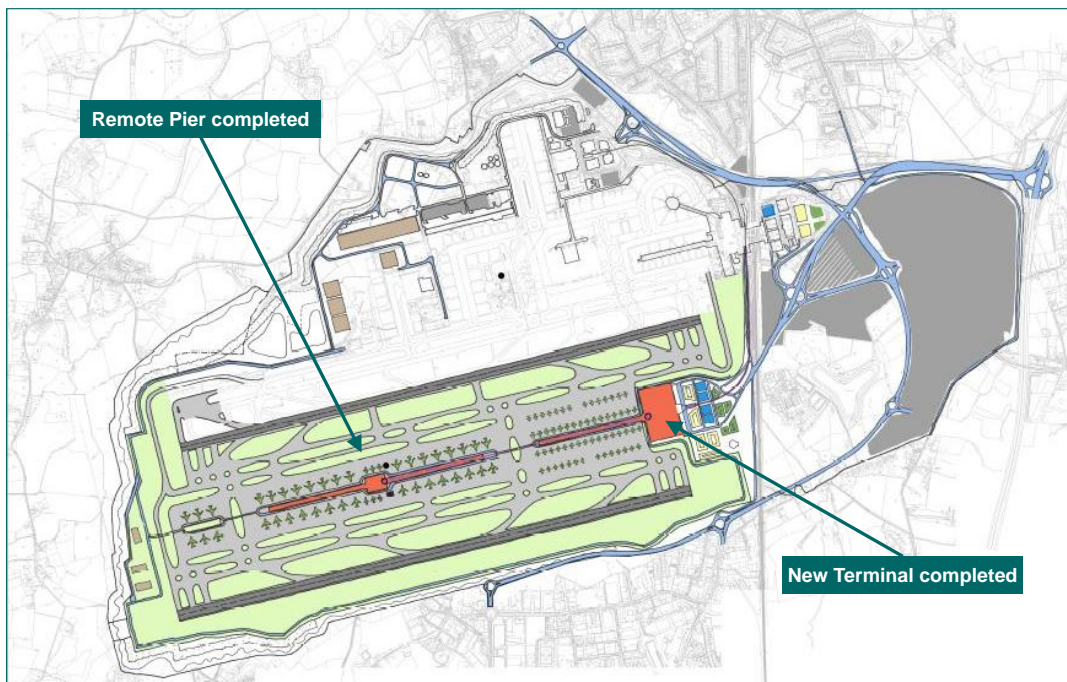


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Phase 4 – opening 2040

- 2.30 Phase 4 comprises the full build out of the midfield apron and terminal area with the new terminal expanded to its full size of 228,000m² and the total floor area of the remote pier being 118,000m². The mid-field apron will accommodate a total of 104 stands of which 32 will accommodate Code E aircraft and 6 will accommodate Code F aircraft.
- 2.31 The taxiway system will be completed and all car park spaces will be provided. By the end of this phase, in 2050, the airport is forecast to be serving 95mppa in total.

FIGURE 2.4: PHASE 4 LAYOUT PLAN



Response to Question 2

The benefits to airlines and passengers

2.32 The improvements to the Gatwick scheme resulting from this revised phasing are:

- It is well aligned with the quality of service airlines wish to offer their customers and enables airlines to compete on the basis of a level playing field;
- It further reduces the number of passengers who would be bussed to their aircraft;
- It eliminates any risk of congestion in the existing terminals;
- It is attractive to airlines looking to grow at Gatwick or who are considering operating from Gatwick for the first time;
- It can be delivered on at the same time as the new runway without delaying the 2025 opening date;
- The timing and scope of the second and later phases can be reviewed at a later stage in the project, when there will be better information.

Benefits to cost and risk

2.33 There are also certain cost and risk benefits as follows:

- It limits the cost of the initial phase to airline users by making more effective use of existing terminal capacity;
- It reduces the cost to airlines of bussing passengers to aircraft;
- The overall cost of the project is reduced by some £100 million as a result of greater efficiency in our method of construction;
- It reduces the risk of a mismatch between growth in demand and investing in a timely manner.

2.34 Appendix 37 provides more information on the capacity, programme, and cost of the revised phasing approach.

Response to Question 2

Gatwick railway station project

- 2.35 Gatwick appreciates the Commission's recommendation in the Interim Report that the Government, Network Rail and Gatwick Airport Limited should work together to deliver a significant improvement to Gatwick's railway station. In the last year considerable progress has been made. The project has been defined in outline, agreement has been reached on how the costs should be shared and we are on course to deliver the new station by 2020.
- 2.36 The Commission's consultants questioned whether the scheme currently being developed will have "sufficient capacity to accommodate passengers associated with a second runway", and cast doubt on the ability of the enhanced Gatwick Airport Station to accommodate future demand associated with a second runway.
- 2.37 Work by Gatwick, independently modelled by Network Rail, in connection with the now committed station project shows that the new station could accommodate Gatwick second runway scheme demand to at least 2050 assuming that the airport achieves its targets of 50% of air passengers and 20% of staff arriving by train – objectives which the new station will assist in meeting. Further scheme design work is ongoing to arrive at the most cost-effective solution but, to ensure that the full demand requirements of a second runway are met, Gatwick has included a further £25 million in its cost plan for the Gatwick second runway scheme.
- 2.38 In order to allow a fair comparison between Gatwick and the other two runway schemes, the Commission and its consultants should update statements on Gatwick Airport Station to reflect the latest work undertaken by Gatwick and Network Rail, the announcement in the Chancellor's Autumn Statement 2014 of funding for the station project, and the funding committed by Gatwick. The result of these developments is that that the project will accommodate 2050 demand.

FIGURE 2.5: NEW RAILWAY STATION CONCOURSE



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Night noise and alternation of runways

- 2.39 Despite the long term trend of aircraft becoming progressively much quieter and airlines investing huge amounts of money in these aircraft, the prospective incremental benefits in the future will be much less than in the recent past. In addition, it is clear that aircraft noise remains a very sensitive issue for local communities. Both Gatwick's and the Commission's assessment of noise associated with a two-runway Gatwick shows that there will be an increase in the number of people experiencing noise nuisance. We have already given careful consideration to how we might limit, mitigate and compensate for these additional noise effects.
- 2.40 We will continue to explore new operational practices and procedures that would reduce further the impact on the local community. We have already proposed that it would be appropriate to alternate the use of the runways for early morning arrivals and we see no need to increase night flying when the new runway first opens. This will limit the night time impact of the airport.

Regulation, contracts and commitments

- 2.41 In our May submission, we explained our findings on commercial viability and on the role of Government in relation to airport expansion. We do not believe that investment in Gatwick expansion should be underpinned by Government. This would only be the case if the investment proposed is out of kilter with the market that it is seeking to serve.
- 2.42 We also gave our assessment of the key risks. These should be considered over an extended period of time to match the duration over which an appropriate return will be earned. Given the front-end loading of the capital investment, the airport will be exposed to regulatory / political risk, in particular at the time when investment is made and after a period of planned lower returns: changes at this point in the political or regulatory landscape may not allow investors to recoup an appropriate return. Consequently, we stated that it may be necessary for the Government to provide assurances to financial investors as to the scope for future regulatory intervention. We also said that Gatwick's existing Contracts and Commitments framework is an approach that could support a new runway at Gatwick, and we committed to developing this approach further.
- 2.43 Accordingly, we welcome the Commission's approach of developing a risk framework within its Financial Case and think it right that this will be a key area of focus in its funding and financing assessment. Gatwick believes it is critical the Commission takes into account how risk is to be managed, as between the three proposals. So far, the Commission's economic assessment has applied the same RAB-based model to all three schemes. This RAB-based approach places most of the risk on airlines passengers and Government. It is a fundamental flaw to apply RAB to all three schemes and ignore the factually more realistic Contracts and Commitments route.
- 2.44 As an alternative approach to managing economic risk, we explain the principles of our R2 Commitments in this response. We have also submitted these principles in response to the CAA's consultation on its draft policy on Economic Regulation of New Runway Capacity (CAP1221). We envisage R2 Commitments to comprise a contractual undertaking between Gatwick, the Government and the CAA. This contract will establish a long-term framework for

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the expansion of the airport, the specification of service standards, and the setting of airport prices. We envisage the R2 Commitments extending to 2050 to match the long term nature of the funding and financing of a new runway.

- 2.45 Under these terms, Gatwick would be committed to delivering the second runway and the initial phase of the third terminal by the end of 2025, with expected long-term prices in the range of £12 to £15 net airport charges per passenger. To protect airlines and passengers against increases in price, we propose a firm price limit of £15 net airport charges per passenger. In limiting the scope for price increases, Gatwick would carry the great majority of the investment risks associated with the expansion, primarily: traffic, construction and market price risk. Gatwick's ability to underwrite risks in this manner reflects the confidence it has in its second runway development and in its business plan, particularly its traffic and capital cost projections.
- 2.46 We believe that the Commitments approach for Gatwick expansion reflects the potential for much greater competition within the London System and will encourage such airport/airline competition more effectively than RAB style regulation.
- 2.47 We believe there are other significant benefits to a Commitments approach, as compared to a standard RAB based model. An important element of this approach is the focus on delivering key outputs with less focus on determining how these outputs are to be delivered. This results-based approach drives greater innovation and eliminates the tendency for the regulator to micro-manage the airport. We also believe it provides an appropriate backdrop in which value creating contractual arrangements between the airlines and airports can be developed. R2 Commitments also gives certainty to users and the government that risk can be allocated to the airport, while still ensuring that expansion is delivered, for a capped price. A fuller description of the benefits of R2 Commitments, as well as the drawbacks of a RAB-based approach, can be found in our Question 4 & 5 response to Module 13.

Other improvements

Boundary alignment changes implemented following consultation

- 2.48 As indicated in our May 2014 submission, a key priority has been to minimise the impacts of a second runway on the local area. One of the principal purposes of our public consultation in the spring of 2014 was to seek views as to how we might achieve this. As a result, we paid close attention to the comments we received and have made a series of adjustments to the boundary of the expanded airport. These are aimed at reducing as far as possible the direct impact of the development on land, property, woodland and habitat and we ask the Commission to take these improvements into account in making its recommendations to Government.
- 2.49 Neither Heathrow scheme has undergone the same type, level or depth of public consultation as Gatwick's. This is important because
- the Gatwick consultation exercise accorded with what the Commission, in its earlier published material, anticipated;
 - the results of the consultation have been taken into account in our updated scheme design;

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- the consultation revealed consultees' preference for our preferred (now chosen) scheme.

- 2.50 This is bound to have implications in terms of timing of delivery, since in terms of consultation on both a draft Aviation National Policy Statement (NPS) and any Development Consent Order (DCO) application, either of the Heathrow schemes would be starting from scratch, whereas for Gatwick the views of local stakeholders on a number of the key questions that will arise in the later, statutory consultation processes (notably choice between different expansion options at the airport in question) have already been tested.
- 2.51 Gatwick's Report on Consultation was published in July 2014 and a copied to the Commission. For convenience, a copy is provided as Appendix 36.

Gatwick – Community pledges following public consultation

- 2.52 As we indicated in our May 2014 submission, Gatwick enjoys a significant advantage over the Heathrow schemes because of its less urbanised location. This means that the number of people affected by the construction of a second runway and, by its environmental effects once it comes into operation, is an order of magnitude lower than Heathrow. The Commission's consultation document does not seek to compare and contrast how the schemes perform relative to one another but it is obvious that, from an environmental and sustainability perspective, the Gatwick scheme is far superior to the Heathrow schemes in these respects. Nonetheless, Gatwick continues to take very seriously its responsibility to limit and manage the impacts we do have.
- 2.53 In refining our proposals, we have listened to our neighbouring communities and local authorities before, during and after our public consultation in the spring of 2014 and as a result have responded to many of the issues raised making a series of pledges, many of which we would expect to become legally binding if Gatwick is selected and the project proceeds. These pledges were published in July 2013. A copy of our pledges is provided as Appendix 35. By making these pledges we have reduced the net environmental effects of our scheme and have identified how additional economic and social benefits will be enhanced and delivered. The Commission must take account of these when formulating its recommendations to the Government.
- 2.54 The pledges relate to: measures that mitigate an environmental effect (such as the noise insulation scheme); measures to compensate for the environmental effects (such as the unique Council Tax Initiative); and measures which seek to spread the economic benefits (such as the apprenticeship scheme or making a financial contribution to the provision of community infrastructure). We notified the Commission of these pledges in July 2013 in our response to Discussion Paper 7.
- 2.55 We note that, despite Gatwick's much lower level of environmental impact compared to the other two short-listed schemes, neither of the other promoters has sought to match Gatwick's pledges in several very important respects. This is most notable with regard to aircraft noise where our Council Tax Initiative has not been matched. If it was to be matched the Council Tax Initiative would reach Windsor and Richmond and would cost some £100 million annually.

Response to Question 2

TABLE 2.1: COMPARISON OF COMMUNITY IMPACTS

Pledge	Gatwick	Heathrow
£1,000 Council Tax contribution every year for residents within 57 Leq contour?	Yes	No (would cost £100m per annum for Heathrow to match Gatwick)
Entire communities lost?	No	Yes
Communities cut in two?	No	Yes
Market value plus 25% offer to homes lost to development?	Yes	Yes
Number of people newly affected by serious noise	11,000	320,000

Gatwick – Indicative landscape and habitat management plan

- 2.56 Following on from our ‘Refreshed Scheme Design’ submission in May 2014 and our public consultation we have now developed an indicative Landscape and Habitat Management Plan (shown in Figure 2.6) which sets out our initial proposals to maintain and enhance biodiversity. This plan will enable us to begin to engage stakeholders in developing a firm plan but will also allow the Airports Commission to assess the net environmental effects of the Gatwick scheme i.e. after mitigation.
- 2.57 Our response to question 5 explains further the factors influencing the plan, including the replacement of woodland and ancient woodland, and how areas within the plan could also accommodate Community interests.

Delivery strategy and Project Execution Plan

- 2.58 We have developed a Project Execution Plan (PEP) that provides structure and detail for how the project will be executed and delivered. The PEP reflects a thorough examination and clear identification of scope, interfaces, plans, procedures, processes, construction phasing, sequencing, logistics, material & equipment requirements, labour requirements and construction risks.
- 2.59 In developing our PEP we have utilised industry best practice and built on the lessons learned from other similar large infrastructure programs such as Crossrail, High Speed 1, the London Olympics, and Gatwick’s continuing improvements in delivering our current Capital Improvement Program (CIP), all with a focus on safety and quality.
- 2.60 We have utilised the PEP to review and refine our cost, schedule, and risk assessments through an iterative process to provide a high level of certainty that our scheme can be delivered to the programme and budgets that we have established; providing an increased level of delivery certainty for the Gatwick second runway scheme.
- 2.61 A full copy of the PEP is provided as Appendix 29.

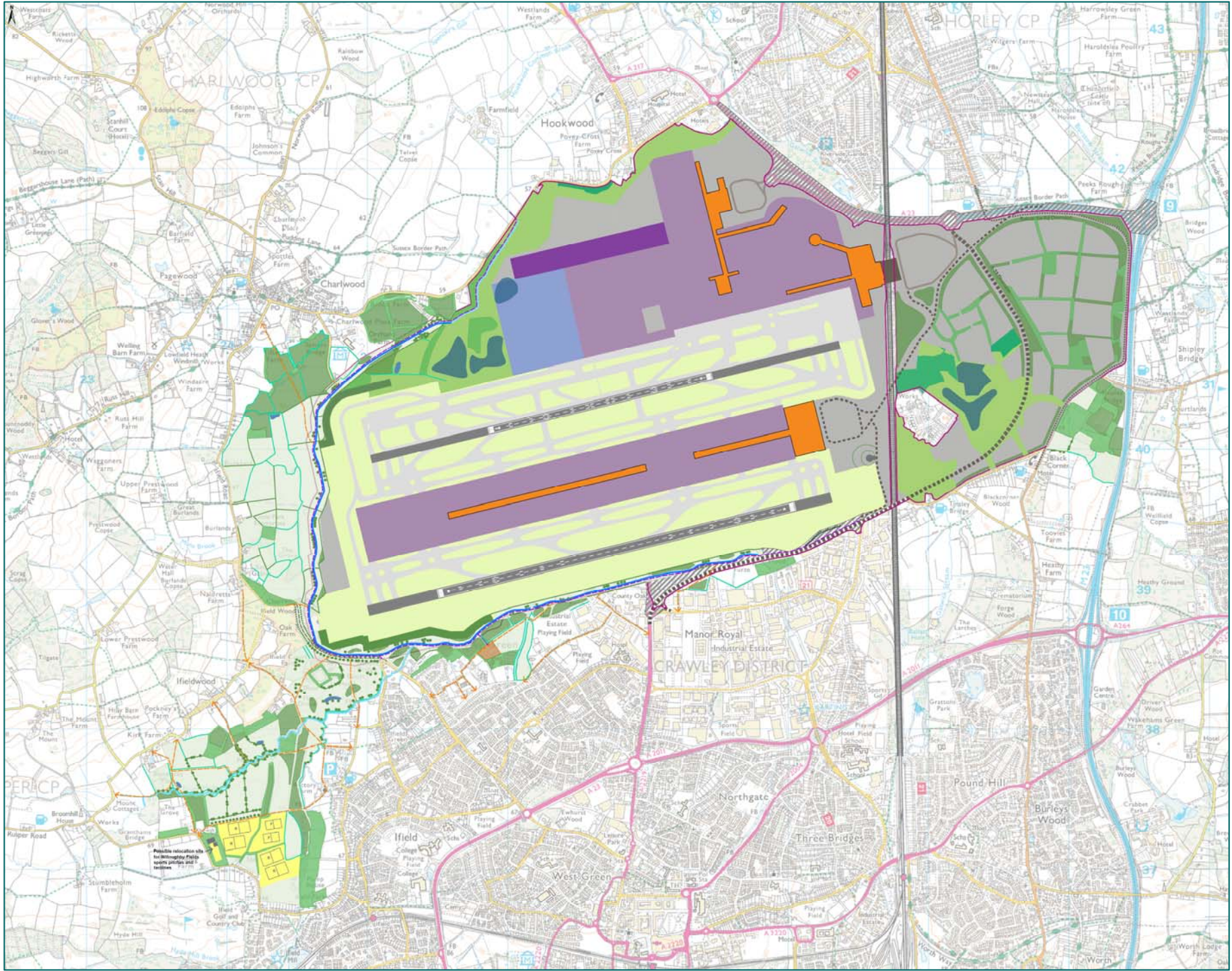
Response to Question 2

Heathrow's inherent site and locational disadvantages

- 2.62 Neither of the Heathrow schemes is able to overcome the inherent disadvantages of a layout which has grown piecemeal over many decades and a location which imposes many constraints which limit the options for expansion.
- 2.63 Both of the promoters of the Heathrow schemes have sought to work within the constraints that are imposed by its location. These include in particular: the transport network; a number of nearby towns and villages and a large number of other local features and designations such as Green Belt, regional parks and areas of ecological importance including the RAMSAR site.
- 2.64 Even though the Heathrow schemes have significant impacts on these features the proposed airport layouts remain inefficient and not user-friendly.
- 2.65 Heathrow's principal disadvantages in these respects, are:
- Three "front doors" (the central terminal area, Terminal 4 and Terminal 5); passengers (especially those unfamiliar with the airport) may experience difficulty in knowing which "front door" is most suitable for them;
 - This disadvantage is compounded by there being multiple locations for short and long-stay car parks, only one main bus and coach station and rail services that do not serve all terminals without transferring;
 - An inefficient taxiway system with many 'pinch points' leading to congestion and long taxiing distances. These limitations will significantly worsen with a three runway layout (as identified by NATS in its work for Heathrow);
 - Multiple terminal buildings with complex and lengthy transfer times;
 - Complex dependencies arising from integration of a three runway Heathrow into London airspace. When these are combined with the operational complexity of the airfield, Heathrow's proposed noise abatement procedures, and environmental constraints, it is clear that the Heathrow scheme promoters' ATM numbers will not be delivered. Simulation modelling carried out by Deutsche Flugsicherung GmbH (DFS), a leading European air navigation service provider, presented in Appendix 26, indicates the hourly capacity will be in a range of 100 to 118 hourly movements. We believe the most likely capacity is around 112 movements per hour. Appendix 1, from global experts in aviation traffic forecasting ICF, shows how these hourly values convert to a range of 580,000 to 680,000 annual movements with a most likely value of 645,000 annual movements and 118m annual passengers. The incremental capacity generated by a third runway at Heathrow is therefore likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow.
 - Lower aircraft utilisation combined with higher operating costs (airport charges, fuel burn and punctuality) resulting from the above constraints.

SEE OVERLEAF FOR FIGURE 2.6: INDICATIVE LANDSCAPE AND HABITAT MANAGEMENT PLAN

FIGURE 2.6: INDICATIVE LANDSCAPE AND HABITAT MANAGEMENT PLAN



Legend

- Airfield
- Aprons
- Runways
- Taxiways
- Cargo
- Maintenance
- Terminal Building
- Landscape Areas
- Ancient Woodland
- Ancillary and Surface Transport Facilities including parking
- Existing Airport Roads
- Proposed Road Network
- Road improvements corridor
- Train Station
- Acoustic Bund
- Balancing Pond
- Proposed Noise Wall
- Airport Boundary Opt 3

Landscape Mitigation Proposals

- Existing woodland
- Existing hedgerows
- Existing river
- Proposed woodland/copses/shaws/coppice
- Proposed hedgerows
- Proposed trees - parkland groups/avenues and pollards
- Proposed species rich grassland
- Proposed amenity grassland/sports pitches
- Allotments and community orchard
- Proposed river diversion corridor
- Proposed footpath / bridleway / cycleway
- Existing footpath / bridleway / cycleway

Question 3:

Comments on how the Commission has carried out its appraisal

Q3: Do you have any comments on how the Commission has carried out its appraisal?

Key points

- 3.1 Gatwick has a number of major concerns about how some aspects of the work have been undertaken, as follows:

A structural bias in traffic allocation to individual airports

- 3.2 While the traffic modelling used to generate the Commission's analysis appears to be an acceptable tool for national projections, the modelling has some very serious limitations when it attempts to allocate future passenger growth to individual airports which make it unfit for purpose. It has a persistent tendency to over-forecast traffic at Heathrow and other airports; and to under-forecast traffic at Gatwick. This structural bias leads to consistent and large errors in both these directions, rendering the model vulnerable and therefore unsuitable as a basis for a decision on the location of future growth between Heathrow and Gatwick.

Heathrow's three runway capacity has been overstated and is not achievable

- 3.3 The complexity of the proposed runway operating methods and the proposed noise abatement procedures, together with the effect of the restrictive conditions which are likely to be included in any development consent (including a movements cap), mean that it is almost certain that the annual Air Transport Movements at Heathrow will be less than the 740,000 adopted by the Commission in their traffic forecasts.

Significance of competition in the market has not yet been taken into account

- 3.4 The Commission has acknowledged the importance of competition in increasing connectivity and passenger choice, but has yet to quantify fully the economic effects of generating more competition in the market or (therefore) the significance of increased competition to the choice between Heathrow and Gatwick.

Commission's TEE economic analysis needs to be corrected, and the PwC analysis should not be relied on

- 3.5 The TEE analysis should be corrected with adjusted traffic forecasts and include the impacts of competition, costs and externalities, as well as including all costs in BCR and NPV results.
- 3.6 The separate PwC analysis uses novel methodologies which have to date not been employed in the aviation market and, as the Commission has pointed out, its results should be interpreted with caution. The PwC analysis has produced some results that are not credible, such as that every single passenger travelling through all the airports in the UK

Response to Question 3

generates on average twice as much economic benefit to the UK if Heathrow is expanded as opposed to Gatwick. Material reliance cannot therefore be placed by the Commission on work that produces anomalies of this kind.

Future noise improvement benefits should be applied to 'do minimum' case

- 3.7 The Commission's current analysis of noise at Heathrow ascribes all the likely benefits that will arise in any event from operational and technical improvements to the provision of new runway capacity. In reality, these should be attributed to the two runway 'do minimum' case, reflecting best practice planning.

Noise analysis understates Heathrow's noise impacts

- 3.8 The consequence of the Commission's current approach is to understate significantly the increase in local and national noise impacts of the Heathrow schemes and, similarly, significantly to exaggerate the national noise impacts of the Gatwick scheme. A fair and balanced assessment requires a consistent approach that assessed more accurately the noise impacts of non-expanded airports and compares this with the expansion scenarios.

Heathrow expansion will worsen air quality, and could lead to continued breach of legal air quality limits

- 3.9 Air quality is subject to legal limits that are derived from the impact on human health and mortality caused by air pollutants. The Commission has not yet completed its dispersion modelling of these impacts. Such analysis is urgently required, since the only lawful basis upon which a scheme can be allowed to come forward is if it is demonstrated that, during the forecast level of operations, air quality limits would be met and that compliance with them would not be delayed.

Comparative safety of the schemes should be considered

- 3.10 The issue of the comparative safety of the schemes has so far received inadequate attention. We consider that a full risk analysis of the safety and security risks inherent in putting a significant volume of additional traffic over the large populations of central London as compared with the less populous areas around Gatwick should be undertaken as an integral part of the Commission's recommendations.

A detailed and comprehensive risk analysis should be completed

- 3.11 The Appraisal Framework is comprehensive in scope. However, while the Commission's consultation documents mention risks in different places, and there are several brief analyses of risk, these risk analyses do not have much depth and they do not provide a view of the risks in aggregate for each of the three schemes. We consider that a detailed and comprehensive assessment and comparison of risks of all three schemes must be undertaken if the Commission is to have a robust basis for its eventual recommendations.

Response to Question 3

Appraisal framework

- 3.12 The Commission is to be commended for its development of the Appraisal Framework, a comprehensive and integrated methodology against which the three scheme designs can be assessed. The Commission's task is extremely challenging, both in terms of technical complexity and timescale, and it is Gatwick's view that the process undertaken to date, and the approach adopted in the appraisal framework, is sound overall.
- 3.13 It is, however, essential that the Commission applies its appraisal criteria in a thorough, balanced and fair way across the three schemes if it is to make a robust and well evidenced recommendation to Government. Gatwick considers that there are a number of important instances where it appears that the Commission's assessments have been applied inconsistently and other instances where the Commission has not strictly followed its own appraisal criteria.
- 3.14 We identify below the areas where Gatwick has serious concerns as to the validity of the Commission's analysis. These points are fully dealt with in our response to Questions 4 and 5:
- **Traffic Modelling:** The Commission's use of the DfT forecasting model to assess national demand is appropriate for the purposes of undertaking an overall, UK-wide, Assessment of Need. However it is clear that the validity of using the DfT Allocation model is open to serious question. It is currently not fit for the purposes of making a robust and reliable recommendation on the location of future airport capacity - a point the DfT Peer review makes. The model consistently under-forecasts Gatwick traffic and over-forecasts traffic at the other London airports. The Commission's efforts to correct the model have also been incomplete or inconsistently applied: for example "seeding" – manual intervention to allocate new routes to Gatwick - has been applied to some scenarios and not to others;
 - **Capacity Assessments:** The Commission has assumed an annual runway movement capacity of 740,000 for the Heathrow schemes without critically examining whether this can actually be achieved. Airspace analysis undertaken for Gatwick by DFS, a major supplier of air navigation services, presented in Appendix 26, highlights the complex dependencies arising from integration of a three runway Heathrow into London airspace. When these are combined with the operational complexity of the airfield, Heathrow's proposed noise abatement procedures, environmental constraints, and the restrictive conditions that are likely to be included in any development consent (including a movements cap) it is clear that such levels are almost certain not to be deliverable. Simulation modelling carried out by DFS indicates the hourly capacity will be in a range of 100 to 118 hourly movements. Based on the DFS analysis, we believe the most likely capacity is around 112 movements per hour. Appendix 1 from ICF shows how these hourly values convert to a range of 580,000 to 680,000 annual movements with a most likely value of 645,000 annual movements and 118m annual passengers. The incremental capacity generated by a third runway at Heathrow is therefore likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow;
 - **Competition:** As we set out in detail in our Question 3 and 4 Strategic Fit response, the Commission acknowledges that their traffic modelling does not incorporate the effects of

Response to Question 3

airport and airline competition on airport charges and air fares. The Commission, therefore, invited ITF / OECD to advise on this subject. In Gatwick's opinion, the OECD report does not sufficiently reflect the commercial realities of a competitive aviation market and the consequences for passenger choice;

- **Economy:** The Commission's Transport Economic Efficiency analysis should be expanded to include the impact of competition, as well as costs and other externalities as is standard practice. The PwC economic analysis is deeply flawed and no reliance should be placed on it;
- **Noise:** The Commission has applied inconsistent methodology when assessing the noise impacts of each scheme. It has ascribed the benefits of technological improvements wholly to the Heathrow North West Runway scheme but has not done the same for the Hub or Gatwick schemes. The result is a significant underestimate of the increase in noise from the North West Runway scheme as compared to 'Do Minimum' and overstates the national noise impacts of the Gatwick scheme;
- **Air Quality:** The Commission has not interrogated the Heathrow assumptions on which it bases its statement that air quality will improve and it has only just started its Air Quality dispersion modelling. The results of such modelling should be published by the Commission as soon as practicable and opportunity given to consultees to comment on these;
- **Safety:** The Appraisal Framework takes insufficient account of the comparative safety characteristics of each scheme, particularly the relative risks of additional flights over the populations adjacent to Heathrow and Gatwick airports respectively;
- **Delivery:** The way in which the Commission's risk framework has been applied so far does not bring out the significant differences in the risk profiles of the three schemes. The analysis needs to be more detailed and the impact of the various risk factors should be assessed cumulatively as this will reveal the relative complexity, timing and likelihood of delivery of each scheme. Gatwick believes that its scheme can be delivered with a high degree of certainty, whereas schemes at Heathrow may well not clear the technical, political, environmental and planning hurdles facing them;

- 3.15 Our response to Questions 4 and 5 sets out a number of examples of where a more consistent approach would lead to fair and balanced comparative assessments of the performance of each scheme, and as a result would provide a properly robust basis for the Commission's recommendations to Government. It is essential that the different risk characteristics of the schemes are fully and fairly evaluated, including Gatwick's proposal under R2 Commitments to bear the majority of capital and operational risk.

Response to Question 3

Appraisal process

- 3.16 The Commission has always made clear that it would take an integrated approach – taking account of a range of economic, social and environmental factors. We would expect that the Commission's recommendations to Government will be based on the scheme that performs best across the full range of evaluation criteria. In doing so, it is likely that the Commission will need to make 'trade-offs' between factors; if that is the case, it is essential that the Commission clearly states how it has done this, and how it has arrived at its conclusions.
- 3.17 Gatwick requests the Commission keep an open dialogue with promoters for as long as possible in order that all the scheme designs can be optimised and benefits / impacts can be accurately assessed. It is normal in relation to major infrastructure projects for this process of iteration to continue throughout the life of the proposal up to the point where it comes into operation and beyond. Accordingly it is likely that certain strands of work will need to continue beyond the timeframe of the Commission's advice, in which case we anticipate that these would be taken up by the Department for Transport.
- 3.18 In relation to air quality impacts at Heathrow, Gatwick considers that the Commission must publish the results of dispersion modelling for the Heathrow schemes, and seek the views of consultees on these, before its final report is published. To leave this key issue to be addressed at a later stage by the DfT and Government would be a very risky approach to take.

Question 4 and 5: Comments on modules including factors not fully assessed

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?

4.1 We have responded to questions 4 and 5 on a module by module basis dealing with factors not fully addressed and comments on appraisal methodology for each module in turn.

4.2 The responses are provided on the following pages.

Module 1: Strategic Fit

Key points

The traffic allocation to individual airports is seriously flawed

- 4.3 We consider that the Commission's forecasts for the allocation of traffic between airports are not fit for the purposes of a balanced, fair and robust assessment. They are unfairly biased against Gatwick, due to flaws in the DfT allocation model. However, if certain steps are taken, which we set out in this response, these results can be made significantly more reliable.
- 4.4 The forecasts in relation to Gatwick traffic are not credible in the majority of the Commission's scenarios. The Commission's forecast traffic growth at Gatwick is very low in the years up to and after the introduction of new runway capacity, with traffic growth primarily allocated to Stansted and Luton. This is the opposite of current trends and directly conflicts with the last several years of traffic growth across the London system.
- 4.5 This pattern of demand allocation is consistent with previous DfT forecasts, which have systematically under-forecast Gatwick whilst traffic growth at all other London airports has been over-forecast.
- 4.6 This has serious implications for the whole of the Commission's assessment, leading the Commission to forecast unrealistically high airport charges and unrealistically low economic benefits for the Gatwick scheme.
- 4.7 We have identified a number of methodology issues and suggest practical remedies. These cover the traffic allocation methodology, the scenarios modelled and input assumptions relating to airport capacity at Heathrow.

Introduction

- 4.8 The airport level traffic forecasts generated by the Airports Commission are seriously flawed. The forecast model, operation of the model, scenario selection and input assumptions result in a significant and unfair bias against Gatwick which is contrary to current trends and contrary to clear historic market evidence, current market evidence and the factors that are currently reshaping the aviation industry.
- 4.9 These shortcomings have been apparent in previous DfT traffic forecasts, which have systematically under-forecast Gatwick traffic while over-forecasting all other major London airports. The level of forecast error in previous projections is very material, with a Heathrow/Gatwick traffic allocation error spread of between 17% and 21% over 5 and 11 year periods respectively.
- 4.10 A number of the issues with the Commission's traffic forecasting approach were identified previously in the 2010 peer review of the DfT model. In particular, the peer review highlighted the under-predictions for Gatwick and over-predictions for Heathrow, and recommended that

Response to Questions 4 and 5

Module 1: Strategic Fit

its use in policy testing should be subject to caution. The concerns raised in the peer review do not appear to have been addressed.

- 4.11 Accurate airport level forecasts are critical in the context of choosing the location for new runway capacity. Whilst the Commission's assessment does not rely on one single central forecast case, comparisons between the three short-listed schemes are being made by the Commission's consultants in areas including economic value, direct employment, connectivity, surface access and CO₂ emissions, which derive directly from the Commission's airport level traffic forecasts.
- 4.12 The forecasting approach adopted by the Airports Commission is not robust. It is particularly unsuited for forecasting long term traffic demand at airports with step changes in capacity. Therefore, the forecasting approach to traffic allocation is not fit for purpose in relation to supporting runway policy decisions.
- 4.13 In **Part A** of this response we present:
- a summary of the key components of the Gatwick traffic case, and note whether or not these issues have been properly considered in the Commission's traffic forecast modelling;
 - a review of past performance of DfT forecasts;
 - analysis of the Commission's forecasting results, highlighting examples of where the results lack credibility and are contrary to market evidence;
 - a critique of the fundamental flaws in the forecast modelling approach, referencing the peer reviews of the DfT model;
 - recommendations for practical remedies that the Commission could adopt within the timescales of the process. While these would not resolve some of the more fundamental problems with the forecasts, these remedies have the potential to improve the credibility of the results significantly.
- 4.14 In **Part B** we provide comments on a number of other elements of the Strategic Fit assessment
- 4.15 We have supplemented our arguments on traffic presented here with a separate submission to the Commission (entitled "Traffic, Capacity and Competition Evidence" dated 2 February 2015). This sets out in more detail the key elements of the Gatwick traffic case and the evidence which supports it.
- 4.16 This response should be read in conjunction with Appendix 1 – ICF International Technical Report – Traffic & Forecasts, Appendix 2 – InterVISTAS – The Importance of Airport Competition on Air Fares Paid by Consumers, Appendix 3 – GAL – Supporting Traffic & Competition Analysis, Appendix 4 – CTAIRA – Supply side issues and the London market, Appendix 5 – RPS – Fit with wider spatial and socio-economic development strategies, Appendix 26 – DFS Fast-Time Simulation Report, Appendix 39 – Momentum Grows for Gatwick, Appendix 40 – GAL – Connecting the UK's Regions to the Future, Faster.

The Gatwick traffic case compared to the Commission's modelling approach

- 4.17 We have set out in Table 4.1.1 below a number of key pillars of the Gatwick case and commented on whether these have been considered by the Commission in any of their modelling. In the majority of cases the key elements of Gatwick's case have been largely ignored.

TABLE 4.1.1: GATWICK'S TRAFFIC CASE

Component of Gatwick Traffic Case	Factor modelled by AC in Traffic Forecasts?
Gatwick expansion will deliver more additional runway movements than the Heathrow schemes.	✗
LCCs are and will continue to be the most important traffic segment, driving traffic growth. A two runway Gatwick, with efficient infrastructure and low charges, will be attractive to this key segment and meet their operational requirements. Heathrow will continue to be unsuitable for traditional LCCs on any significant scale because of extremely high prospective charges and operational inefficiencies.	✗
For structural reasons (e.g. new aircraft technology and rapid expansion of better-located hubs in the Middle and Far East), transfer traffic will decline in importance. This reduces the need for hub capacity in Europe. Nevertheless, the growing network of flights will see a two runway Gatwick capture a share of the transfer traffic market.	✓
A continuation of existing market trends and airline economics will see growth remaining low from traditional European legacy airlines. Airlines from fast growing markets such as China and India will increase their share of UK traffic. Gatwick already competes strongly with Heathrow in many market segments; its attractiveness in segments where it is less established will improve significantly with a second runway and the changing market dynamics.	✗
The Gatwick runway scheme will facilitate stronger competition between airlines, airports and airline/airport combinations. It will enable more LCC versus legacy airline competition, expand the number of airlines serving key markets, and generate greater airport competition. In turn, this will result in substantial fare benefits to consumers, further stimulating market demand.	✗
A more balanced London airports system will result in lower weighted average journey times to airports. Major upgrades to Gatwick surface access will lead to Gatwick becoming the most convenient option for a greater share of the South East England and wider catchment. This will result in changes in airport preferences and passenger behaviour.	✗
Gatwick expansion will also support the development of direct services from regional airports, as well as providing improved air services between London and the UK regions and nations.	✓

Previous DfT projections have systematically under forecast Gatwick traffic

- 4.18 The DfT passenger allocation model (NAPAM) has been used by the Commission to allocate traffic demand to individual UK airports. Our review of a number of previous DfT airport level forecasts illustrates NAPAM's limitations.
- 4.19 For forecasts issued in 2003 and 2009, we have compared the projections made for 2015 (the first spot year in the forecasts) with 2014 outturn. Table 4.1.2 below illustrates how poorly the model has performed in the past, with a particularly (and unrealistically) negative impact on Gatwick.

TABLE 4.1.2: FORECAST PASSENGER GROWTH BY LONDON AIRPORT BETWEEN 2014 AND 2030

DfT White Paper Forecasts (no new runways), December 2003

	2002 Actual	2015 Forecast	Forecast Growth	2014 Outturn	Actual Growth	2015 Forecast versus 2014 Outturn	
						Difference	% Difference
Gatwick	29.5m	33.5m	4.0m	38.1m	8.6m	(4.6m)	(12%)
Heathrow	63.0m	79.9m	16.9m	73.4m	10.3m	6.5m	9%
Stansted	16.0m	32.8m	16.8m	19.9m	3.9m	12.9m	65%
Luton	6.5m	25.5m	19.0m	10.5m	4.0m	15.0m	143%
London City	1.6m	2.9m	1.3m	3.6m	2.0m	(0.7m)	(21%)
	116.7m	174.6m	57.9m	145.5m	28.9m	29.1m	20%

DfT UK Air Passenger Demand and CO₂ Forecasts (Stansted new runway 2015), Jan 2009

	2008 Actual	2015 Forecast	Forecast Growth	2014 Outturn	Actual Growth	2015 Forecast versus 2014 Outturn	
						Difference	% Difference
Gatwick	34.2m	35.0m	0.8m	38.1m	3.9m	(3.1m)	(8%)
Heathrow	66.9m	80.0m	13.1m	73.4m	6.5m	6.6m	9%
Stansted	22.3m	35.0m	12.7m	19.9m	(2.4m)	15.1m	76%
Luton	10.2m	15.0m	4.8m	10.5m	0.3m	4.5m	43%
London City	3.3m	4.0m	0.7m	3.6m	0.4m	0.4m	10%
	136.8m	169.0m	32.2m	145.5m	8.7m	23.5m	16%

- 4.20 Key differences between forecast and outturn are:
- Gatwick passengers under forecast by 8% to 12% (in fact actual volume growth was 2 to 5 times higher than forecast growth);
 - Heathrow passengers over forecast by 9% in both sets of forecasts, with actual growth around half the predicted volume. The net impact is that the forecast traffic allocation

Response to Questions 4 and 5

Module 1: Strategic Fit

between Heathrow and Gatwick has been overstated in Heathrow's favour by 10 million-11 million passengers, or in percentage of error spread terms between 17% and 21% over 5 and 11 years respectively;

- massive over-predictions for Stansted and Luton airports in both DfT forecasts. The combined over-prediction was 28m (2003 projections) and 20m (2009 projections).

- 4.21 In the 2003 forecasts, the DfT predicted that Gatwick would capture only 7% of new traffic growth in London by 2015. In the 2009 forecasts, Gatwick was projected to capture only 3% of new traffic. However, Gatwick actually captured 30% (2002-2014) and 45% (2008-2014) of all new London traffic.
- 4.22 This pattern has continued with more recent DfT forecasts. Traffic at Gatwick has already surpassed the 2020² projections from both the 2011 and 2013 DfT forecasts. This is not the case for any other London airport.
- 4.23 The allocation issue has been clearly recognised by the DfT's peer review of 2010, which stated: "Potentially worrying is the model overprediction at LHR and the underprediction at LGW....This does suggest that the allocation between these two London airports could be improved." In contrast, the Commission's public consultation documents merely state that the DfT's model has been peer reviewed and omit to mention this critical caveat.

Airports Commission traffic projections for Gatwick are not credible

- 4.24 We have reviewed the Commission's traffic forecasts for Gatwick and other London airports. The Commission's forecasts are analysed in the context of historic growth trends at the 5 major London airports.
- 4.25 Table 4.1.3 below illustrates how each of the main London airports has contributed to passenger growth between 2004 and 2014:
- operating with constrained capacity (especially at peak times), Gatwick captured 40% of all London growth in the last decade (6.7m of 16.9m total London growth),
 - in contrast, Stansted and Luton between them only added 2.0m passengers (12% of all London growth).

² 2020 was the first spot year of the more recent DfT forecasts.

Response to Questions 4 and 5

Module 1: Strategic Fit

TABLE 4.1.3: SHARE OF NEW GROWTH BY AIRPORT: HISTORIC TRENDS

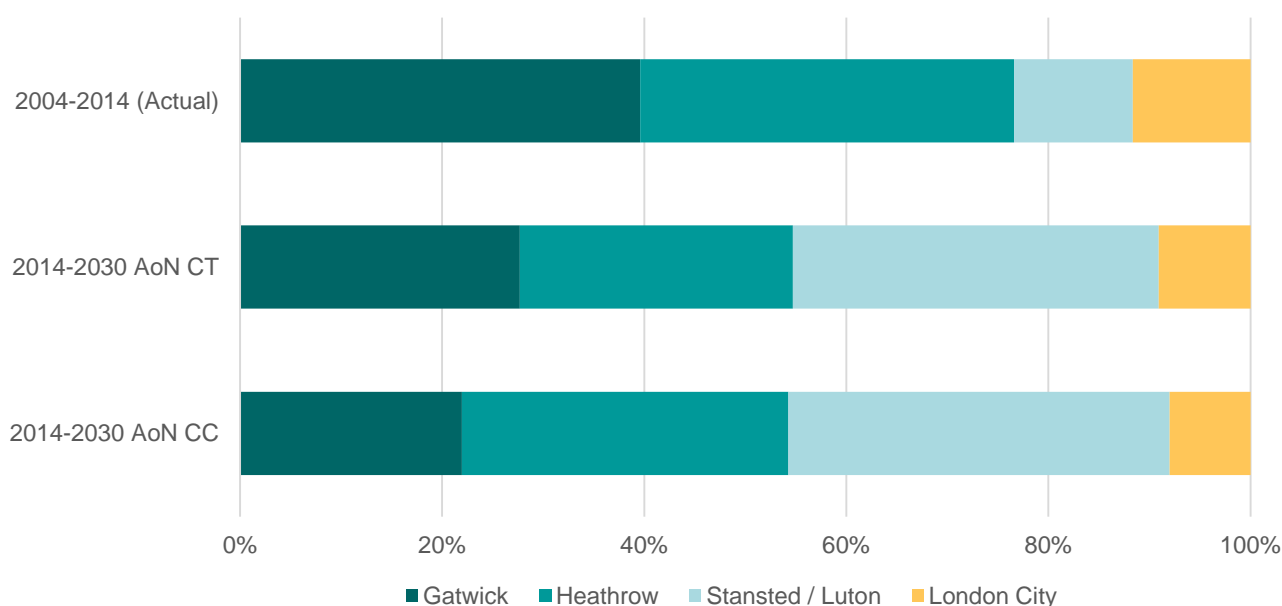
	2004	2014	Growth 2004-2014	Share of Growth 2004-14
Gatwick	31.4m	38.1m	6.7m	40%
Heathrow	67.1m	73.4m	6.3m	37%
Stansted / Luton	28.4m	30.4m	2.0m	12%
London City	1.7m	3.6m	2.0m	12%
Total	128.6m	145.5m	16.9m	100%

4.26 However, the Assessment of Need forecasts (2014-2030) unrealistically suggest the following:

- Gatwick is forecast to capture only between 22% and 28% of new London traffic, despite the addition of a new runway (creating new valuable peak time slots), and capacity shortages elsewhere. This is much lower than Gatwick's historic growth performance and is particularly difficult to understand in a context of abundant peak period capacity available at Gatwick;
- in contrast, Stansted/Luton are forecast to capture 37% of new traffic (compared to 12% historically) despite peak period capacity becoming increasingly constrained at those airports.

FIGURE 4.1.1: SHARE OF LONDON TRAFFIC GROWTH

Historic Outturn versus Airports Commission Assessment of Need Projections for Gatwick



Notes: AoN CT = Assessment of Need Carbon Traded Scenario,
AoN CC = Assessment of Need Carbon Capped Scenario

Source: Airports Commission Forecasts, Gatwick Analysis

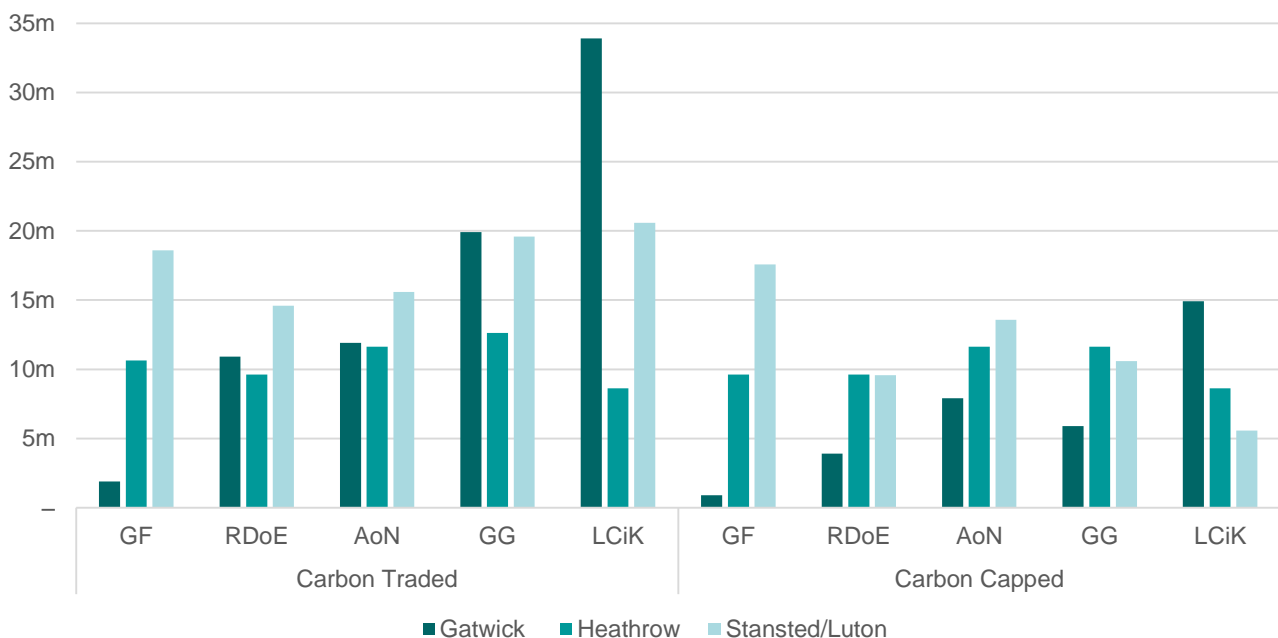
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- 4.27 A similar pattern of results is repeated across the majority of the Commission scenario forecasts. With a new runway, by 2030 Gatwick is forecast to add as few as 1 million passengers in one scenario (average Gatwick growth from all scenarios is just 11m passengers). Without any additional capacity, Heathrow is forecast to add an average of 10m passengers by 2030, with Stansted/Luton combined adding an average of 15m passengers.
- 4.28 In other words, by 2030, a Heathrow that is highly constrained is – on average – expected to have grown by almost as much as Gatwick (which by this stage will have been operating a second runway for 5 years). Even more surprisingly, Stansted/Luton are forecast, on average, to add 30% more traffic than an expanded Gatwick.

FIGURE 4.1.2: FORECAST PASSENGER GROWTH BY LONDON AIRPORT BETWEEN 2014 AND 2030

Projections for Gatwick Second Runway Scheme



Notes: GF= Global Fragmentation, RDoE = Relative Decline of Europe, AoN = Assessment of Need, GG = Global Growth, LCiK = Low Cost is King

Source: Airports Commission Forecasts, Gatwick Analysis

- 4.29 The chart above and further analysis shows that:

- in the most extreme scenarios (Global Fragmentation carbon traded and carbon capped), an expanded Gatwick only adds 1m-2m passengers over a 16 year period whilst Heathrow, Stansted and Luton collectively grow by almost 30m passengers;
- an expanded Gatwick gains materially more traffic than Stansted/Luton in only 3 of the 10 Commission scenarios;
- an expanded Gatwick's market share actually declines in 5 of the 10 scenarios; it only improves by greater than 1 percentage point in 3 of the scenarios;

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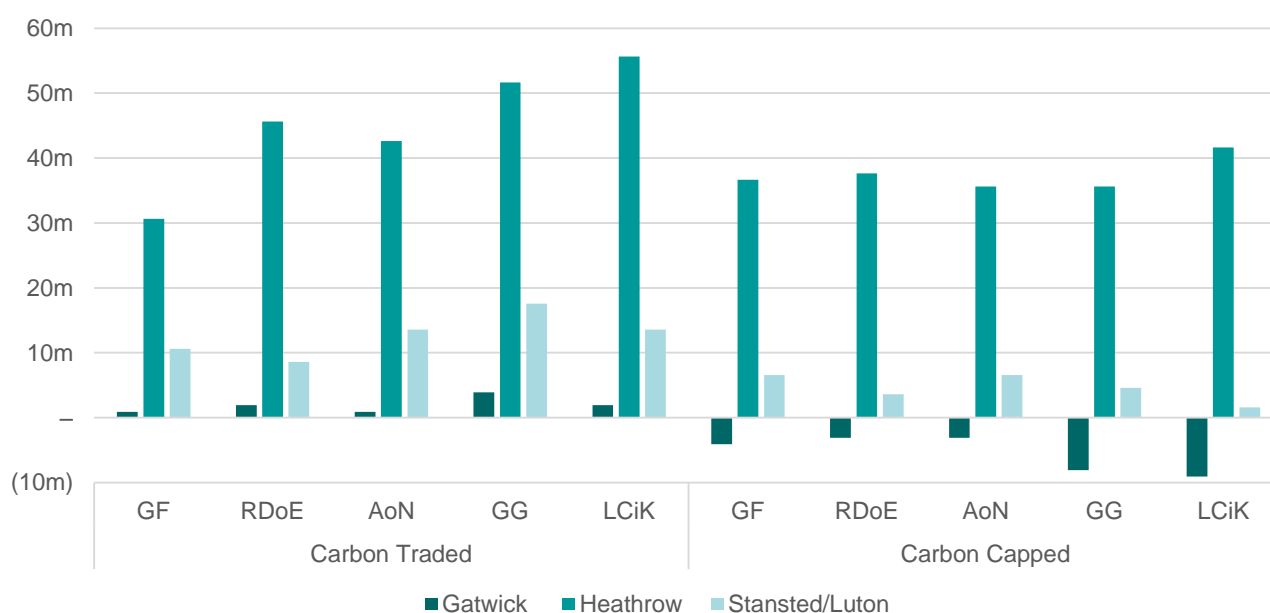
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- on average, an expanded Gatwick will be less than 50% utilised in 2030 (relative to maximum passenger throughput). In contrast, the rest of the London airport system will be 90% full.

- 4.30 Such results are not credible.
- 4.31 The model outputs suggest that airlines would prefer to use off peak capacity at Luton and Stansted, over peak period capacity at Gatwick, whereas in practice airlines have historically preferred off-peak capacity at Gatwick to on-peak capacity at Luton and Stansted. (see Appendix 3, Section 1.3 for additional analysis). In effect, the model wrongly allocates traffic to Gatwick as capacity of last resort.
- 4.32 The forecast modelling preference for Stansted/Luton at the expense of Gatwick is also demonstrated. In the Heathrow expansion forecasts Stansted/Luton is forecast to grow in all 10 scenarios, whilst Gatwick loses traffic compared to today in all 5 carbon capped scenarios. It is the only one of the four airports to do so. In the light of clear market evidence, this is inexplicable.
- 4.33 In contrast, the forecasts for Heathrow expansion indicate strong growth for Heathrow in all scenarios. In the forecasts for the Heathrow North West Runway scheme, the minimum level of traffic uplift between 2014 and 2030 is 31m passengers.
- Every single Commission scenario has higher traffic projections for Heathrow (North West Runway scheme) than Heathrow Airport Limited's own forecasts for 2030;
 - On average the Commission scenario forecasts are 11m passengers higher than Heathrow's, with the highest Commission scenario more than 25m passengers in excess of Heathrow's forecasts.

FIGURE 4.1.3: HEATHROW FORECAST PASSENGER GROWTH 2030 VERSUS 2014

Projections for Heathrow North West Runway Extension Scheme



Source: Airports Commission Forecasts, Gatwick Analysis

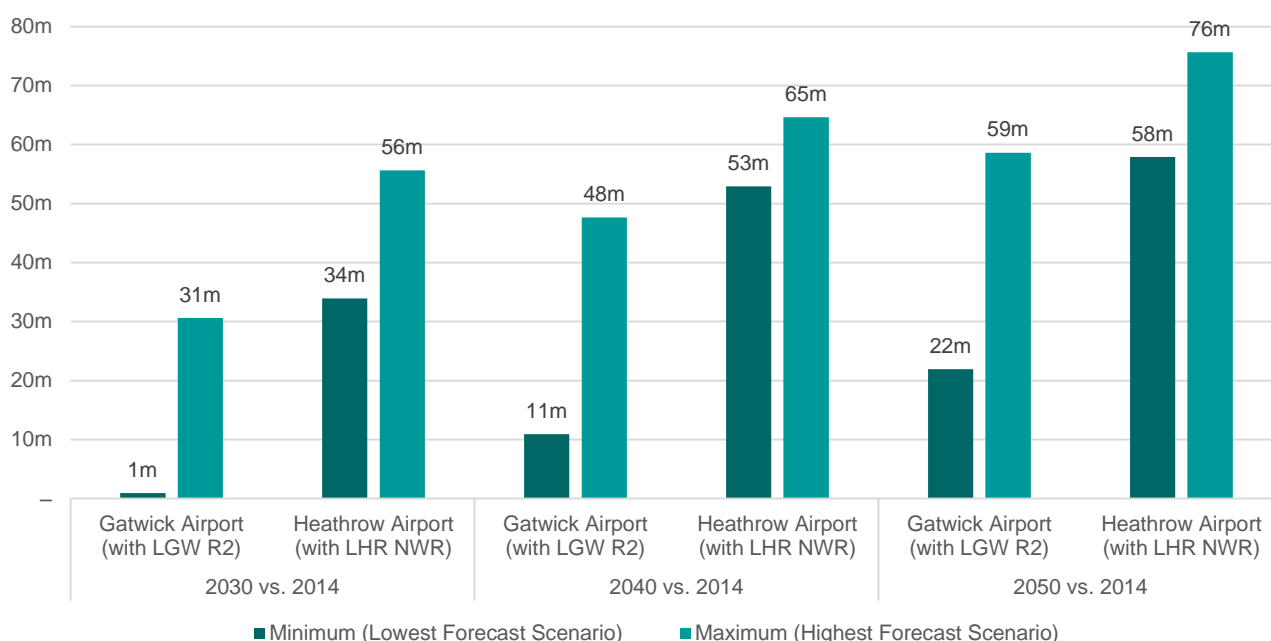
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- 4.34 This pattern continues throughout the forecast period. The maximum forecast growth for an expanded Gatwick is typically similar to the minimum forecast growth for an expanded Heathrow.

FIGURE 4.1.4: AIRPORTS COMMISSION FORECASTS: RANGE OF RESULTS

Forecast Growth versus 2014 at Airports with Runway Expansion



Source: Airports Commission Forecasts (carbon traded and carbon capped), Gatwick Analysis

- 4.35 In 2040 and 2050, the forecasts for Heathrow North West Runway scheme continue to be higher than Heathrow's projections in the majority of scenarios – often significantly higher.
- 4.36 One final issue to note is that the increase in passengers forecast in the year following runway opening is often unrealistic. For example, 15m passengers are added in the Low Cost is King scenario. This applies to both Heathrow (with Heathrow expansion) and Gatwick (with Gatwick expansion).
- 4.37 Analysis of major airports that have added runway capacity indicates that this level of growth is unprecedented. From a supply side perspective, the underlying assumption that sufficient aircraft will be available to provide this level of traffic growth in a single year is unrealistic.

There are serious deficiencies in the traffic forecast methodology

Issue 1: Marked differentials in unconstrained demand growth by airport

- 4.38 In its Interim Report, the Commission published the unconstrained forecasts by airport. While these forecasts do not correspond to a real-life scenario, they provide a useful insight into how the allocation model would allocate traffic in the absence of capacity-imposed shadow costs. As such they broadly represent passengers' choice in respect of surface access, availability of service and 'preference'.

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- 4.39 What is immediately obvious from the results of the Commission's forecasts is that the underlying premise in the model's algorithms is that Heathrow is the 'preferred' airport in the London system. In an unconstrained environment, Heathrow grows by a Compound Annual Growth Rate (CAGR) of 2.2% from 2011 to 2050. The equivalent CAGR for Gatwick is 1.0% per year – less than half the Heathrow growth rate. Unconstrained demand for Stansted and Luton (CAGR 1.7% at each airport) is also projected to grow much more quickly than at Gatwick, in stark contrast to the historic facts.
- 4.40 The unconstrained forecast for Gatwick traffic in 2050 is 49m (only 11m higher than 2014 outturn and broadly at the level of maximum throughput with one runway). The implication of this is that for Gatwick requires spill traffic from Heathrow in order to grow beyond current capacity.
- 4.41 These unconstrained projections, and the assumptions that appear to underlie them, are fundamentally inconsistent with trends over the last decade, as presented in the earlier sub-sections, and are not credible. However, they do provide an insight into the structural flaws in the traffic allocation model.

Issue 2: Approach to allocating demand between airports

- 4.42 NAPAM has serious limitations in the way it allocates demand to individual airports. These factors all have an unfairly and misleadingly negative impact on Gatwick's traffic forecasts.
- *Baseline data.* In an aviation market which continues to evolve each year, we consider that the baseline CAA passenger survey data (principally from 2008) is outdated, and that reliance on this is potentially misleading, since a step change in runway capacity will signal changes in future airline and passenger preferences in perpetuity. The current approach also makes no adjustment for the improved attractiveness over time at Gatwick as it progressively offers more routes and frequencies and is more accessible to a wider catchment area;
 - *Cost differentials.* The allocation methodology unrealistically excludes fares as an explanatory variable. We consider it inconceivable that fare levels have no impact on passenger choice. A major component of the classic LCC business model is to use low fares to successfully compete with legacy airlines from alternative airports. This is a major shortcoming of the modelling, particularly in the current context. Different schemes will result in very different airport charges and air fares, and the current methodology disregards the effects of these on passenger choice altogether. This omission was also highlighted in the DfT's 2010 peer review of NAPAM, which concluded that "*the absence of a convincing fare coefficient is a significant drawback for the model*";
 - *Step change in capacity.* When airport capacity is increased following a period of suppressed demand, airport operators are strongly incentivised to fill that capacity, resulting in new services and the attraction of additional passengers to that airport. The backward-looking allocation model does not and cannot reflect this;
 - *Surface access:* Improvements in surface access are only reflected in the demand forecasts where an airport already operates a route. The modelling does not reflect (as it should) that surface access upgrades may lead to changes in passenger preferences and new route development;

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- *Competition.* As a result of the flaws described above, the modelling approach is not capable of reflecting the impact of changes in competitive dynamics. It does not factor in the greater attractiveness to passengers and airlines of a two runway Gatwick. The competitive benefits of enabling expansion of the LCC sector through provision of suitable capacity are not modelled. These benefits include traffic stimulation through lower fares.

4.43 The principal technical shortcomings in the Commission's allocation methodology are set out in more detail below.

4.44 *Frequency Seeding at Gatwick (Gatwick Schemes)*

- The process for adding frequency on individual routes is problematic. Without intervention, NAPAM has a strong bias towards adding frequency at airports with existing services. This is because the modelling uses historic data as its baseline and effectively assumes that passengers have a strong preference for the airport with existing services;
- The peer review of the DfT model undertaken in 2010 only reviewed two of the 19 standard models in any detail. In particular, it was noted that "*the process for allocating new routes in future years has not been examined*";
- This deficiency is particularly acute in the context of a step change in capacity at Gatwick. Without intervention, the model will typically not add new routes to Gatwick when they are already served by Heathrow. This remains the case until Heathrow is so full it cannot add any additional passengers. In this situation, new routes may then become viable at other London airports (including Gatwick) from demand being spilt from Heathrow;
- In reality, a proportion of the passengers using existing services at Heathrow would prefer to use Gatwick if a service was available. In two of the five scenarios, the Commission rightly intervenes in the forecasts to generate new routes and frequencies at Gatwick following runway expansion ("seeding"). This approach partly simulates the typical supply-side response to a step change in capacity;
- However, seeding is not adopted, as it should be, for three of the five scenarios. This is one of the main reasons for the particularly unrealistic results for the Assessment of Need, Relative Decline of Europe and Global Fragmentation scenarios (both carbon capped and carbon traded).

4.45 *Frequency Culling (Various Scenarios)*

- When the forecasts assume airline services are switched from Heathrow to Gatwick, the "lost" services at Heathrow are assumed to be instantaneously replaced. This is not realistic in the aviation market;
- Low frequency routes are removed from Gatwick in the Global Fragmentation scenario. However, this is not done for Heathrow in the equivalent scenario. This inconsistency in approach is unjustified.

4.46 *Low Cost Carrier Presence at Heathrow (Heathrow Expansion Schemes)*

- Currently, Heathrow's LCC presence is almost non-existent, with no services by independent LCCs;

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- Heathrow's complex airfield operation does not enable the quick turnarounds and short taxiing times that are fundamental to the LCC high aircraft utilisation model. With three runways, the operational challenges will be even greater as outlined in the DFS report (see Appendix 26). Further, air space constraints reflecting the density of air traffic corridors around Heathrow exacerbate problems for the LCCs;
- Airport charges at an expanded Heathrow will be at least double the most expensive airport in Europe that is used by LCCs, even if Heathrow is able to deliver its project on time and on budget. While it is possible that existing LCCs may develop some services from an expanded Heathrow, this would require a change from the traditional LCC business model. It is likely that incremental traffic would be modest, with growth restricted to niche routes or replacement of existing legacy carrier traffic;
- In the Low-Cost is King scenario, LCCs are completely "unbanned" from Heathrow in the DfT model. This is commercially unrealistic, and leads to the highest traffic forecasts for all Heathrow expansion scenarios. These forecasts are significantly in excess of Heathrow's own projections. There is no explanation as to why the switch in the DfT model to eliminate LCCs from Heathrow has been "unbanned" or indeed any sensitivity analysis undertaken of what Heathrow would look like if this were not the case.
- A more credible scenario where there is only limited LCC development at Heathrow has not been modelled.

Issue 3: Capacity input assumptions for Heathrow

4.47 The capacity assumptions for Heathrow are highly optimistic. A more realistic set of assumptions would result in significantly lower traffic forecasts for Heathrow. In turn, this would lead to higher airport charges and lower economic benefits.

4.48 *Runway Capacity at Heathrow*

- The Heathrow North West Runway scheme entails a complex and varied set of airfield and airspace operational constraints. The resulting operational dependencies will impact achievable capacity. As the Commission has previously stated in its analysis of the Thames Estuary schemes, adding a third and subsequent incremental runways to an airport delivers progressively less capacity due to operational, environmental and airspace constraints;
- The deliverability of the assumed 128 runway movements per hour capacity for the LHR NWR scheme is extremely questionable, and subject to material risk. Detailed work undertaken by DFS, (see Appendix 26) indicates that a range of 100-118 movements per hour is more realistic and achievable. Based on the DFS analysis we believe that a figure of around 112 movements per hour is a most likely capacity estimate. This will very materially reduce the available annual movement capacity, which in turn will reduce the traffic forecasts for Heathrow. In Appendix 1, ICF shows that this more realistic level of hourly movements translates into 580,000 to 680,000 annual movements and 106 to 124 mppa. The most likely capacity estimate of 112 movements per hour translates into 645,000 annual movements and 118 mppa. The incremental capacity generated by a third runway at Heathrow is therefore likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow;

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- There is also a high risk that, for environmental reasons, as is the case today, along with other restrictive conditions, a movement cap will be included in any development consent for a third runway, further limiting available capacity to a level below the theoretical operational maximum. To date the Commission has not taken this into account in its assumption on Heathrow capacity; it should do so;
- Similarly, the Heathrow Extended Northern Runway scheme is unique and unproven, with many dependencies and risk concerns, and is also likely to be subject to a movements cap for environmental reasons. Again the Commission has not taken this into account in its assumption on Heathrow Extended Northern Runway capacity, but needs to do so.

4.49 *Passengers per Flight at Heathrow*

- In the Heathrow NWR scheme, the Commission forecasts see the Heathrow passengers per flight rise to as high as 201 by 2050 (an increase of 46 over 2013). This projected Heathrow average passenger load is at the very top end of the range of plausible outcomes. It is significantly higher than Heathrow's own implicit passenger per flight assumption of 182 in 2050;
- In recent years, the average aircraft size at Heathrow has actually declined for long haul services and grown only marginally for short haul. Aircraft orders and airline emphasis on fuel efficient aircraft with fewer seats are likely to prevent such a rapid increase in passengers per flight to well below the levels required by the Commission's traffic projections.

4.50 *Opening date*

- Current traffic trends indicate that new runway capacity may be needed in advance of 2030. Given the complexity and uncertainty in relation to the deliverability of the Heathrow schemes, it would be prudent to undertake sensitivity analysis in relation to a delayed opening date.

Conclusions and Recommended Next Steps

- 4.51 As noted above, the Commission's forecasts for allocation of traffic to individual airports are not robust. The peer review of the DfT traffic allocation model stated that "some of its use for policy testing should be subject to caution". With a new runway at Gatwick the Commission generates a wider forecast range for Gatwick and slower take up of new capacity compared to Heathrow. Neither result is consistent with traffic performance over the last decade.
- 4.52 We recognise that addressing all of the issues we have raised may not be achievable within the Commission's published programme. We therefore propose a number of practical remedies that – if properly implemented – are likely to make the forecasts more credible. Nevertheless, it is for the Commission to address the forecast deficiencies as it sees fit, and to ensure that the traffic forecasts used to support its recommendations are thorough, balanced and fair.
- 4.53 In previous peer reviews of the DfT model, "the process for allocating new routes in future years has not been examined". Given the importance of this process in the current context, we would strongly suggest that a full peer review of this process is necessary.

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- 4.54 In addition, we put forward the following specific proposals in relation to individual scenarios as practical remedies which would substantially correct the most significant modelling deficiencies.
- **Assessment of Need:** Seed long-haul frequencies at Gatwick following opening of the second runway as is currently being implemented in Low Cost is King. Leave Heathrow unchanged, reflecting the stimulatory impact of the expansion;
 - **Low Cost is King:** Do not 'unban' LCCs from Heathrow;
 - **Global Growth:** Move SkyTeam as modelled, but remove the frequencies from Heathrow and allow the model to refill naturally;
 - **Global Fragmentation:** Do not cull low frequency routes from Gatwick and leave Heathrow unchanged also;
 - **Relative Decline of Europe:** Maintain seeding assumptions related to Middle East growth. Do not unban LCCs from Heathrow.
- 4.55 Input Assumptions (More detail is provided in the ICF traffic report – Appendix 1).
- **Heathrow Runway Capacity:** The impact of lower runway movement capacity should be modelled as a base case for both Heathrow schemes;
 - **Maximum Passengers per Flight at Heathrow:** The implications of a more realistic passengers per flight cap should be modelled and quantified by the Commission.
- 4.56 We also request that forecast traffic allocations between airports are sense checked against historically observed behaviour. We suggest some simple metrics that could provide guidance on the minimum share of new traffic that Gatwick or Heathrow could expect to attain after runway expansion. Details of this analysis are provided in Appendix 3, Section 1.4.

Module 1: Strategic Fit – Part B: Other Issues

Key points

Airport Commission national forecasts show Gatwick expansion better for UK overall

- 4.57 We have described the serious concerns that we have about the Commission's forecast allocation of traffic between airports. However, we are broadly in agreement with the national level projections produced by the Commission. While there are differences between these and Gatwick's own forecasts, we consider that the unconstrained national forecasts developed by the Commission are fit for purpose.
- 4.58 The Commission's traffic forecast results demonstrate that the Gatwick expansion scheme is the most favourable for the UK overall and best meets the Commission's terms of reference. At a national level, the Commission forecasts that the Gatwick scheme will result in more foreign passengers flying into the UK, more business passengers, and significantly higher numbers of O&D passengers.
- 4.59 The Commission's forecasts show that the number of destinations served from regional airports would be higher with Gatwick expansion. Gatwick's expansion therefore better complements regional development while still providing additional connections for the regions to and through London.

Benefits of competition should be taken fully into account

- 4.60 The Commission has acknowledged the importance of competition in increasing connectivity and passenger choice, but has not properly quantified the significance of generating more competition in the market. The Commission's economic analysis also suffers from being based on air traffic forecasts that have serious shortcomings.
- 4.61 Estimates of reductions in scarcity rents and air fares do not reflect the impact of competition from airlines at neighbouring airports, nor the clearly demonstrated downward pressure LCCs bring on fares across the whole market. Furthermore, the Commission's analysis does not recognise the consumer benefits that competition can deliver through the introduction of a greater choice of routes in the market, improved customer service and other innovations.
- 4.62 Our view, supported by independent evidence (Appendix 2), is that:
- LCCs bring a significant reduction in fares to the markets in which they operate.
 - Competing airlines, especially LCCs, operating at different airports generate significantly more consumer benefits than when airlines operate and compete with each other at the same airport.
- 4.63 These factors can deliver fares that are 60% lower than they otherwise would be.
- 4.64 In contrast, network carriers competing at the same airport generate only limited competition benefits. This is a particular issue on the important US routes which are dominated by the three anti-trust immunised airline groups principally operating at Heathrow and accounting for over 90% of the transatlantic market.

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- 4.65 Addressing these points will help quantify the benefits that would flow to the UK through the further enhancement of competition across the aviation sector at London airports. Oxera has estimated that the direct benefits of competition are in the range £10-14 billion and that the indirect benefits could be just as large. A robust assessment should address this important issue.

Other issues

- 4.66 The Commission's analysis of passenger experience has been limited to a simplistic calculation of space per passenger. Factors such as time taken to pass through the terminal, walking distances, queuing, delay times and level changes have not been considered. We consider that the Commission's approach is too narrow in scope and uses a methodology which can deliver misleading results. We request that full account is taken of other aspects of the passenger experience (both qualitatively and quantitatively).
- 4.67 In respect of freight traffic, whilst the Commission has recognised that expansion at Gatwick may produce benefits for the air freight sector, it views expansion at Heathrow as being more likely to deliver benefits (based on qualitative analysis). However, where long haul bellyhold capacity is available at Gatwick, freight uplift per aircraft movement is similar to equivalent Heathrow routes. Since the Commission traffic forecasts envisage comparable levels of long haul activity from UK airports regardless of which scheme is chosen, we expect that cargo volumes at the UK level will be similar whichever scheme is selected. Furthermore, expansion at Gatwick will generate much needed competition in the freight market.
- 4.68 In respect of fit with wider spatial and socio economic strategies, expansion at Gatwick is consistent with many existing local and regional plans, the London Plan and the Mayor's Economic Development strategy. In particular, the Gatwick option will bring dispersed economic benefits to South, Central and East London in a balanced and sustainable way. The same cannot be said for either of the Heathrow schemes, which conflict with local and regional planning policies and the London plans. They are likely to focus development on already congested areas.

Passenger Traffic Forecasts – National Demand

- 4.69 The DfT national air passenger demand model (NAPDM) is generally accepted as a robust tool for assessing overall national demand. At the unconstrained level, it produces a reasonable range of national forecasts which are being used by the Commission for consultation.
- 4.70 While there are differences between these and Gatwick's own forecasts, we consider that the unconstrained national forecasts developed by the Commission are fit for purpose.
- 4.71 The Commission's traffic forecast results demonstrate that the Gatwick expansion scheme is the most favourable for the UK overall and best meets the Commission's objectives. We agree with the Commission that the Gatwick scheme (compared to the Heathrow schemes) will generate more passengers at UK airports. Current rates of growth at the London airports also suggest that additional capacity will be required before 2030, consistent with Gatwick delivery in 2025.

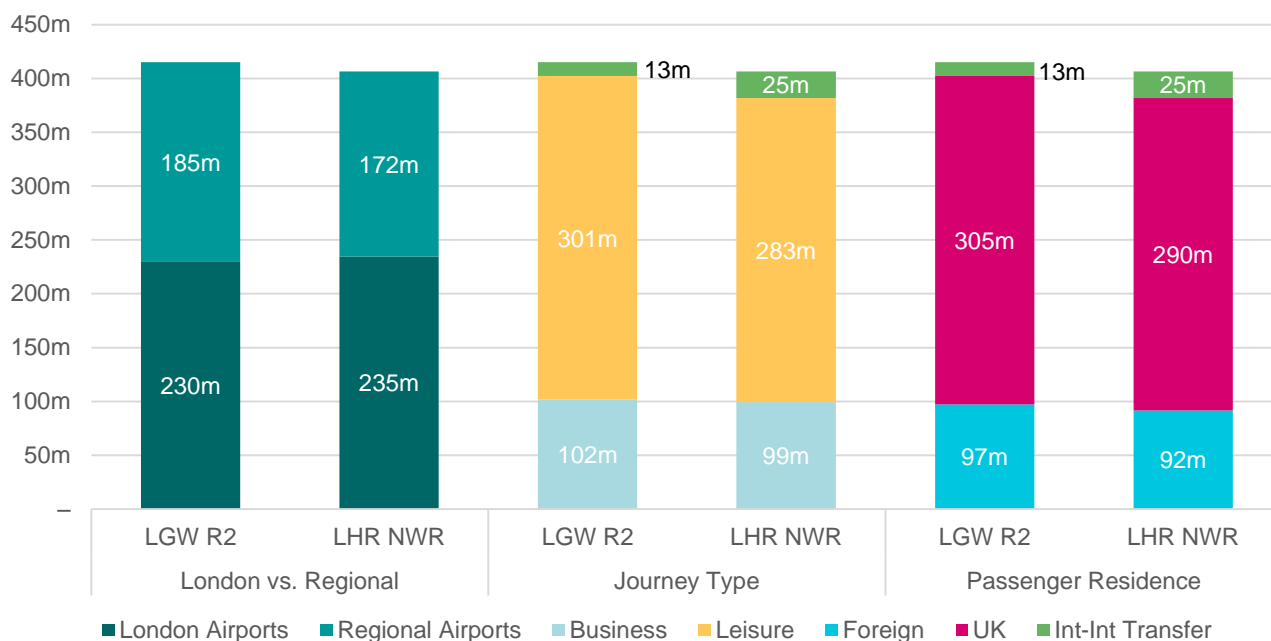
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FIGURE 4.1.5: FORECAST UK PASSENGERS IN 2050

Average of 10 Airports Commission Scenarios

Gatwick Second Runway versus Heathrow North West Runway Scheme



Source: Airports Commission Forecasts, Gatwick Analysis

Impact on connectivity to UK regions and nations

- 4.72 Gatwick agrees with the Commission's conclusion that Gatwick currently has a strong domestic route network and that increased international connectivity enabled by a second runway would provide valuable improvements in connectivity for travellers from outside London and the South East. Such connectivity improvements would take the form of additional routes and frequencies into and out of London airports, together with enhanced routes and frequencies direct from airports outside of London. This latter point is particularly important as most passengers would prefer a direct service from their local airport as opposed to having to transfer in London.
- 4.73 Gatwick has consistently argued that connectivity from the UK does not depend on the provision of additional "hub capacity". We are pleased that the Commission's quantitative analysis in relation to connectivity / destinations served shows that:
- with Gatwick expansion, more passengers would fly directly to and from regional airports compared to expansion at Heathrow (Fig 4.1.5);
 - the UK would be equally well connected with expansion of Gatwick compared to expansion at Heathrow;
 - the impact of feeder traffic on the number of destinations served is negligible, and is clearly not a supporting argument for the development of a super hub.
- 4.74 The incentives on a hub are to attract services and frequencies in order to feed its transfer product. In the case of Heathrow this poses the distinct risk that direct services successfully

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developed by regional airports over the past decade are sacrificed in favour of flights serving the Heathrow hub. This is because the overall economics of direct services to and from regional airports would be undermined by the loss of passengers to the hub. As a result more connections through London could displace, rather than add to, other services from regional airports.

- 4.75 It is vital, therefore, that the Commission considers the impact of London airports expansion on regional aviation in the round. Improved connectivity for the UK as a whole will be achieved through a combination of services via London together with an increasing number of air services from airports outside of London. This increase in direct services from the UK regions and nations will provide significant economic benefits to them.
- 4.76 Expansion of Gatwick will better complement regional aviation. Heathrow would continue to offer access to UK passengers who wish to transfer onto international routes not served by their local airport. Gatwick would do the same but, crucially, the business models of its airlines do not depend on maximising transfer traffic. It can therefore better co-exist with strong regional airports that are both well connected to London and have their own direct services such as those increasingly operated by long haul airlines.
- 4.77 A constellation of London airports bring other passenger benefits, notably:
- enabling passengers to reach a wide range of destinations within London and the South East;
 - minimising passenger surface access journey times by spreading services among London's airports rather than concentrating services at Heathrow;
 - enabling competition between airports and airlines, thereby increasing passenger choice, lower fares and better value for money for the UK as a whole.
- 4.78 Ultimately, the range and frequency of services to and from London and other UK airports will be determined by the commercial decisions of airlines. That said, Gatwick will continue to explore ways of incentivising airlines to operate services to other UK airports. These could include:
- an examination of the structure of airport charges for the use of new capacity so as to encourage more domestic services;
 - an examination, within the scope of UK and EU slot regulation, of creating a slot pool for regional services;
 - developing marketing agreements with other UK airports for services between them and Gatwick;
 - exploring the potential for supporting Public Service Operator applications for operations from UK airports;
 - commitments to build on activities to improve and increase transfer traffic at Gatwick, for instance the Gatwick Connect product.
- 4.79 In summary, the Commission's analysis clearly shows that new runway capacity at Gatwick is the best overall solution for the UK and best meets with Commission's terms of reference.

Impact of fuel prices on the aviation market

- 4.80 The recent fall in fuel prices from over \$100 per barrel to under \$50 per barrel has the potential to impact the demand and supply side characteristics of the aviation market that uses the London airports today. These impacts are likely to affect the overall demand, airline business models and fleet planning decisions:
- **Demand:** Lower operating costs will result in a stimulation of demand for air travel and it is the most cost sensitive airlines such as the LCC market which stands to benefit the most;
 - **Capacity:** This stimulation of demand is likely to lead to capacity constraints becoming binding at an earlier date supporting Gatwick's case for a more deliverable option ahead of that offered by Heathrow;
 - **Airlines:** A reduction in fuel price will contribute to a greater unit cost advantage for the LCC market segment which is already set to drive passenger growth in the London market. It will also support the emergence of new business models such as low cost long haul;
 - **Fleets:** Lower fuel prices will enable airlines to extend the operating life of their fleets however the commercial gains offered by next generation aircraft will still be significant. There may be some environmental implications relating to noise contours which would disadvantage Heathrow more than Gatwick given the number of people impacted.
- 4.81 Gatwick's case for additional runway capacity is supported in the context of an ongoing shift to lower fuel prices supporting greater levels of demand and the airlines most able to deliver this growth.

Competition

Context

- 4.82 The Commission has examined the economic impacts of expanding either Gatwick or Heathrow. This analysis includes consumer benefits from reduced fares, driven by a reduction in airline scarcity rents.
- 4.83 ITF/SEO were commissioned to undertake studies to determine how the shortlisted expansion schemes may impact the competitive nature of the UK airport system.
- 4.84 Gatwick welcomes the Commission's decision to expand its evidence base by commissioning external analysis covering some of the supply side issues. We have consistently stressed the importance of taking into full consideration how the immediate customers of new capacity – the airlines – are likely to respond.
- 4.85 However, it remains the case that the Commission's analysis is flawed because it is based on air traffic forecasts that have the severe shortcomings identified earlier in Part A of this module. It follows that this analysis will need to be updated to reflect changes to address these shortcomings, in order to ensure a thorough, balanced and fair assessment.

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Impact on Scarcity Rents / Air Fares

- 4.86 Gatwick agrees with the qualitative assessment from ITF/SEO that expansion of Gatwick is likely to have the strongest positive impacts on competition. The quantitative analysis from ITF/SEO also estimates higher average competition benefits from Gatwick expansion.
- 4.87 Nevertheless, we believe that the competition benefits are significantly understated. Estimates of reductions in scarcity rents and air fares do not reflect the impact of competition from airlines at neighbouring airports, nor the downward pressure LCCs bring on fares across the whole market. Furthermore, the Commission's analysis does not recognise the consumer benefits that competition can deliver through the introduction of a greater choice of routes in the market, improved customer service and other innovations.
- 4.88 We provide evidence below that suggests that the scale of the benefit from a much enhanced competitive environment following Gatwick expansion is substantially greater than that modelled by the Commission and its consultants.
- 4.89 We contend that the ITF/SEO report does not fully address the impact/benefits of competition. Its commentary in relation to economic rent and air fares fails to acknowledge that Gatwick can and already does act as a substitute for Heathrow in many business and leisure markets.
- 4.90 We disagree with the ITF/SEO approach to modelling scarcity rents. No evidence is provided for its conclusions that expansion at capacity constrained airports will lead to lower fares regardless of airport charges. This implies that existing airlines will be able to absorb lower revenues and higher costs through a reduction in profits: however, the profit margins for legacy short haul operations in particular are typically very thin or non-existent. The assumption that airlines will grow unprofitable routes is unrealistic.
- 4.91 The theoretical and simplistic cost / demand models presented are only applicable in a single (closed) airport system. Given that Heathrow and Gatwick compete as part of the wider London airport system, additional capacity at either airport would reasonably be expected to have an impact on the other airports in the London airport system. This dynamic competitive impact does not appear to have been taken into account in either the Commission's or ITF/SEO's modelling.
- 4.92 Independent evidence by Oxera suggests that the quantified direct benefits of competition from Gatwick expansion are around £10-14 billion; and that indirect benefits could be just as large. This is because Gatwick expansion permits an increase in the number of airlines operating on overlapping routes and an increase in the number of routes competed between airports.
- 4.93 On the other hand, Heathrow expansion would result in increased domination of the market for long haul routes that would otherwise be competed for across other London airports. This is a particular issue on the important US routes which are dominated by the three anti-trust immunised airline groups principally operating at Heathrow and accounting for over 90% of the transatlantic market. Further detail is provided in Module 2 of this document and the full Oxera report in Appendix 6.
- 4.94 To understand the competition issues, Gatwick commissioned InterVISTAS to assess the Importance of Airport Competition on Air Fares Paid by Consumers and focused on two key issues:

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- What is the impact of different types of airport competition on air fares?
 - How does the presence of LCCs influence overall fare levels for an origin-destination city pair?
- 4.95 The InterVISTAS work draws upon a review of 30 years' worth of literature on market structure (i.e. competition). They also undertook original research analysing the impact of airport competition on both European and US air fares. This research included the 1,000 largest airport pair markets for both the US and Europe. The full methodology and detailed results are set out in the InterVISTAS report in Appendix 2.
- 4.96 The InterVISTAS report found that:
- the presence (or not) of an LCC in a city-pair market is a key driver of lower fares for consumers with 20%-40% fares reduction (depending on type of airport competition) compared to full service network carrier only scenarios;
 - in addition, there is also a separate airport competition effect. Airport competition between the same airline types leads to a fare reduction impact in the range 30%-40%;
 - the combined impact of airport competition and presence of LCCs can reduce fares by up to 60% (compared to a market with a monopoly full service carrier);³
 - additional network carrier competition on the same airport pair produces limited fare benefits for consumers.
- 4.97 Overall, therefore, the Commission's modelling of the economic benefit from reducing airline scarcity rents as a result of airport expansion needs to take fuller account of:
- the impact of competition from neighbouring airports on reducing airline scarcity rents;
 - the stronger reduction in air fares achieved as a result of LCC versus network carrier competition across airports in the London airport system.

Passenger Experience

- 4.98 The Commission suggests that Gatwick will 'offer a reasonable level of terminal capacity for passengers, broadly in line with existing facilities', whereas it suggests that both Heathrow schemes will 'continue to offer a high level of terminal capacity for passengers'⁴. We disagree with this assessment.
- 4.99 We believe that the Commission's view on this is distorted by the too limited approach taken by its consultants in reviewing passenger experience. This has been largely limited to a simplistic analysis of how much space per passenger will be provided in the terminals and piers.
- 4.100 This approach fails to identify the true differences between the schemes in terms of passenger experience. A simple space per passenger metric has very limited relevance to a

³ This aligns with Association of European Airlines analysis which showed a 63% decline in legacy airline European short haul fares following market liberalisation and the growth of LCC competition.

⁴ All quotes from the 'Strategic Fit' descriptions contained in the Consultation Document

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passenger's journey through the airport since space for offices, baggage halls, plant rooms, retail stores, training rooms and equipment rooms has been counted but provides no direct passenger amenity benefits.

- 4.101 The way space is used is important: compare for example the poor passenger experience in Heathrow Terminal 5 security with its equivalent in Gatwick South Terminal.
- 4.102 The International Air Transport Association's (IATA's) internationally recognised manual on airport design (The Aerodrome Design Reference Manual) states that floor space metrics should be used only for preliminary 'rule of thumb' assessments and that detailed assessment should focus on other issues affecting the quality of passenger journey, including process times.
- 4.103 An assessment of other elements of the master plan would help build up a complete picture of passenger experience, in particular:
- number of terminals;
 - time taken to pass through the terminal (arrivals and departures);
 - time taken to transfer between terminals;
 - walking distances;
 - queuing and delay times, especially check-in and security;
 - level changes;
 - ease of way-finding;
 - existing service quality levels.
- 4.104 The Commission's assessment should therefore be broadened to include these elements. It would then be evident that the Gatwick proposal offers many relevant advantages:
- an efficient three terminal layout with over half of the future passenger capacity provided in a new terminal between runways;
 - a single 'front-door' for road and rail passengers to simplify way-finding;
 - a central 'Gateway' public transport interchange located at South Terminal from which automated people movers provide rapid transfer to the other two terminals;
 - short journey times through the terminals with minimal level changes;
 - a passenger journey that is almost exclusively above ground and intuitive in comparison with the Heathrow journey which is subterranean for most passengers;
 - a history of innovation in new passenger-facing processes e.g. common-use bag-drop technologies and industry leading security screening;
 - a history of high performance against Civil Aviation Authority (CAA) service quality targets since independence from BAA/Heathrow ownership.

Freight

- 4.105 The Commission has recognised that expansion at Gatwick may produce benefits for the air freight sector. However, in the Commission's view, expansion at Heathrow is more likely to deliver benefits and the scale of benefit may be higher (based on qualitative analysis). There is, however, no evidence presented by the Commission that increasing the amount of freight through Gatwick relative to Heathrow will generate any benefits.
- 4.106 Freight volumes at Heathrow and Gatwick are driven by the availability of long haul bellyhold cargo capacity on wide body aircraft. For both airports, around 95% of freight is carried on long haul passenger aircraft.
- 4.107 Short haul passenger aircraft contribute only marginal freight volumes at Heathrow and Gatwick. This is the case for both full service carriers and LCCs. The vast majority of short haul freight is typically flown from integrator hubs (e.g. East Midlands Airport) or uses surface modes of transport.
- 4.108 For similar long haul routes, Heathrow and Gatwick achieve similar levels of freight uplift per movement. For example:
- 2013 freight tonnage per movement was higher for Emirates at Gatwick than at Heathrow;
 - both Continental and Delta reported higher freight tonnage per movement at Gatwick than at Heathrow.
- 4.109 This is supported by feedback from airlines and freight forwarders, who have stated that there is no separate Heathrow or Gatwick market for freight. For both airports, freight is trucked to/from all parts of the UK.
- 4.110 Heathrow's current domination of the bellyhold freight market is a function of its long haul network. An expanded Gatwick with development of its long haul network would attract much stronger freight volumes.
- 4.111 The Commission's forecasts envisage strong growth of long haul passenger traffic at Gatwick under the Gatwick expansion scheme.
- 4.112 This would be expected to lead to substantial freight volumes at Gatwick in the future.
- Gatwick's own traffic forecasts show freight reaching 1.1 million tonnes by 2050 (under the Gatwick expansion scheme);
 - nevertheless, Heathrow is forecast to remain the leading freight airport even under Gatwick expansion (1.8 million tonnes in 2050).
- 4.113 The Commission has stated that "should most growth emerge from the low cost sector, then any prospective cargo benefits may be reduced, because currently few low-cost airlines carry bellyhold". However, we disagree that the penetration of LCCs at Gatwick could be a significant impediment to freight growth. Whilst short haul passenger flights of any airline type generate very limited cargo, long haul LCCs already see cargo as a vital part of their business model. For example, Norwegian has successfully developed its freight volumes on long haul routes from Scandinavia and is actively developing its UK freight business.

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- 4.114 The Commission notes the availability of space around Gatwick to develop enhanced freight handling facilities. We agree with this assessment, with 65,000m² of new cargo sheds included in our master plan. The sheds will be located on the airside-landside boundary with excellent connections to both the apron and the motorway network.
- 4.115 As noted in our May submission (see SD1, Section 2.11), an expanded Gatwick can offer the air freight sector lower costs, better facilities and greater reliability than currently available at Heathrow.
- 4.116 Furthermore, the Gatwick second runway will generate much needed competition in the market. Overall, we contend that Gatwick expansion provides the best solution for the UK air freight sector.
- 4.117 We therefore request that the Commission revisits its analysis of the cargo proposals taking account of the above points. We believe that this will show that the Gatwick proposals will significantly benefit the UK's cargo customers, offering more capacity and introducing real choice and competition into the market.

Fit with wider spatial and socio economic development strategies

- 4.118 Expansion at Heathrow would conflict directly with the London Plan and the Mayor's Economic Development Strategy. In contrast there is a wealth of evidence within strategic planning documents which demonstrates that expansion at Gatwick would directly support and deliver against a significant number of the spatial and socio-economic development strategies for London. In fact, expansion at Gatwick will bring several benefits over the Heathrow schemes in key areas relating to the spatial and socio-economic vision for London.
- 4.119 At a broad level, a key strength of the Gatwick scheme is that it provides the opportunity to spread economic development to South, Central and East London as well as the South Coast (where there are several areas in need of regeneration), whilst capturing the benefit of a sustainable amount of growth in the immediate Gatwick area, thus providing a more balanced and sustainable solution.
- 4.120 And, whilst it is inevitable that there will be negative environmental, and social impacts from all the schemes when measured against the relevant strategies, the extent and scale of the likely negative impacts at Heathrow are significantly greater. In contrast, expansion at Gatwick has the potential to align substantially better with local and regional development strategies in terms of environmental and social impacts.
- 4.121 We therefore request that the Commission reviews its assessment that the Gatwick and Heathrow schemes align equally well with local and regional development strategies including the London Plan.

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Key points

The economic analysis has underlying weaknesses in relation to traffic forecasts and competition

- 4.122 The issues highlighted in our response to Module 1 (Strategic Fit) in relation to traffic forecasts and competition have a direct impact on the economic assessment, resulting in over-forecasting of traffic at Heathrow and an under-forecasting of Gatwick traffic. These weaknesses need to be remedied.

ITF/SEO's competition assessment methodology underestimates the effect of competition

- 4.123 The methodology chosen by ITF/SEO to calculate the benefits of competition underestimates such benefits. This is caused in part by the way that ITF/SEO measures competition and also by taking a snapshot assessment at 2030, only five years after the opening of a Gatwick second runway and therefore before the full effects of competition will be evident.
- 4.124 We ask the Commission to include the quantified benefits of competition in its TEE analysis. Such quantification was an important feature of the Oxera/PA Consulting report, which was submitted to the Commission in May 2014. Given the number of significant concerns with the ITF/SEO analysis, we suggest the inclusion of Oxera/PA Consulting's quantification of competition benefits within the TEE analysis.

The Commission's Transport Economic Efficiency ("TEE") assessment also has limitations, but these can be remedied

- 4.125 The Commission's TEE analysis shows the Heathrow schemes providing greater benefits than a Gatwick expansion in all but one of the Commission's scenarios. However, we believe that this analysis is incomplete and needs the following improvements, in addition to others discussed in response to this Module:
- We would encourage the Commission to follow the DfT's WebTAG guidelines and bring together costs, including all surface access costs, and benefits to assess benefit-cost ratios and net present values in line with established guidance and practice. On these key metrics, the Gatwick scheme delivers much better value for money than Heathrow in all of the Commission's scenarios; and
 - The TEE analysis does not at present include any competition benefits; this should be rectified. Oxera's analysis suggests that the quantified direct benefits of competition of a Gatwick scheme, relative to one at Heathrow, are around £10-14 billion; and that indirect benefits could be just as large.
- 4.126 Given ITF/SEO's underestimation of competition benefits and the flaws in the PwC analysis described below, we consider that the Commission should use the TEE analysis, with improvements discussed in this chapter (including changes to the Commission's traffic forecast), as the economic impact assessment within its final conclusions. In addition, we

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consider that the Commission should add the quantification of environmental impacts and wider economic benefits, consistent with WebTAG guidance.

PwC's analysis is experimental and should not be relied on by the Commission

- 4.127 Given the limited information available about the model that PwC has used to calculate wider benefits, it is impossible to understand its workings fully. However, there are a number of identifiable shortcomings in its methodology, and weaknesses in the econometric analysis.
- 4.128 It is also clear that the results produced by PwC (estimates of up to £211 billion of benefits coming from Heathrow expansion and up to £127 billion from Gatwick) are far higher, in proportion to user benefits, than have been found in studies of such benefits elsewhere or in other major transport projects. In addition, PwC's model produces around twice the economic benefits for an expansion at Heathrow, compared with Gatwick which is implausible given that 2050 UK passenger forecasts are similar for both airports.
- 4.129 The errors in the traffic forecasts feed into PwC's analysis together with other questionable assumptions (e.g. that passenger mix at each airport will remain the same as today, and as the differentials between the time values of passengers at each airport).
- 4.130 The Commission has said that PwC's analysis of wider benefits should be "interpreted with caution". We regard that as a major understatement. We consider that the evident shortcomings in the analysis mean that reliance cannot be placed upon its results.
- 4.131 This response should be read in conjunction with Appendix 6 – Oxera Economy Impact Analysis.

What the Consultation document said

- 4.132 The Commission's consultation document cited the results from two pieces of analysis:
- the Commission's own Transport Economic Efficiency ("TEE") assessment of welfare benefits; and
 - PwC's wider economic impacts assessment, which assessed the indirect benefits from a macroeconomic viewpoint.
- 4.133 In addition, the Commission published its own analysis of the value of passenger delays. Subsequently, the Commission also published analysis by ITF/SEO of the effects of competition.
- 4.134 The consultation document presented a range of economic benefits from the Commission's TEE analysis for Gatwick expansion of between £3.7 billion and £44.1 billion; while PwC's analysis presented a range of between £42 billion and £127 billion for Gatwick⁵. The Gatwick benefits were generally smaller than the benefits for either of the Heathrow scheme options. For example, the Heathrow North West Runway option was cited with economic benefits from the Commission's own analysis of between £10.3 billion and £42 billion; while PwC's analysis showed much higher benefits for this option of between £112 billion and £211 billion⁵.

⁵ PwC (2014). "Airports Commission. Economy: Wider Impacts Assessment". Pages 74 and 122.

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4.135 With reference to the PwC analysis, the Commission stated that:

“these results should be interpreted with caution, given the innovative methodology used, but they provide an indication of the scope for wider benefits to be felt throughout the economy, for example from enhanced productivity, trade or consumer spending, as a result of expansion.”

Gatwick's overall view on the consultation document

4.136 In response to Module 2, we identify a number of concerns with the Economy analysis provided by the Commission:

- **Weaknesses in the traffic forecasts and competition analysis:** Our response to Module 1 describes our serious concerns with these factors. The traffic forecasts and competition assumptions drive the economic benefits calculation, and as such, they are central to the Commission's TEE analysis, as well as to the PwC report. We consider that the Commission should remedy these limitations;
- **ITF/SEO's competition assessment methodology underestimates the effect of competition:** We believe that enhanced competition is a key driver of economic benefits from expansion at Gatwick. We note that the analysis undertaken for the Commission by the International Transport Forum of the OECD and SEO (“the ITF/SEO report”) included an assessment of competition benefits. The methodology chosen by ITF/SEO underestimates such benefits both in absolute terms and in relative terms (i.e. it overstates benefits at Heathrow, and underestimates them at Gatwick). This is caused in part by the way that ITF/SEO measures competition and also by taking a snapshot assessment at 2030, which is only five years after the opening of a Gatwick second runway. This chapter outlines our concerns with aspects of this analysis;
- We encourage the Commission to include the quantified benefits of competition in its TEE analysis. The quantification of competition benefits was an important feature of the Oxera/PA Consulting report, which was submitted to the Commission in May 2014. Given the number of concerns with the ITF/SEO analysis, we suggest the inclusion of Oxera/PA Consulting's quantification of competition benefits within the TEE analysis;
- **The Commission's TEE assessment also has some limitations, but these can be remedied:** Broadly we support the Commission's TEE analysis, but we make suggestions below for improvements to it. Critically, the TEE analysis should be presented in standard format which would show that Gatwick provides greater value for money in each of the Commission's five scenarios, when the costs are netted from the economic benefits. The DfT's guidance for a standard WebTAG economic impact assessment requires the presentation of this value for money calculation; and
- **PwC analysis is experimental and should not be relied on by the Commission:** We identify a number of flaws with the analysis below. We have also sense-checked the analysis, given its experimental nature and the dependency of the model on the inputs chosen by PwC. The analysis estimates wider benefits far higher in proportion to user benefits than have been identified in transport projects elsewhere, or from major UK transport projects such as for Crossrail and HS2. In addition, we note that PwC's model

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produces around twice the economic benefits for an expansion at Heathrow, compared with Gatwick, despite the 2050 UK passenger figures being similar for both airports. As a result of such issues, the Commission cannot place any material reliance on the PwC report.

- 4.137 Given the concerns with the ITF/SEO and PwC reports, we encourage the Commission to rely instead on the TEE analysis, with improvements described in this chapter, as the economic impact assessment on which to base its final conclusions.

Weaknesses in the traffic forecasts and competition analysis

- 4.138 Our response to Module 1 expresses fully our concerns about the Commission's traffic forecasts and competition analysis. These concerns are relevant to the Commission's calculation of economic impacts because these factors underpin the analysis conducted in each of the reports published by the Commission.
- 4.139 We consider that the Commission's forecasts for the allocation of traffic between airports are not fit for purpose and are unfairly biased against Gatwick. If certain changes are made, which we set out in response to Module 1, these results can be made significantly more reliable.
- 4.140 The forecasts for Gatwick traffic are not credible in the majority of the Commission's scenarios. The Commission's forecast traffic growth at Gatwick is very low in the years following introduction of new runway capacity, with traffic growth primarily allocated to Stansted and Luton. This is clearly contrary to current trends.
- 4.141 This pattern of demand allocation is consistent with previous DfT forecasts, which have systematically under-forecast Gatwick whilst traffic growth at all other London airports has been overstated.
- 4.142 This has serious implications for the whole of the project assessment, leading the Commission to forecast unrealistically high airport charges and unrealistically low economic benefits for the Gatwick scheme.
- 4.143 In response to Module 1, we have identified a number of methodology concerns and suggest practical remedies. These cover the traffic allocation methodology, the scenarios modelled and input assumptions relating to airport capacity at Heathrow.
- 4.144 Given the importance of these factors for the economic impacts calculations, it is clear to us that the Commission should remedy these weaknesses.

ITF/SEO's competition assessment methodology underestimates the effect of competition

- 4.145 The Commission has published two ITF/SEO reports. The first report describes conditions in the aviation industry and the progression of competition through liberalisation of airline routes and the development of low cost short haul travel. We would underline two conclusions from its analysis of the potential for competition from expansion at either Heathrow or Gatwick which have important implications for the choice that the Commission must make:

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4.146 First, concerning expansion at Heathrow:

“a high increase in charges might prevent the hub carrier at Heathrow developing a hub operation with the same extensive feeder network as for example at Frankfurt or Amsterdam, potentially in contrast to a hub operation at Gatwick if charges at Gatwick prove lower than at Heathrow ... It remains to be seen to what extent hub expansion at Heathrow will result in more capacity on existing routes as opposed to adding new routes”⁶;

4.147 Second, concerning expansion at Gatwick:

“Expansion of Gatwick is likely to have the strongest positive impacts on competition, with benefits to the consumer due to the expected increase in low-cost carrier competition and a less dominant position of a single alliance, resulting in more choice for the consumer and lower fares”⁷

4.148 However, we do not agree with SEO’s conclusion that competition between hubs is likely to be the most beneficial form of competition. The evidence and actual experience demonstrate that it is competition between airlines of different types and business models, enabled by non-hub airports that creates the most benefits. Indeed, it has been the emergence of LCCs based predominantly at non-hub airports that has led to major changes in the full-service carrier (“FSC”) business model at hub airports. LCCs compete with both LCCs and FSCs, leading to significant benefits for passengers and contributing to overall passenger growth.⁸

4.149 The second ITF/SEO report produces quantitative point estimates in 2030 of the effect on competition of expansion at Heathrow and Gatwick under four scenarios:

- expansion at Heathrow under the Assessment of Need scenario—£33 million;
- expansion at Heathrow under the Low Cost is King scenario—£189 million;
- expansion at Gatwick under the Low Cost is King scenario—£187 million; while
- expansion at Gatwick under the Relative decline of Europe scenario—£55 million.

4.150 These results are very significantly lower than Oxera/PA Consulting’s calculations. These estimated the benefits of competition from Gatwick expansion in a London market (which would then have two runways at both Heathrow and Gatwick) at between £20 billion and £28 billion by 2050, including both direct and indirect impacts of competition. We are concerned that ITF/SEO appear to have made no attempt to consider the methodology or results of the Oxera/PA Consulting report, despite their report being published seven months after the Oxera/PA Consulting report was submitted to the Commission.

4.151 This section describes specific concerns that we have about ITF/SEO’s analysis, as well as outlining the methodology used by Oxera/PA Consulting when they calculated the benefits of

⁶ International Transport Forum (2014), “Expanding Airport Capacity: Competition and Connectivity”. Page 81.

⁷ International Transport Forum (2014), “Expanding Airport Capacity: Competition and Connectivity”. Page 82.

⁸ See, for example: Pitfield, D.E. (undated), “Ryanair’s impact on airline market share from the London area airports: a time series analysis”, Transport Studies Group; Alderighi, M. et al (2004), “The Entry of Low-Cost Airlines”, Tinbergen Institute Discussion Paper.

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competition. Given our concerns with the ITF/SEO analysis, we request that the Commission includes the Oxera/PA Consulting's quantification of competition benefits within the TEE analysis.

Specific concerns about the analysis

4.152 We have the following specific concerns about the second ITF/SEO report's analysis and methodology:

- **Inconsistencies with the Commission's own analysis:** Despite the Commission explicitly stating that its demand model does not account for the effects of competition, the SEO research estimates its competition impacts from within the parameters established by the Commission's demand forecasts. Specifically, it estimates the shadow cost required to match constrained and unconstrained demand forecasts, and derives the competition impact from within this shadow cost. This is clearly inconsistent with the Commission's analysis, as well as Oxera's, which show that competition impacts are additional to the shadow costs arising from the Commission's demand forecasts. Additional competition would lead to fare reductions and service quality improvements that would increase demand further, over and above the Commission forecasts;
- **Limited time horizon:** ITF/SEO analyse competition as far as 2030, which is only five years after the opening of Gatwick's runway. Clearly, this horizon is not long enough to measure the full benefits from competition. The horizon is also inconsistent with the Commission's own 60 year horizon;
- **Unrealistic switching between airports:** The ITF/SEO report assumes traffic shifts between Heathrow and Gatwick in only one of the four scenarios modelled. This is unrealistic. One would expect the opening of the Gatwick Second Runway to lead to passengers unable to fly from Heathrow switching to Gatwick and, in due course, for Heathrow airlines to respond to this by starting to fly from Gatwick in addition to (or instead of) flying from Heathrow. Switching from Heathrow is therefore likely to occur;
- **Inappropriate use of market concentration metric to measure competition:** The ITF/SEO report uses the Herfindahl–Hirschman Index of market concentration ("HHI") to represent the way that competition works. This ascribes higher competition benefits where market concentration falls (i.e. a greater number of airlines in the market). We believe that this over-simplifies the working of competition because of:
- **Parallel competition:** The ITF/SEO analysis ignores the impact of competition between airlines operating from competing airports (e.g. the impact on a British Airways flight from Heathrow to Amsterdam of an easyJet flight from Gatwick to Amsterdam, as well as of flights to other airports that may serve the Amsterdam market);
- **Service competition:** It cannot distinguish between the competition impacts of the types of service offered – for example, low cost flights versus full service carriers; and
- **Technical bias:** Oxera has identified a technical bias (in addition to other technical issues) in the SEO econometrics, which has the effect of significantly reducing the benefits of competition.

4.153 Overall, the use of HHI and a discredited econometric approach combine to under-estimate the absolute level of competition benefits, and, by being unable to distinguish between

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different types of competition, will under-estimate benefits from a Gatwick scheme (which offers the prospect of competition that the evidence suggests is more beneficial) relative to one at Heathrow.

Oxera/PA Consulting's approach to quantifying competition benefits

- 4.154 We consider that these are serious issues concerning the methodology used by ITF/SEO. We consider that the Oxera/PA Consulting report better captures the complexities and dynamics of competition in this market.
- 4.155 The benefits of increased competition between airlines and/or airports are likely to include lower prices to passengers, greater innovation and investment by airlines and airports, and better planning and capacity development. To quantify these benefits, Oxera considered the available theoretical and empirical evidence, which focuses on the extent of competition between airlines and the associated effect on passenger fares.
- 4.156 Given that there is no DfT guidance on estimating competition effects, Oxera developed a methodology for the purposes of the Oxera/PA Economic Impact Assessment (EIA) submitted to the Commission in May 2014. This involved combining traffic forecasts from ICF/SH&E for Gatwick, Heathrow and other London airports with estimates of the competition effect on air fares from the literature. ICF/SH&E's traffic forecasts predict the frequencies of flights, and the number of airlines operating, from each of Gatwick, Heathrow and other London airports to specific destinations under the two expansion scenarios and the Do Minimum (i.e. the current structure). Oxera used these forecasts to consider the change in competitive dynamics, and the intensity of competition, that would occur as a result of expansion of Gatwick compared to expansion of Heathrow in 2050, and relative to the Do Minimum.
- 4.157 The Oxera methodology distinguished between the different competitive impacts of changes at route level—e.g. a change (after expansion) from one airline to two was treated differently to a change from two airlines to three. Oxera also accounted for an additional effect of competition between airports, which is a factor that the SEO analysis does not capture.
- 4.158 Oxera's analysis indicated that an additional runway at Gatwick (compared with either Heathrow scheme) would be likely to lead to airports competing more vigorously for airlines, and airports and airlines competing more vigorously for passengers and freight traffic.
- 4.159 Oxera estimated that this direct competition impact would result in a £7.7 billion benefit from Gatwick expansion, as this permits an increase in the number of airlines operating on overlapping routes and an increase in the number of routes competed between airports. On the other hand, Oxera estimated a £2.5 billion disbenefit from Heathrow expansion, because this would result in increased dominance of the market for long haul routes that would otherwise be competed to a greater extent across other London airports. These quantitative estimates reflect a number of mechanisms, which vary depending on whether the competition is between airlines of the same type, and whether those airlines are competing from the same or different airports.
- 4.160 The benefits from increased competition are also likely to disperse throughout the London airport system, benefiting all passengers, even on routes where there is no direct competition. For example, as the intensity of competition on individual routes increases, this is likely to increase the tendency for passengers to switch routes, in order to benefit more

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from lower fares. Also, a more intense competitive environment on some routes may lead to increased innovation by airlines which can benefit passengers across the whole of the airline's business. These can be considered as indirect competition effects which in aggregate could be as much again as the direct competition effect.

- 4.161 We would encourage the Commission to include the quantified benefits of competition in its TEE analysis. This was an important feature of the Oxera/PA Consulting report, which was submitted to the Commission. Given the number of major concerns with the ITF/SEO analysis, we suggest the inclusion of Oxera's quantification of competition benefits within the TEE analysis.

The Commission's TEE assessment also has limitations, but these can be remedied

- 4.162 The TEE report focuses on welfare impact on users and providers under each of the three airport expansion options. The Commission notes that it bases its approach predominantly on HM Treasury's Green Book and the DfT's WebTAG appraisal guidance. Therefore, its analysis is broadly comparable with Oxera's economic impact analysis, which was provided to the Commission in May 2014, and is also based on WebTAG.
- 4.163 Broadly, we support the TEE analysis, subject to a number of improvements which we think are essential to allow the Commission to use the report as the central economic impact assessment, within the Commission's overall conclusions. These improvements include:
- presenting the results with costs and benefits following WebTAG guidelines;
 - remedying the limitations on the traffic forecasts;
 - including the quantified benefits of competition, environmental impacts and wider economic benefits; and
 - reviewing the values of time.

Presenting the results with costs and benefits following WebTAG guidelines

- 4.164 The Commission's analysis quantifies the benefits that accrue to passengers, the disbenefit to airlines, and the impact on government from airport expansion, in the three expansion options. Each scenario is assessed in relation to a baseline scenario in which there is no airport expansion. Table 4.2.1 below provides a summary of the Commission's analysis in the Gatwick Second Runway and Heathrow North West Runway scenarios.

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TABLE 4.2.1: PASSENGER, PRODUCER AND GOVERNMENT IMPACTS (£BN, PRESENT VALUES)

	Assessment of Need	Global Growth	Relative Decline of Europe	Low Cost is King	Global Fragmentation
Gatwick R2					
Total net benefits (excluding I-I) (A)	6.1	25.6	5.6	36.9	2.8
Heathrow NWR					
Total net benefits (excluding I-I) (B)	11.8	32.2	12.5	33.3	4.7
Differential – Heathrow’s advantage (B-A)	5.7	6.6	6.9	(3.6)	1.9

Note: Present value (£bn). I-I refers to international transfer passengers. Producer surplus is the impact on airlines from a reduction in the shadow cost that they were charging in the baseline scenario.

Source: Airports Commission.

4.165 Presented in this form, it would appear as if Heathrow is superior to Gatwick, in that it delivers more economic benefits in all but the Low Cost is King scenario. However, we do not consider that this form of presentation is either adequate or fair. While the Commission quantifies both the benefits and costs, they are not presented in conjunction with each other in a cost benefit analysis and no Benefit-Cost Ratio is presented. This is not consistent with HM Treasury’s Green Book and the DfT’s WebTAG appraisal guidance, which advise that costs and benefits should be evaluated together:

“The Green Book [HMT, 2003] sets out best practice guidance on assessing and evaluating policies, programmes and projects and recommends that options should be appraised using cost-benefit analysis (CBA).”⁹

4.166 Further, WebTAG recommends that:

“results should be presented in the appropriate cost-benefit analysis metrics, normally a Benefit-Cost Ratio (BCR).”¹⁰

4.167 Oxera has constructed the benefit–cost ratio and net present value of the Gatwick R2 and Heathrow North West Runway options across the five scenarios. All the values used to construct the benefit–cost ratio and net present value are taken from the various consultation documents published by the Commission. They comprise the benefits from the Commission’s TEE report, the costs in each scheme’s business case, and the delay impact, as shown in table 4.2.2 below.

⁹ Department for Transport (2014), “TAG UNIT A1.1: Cost-Benefit Analysis”. Page 1.

¹⁰ Department for Transport (2014), “TAG UNIT A1.1: Cost-Benefit Analysis”. Page 2.

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TABLE 4.2.2: BENEFIT-COST RATIO AND NET PRESENT VALUE (£BN) OF GATWICK R2 AND HEATHROW NWR

	Assessment of need	Global growth	Relative decline of Europe	Low cost is king	Global fragmentation
Gatwick R2 (£bn)					
Total net benefits (excluding I-I) (A)	6.1	25.6	5.6	36.9	2.8
Delay impact (B)	1.0	0.7	1.8	1.1	1.6
Total net benefits (excluding I-I) (C=A+B)	7.1	26.4	7.4	38.0	4.3
Total costs (D)	7.0	7.0	7.0	7.0	7.0
Heathrow NWR (£bn)					
Total net benefits (excluding I-I) (E)	11.8	32.2	12.5	33.3	4.7
Delay impact (F)	0.8	0.8	2.2	1.4	2.1
Total net benefits (excluding I-I) (G=E+F)	12.6	33.0	14.7	34.7	6.8
Total costs (H)	16.8	16.8	16.8	16.8	16.8
Benefit–cost ratio					
Gatwick R2 benefit–cost ratio (J=C/D)	1.0	3.8	1.1	5.4	0.6
Heathrow NWR benefit–cost ratio (K=G/H)	0.7	2.0	0.9	2.1	0.4
Differential—Gatwick’s advantage (J-K)	0.3	1.8	0.2	3.3	0.2
Net present value					
Gatwick R2 net present value (L=C-D)	0.1	19.4	0.4	31.0	(2.7)
Heathrow NWR net present value (M=G-H)	(4.2)	16.2	(2.1)	17.9	(10.0)
Differential—Gatwick’s advantage (L-M)	4.3	3.2	2.5	13.1	7.3

Note: The calculations use the present value of scheme costs. Benefits accruing to international transfer passengers have been excluded. The Heathrow Extended Runway option also has a lower benefit–cost ratio and net present value than Gatwick Second Runway across all five scenarios.

Source: Oxera analysis of Airports Commission data.

4.168 Table 4.2.2 shows clearly that when using the Commission’s own analysis and figures, Gatwick Second Runway has a higher benefit–cost ratio than the Heathrow North West Runway scheme, in all five traffic scenarios. Similarly, the net present value of Gatwick

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Second Runway is also higher in all scenarios. This would be true also if the uplift to costs applied to both airports by the Commission was taken into account.

- 4.169 This is an important finding because these are key indicators used by the DfT to rank schemes on the basis of value for money. Moreover, in this case the benefit–cost ratio indicates that the Gatwick scheme offers a higher pay-off to the UK economy for the investment across every future scenario considered by the Commission.
- 4.170 In addition, this result holds even without the adjustment of traffic forecasts, quantification of competition benefits, or allowance for environmental impacts that are not included in the Commission’s TEE report. These impacts would move the result further in favour of the Gatwick scheme.

Remedying the weaknesses in the traffic forecasts

- 4.171 As discussed earlier in this chapter, given the significance of the underlying traffic forecasts for the calculation of economic impacts, we consider that the Commission must remedy the weaknesses that we have identified with these forecasts.

Including the quantified benefits of competition, environmental impacts and wider economic benefits

- 4.172 We note that the Commission has not included any quantified values for the economic benefits from competition. We request that these values are presented as part of the TEE analysis in the final report. In commenting above on the ITF/SEO analysis, we have provided a description of Oxera’s approach to quantifying the benefits of competition, an approach which could be adopted by the Commission in their final analysis.
- 4.173 Similarly, we would encourage the Commission to include the quantification of environmental impacts, which was also included in the Oxera/PA Consulting EIA, provided to the Commission in May 2014.
- 4.174 Finally, to ensure that the economic impact assessment is complete, we would encourage the Commission to calculate wider economic benefits, using WebTAG methodology. In our critique of the PwC report below, we highlight that typically, wider economic impacts average around 25%¹¹ of user welfare benefits in appraisals using the DfT’s WebTAG guidance¹². This should provide a benchmark against which the final TEE analysis could be sense checked.

Reviewing the values of time

- 4.175 The TEE report uses values of time as part of the passenger frequency benefits calculations. The values of time for business passengers are markedly higher at Heathrow than Gatwick reflecting the characteristics of current business traffic. However, there is no reason to think that such a difference would persist once a second runway is built at Gatwick – in the same way that the mix of passengers at Gatwick will change so will the value of time. Gatwick will be drawing on the same pool of business passengers as an expanded Heathrow which will

¹¹ With a range of 5–56%.

¹² SDG (2011), “Wider economic impacts of transport investment in New Zealand”. Note: this study included the assessment of Crossrail as a case study.

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result in a convergence between the values at the two, now more substitutable, airports. Moreover, to the extent that the current difference has its origins in a different mix of long haul and short haul traffic at the two airports that too will change as the proportion of long haul at Gatwick increases. For example, the Commission's forecasts show that in the Low Cost is King scenario, the proportion of long-haul passengers at an expanded Gatwick increases from 20% in 2011 to over 50% in 2050.

- 4.176 For the reasons set out above, expansion of Gatwick is likely to be accompanied by a change in the business values of time at the airport. Therefore, we request that the Commission review the relativity between these values for Heathrow and Gatwick, as retaining the existing values is unrealistic.

Conclusion – Gatwick's suggestion for completing the economic impact assessment

- 4.177 Given the limitations and flaws of both the ITF/SEO and PwC analyses discussed above, we would suggest that the Commission's economic impact assessment is based on the TEE analysis. This should be subject to changes to traffic forecasts and enhanced through incorporation of quantified competition and environmental impacts and the use of the WebTAG methodology to analyse wider economic impacts.

PwC's analysis is experimental and should not be relied on by the Commission

- 4.178 The Commission has itself advised caution in the interpretation of the results of the PwC analysis of wider economic impacts. We would go further. We have a large number of very serious concerns about the analysis which we believe are significant enough to mean that the analysis should not be relied upon by the Commission. Given these concerns, we encourage the Commission to rely on the TEE analysis, with the improvements we describe in response to this Module, as the economic impact assessment on which to base its final conclusions.
- 4.179 This section provides our sense-checking of PwC's results, followed by our description of flaws identified in the analysis.

Sense-checks show that the PwC analysis produces unrealistic results compared to other transport studies

- 4.180 We recognise that, in principle, well conducted spatial computable general equilibrium ("S-CGE") modelling can contribute to transport appraisals. While the use of S-CGE models is not specifically called for in WebTAG, such modelling can enable the impacts on a wider range of economic actors and variables to be taken explicitly into account in estimating wider effects¹³. However, we note that the use of such modelling in significant transport schemes is largely untested, compared with the traditional way of calculating wider benefits. Specifically, such modelling is highly dependent on the choice of inputs while, given the

¹³ Department for Transport (2011), "What is the impact of transport schemes on economic geography? Summary of position in DfT guidance, and supporting evidence", November.

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macro nature of the modelling, it does not produce analysis of sufficient granularity to be useful at a local area level.

- 4.181 We have conducted sense-checks on the results of PwC's S-CGE modelling, in order to assess top down whether the modelling could be viewed as credible. Typically, wider economic impacts average around 25%¹⁴ of welfare benefits in appraisals using the DfT's WebTAG guidance¹⁵. This figure includes an assessment for Crossrail, which was estimated to have wider economic benefits that added 56% to the welfare benefits. In addition, the more recent appraisal of HS2 estimated the wider economic impact of the high speed rail project to add 35% to the user welfare benefits¹⁶. However, the PwC analysis implies much greater impacts than this. When compared with gross user benefits, these wider impacts average 72% for Gatwick but 171% for Heathrow North West Runway, and when compared with net user benefits (after deducting loss of producer surplus) they are much greater, averaging between 532% and 961%, respectively.
- 4.182 In addition, as a sense check, we have compared the economic benefits derived by PwC with the forecasts for UK passengers at an expanded Heathrow and an expanded Gatwick. We note that PwC's total UK passengers for Heathrow North West Runway expansion at 2050 are between 420m and 496m, depending on the scenario, while the passenger forecast for Gatwick expansion is broadly comparable, at between 406m and 502m¹⁷. Given this similarity in passenger numbers we would expect a broadly comparable scale of economic benefits to be derived for each airport's expansion. However, PwC suggests benefits for Heathrow North West Runway that are around twice the benefits calculated for Gatwick¹⁸.
- 4.183 Both of these sense-checks suggest flaws in the modelling and its supporting assumptions, as these may well be implying spuriously high economic benefits.

Other flaws in the analysis

- 4.184 Our other concerns about the PwC analysis continue in the following areas:
- Passenger mix assumptions are not credible;
 - Modelling rewards capital inefficiency with higher economic benefits;
 - The analysis overstates the amount of productivity that is caused by connectivity;
 - Lack of granularity in the assessment of local area impacts;
 - Impact on UK regions and nations is inconsistent; and
 - Inconsistencies with the Commission's TEE analysis.

Passenger mix assumptions are not credible

- 4.185 The forecasts of the types of future passengers at each airport drive fundamental differences in the value of economic benefits at the different airports. We have identified concerns about the mix of business/leisure passengers emerging from the forecasts and therefore carried

¹⁴ With a range of 5–56%.

¹⁵ SDG (2011), "Wider economic impacts of transport investment in New Zealand".

¹⁶ HS2 Ltd (2013). "Economic Case for HS2". October.

¹⁷ PwC (2014). "Airports Commission. Economy: Wider Impacts Assessment". Pages 83 and 130.

¹⁸ PwC (2014). "Airports Commission. Economy: Wider Impacts Assessment". Pages 74 and 122.

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into the PwC analysis. We also have concerns about the assumptions about the inbound/outbound passenger mix in the PwC analysis, as discussed below.

- 4.186 PwC has assumed that the proportion of inbound to outbound passengers at the airports remains unchanged from today, despite expansion. This means that an expansion at Gatwick results in a different total mix of passengers in London and the South East, compared to expansion at Heathrow.
- 4.187 In practice, the passenger mix at Gatwick would be driven by demand and would therefore change significantly as passengers respond to the availability of new capacity and the associated route and fare offerings. Evidence from Stansted since 2000 shows significant change in the mix of inbound and outbound passengers, over a period of significant market change¹⁹. In addition, we note that as the middle classes grow in emerging economies like China and India the demand for inbound travel to London is likely to increase.
- 4.188 The assumption of no change in passenger mix also implies that it is the *airport* that determines the mix of passenger demand; whereas Gatwick (and its airlines) will be responding to passenger demand from across London and the South East, Today's passenger mix is therefore very unlikely to remain fixed.
- 4.189 Since Gatwick currently has a higher proportion of outbound passengers than Heathrow, the effect of the unrealistic passenger mix assumption is that expansion at Gatwick results in lower benefits for the UK, as the economic benefits are derived at the passengers' destinations. We do not believe that the underlying market realities support this projection.

Modelling rewards capital inefficiency with higher economic benefits

- 4.190 The PwC model attributes higher economic benefits to the airport with the highest construction cost, rather than recognising the benefits to the economy of the efficiency delivered by a scheme with lower construction costs. Taking airport construction and surface access together, the cost of expanding Heathrow is around double that of expanding Gatwick and, under PwC's modelling, the associated GDP economic 'benefits' are nearly four times higher. This is a perverse outcome.
- 4.191 Any positive impacts on the construction industry are by their nature temporary, occurring only in the construction phase of the projects. Even if such effects occur, they cannot be scored as long-term benefits to the UK economy. In reality, such higher spending would lead to countervailing pressures as, at the macro level, inflationary pressures trigger higher interest rates and an offsetting reduction in economic activity. Even viewed from the narrower perspective of the aviation market, higher construction costs, passed onto passengers, would lead to a dampening of passenger demand, and leave those who do fly with less income for other purposes. The result of these factors would be long term costs which outweigh the temporary increase in construction activity from a more expensive project – even assuming that this should be regarded as a benefit.
- 4.192 In contrast, a more efficient, lower capital spend at Gatwick would result in lower fares per passenger with a consequential long term benefit to GDP.

¹⁹ Oxera technical report paragraph 2.11.

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The analysis overstates the amount of productivity that is caused by connectivity

- 4.193 PwC has cited its own econometric analysis, which derives a causal link, whereby aviation connectivity drives trade and, therefore, productivity, but not the reverse. This is a fundamental driver of PwC's analysis, which we asked Oxera to review. Oxera's technical report in Appendix 6 lists reasons why PwC's approach is flawed. There is no reliable evidence to prove that causation runs only this one way. Indeed, this is highly implausible. The more prudent approach therefore would be to recognise that causation between productivity and connectivity runs in both directions. This is important because it would act to reduce the unrealistic productivity results flowing from the PwC analysis and could also, in conjunction with remedying the other issues raised, change radically the rankings of the airports.

Lack of granularity in the assessment of local area impacts

- 4.194 We are concerned that the PwC modelling is insufficiently granular to take into account the different impacts on the local areas surrounding Heathrow and Gatwick. We understand that the PwC model distinguishes only four regions—London and the South East, Rest of England, Rest of UK and Rest of the World. Therefore, the impact of expansion on the local areas around the two airports cannot have been considered by PwC.
- 4.195 The Commission's local economy report indicates that expansion at Heathrow would have significantly higher airport-related impacts on the local area than expansion at Gatwick; in particular, higher land take—both for the airport itself and its surface access requirements, and for the additional housing requirements (as Heathrow requires much higher employment to deliver the same capacity increase). The relative inefficiency of Heathrow adds much more activity into an already congested area of London, which would have adverse implications for prices and the local economy.
- 4.196 However, this overheating effect on Heathrow's local area and the alternative opportunity to develop areas South of London cannot have been considered in the PwC model, given the much broader level at which impacts have been analysed. The area South of London in which Gatwick sits is more sparsely populated than the area around Heathrow, and thus is better able to accommodate any given increase in demand for land and housing as a result of expansion, without putting undue pressure on prices or greatly increasing congestion and pollution. These local effects are likely to favour expansion at Gatwick.

Impact on UK regions and nations is inconsistent

- 4.197 The regional analysis in the PwC model is unlikely to be robust, given the absence of good data on regional flows and behavioural responses. The Commission's traffic analysis suggests that Gatwick Second Runway would be better for business travel from UK airports outside London and the South East than either of the Heathrow schemes—although in all scenarios, business travel at these other airports falls for all three expansion schemes. Despite the apparent connectivity detriment the PwC analysis finds counterintuitively larger GDP and employment benefits in the regions if Heathrow, rather than Gatwick, were expanded.

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Inconsistencies with the Commission's TEE analysis

- 4.198 We are concerned that the PwC analysis uses traffic forecasts that are inconsistent with those used in the Commission's TEE analysis. For example, the passenger flows under the Gatwick Second Runway (for the UK) in Table 15 of the PwC report do not match those published in Table 6.1 of the Commission's forecasting report.
- 4.199 More widely, the PwC report quotes figures for transport economic efficiency (the core subject of the Commission's TEE report), that are different from those resulting from the Commission's analysis – without explanation.
- 4.200 The lack of consistency in forecasts and outcomes as between the Commission's and PwC's reports is extremely worrying and casts further doubt on the reliability of the PwC report.

Conclusions – How the PwC analysis should be viewed

- 4.201 We have a number of very serious concerns about the Commission's reliance on the PwC analysis. Both of our sense-check factors would suggest that the modelling is unreliable: the substantially greater size of the wider benefits compared to what has been seen in other transport studies as well as a doubling of economic benefits attributed to Heathrow expansion compared with Gatwick, despite comparable UK passenger forecasts in 2050. In addition, the number of significant concerns expressed above (as well as others identified in the Oxera's technical report), together with the fundamental nature of the issues they raise about PwC's results, mean that we believe that the Commission should not place any material reliance on the PwC outcomes in its final report.
- 4.202 Therefore, we propose that the Commission's overall assessment should rely on the TEE analysis, extended to cover wider benefits and presented in accordance with WebTAG guidelines, together with the improvements identified earlier. This would be in line with the approach taken for recent substantial UK transport projects.

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Key points

- 4.203 Whilst we support the Commission's overall approach and methodology, there are four areas where we disagree with the Commission's assessment:

Ranges too broad to allow useful comparison

- 4.204 The Commission's ranges for employment and housing impacts are too wide to allow useful comparisons to be made, or meaningful conclusions to be drawn. For example, the Commission concludes (in paragraph 3.24 of the Consultation document) that the number of new jobs at Gatwick in 2030 would be between 500 and 23,600.

Heathrow employment generation assumptions are overstated

- 4.205 The employment multiplier for Heathrow overstates the employment effects because the assumed induced impact is excessively high;
- 4.206 We provide evidence that shows that the number of jobs generated by Heathrow will be lower than the Commission's assessment, and consequently so will the related economic benefits.

Housing requirements are overstated

- 4.207 The Commission housing assessment excludes key factors, leading to an overstatement of requirements at Gatwick and Heathrow.

But, housing-related impacts are understated

- 4.208 The Commission's assessment also significantly understates the challenges which local authorities face in accommodating housing demand and related infrastructure needs, even without airport expansion. With respect to these other impacts, we consider that further work will be necessary to assess the need for improvements to and upgrading of local roads in surrounding districts, and the impacts on social infrastructure such as schooling and healthcare which might also require substantial further investment over time. Whilst these impacts may be quite diffuse, we consider they may be significant and of considerable importance to the districts surrounding the airports. Such challenges and difficulties are far greater in the Heathrow area than at Gatwick.

Gatwick is a much more compelling scheme

- 4.209 Our conclusion is that the local economic benefits at Heathrow are overstated and the risks to delivery of these benefits are understated. We consider that, on a fair assessment, Gatwick is a much more compelling scheme in terms of its impacts on the local economy than either of the Heathrow schemes.

- 4.210 This response should be read in conjunction with Appendix 7 – RPS/Optimal - Local Economy Report (Employment & Housing), Appendix 38 – Farrells Place-Based Economic Benefits Report.

Ranges too broad to allow useful comparison

- 4.211 The ranges of the Commission's results for employment and housing numbers are too wide. For example, the Commission concludes (in paragraph 3.24 of the Consultation document) that the number of new jobs at Gatwick in 2030 would be between 500 and 23,600. Whilst we recognise that the ranges are a result of applying the various scenarios that the Commission has tested, presenting the outputs across such a wide range does not allow useful comparisons to be made or meaningful conclusions to be drawn.
- 4.212 In our discussions with local authority representatives, a strong theme has been the critical importance of understanding and quantifying the employment and housing effects of airport expansion, so that the balance between benefits and impacts can be properly understood. For local authorities to be able to plan for the implications of future growth, they require robust and specific information.
- 4.213 The Commission should therefore present a narrower range of outputs, to enable a more meaningful assessment of the schemes to be made.

Heathrow employment generation assumptions are overstated

- 4.214 Overall, the maximum passenger increases for all three schemes are of the same general order of magnitude, with only a 7mppa difference between the highest and the lowest (the two Heathrow schemes). The largest difference between Gatwick and Heathrow North West is only 6mppa (or 11%).
- 4.215 However, in contrast to the relatively small differences in passenger numbers, the Commission's projections of local employment show significant variation. For example, total employment (direct, indirect and induced) in the local area for Gatwick expansion is predicted by the Commission to increase by a maximum of 32,500 at 2050. The equivalent maximum figure for Heathrow North West scheme is 112,400 at 2030 which is 3.5 times the increase for Gatwick.
- 4.216 We have examined the assumptions and data presented in the Commission's consultation documents. This has revealed a number of significant differences in assumptions adopted by the Commission as between Gatwick and Heathrow. For example, in calculating direct employment (people working at the airport) the Commission has assumed a higher ratio of employees to passengers at Heathrow. This is partly driven by the traffic mix (long haul operations traditionally require more workers than short haul). A second example is the very high level of "indirect" employment expected at Heathrow compared to Gatwick (people working for suppliers linked to the airport's operation), which has been calculated using different multipliers. However, the most significant difference is found in the numbers of 'induced' jobs (airport related employees spending their wages with businesses in the local area), and therefore this is where we focus our response on employment.
- 4.217 Induced employment is calculated based on assumptions concerning local multiplier values. The Commission's analysis assumes that the ratio of induced jobs to direct jobs at Heathrow (the induced multiplier) will be 1.01 (this is the same assumption used by Heathrow Airport Limited in their submission). The comparable ratio used for Gatwick is 0.21. The reasons for selecting this very high figure for Heathrow have not been explained by the Commission. A

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ratio of 1.01 for induced to direct jobs is far higher than would be suggested by any regional-level study in the UK or elsewhere, where typically a value of 0.2 to 0.4 would be applied.

4.218 The results generated using the Commission's multiplier assumptions are as follows:

TABLE 4.3.1: RESULTS GENERATED USING COMMISSION'S MULTIPLIER ASSUMPTIONS

Scheme	Induced employment
Gatwick	5,100
Heathrow North West	42,900
Heathrow Hub	36,800

4.219 By applying such a high multiplier for Heathrow, the results show an induced impact which appears to have been overstated by at least 30,000 jobs. In fact the effect is so disproportionate that the number of induced jobs actually exceeds the number of direct jobs, which is highly implausible.

4.220 The Literature Review paper prepared by PwC for the Commission pointed out that the size of the multiplier is related to the size and structure of the economy to which it is applied²⁰. While the Heathrow area economy is about 23% larger than the Gatwick area economy (so that a larger multiplier would be a reasonable assumption), it is not larger by the orders of magnitude which could conceivably justify such a large difference.

4.221 Our principal concern is that these differences give an overall impression that the difference between the local employment benefits of Gatwick and Heathrow schemes is much greater than it is ever likely to be. By way of illustration, we have applied a more credible multiplier of 0.2 (based on evidence in other comparable regional studies) to the Heathrow schemes and without any change to the indirect multiplier, producing the following comparative impacts in 2050.

TABLE 4.3.2: REVISED MAXIMUM EMPLOYMENT IMPACTS 2050

	Gatwick	Heathrow NWR	Heathrow ENR
Direct	24,000	40,100	34,400
Indirect	1,600	25,200	21,700
Induced	7,000	8,000	8,000
Total	30,800	73,300	64,100

²⁰ Local Economy Literature Review PwC November 2014 pages 3, 9, 15 and 16

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- 4.222 It should be noted that the air traffic forecasts, and traffic mix are a key input to the local economy assessment as these influence the ratio of passengers to employees (put very simply, long haul operations traditionally require more employees than short haul). Assumptions made by the Commission on Gatwick's future traffic mix in a number of scenarios have therefore influenced the direct employment assessment. Were more realistic assumptions to be made, this would reduce the differences between the employment forecasts still further.
- 4.223 The above results provide a more credible assessment for induced employment. Table 4.3.2 also highlights that the indirect employment effects are disproportionately high for both Heathrow schemes. We therefore consider that the local employment effects for Heathrow have been significantly overstated, and that the indirect and induced employment estimates for the Gatwick and Heathrow schemes should be reviewed and adjusted.

Housing requirements are overstated

- 4.224 In presenting additional housing numbers, the Commission states that there are many reasons why the 'true' requirement for extra housing will be less than the figures which it sets out. The factors which the Commission lists are:
- The growth of the indigenous workforce which will increase local labour supply and thus reduce any need for in-migration
 - Recruitment of people who would otherwise be unemployed
 - Reduced out-commuting
- 4.225 The Commission is right to have identified these factors, which are all widely adopted in calculating housing demand. In fact, Gatwick applied all three factors in our Local Economy submission. This showed that the effect for reduced unemployment/economic inactivity and out-commuting was, on conservative assumptions, equivalent to 3,500 extra workers in 2031 and 3,800 in 2051. Applying these estimates to the Commission's housing figures would reduce their maximum 2030 figure for Gatwick to less than 15,000. We consider this to be a reasonable adjustment.
- 4.226 Our analysis also takes account of the fact that it is not generally expected that one job will equate to one house (as the Commission has assumed) but rather a ratio of one house per 1.6 jobs (as more than one economically active person may live in a house). Combined with an adjustment for labour supply that would imply a maximum additional housing requirement for Gatwick of 9,400 in 2030 (this is a reduction of 5,600 from 15,000). The Commission has not provided a 2050 figure for Gatwick; however, the same assumptions would imply a housing figure of 14,000 in 2050.
- 4.227 If the same assumptions were applied to the Heathrow schemes, this would also result in a reduction in maximum housing requirements. Adjusting for the degree of over-statement of induced effects, and the Commissions' assumption that 63% of employees in Heathrow related jobs will live in the relevant study area, this would reduce the estimated maximum housing requirement at Heathrow from 70,000 to around 50,000.
- 4.228 However, for the reasons we set out in the next section, we believe there is clear evidence to demonstrate that, even at such reduced levels of additional housing demand, land supply in

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the Heathrow area is already heavily constrained, and this in itself puts at risk the ability of the Heathrow schemes to deliver the economic benefits required.

Housing-related impact understated

- 4.229 The Commission's conclusions in relation to land supply (principally expressed in terms of housing) are identical for both the Gatwick and Heathrow local area. In the Local Economy Assessment report for both areas the conclusion is that land supply should not be considered a barrier to airport expansion or to realising the benefits associated with that expansion.
- 4.230 We consider that, the Commission's assessment significantly oversimplifies the ease with which local authorities are able to accommodate housing demand today as well as understating the difficulties that will be faced by local authorities in accommodating future demand for housing and other local infrastructure such as schools, hospitals and doctors' surgeries. With respect to these other impacts, we consider that further work is necessary to assess the need for improvements to and upgrading of local roads in surrounding districts, and the impacts on social infrastructure such as schooling and healthcare which might also require substantial further investment over time. Whilst these impacts may be quite diffuse, we consider they may be significant and of considerable importance to the districts surrounding the airports. Overall, however, these challenges are significantly greater in the Heathrow area than at Gatwick.
- 4.231 Gatwick's May 2014 submission concluded that additional housing demand (9,300 homes) would represent less than 7% of overall annual planned house building rates in the local area. On the basis of the Commission's forecasts, if adjusted as suggested above (14,000 homes), this would still only represent a maximum of around 10%. A significant proportion of this housing would be delivered between 2030 and 2050 which means that there would be a long time frame over which these houses, and the associated infrastructure, could be planned and delivered.
- 4.232 The situation with Heathrow gives rise to much greater difficulties than at Gatwick. Even with the reduction we suggest from 70,000 homes to 50,000. This is still very significantly higher than Gatwick and is needed much earlier, mostly by 2030 as Heathrow is forecast to reach maximum employment levels by this date. The implications are therefore much greater.
- 4.233 In its Local Economy Assessment, the Commission concludes that, whilst accommodating this maximum level of growth may be "challenging", the Heathrow local area is flexible enough to accommodate this order of growth (commentary relating to Table 63, page 136). We consider that this significantly underestimates the complexities involved.
- 4.234 The Heathrow and Gatwick defined local areas are very different in character in terms of current levels of urbanisation and existing constraints affecting the delivery of new development. The Heathrow area is already highly urbanised and constrained by significant areas of Green Belt, as well as by national and international nature conservation sites. By contrast, the urbanisation implications of expansion of Gatwick area are more limited in terms of scale, would occur in a wider area which is much less constrained, and would involve delivery over a much longer period.
- 4.235 Accommodating airport related growth in the Gatwick local area will still be challenging. However, land supply in the Gatwick area gives rise to far less risk than Heathrow in terms of

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delivering economic benefits. The potential problems associated with finding land within the Heathrow local area to secure the Commission's forecast benefits represent a significant and obvious threat to either Heathrow scheme. The balance that needs to be struck between the level of local economic benefit, and the problems associated with delivering the housing and associated infrastructure needed to achieve this, clearly demonstrate that Gatwick is at least equal to, if not better than, Heathrow in terms of Local Economy impacts.

- 4.236 Overall, we consider that the number of jobs generated by Heathrow is very likely to be lower than the Commission's assessment, and consequently so will the related economic benefits. Also, the evidence clearly suggests that for both Heathrow schemes, even at an adjusted level, the risks that airport expansion cannot sustainably deliver the scale of economic benefits are far greater, and more adverse, than the Commission's assessment indicates.
- 4.237 For Gatwick these risks are far lower. Therefore Gatwick can be relied upon with a much greater degree of confidence to deliver significant local economic benefits in a sustainable way.

Gatwick is a much more compelling scheme

- 4.238 Our conclusion is that the local economic benefits at Heathrow are overstated and the risks to delivery of these benefits are understated. We consider that, on a balanced and fair assessment, Gatwick is a much more compelling scheme in terms of its impacts on the local economy than either of the Heathrow schemes.

Module 4: Surface Access

Key points

Gatwick has strengthened its surface access case since May

- 4.239 Since May, Gatwick's already strong surface access case has been strengthened by further local road enhancements around the boundary of the airport, which improve access for local communities and businesses, and by the announcement in the 2014 Autumn Statement of agreement on the £120 million Gatwick Airport Railway Station project.

The Commission's conclusions are supportive of Gatwick

- 4.240 We welcome the Commission's conclusion that Gatwick's surface access strategy:

- will accommodate the demands of a second runway;
- is fully funded;
- has no significant risk to delivery; and
- will widen Gatwick's catchment area.

- 4.241 The Commission's consultants confirm that Gatwick meets the appraisal objectives.

But we are concerned that the Commission does not adequately reflect the significant differences between the Gatwick and Heathrow schemes

- 4.242 The surface access requirements to support delivery of the Heathrow schemes are an order of magnitude more costly than those at Gatwick and assume significant Government funding which may not be forthcoming and which may fall foul of State Aid rules.

- 4.243 The Commission should give greater weight to the fact that parts of Heathrow's surface access strategy are not fully defined and carry significant delivery risks. The issues of cost, disruption during construction, and the complexity of delivery should be the subject of much more analysis and assessment.

- 4.244 In order to ensure a fair comparison, the Commission should subject the Heathrow schemes to the same type of analysis as was undertaken for Gatwick on resilience and local road traffic impacts.

- 4.245 Gatwick's surface access strategy performs far better than that of the Heathrow schemes, whilst the complexity and risk inherent in the far more costly Heathrow schemes present substantial risks to timely delivery.

- 4.246 This response should be read in conjunction with Appendix 8 – Arup Surface Access Report.

Gatwick has strengthened its Surface Access Case since May

- 4.247 Gatwick presented a strong surface access case in its May 2014 submission to the Commission. Since that submission, Gatwick's case has been strengthened by changes to the local roads design around the boundary of the airport to improve access for local communities and businesses. The Gatwick Airport Railway Station project has also reached a major milestone with the Chancellor's confirmation in the 2014 Autumn Statement that Heads of Terms have been agreed, providing much greater confidence of the delivery of this major enhancement and its resulting benefits.
- 4.248 Gatwick's surface access will be transformed over the next five years by road and rail upgrades that are already planned and funded, as set out in Gatwick's submission. As a result, there will be a step change in both the quality and scale of public transport access to the airport regardless of expansion, with direct rail connections to 175 stations and over 1,000 via one interchange.
- 4.249 These improvements will enable Gatwick to meet all the passenger demands from a second runway without any additional taxpayer investment and without the disruption that would be caused at Heathrow by tunnelling the M25, diverting the UK's busiest motorway and imposing a congestion charge.
- 4.250 Gatwick's proposals will achieve the highest use of sustainable modes of transport: it will achieve a 60% public transport mode share for customers (around 50 million by 2050) and a 50% sustainable mode share for staff.
- 4.251 Gatwick's plans will accommodate the needs of other transport users: in 2040 and 2050 there will be enough road and rail capacity to serve the airport, background users and the economic growth generated. Both Network Rail and the Highways Agency support this analysis.
- 4.252 Gatwick's plans will provide access from a wider catchment area than the Heathrow options: 3.2 million people live within 30 minutes, 10.8 million within 45 minutes and 14.8 million people within 60 minutes – better than any other major UK airport.

We are concerned that the Commission does not adequately reflect the significant differences between the schemes.

- 4.253 Although we accept the overall conclusions for Gatwick, our review of the documents published for consultation has identified a number of issues with the assessment that the Commission should address in preparing its final appraisal of the competing schemes. This is essential for a full, fair and reliable comparison of the schemes that expands on the Commission's work to date.
- 4.254 The Commission's appraisal does not reflect the significant differences between the schemes and excludes some surface access impacts that are key to how the schemes should be appraised. The Commission should undertake further analysis of the three schemes in terms of their costs, the capacity and resilience of their transport networks, the risks to their delivery as well as disruption during construction. Gatwick is confident that a full appraisal will emphasise still further the significant surface access advantages of the Gatwick proposal and

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highlight the risks and wider impacts on communities affected by the surface access strategies proposed for the Heathrow schemes.

Order of magnitude difference in surface access costs

- 4.255 The Commission should reassess the total airport scheme costs and affordability conclusions by including all relevant surface access costs. This is to ensure a full and fair comparison of the overall financial impacts (both public and private) and the social, commercial and economic benefits from all investment. It will assist the overall appraisal and the Commission's ultimate recommendation given the scale of difference between the cost of the surface access mitigation measures identified for the Gatwick and Heathrow schemes as shown in Table 4.4.1 below.

TABLE 4.4.1: COMPARISON OF SURFACE ACCESS COSTS FOR EACH SCHEME

	Gatwick	Heathrow	Heathrow Hub
Promoter's assessment²¹			
Surface Access Mitigation costs	£0.8 billion	£2.2 billion ²²	£4.3 billion ²³
Promoter's assumed contribution	£0.8 billion ²⁴	£0.9 billion	£3.3 billion ²⁵
Commission's assessment²⁶			
Surface Access Mitigation costs	£0.8 billion	£5.7 billion	£6.3 billion
Additional Hub Interchange ²⁷	–	£2.1-4.1 billion	£2.1-4.1 billion

- 4.256 The following points should be addressed through further analysis to ensure a balanced appraisal:
- Inclusion of all costs** – In accordance with the Commission's Appraisal Framework, the Commission should include all surface access costs required for the delivery of each scheme, as identified by their consultant, including all Heathrow surface access required to support the two proposed schemes. These should allow for changes to baseline schemes and all other measures in the Heathrow and Heathrow Hub surface access cases including Southern Rail Access, a deliverable M25 proposal which meet design standards, and all local access and interchange costs. It should be noted that Heathrow has already benefitted from significant Government funding related to recent highway improvements around the airport, including M25 widening to facilitate access to Terminal 5. In contrast Gatwick has received no recent Government investment in roads specifically serving the airport and the Smart Motorway scheme for the M23 is fully

²¹ Taken from various promoter documents submitted with the Commission's consultation

²² Heathrow Airport Limited, Taking Britain Further – Volume 1, p413, May 2014. Identified public sector costs for surface access of £1,292 million plus scheme surface access costs of £892 million

²³ Heathrow Hub, Updated Scheme Design – Heathrow Expansion, Preliminary Indication of Cost (supporting documents 34.1, 77, 78 and 79). Costs comprise M25 works £530 million, Southern Rail Access £1,050 million, Hub station and associated works £2,820 million

²⁴ Note, this includes costs for the Gatwick Gateway multi-modal interchange on the Brighton Main Line, fully integrated with the airport.

²⁵ Estimated based on the Hub station costs of £2.8 billion plus £0.5 billion for M25 works quoted in the submission. Heathrow Hub claims all other costs for rail improvements are offset by other industry savings.

²⁶ Airports Commission, Consultation Document, p48, p66 and p82, November 2014. Note: calculation of costs differs from those of the promoters even if the totals are the same.

²⁷ Note, the Airports Commission has assessed the Hub railway station as a potential add-on to either Heathrow scheme

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justified by increased background traffic growth. Since its change of ownership in 2009 Gatwick has financially supported the development of Gatwick Airport railway station as part of the operational improvements on the Brighton Main Line (BML).

- **Funding arrangements** – The Commission correctly highlights that a key issue for Government is how surface access improvements are funded. Any scheme not required except as a result of airport expansion should be included in the scheme cost plans evaluated by the Commission. Gatwick has included all such costs but the Heathrow proposals make clear that significant public sector funding is required for infrastructure that solely or primarily benefits the airport.
- **Business Case** – Surface access costs incurred as a direct result of airport expansion should be included in the financial and business case for each scheme. This will have an important impact on the resultant airport charges calculated in the Commission's analysis.

Significant delivery risks and disruption with Heathrow schemes

- 4.257 The scale and complexity of surface access mitigation differs significantly between Gatwick and Heathrow, and the Commission should fully recognise the reasons for this and appraise delivery risks associated with each proposal in their overall assessment. The proposals for the M25 and M4 in the Heathrow schemes will cause massive disruption to local communities and businesses. This is not referred to in the Commission's analysis despite the fact that it is plainly material to the assessment of impact and risks to delivery.
- 4.258 The DfT recognises major issues for the M25 in its Road Investment Strategy²⁸, where it commits to funding a new study on the M25 South West Quadrant to identify long term capacity solutions. The Commission should undertake further work and consult the Highways Agency to develop a robust assessment of the impacts during construction on all users. This affects the surface access appraisal and also Delivery, Quality of Life and Local Economy modules. Table 4.4.2 is drawn from the Commission's consultant's report, illustrating the scale and range of impact estimated for Heathrow schemes. We consider that the appraisal should characterise the impact of tunnelling and diverting the M25 as 'severe' not 'moderate' due to the very high traffic volumes affected.

²⁸ Department for Transport, Road Investment Strategy: Investment Plan, p51, November 2014

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TABLE 4.4.2: HEATHROW ROAD ACCESS INTERVENTIONS AND LIKELY IMPACT LEVEL (JACOBS, APPRAISAL FRAMEWORK MODULE 4. SURFACE ACCESS: HEATHROW AIRPORT NORTH WEST RUNWAY, NOVEMBER 2014)

Intervention	Impact	
	Commission's view	Gatwick's view
Tunnelling the M25	Moderate	Severe
M4 J2 to J3 widening	Severe	Severe
M4 J4 to J4a widening	Severe	Severe
Constructing a system of collector-distributor roads	Moderate	Severe
Construct a new Southern Road Tunnel access	Moderate	Moderate
Implementation of a new one-way access arrangement	Minimal	Moderate
Realigning the A4 to the north of the airport	Severe	Severe
Replace sections of the A3044	Severe	Severe
Remove the existing Western Perimeter Road	Minimal	Minimal
Grade separate the roundabout	Severe	Severe
Construct new junction on the Southern Perimeter Road	Severe	Severe

Source: Table 15 of Jacobs, Appraisal Framework Module 4. Surface Access: Heathrow Airport North West Runway, p68, November 2014

- 4.259 The Commission should note the DfT considers that following committed Smart Motorway improvements on the M25 between Junction 11 and junction 16 “This investment programme will help improve conditions on this stretch, but further widening of the road beyond this point would be a considerable feat of engineering”²⁹. Putting the M25 in tunnel would fix its width, making it more difficult in the future to provide additional roadspace in a cost-effective way.
- 4.260 During construction there will be months of disruption while the new M25 is built and connected to the existing motorway. Neither of the schemes for Heathrow expansion provides detail of how traffic will be managed during construction, or which routes will remain open. The M25 between Junction 11 and Junction 16 is the busiest section of motorway in the UK³⁰ and carries an average of up to 107,000 vehicles in each direction, each day equal to more than 6 million business, commuter and leisure journeys per month. The Commission needs to take into account the economic impacts arising from delays to this traffic flow.
- 4.261 Heathrow's construction schedule for the North West Runway has the M25 works completed at the same time as the A4 Bath Road diversion, the construction of a new Southern Perimeter road tunnel and other access roads³¹. Added to this, the Commission finds the M4 will have to be widened. The Commission should ask the Highways Agency to confirm whether or not all of this could be achievable in accordance with the programme submitted.

²⁹ Department for Transport, Road Investment Strategy: Investment Plan, p51, November 2014

³⁰ Highways Agency, London Orbital and M23 to Gatwick Route Strategy Evidence Report, April 2014

³¹ Heathrow Airport Limited, Taking Britain Further – Volume 3, p44, May 2014

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Analysis of resilience should be completed for all schemes

- 4.262 The Commission's focus is on the comparative resilience of surface access to the Gatwick and Heathrow schemes. While we have set out below our view that the Commission's current comparative evaluation between the schemes lacks balance, we believe that the Commission has largely overlooked the key question of how to maximise resilience of the system as a whole. This is important as, by expanding Gatwick, system resilience will be improved overall.
- 4.263 The Commission questions the resilience of road and rail access for Gatwick without undertaking a complete analysis and without presenting equivalent data for Heathrow. The Commission should consider the reliability of journey times and the available capacity that these networks offer, noting the concerns that its own consultants raise regarding the future capacity of Crossrail and the Piccadilly Line and congestion on the M25 and M4. The Commission and its consultants should reflect these parameters in the analysis and consult Network Rail and the Highways Agency to corroborate the assumptions and data used for all schemes so they are assessed on a fair and equal basis.
- 4.264 Rail – The Network Rail Sussex Route Plan³² shows that the Brighton Main Line (BML) and Sussex Routes met their reliability targets in past years, but recently they have been affected by disruption as essential improvements associated with the £6.5 billion Thameslink Programme are being completed. Once the Thameslink improvements are fully operational, committed and planned enhancements will help to improve resilience and ensure the BML infrastructure is no more prone to breakdown or failure than other Main Lines on the rail network³³. Therefore it is not instructive to focus on recent issues for reliability when assessing the resilience of the future network. The Commission should instead recognise proposals set out by Network Rail in the Sussex Area Route Study³⁴ and the aim to further improve resilience by 2024, including enhanced resilience on parallel diversionary routes, such as the Arundel Chord³⁵. Network Rail is following the rail industry's regulated approach for developing funding options. Detailed design work on the schemes in the Sussex Area Route Study is to be completed by mid-2016 and will then give greater cost certainty.
- 4.265 The Commission should compare the Great Western Main Line (GWML) and BML equally in terms of resilience in order to compare their performance. Any industry-wide issues not related to main line infrastructure should be excluded. The Commission's consultant's report³⁶ states that around 70% of incidents relate to trespass and suicide fatalities so do not reflect infrastructure resilience issues on the BML. The Commission's analysis implies that the BML between East Croydon and Gatwick Airport is particularly susceptible to disruption. However, as the technical analysis appended to this response shows, only approximately half of this section of the route has no direct alternative route to use in case of an incident and only 10 of the 22 incidents in three years (including fatalities) occurred on this stretch of line, confirming that there is no greater incidence of disruption and therefore no specific resilience issue.

³² Network Rail, Sussex Route Plan, p4, 2013

³³ Network Rail Sussex Area Route Study Draft for Consultation, October 2014

³⁴ *ibid*

³⁵ *ibid*, pp131-133

³⁶ Jacobs, Appraisal Framework Module 4 Surface Access: Gatwick Airport Second Runway, p37, November 2014

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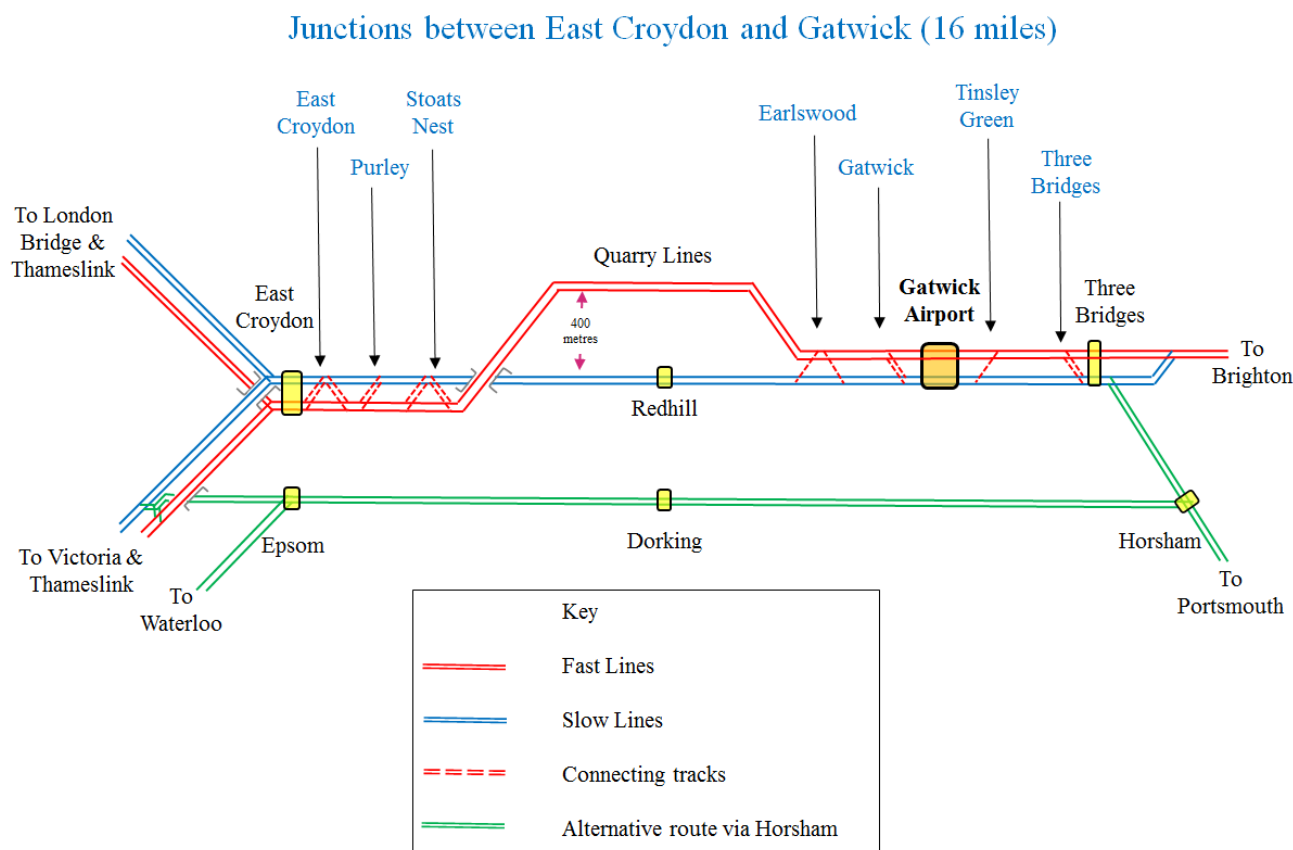
Module 4: Surface Access

- 4.266 Should the Commission regard resilience of the railway main lines a significant factor in comparing the feasibility of surface access proposals it should consider all available routes. Gatwick is already directly connected to 129 stations and has alternative routes to London via Guildford or Tonbridge, which would be available in case of disruption on the BML. Although journey times would be longer this is comparable to use of Heathrow's Southern Rail Access as an alternative to the GWML. In most cases access from Gatwick would entail an available alternative route that avoids having to re-trace steps back to the airport to start the journey again on a different line.
- 4.267 There is no analysis presented that shows how resilient the rail infrastructure already in tunnel around Heathrow (between the airport and Airport Junction on the GWML) and the proposed lines for Western Rail Access and Southern Rail Access will be once the proposed service frequencies are combined. This includes provision of platform capacity, turnback facilities, flat junctions and signalling, bearing in mind there is no cost allowance for additional works in the Heathrow schemes' cost plans.
- 4.268 The following figures show that alternative tracks available in the event of an incident mean that the BML has more resilient infrastructure built in than the GWML that will carry Crossrail and Heathrow Express as well as main line services. Furthermore, the Commission's analysis highlights future crowding on the Piccadilly Line and Crossrail³⁷ that will affect resilience and capacity for growth.
- 4.269 Figure 4.4.1 shows how the BML is made up of two separate routes to London as well as the parallel diversionary route via Horsham and Dorking.
- 4.270 Figure 4.4.2 shows that, for the GWML between Paddington and the spur to Heathrow, there is no alternative diversionary route.

³⁷ Jacobs, Appraisal Framework Module 4. Surface Access: Heathrow Airport North West Runway, p7, November 2014

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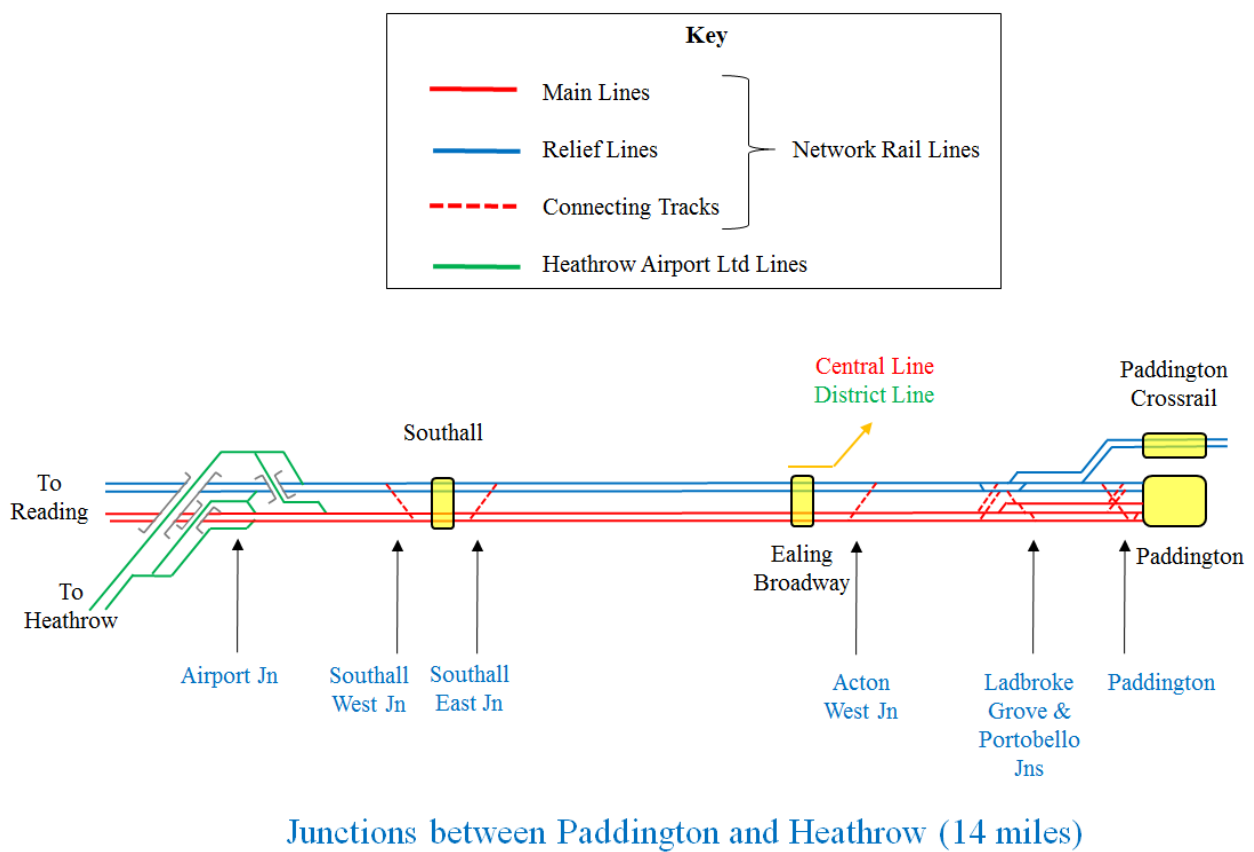
FIGURE 4.4.1: SCHEMATIC LAYOUT OF BRIGHTON MAIN LINE SHOWING FOUR TRACK AND PARALLEL CONFIGURATIONS FOR RESILIENCE



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FIGURE 4.4.2: SCHEMATIC LAYOUT OF GREAT WESTERN MAIN LINE SHOWING FOUR TRACK CONFIGURATION WITHOUT DIVERSIONARY ROUTE



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- 4.271 Roads – The Commission states that Gatwick has a “heavy reliance” on the M23. Again, if resilience is being raised for one runway scheme it should be assessed for all schemes to ensure a fair and balanced assessment. The Commission’s appraisal should consider all available capacity and the typical traffic conditions experienced on motorways and parallel alternative routes around each scheme, not solely a simplistic count of the number of motorways available.
- 4.272 Highways Agency data shows that traffic demand on motorways around Heathrow is equal to or exceeds capacity today and that these routes are vulnerable to breakdowns or emergencies as there is no capacity on alternative roads. The latest information for “on time” journeys from the Department for Transport³⁸ shows reliability on the M25 near Heathrow declining. Highways Agency data³⁹ show the M25 between Junction 11 and Junction 16 as having the highest incidence of regular delay, and the greatest traffic flow of any UK motorway, with average peak hour speeds below 40mph compared with above 60mph for the M23. A summary of data comparing the two routes is shown in Table 4.4.3 below, highlighting the typical experience of road users in these locations.

TABLE 4.4.3: SUMMARY DATA FOR M25, M23 AND M4 (HIGHWAYS AGENCY, LONDON ORBITAL AND M23 TO GATWICK ROUTE BASED STUDY, APRIL 2014)

Motorway Section	Annual Average Daily Traffic (per direction)	Probability of Peak Congestion (%)	Average Peak Hour Speed (mph)
M25 Jn 13-14	102,000	>90%	<40mph
M25 Jn 14-15	107,000	>90%	<40mph
M25 Jn 15-16	95,000	>90%	<40mph
M4 Jn 4-4b	80,000	70-80%	<40mph
M23 Jn 8-9	57,000	<30%	>60mph

- 4.273 The Commission does not provide any analysis of the resilience of road and rail networks serving Heathrow. The Commission should present analysis for both the road and rail routes serving each scheme and also reflect the greater resilience of transport networks around London through the dispersal of airport-related demand inherent in the Gatwick proposal, which avoids overheating West London road and rail corridors that are already under strain and will remain congested even with committed improvements.

³⁸ Department for Transport, CGN0106 journey reliability statistics, January 2014 (www.gov.uk/government/statistical-data-sets/cgn01-journeys-on-time-ha-motorways-and-a-roads)

³⁹ Highways Agency, London Orbital and M23 to Gatwick Route Strategy Evidence Report, April 2014

Other Issues – Technical assessment against appraisal objectives

4.274 In addition to the key points for surface access identified above, our review of the Commission's documentation reveals a number of other issues with the analysis underpinning its surface access conclusions, and consequential impacts on other modules. To build on the extensive work already undertaken by the Commission and its consultants, the conventional approach in these circumstances would be to address the issues and to correct methodological errors, or to complete analysis that has not yet been presented. Further background on Gatwick's review of the technical assessment is provided in the Surface Access Technical Report, which is provided as Appendix 8 with this response. This analysis also affects the following other modules: Economy and Local Economy, Noise, Air Quality, Carbon, Place, Quality of Life, Community, Operational Risk and Delivery. The technical issues for which such further analysis would be most beneficial are as follows:

- **Appraisal criteria** – The Commission's final assessment of the competing schemes and how they meet the three surface access objectives needs to be entirely transparent;
- **Treatment of committed and planned schemes** – The sensible approach taken by the Commission to defining the Core and Extended baselines should be corrected for the M23 and HS2 Spur;
- **Roads analysis** – The omission of strategic routes such as the A24 and sections of the A27 should be corrected and references to further widening of the M23 and M25 removed as not justified;
- **Local Roads Appraisal** – The Commission should assess the impacts on local roads across all schemes equally so that the appraisal criteria are fully applied;
- **Assessment of Congestion Charge proposals** – The Commission should make clear how the congestion charge would be implemented, how it would work, the inherent risks and traffic impacts, and how essential it is for Heathrow's economic case and for meeting air quality targets;
- **Freight** – The Commission should include analysis of freight traffic as an important part of its overall assessment for surface access, as recognised in the Commission's consultant's report⁴⁰;
- **Rail analysis** – Errors in the rail journey time analysis and demand assumptions for the Gatwick Express should be corrected in order for the Commission to draw robust conclusions;
- **Connection times** – The Commission should present connection times to correct their analysis. This will enable them to accurately appraise passenger experience, and calculate surface access times and economic benefits.

⁴⁰ Jacobs, Appraisal Framework Module 4 Surface Access: Gatwick Airport Second Runway, p1, November 2014

Summary – Gatwick’s surface access strategy performs better than the Heathrow schemes

- 4.275 Overall Gatwick welcomes the Commission’s and its consultant’s confirmation that the Gatwick surface access strategy is low cost, deliverable, effective and meets the appraisal criteria published by the Commission. However, the Commission should build further on its consultant’s analysis so that the assessment of differences between the schemes is presented fully, on a fair and equal basis, and to support robust conclusions. The suggested further work will also help improve the Cost, Delivery, Economy, Noise, Air Quality, Place and Local Economy assessments.
- 4.276 The Commission should fully assess the following areas:
- treatment of surface access costs;
 - road and rail resilience;
 - the disruption caused by surface access proposals for Heathrow schemes;
 - assessment of surface access delivery and risks;
 - technical analysis against surface access appraisal objectives.
- 4.277 Gatwick’s surface access proposals already meet the Commission’s objectives. Were all of the above to be completed by the Commission, we consider this would show the following:
- Gatwick’s surface access case not just meets, but exceeds the Commission’s objectives;
 - committed and planned highway and rail improvements will enhance the already excellent accessibility at Gatwick and will accommodate all future second runway demand;
 - there is minimal risk to the delivery of surface access improvements at Gatwick and the proposals fully meet the needs of both airport and non-airport traffic;
 - Gatwick has the best connectivity and catchment population of the shortlisted schemes;
 - expansion at Gatwick will deliver the greatest public transport mode share for passengers and is more resilient in its impact on road and rail networks across the South East;
 - Gatwick has superior connection times and interchange access compared to Heathrow schemes;
 - future resilience of the rail network serving Gatwick matches that of committed improvements for Heathrow, and will meet or exceed the industry standard;
 - there are significant financial and delivery risks associated with the road and rail schemes suggested for the Heathrow schemes;
 - major disruption will result from the intense road construction and changes around Heathrow, including works to the M25 and M4, both of which are heavily congested already;

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- the claims of no overall increase in road traffic in both Heathrow proposals are neither justified nor likely to be achievable with a deliverable congestion charge regime;
- the highways mitigation for both Heathrow schemes fail to meet design standards, and compliant schemes should be developed for comparison and Highways Agency approval;
- the proposed congestion charge around Heathrow is highly contentious, would be difficult to implement and there is as yet no evidence that it is likely to deliver the intended mode shift and road traffic reduction;
- the inclusion of all costs of delivering surface access mitigation will show clearly that Gatwick makes a stronger surface access case than Heathrow;
- the appraisal will conclude that the required surface access costs for Heathrow schemes have a material impact on the business case and require considerable public sector funding.

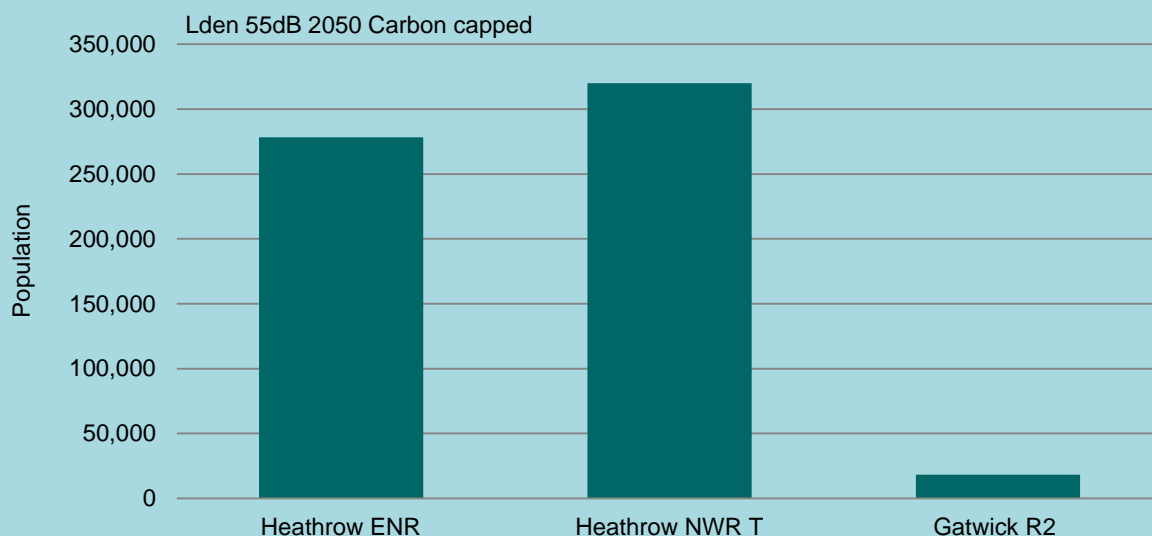
Module 5: Noise

Key points

The scale of the noise problems from Heathrow expansion is not highlighted adequately in the Consultation

- 4.278 The current environmental performance of Heathrow and Gatwick is a clear indicator of the relative challenge in adding a runway's worth of capacity at either site. Today, some 3,200 people are significantly affected by aircraft noise around Gatwick; the comparable figure for Heathrow is 240,000.
- 4.279 Recent experience of trials of new airspace routes and procedures at both Gatwick and Heathrow have demonstrated very clearly that local residents remain understandably very sensitive to changes in the spread of aircraft noise and that, in particular, people newly exposed to noise are the most sensitive of all.
- 4.280 For that reason, the Commission must ensure that the analysis of noise impacts is conducted in a transparent and even handed way for all three schemes.
- 4.281 Full weight must be given to the very significant difference in the numbers of people exposed to significant noise by the different schemes. In particular, the fact that the Commission's assessment demonstrates that over 320,000 people would be exposed to significant noise for the first time by the Heathrow North West Runway scheme and 280,000 for the Heathrow Extended Northern Runway should be made very clear; as should the fact that the comparable number for Gatwick is 18,000 people. The diagram below clearly illustrates this point.

SIZE OF POPULATIONS 'NEWLY AFFECTED' (Lden 55dB 2050 CARBON CAPPED)



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Module 5: Noise

The Commission's approach significantly understates increase in noise at Heathrow

- 4.282 The Commission's current analysis of noise at Heathrow ascribes benefits to the Heathrow schemes that will arise in any event from operational and technical improvements to the provision of new runway capacity. In fact, these should be attributed to the two runway (do minimum) case, reflecting best practice planning.
- 4.283 The Commission's current approach has, in a number of respects, significantly understated the increase in local and national noise impacts of the Heathrow schemes and, similarly, has significantly exaggerated the national noise impacts of the Gatwick scheme. A consistent approach is required that examines the impact on a non-expanded base case of expansion at each airport so that the impact of that development can be understood clearly.
- 4.284 The weaknesses that we have identified must be remedied if the Commission's noise assessment is to be robust.

Heathrow schemes are high risk

- 4.285 It would be very risky to assume that any scheme with noise impacts on the scale implied by developing either of the Heathrow schemes, particularly as regards numbers of people 'newly affected', could gain political support and planning consent.

Introduction

- 4.286 The Commission's noise assessment work already provides a great deal of objective noise assessment material on which the relative merits of the three schemes can be understood.
- 4.287 It is therefore regrettable that the presentation of this information in the Commission Consultation Reports makes it difficult for readers to see this or to fully understand the impacts of the short listed schemes.
- 4.288 We also have a number of significant concerns about the way that the Commission has undertaken its Local and National noise assessments, which has resulted in the Commission significantly understating the noise impacts of the Heathrow schemes and exaggerating the noise impact of the Gatwick scheme. Nevertheless the Commission correctly arrives at the conclusion that the impacts of the Gatwick scheme would be a fraction of the impact of the Heathrow schemes.
- 4.289 This response should be read in conjunction with Appendix 9 – ERM Air Noise Report, and Appendix 10 – Flindell & Associates Ground Noise Report.

The scale of the noise problems from Heathrow expansion is not highlighted fully in the Consultation

- 4.290 The presentation of information in the Commission's main consultation reports has masked the scale of local impacts of Heathrow in terms of populations that would be 'newly affected'.
- 4.291 The reporting has also not enabled an easy side by comparison to be made of the assessed main noise impacts of the short listed schemes.

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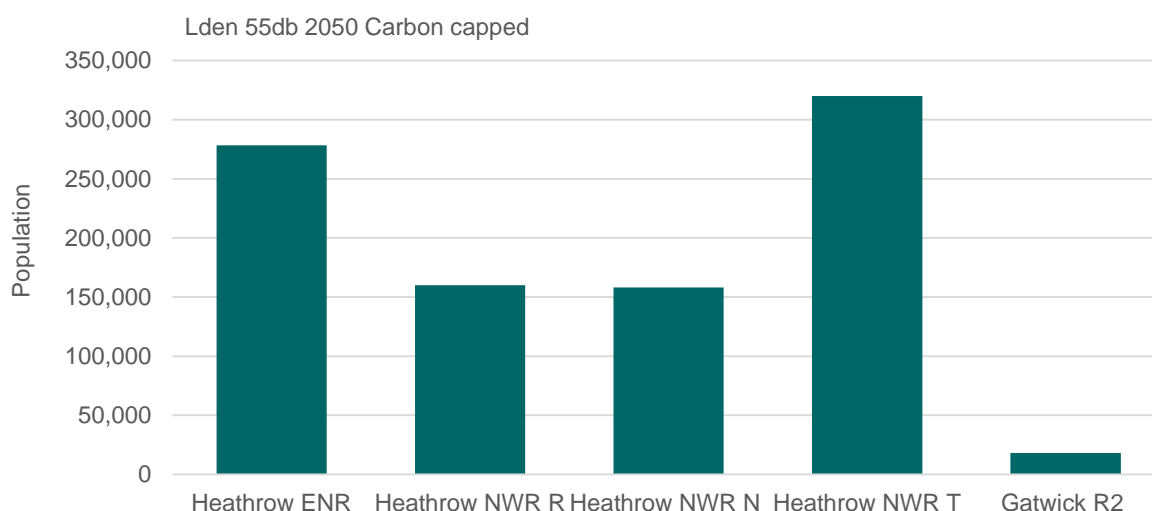
Module 5: Noise

- 4.292 The following information puts some of the results of key parts of the Commission assessments of the short listed schemes side by side so that it is easier to see the magnitude of the difference between the schemes.

Number of People ‘Newly Affected’

- 4.293 The size of the populations that would be ‘newly affected’ in the Lden 55dB noise contour in 2050 is presented in Figure 4.5.1 below.

FIGURE 4.5.1: GRAPH COMPARING NUMBER OF PEOPLE ‘NEWLY AFFECTED’ BY THE HEATHROW NORTH WEST RUNWAY SCHEME (‘T’, ‘R’ AND ‘N’ OPTIONS⁴¹), HEATHROW EXTENDED NORTHERN RUNWAY SCHEME AND GATWICK SCHEME WITHIN THE Lden 55dB CONTOURS (BASED ON THE COMMISSION’S CARBON CAPPED FORECASTS FOR 2050)



- 4.294 The number of people that would be ‘newly affected’ by the Gatwick scheme (18,200) is 5% of those by the Heathrow North West Runway ‘T’ airspace option (320,700) and 6% of the people who would be newly affected by the Heathrow Extended Northern Runway scheme (278,300).
- 4.295 The Heathrow North West Runway ‘N’ airspace option has been specifically designed by HAL to minimise the number of ‘newly affected’ people. The Gatwick scheme would still affect less than 12% of the 157,900 people affected.
- 4.296 The Commission has not calculated the size of populations ‘newly affected’ for the higher carbon traded forecasts. Had it done so, the size of the populations ‘newly affected’ would be higher for all three schemes and the difference between the Gatwick scheme and the Heathrow schemes would be even greater.

Location of People ‘Newly Affected’

- 4.297 Figure 4.5.2 at the end of this section shows where the 320,700 people that would be ‘newly affected’ by the Heathrow North West Runway ‘T’ option live.

⁴¹ The Commission’s assessment of the Heathrow NWR scheme has assessed three alternative different airspace options:
‘T’ (minimise Total population affected),
‘R’ (maximise Respite to affected populations)
‘N’ (minimise Newly affected population).

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Module 5: Noise

- 4.298 The 320,700 people ‘newly affected’ live in the areas outside the blue ‘do minimum’ contour line but inside the black ‘do something’ contour line. The areas affected including Windsor, Slough, Langley, West Drayton, Hayes, Brentford, Hammersmith, Acton, Chiswick, Bayswater and Notting Hill.
- 4.299 Whilst 264,200 people would be ‘newly removed’ from the noise contour (in those areas outside the black ‘do something’ and inside the blue ‘do minimum’) such that the net increase in people affected is 56,500, we consider that it would be a serious misjudgement by the Commission if it was to use this ‘net change’ as a robust indicator of the local noise impact.
- 4.300 Recent trials at Heathrow and Gatwick, as well as elsewhere, have revealed the very significant opposition generated from relatively small reconfigurations of flightpaths that lead to effects on people who have not previously been affected. For example a recent six-month flight path trial at Heathrow had to be curtailed after only 2 months because of the scale of complaints that arose. At Gatwick, a recent six month trial of a new route has led to the temporary suspension of further proposed airspace changes to allow more time for consultation and to consider options.
- 4.301 Such recent experience must cast severe doubt over the acceptability, plausibility and deliverability of any scheme that involves wholesale airspace changes, such as those that underpin Heathrow’s assumed ‘T’ and ‘R’ airspace options.
- 4.302 The ‘N’ airspace option – the option that more closely reflects current airspace arrangements – still gives rise to very significant increases in the number of people newly affected. This issue goes directly to the question of delivery, and in our view the Commission should attach very significant weight to the effect on ‘newly affected’ people.

Change in total number of people affected

- 4.303 The Heathrow North West scheme ‘N’ airspace option, whilst minimising the number of people ‘newly affected’, results in greater net increase in the total number of people affected.
- 4.304 Figures 4.5.3 and 4.5.4 compare the Commission’s results for the Heathrow North West Runway ‘N’ airspace option, with the even greater impact of the Heathrow Extended Northern Runway scheme and the very significantly lower impacts of the Gatwick scheme.
- 4.305 Figure 4.5.5 compares the Commission’s results for schools affected by the Heathrow North West Runway ‘N’ option, Heathrow Extended Northern Runway and the Gatwick Schemes.

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FIGURE 4.5.3: POPULATION WITHIN THE 54dBLeq CONTOUR FOR THE HEATHROW NORTH WEST RUNWAY SCHEME ('N' OPTION), HEATHROW EXTENDED NORTHERN RUNWAY SCHEME AND GATWICK SCHEME (BASED ON THE COMMISSION'S CARBON CAPPED FORECASTS FOR 2040 AND 2050)

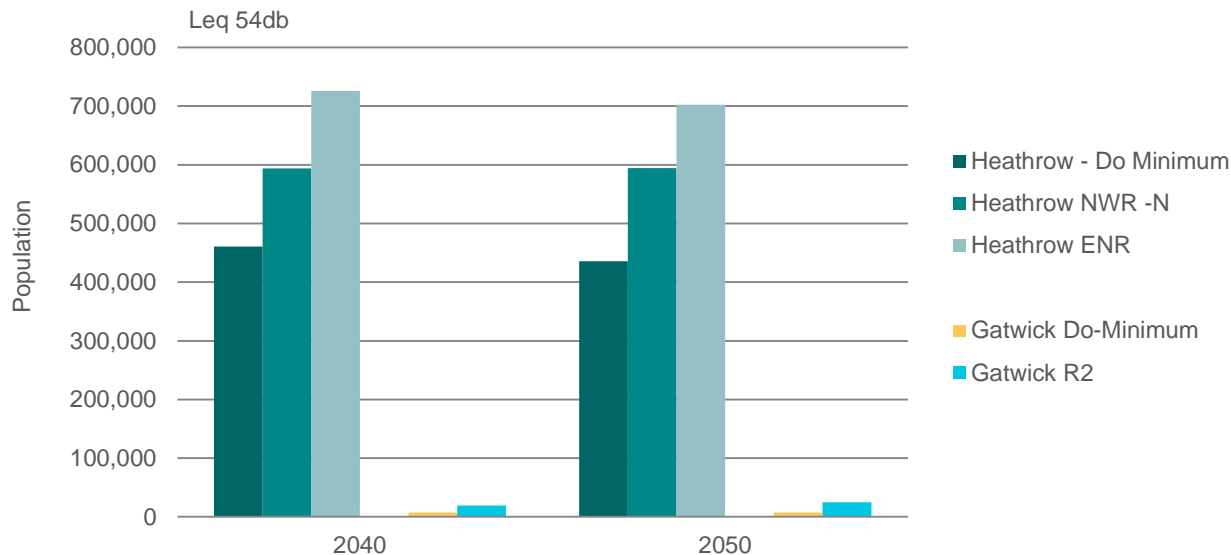
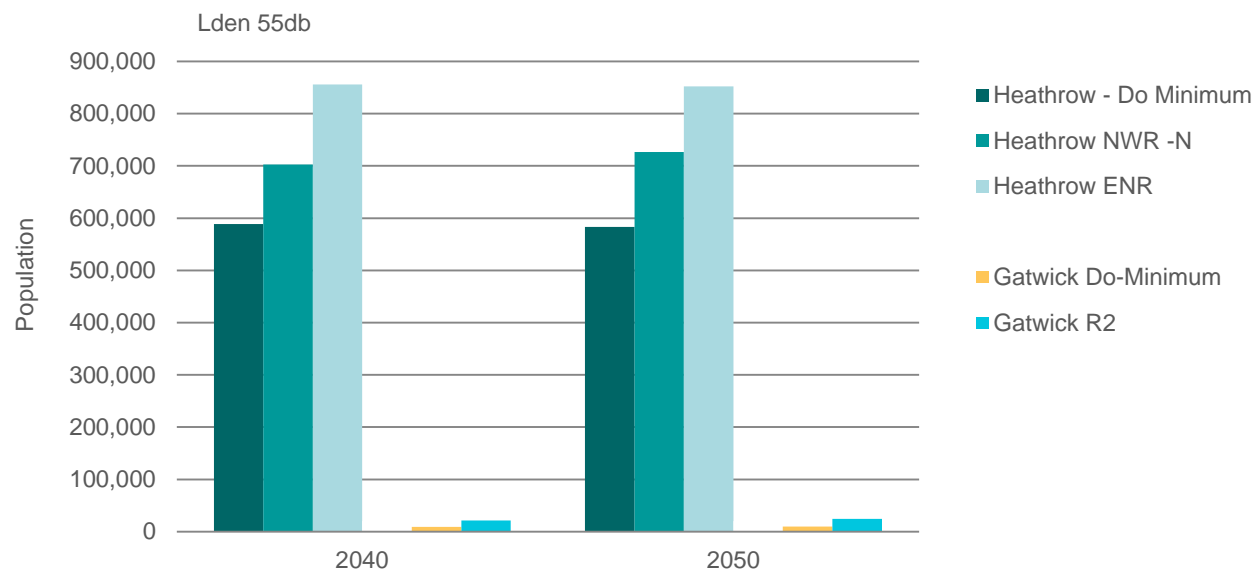


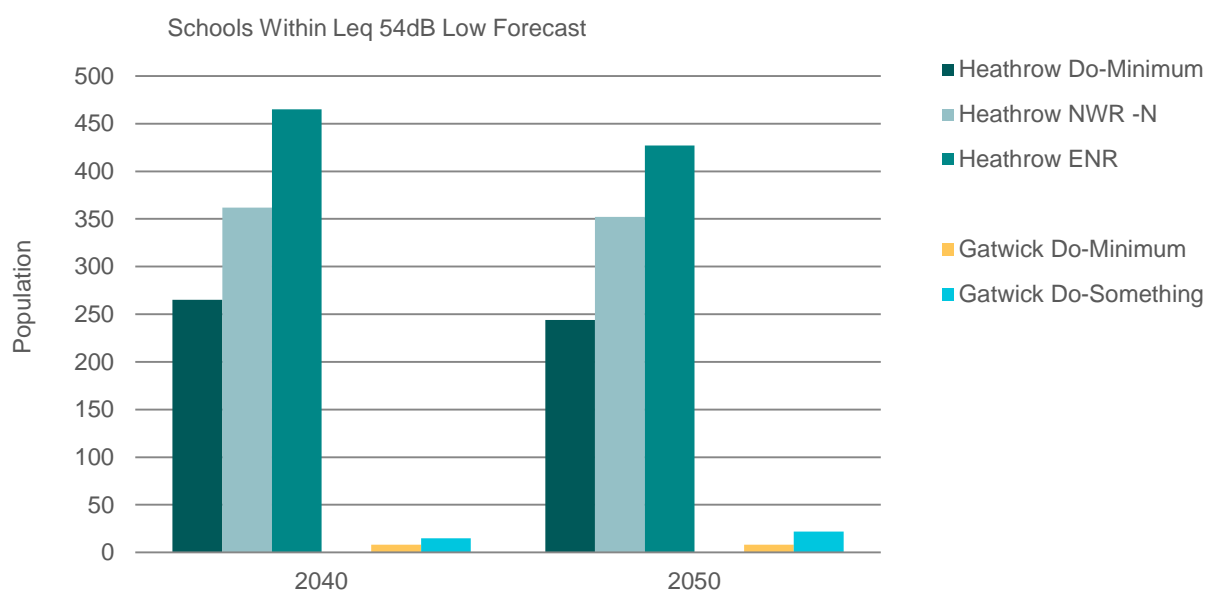
FIGURE 4.5.4: POPULATION WITHIN THE 55dB Lden CONTOUR FOR THE HEATHROW NORTH WEST RUNWAY SCHEME ('N' OPTION), HEATHROW EXTENDED NORTHERN RUNWAY SCHEME AND GATWICK SCHEME (BASED ON THE COMMISSION'S CARBON CAPPED FORECASTS FOR 2040 AND 2050)



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FIGURE 4.5.5 SCHOOLS WITHIN THE 54dBLeq CONTOUR IN 2040 AND 2050 FOR THE HEATHROW NORTH WEST RUNWAY SCHEME ('N' OPTION), HEATHROW EXTENDED NORTHERN RUNWAY AND GATWICK SCHEMES (BASED ON THE COMMISSION'S CARBON CAPPED FORECASTS FOR 2040 AND 2050)



- 4.307 The above charts all demonstrate the very different order of magnitude of impacts of the Gatwick scheme compared to the Heathrow schemes.
- 4.308 The change in the size of populations impacted and number of schools impacted would be even greater for the higher carbon traded forecasts, had they been calculated by the Commission, and the difference between Gatwick and Heathrow would also be greater.

The Commission's ratings

- 4.309 The Commission rates Gatwick's performance as 'adverse' and both Heathrow schemes as 'significant adverse'. But as can be seen from the above charts that rating does not adequately reflect the true extent of the difference in the scale and nature of the noise impacts.
- 4.310 The Commission's Business Case and Sustainability Assessment for the Heathrow North West Runway scheme further reports that the Heathrow North West Runway scheme could have the potential "*to bring noise impacts closer to adverse*". Whichever airspace option is assumed for Heathrow, the noise impacts are of a very different order of magnitude to the Gatwick scheme impacts, and it is difficult to conceive how such a conclusion could realistically ever be reached.

The Commission's approach significantly understates the increase in noise at Heathrow

- 4.311 We have set out above the very significantly greater noise impacts of the Heathrow schemes compared with the Gatwick scheme. For reasons we now explain, the differences should actually be recognised as being greater than has been stated. In particular the Commission's work:
- has not fully assessed the Local and National noise impacts of the higher carbon traded forecasts of the Heathrow North West Runway scheme; nor has it fully assessed impacts on noise sensitive amenities;
 - contains a number of serious inconsistencies of approach in relation to operational assumptions in different cases; and
 - is underpinned by implausible traffic forecasts for the 'do-minimum' and 'do-something' cases.
- 4.312 We provide further comments on each of these below and in the supporting technical report.
- 4.313 These concerns are sufficiently serious as to indicate that the conclusions of the Local and National Assessments conclusions are currently unsound, in that they do not identify the true extent of the differences between the Gatwick and Heathrow schemes in noise terms.

Not a full Assessment

- 4.314 In respect of population impacts, for the short listed Heathrow North West Runway scheme, the Commission has not assessed the noise impacts of the higher carbon traded forecasts for the Heathrow North West scheme 'R' and 'N' airspace options.
- 4.315 In respect of noise sensitive buildings, the Commission has not assessed the impacts of the higher carbon traded forecasts for any of the short listed schemes. Nor has it quantified the number of newly affected / newly removed noise sensitive buildings.
- 4.316 In respect of the National noise assessment, the Commission has not assessed the noise impacts for the carbon traded forecasts.
- 4.317 If the Commission considers that all three Heathrow North West Runway airspace options – 'T', 'R' and 'N' – are plausible then it is important for the Commission to fully assess all three so that the potential upper bound future impacts of the scheme are fully understood. The Commission should similarly fully assess the impacts on noise sensitive buildings.

Underpinning operational assumptions

- 4.318 The Commission rightly recognises that operational improvements such as steeper approaches are as likely to be applied in the 'do minimum' cases as in the 'do something' cases. It therefore correctly applies steeper approaches to the noise modelling for both cases in the assessment of all three of the short listed schemes. But in relation to other operational assumptions, such as displaced thresholds and airspace designs, the Commission applies these only to the Heathrow North West Runway 'do something' 'T', 'R' and 'N' cases.

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- 4.319 Given that these improvements are equally plausible for the 'do minimum' case, the result must be that the Commission's analysis overstates the noise impacts of the Heathrow 'do minimum case' and correspondingly understates the increase in noise impacts that would result from the Heathrow schemes. In short, displaced thresholds and potential future airspace designs should be applied equally to a two runway Heathrow.
- 4.320 To rectify these deficiencies in the assessment, the operational assumptions the Commission has adopted for the Heathrow North West Runway 'do something' 'T' and 'R' scenarios must also be ascribed to the equivalent 'do minimum' 'T' and 'R' and 'N' scenarios.
- 4.321 Furthermore, if the Commission is to base its assessment on the 'T' or 'R' airspace options⁴², the Commission would need to satisfy itself that these result in airspace designs that are capable of being operated and delivered. We have serious reservations, for the reasons set out earlier, about their deliverability. We also believe that there is a real risk that they would not be accepted by air traffic service providers and would certainly not deliver the capacity that they are purported to deliver or the purported noise 'benefits'. In our response on Module 14 and in our technical response on noise we set out the reasons for this in more detail.
- 4.322 The Commission should undertake consultation on the results of this further work once it is available. This is necessary in order to ensure that the Commission's recommendations to Government are based on a full, robust and realistic assessment of the impacts of the Heathrow schemes in noise terms.

Underpinning air traffic forecasts

- 4.323 As the Commission rightly recognises, the air traffic forecasts (in terms of the numbers of flights, the fleet mix and the noise emissions of the various aircraft types) are central to the noise modelling and the forecast of noise exposure within given contours that result.
- 4.324 We have a number of concerns relating to the forecasts presented for Heathrow in the LeighFisher appendix to the Noise Baseline report. We consider it likely that the forecasts for Heathrow have significantly overstated likely noise impacts in 2040 and 2050 'do minimum' cases, and understated the likely noise impacts in the respective 'do something' cases.
- 4.325 These forecasting errors have three very important consequences for the soundness of the noise assessment:
- they result in an understatement of the impacts of the two Heathrow schemes in the Local Assessment;
 - they result in an understatement of the impacts of the two Heathrow schemes in the National Assessment; and
 - they result in an overstatement of the impacts of the Gatwick scheme in the National Assessment (because Heathrow's 'do minimum' impacts are added to Gatwick's 'do something' impacts in the Gatwick Second Runway scheme National Assessment).

⁴² The 'T' and 'R' airspace options both assume radical reconfiguration of airspace. The 'N' airspace option more closely reflects current airspace arrangements.

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4.326 Our principal concerns are:

- The Heathrow North West Runway 'do something' case shows a reduction in night movements (2300 to 0700) between 2040 and 2050. Given the increasing capacity constraints by 2050 and the expectation of quieter aircraft, we consider that there will be pressure to fully utilise permitted night movements limits. This assumption is likely to lead to an understatement of noise impacts in the 'do something case'
- For both 'do minimum' and 'do something' Heathrow North West Runway cases, the forecasts show a fall in the proportion of the largest aircraft (aircraft categories 5 & 6 fall as a percentage of the whole). This is counter to trends observed at congested airports, which show a consistent rise in average seats for both short-haul and long-haul aircraft. Heathrow's congestion has, for example, led to it having one of the highest average seats per movement of any airport in the western world⁴³. It is likely that the noise impacts will have been understated.
- In respect of Heathrow 'do minimum' case it is assumed, quite reasonably, that there will be no growth in flights in the night quota period (2330-0600) because government restrictions will continue to apply. However in the shoulder period (2300-2330 and 0600-0700 hours) it is assumed that flights will decrease between now and 2030 and then increase dramatically in the period 2030 to 2050. If the Commission has overstated growth in the 'do minimum' night flights in 2040 and 2050 it will exaggerate the noise impacts of the 'do minimum' case and narrow the difference between the 'do something' and 'do minimum' cases.

4.327 Our concerns in relation to the Heathrow 'do minimum' can best be illustrated through examination of the Commission's noise assessment results for the Heathrow 'do-minimum' case over the period from now to 2050 for the 24hr period and 8hr night periods.

4.328 Historic trends would suggest that over this period (in circumstances where the capacity of Heathrow's aircraft operations as a whole are constrained, and where it is assumed that Government night flying restrictions will continue), the noise footprint would gradually reduce during the day and at night – as a result of new technology out-performing changes to aircraft fleet mix sizes.

4.329 The two graphs below demonstrate, however, that the Commission's 'do minimum' forecasts lead to trend-defying day and night time noise impacts over the period 2030 to 2050:

- Figure 4.5.6 shows that at night the noise impacts reduce significantly between now and 2030 followed by an increase of over 100,000 more people being affected between 2030 and 2050. This growth is equivalent to a 38% increase in population affected over that period.
- Figure 4.5.7 shows that during the 24 hr period there is a significant reduction between now and 2030 followed by 20 years of no improvement in the noise climate.

⁴³ Seats per movement at a selection of large European and N. American Hubs: LHR: 203; CDG: 179; FRA: 176; MAD: 158; AMS: 154; JFK: 165; LAX: 147. Heathrow's runway constraints have resulted in seats per movement of 20% above the group average.

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FIGURE 4.5.6: CHANGES IN POPULATION AFFECTED IN HEATHROW 'DO-MINIMUM' CASE 2012 TO 2050 FOR 8HR 48dBLNight CONTOURS

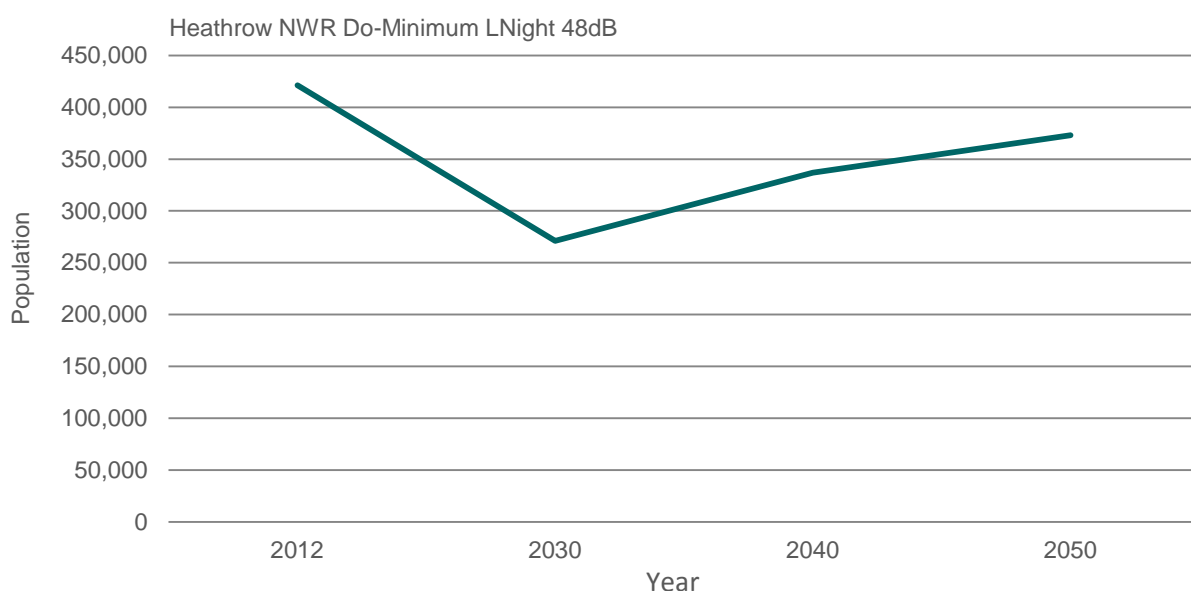
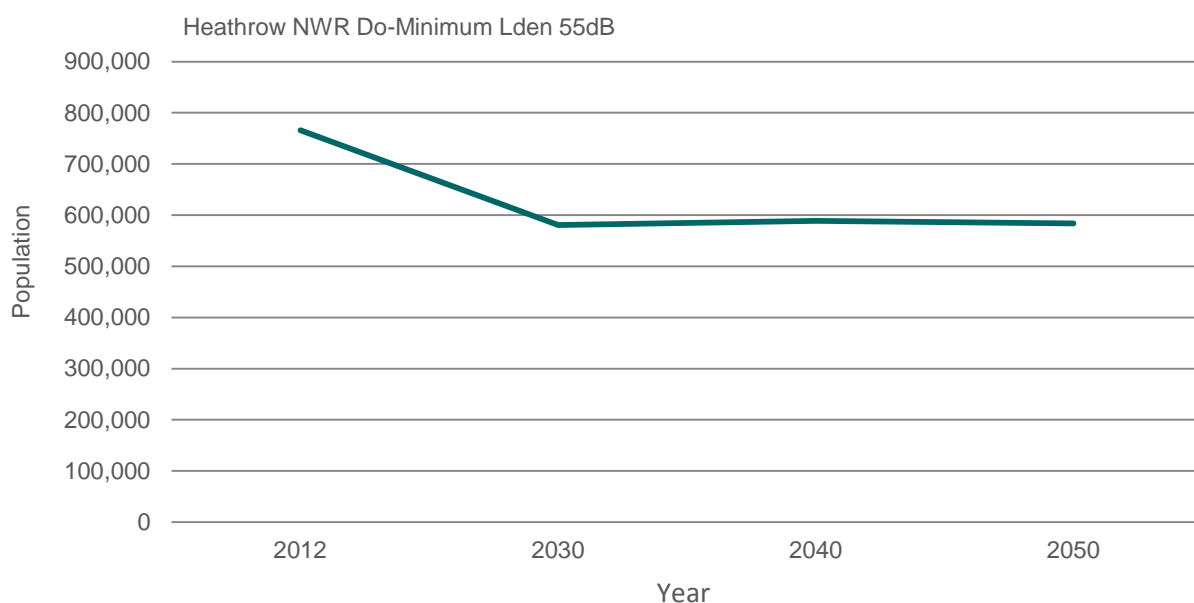


FIGURE 4.5.7: CHANGES IN POPULATION AFFECTED IN HEATHROW 'DO-MINIMUM' CASE 2012 TO 2050 FOR 24HR 55dBLden CONTOURS



- 4.330 In the light of the above, we have serious reservations about the underlying 'do minimum' and 'do something' forecasts for Heathrow in 2030, 2040 and 2050.
- 4.331 Not only do these forecasts seem implausible overall, but in relation to night movements, they appear incredible given the scale of assumed growth in impacts in the highly sensitive late night and early morning periods, which would lead to very significant increases in noise

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in the 8 hour night time period – something which successive Governments have consistently sought to reduce.

- 4.332 The effect of these forecasting points, taken together with our concerns about underpinning operational assumptions and the fact that the Commission has not undertaken a full assessment, mean that the local effects of the Heathrow schemes, both in absolute terms and relative to the their 'do minimum' baselines have been understated.

National Noise Assessment Methodology

- 4.333 The local noise assessment results for the short listed schemes are used by the Commission to calculate the national noise assessment results. The above points will also therefore affect the soundness of the Commission's National Noise assessment of the Gatwick and Heathrow schemes.
- 4.334 We further note that the National Assessment has been based solely on the Carbon Capped air traffic forecasts. Under these forecasts, the number of ATMs at the 13 UK airports used for the national assessment is set to grow by 114,000 if Gatwick is expanded but by only 12,000 if Heathrow is expanded. Under the carbon traded forecasts the national picture is different, with national ATMs forecast to grow more if Heathrow is expanded and less if Gatwick is expanded. It follows that if the national assessment had been undertaken based on carbon traded forecasts the results would show a very different outcome – the impacts of Heathrow scheme would be much higher and those of the Gatwick scheme lower still.
- 4.335 We therefore have serious reservations as to the robustness of the assumptions adopted for, and the results of, the National Assessment which the Commission has undertaken.
- 4.336 The Assessment should be reviewed in light of the comments we have made in relation to the underpinning local and national forecasts, underpinning operational assumptions and to cover the carbon traded forecasts. This would ensure a more realistic and robust National Assessment.

Noise: National Impacts

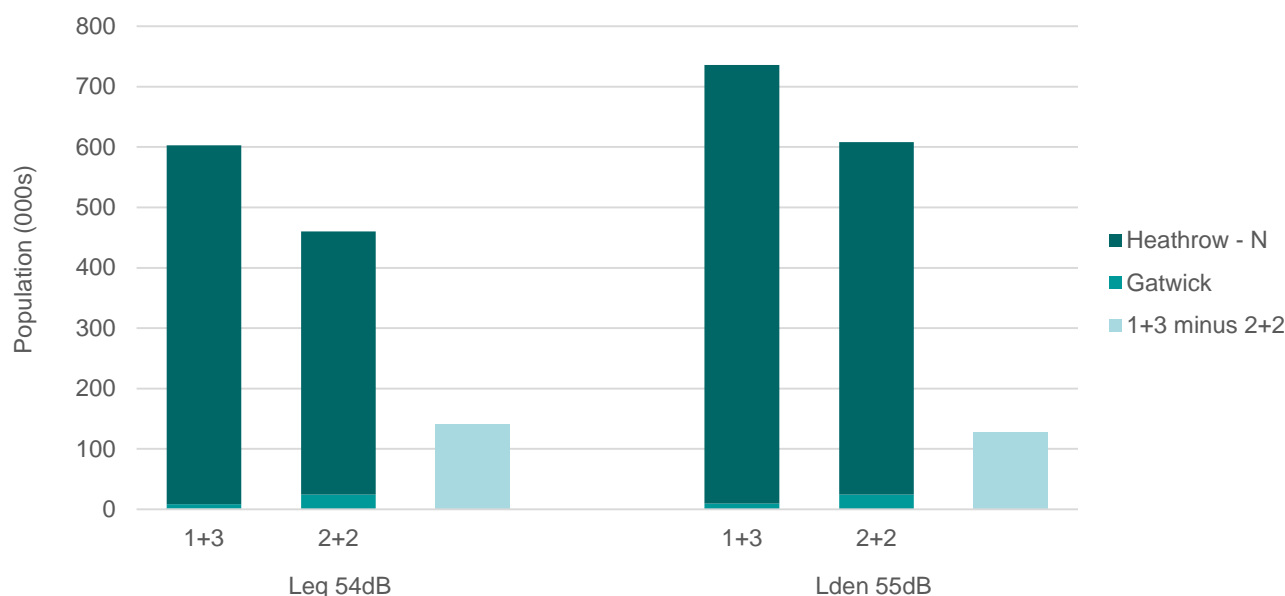
- 4.337 For the reasons set out within this response, we consider that the results of the Commission's work to date, whilst showing an advantage to Gatwick, significantly understates Gatwick's advantage for two reasons:
- The Heathrow 'do minimum' impacts, which also count against Gatwick in the National Appraisal, are exaggerated; and
 - The Commission's assessment to date is based on the lower carbon capped impacts.
- 4.338 Taken together, the effect of these two assumptions is to overstate the 'do minimum' case for Heathrow,; an effect which counts against Gatwick in the National Noise Assessment as they contributed to the noise generated by all airports taken together other than Gatwick.
- 4.339 In our Updated Scheme Design submission we provided a simpler National Assessment based on a 2+2 versus 3+1 assessment.
- 4.340 We have redone that assessment for populations impacted, based on the Commission's assessment. To do this, we have taken the Commission's carbon capped results for the

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Heathrow North West Runway 'N' option in 2050 and then applied them to the Commission's Gatwick Second Runway carbon capped results.

FIGURE 4.5.8: 2+2 VERSUS 3+1 POPULATIONS IMPACTED IN 2050 FOR HEATHROW NORTH WEST RUNWAY SCHEME ('N' OPTION) AND GATWICK SCHEME (Lden 55dB AND Leq 54dB) BASED ON THE COMMISSION'S CARBON CAPPED FORECASTS



- 4.341 The green bars show the negative national impact of expanding Heathrow (1+3) over expanding Gatwick (2+2). In terms of exposure to noise levels above Leq 54dB, expanding Gatwick would lead to 142,000 fewer people impacted. For exposure to noise levels above Lden 55dB the benefit of the Gatwick scheme is 128,000 fewer people impacted.
- 4.342 For the reasons set out above, the national noise benefit of expanding Gatwick would actually be much greater.

Noise: Tranquillity

- 4.343 The Commission's Consultation Report observes that areas around Gatwick are rural and have high levels of tranquillity that would be adversely affected (Paragraph 3.34).
- 4.344 The Commission's own detailed analysis does not, however, support this conclusion; The Commission's methodology overlays the N70 20 event contours onto the Council for the Protection of Rural England's Tranquillity Maps. This demonstrates that the Gatwick scheme would have a negligible effect on the High Weald Area of Outstanding Natural Beauty (AONB) (affecting just 0.02% of its area) and has no effect on the South Downs National Park
- 4.345 Further examination indicates that, in comparison with Gatwick scheme, the Heathrow North West scheme will affect significantly greater areas of registered parkland and gardens, and areas of valued open space. These include a World Heritage Site – The Royal Botanic Gardens at Kew, Windsor Great Park and numerous Conservation Areas and many more heritage assets.

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- 4.346 Unless the Commission regards all areas of countryside as areas that should be protected for their tranquillity (a position which does not in our view properly reflect the overriding aim of Government policy “*to minimise the number of people significantly impacted*”), then the Commission’s statement at paragraph 3.34 overstates the impact of Gatwick on tranquillity.
- 4.347 In summary, the Gatwick scheme should not be disadvantaged because there are more flights over areas of countryside. This is an important advantage of Gatwick in the noise assessment. This is all the more so given that impacts on spaces that are actually to be valued for their tranquillity are shown by the Commission’s own assessment to be negligible.

Heathrow schemes are high risk in terms of noise impacts

- 4.348 The scale of the noise impacts of the Heathrow schemes bears directly on the question of delivery.
- 4.349 Gatwick, with a maximum additional 17,000 people being affected (2040 Carbon Capped 54Leq) will we concede prove challenging
- 4.350 The challenge at Heathrow, whether or not there is also wholesale reconfiguration of airspace routes, is of a wholly different magnitude. New airspace routes designed to minimise total population impacted will on the Commission’s current assessment mean 320,700 people being ‘newly affected’. Even based on the Heathrow North West Runway ‘N’ option (to minimise the number of ‘newly affected’ people) there would still be some 160,000 people ‘newly affected’. It is difficult to conceive of a situation where such a proposition is ever going to be acceptable to the many communities who will be affected by such a dramatic change or increase in noise. The Commission must therefore attach very significant weight to these impacts and be fully aware of the risk that such impacts might never be deemed acceptable.

Conclusions

- 4.351 The Commission’s noise assessment work already provides a great deal of objective noise assessment material on the relative merits of the three schemes.
- 4.352 It is therefore regrettable that the presentation of this information in the Commission Consultation Reports makes it difficult for readers to fully understand the impacts of the short listed schemes.
- 4.353 The Commission must remedy those elements of the assessment that we have identified are unsound and complete the assessment in accordance with the Appraisal Framework. The Commission should then consult again on the assessment, ensuring those that could be most affected by the schemes are informed more clearly as to impacts on them. Specifically:
- The local and national impacts of the Heathrow schemes have been significantly understated due to inconsistent operational assumptions between ‘do minimum’ and ‘do something’ scenarios and implausible forecasts.
 - Impacts of the carbon traded forecasts and on noise sensitive amenities have not been fully assessed

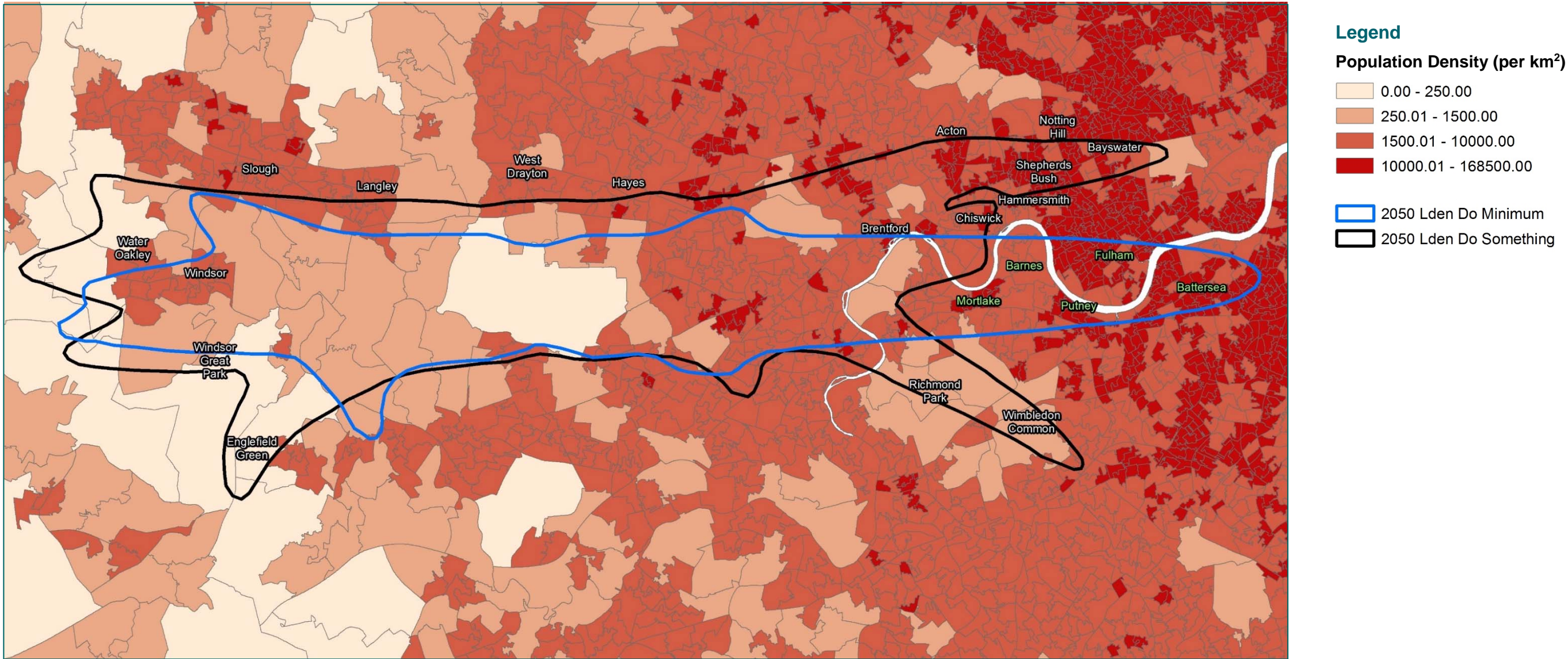
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- The national noise impacts of the Gatwick scheme have been overstated.

- 4.354 The Commission is clearly correct to have concluded that the impacts of the Heathrow schemes are 'significant adverse'. However, we consider that it is inconceivable that the rating of Heathrow North West Runway scheme could 'move closer to adverse'. In reality the ratings do not adequately reflect the different magnitude of the impacts of the Heathrow schemes compared to the Gatwick scheme for a topic which, as the Commission notes, "is the topic that generates the most intense emotions".
- 4.355 But even if the Commission was to rely solely on its current assessments it is clear that the impacts of the Heathrow schemes would be very significant. Indeed it would be very risky to assume that any scheme with noise impacts of the scale identified in relation to either Heathrow scheme, particularly as regards numbers of people 'newly affected', would be likely to gain political support and planning consent.
- 4.356 The Appraisal Framework and Government objectives are 'To minimise and where possible reduce noise impacts' and 'to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise'. We believe that Gatwick is the scheme which, by a very significant margin, best supports these objectives.

FIGURE 4.5.2: MAP SHOWING AREA WHERE PEOPLE 'NEWLY AFFECTED' BY THE HEATHROW NORTH WEST RUNWAY SCHEME LIVE (FOR THE 'T' AIRSPACE OPTION).



Module 6: Air Quality

Key points

Heathrow will not comply with air quality limits and increasing activity associated with a major expansion will exacerbate the problem.

- 4.357 Air quality is subject to legal limits that are derived from the impact on human health and mortality of concentrations of air pollutants. The Commission is now undertaking detailed modelling of these impacts and we strongly urge the Commission to consult on the results of this detailed work.
- 4.358 The only basis upon which a scheme can be allowed to come forward is if it is demonstrated that, during construction and the forecast level of operations, air quality limits would be met and that compliance with those limits would not be delayed. Gatwick does not breach legal air quality limits, while in the Heathrow area ongoing breaches are expected to continue into the 2020s.
- 4.359 Previous work done on air quality at Heathrow, as well as the Commission's interim work, underline the high risk that the initial main construction and early operational phases of the Heathrow schemes would delay compliance with, or cause a breach of, EU limit values. Modelling must therefore examine in detail the potential air quality impacts of these schemes during these phases
- 4.360 Given the current state of air quality at Heathrow it seem highly unlikely that the addition of more aviation activity and associated additional surface traffic will result in air quality limits being met or, in any event, that their attainment will not be delayed.

Heathrow is a high risk scheme

- 4.361 There has been an important judgement of the European Court of Justice in the Client Earth case (C – 404/13). The Court held that the Government must ensure that the period during which the limit values are exceeded is as short as possible and that court action could be bought to enforce that obligation. It is also noteworthy that the Government's National Policy Statement for National Networks, published in December 2013, states that 'the Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will affect the ability of a non-compliant area to achieve compliance with the most recent timescales as reported to the European Commission at the time.
- 4.362 Heathrow's case that it can meet air quality limits is founded upon a number of assumptions. None can be relied upon and none is supported by compelling evidence that establishes they are realistic. Adverse factors such as the impact of inevitably more congested roads resulting from a busier Heathrow and growth in background traffic on the busiest part of the UK's road system are simply not considered in Heathrow's proposals. Nor is the prospect of tightened air quality limits in the future as legislators adapt to lower emission road vehicles and other developments.
- 4.363 The only scheme before the Commission that can demonstrate that its proposals would meet legal air quality limits is that put forward by Gatwick. This clearly provides a compelling reason for preferring development at Gatwick.

Air Quality: A critically important issue

- 4.364 The Commission's Consultation Report (para 2.55 – 2.56) acknowledges that the assessment it has undertaken so far is 'high level' and that prior to making final recommendations it intends to supplement the work with more detailed dispersion modelling to provide assurance in respect of the air quality implications of each proposal.
- 4.365 This work will be a critical element of the Commission's overall assessment. Consistency with EU standards is a strict legal requirement. It is EU law (air quality directive 2008/50/EC) that a member State must not act in a way which will cause breaches or delay the achievement of air quality limit values.
- 4.366 The Government's recently published National Policy Statement for National Networks makes clear that the Secretary of State "should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will result in an area which is currently reported as being compliant with the Air Quality Directive becoming non-compliant; or affect the ability of a non-compliant area to achieve compliance". This national policy position properly reflects the legal position and must equally apply to any future Airports National Policy Statement.
- 4.367 This response should be read in conjunction with Appendix 11 – Arup Air Quality Report.

The Need for Further Consultation

- 4.368 Whilst we acknowledge the very tight timeframes that the Commission is working to, we consider that the detailed modelling work which the Commission is currently undertaking on this extremely important matter, on which we comment further below, should also be subjected to further scrutiny and consultation prior to the Commission making its recommendation.
- 4.369 In theory, consultation could be left for Government to undertake during the preparation of a National Policy Statement. It would, however, be regrettable if during that process it was subsequently found that the Commission's recommendation was underpinned by an unsound air quality assessment, such that the recommended scheme could not lawfully be taken forward.
- 4.370 We consider therefore that the Commission should not make a recommendation to Government on any scheme without having satisfied itself fully that the recommended scheme is likely to be compliant with the Air Quality Directive and EU law.
- 4.371 We feel sure that the Commission would wish to avoid a situation in which a scheme is recommended, only for it to be prevented from being taken forward at a later stage because subsequent detailed appraisal work found it could not lawfully be promoted as consistent with policy, or in respect of which development consent could not lawfully be granted.

The Commission's 'High Level' Assessment of Gatwick and Heathrow

- 4.372 We are pleased that the Commission's work to date aligns with our own assessment in concluding that the Gatwick scheme presents no compliance risks with respect to fine particulates.
- 4.373 With respect to NO₂, we note that the Commission indicates only a low risk of concentrations not meeting the EU limit value around Gatwick with the Gatwick scheme. However, the Commission's consultants also report that there is a high risk of the NO₂ concentration not meeting the national air quality objective at one site in Crawley. On closer examination, we observe that the baseline concentration is projected, in 2030, to be 4.1µg/m³ below the annual mean objective value (40µg/m³), using methods that incorporate a considerable degree of pessimism. Moreover, this is not a location where the NO₂ annual average objective applies and the analysis should instead be adjusted to reflect the nearest relevant point of exposure. Furthermore, there is no evidence to suggest that Gatwick makes any material contribution to air quality in the vicinity of this monitoring site. On this basis, we do not consider the risk exists. Indeed, the Commission's own Business Case and Sustainability Assessment correctly reports that there is limited risk of exceedance in the future around Gatwick.
- 4.374 Based on the detailed air quality modelling work we have undertaken on the Gatwick scheme, we agree with the conclusion that there are no locations around Gatwick where air quality objectives and limit values would not be met. We are confident that the Commission's own dispersion modelling will confirm this in due course.

Heathrow will not comply with air quality limits

- 4.375 By contrast to the situation at Gatwick, concentrations of air quality around Heathrow are already elevated and it is well documented that in a number of locations close to the airport breaches of air quality limit values continue and are expected to do so until into the 2020s.
- 4.376 In the past, notably in the December 2003 White Paper "The Future of Air Transport", the Government has ruled out or postponed a third runway at Heathrow, for environmental reasons with particular reference to issues relating to NO₂.
- 4.377 The Commission's high level work on the Heathrow schemes also now anticipates exceedances of human health based NO₂ limits unless 'forceful mitigation measures' are implemented'. We therefore support the Commission's conclusions at this stage that the Heathrow schemes' effects are 'significant adverse'.
- 4.378 Indeed, given the state of air quality at Heathrow currently, it seem highly unlikely that adding yet more significant construction and aviation activity there, at a time when it is just conceivable that, absent airport expansion, compliance with limit values might be attained, or, in any event, would not delay the attainment of the limits. Ultimately, of course, the Commission will only be able to properly evaluate any such risks following the completion of its detailed modelling.

Detailed Modelling Methodology Points

- 4.379 On 3rd December 2014, following the publication of the Consultation Report, when it became evident that the Commission had not undertaken detailed dispersion modelling but planned to do so, we wrote to the Commission setting out suggested detailed points on modelling that we urged the Commission to consider. These included evaluating the risk of non-compliance not only during the initial and mature operation phases, but also - reinforcing a point we made in response to the Draft Appraisal Framework – that it must also evaluate the risks during the initial main construction phase.
- 4.380 The construction stage presents a particular risk at Heathrow for a number of reasons:
- i) the anticipated timeframe of the works in the period 2020 – 2025 is when levels of NO₂ around Heathrow, which currently exceed limit values, are expected to be approaching or compliant with limit values;
 - ii) the scale and complexity of construction works entailed in both Heathrow schemes, including for example very significant road works;
 - iii) the traffic generation and congestion likely to be caused during construction including as a result of disruption caused by road works; and
 - iv) the length of the construction period (as noted in the Delivery section of this response).
- 4.381 We also draw to the Commission's attention the fact that the assessment of proposals for most major infrastructure projects considers the impacts of traffic on air quality during the construction period as it is well recognised that, whilst these are temporary effects, the construction periods for such projects extend for a number of years and impacts may affect compliance with European air quality limits values.
- 4.382 The National Policy Statement for National Networks also now states that where the impacts of a project (both on and off-scheme) are likely to have significant air quality effects in relation to the UK's ability to comply with the Air Quality Directive, an assessment of the impact of the proposed project during construction phases, taking account of the impact of road traffic generated, should be undertaken (para 5.6).
- 4.383 It is thus essential that the effects of emissions from construction works upon the achievement, or any delay to the achievement of NO₂ limit values are examined as well as the operational phases.
- 4.384 We have carried out some further work on air quality risks associated with the construction of the Heathrow North West runway scheme and we report our findings in the air quality report that supports this response. In summary it is evidently the case that the nature of the construction works required will result in significant changes in traffic in West London, including as a result of the various highway works, and the scale of these changes are such that a significant air quality impacts could occur. There is therefore a risk that pollutant concentrations in areas where there are existing concentrations of nitrogen dioxide above air quality limit values may increase and where compliance with air quality limit values may be delayed.

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- 4.385 These findings further reinforce the need for the Commission to undertake the detailed dispersion modelling of the construction as well as the early operational phases.
- 4.386 In the absence of dispersion modelling it will not be possible to discount the risk that the construction phases of either of the Heathrow schemes would lead to either a delay in achieving or breach of the NO₂ limit values in breach of EU Law.

Assumptions with regard to Mitigation

- 4.387 Heathrow's case, that it can meet air quality limits, is founded upon a number of assumptions.
- 4.388 If, as previous modelling work has shown, mitigation is required to achieve compliance at Heathrow then the nature and likely effectiveness of the mitigation must be understood and the modelling needs to demonstrate that compliance would be likely to be achieved.
- 4.389 All of Heathrow's assumptions are questionable and none is supported by compelling evidence that establishes they are realistic. The sources of NO_x at Heathrow are many and varied, as is the dispersion of emissions from them and the factors that influence dispersion. It is not possible to control the emission and dispersion of NO_x from those sources reliably so as to ensure that limit values are met on an annual average basis at all the relevant points around Heathrow. In short, the use of a mechanism, such as congestion charging, to control the contribution of airport related sources of NO_x to achieve ground level concentrations of NO₂ on an annual average basis would be highly speculative, potentially ineffective and with unforeseen adverse consequences.
- 4.390 The Commission should not therefore make a recommendation in favour of any particular scheme based on undefined, unquantified, unassessed, unreliable or potentially unenforceable mitigation measures.

Other Air Quality Issues

- 4.391 Air Quality impacts are not simply a legal issue.
- 4.392 As most recently highlighted by the Environmental Audit Committee, poor air quality gives rise to serious effects on health and wellbeing. This position is also reflected in the National Policy Statement for National Networks – the most recent statement of government policy on significant infrastructure. This states that even where compliance with limit values is not at risk, the Secretary of state “must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant deterioration in air quality”.
- 4.393 Therefore, even if the legal barriers to expanding Heathrow could be overcome, the other environmental and human health effects are further important considerations.
- 4.394 In this regard, the Gatwick scheme would take place in an area where pollutant concentrations are low, where there is compliance with limits currently, and where far fewer people would be exposed to additional emissions. Adding capacity at Heathrow would increase emissions in an area of significantly higher population density, that already suffers

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Module 6: Air Quality

from unacceptable air quality and therefore expose a much higher number of people to greater increased adverse effects on health and wellbeing.

- 4.395 The higher concentrations of NO₂ around Heathrow, before any further development takes place, and the greater exposure of people to these concentrations, are major reasons for concluding that locating the second runway at Gatwick would not only present the lowest risk to compliance with air quality limit values and objectives, but would also mean that far fewer people will be exposed to the additional harmful pollutant concentrations.
- 4.396 Even if Heathrow could be shown to be lawful with current standards, Gatwick would remain the scheme which has far lower air quality impacts; affects fewer people; and has lower health effects; as well as being the scheme that does not impact sensitive eco systems. Gatwick could also comply with a tightening of air quality standards if as, appears likely, legislators will seek to drive further improvements to standards in the future.
- 4.397 These factors should also be given proper weight in the assessment of the air quality performance of the three schemes.

Heathrow is a high risk scheme

- 4.398 We strongly support the Commission's intention to undertake detailed dispersion modelling. Indeed, it is essential that it does so.
- 4.399 Previous work done on air quality at Heathrow, as well as the Commission's interim work, underline the high risk that the initial main construction and early operation phases of the Heathrow schemes would delay compliance with, or cause a breach of, EU limit values. The modelling must therefore examine the impacts during these phases.
- 4.400 We further strongly urge the Commission to consult on its detailed work.
- 4.401 Furthermore, if it is shown that mitigation is necessary to achieve compliance with legal standards, then the nature and effectiveness of the mitigation needs to be understood. The modelling would need to demonstrate that compliance would be achieved.
- 4.402 Apart from compliance with standards, Gatwick is the scheme that has the lowest air quality impacts on surrounding populations and as a result impacts on human health would be far lower than such impacts associated with the Heathrow schemes. It is also the only scheme that does not present an air quality risk to protected eco-systems and it is a scheme that could survive a tightening of legislative standards.
- 4.403 The Commission is therefore correct to rate Gatwick as the best performing scheme. The assessment rating should properly reflect the magnitude of the difference between the Gatwick and Heathrow schemes. Gatwick should, with mitigation be rated as 'neutral' but we consider it inconceivable that the significantly greater impacts of the Heathrow schemes on human health and wellbeing could justify a rating other than 'significant adverse', even if legal compliance could be demonstrated.
- 4.404 The critical point that remains to be resolved, and which can only be resolved by detailed modelling, is the question as to whether either of the proposed Heathrow schemes could lawfully be delivered.

Module 7: Biodiversity

Key points

Assessment understates Gatwick performance; overstates Heathrow North West scheme

- 4.405 At present the Commission's analysis understates Gatwick's biodiversity credentials, and overstates the performance of the Heathrow North West scheme. When judged against the Commission's Appraisal Framework, Gatwick performs better than either of the Heathrow sites, and has a significantly lower range of Ecosystem Services costs than either Heathrow scheme.

Gatwick performance should be more positive than indicated in the consultation

- 4.406 The Commission's analysis
- overstates the extent of ancient woodland lost at Gatwick
 - does not take into account the mitigation proposed by Gatwick; and
 - gives insufficient weight to the fact that the Gatwick scheme is compatible with the EU Water Framework Directive and has no effects to EU or nationally designated sites.
- 4.407 We accept that, when judged against the Commission's Appraisal Framework, Gatwick's performance is rightly appraised as initially "Adverse". However, we consider that, over time, effects on Biodiversity will be "Neutral", and then move towards "Supportive" in the longer term.

Heathrow North West performance should be more negative than indicated in the consultation

- 4.408 The Commission's analysis
- shows that the extensive combining and culverting of rivers for the Heathrow schemes (up to 3km for Heathrow North West) will have very significant adverse consequences for biodiversity and will be contrary to the EU Water Framework Directive objectives to achieve "Good Ecological Status" in the watercourses concerned.
 - shows that "Appropriate Assessment" is required for both Heathrow schemes under the Habitats Regulations, owing to their likely significant effects on EU sites; and
 - demonstrates that mitigation for the above effects may be practically impossible - or could make matters worse.
- 4.409 We believe that the Heathrow North West scheme should be assessed as having "Adverse" effects tending towards "Highly Adverse" following mitigation, consistent with conclusions already reached for the Heathrow Extended Northern Runway scheme.

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Module 7: Biodiversity

Our submission in May 2014

- 4.410 In our May 2014 submission we showed that the Gatwick scheme would not affect any sites designated for nature conservation at international, European or UK level.
- 4.411 We acknowledged, however, that the Gatwick scheme would still have adverse effects on biodiversity and that in particular there would be some loss of ancient woodland.
- 4.412 We also provided:
- strong evidence that the proposals to divert the River Mole and Crawters Brook from culverts and engineered channels into new naturalised river valleys would be beneficial to biodiversity at a regional level; and
 - strong evidence that the Gatwick scheme would be compliant with the Water Framework Directive.
- 4.413 Our mitigation strategy is based around a comprehensive series of commitments. We will replant woodland, provide habitat to meet statutory requirements and work with stakeholders over the longer term to achieve overall enhancement for biodiversity.
- 4.414 Since May 2014 we have undertaken further work to show how an integrated habitat and landscape scheme could be accommodated around Gatwick. We discuss this further in Appendix 13. This response should be read in conjunction with Appendix 12 – RPS Biodiversity Report and Appendix 13 – Indicative Habitat and Landscape Plan.

Gatwick performance should be rated more positively than indicated in the consultation

- 4.415 The Commission's assessment is that Gatwick's impact on biodiversity will be "Adverse" and will not reach "Neutral". This conclusion is framed in the context of the effects on irreplaceable habitat and an assessment of Ecosystem Services costs.
- 4.416 For ancient woodland, the Commission's consultants have incorrectly interpreted some of the information we provided to the Commission. Around 6ha of ancient woodland would have to be cleared, rather than the 14ha identified by the Commission.
- 4.417 The Commission has not properly taken into account the commitments made by Gatwick to achieve net benefits to biodiversity, and incorrectly states that Gatwick's compensation proposals relate only to the replanting of woodland. We are including an indicative proposal within this submission which responds to the effects of the scheme, and which we believe to be deliverable without unacceptable increase in bird hazard. We believe that the successful mitigation provided by the Manchester Second Runway scheme provides compelling evidence that similar landscape and habitat compensation areas could be developed at Gatwick to provide net benefits to biodiversity within 25 years. We would welcome the opportunity to discuss these matters with the Commission and its consultants in the next few months.
- 4.418 For Ecosystem Services, the Commission's analyses confirmed that non-agricultural ecosystem services costs (i.e. those more directly related to biodiversity) are substantially

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lower for Gatwick than the two Heathrow schemes. Further, that the high range of total Ecosystem Services costs for the Heathrow schemes are potentially over 70% higher than the high range estimate for Gatwick. The relative deliverability of mitigation at Gatwick should also be a factor in assessing long term Ecosystem Services costs.

Heathrow North West performance should be rated more negatively than indicated in the consultation

- 4.419 The Commission's Appraisal Framework required consideration of effects to sites designated as being important for nature conservation. The Commission's analysis has found that the Heathrow schemes may affect sites with International, European and UK level designations.
- 4.420 Both Heathrow schemes would require "appropriate assessment" under the Habitats Regulations of potential likely effects on the South West London Waterbodies European Special Protection Area (SPA) and RAMSAR site. They are also likely to affect UK level SSSI⁴⁴ designations.
- 4.421 The underlying technical reports for both Heathrow schemes make it clear that mitigation for effects may be very difficult to achieve without increasing bird strike risk unacceptably. Actions to control or reduce the bird strike risk could have significant adverse effects to the adjacent SPA.
- 4.422 The extensive combining and culverting of rivers for the Heathrow schemes (up to 3km culverting for Heathrow North West, with overall loss of around 12km of river habitat) will have very significant adverse consequences for biodiversity and will be contrary to the EU Water Framework Directive objectives to achieve "Good Ecological Status" in the watercourses concerned.

Assessment understates Gatwick performance; overstates Heathrow North West scheme

- 4.423 We consider that the Commission's final considerations should take into account the following matters:
- the fact that the Heathrow schemes are likely to impact on sites with the highest levels of protection for their importance to nature conservation interests, whereas Gatwick would not;
 - the severe adverse effects of the Heathrow schemes with respect to the water environment and their incompatibility with the Water Framework Directive;
 - the correct extent of ancient woodland likely to be lost at Gatwick;
 - the actual relative performance of the three schemes with respect to Ecosystem services costs;

⁴⁴ Site of Special Scientific Interest

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- the relative deliverability of mitigation at Gatwick in comparison to Heathrow.
- 4.424 We think a fair equitable application of the Appraisal Framework should actually result in Gatwick's performance being appraised as "Adverse" initially but that, in time and subject to the correct mitigation and compensation scheme being delivered, effects on Biodiversity will be "Neutral" and then move towards "Supportive" in the longer term.
- 4.425 On the other hand, we consider that consistent application of the Commission's Appraisal Framework demonstrates that the Heathrow North West scheme should be assessed as having "Adverse" effects tending towards "Highly Adverse" following mitigation, owing to actions required to manage bird hazard having detrimental effects to the South West London Waterbodies SPA. The Commission's assessment for the Heathrow North West runway would then be consistent with the conclusions it has reached for the Heathrow Extended Northern Runway scheme, particularly in view of the fact that the underlying technical reports for the two schemes use almost identical language when describing the issues they face with regard to the SPA.
- 4.426 When the Commission comes to make its final assessment of the relative performance of the schemes, we consider that it should take the above factors and the additional evidence we have provided into account. We consider that a fair application of the Commission's Appraisal Framework would actually result in the conclusions below.

TABLE 4.7.1: APPRAISAL RATINGS – SUGGESTED REVISIONS

Scheme	Performance – Consultation Document	Performance – Suggested Revision
Gatwick	Adverse and unlikely to reach Neutral	Adverse, reaching Neutral/Supportive in longer term
Heathrow NWR	Adverse with possibility of becoming Neutral in the longer term	Adverse, possibly increasing to Highly Adverse
Heathrow ENR	Adverse, possibly increasing to Highly Adverse	Adverse, possibly increasing to Highly Adverse

Module 8: Carbon

Key Points

The Commission should normalise baselines in order to ensure fair analysis

- 4.427 The Commission has wrongly appraised the carbon performance of the competing schemes' airport operations (energy and fuel) based on the percentage increase of emissions over different baselines. This method unfairly disadvantages Gatwick because, as a smaller airport currently, Gatwick inevitably starts from a lower baseline. The Commission should apply metrics such as carbon emissions per passenger to each scheme to 'normalise' the effects and enable a clear comparison. On this basis, the Commission's figures demonstrate that Gatwick performs significantly better than the Heathrow schemes.

The Commission's analysis does not take into account key issues

- 4.428 The Commission's analysis of airport operational carbon emissions does not reflect Gatwick's proposed Energy Strategy.
- 4.429 We agree with the Commission's findings that the Heathrow schemes would be significantly more carbon intensive than Gatwick in their construction. However, the Commission's assessment is based only on the cost of airport infrastructure, surface access infrastructure, and fuel emissions. It therefore omits the carbon impact of associated and enabling works, such as road tunnelling and diversion and rail works, and indirect sources such as the excavation, remediation and removal of waste.
- 4.430 The Commission's surface access assessment does not fully reflect the fact that Gatwick's surface access proposals would have significantly lower carbon emissions than the surface access proposals for either of the Heathrow schemes.

Gatwick performs better

- 4.431 The Commission's conclusions do not therefore properly reflect the fact that the Gatwick scheme performs significantly better than the two Heathrow schemes.
- 4.432 In relation to the Appraisal Framework objective '*to minimise carbon emissions in airport construction and operation*', the Commission's assessment identified five indicators that it would examine: increased airport capacity leading to a net change in air travel; aircraft route changes and flight operations; passenger surface access; airport energy and fuel use; and construction.
- 4.433 We consider that it was appropriate for the Commission to acknowledge in the Consultation Reports that at this stage the impacts from aircraft route changes and flight operations are not sufficiently understood to form part of the assessment.
- 4.434 With regard to carbon emissions from increased airport capacity leading to a net change in air travel, we note that the carbon impacts from this indicator are by far the largest contributor in the Commission's carbon assessment. However, we have explained elsewhere in this submission that the Commission's air traffic forecasts understate Gatwick's potential growth

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and overstate the growth that would result from the Heathrow schemes. We therefore consider that the Commission's calculations at this time are likely to be incorrect. The Commission should therefore not attach any weight to this part of its assessment.

- 4.435 We support the Commission's use of passenger surface access, airport energy and fuel use, and construction as appropriate indicators and differentiators between the schemes. We are concerned that the ratings of the schemes against these indicators does not properly reflect the schemes' relative performance.
- 4.436 This response should be read in conjunction with Appendix 14 – RSK Carbon Technical Report.

The Commission should normalise baselines in order to ensure fair analysis

- 4.437 In relation to emissions from airport operations and energy use, the Commission's figures are based on percentage increases for each scheme over different baselines, and on absolute total figures. Applying these methods leads to misleading and contradictory conclusions. For example, the Gatwick scheme performs worst when measured on percentage increases over a baseline (but this is only because Gatwick, being a smaller airport, starts from a much lower baseline) and best when measured on absolute emissions. To 'normalise' the results the Commission should apply metrics such as carbon emissions per passenger.
- 4.438 On the basis of emissions per passenger, using the Commission's carbon emissions forecasts and passenger numbers, Gatwick's operational carbon emissions would be lower than both of the Heathrow schemes. The Gatwick scheme would be the most carbon efficient proposal, able to accommodate passenger demand with lowest carbon impact.

The Commission's analysis does not take into account key issues

Airport energy and fuel use

- 4.439 The Commission's assessment has overstated Gatwick's energy emissions. In particular its appraisal has overlooked Gatwick's energy and utilities strategy as contained in its May 2014 Engineering Plans submission. This strategy presents Gatwick's exemplar low / zero carbon strategy for the management of energy, water and waste. These plans consider a situation where, as appears likely, the UK electricity network will not have been fully decarbonised at the time of initial operation.
- 4.440 The Commission's conclusions, by contrast, assume that the provision of all power and heat will be delivered by national electricity and gas infrastructure, which is further assumed to undergo a rapid transition to a 'decarbonised state'. In the absence of formally confirmed or agreed projections and timelines for the anticipated reduction in carbon intensity of the national energy grids, it is not realistic for the assessment to be undertaken on that basis. The assessment thereby overlooks proposals made by scheme promoters in their plans to manage and minimise carbon emissions. By adopting the decarbonisation assumption, the Commission's assessment has underestimated the anticipated scale of reductions in carbon

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emissions at Gatwick. If the Commission's assessment had been based on the submitted Engineering Plans, the Gatwick scheme would perform even better.

Carbon from construction

- 4.441 In relation to carbon from construction, and whilst accepting its limitations in terms of accuracy, we agree with the Commission that due to a lack of meaningful construction data at this stage, it is appropriate to forecast emissions based on capital costs rather than more detailed evaluation.
- 4.442 However, the assessment has significantly understated the construction carbon emissions of the Heathrow schemes because the construction costs for each scheme only take into account the costs of airport infrastructure, surface access infrastructure, and fuel emissions. They therefore do not properly reflect the greater capital cost of enabling works for the Heathrow schemes.
- 4.443 Elsewhere in this submission we demonstrate that the Commission and Heathrow have overlooked and underestimated some of the construction complexities and difficulties associated with the Heathrow schemes. These include the cost and complexity of re-providing Energy from Waste Facilities and the enabling road and rail infrastructure works. We have also provided the Commission with information on the need for the both Heathrow schemes to manage the excavation, remediation and removal of millions of tons of landfill wastes. These matters, including the liberation of CO₂ from large quantities of methane, have not been taken into account in the Commission's construction assessment work to date, are not accounted for in Heathrow's costs and are not reflected in carbon calculations.
- 4.444 Congestion from road works, tunnelling and temporary diversions would also be likely to have a far greater carbon impact for the Heathrow schemes. Carbon impacts from these indirect emissions are not accounted for in the Commission's methodology.
- 4.445 We consider that the Commission should further consider the relative performance of each scheme on construction carbon. When it does so it will find that the relative performance benefits of the Gatwick scheme are even greater than the Commission's current conclusions.

Carbon from Surface Access

- 4.446 The Commission's assessment of surface access carbon emissions finds that Gatwick's surface access emissions would be greater than for both Heathrow schemes. We are concerned that the outputs from the Commission's surface access assessment which have fed into the carbon forecasts are not fully representative of Gatwick's rail transport strategy. The surface access forecasts do not reflect the efficiency benefits of Gatwick's Thameslink upgrade and the more frequent services that would be provided (particularly Gatwick to Peterborough and Cambridge, and the higher frequency to/from central London). It also fails to reflect Gatwick's superior public transport mode share, both now and with the second runway in place, compared with the short listed Heathrow schemes.
- 4.447 The Commission's surface access analysis of the effects on local traffic around Heathrow is also incomplete. This is because the Heathrow promoters have not provided the Commission with enough information. It is essential that the Commission's comparative transport modelling takes into account all trips, including goods traffic and employee trips. This will allow a more accurate representation of each schemes' modal shares, thus allowing a

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clearer comparison of the benefits of the surface access strategies to be employed. It will also allow the Commission properly to assess each scheme's likely carbon impacts.

- 4.448 We also point out within our response on Module 4 (Surface Access) that a more rigorous analysis of the impacts of committed and planned schemes on population catchment is required. In particular this should properly take into account the broader effects of accessibility beyond the SE and London.
- 4.449 We have already noted that the Commission has appraised carbon performance based on the percentage increase of absolute carbon emissions, which are calculated over different baselines. Applying these methods to surface access emissions also leads to unreliable conclusions because Gatwick has a much lower starting baseline, such that it is inevitable that Gatwick's carbon emissions would rise at a greater percentage rate. Once again, the Commission should 'normalise' these results by applying metrics such as carbon emissions per passenger to achieve a more accurate measure of carbon efficiency.
- 4.450 The Commission has concluded in its respective Business Case and Sustainability Assessment Reports for each of the short listed schemes that the impact of a new runway (at either Gatwick or Heathrow) would reduce total UK surface access emissions as a result of passengers 'substituting' into an expanded airport from another airport where surface access emissions would have been higher. This comparative carbon 'saving' has then been credited with improving the ranking of each of the proposals from 'highly adverse' to 'adverse'. However, a detailed methodology does not appear to have been provided to underpin these forecasts, so this conclusion should be reconsidered in the Commission's final assessment.

Gatwick performs better

- 4.451 The Commission's carbon assessment does not properly distinguish between the merits of the three short listed schemes.
- 4.452 Its energy assessment is based on a decarbonisation assumption that overlooks Gatwick's Engineering Plans which focus on low / zero carbon efficient resources.
- 4.453 Its construction assessment has been overly simplified and does not properly take into account important material differences between the schemes.
- 4.454 Although the Commission's detailed work demonstrates that Gatwick performs better than the Heathrow schemes on construction and airport operations, the magnitude of Gatwick's advantage has been understated. Also the Commission's surface access assessment is not fully representative of Gatwick's surface access strategy and so does not reflect the benefits of Gatwick over the Heathrow schemes in minimising emissions.
- 4.455 Gatwick is the scheme that best supports the Appraisal Framework objective 'to minimise carbon emissions in airport construction and operation' and should accordingly be rated as performing better than the Heathrow schemes.

Module 9: Water and Flood Risk

Key points

Gatwick's scheme is deliverable in compliance with the Water Framework Directive and has elements which are highly beneficial to the water environment

- 4.456 The Environment Agency has concluded that, subject to further details, "it is possible to meet all statutory requirements ... The proposals could create an improved river for biodiversity and flood risk, whilst runoff treatment should ensure that water quality standards are maintained⁴⁵."
- 4.457 The local water companies have confirmed that there are no major issues in principle with supply of potable water or with waste water treatment for a two-runway Gatwick.

The Commissions analysis fails to highlight the relative performance of the three schemes

- 4.458 We consider that overall Gatwick's impact on water and flood risk should be classified as "Neutral towards Supportive" rather than "Adverse with good possibility of reaching Neutral". The Commission's analysis fails fully to recognise the extent to which the Gatwick scheme is superior to the Heathrow schemes in this regard, in particular the very considerable difficulties faced by the Heathrow schemes in respect of extensive culverting of up to 12km of watercourses, increasing flood risk, and practical difficulties in providing mitigation.
- 4.459 Heathrow's proposal to treat sewage directly for reuse as potable water is not practiced in Europe and rarely used in the rest of the world due to potential health risks. It would have high operational and energy/carbon costs.
- 4.460 We believe that the Environment Agency's view as to the compatibility or otherwise of the Heathrow schemes with the requirements of the Water Framework Directive⁴⁶ is very important, and that this view and its implications should be brought out fully in the Commission's final analysis of the relative performance of the schemes.
- 4.461 This response should be read in conjunction with Appendix 15 – CH2M Hill Water & Flood Risk Report.

⁴⁵ Consultation response letter from Environment Agency to Gatwick, 2 May 2014 (GAL submission Appendix 12; G).

⁴⁶ Directive 2000/60 EC; "the WFD"

Gatwick's scheme is deliverable in compliance with the Water Framework Directive and has elements which are highly beneficial to the water environment

- 4.462 The Environment Agency has confirmed it has no substantive issues with Gatwick's submissions. Surrey & East Sutton and Thames Water companies (water supply and wastewater treatment respectively) have confirmed that the Gatwick scheme is feasible, subject to provision of appropriate infrastructure.
- 4.463 The EA's conclusion on the river diversion is:
- As currently proposed, the newly diverted river channel has the potential to create significant benefits for biodiversity. If the currently proposed design principles are established and built upon in greater detail, the scheme would fulfil statutory requirements with regard to biodiversity and the water environment. Key relevant legislation includes the EU Water Framework Directive, Natural Environment and Rural Communities Act and Countryside Act. Furthermore, the scheme has the potential to contribute towards targets set out within the England Biodiversity Strategy in terms of creating new priority habitats.*
- 4.464 The EA agrees that the options proposed by Gatwick for managing the quality of discharged waters all have merit and would meet the Agency's requirements.
- 4.465 The Commission's underlying technical reports acknowledge that the Gatwick proposal could *"...fundamentally... lead to an improvement in the River Mole and Crawter's Brook. As a result this could have the potential to improve the current statuses of these waterbodies by removing sections of modification and reinstating a more 'natural' channel"*
- 4.466 However, this conclusion is not reflected in the Commission's Consultation document or Sustainability Assessment.
- 4.467 The Sustainability Assessment instead references particular risks in relation to the need to provide for a weir at the junction of the River Mole and Crawters Brook, and need for the river valley to turn from west to north around the airport perimeter. We have discussed these matters at length with the EA, and provided technical information on both the weir design and the methodology for the river design in our submission. Whilst we acknowledge that these are important matters for detailed design, they are simply not risks of the same order of magnitude as those faced by the Heathrow schemes.
- 4.468 With respect to flood risk from the Gatwick scheme, the Commission's overall conclusion is that there should be no significant impacts. Whilst this is acknowledged in the Sustainability Assessment, it is heavily qualified with text that does not acknowledge the level of concept design information provided by Gatwick or the extent of its consultation on the issue with the Environment Agency.
- 4.469 The river diversion corridors have been specifically designed to mitigate fluvial flood risk. This has been given qualified acceptance by the underlying technical report, but the Sustainability Appraisal implies that a lower level of design information has been submitted than actually has been. In particular, we do not agree that the statement below is justified or indeed supported by the underlying technical report:

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Module 9: Water and Flood Risk

Because the scale of the changes are so extensive it is difficult to determine without very detailed plans, which are not available at this stage of design, exactly how the potential positives and negatives would interrelate in impacting water quality⁴⁷.

- 4.470 This is at odds with the conclusion that the EA has reached. It also does not seem to take into account the concept plans submitted by Gatwick which are based on best-practice engineering modelling and provide information on gradient, channel and valley cross sections, meander paths, pool and riffle formation along the water courses concerned.
- 4.471 We also note that in the underlying Flood Risk report prepared for the Commission by Jacobs, concerns are raised regarding the ability of the Gatwick design to manage extreme surface water flood events. This concern is misplaced. The modelling undertaken by Gatwick in respect of surface water flooding is based on available industry standard modelling techniques applied to the concept engineering designs. We are happy to share the calculation methodology and input data with Jacobs should the Commission request this, so as to remove any doubt on the issue.
- 4.472 We also stress that risks to the present airport infrastructure are being addressed in line with the recommendations of the McMillan review⁴⁸ which we have discussed separately with the Commission.

The Commission's analysis fails to highlight the relative performance of the three schemes

- 4.473 In its final analysis of the relative performance of the schemes, the Commission should acknowledge more clearly:
- that the Gatwick scheme is in principle compliant with statutory requirements, and poses no significant issues with water supply and wastewater treatment;
 - that the residual risks faced by the Gatwick scheme are considerably less than those for the Heathrow schemes and that overall it performs better in the terms of the Appraisal Framework;
 - Gatwick's significant superiority in terms of compliance with the WFD; culverting, residual flood risks, surface and groundwater interactions and supply of potable water.
 - the risks to the deliverability of the Heathrow schemes from their failure to comply with statutory requirements and risks and uncertainties as identified below. These risks to delivery should be specifically assessed as part of the Management Case's assessment of delivery risks.

Scale of issues facing Heathrow

- 4.474 We consider that the scale of the issues in relation to the water environment for both Heathrow schemes is very considerably greater than that at Gatwick, and that the Commission's analysis so far does not adequately bring this out. For example, the underlying

⁴⁷ Business Case & Sustainability Appraisal, §13.3

⁴⁸ http://www.gatwickairport.com/globalassets/publicationfiles/business_and_community/all_public_publications/2014/mcmillan_report_feb14.pdf

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technical reports prepared for the Commission identify a number of water environmental components of the Heathrow North West scheme that would be resisted by regulators because they are suboptimal, untested, may not be compliant with European or National legislation, or would lead to a deterioration in the “status” of the waterbody concerned⁴⁹. These include:

- increasing length and number of culverts;
- combining waterbodies into one;
- a new diverted channel at an elevation above the M25 tunnel, increasing residual flood risk of a major transport link;
- the use of treated sewage as drinking water.

4.475 The underlying consultant reports also conclude that many of these issues cannot be mitigated, and/or will result in residual risk:

- Major changes to the fluvial environment would pose major flood risk even with mitigation measures. Culverting carries an increased risk of blockage leading to residual flood risk. There are residual risks from groundwater flooding that have not been adequately addressed.
- For Heathrow North West, approximately 3km of open channels would need to be culverted, which is directly contrary to efforts by the EA to provide environmentally-friendly flood schemes. The Commission’s technical report remarks:
“This would probably be unprecedented in the UK in modern times⁵⁰.”
- The impact of culverting and combining on water quality and ecology is generally accepted to be a loss that cannot be mitigated.
- Approximately 12km of existing watercourse would be ‘lost’ with diversion of the Colne Brook, parts of Duke of Northumberland’s River, and River Colne.
- The Commission’s consultant has stated that creation of a new channel, the ‘River Colne Spur’, is likely to have a significant residual impact. The design proposed would change the way the river flows and carries sediment, and could have adverse effects to the ecology and water quality. Additionally the new watercourse would run through areas of landfill where it could come in to contact with polluted groundwater. It would also interact with the Horton Brook over 400m and risk polluting it too⁵¹.
- There could also be residual water quality impacts arising from polluted runoff.

4.476 The underlying consultant reports also note a number of areas where technical work has not been completed, or where there are significant uncertainties about the success of some of the mitigation concepts proposed:

⁴⁹ Within the terms of the Water Framework Directive (see later sections).

⁵⁰ Jacobs Water and Flood risk – quantity and quality assessment – section 4.6 p36

⁵¹ Jacobs Water and Flood risk – quantity and quality assessment – Executive Summary page (ii)

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- The Jacobs Water quantity appraisal notes that neither of the two Heathrow scheme promoters has consulted with the respective water companies, that the proposed solutions for demand management are optimistic, and that the mitigation proposed is unlikely to be acceptable to either the regulator or the public.
- The impact of development on groundwater flows has not been assessed, and the Jacobs Flood Risk Assessment concludes that the implications of high groundwater levels on managing flood risk were not explored sufficiently. Of most concern is that surface water / groundwater interactions may make the proposed fluvial defences less effective than anticipated by the hydraulic modelling of the rivers.

4.477 These uncertainties and residual risks have not been acknowledged in the Commission's "Delivery; Risks and Mitigation" or "Management Case" reports with respect to the Heathrow Schemes. These omissions should be rectified in the Commission's final analysis of the relative performance of the schemes.

No consultation undertaken at Heathrow

- 4.478 It is notable that neither Heathrow promoter has undertaken consultation to the same extent as Gatwick in respect of their water environment stakeholder's views on the effects of their schemes. There is no independent advice in the promoters' submissions from the EA or the local water companies regarding their views on the airport schemes or mitigations proposed.
- 4.479 We note also that the Commission itself intended to consult with the EA. The Commission's Appraisal Framework document states that "The Environment Agency and other flood risk management authorities will be consulted on how to manage flood risk in an area."⁵² There is no information within the Consultation material regarding the results of the consultation and the views that the EA relayed, and which we assume will also extend to compliance or otherwise with the Water Framework Directive.

Compliance with Water Framework Directive

- 4.480 The Commission's methodology emphasises the importance of developing a scheme in compliance with the Water Framework Directive^{53 54}.

"The Commission is mindful that an airport scheme should be developed in line with the Water Framework Directive (WFD)."

- 4.481 The WFD stipulates three primary commitments:

- to meet legal requirements related to protected areas;
- to ensure that the status of water bodies does not deteriorate; and,
- to look to achieve good status in water bodies.

- 4.482 Given the above, it is surprising that the Commission's Sustainability Assessment does not make any mention of the relative ability of the three schemes to comply with the WFD. Whilst there is every indication that the Gatwick scheme will be acceptable under the terms of the

⁵² Airports Commission Appraisal Framework Module 9 §9.10

⁵³ Directive 2000/60 EC; "the WFD"

⁵⁴ Appraisal Framework, Appendix A, Module 9 Water & Flood Risk §9.6

Response to Questions 4 and 5

Module 9: Water and Flood Risk

WFD, the Commission's assessment has raised serious concerns which suggest that neither Heathrow scheme can be.

- 4.483 This bears directly on the deliverability of either of the Heathrow schemes. Compliance with the WFD needs to be addressed at concept design stage. It represents a significant planning and deliverability risk. If either Heathrow scheme was chosen, it would have to be given exemption in accordance with Article 4.7 of the WFD.
- 4.484 Heathrow Airport Limited has undertaken a preliminary Water Framework Directive assessment⁵⁵ for the Heathrow North West Runway Project however, unlike the Gatwick scheme, this has not been the subject of consultation with the Environment Agency. The assessment identifies a number of mitigation measures already planned in the Thames River Basin Management Plan to meet the statutory requirements of the WFD, that cannot be delivered should the scheme go ahead. It also clearly identifies that deterioration cannot be avoided, and that the scheme will prevent achievement of good status.
- 4.485 The preliminary Water Framework Directive assessment for Heathrow North West also states that use of best practice in construction techniques and operation will avoid any impact on water biochemistry. This is not the case, as culverting changes the amount of light the channel receives and this will always have an impact on biochemistry.
- 4.486 We assume the Commission has received advice from the EA regarding the performance of the Heathrow schemes in terms of flood risk, the Water Framework Directive and possibly other effects to the water environment. We consider it important that the Commission sets out full details of this advice in its final assessment.
- 4.487 Based on the evidence we have set out above, our conclusion is that the assessments for the three schemes against the Commission's objective should actually be as follows:
- Gatwick should be rated as "Neutral towards Supportive" rather than "Adverse with a good possibility of reaching Neutral". Gatwick's scheme will comply with the WFD, is unlikely to increase flood risk, will improve the conditions for the local rivers. It poses no strategic issues for water supply or waste water treatment.
 - Heathrow North West should be rated as "Highly Adverse, with the outline possibility of being mitigated to Adverse", rather than "Adverse and unlikely to become entirely Neutral". It does not comply with the WFD, has significant residual flood risk issues, will result in the deterioration of local rivers, and has strategic issues with water supply and waste water treatment.
 - The Heathrow Extended Northern Runway scheme should be rated as "Highly Adverse, with the outline possibility of being mitigated to Adverse", rather than "Adverse and unlikely to become entirely Neutral". Its effects are likely to be worse than the Heathrow North West scheme making it the worst performing scheme overall. It does not comply with the WFD, has significant residual flood risk issues, and will result in the deterioration of local rivers. There is less information provided by the scheme promoters than for the Heathrow North West regarding water supply and waste water treatment proposals but the issues faced will be very similar to those for the Heathrow North West scheme.

⁵⁵ Heathrow Airport Ltd, Water Quality and Hydroecology Assessment, Appendix C

Module 10: Place

Key points

Ground conditions at Gatwick are much more straightforward than at either Heathrow site

- 4.488 Gatwick has just 1ha of landfill with inert waste within a scheme of around 600ha, and underlying geology which allows for lower risk to construction than at Heathrow.

Heathrow faces severe issues in relation to remediation of landfills and has much poorer ground conditions

- 4.489 In the period since May 2014, we commissioned a review by RSK, a respected environmental consultancy, of geo-environmental issues associated with the Heathrow North West scheme. This has identified that:
- 180ha (around 37%) of the Heathrow North West scheme site area comprises landfills; in the order of 9,000,000m³ of waste will require remediation to allow construction;
 - about 1,000,000m³ of the extracted waste would likely be classed as “hazardous” and require disposal off-site;
 - the costs of the excavation, separation, and remediation of the wastes concerned could exceed £600 million;
 - it is likely Heathrow would have to provide very substantial waste treatment or incineration capacity to compensate for the wastes arising;
 - some 200ha of the site is underlain by sands and gravels (up to 6,000,000m³) which have been identified in the London 2011 Plan as providing mineral resources for London;
 - the operation to deal with the wastes would be of unprecedented scale, risking pollution mobilisation, bird hazard and odour. The operations would be very intensive in terms of water usage and would increase vehicle movements both on site, and off-site on already congested routes.

There are other major differences between Gatwick and Heathrow that are not acknowledged in the Commission’s analyses

- 4.490 The Commission’s overall assessment should take into account the risks to programme, cost and the environment arising from ground conditions at Heathrow, and the knock-on effects that development at Heathrow would have for London.
- 4.491 The assessment should also take into account the scale of the difference between the Gatwick and the Heathrow schemes in the amount of Green Belt Land required to be taken (Gatwick 9 ha and Heathrow North West 694 ha).
- 4.492 This response should be read in conjunction with Place Appendix 16 (Heritage), 17 (Landscape), 18 (Land Use), 19 (Waste), and 20 (Landfill).

Ground conditions at Gatwick are much more straightforward than at either Heathrow site

4.493 It is surprising that the 'Place' Sustainability Assessment makes no mention of geo-environmental issues, given that the Commission's Appraisal Framework states that⁵⁶:

28. *Promoters should establish the situation in relation to the following areas:*

- ground contamination, including requirements and options for eliminating any potential for significant environmental harm, and rendering land safe and fit for intended use (including protecting controlled waters);
- specialist engineering works which may be necessary due to the quality of the ground surface, such as working on land in low-lying or water-logged areas.

4.494 Based upon the detailed desk-based work undertaken to date by Gatwick, it is clear that the Gatwick second runway site presents a low-risk geo-environmental profile, which in turn presents low risk of cost or time escalation to the overall works. The amount of potentially contaminated land is limited, and there is less than one hectare of landfill within the overall landtake. There is no loss of mineral resource, and relatively minor physical geotechnical challenges associated with alluvial clays which may have low strength.

4.495 We welcome the fact that the Commission's consultants, Jacobs, have agreed with the methodology that Gatwick has adopted to assess ground conditions and that the risks and mitigation measures proposed are generally appropriate for the study undertaken at present⁵⁷, and we accept that there will be a need to undertake further ground investigations.

4.496 We consider, however, that Jacobs places undue emphasis on the risks associated with ground gases at Gatwick, and the need to protect buildings located over landfill. There are no landfills in the built development area for Gatwick's second runway; and, if ground gas is detected, it is likely to be associated with a localised and unknown spill of hydrocarbons, or generation of methane from natural peat deposits.

Heathrow faces major issues in relation to remediation of landfills and has much worse ground conditions

4.497 In the period since May 2014, we have commissioned a review by RSK, a respected environmental consultancy, of geo-environmental issues associated with the extensive landfills at the Heathrow North West scheme.

4.498 The RSK review produced for Gatwick has shown that there is in the order of 180ha, containing around 9,000,000m³ of landfilled material, within the boundary of the Heathrow North West scheme⁵⁸. Upwards of 1,000,000m³ of this waste would be classified as hazardous and require disposal off-site. This is illustrated in figure 4.6.1

⁵⁶ Appendix A §28 as quoted, however, a very many other paragraphs and elements of assessment modules are also relevant.

⁵⁷ Place Assessment Table 5.9

⁵⁸ RSK 2015; Commentary on Landfills and Ground Conditions at Heathrow (Report produced for Gatwick).

Response to Questions 4 and 5

Module 10: Place

- 4.499 A further 200ha area is underlain by mineral (sand and gravel) resources for London. These mineral resources and requirement for additional landfill capacity or treatment facilities represent a significant part of the entire provision for Greater London identified in the London Plan 2011.
- 4.500 Of additional concern is that the Heathrow North West scheme promoter appears to make unrealistic assumptions regarding the quantity of fill material available to the scheme. At present it seems likely that there will be a deficit in fill material and that additional material will require to be imported to site.
- 4.501 There is no substantive information on the scale, cost and programme issues associated with remediation of landfills and piling in the Heathrow North West promoter's submission. The proposed specialist engineering solutions are industry-standard generic solutions. However, the submissions do not provide any realistic estimate of the likely actual works associated with Heathrow's indicative options to excavate and replace landfills.
- 4.502 The evidence provided in RSK's analysis implies that the scale and complexity of necessary operations to excavate and replace landfills would be a very material consideration in the overall programme and cost for the proposed Heathrow North West runway and associated developments. Furthermore, there is no certainty that agreement would be reached with the Environment Agency on the developer's preferred detailed design and method statement for the remediation measures, which represents a significant risk factor to the delivery programme and costs.
- 4.503 The existing landfills generally comprise contaminated land with poor geotechnical characteristics, such that overfilling them is likely to result in hazardous gas and leachate pollution migration, together with physical instability and long term total and differential settlement. Piling through landfills can also create new pollution pathways and linkages. Continuing landfill gas and leachate generation within the expanded airport would continue to pose risks to human health and the environment for decades to come.
- 4.504 In any case, the specialist engineering solutions proposed for physical ground improvement techniques may be applicable only to landfills proven to contain solely inert materials. Based on RSK's analysis, this could limit their applicability to perhaps only 15% to 20% of the total area of landfills beneath the proposed development footprint.
- 4.505 RSK estimate that the total costs to deal with the landfill are likely to exceed £600 million, which is a major cost not specifically identified within either the Heathrow North West project programme or its cost plan. The treatment operation would be the largest operation of its kind ever in the UK. It is likely that Heathrow would have to provide mitigation for the loss of landfill capacity to other users (for instance, additional incineration or waste disposal capacity).
- 4.506 The space required for processing, soil washing, bioremediation, liquid treatment and storage is extremely large. There would be a requirement to provide multiple locations for treatment purposes, with all the waste being transported within the site boundary to these facilities.
- 4.507 Figure 4.10.1 at the end of this section shows the extent of the landfills around Heathrow and the extent of development proposed over them.

Response to Questions 4 and 5

Module 10: Place

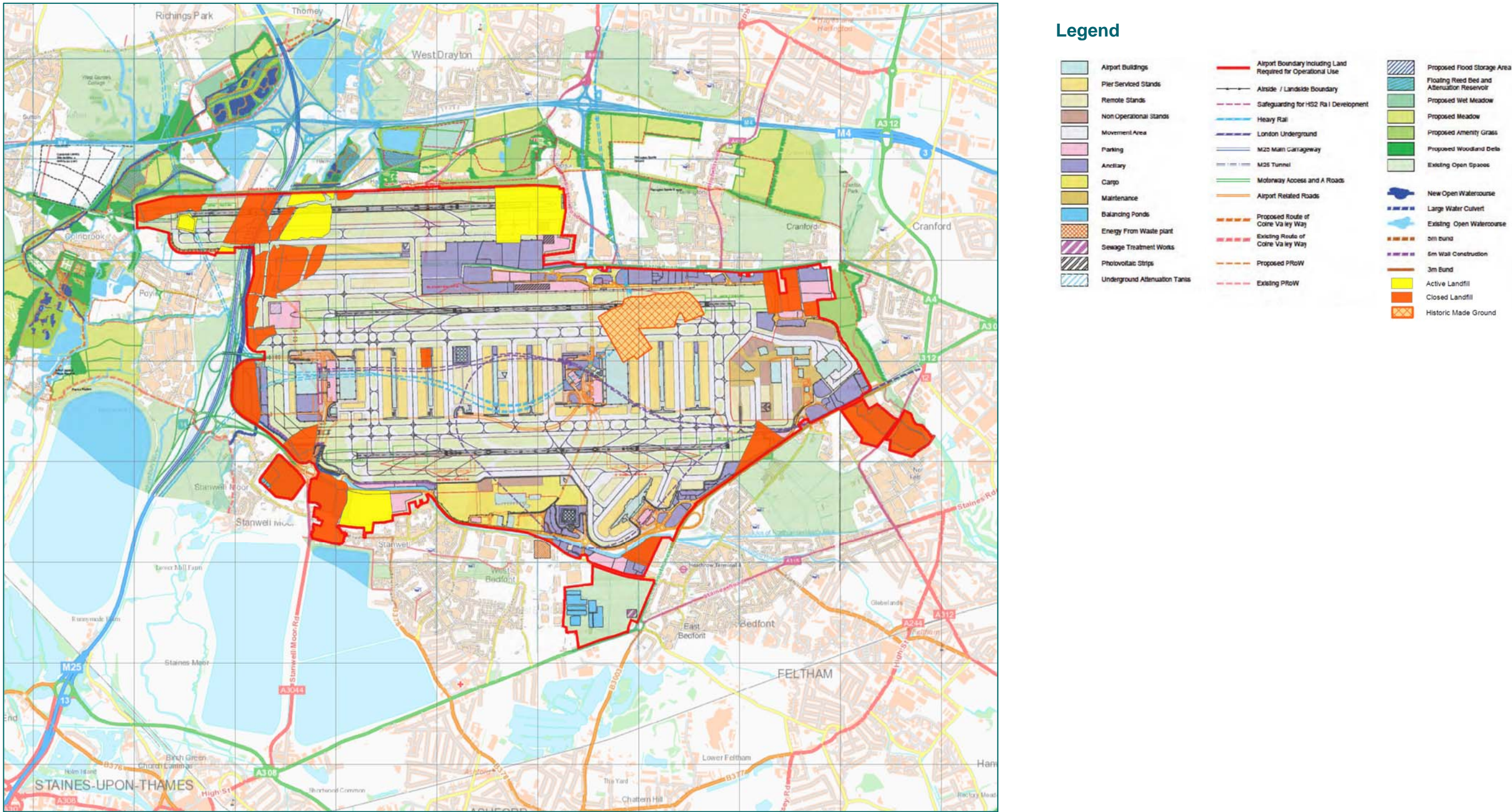
- 4.508 There are significant environmental issues associated with the operation to open and treat the contaminated land – these include
- mobilisation of pollution from the contaminated land to ground and surface waters;
 - attracting large numbers of birds (hence birdstrike risk to the airport operation);
 - attracting vermin;
 - creating odour.
- 4.509 Additionally the treatment of wastes on site would require significant volumes of water for soil washing and result in a similar demand for wastewater treatment and disposal, subject to the normal discharge consent considerations.
- 4.510 There are around ten suitably licensed landfills within a 50mile radius of Heathrow that could accept the materials not suitable for reuse on site. If the refuse was to be moved by road, there would be significant vehicle movements. If it was to be moved by rail, this would require significant infrastructure at each end and the ability to secure train paths.
- 4.511 The Heathrow Extended Northern Runway scheme may lie over greater areas of landfill than that for the Heathrow North West Runway. However, very little information is provided by the scheme promoters.
- 4.512 We note that the underlying technical review prepared for the Commission by Jacobs concludes with the following regarding the Heathrow North West scheme: *... In summary, limited data has been provided by the scheme promoter to substantiate how key points of the assessment framework have been addressed*⁵⁹.

There are other major differences between Gatwick and Heathrow that are not acknowledged by the Commission's "Place" analyses

- 4.513 The underlying technical assessment prepared for the Commission does not fully recognise the scale of the issues and risks associated with remediating contaminated land for either Heathrow scheme. Given the scale of issues for both Heathrow sites in comparison with those for Gatwick, it is clear that this is a material issue that the Commission should take into account in coming to its final conclusions regarding the relative environmental effects, costs and deliverability of the shortlisted schemes.
- 4.514 The "Place" topic is very wide ranging, and a more general review shows clearly the worse performance of the Heathrow schemes in comparison with Gatwick in a great many important areas. The technical analyses prepared for Gatwick which support this submission highlight these for the Landtake, Landscape and Heritage topics in particular. By way of example, one key difference between the schemes is the amount of Green Belt Land required. This is around 9ha for the Gatwick scheme and about 694 ha for the Heathrow North West scheme. Although we have focused on ground conditions in this main submission, we consider that significant differences in these other topics should be taken into account in the Commission's overall analysis.

⁵⁹ Jacobs Report 10; §5.3.2; General Observations

FIGURE 4.10.1: LANDFILLS WITHIN DEVELOPMENT FOOTPRINT FOR THE HEATHROW NORTH WEST SCHEME, AND THE EXTENT OF DEVELOPMENT PROPOSED OVER THEM (RSK 2015).



Module 11: Quality of Life

Key Points

- 4.515 The Commission's methodology deployed to-date requires considerable strengthening if it is to be a robust basis for assessment.
- 4.516 It should have regard to a range of key best practice Quality of Life indicators, notably health, access to services, and impacts on different stakeholder groups.

4.517 This response should be read in conjunction with Appendix 21 – ERM Quality of Life Report.

4.518 In our May 2014 Submission we set out a comprehensive assessment of Gatwick's performance in relation to Quality of Life. We used a wide range of indicators, including

- natural environment;
- personal wellbeing;
- health;
- what we do;
- where we live;
- personal finance; and
- economy.

4.519 The Commission has not yet undertaken a full assessment of Quality of Life. However, whilst acknowledging a full assessment is still required, the Commission has nonetheless provided a rating for each of the schemes. We do not accept the basis for these ratings with respect to the methodology deployed and the score which Gatwick has received. The Commission should revisit its conclusions taking into account fully the factors set out above.

4.520 Our major concerns with the Commission's methodology are:

- The Commission's approach to assessing Quality of Life is not defined and ignores best practice in relation to Health Impact Assessment / Quality of Life, which would reasonably be expected to inform the Commission's approach.
- Through the PwC report, the Commission appears to have focused almost exclusively on one determinant of Quality of Life – subjective wellbeing. The use of subjective wellbeing as the main measurement of Quality of Life excludes a range of factors such as health, access to services etc. which are critical to Quality of Life, many of which can only be assessed qualitatively.
- The primary basis for the Commission's assessment of Quality of Life – the PwC report – does not actually assess the schemes. The PwC report is instead a study of how one factor informing Quality of Life may or may not be considered in an assessment of Quality of Life. It is not a methodology or assessment for considering Quality of Life, in

Response to Questions 4 and 5

Module 11: Quality of Life

and of itself. Its relationship to a future assessment of Quality of Life remains undefined, as is its relationship to the selection of topics which the Commission cross-references at the end of the Quality of Life module.

- The rationale for the choice of indicators or topics which the Commission brings into the concluding sections of the Quality of Life modules is unclear and fails to take into consideration wider determinants, as outlined previously.
- Failure to consider the full range of factors which inform Quality of Life, in combination with the lack of actual scheme assessment and methodological concerns in the PwC report approach, listed below, mean that the Commission does not have an adequate basis for assessment and its current ratings cannot be substantiated.

4.521 We also have the following major concerns in respect of the PwC report:

- The PwC report has relied almost exclusively on one data source (Mappiness). Consideration of other available data sources is required to give credibility to the approach.
- The study's adopted parameters for a future assessment of subjective wellbeing are based on a generic and unexplained 5km radius around each airport. To be robust, an assessment should be based on specific consideration of the potential area of influence for each proposal based on the presence of communities and specific stakeholder groups.
- The study ignores the importance of considering the differential effects on different stakeholder groups, as outlined in the assessment framework for Quality of Life. This is a critical factor in assessing impacts on specific groups, in particular, vulnerable groups and their wellbeing, subjective or otherwise.
- To be robust and defensible as an approach, the consideration of subjective wellbeing must take into account these factors.

Module 12: Community

Key points

Gatwick's community impacts are significantly lower than Heathrow's, but the Commission's ratings do not adequately reflect this

- 4.522 The Commission's assessment makes clear that Gatwick's impacts on residential property, community cohesion, and community severance are significantly lower than for either of the Heathrow schemes, but the Commission's ratings do not fully reflect this.

The comparative assessment should recognise Gatwick's substantially stronger performance

- 4.523 Given the potential scale of the impacts on the local communities (and specifically the loss or severance of whole communities) the score for the Heathrow North West Runway scheme should remain as "Highly Adverse", and the comparative assessment should recognise Gatwick's substantially stronger performance.

- 4.524 This response should be read in conjunction with Appendix 22 – RPS Community Report.

Gatwick's impacts are significantly lower than Heathrow's, but the ratings do not fully reflect this

- 4.525 The community assessments undertaken by the Commission and the scheme promoters of the highlight that there are a number of key community issues that differentiate the schemes. These are:

- Effects on residential property;
- Community cohesion; and
- Community Severance.

- 4.526 When the evidence in respect of each of these issues is examined it is clear that Gatwick performs substantially better than the other schemes. However, this is not fully reflected in the Commission's overall assessment. In particular, we believe that the Commission's rating of the Heathrow North West Runway scheme (with mitigation) should be revised to highly adverse.

- 4.527 The evidence which supports this conclusion is set out below:

Effects on residential property

- 4.528 The number of residential properties that are likely to be demolished as a result of the competing schemes is shown in Table 4.13.1 below. This illustrates that Gatwick performs

Response to Questions 4 and 5

Module 12: Community

significantly better than either Heathrow scheme, particularly when properties potentially lost within the surface access corridors are also taken into account.

- 4.529 Of particular note is the number of properties that would fall within the Commission's 63 LAeq16hr noise contour (2030) for each of the schemes. For Gatwick a relatively small number of properties (around 106) in the settlements of Ifield wood, Shipley Bridge, Langley Green and Tinsley Green would lie within this contour. For the Heathrow Extended Northern Runway scheme a far greater number of properties (around 2000) would be affected including the majority of the households in the town of Datchet, together with isolated properties in the north-eastern part of Windsor Great Park, and some properties at Ham Island and in Colnbrook. The extent of the 63 LAeq16hr noise contour for the Heathrow North West Runway scheme includes the remaining part of Harmondsworth, the village of Sipson (which would lie immediately adjacent to the proposed airport boundary), and a number of other settlements around the new runway.
- 4.530 Heathrow Airport Limited has acknowledged potential impacts on residential occupiers close to the extended airport in their new property compensation proposal that was announced on 1 December 2014. Under this new scheme, the owners of approximately 3750 homes in Harmondsworth, Sipson, Harlington, Cranford Cross, Poyle, Colnbrook and Brands Hill outside the boundary of the expanded airport would have the option to sell their homes at 25% above market value once the new runway has been constructed.

TABLE 4.12.1: EFFECTS ON RESIDENTIAL PROPERTY FOR GATWICK AND HEATHROW SCHEMES

	Gatwick	Heathrow Extended Northern Runway	Heathrow North West Runway
Airport (property demolition)	168	242 (246 in Heathrow Hub submission including surface access land take)	783 (Approx. 750 in Heathrow submission)
Surface Access* (property demolition)	37 (Gatwick calculates 23 within AC surface access footprint)	165	289
AC 63 LAeq16hr noise contour (2030) – plus the settlement of Poyle** (Noise effects on property)	Limited number of properties (around 106) to the west (Ifieldwood); east (Shipley Bridge) and south (northern edge of Langley Green and Tinsley Green).	The majority of the settlement of Datchet (around 2000 households), isolated properties in the north-eastern part of Windsor Great Park, and some properties at Ham Island and Colnbrook.	3,750 properties affected (not demolished) The remaining part of Harmondsworth and the settlements of Sipson, Harlington, Cranford Cross and Heston to the east; the settlements of Brands Hill, Colnbrook ; part of Datchet to the west; and the settlement of Poyle

* As estimated by the Commission within 200m surface access buffers

** Properties/settlements outside the proposed airport footprint and surface access buffers, and the AC 63 LAeq16hr noise contour (2030) – covered by Heathrow Airport Limited new compensation area announced in December 2014 which includes most of the properties/ settlements within the 63 LAeq16hr noise contour, together with the settlement of Poyle.

Response to Questions 4 and 5

Module 12: Community

Community cohesion

- 4.531 The Gatwick proposal performs significantly better than either of the Heathrow schemes in terms of impacts on community cohesion. Most of the residential properties that would be demolished are located along local roads within the 2005 safeguarded area outside the town of Crawley and outlying villages. Similarly, those community facilities that would be displaced within the airport footprint are not specifically linked with existing settlements but serve the wider local population and could be successfully relocated to continue to serve their existing function. Community cohesion in Crawley or other local settlements would not be adversely affected by the expansion of the airport (we note in this regard that the Commission in its Community Impact Assessment report does not mention any such impacts).
- 4.532 The Heathrow Extended Northern Runway scheme would have a very substantial impact on the community of Poyle, where most of the 242 residential properties likely to be demolished as a result of the airport extension and surface access works proposal are located. The Heathrow Extended Northern Runway submission suggests that it may be possible to relocate the displaced residents to the north of Poyle or to the edge of Colnbrook but, as the Commission highlights, this presents a number of challenges including Green Belt issues and as a result significant uncertainty remains for those residents. The impact on the integrity of the settlement of Poyle will therefore be considerable, as will the cohesion between the remaining residents, relocated residents and the settlement of Colnbrook.
- 4.533 The Heathrow North West Runway scheme would have an even greater impact on the cohesion of communities within the proposed airport boundary and surface access corridors and also on number of communities located close to the expanded airport. Within the proposed airport boundary the community of Longford would be lost in its entirety and the village of Harmondsworth would effectively be cut in half. The Heathrow Airport Limited submission states that as a result of moving the proposed runway further south, “In Harmondsworth, this means that some of the village will be retained. We have sought to develop a boundary between the new airport and the remaining community, so as to maintain the village high street”. The illustrative masterplan shows a 3 metre high bund along the boundary in this location but it is clear that the proposer now acknowledges in bringing forward its new property compensation proposal that this would be insufficient to mitigate noise impacts on the remaining community. In addition, a number of community facilities, including Harmondsworth Primary School would have to be re-located, the siting of which may or may not be close to the remaining and re-located sections of the community. All these factors are likely to have a significant adverse impact on community cohesion in Harmondsworth. This is acknowledged by the Commission in its Community Impact Assessment that “at the very local level it is difficult to see any existing community cohesion being maintained”.
- 4.534 The Commission acknowledges in its Community Impact Assessment that the relocation of the A4 to the north of the airport will impact upon properties in Sipson, as well as those in Harlington and those remaining in Harmondsworth. It considers that some may need to be demolished and some residents may need to be re-located due to a reduction in quality of life. These settlements, together with those of Cranford Cross, Poyle, Colnbrook and Brands Hill are now included within the boundary of the new property compensation proposal that has been announced in relation to the Heathrow North West Runway scheme. Altogether this brings the number of settlements affected within and outside the boundary of this proposal to 8. In line with Commission consideration on this issue, potential re-location of all or part of

Response to Questions 4 and 5

Module 12: Community

these communities and their facilities and the uncertainty as to where they would be re-located has significant effects on community cohesion at a local level unless entire communities and their facilities could be moved en-masse at the same time. It is not possible to speculate on how many local residents might take advantage of the new property compensation proposal or, if they did, when they might move and therefore the impacts on community cohesion will remain highly adverse.

Community severance

- 4.535 As with community cohesion, the Gatwick proposal performs significantly better than either of the Heathrow schemes in terms of community severance. No existing communities would be severed as a result of the new runway or surface access proposals, with existing local roads around the airport maintained along their existing alignments or re-aligned to maintain connectivity between the main settlements of Crawley to the south and Horley to the north and to local villages. The community facilities that would be lost as a result of the new runway comprise private nursery and care facilities, places of worship and a sports facility. Some alternative facilities are already available in the local area (some run by the same company) to which access for local residents would be unaffected. Others would be re-provided in the local area, for example the Crawley Rugby Club which serves Crawley and the surrounding area, to which vehicular and non-vehicular access facilities would be put in place.
- 4.536 The Heathrow Extended Northern Runway scheme would have a number of severance impacts arising from the new runway severing some local roads including the Poyle Road linking Poyle and Colnbrook to Wraysbury and Horton to the south. Although alternative routes or diversions are proposed, the Commission rightly considers that issues of severance require further consideration to ensure that access is maintained to key local facilities such as the doctors' surgeries in Colnbrook.
- 4.537 The Heathrow North West Runway scheme would also result in severance impacts, particularly between communities to the north and south of the expanded airport i.e. between Stanwell and the remaining part of Harmondsworth and Sipson. Vehicular access at the western end of the existing airport is currently provided by the A3044, with links to Harmondsworth and Sipson via the A4, the northern part of the A3044 and the A408; and links to Poyle and Colnbrook to the A3113. All of these roads will be within the expanded airport footprint and will therefore be stopped up. The masterplan for the North West Runway submitted to the Commission in May 2014 shows a number of planned road diversions, however these would add significantly to local journey times for these communities.
- 4.538 Heathrow Airport Limited released a revised expansion plan on 1 December 2014, which included proposals for a Colnbrook and Poyle by-pass. This new road is proposed to replace the A3044, although it would be on the other side of the M25 to the existing A3044. The route starts from the A4 at Colnbrook to the immediate west of the new runway and then runs along the northern and eastern sides of Poyle meeting the existing local road to the west of Junction 14. Although it would avoid the existing local road junction in Poyle it would not significantly reduce the extended journey times for those wishing to travel between communities to the north and south of the expanded airport.
- 4.539 The Commission's Community Impact Assessment also acknowledges severance issues associated with the A4/M25 and Southern Rail Access works during the construction period

Response to Questions 4 and 5

Module 12: Community

and also uncertainty in relation to journey times for those displaced from existing communities and/or using re-provided facilities.

The comparative assessment should recognise Gatwick's substantially stronger performance

- 4.540 Taking account of the evidence we have presented on these key issues, it is clear that Gatwick continues to perform substantially better than either of the Heathrow schemes, most significantly in relation to the number of residential properties that would be affected. Given the potential scale of the physical impact on the local communities (and specifically the potential loss of whole communities) we consider that the Commission should revise the rating for the Heathrow schemes (with mitigation) to Highly Adverse, in contrast to the Gatwick schemes which the Commission rates (with mitigation) as potentially neutral.

Module 13: Cost and Commercial Viability

Key Points

4.541 Our response to the Commission in relation to this key area of Cost and Commercial Viability is set out below in five sub-sections:

Gatwick is the lowest cost and lowest risk scheme

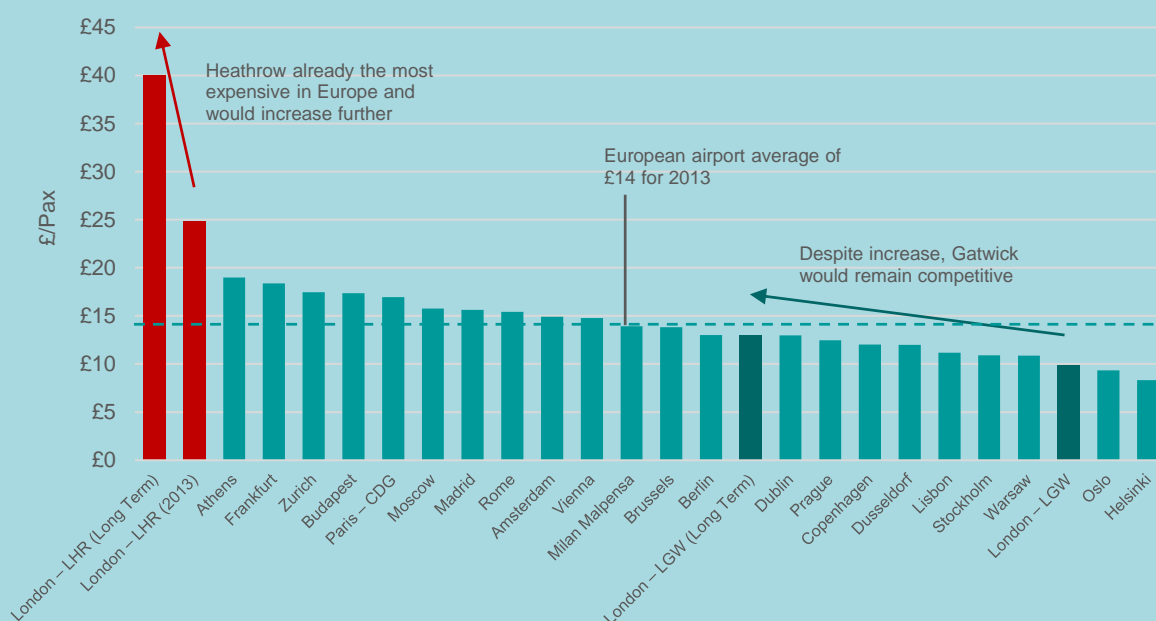
4.542 According to the Commission's analysis Gatwick can deliver the required capacity at half the cost of the Heathrow North West Runway scheme. We remain confident that the Gatwick Second Runway project can be delivered for around £8 billion. In part, this is driven by a mature risk management framework that has been tested by highly experienced expert consultants as we assembled our proposals. It also reflects the fact that the Gatwick scheme is inherently a much lower risk project that can be built on non-operational land, with much simpler political, planning and construction challenges.

4.543 In addition, we have developed a revised phasing approach that offers a better blend of cost efficiency and operational performance for the project. The first phase, which will deliver upgraded surface access, a fully operational new runway, state of the art new terminal, people-mover and associated facilities, would cost only £3 billion, a fraction of the cost of Heathrow's expansion up to runway opening. All costs would be financed by Gatwick privately with no recourse to taxpayer funding.

R2 can be delivered and financed with airport charges of £12-15 per passenger

4.544 We anticipate that the charge would be £12-15 per passenger at today's prices, in stark contrast to charges well in excess of double this at Heathrow.

FIGURE 4.13.2: AIRPORT CHARGES FOR EUROPEAN AIRPORTS



Response to Questions 4 and 5

Module 13: Cost and Commercial Viability

The Gatwick scheme can be fully privately financed

- 4.545 The combination of lower costs and risks – and our phased approach to the development – ensures the Gatwick scheme can be fully privately financed, without reliance on public sector funding, which may give rise to challenges of unlawful state aid. The very large increase in airport charges at Heathrow Airport would clearly choke off significant traffic demand compared with the much lower charges associated with Gatwick expansion.
- 4.546 Gatwick's financing requirement to deliver the first phase is substantially lower than that required for the schemes at Heathrow. There is ample liquidity in the financing market to cover Gatwick's needs, whereas the scale of Heathrow's funding requirement is unprecedented and the financing risk is accordingly substantial. We believe the Commission must recognise this differential in its financing assessment.

Gatwick is prepared to assume the majority of the risk of the delivery of the project

- 4.547 Gatwick is prepared to assume the majority of the risk of the delivery of the project through a formal contract with the Government which would ensure both provision of the capacity and a long term level of return for the provider. In this way, Gatwick will be assuming the majority of the risk associated with the new runway – consistent with the CAA's recently proposed principles on how a new runway might be financed.
- 4.548 Such an approach would deliver benefits to the Government, airlines and users – in relation to the certainty of delivery of the project; and to our shareholders – in relation to a proper understanding of the risk/reward commitments they would be taking on.
- 4.549 This proposal gives certainty for airlines, passengers, regulators and the Government early in the process – in contrast to a traditional RAB based approach which would leave open the risk of cost overruns or traffic shortfalls leading to substantial price increases for users, or possibly even putting the whole project at risk.
- 4.550 Given its importance, we believe that in its report the Commission should take full account of this innovative approach to regulation, which essentially comprises a Contract between the airport developer and the Government. Failure to consider this Regulatory approach in the Commission's analysis would be incorrect and prevent value for money being fully considered.

Next steps

- 4.551 We consider that these are key issues which the Commission must address before it can complete a fair and robust appraisal in these areas.

- 4.552 This response should be read in conjunction with Appendix 23 – EC Harris Cost and Commercial Technical Report, and Appendix 41 – Response to the CAA Draft Runway Policy, December 2014.

Cost, Risk and Delivery – Gatwick is the lowest cost and lowest risk scheme

Summary – straightforward development concept

- 4.553 Gatwick has prepared a thorough, considered and robust development plan supported by well-progressed technical plans and with a high level of confidence in its delivery to time, budget and specification. The cornerstones of the scheme continue to be its:
- **Low cost base**, supported by the simplicity of engineering design and construction, both in absolute terms (for a project of this nature) and when compared to the complexities presented by the construction of a third runway at Heathrow (including diverting the M25 and A4; extensive underground construction for baggage, rail and road access; and extensive landfill removal and remediation).
 - **Low risk of cost escalation and delay**, reflecting the non-complex nature of the Gatwick construction programme, both in absolute terms (for a project of this nature) and when compared to the risks associated with the construction of a third runway at Heathrow.
 - **Modular and phased programme**, such that the project will meet forecast future demand, but can also be flexed to adapt to changes over time in both the level of demand and the evolution of different airline business models.

Low cost base

- 4.554 We note that the Commission has independently assessed the cost of Gatwick's scheme, as well as the cost of maintaining and developing Gatwick's existing infrastructure, and broadly agrees with our projections – apart from the inclusion of various optimism biases. Separately, Gatwick has reviewed our costing approach and breakdowns with key airline partners and experienced cost consultants, which has further validated our cost projections.
- 4.555 We note that the cost estimates prepared by the Commission consultants show that the Gatwick proposal for a second runway is significantly less costly than either of the Heathrow schemes. However, it remains necessary for the Commission to review and further refine its assessment of costs to achieve a complete and fair comparison between the schemes.
- 4.556 A detailed comparison should be made between the costs of the three schemes to ensure that all costs necessary to deliver each scheme and the additional passengers are included, as outlined in the following paragraphs.
- 4.557 **Surface access costs:** While Gatwick has included all surface access costs in its business case, the Commission's assessment has considered surface access costs in isolation from the overall business cases for all three proposals, but has not indicated or taken account of the amount of public sector funding required for each proposal (as required if the Commission is following the HMT Green Book methodology⁶⁰).

⁶⁰ HM Treasury, The Green Book: appraisal and evaluation in central government, 18-April-2013.

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- 4.558 All surface access costs that are directly attributable to the scheme and the infrastructure which is required to meet projected capacity growth should also be included in the relevant business case, as shown in table 4.13.1 below.

TABLE 4.13.1: THE COMMISSION'S ASSESSMENT OF TOTAL SCHEME CAPEX, INCLUDING SURFACE ACCESS COSTS.

£m, real	Gatwick ⁶¹	Heathrow NWR	Heathrow ENR
Scheme	9.5	18.6	13.5
Surface Access ⁶²	0.7	4.8	5.3
Total	10.2	23.4	18.8

- 4.559 In addition, the Commission should identify whether these costs are to be met by the travelling public (through airport charges) or the public sector, or a combination of the two. We note the airport sector in the UK is privately financed and there are strict tests in relation to state aid.
- 4.560 **Scheme costs categorised as replacement capex:** Some very substantial costs (e.g. of expanding T2) have not yet been included in the Heathrow scheme costs comparisons prepared by the Commission, despite these being necessary to deliver the additional passengers proposed by Heathrow. These amount to some £6 billion, as summarised in the table 4.13.2 below:

TABLE 4.13.2: HEATHROW SCHEME COSTS INCORRECTLY CATEGORISED AS REPLACEMENT CAPEX

Element	Cost (£m)
Terminal T2A extensions	2,000
Satellites T2D & E	2,000
Eastern Campus TTS and Baggage, civils and equipment	1,500
Southern Road tunnel	500
Total	6,000

Source: Appendix 31 – EC Harris, Heathrow North West Runway Critique, Section 2.8.1.2, Page 33.

- 4.561 **Uplift in scheme costs by Commission:** The justification for, and reliability of, the uplift in scheme costs assessed by the Commission's consultants should be reviewed. The Commission's consultants have increased Gatwick's scheme costs (before risk and optimism bias) by 18%⁶³ and Heathrow's by only 5%. The judgements underlying these adjustments are not clearly explained and appear to be inconsistent, taking into account the relative level of detail in the documents submitted by the scheme promoters and the relative risk of the schemes.

⁶¹ Appendix 23 – EC Harris, Runway 2 – Airport Commission Consultation, Technical Report – Cost & Commercial, Page 7. The Commission's scheme estimate has been adjusted to reflect a computation error.

⁶² Surface access is stated excluding asset replacement and Opex costs.

⁶³ Appendix 23 – EC Harris, Runway 2 – Airport Commission Consultation, Technical Report – Cost & Commercial, Page 28.

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- 4.562 The Commission should apply any increases to unit construction rates consistently and transparently against all three scheme proposals. It appears that the Commission's consultants have increased the Gatwick scheme unit rates by 5.2% across the board, with no explanation⁶⁴. Moreover, the rates used by the Commission's consultants appear much higher than any we recognise, particularly for road construction, and are not consistent with benchmark rates recently compiled by Davis Langdon⁶⁵ for the Civil Aviation Authority.

Gatwick has much lower risk of cost escalation and delay

- 4.563 The Commission's analysis rightly identifies that the Gatwick scheme has the lowest risk profile of the three options in terms of construction delivery. Since the May submission, Gatwick has worked with EC Harris and Bechtel to further develop the delivery programme, cost plan and risk register through the creation of a Project Execution Plan, as well as continuing with our ongoing risk management processes. This work further underpins our confidence in the deliverability and programme timelines, and provides further robustness to our cost estimate.⁶⁶
- 4.564 We are concerned that the Commission has not fully reflected Gatwick's lower risk profile in its evaluation. It is essential that it does so in its final report. In this regard, and as outlined in the following paragraphs, the application of optimism bias by the Commission is particularly important, as is its assessment of the delivery risk inherent in the capital expenditure profile of each of the schemes.
- 4.565 The need to properly differentiate the relative riskiness of each proposal is further emphasised by the R2 Commitments proposal under which Gatwick will underwrite the majority of the project risks.
- 4.566 **Optimism bias:** We understand the Commission's purpose in applying optimism bias at this stage is to use it as a tool to incorporate and evaluate the delivery risk associated with each of the schemes. We agree that the delivery risk is an important part of the evaluation and needs to be assessed.
- 4.567 Optimism bias was specifically developed for application to public sector projects to counter "poor governance and ineffective incentivisation of cost control"⁶⁷, and has little application in the private sector.
- 4.568 Instead, drawing on Gatwick's experienced capital delivery team and the expertise of its development and delivery partners, substantial assurance work has been carried out on our cost and programme, providing a detailed and scheme specific risk appraisal. This significantly mitigates the factors that are deemed to cause optimism bias as per HM Treasury Green Book methodology.
- 4.569 We believe the Commission's approach to scheme risk analysis should similarly be to assess the actual level of risk inherent in each scheme on a consistent basis and apply the level of risk thus identified to the base costs for that scheme. However, if the Commission is to continue to apply optimism bias, then there are a number of shortcomings that the

⁶⁴ Appendix 23 – EC Harris, Runway 2 – Airport Commission Consultation, Technical Report – Cost & Commercial, Page 28. The benchmark rates used by Jacobs in their report are 5.2% higher than those used by Gatwick in our May-2014 submission.

⁶⁵ Davis Langdon – Gatwick Airport Q6 Capex Review for the CAA, Phase Three Report – Final.

⁶⁶ Appendix 28 Bechtel construction delivery report and Appendix 29 Bechtel project execution plan

⁶⁷ HM Treasury & Infrastructure UK - Infrastructure Cost Review: Main Report, Section 2.25, Page 14.

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Commission consultants must address to ensure a fair and robust comparison between schemes. In particular the Commission should:

- Review the cost percentage split between Standard Civil Engineering/Standard Buildings as recommended by the HM Treasury Green Book for each of the schemes. The current evaluation overstates the proportion of Standard Civil Engineering;
- Review whether optimism bias should be applied to benchmarked costs which already inherently include a risk allowance. We consider that such an approach results in a double counting of risk factors which is inappropriate;
- Review whether optimism bias should be applied to all project costs. We consider that such an approach results in a double counting of risk factors which is inappropriate. For example, the Commission's consultants have:
 - included an additional £250 million in the Gatwick Second Runway scheme base cost for environmental mitigation as a pure risk allowance, and then applied optimism bias on top of that⁶⁸; and
 - applied 20% risk and 20% optimism bias to Gatwick's asset replacement Capex, which already include a risk allowance of between 10% and 20%, dependent on project type.

- 4.570 The resulting optimism bias ratings should reflect the increased complexity of the two Heathrow schemes, and a higher level of risk and cost should be applied to those schemes. We think it is extraordinary that the Commission's consultants could conclude that a 20% optimism bias should be applied equally to all three schemes. This is far from a fair representation of the relative complexities of the Gatwick scheme as compared to the construction of a third runway at Heathrow (including diverting the M25 and A4; extensive underground construction for baggage; rail and road access; and extensive landfill removal and remediation). Nor does it take due account of the maturity of Gatwick's scheme development and risk assessment.
- 4.571 The shortcomings in the Commission's application of optimism bias must be rectified since, at this stage, it accounts for over 74% of the difference between Gatwick's scheme cost estimate (based on a professional, scheme specific risk assessment) and the Commission's estimate. It also has a material bearing on the relative costs of each scheme.
- 4.572 **Delivery risk inherent in the capital expenditure profiles:** the delivery risk inherent in Gatwick's scheme is significantly lower than either of the Heathrow schemes, as more fully explained in 'Module 16 – Delivery' of this consultation response.
- 4.573 The Commission needs to undertake further analysis of the expenditure profiles for each scheme, in particular to properly assess the ability of a skilled contractor to manage and deliver the expenditure in the timescale envisaged.
- 4.574 The expenditure forecasts for the Gatwick scheme and the Commission's assessment of the Heathrow schemes are set out in the charts below. It shows Gatwick has a realistic and manageable profile with annual scheme expenditure peaking at c. £600 million for Phase 1

⁶⁸ Jacobs – Appraisal Framework Module 13 - Cost and Commercial Viability: Cost and Revenue Identification Gatwick Airport Second Runway, Appendix C, Page C-7.

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(equivalent to c. £50 million per month in the peak year) and more evenly spread through a phased programme across an extended period. The Gatwick spend profile is in line with historic performance on comparable projects.

- 4.575 On the other hand, the Commission's assessment of the expenditure on both Heathrow schemes is concentrated within a relatively short time period and results in peak scheme expenditure of well over £3 billion in each of several years. Also, the Commission's analysis indicates an aggregate expenditure profile for Heathrow's plans that peaks at over £6 billion per annum in 2024, when including scheme, surface access, core, and asset replacement costs. Such levels of annual expenditure have never been achieved before on a single UK site, and were only achieved during the Olympics on multiple sites where there were no constraints on operations such as would exist at an operational airport. The Commission would do well to analyse the historic spend of major programmes of work such as the Olympics, Cross Rail, and Terminals 5 and 2 at Heathrow, including a comparison of what was said publicly at the onset of these programmes with what spend was actually achieved.
- 4.576 This unprecedented rate of spend puts into serious question the ability of the Heathrow schemes' promoters to manage and deliver against this spend profile. Gatwick's consultants, EC Harris and Bechtel, have independently assessed a realistic programme delivery year for the Heathrow North West Runway scheme to be 2029⁶⁹. This is three years later than that cited by either Heathrow or the Commission.
- 4.577 We consider that this expenditure analysis highlights a fundamental differentiating factor between Gatwick and Heathrow schemes in terms of delivery risk.

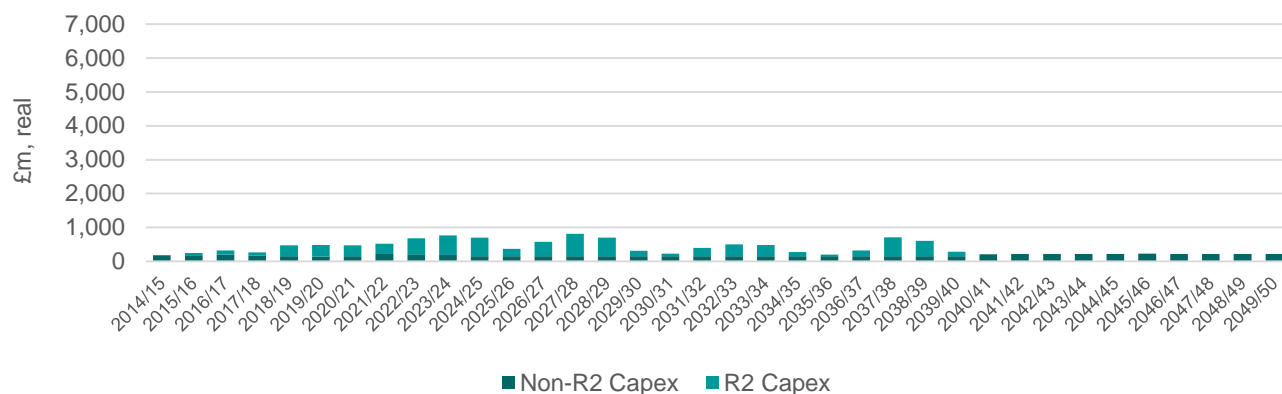
⁶⁹ EC Harris - Appendix 31 - EC Harris, Heathrow North West Runway Critique, Section 1.1.2, Page 5.

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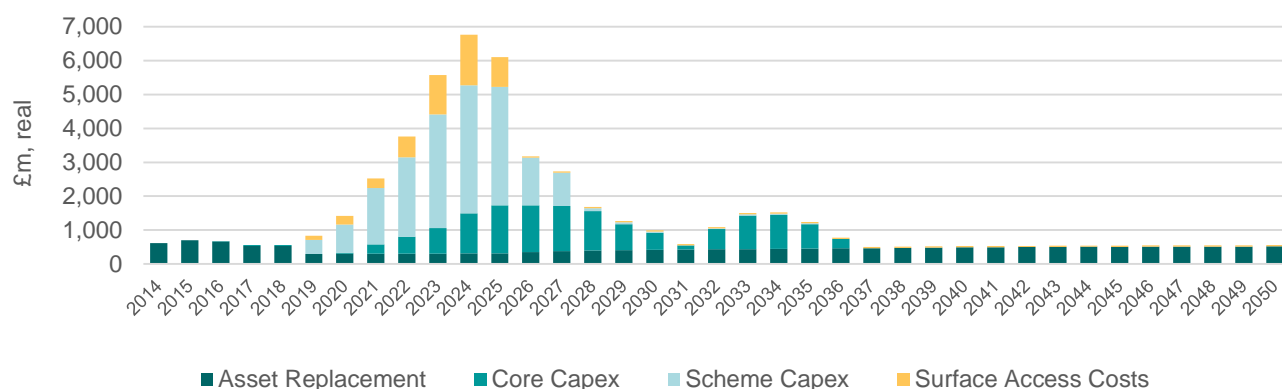
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FIGURE 4.13.1 GATWICK R2, HEATHROW NWR, AND HEATHROW ENR SCHEME CAPITAL EXPENDITURE PROFILES

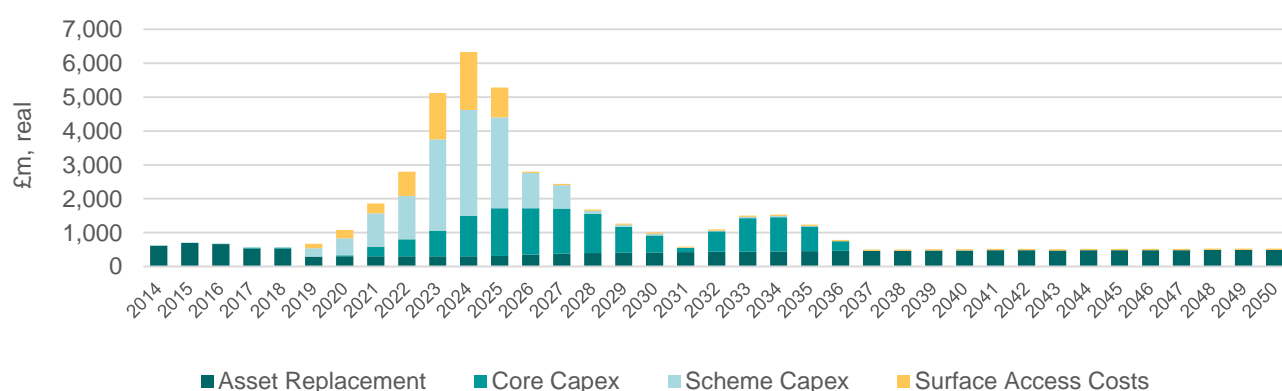
Gatwick



Heathrow North West



Heathrow Extended Northern Runway



Sources: Gatwick's expenditure profile (with updated phasing, and including surface access costs). PwC – 13 – Cost and Commercial Viability: Financial Modelling Input Costs, for HAL NWR and ENR graphs.

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Modular and phased programme

- 4.578 Gatwick has considered carefully the Commission's concerns relating to the scale of the initial phase of the second runway development. We have also discussed with our key airline partners the capacity-cost trade-off associated with the initial phase. We have developed an alternative phasing strategy, maintaining four separate phases, but bringing forward into the first phase elements of the new terminal, pier and inter-terminal shuttle. While this alternative approach increases the capital cost of Phase 1 from £2.1 billion to £3.0 billion (but not the overall capital cost of the scheme), there are significant benefits in terms of passenger experience and operational efficiency. It also can be delivered whilst maintaining the range of £12 to £15 airport charges per passenger.
- 4.579 We are confident that our revised approach to Phase 1 provides assurance of sufficient capacity to meet the Commission's top-end passenger demand, while maintaining passenger service levels and airport charges at a level appropriate in the market. This has been validated through our discussions with airlines. Further detail of our phasing and capacity analysis can be found in Appendix 37.⁷⁰
- 4.580 This modular and phased approach – not possible at Heathrow given the significant upfront expenditure (e.g. on residential / commercial property acquisitions; motorway and rail access tunnelling; landfill remediation; and site preparation) – is a key factor in enabling Gatwick to pace its investment in line with traffic growth. This significantly de-risks the project and enhances its financeability and fundability. This is discussed further in the following section.

⁷⁰ Appendix 37 – Further information on Gatwick's revised phasing strategy (including programme).

Airport Charges – Gatwick Second Runway can be delivered and financed with airport charges of c. £12-15 per passenger

Summary

- 4.581 Gatwick's May 2014 submission set out airport charges in the range of £12 to £15 per passenger over the long term. The Commission estimates of Gatwick's airport charges are significantly higher.
- 4.582 Gatwick has refined the assumptions of the phasing of development, and also has carried out additional assurance work that has further increased our confidence in our cost and programme projections. Our expected price path for the full development continues to fall in the range of £12 to £15 per passenger.
- 4.583 We note that the Commission is projecting peak airport charges for Heathrow's North West proposal of between £30 and £32 although we believe that, if this is properly to reflect the costs to users, these figures should instead be £33 and £35⁷¹ (after including surface access costs). Gatwick's own assessment indicates that Heathrow's peak charge would rise to over £40.
- 4.584 We believe it is crucial that the Commission refines its analysis of airport charges for all the schemes, with a particular focus on:
- the levels of airport charges in the context of the market being served;
 - updated traffic forecasts for each scheme;
 - **the timing of investment**, relative to the underlying traffic;
 - the **modelling of airport charges** for the financing analysis and ensuring a cap is placed on airport charges at a commercially sustainable level; and
 - **assessment of operating expenditure** and the resulting effect on airport charges.
- 4.585 Further, our Commitments proposal which we have outlined to the Commission in this submission establishes a firm price limit of £15 per passenger. This de-risking for users of the Gatwick scheme is a major factor that the Commission should take into account in its comparative assessment of the schemes.

Airport charges in the context of the market

- 4.586 Currently, Gatwick's charges are in the bottom quartile of the major European airports at £9.⁷² While charges will need to increase to fund an additional runway, they will only increase to just above the average current charge of other European airports. We are confident about the commercial viability of these charges in the context of the London aviation market and the ability to support the development of all airline business models, including LCCs.

⁷¹ PwC - 13 - Cost and Commercial Viability: Funding and Financing, Section 3.4.6.1, Page 41. Peak charges range between £30.03 and £31.88, plus £2.90 airport charge sensitivity for inclusion of surface access costs (Section 3.4.4.1, Page 38).

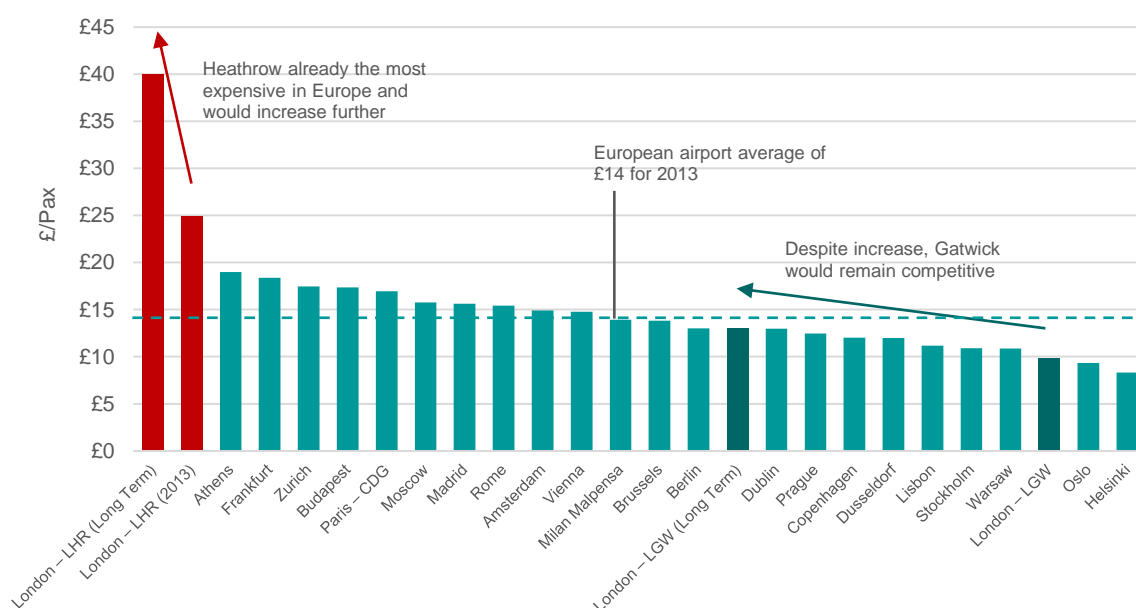
⁷² 2014/15 published Gatwick tariff.

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- 4.587 In contrast, Heathrow's charges are already the highest among major European airports, significantly more than the second highest, Athens. With an additional runway at Heathrow the discrepancy will increase further so that the charges at Heathrow could be more than twice the next most expensive major European airport. This is illustrated in figure 4.13.2. A comparison of Heathrow with international airports outside Europe also indicates that Heathrow already has the highest charges among a global comparator set.
- 4.588 Our conclusion is that charges at Heathrow would need to increase to over £40 per passenger with a third runway. This is £26 above the 2013 average of comparator airports of £14 per passenger, and 60% above 2013 Heathrow charges.
- 4.589 Gatwick's assessment of Heathrow's airport charges reflects a quantification of points highlighted in separate sections of this response, namely Module 1 – Strategic Fit, Module 4 – Surface Access, and Module 16 – Delivery. Our assumptions are summarised in figure 4.13.3.
- 4.590 We note that the Commission conducted some preliminary analysis on how its resultant airport charges fit in the context of the market. While we welcome this analysis, we believe further work needs to be carried out to establish sufficient understanding of airlines' ability to absorb and pass on such increases in airport charges in an extremely competitive market in which LCCs will be important participants. We believe it is important to feed this assessment back into the traffic projections so that the likely behaviours of the airlines in a commercially functioning market can be reflected.

FIGURE 4.13.2: AIRPORT CHARGES FOR EUROPEAN AIRPORTS

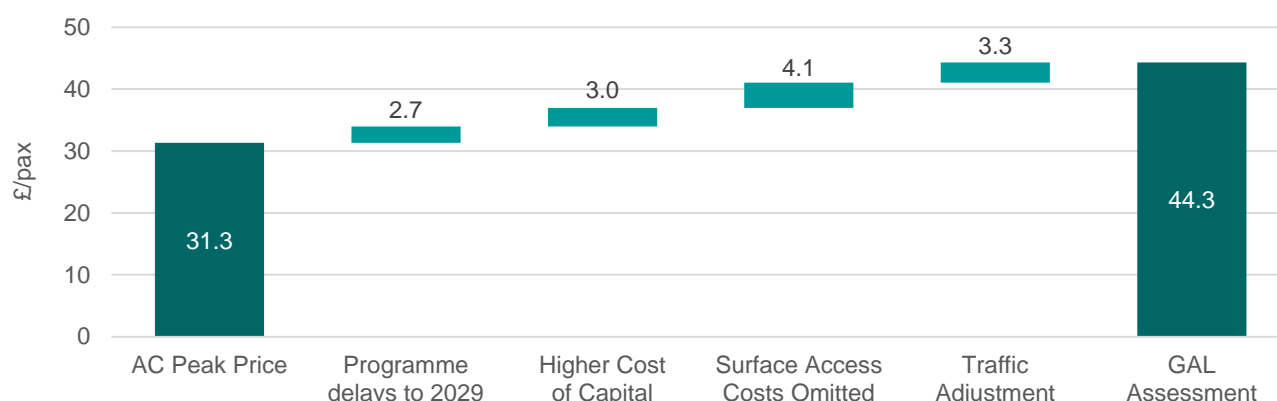


Source: Leigh Fisher – 2013 Review of Airport Charges: A Yearly Review of Airport Charges Worldwide. Adjusted by Gatwick from SDR-based charges to GBP.

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FIGURE 4.13.3: ASSESSMENT OF HEATHROW NORTH WEST RUNWAY SCHEME AERO CHARGES



Adjustments: Gatwick's consultants EC Harris have assessed the runway opening date of Heathrow's programme at 2029, which adds an additional £0.8 billion of construction phase costs⁷³. Heathrow's cost of equity has been increased by 200 basis points, to reflect a more realistic requirement for return on equity. Surface access costs (including operating costs and asset replacement) have been included at £5.7 billion, as identified by the Commission. Traffic adjustment assumes a lower ramp-up post opening of runway and a lower overall capacity level of 118 million passengers per annum.⁷⁴

Updated traffic forecasts

- 4.591 As included in Module 1 – Strategic Fit, the Commission under-forecasts the build-up of traffic at Gatwick, and over-forecasts it for the Heathrow schemes. Correcting this will have a direct bearing on the Commission's assessed level of airport charges for each scheme – lower for Gatwick, higher for Heathrow.

The timing of investment

- 4.592 Throughout the development of Gatwick's phasing strategy, our objective has been to ensure that we can continue to cater for demand at-the-time while offering a high level of passenger service effectively and efficiently, at a price the market can support. We have worked through many development and phasing iterations and have optimised our scheme against these criteria.
- 4.593 In making its adjustments to the Gatwick scheme, we note that the Commission has endeavoured to phase the investment, which as a matter of principle we support. Nevertheless, we are concerned that the Commission significantly overestimates the amount of infrastructure required for a given level of demand. This results in an unnecessary over-specification of Gatwick's construction plan, which brings forward significant costs.
- 4.594 One measure Gatwick has used to sense-check the pace of investment has been to compare the level of invested capital per passenger to that which we believe can be supported by commercially viable airport charges. This measure is a useful aid to ensure that the rate of investment is keeping pace with the level of demand and ensure the level of infrastructure provided per passenger is efficient and optimised. Large peaks and troughs in

⁷³ Appendix 31 EC Harris - LHR NWR Critique, page 2

⁷⁴ Appendix 1 - ICF International Technical Report - Traffic & Forecasts, page 64

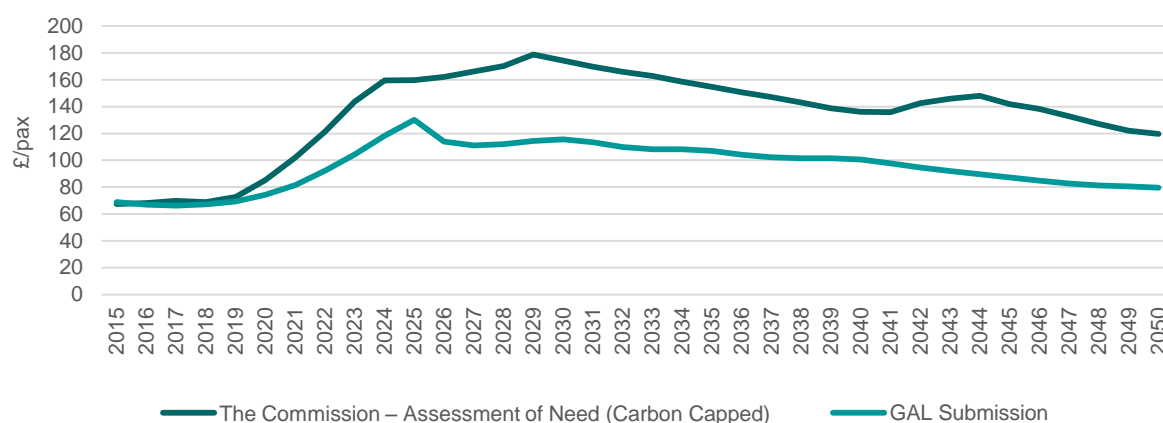
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this measure are economically disadvantageous to both airport and airlines as charges broadly need to rise and fall in line with it (albeit profiling can assist with smoothing price transitions).

- 4.595 Figure 4.13.4 below shows the Invested Capital per Passenger assumed by both Gatwick and the Commission, highlighting a significantly lower level of invested capital for the Gatwick solution, which enables airport charges to be kept at commercially viable levels.

FIGURE 4.13.4: COMPARISON OF INVESTED CAPITAL PER PASSENGER



Sources: Jacobs, Appraisal Framework Module 13 – Cost and Commercial Viability: Cost and Revenue Identification Gatwick Airport Second Runway, and GAL submission.

Financing analysis

- 4.596 Gatwick endorses an airport charge of between £12 and £15 per passenger as a sustainable business model when considering the aviation market that will likely exist ten years hence. Lower airport charges are fundamental to Gatwick's scheme: for airlines in order to attract and develop new demand, and for investors who need to be confident that the level of airport charges can be borne by the market and therefore support the generation of cash flows necessary to earn an appropriate return.
- 4.597 We believe the Commission's financing analysis needs to make a similar judgement and cap airport charges at a commercially sustainable level for all three schemes. Consequently, airport charges become an input to the Commission's analysis instead of an output. Similarly, pinch-points in the financing should no longer be plugged by unrealistic levels of airport charges and instead equity should meet any shortfalls.
- 4.598 We also suggest that the Commission's financial sensitivity analysis needs to be adjusted. Currently, under any downside sensitivity, airport charges are assumed to rise to a level that ensures returns are broadly neutral. This is unrealistic and airport charges should be capped, with the sensitivity analysis picking up the impact on debt metrics, equity and rate of return.

Assessment of Operating Expenditure

- 4.599 There are several areas of concern with regard to the Commission's projection of Gatwick's Operating Expenditure (Opex), which in aggregate add c. £2.30 to airport charges per passenger in the later years of the forecasts. We consider that the Commission should re-assess these areas.

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- 4.600 **Elasticities and Staff Costs:** The Commission uses both a passenger elasticity factor of 40% as well as an area-based elasticity factor of 40% to drive the calculation of staff operating costs⁷⁵. This overly simplistic approach results in an overestimation of Opex.
- 4.601 In 2030, when the Commission estimates the new terminal will open, it calculates that Gatwick staff costs would permanently increase by £16 million (pre risk and Optimism Bias at +20%), despite only a +2% year-on-year increase in passengers. Although Gatwick agrees that a new terminal will produce a step increase in staff costs, we have assessed this at half the rate of the Commission's assumption. The Commission also needs to consider separately the increased management and administrative overheads needed to support the operation of a second runway and third terminal, rather than projecting these in the same manner as changes to operational staff (i.e. bearing in mind that some staff costs will be largely fixed, and will not vary in proportion to passengers).
- 4.602 **Risk and optimism bias:** The Commission adds overlays onto Gatwick's Opex for both risk and optimism bias – an additional £162 million per annum by 2050. While there may be an element of short term Opex increases during the period of transition to account for the 'unknown unknowns', we question both the size of this additional overlay and whether it would continue in perpetuity.
- 4.603 **The simplistic application of optimism bias to Opex** is inconsistent with Gatwick's track record of controlling operating costs and running an efficient operation since separation from BAA. It does not take into account future planned initiatives and efficiencies (e.g. in areas such as security), and it goes against economic principles such as the 'frontier shift' under which organisations are generally anticipated to find ways to become more efficient over time (e.g. the 1% efficiency overlay applied by the CAA in the recent review of Gatwick and Heathrow)⁷⁶.
- 4.604 **Depreciation:** The Commission's method of calculating depreciation does not appear to properly reflect the underlying assets, asset lives or timing of either new or existing infrastructure. A flat percentage has been used to depreciate the RAB value of existing assets, rather than applying different rates to take into account the age of the underlying assets and their nature (e.g. a proportion being land or investment properties that attract no depreciation). Depreciation of new assets also appears to commence in the year of investment rather than at the time an asset comes into use.

⁷⁵ Jacobs, Appraisal Framework Module 13 – Cost and Commercial Viability: Cost and Revenue Identification Gatwick Airport Second Runway, Appendix F.

⁷⁶ Cambridge Economic Policy Associates Ltd (CEPA), Scope for Efficiency Gains at Heathrow, Gatwick and Stansted Airports – Final Report, April 2013, Page x (Scoping for ongoing efficiency).

Funding and Financing – The Gatwick scheme can be privately financed in full

Summary

- 4.605 In our May 2014 submission, we demonstrated that Gatwick's investment programme could be funded by its shareholders and through the private debt markets without Government support.
- 4.606 Our detailed work since has further validated this important conclusion. Our confidence in the financeability of the project in the private capital markets is based on evidence from further rating agency meetings, extensive market analysis and detailed financial modelling undertaken in conjunction with our retained financial advisor, Royal Bank of Scotland (RBS).
- 4.607 This section sets out progress Gatwick has made since our May submission in de-risking the debt funding plan, specifically:
- The re-phasing of the investment profile results in a modest debt requirement of £1.8 billion (nominal), spread over the seven year construction phase, to finance the £3.0 billion (real, 2014 prices) investment required for Gatwick Second Runway to be open in 2025. Gatwick has raised £1.55 billion in the Sterling bond markets in the last four years alone. We are advised by RBS that up to £15 billion of debt financing is available globally for the project. Gatwick's plan contemplates a diversified mix of debt instruments issued into different currency debt markets. This relatively small debt requirement and diversified strategy mitigates against the risk of financial markets disruption on the project through construction;
 - The robustness of the funding plan has been further validated through exhaustive ratings and stress scenario downside analysis. This work has included the development of a conservative Gatwick debt financing plan which reflects the credit analysis approach of our two rating agencies. Gatwick's work has robustly evidenced investment grade credit metrics within our existing capital structure throughout the construction and operation of Gatwick's second runway. Downside and stress scenario analysis confirms Gatwick's plan is resilient to operational and financial distress in all plausible scenarios. As a result, we are now even more resolute in our conviction that taxpayer support of the project is not required; and
 - While we recognise the Commission has made a lot of progress in the financing area in a short period of time, there are a number of important areas where we do not agree with the Commission's advisor, PwC, particularly in their methodology for calculating airport charges. Moreover PwC's work does not acknowledge the fundamental change in our funding platform – supported by our rating agencies and investors – away from a traditional RAB based covenant basis.
- 4.608 This analysis also confirms Gatwick has a "fit for purpose" capital structure, which is ready to finance the scheme.

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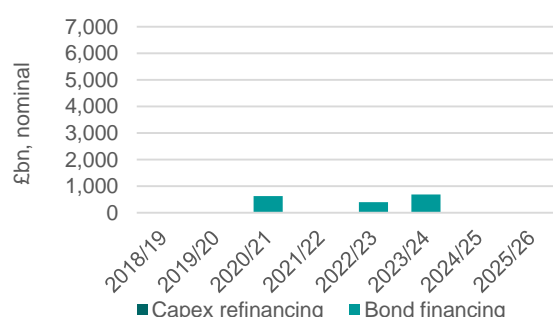
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Scale of funding: Gatwick and Heathrow

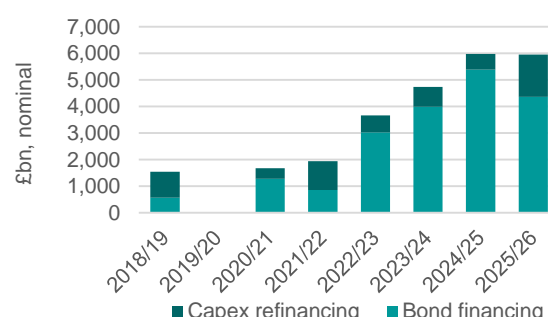
- 4.609 Debt market capacity for a new runway is a critical issue. In this section, we expand on investor appetite for UK infrastructure debt and relate this back to the level of debt required for each of the expansion schemes.
- 4.610 The Commission analysis has identified the enormous difference in financing requirements between the various schemes but fails to differentiate between the total aggregate funding requirements over the next thirty years as each business grows and expands capacity as distinct from the challenge of how would the business fund the initial expansion, then the next phase, then the next? In this regard, the most crucial phase is the financing required to fund an initial phase:
- Heathrow's North West runway scheme requires a level of debt in excess of £30 billion⁷⁷ (nominal) by 2025, which is an increase of £19 billion compared to today. When combined with its known bond re-financing requirements of c. £5 billion⁷⁸ by 2025, then over the six year construction period to 2025 Heathrow will need to issue £24 billion of debt. This is equivalent to at least one benchmark bond (c. £300 million) every single month for six years, irrespective of market conditions. Naturally, the actual issuance profile would be less smooth and Heathrow's debt funding requirements might peak above £6 billion in some years. Of course, it should also be noted that the inclusion of all surface access costs would further compound this funding rate.
 - In comparison, the Commission's estimates indicate the Gatwick scheme requires incremental debt of £3.2 billion (nominal) between 2018 and 2024. Based on Gatwick's own revised Phase 1 programme, the level of issuance is smaller still at just £1.8 billion (nominal) before the runway opens. In either case the debt markets can comfortably accommodate this amount of issuance.
 - This demonstrates that Gatwick's debt financing risk is orders-of-magnitude lower than for other schemes. This is evident from Figure 4.13.5, which shows the difference in corporate bond issuances between the two schemes.

FIGURE 4.13.5: TOTAL CORPORATE BOND ISSUANCES: GATWICK VS HEATHROW NWR

Gatwick bond issuance



Heathrow bond issuance



Sources: Gatwick bond issuance sourced from Gatwick's financial model. Heathrow bond issuance sourced from PwC Funding and Financing report.

⁷⁷ PwC - 13 - Cost and Commercial Viability: Funding and Financing, Section 3.4.5, Page 40.

⁷⁸ PwC - 13 - Cost and Commercial Viability: Funding and Financing, Section 3.4.7, Page 45.

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- 4.611 We note that the Commission has identified only two comparator companies that would have a similar scale of debt to Heathrow – Network Rail and National Grid. While they may reflect similar levels of debt and operate in regulated environments, these companies are both pure network monopolies with a wholly captive user base with a distinctly lower risk profile than an airport, which must compete for business. Furthermore, Network Rail's issuance is backed by a contingent UK Government guarantee and as a result is viewed by the capital markets as a quasi-sovereign issuer rather than an infrastructure corporate.
- 4.612 As well as strengthening our confidence that the Gatwick project can be 100% privately financed, our further work has focussed on proactively de-risking the funding plan to ensure financial robustness in case of disruption to the debt markets:
- While the Sterling bond markets in its own right is sufficiently liquid for Gatwick's needs, our financing plan envisages a broadening of debt instruments to ensure the availability of investment debt financing is not restricted to any one product or market;
 - The plan envisages Gatwick accessing the EUR and USD public bond markets in addition to the core Sterling market which has historically supported Gatwick's £1.55 billion bond raising to date;
 - Gatwick can also access supranational funding sources (like the European Investment Bank (EIB)) and sources of institutional and other private forms of capital which have been increasingly active financing investment in the UK airports sector;
 - We assume modest individual bond issuances in our financing plan of c. £300 million – comfortably achievable in any approach to the capital markets;
 - The financing plan includes managing two existing £300 million bonds, which are currently due to mature in 2024 and 2026, to extend these maturities long before runway construction begins. This ensures Gatwick has no refinancing risk of existing debt in this important period for the project;
 - If necessary, Gatwick can significantly broaden its core bank group from our five relationship banks currently to source further liquidity in case of bond market disruption; and
 - Flexibility of an equity commitment as the ultimate contingency protects against the extremely unlikely scenario of sustained bond and bank market disruption.
- 4.613 Gatwick has confidence that up to £15 billion of debt markets liquidity will be available from multiple sources to finance the anticipated £1.8 billion debt requirement to fund construction to the runway opening. The relatively small scale of this funding means Gatwick needs to access the bond market only a maximum of six times before the opening of the new runway in our phased base case.
- 4.614 The £1.8 billion required should be seen as a natural extension of our existing bond issuance programme. Gatwick has issued £1.55 billion in five approaches to the market since Gatwick's funding platform was established in 2011. We received total orders from investors of £4.8 billion, more than three times over subscribed. This provides additional comfort on the debt sizing required.

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- 4.615 The USD and EUR public bond markets have been a significant source of liquidity for UK infrastructure issuers with more than £40 billion equivalent raised since 1990. In 2013 and 2014, UK infrastructure companies issued in aggregate c. £3.7 billion and £3.4 billion and today c. £20 billion debt is outstanding. This diversification into non-sterling bonds gives access to a wider investor base which has significant appetite to invest in UK infrastructure and would provide further liquidity to Gatwick albeit for shorter tenors and subject to the incremental costs of required cross-currency swaps. This option is one that Gatwick will pursue to de-risk our funding programme. For Heathrow, this is an absolute necessity given its funding requirements dwarf the levels of capacity in the UK market.
- 4.616 While the Commission references the impact of maturing debt as part of each airport's funding requirement, we believe that insufficient emphasis has been placed on the risk of refinancing during the project build phase.
- 4.617 Making a thorough comparison between sponsor financing proposals requires the Commission to evaluate fully the impact on each overall financing structure of debt maturing during the period of heavy capital expenditure. Gatwick's debt structure is based on the assumption of early refinancing of existing bonds that were due to mature in the 2020-25 period so that there is no adverse impact during construction, when new debt needs to be raised. This is possible for Gatwick given it has only £600 million maturing in this period. Conversely, Heathrow has a significant number of bonds (£5 billion) that need to be rolled over during the same period. This is likely to encounter both liquidity and credit issues and the quantum is too large and costly to liability manage ahead of maturity.

Update on Gatwick's funding and financing approach

- 4.618 Gatwick has carried out further work on its financing approach in light of our alternative phasing plan and the development of our R2 Commitments. As we have mentioned above we believe the Commission should place more emphasis on the financing assessment of the first phase of project delivery.
- 4.619 This section highlights the viability of our near term financing and demonstrates the robustness of our financing platform that underpins our R2 Commitments.
- 4.620 The first phase of the capital investment is £3.8 billion in nominal terms (which is equivalent to the £3.0 billion in 2014 terms). This will be financed through £1.8 billion (nominal) of debt and £2.0 billion (nominal) of equity, comprised of retained and reinvested surplus cash flows and new equity injections. Our debt requirements would be financed within our current debt structure with a continuing objective to maintain strong investment grade credit metrics.
- 4.621 Through the construction period, funds will be drawn from a committed banking facility to finance construction costs. Gatwick will put in place a medium term (5-7 years) Committed Revolving Credit Facility (CRCF) through our existing bank syndicate, and additional new banks as necessary. Sizing of this facility will be finalised closer to the time. The facility will ensure the construction programme is funded while allowing Gatwick flexibility to refinance into long dated bonds before it becomes fully drawn.
- 4.622 The funding plan assumes that as the CRCF is drawn to c. £300 million Gatwick will issue into the bond markets, using competing sources of finance to achieve best pricing and terms.
- 4.623 To minimise execution risk and achieve the lowest cost of funds in the bond markets Gatwick plans to issue modest "benchmark" sized bonds of ca. £300 million. Bond proceeds will be

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used to repay the bank facility creating headroom for further drawdown to fund construction costs. This approach replicates Gatwick's existing successful financing arrangements and is typical in the European infrastructure sector. Over the life of the project, short term bank debt is fully financed into the long term bond markets.

- 4.624 As discussed above, Sterling will not be the only currency market available to Gatwick. Gatwick's financing arrangements are documented to facilitate bond issuance in multiple currencies. The most likely issuance currencies are EUR and USD which we assume at this stage in our financing plans.
- 4.625 Gatwick will nonetheless analyse all available markets, including private and institutional markets. The capital structure and relatively modest issuance sizes allow Gatwick to issue bonds on an opportunistic basis. This enables Gatwick to continually optimise the cost of debt and proactively manage our maturity profile and liquidity position.
- 4.626 Importantly it also mitigates against any significant bond market disruption/closure which might otherwise put the funding of the construction programme at risk.
- 4.627 Gatwick may also secure long term funding from the EIB or other Supra-Sovereign agencies as has been seen in similar projects across Europe. This amount may be up to £1 billion in total. Gatwick is not reliant on this lending and can use this funding to compete with other debt sources.

Rating Agency Engagement and Analysis

- 4.628 Gatwick has continued to engage with Standard & Poor's (S&P) and Fitch who currently rate the business to gain comfort around our financial resilience through the construction of the second runway. Moody's does not rate Gatwick and is unfamiliar with our airlines.
- 4.629 The scheme has been presented to and discussed with S&P and Fitch. Our two agencies have confirmed their expectation that they will not fundamentally change the way they assess Gatwick's credit, subject to the impact of cost overruns or delays and the resulting impact on cash-flow generation.

Downside Stress Analysis

- 4.630 The outcome of these discussions has been the creation of a more conservative "Financing Case" to stress our own base case and ensure the sustainability of the financial performance through the lens of the credit agencies. The presentation of our debt and equity figures of £1.8 billion (nominal) and £2.0 billion (nominal) respectively are based on this Financing Case.
- 4.631 The core credit ratios and published guidance thresholds which our two rating agencies use have then been used as the basis for a rigorous analysis of the resilience of our funding plan.
- 4.632 We have tested our expected R2 Commitments price path against a set of more conservative assumptions around traffic and capital cost, noting concerns raised by the Commission. We have also increased the cost of debt and considered other "downside" scenarios which might materialise over the life of the project.
- 4.633 Figure 4.13.6 illustrates the evolution of the three primary credit metrics used by S&P and Fitch in their Ratings assessment under our conservative "Financing Case". The ratio outputs are set alongside their threshold guidance on a future negative rating action. Our debt ratios are most stressed immediately before the second runway opening when

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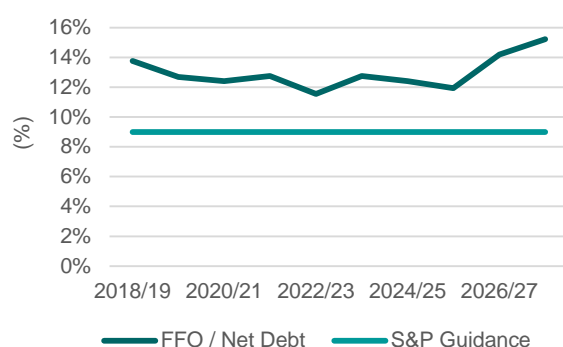
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cumulative expenditure is at its highest, but there is no incremental traffic; hence the graphs do not look further than 2027.

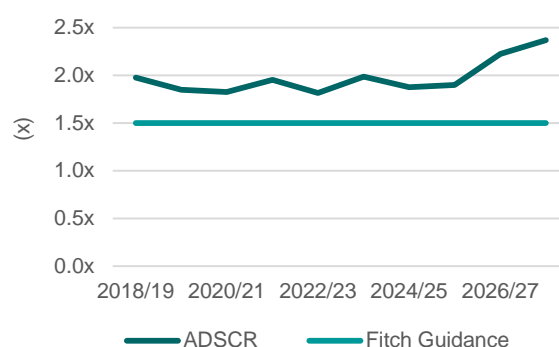
- 4.634 The ratio profiles confirm the robustness of Gatwick's approach. Our primary rating agency metrics remain compatible with preserving our current BBB+ rating.

FIGURE 4.13.6: CREDIT RATIOS UNDER GATWICK'S FINANCING CASE

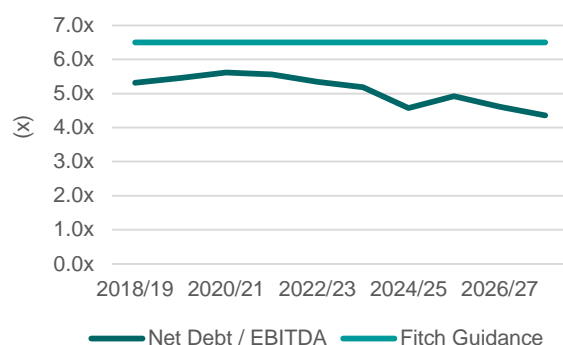
FFO / Net debt



Annual debt service coverage ratio (ADSCR)



Net debt / EBITDA

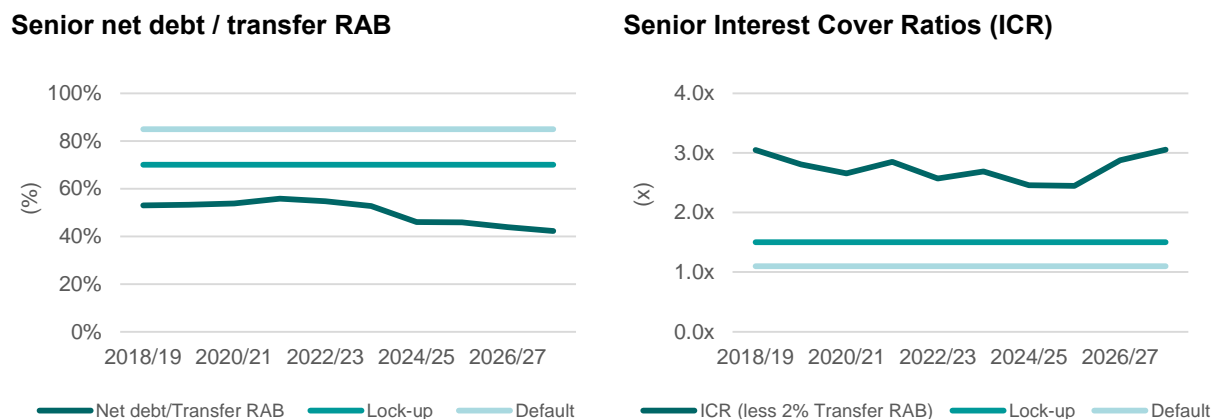


- 4.635 Similarly, our ratios remain comfortably compliant with our covenanted debt and coverage thresholds as highlighted in Figure 4.13.7.

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FIGURE 4.13.7: FINANCIAL COVENANT RATIOS UNDER GATWICK'S FINANCING CASE



- 4.636 Moreover we have tested the resilience of the financing plan against the stressed downside scenarios suggested by PwC in its report to the Commission⁷⁹. Figure 4.13.7 below illustrates that in all cases the financing remains robust. Applying the PwC stresses to even our more conservative Financing Case does not put the financeability of the scheme at risk.
- 4.637 As a further, very significant, downside test we have combined all the PwC stresses to replicate the extremely unlikely event that all the distressed sensitivities occur together.
- 4.638 The analysis shows that even in this highly improbable case, the financing remains Investment Grade and the covenants are met. Moreover with modest and achievable management mitigation the capital structure retains credit ratio metrics consistent with BBB+ from both Fitch and S&P. This can be seen in Table 4.13.3.

TABLE 4.13.3: EFFECT OF PWC SENSITIVITIES ON GATWICK'S FINANCIAL RATIOS

Sensitivites / Ratios	FFO/ Net debt		Net Debt / EBITDA		ADSCR	
Rating agency guidance	> 9%		< 6.5x		> 1.5x	
	Minimum	Average	Maximum	Average	Minimum	Average
Capex + 10%	11.4%	12.3%	5.73x	5.44x	1.83x	1.90x
Opex + 10%	11.5%	12.3%	5.88x	5.46x	1.78x	1.86x
Non-aero revenues - 10%	11.4%	12.3%	5.91x	5.48x	1.78x	1.85x
All-in cost of debt + 100bps	11.8%	12.7%	5.43x	5.08x	1.76x	1.86x
Inflation + 100bps	13.5%	14.3%	5.19x	4.81x	1.99x	2.07x
PWC combined case	8.4%	9.5%	6.74x	6.41x	1.42x	1.53x
PWC combined case: Mitigated	9.6%	10.2%	6.42x	6.06x	1.50x	1.57x
Financing case	11.6%	12.4%	5.61x	5.29x	1.81x	1.88x

- 4.639 The financeability assessment above forms a critical part of the Financial Case, and needs to be taken into account in the Commission's conclusions. We would therefore welcome a meeting with the Commission to run through the detail of this analysis and the assumptions that underpin it.

⁷⁹ PwC - 13 - Cost and Commercial Viability: Funding and Financing, Section 2.4.4.1, Page 20

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Further enhancements to the Commission's Modelling approach

- 4.640 Although we note that good progress has been made by the Commission on the funding and financing assessment, we do not believe the Commission's methodology is sufficiently transparent, particularly in relation to the formulation of airport charges.
- 4.641 We would therefore welcome the opportunity to engage with the Commission in this area to get a better understanding of its approach, as well as work collaboratively to further improve its methodology.
- 4.642 From the Commission's consultation documents, we note a number of areas where we consider it critical to make some amendments, all of which have a material impact on the funding and financing case. We explain the main points below.
- 4.643 The Commission does not reflect our current or proposed capital structure when assessing Gatwick's debt capacity, but instead assumes a RAB based funding programme. Gatwick is no longer regulated through a traditional RAB framework as PwC seem to suggest and it would be incorrect for the Commission to place reliance on this approach.
- 4.644 Gatwick's financing is now effectively managed through Net Debt to EBITDA covenants (what has become known as Transfer RAB), and has been contractually agreed with bondholders and lenders as part of our existing financing platform. This is consistent with the Q6 regulatory settlement with the CAA.
- 4.645 Rating agencies and Gatwick bondholders are both supportive of the evolution of the capital structure away from a RAB basis. Rating agency publications – most recently Fitch 15 January 2015⁸⁰ and S&P 12 March 2014⁸¹ – validate this. Gatwick has successfully raised new debt since this change to the capital structure was announced to the market last year. In March 2014, Gatwick received £1.3 billion orders from 156 investors for our £350 million 2034 bond. 60% of the orders came from new investors not previously invested in Gatwick.
- 4.646 The Commission also does not reference Gatwick's own funding and ratings analysis, which reflects our discussions with our two rating agencies, set out above. During the process of our original submission, we met with both Fitch and S&P to identify the approach that each would likely take to rate debt associated with the build of a second runway.
- 4.647 While the Commission states that it adopted a similar methodology, it does not give any substantive explanation of the ratings analysis and most importantly of the component calculations and thresholds of the credit agency ratios.
- 4.648 The Commission's rating agency approach suggested that debt capacity is mostly limited by the Net Debt to RAB ratio in the early years. We know from our own modelling in conjunction with our financial advisors RBS this is not the case.
- 4.649 The Commission's approach is therefore of considerable concern as it appears that the analysis undertaken may have been based upon the misinformed use of ratios and credit metric thresholds.

⁸⁰ Fitch Ratings – 15 Jan 2015, Fitch Affirms Gatwick Funding's Bonds at 'BBB+'; Outlook Stable.

⁸¹ S&P's – 12 March 2014, Gatwick Funding's Asset-Backed Notes Affirmed at 'BBB+' Following Updated Regulatory Framework.

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- 4.650 We are also concerned by some of the Commission's input assumptions on equity funding. We do not consider the equity rate of return used by the Commission as reflective of a normalised return for an infrastructure investment of this nature in the UK. The Commission also assumes that equity holders would require an annual cash return, an assumption which would ultimately put unnecessary financial pressures on any of the promoted schemes.
- 4.651 However, the requirement for a cash return depends very much on the type of investor involved. Long term infrastructure investors are typically comfortable with a deferment of cash returns for a period of time, especially where this offsets the need for further capital injections. A deferment of distributions also maintains healthy financial ratios prior to the opening of a new runway, with operating earnings being used to fund infrastructure development. As a step increase in cash inflow occurs with runway opening, particularly under Gatwick's own traffic forecast and the Commission's Low Cost is King scenarios, payment of dividends can then resume.
- 4.652 We also believe the Commission's work on debt funding needs to consider other important areas. The Commission appears to ignore hedging costs in their cost of debt analysis. This is particularly important for the funding plan going forward; the depth of global markets to finance capital investment is driven as much by hedging liquidity as bond market capacity.
- 4.653 Finally, the Commission does not reference any analysis of the airport debt capital markets. For example, we would expect Gatwick's senior debt to have a price premium that is no more than 10 basis points wider than Heathrow's, in line with market pricing. Similarly, we do not believe that consideration has been given to the fact that Gatwick has no junior debt (i.e. Class B). We would therefore expect that analysis of Heathrow's proposal would separately price any Class B debt. Overall, we would expect a blended average cost of debt for Heathrow across Class A and Class B to be higher than that of Gatwick, reflecting the more highly leveraged, near ratio threshold, two tier debt capital structure utilised by Heathrow.
- 4.654 We look forward to engaging further with the Commission on these important points.

R2 Contracts and Commitments – Gatwick is prepared to assume the great majority of project risks

Summary

- 4.655 In our May submission we outlined our views on commercial viability and on the role of Government in relation to airport expansion. We made our view clear that this investment does not need to be underpinned by the Government. This would only be the case if the investment proposed is out of kilter with the market that it is seeking to serve.
- 4.656 We also explained our assessment of the key risks. These must be considered over an extended period of time to match the duration over which an appropriate return will be earned. Given the front end-loading of the capital investment the airport will be exposed to regulatory or political risk, in particular at the time when investment is sunk and after a period of planned lower returns; changes at that point in the political or regulatory landscape may not allow investors to recoup an appropriate return. Consequently, we outlined that it may be necessary for the Government to provide assurances to financial investors as to the scope for future regulatory intervention. We also said that Gatwick's existing Contracts and Commitments framework is an approach that could support a new runway at Gatwick, and committed to developing this approach further.
- 4.657 Accordingly, we welcome the Commission's approach of developing a risk framework within its Financial Case and are pleased that this is a key area of focus in its funding and financing assessment. Gatwick believes it is critical the Commission takes into account how risk is to be managed, for the three proposals. So far, the Commission's economic assessment has applied the same RAB-based model to all three schemes. This approach places most of the risk on the user.
- 4.658 As an alternative approach to managing economic risk, we explain the principles of our R2 Commitments in this response. We have also submitted these principles in response to the CAA's consultation on its draft policy on Economic Regulation of New Runway Capacity (CAP1221)⁸². We envisage R2 Commitments to comprise a contractual undertaking between Gatwick, the Government and the CAA. This contract will establish a long-term framework for the expansion of the airport, the specification of service standards, and the setting of airport prices. We envisage the R2 Commitments extending to 2050 to match the long term nature of the funding and financing of a new runway.
- 4.659 Under these terms, Gatwick would be committed to delivering the second runway and the initial phase of the third terminal by the end of 2025, with expected long-term prices in the range of £12 to £15 net airport charges per passenger. To protect airlines and passengers against increases in price, we propose a firm price limit of £15 net airport charges per passenger. In limiting the scope for price increases, Gatwick would carry the great majority of the investment risks associated with the expansion, primarily: traffic, construction and market price risk. Gatwick's ability to underwrite risks in this manner reflects the confidence it has in its R2 development and business plan.

⁸² Appendix 41: Gatwick Airport Limited. Response to CAA Draft Runway Policy, December 2014

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- 4.660 We believe there are significant benefits of a Commitments approach, as compared to a standard RAB based model. A substantive element is the focus on delivering key outputs with less focus on determining how these outputs are to be delivered. This results-based approach drives greater innovation and eliminates the tendency for the regulator to micro-manage the airport. We also believe it provides an appropriate backdrop in which value creating contractual arrangements between the airlines and airports can be developed. R2 Commitments also gives certainty to users and the Government that risk can be allocated to the airport, while still ensuring that expansion is delivered, for a capped price. A fuller description of the benefits of R2 Commitments, as well as the drawbacks of a RAB-based approach, can be found in Section 3 of our response to the Civil Aviation Authority.⁸³

Treatment of risk

- 4.661 So far, the Commission has assessed the economic benefits and financing case of all three schemes using a conventional RAB based model. A RAB based model tends to place most of the risk on users, as constantly lower traffic or higher capex would result in price increases. Gatwick's R2 Commitments are very different in that the airport assumes the great majority of the key project risks with a cap on prices.
- 4.662 We believe the way the regulatory regime is changing needs to be acknowledged by the Commission and that different approach to risk needs to be taken into account in its assessment.
- 4.663 We outlined our R2 Commitments proposal to the CAA in December in our response to its draft policy on the economic regulation of new runway capacity. We have re-iterated and refined the relevant section below that summarises our proposal.

Gatwick's proposal for R2 Commitments

- 4.664 Gatwick proposes to extend to the second runway scheme the successful concept of Commitments already entered into by Gatwick as an alternative approach to managing economic risks at the airport. This chapter sets out a summary of the key principles that have shaped the proposal, together with an outline of the R2 Commitments that we are putting to the Government, through the Commission. We also set out the next steps which we will need to undertake.

Building on the existing Commitments

- 4.665 During the most recent review of economic regulation at Gatwick Airport, the concept of Commitments was supported by the CAA as a better approach than a RAB based price control, aligning the interests of airlines and airport and allowing the development of commercial bilateral arrangements. The CAA backed-up the Commitments approach with a licence and monitoring programme.
- 4.666 These "existing Commitments" set out, amongst other matters, the service standards that Gatwick will deliver to passengers and airlines, the minimum investment in infrastructure it will undertake, and the limits on airport charges that Gatwick may levy. The existing Commitments have a 7 year duration. The Commitments provide an overarching framework

⁸³ Appendix 41: Gatwick Airport Limited. Response to CAA Draft Runway Policy, December 2014

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within which Gatwick and its airlines can operate, but also allow for the development of bilateral contractual arrangements between Gatwick and individual airlines.

- 4.667 The R2 Commitments are a logical extension of this successful concept, providing a long-term framework for investment in the airport, the specification of service standards, and the setting of airport prices. However, given the transformational nature of the Gatwick Second Runway in terms of economic value for the UK and the scale of the investment required, the R2 Commitments differ in that they are envisaged to comprise a contractual undertaking between Gatwick, the Government and the CAA.
- 4.668 We are encouraged to note that the CAA's draft policy paper recognises that "the commitments approach adopted at GAL ... could provide a useful framework for us to build on".

Risk allocation

- 4.669 In proposing the R2 Commitments, we have taken into account the CAA's first principle that: risk should be allocated to those who can manage it best. The R2 Commitments provide that the airport bears long-term traffic, market price, and construction risks, while having the latitude to set prices within certain defined boundaries. This approach to risk management similarly creates the right incentives to efficiently manage the development and operation of the airport.

Commercial negotiations

- 4.670 In drafting the R2 Commitments, we have taken into account the CAA's second principle that: commercial negotiations should be encouraged. The implementation of an overarching Commitments framework has enabled already Gatwick to enter into a series of long-term bilateral contracts with airlines. We are confident that, in due course, such contracts can form the basis of extended bilateral agreements encompassing the development of a second runway.
- 4.671 Nevertheless, it must be recognised that the level of uncertainty surrounding the second runway development – not least the timing of any Government decision – is likely to affect the negotiation timetable for such contracts. In this context, the R2 Commitments play an important role in the near-term in providing sufficient certainty (to the airport, Government, passengers and airlines) to progress the planning and development of the second runway.
- 4.672 Further, business models of airlines have evolved in recent years and, in a competitive airline market, they are extremely cautious around providing absolute volume guarantees and/or entering into fixed price arrangements of any meaningful duration. But, medium to long-term contracts with year-by-year incentives to maintain and grow passenger volumes are certainly achievable. Such arrangements, while not fully mitigating long-term traffic and market price risks for the airport, will remain important as a means of accelerating traffic growth and building the airport's market share at a predictable price. In this context, R2 Commitments will play an important role in providing a framework within which multi-year contracts can be put in place and extended and replaced over time.
- 4.673 In structuring the R2 Commitments, we propose to put in place an overarching framework, involving the airport, Government and CAA (acting on behalf of Government and passengers). This framework – extending out to c. 2050 – will provide the airport with the

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necessary confidence to bear long-term traffic, market price, and construction risks, while encouraging commercial negotiations with airlines.

Key elements of the R2 Commitments

- 4.674 Set out in the following paragraphs is a summary of the principal terms of the R2 Commitments.

Form of R2 Commitments

- 4.675 The existing Commitments are a 7-year contractual undertaking between Gatwick and its airlines, backed by a licence issued by the CAA. Bilateral agreements of similar duration have been negotiated between Gatwick and individual airlines, within the framework of the existing Commitments.
- 4.676 The level of capital expenditure planned within the existing Commitments period is sizeable, being approximately £150 million p.a., with a balance between replacement and expansionary expenditure. However, the development of a second runway requires much more substantial investment and is a project of much greater national significance. This, we believe, requires a shift in emphasis as compared with the nature of the existing Commitments.
- 4.677 The R2 Commitments differ in that they are envisaged to comprise a contractual undertaking between Gatwick, the Government and the CAA. This contract will establish a long-term framework for the expansion of the airport, the specification of service standards, and the setting of airport prices. While envisaged as a contract, it may be that alternative statutory or legal mechanisms might be, or need to be, employed to achieve the same outcome – this will be something to be considered in due course.
- 4.678 It is expected that over time we will seek to renew or renegotiate the bilateral contracts already signed with certain airlines, and enter into new agreements with other airlines seeking to access the airport. These contracts would sit within the longer-term R2 Commitments framework.

Duration of the R2 Commitments

- 4.679 The existing Commitments have a duration of 7 years, with potential for extension. This was appropriate in the context of a relatively mature business with a capital programme of c. £150 million p.a. on average over this period, and a balance of expansionary and replacement projects.
- 4.680 A much longer duration is required to accommodate the transformational expansion of Gatwick with a second runway, reflecting: the long-lived nature of the assets; the time taken to fully utilise the new capacity; Gatwick's proposal to smooth prices such that returns are lower in the initial years of the second runway scheme; and the need to match the tenor of the financing.
- 4.681 The R2 Commitments are envisaged to extend to 2050, effectively 25 years from opening the second runway, and 35 years from recommendation by the Airports Commission.

Infrastructure development

- 4.682 The cornerstone of the R2 Commitments will be an undertaking by Gatwick to complete the second runway and initial phase of the third terminal by the end of 2025 ("Phase 1"), subject

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to completion of the necessary planning process by no later than December 2019. This will deliver the increase in capacity required to accommodate the traffic anticipated by the Airports Commission out to the mid-2030s (under almost all traffic scenarios). Gatwick is committed to delivering this at a price range of £12 to £15, which can be set today (see “Price” section below). We will continue to refine these development proposals through consultation with representatives of passengers, the CAA and airlines, and through the planning process involving local authorities and the general public.

- 4.683 Gatwick has also set out in considerable detail for the Airports Commission its plans for further terminal capacity increases (Phases 2, 3, 4) in the 2030s and 2040s. However, the timing and scope of these subsequent developments are naturally less certain, and will be defined and delivered at such time as required to meet passenger demand and the then prevailing passenger service standards. As such, consequently, the Phases 2+ developments are not pre-determined at the outset by the R2 Commitments. But, recognising that the airlines and the CAA will want to ensure that these developments are appropriate at the time they are needed and defined in 2030s and beyond, we propose that they will be subject to:
- Appropriate consultation at the relevant time, including as to scope, timetable and cost (including the resultant effect on airport charges); and
 - The approval of airlines and/or CAA, if there are required changes to the R2 Commitments prices.
- 4.684 The combination of consultation and approval will provide significant assurance to the airlines and the CAA.

Service

- 4.685 The existing Commitments specify airport-wide core service standards that Gatwick undertakes to meet, and the rebates paid in the event that it fails to do so. The standards encompass a range of matters relevant to passenger service (e.g. reliability lifts and escalators, security clearance times, pier service) and availability of equipment for use by the airlines (e.g. outbound and inbound baggage systems), and includes the results of a qualitative passenger survey.
- 4.686 These standards will be replicated in the R2 Commitments. However, given the extended duration of the R2 Commitments and the likelihood that passenger and airline requirements will evolve over time, we believe there should be provision for a periodic review of these airport-wide service standards. It is envisaged that the CAA would be best placed to represent the general passenger interests in agreeing any such changes.
- 4.687 Of course, the requirements of individual airlines – if different to the airport-wide service standards – can be dealt with separately through bilateral agreements, as is currently the case.

Price

- 4.688 The airport would carry the great majority of the investment risks associated with the expansion, primarily: traffic, construction and market price risk.
- 4.689 We believe that market conditions – currently, and most certainly in the future if there is additional runway capacity at Gatwick or Heathrow – are likely to be such that there is no

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requirement for the regulation of prices at Gatwick. Nevertheless, we recognise that airlines and the CAA will take significant comfort from some form of price oversight. Further, even if such oversight is not imposed at the time that the new runway is open, it may emerge at some later stage when the airport has already sunk significant capital into the airport expansion. This exposes Gatwick to political and regulatory risks, over-and-above the core investment risks noted above.

4.690 To address both these concerns, we believe it is essential that the R2 Commitments establish firm boundaries within which Gatwick can exercise pricing discretion. The details of these will need to be refined in due course. However, the key principles are as follows:

- Real terms: All prices are quoted in terms of 2014 prices, and will be indexed annually at RPI;
- Price basis: The primary price benchmark will be net airport charges per passenger, since this relates to the actual charges per passenger received by Gatwick (after discounts) for the provision of airport core services;
- Expected price path: The R2 Commitments will set out an expected net price path, taking into account Gatwick's base case assumptions on traffic, capital expenditure, etc. Actual prices may be higher or lower than this dependent upon market conditions and the crystallisation of risks;
- In our submission to the Airports Commission in May 2014 we indicated that net prices are expected to fall in the range of £12-15 per passenger over the duration of the R2 Commitments, building from c. £9 per passenger in 2014/15. This remains our expectation;
- Discounts given under the terms of bilateral agreements will generally be applied relative to the published tariff. It is expected that the level of discounts will be higher in the initial years following the opening of the second runway than in the years immediately before, reflecting the tighter capacity prior to the runway opening, and release of capacity thereafter;
- Firm price limit: In order to protect airlines and passengers against increases in prices, we propose that a Firm price limit be established, restricting the ability of Gatwick to increase prices above this level, calculated over the duration of R2 Commitments. Consistent with our £12-£15 range we envisage that this cap will be £15 net airport charges per passenger;
- Given the early stage of development of the second runway scheme, some aspects of the R2 Commitments are still being considered and/or refined. These include limited circumstances in which there may be adjustments to the Firm Price Limit as a result of substantial market events such as: land cost and/or construction price inflation outside of the normal range; scope changes imposed through the planning process; and/or changes to the regulatory/legal environment. Other adjustments will be consistent with more operational mechanisms already adopted in the existing Commitments (e.g. the imposition of more stringent security measures);
- Further, we envisage there being provision for possible adjustment of the Firm price limit, but only with the approval of the airlines and/or the CAA e.g. in relation to development Phases 2+ (but not Phase 1), potentially in relation to airlines' requirements from later

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phase developments of airport infrastructure as described in the “Infrastructure development” section above; and

- Price monitoring: There may be a variety of reasons as to why we find it necessary to increase net prices above the expected price path towards the firm price limit. To provide even greater assurance to CAA, passengers and airlines, we propose the inclusion of Price monitoring provisions in the R2 Commitments. These will enable the CAA to consider whether Gatwick is pricing appropriately in developing the second runway, while still ensuring there is sufficient long-term certainty to support the initial investment and financing.

Benefits

- 4.691 We believe there are significant benefits to a Commitments approach, as compared to a standard RAB based model. One important element is the focus on delivering key outputs with less focus on determining how these outputs are to be delivered. This results-based approach drives greater innovation and eliminates the tendency for the regulator to micro-manage the airport. We also believe it provides an appropriate backdrop in which value creating contractual arrangements between the airlines and airports can be developed. R2 Commitments also gives certainty to users and the Government that risk can be allocated to the airport, while still ensuring that expansion is delivered, for a capped price. A fuller description of the benefits of R2 Commitments, as well as the drawbacks of a RAB-based approach, can be found in Section 3 of our response to the CAA.

Conclusion and Next steps on R2 Commitments

- 4.692 Given that R2 Commitments will essentially be a proposal to the Government and the CAA, we would propose to enter a period of negotiation on the final terms of the framework from Summer to the end of 2015, when we are recommended by the Commission. In order for the CAA to assure itself at that stage of the validity of Gatwick’s proposal, we anticipate engaging with the regulator’s process after a Government decision. We commit ourselves to seeking an outcome which provides assurance to the Government that capacity will be built and, to the CAA that the interests of passengers will be furthered. We anticipate R2 Commitments would start to be implemented in 2021, following the conclusion of the existing Commitments.

Summary of next steps – Cost and Commercial Viability Module

- 4.693 In order to assess the costs and delivery risks of the schemes submitted by promoters and to be able to make a meaningful direct comparison between the proposals, we ask the Commission to:
- assess the costs and delivery risks of the schemes submitted by proposers such that a meaningful direct comparison can be presented;
 - include all costs relevant to each scheme, including scheme costs incorrectly categorised as replacement capex, and surface access costs;
 - review whether the approach of the Commission's consultants of increasing Gatwick's scheme costs by 18% and Heathrow's by only 5% is justified and reliable;
 - use recognised industry benchmark rates and apply any increases to rates consistently against all three scheme proposals.
- 4.694 If optimism bias is to be used to evaluate delivery risk rather than undertaking a scheme specific risk assessment, the Commission should:
- review the cost percentage split between Standard Civil Engineering/Standard Buildings as recommended by HM Treasury's The Green Book for each of the schemes;
 - review whether optimism bias should be applied to all project costs; and
 - review whether optimism bias should be applied to benchmarked costs which already include a risk allowance.
- 4.695 We also ask the Commission to re-examine the delivery risks associated with the proposed expenditure forecasts for each scheme. We believe these should be re-examined given that the Heathrow proposals result in a scale of expenditure that has never been achieved previously on a single operational site in the UK, let alone a site as complex as this one.
- 4.696 Under airport charges, we ask the Commission to:
- review the revised phasing proposed by Gatwick and developed with our airline partners to address their concerns and those of the Commission (as set out in our response to Question 2) and, where necessary, carry out a bottom-up and process-by-process capacity assessment; and
 - assess a commercially viable range of airport charges for each of the schemes, and thereby determine the effective cap on funding that may be sourced from airport charges.
- 4.697 Under the Commission's funding and financing analysis, we ask the Commission to:
- focus its debt market liquidity analysis primarily on the first phase of each scheme and assess the viability of the different debt funding proposals under this timeframe. We believe this should consider the feasibility of issuing debt at the rate and quantum required for each scheme, alongside any re-financing of existing facilities;

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- place an emphasis in its appraisal on the finance 'readiness' of each scheme as well as reflect Gatwick's funding and financeability assessment, which supports a well-developed and robust Financial Case; and
- revise some of its assumptions in its financial modelling in areas where Gatwick can robustly demonstrate areas of concern.

4.698 We would welcome a meeting with the Commission to present the detail of our financing analysis and the assumptions that underpin it.

4.699 Lastly, we ask the Commission to:

- Engage further with Gatwick on its R2 Commitments proposal; and
- Incorporate our R2 Commitments principles into its appraisal on the management of economic risks, and similarly reflect the alternative approaches of the other schemes.

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Key points

Gatwick supports growth and resilience

- 4.700 The Commission rightly finds that Gatwick's proposals will support growth to 560,000 movements and 95 million passengers per annum, and that the design of the airport provides flexibility to support different operating models. We also note that the Commission recognises the additional resilience that a second runway will provide to the airport and that expansion at Gatwick is unlikely to impact in airspace planning terms on other South East Airports.

Heathrow's capacity has been overstated

- 4.701 We have taken advice from DFS – Deutsche Flugsicherung GmbH, a leading European air navigation service provider, on the Heathrow North West Runway proposal. DFS has identified several reasons why the runway capacity will be less than Heathrow has stated. The incremental capacity generated by a third runway at Heathrow is likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow.
- 4.702 These important differences between the schemes in terms of airspace efficiency and capacity have not been recognised and the Commission's assessment takes no account of the likelihood that the capacity of Heathrow will be less than assumed in the Commission's appraisal.
- 4.703 Capacity of Heathrow will be lower because:
- Both Heathrow schemes propose complex patterns of alternating runway use which will compromise the independent operation of the runways,
 - For both Heathrow schemes, there are likely to be interactions between departures from one runway and missed approaches on an adjacent runway, and
 - The Heathrow North West Runway scheme relies on the operating rules for arriving flights to be changed to facilitate the proposed independent curved approaches – an outcome which cannot be guaranteed.
- 4.704 The methodology used has underestimated Gatwick's ability to accommodate Code F aircraft, has overestimated Heathrow's ability to accommodate low-cost airlines, with the consequence that Heathrow's traffic growth potential has been overstated, and has overlooked genuine performance differences between the schemes.
- 4.705 This response should be read in conjunction with Appendix 24 – Arup Operational Efficiency & Passenger Experience Report, Appendix 25 – Reid Aviation Air Space and Operational Concepts Report, Appendix 26 – DFS Fast-Time Simulation Report.

Gatwick supports growth and resilience

- 4.706 The Commission's analysis of the Gatwick scheme under the Strategic Fit module indicates that the airport will have capacity for 560,000 ATMs and 95mppa at 2050. It also indicates that Gatwick will be capable of handling a range of different airline and traffic types⁸⁴.
- 4.707 The Commission also finds that the addition of a second runway will provide a degree of additional resilience and that expansion of Gatwick is unlikely to lead to any reduction in capacity at other commercial airports in London and the South East⁸⁵.
- 4.708 We welcome and support the above findings. However we do have some comments to make on other aspects of the Operational Efficiency Module which are provided below.

Heathrow's capacity has been overstated

- 4.709 While the Commission has taken separate advice from its consultants and expert advisers (e.g. CAA and NATS) on the operational concepts for the three schemes, the Consultation documents say relatively little about airspace issues.
- 4.710 The Commission refers to the Future Airspace Strategy and London Airspace Management Programme and we are pleased to note its view 'that the airspace design work for the Gatwick Second Runway proposal could be integrated into these programmes to ensure timely delivery'⁸⁶. While this demonstrates confidence that the expansion of Gatwick poses no significant risks in terms of airspace delivery, there are some important differences between the schemes in terms of airspace that have been overlooked.

Airspace Capacity

- 4.711 The capacity of the runway schemes is clearly a critical factor that will govern how much air traffic can be accommodated. This in turn affects the scale of the social and economic benefits that will be realised. It is therefore very important to ensure that the true capacity potential of each proposal is assessed on a consistent basis and fully understood.
- 4.712 Gatwick's proposal (two mixed mode runways) is based on proven design concepts with low risk methods of operation. As a two-runway airport the operation is inherently simple and provides more flexibility for different airspace solutions including those designed to mitigate environmental effects. A pair of mixed mode runways presents no unusual challenges and therefore we have a high degree of confidence that the capacity claimed can be achieved.
- 4.713 In contrast Heathrow's North West Runway scheme is based on:
- two segregated mode runways and one mixed-mode runway;
 - a layout where the new runway is staggered to the west relative to the others, and;
 - a complex pattern of alternating operating modes.

⁸⁴ Airports Commission Consultation Document. Paragraph 3.11 and 3.12

⁸⁵ Airports Commission Consultation Document. Paragraph 3.49 and 3.50

⁸⁶ Gatwick Airport Second Runway: Business Case and Sustainability Assessment. Paragraph 4.38

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- 4.714 This is a much more complex solution which is likely to result in a runway operation which is not fully 'independent'. An independent operation means that operations on one runway have no impact on the operations of another runway, thereby maximising runway capacity. Heathrow has assumed a fully independent operation in its submission.
- 4.715 The opposite (a 'dependent' or 'partially dependent' operation) is where the operations on one runway do somehow affect the operations on another runway. This usually results in the need to coordinate movements in some way. An example of a dependent operation would be where a flight departing from one runway needs to hold until an arriving flight on an adjacent runway has landed, in order to ensure the safe separation of both aircraft. These kinds of dependences invariably result in lower runway capacity.
- 4.716 The configuration of the runways in the Heathrow North West Runway scheme, and the proposed method for their operation, mean that fully independent operations cannot be guaranteed and therefore the stated capacity is likely to be unachievable. A rigorous assessment is needed of the reliability of the capacity claimed for this scheme. In addition to the above constraints, the Commission's assessment needs to include the likelihood that the environmental impacts of expanding Heathrow will result in a movement cap being imposed by the planning system, as is the case today.
- 4.717 Heathrow suggest that the North West Runway scheme will deliver an hourly capacity of 128 movements per hour from the three runways. This is not achievable for the reasons set out below, as it would require:
- the traffic demand (volume of movements and mix of aircraft types) for each runway can be matched perfectly to the available capacity of that runway;
 - the operations of the two arrivals runways are entirely independent of each other and the same is true for the two departures runways.
- 4.718 The first condition will not be achieved because of four competing Heathrow objectives:
- minimising taxiing distances and runway crossings;
 - operating 'compass departures' to minimise departures conflicts;
 - operating 'terminal arrivals' when arrivals are approaching from both the north and south of the airport;
 - switching between at least four different operating modes to reduce noise impacts.
- 4.719 It will be impossible to achieve all of these objectives and balance runway demand perfectly as has been assumed. Some compromises would inevitably be needed, probably resulting in longer taxiing distances and longer flight-paths with resulting environmental impacts.
- 4.720 The second condition is also unachievable. We have taken advice from DFS on the Heathrow proposal. DFS has identified dependences that will exist in two of the four runway operating modes proposed by Heathrow. DFS has carried out detailed simulation of these two operating modes to quantify the impact of these dependencies on runway capacity.
- In 'Period 1' arriving flights will land on both the northern and central runways, which are separated by only 1,035m. In order to reduce air noise impacts Heathrow are proposing curved approaches with aircraft joining the final approach as close as 4 nautical miles

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(nm) from the runway. DFS advises that under current regulations this would result in dependent operations. This means that a 2.5nm separation would need to be maintained between an aircraft approaching one runway and an aircraft approaching the other runway. This will significantly reduce typical arrivals capacity from the stated 64 to around 50 movements per hour. While future technologies (e.g. GBAS⁸⁷) might resolve this, there is no certainty that this will be so, and it would be unsafe to make that assumption.

- In 'Period 3' DFS advises that there will be a dependency between departures from the central runway turning south and departures from the southern runway. DFS also advises that there will be a dependency between missed approaches from the northern runway and northern departures from the central runway. In combination these two dependences will reduce the typical departures capacity from the stated 64 to, at best, 59 movements per hour and possibly only 56.

- 4.721 The DFS study confirms that the 128 movement per hour capacity claimed by Heathrow is not feasible owing to the complex runway operating methodology proposed to mitigate noise impacts. Its analysis shows that the arrivals dependency in 'Period 1' will reduce the two-way capacity to around 100 movements per hour. In 'Period 3' the two-way capacity would be, at most, 118 movements per hour, with 112 being a more likely capacity figure. Appendix 1 by ICF shows that this hourly capacity range would only support 580,000 to 680,000 annual movements.
- 4.722 Based on the DFS analysis, we believe that a capacity value of 112 movements per hour represents the most likely capacity figure for Heathrow. Appendix 1 shows how this converts to 645,000 annual movements and 118mppa. This is significantly lower than that assessed by the Commission. The incremental capacity generated by a third runway at Heathrow is therefore likely to be some 60% of that generated by a second runway at Gatwick – and of the capacity claimed by Heathrow. As this issue is fundamental to the appraisal of the Heathrow scheme it must be subjected to further analysis by the Commission in order to understand the trade-offs between runway capacity and environmental mitigation at Heathrow. Additional information on this capacity issue is provided in Appendix 24 – Reid Aviation's Air Space and Operational Concepts report and Appendix 25 DFS Fast-Time Simulation report.
- 4.723 The capacity of the Heathrow Extended Northern Runway scheme is harder to predict owing to its unusual configuration. It is possible that this will also have dependencies. For example missed approaches to the extended runway may compromise the safety of flights departing from this runway unless arrivals and departures are co-ordinated in some way (with resulting loss of capacity). The CAA makes reference to this possibility in its report. We consider that further analysis is also needed here to establish whether dependencies exist or not.
- 4.724 No account of the above issues has been taken by the Heathrow proposers or the Commission in its own analysis. The Commission should therefore re-examine the three shortlisted schemes, alongside the observations from the CAA⁸⁸ to obtain a better appreciation of their relative complexity, feasibility and capacity from an airspace perspective.

⁸⁷ Ground Based Augmentation System.

⁸⁸ Operational Efficiency – preliminary safety review

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Airport Location

- 4.725 The Commission appears to have overlooked the locational advantages of Gatwick relative to the London airspace, although these were recognised in the CAA's report. Gatwick's southerly location means that it is likely to result in a low level of impact on other airports in the region. By contrast, Heathrow's more central location will make it much more difficult to avoid impact on other airports. Indeed, we note that the CAA identifies that significant impacts upon RAF Northolt would be likely and that impacts on airfields to the west, and on London City Airport to the east, can only be measured once the airspace design has been clarified. The same is true for the Heathrow Extended Northern Runway scheme but these points do not appear in the Commission's appraisal, as they should.

Airspace Resilience

- 4.726 In its analysis the Commission concludes that the second runway at Gatwick would not lead to any worsening of whole-system resilience of the London airspace. This understates the significant airspace benefits of expanding Gatwick over expanding Heathrow. By avoiding further expansion at Heathrow, a two runway Gatwick will result in a more resilient airspace structure, with a greater ability to absorb disruption events by spreading the capacity between the airports rather than focussing it at a single airport. In its report to the Commission (Operational Risk: Airspace Resilience) NATS identifies the significant adverse impact airport closure (for example, owing to snow) can have on the London and surrounding airspace. However the closure of a three-runway Heathrow would clearly disrupt more air traffic, and therefore have a far greater impact on airspace resilience, than the closure of a two-runway Gatwick. Therefore a greater focus should be placed by the Commission on the relative advantages in terms of airspace resilience of a 2+2 runway solution over a 3+1 solution.

Environmental mitigation

- 4.727 The Heathrow North West Runway proposal suggests many ways in which the noise impacts of a three-runway operation could be reduced. These include noise respite through runway alternation, steeper approaches, curved approaches, continuous descent approaches and continuous climb departures.
- 4.728 While each of these may be possible in isolation, the Commission should assess whether these operating practices are in reality capable of being combined and operated in the context of the claimed throughput rates and Heathrow's location in the centre of the London airspace system. We believe that many of these initiatives are actually mutually exclusive or, at best, could be operated only with a materially lower level of traffic throughput than has been assumed.
- 4.729 As stated above, the demand between the two arrivals runways would have to be balanced, in order to achieve the throughputs proposed by Heathrow. This would mean that some arriving flights from the north would need to land on the southern runway and some flights from the south would need to land on the northern runway. These additional flight tracks, needed to allow traffic to position to the correct runway, will handle substantial volumes of traffic but do not seem to feature in the environmental impact assessment. If they are located close to the final approach paths to the two arrivals runways they would result in a substantial increase in overflights of central London. Alternatively they might be located

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further out, but this would involve a significant increase in the miles flown, thereby increasing costs, and create potential conflicts with the airspace of other airports.

- 4.730 More information on all of the points outlined above is available in Appendix 24 – Reid Aviation’s Air Space and Operational Concepts report and Appendix 25 DFS Fast-Time Simulation report.
- 4.731 These issues need to be thoroughly investigated and that the Commission is likely to find that:
- The deliverability of suitable airspace configurations for the two Heathrow schemes is far less certain than it is for the Gatwick scheme.
 - The capacity of both Heathrow proposals is likely to be significantly less than that assumed in the appraisal.
 - The methods of environmental mitigation proposed by Heathrow may not be feasible.
 - The scale of airspace change required to accommodate expansion at Heathrow will result in a very significant number of people in and around London ‘newly affected’ by air noise.
 - The expansion of Heathrow will have a significantly greater level of impact on other London airports than the expansion of Gatwick.

Taxiway capacity

- 4.732 In our May 2014 submission we highlighted the efficiency of the proposed taxiway system and how this will deliver a resilient operation with minimal taxiing distances. We also explained how the taxiway system had been thoroughly tested through detailed simulation modelling.
- 4.733 However the Commission’s analysis suggests that pinch points may exist in the Gatwick layout that might result in congestion and delays during the later years of the operation. These conclusions seem to be based on a high-level, qualitative review of the airfield plan, whereas we have carried out a full computer simulation of the Gatwick airfield⁸⁹ operating at high levels of utilisation and no evidence of congestion or delays has been identified. Therefore we are confident that capacity pinch points do not exist in our layout.
- 4.734 The Commission should commission computer simulation of all three schemes including the different operating modes proposed by Heathrow. We believe that this would show that the greater geographic spread of Heathrow airport will result in longer taxiing times (as demonstrated by the NATS modelling of the Heathrow North West Runway scheme) and that the complex runway alternating patterns of the Heathrow schemes will create significant taxi time variability. Airlines will need to set their schedules on the basis of the most onerous operating pattern and taxiing times. Therefore this lack of predictability will result in longer block times; a damaging consequence, notably for low-cost airlines where quick turnarounds are vital to support the necessary high levels of aircraft utilisation.

⁸⁹ 14th May 2014 Scheme Design Submission, Appendix A5 Operational Efficiency – Master Plan, Appendix A – Airfield Simulation Report

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- 4.735 If further simulation modelling is not possible, an examination of the results of the modelling carried out by Gatwick and Heathrow Airport will provide some useful insight into the issues outlined above.
- 4.736 More information on the above can be found in the Arup Operational Efficiency & Passenger Experience report – Appendix 24.

Suitability for all aircraft types

- 4.737 In our May 2014 submission we explained how our proposal ‘provides a highly efficient airport layout that is suitable for all airline business models, thus better supporting growth of short haul, LCCs and charter traffic...as well as full service long haul traffic’⁹⁰.
- 4.738 We welcome the fact that the Commission recognises Gatwick’s ability to accommodate a wide range of airline types. However, we believe that some important differences between the schemes have been overlooked.
- 4.739 For the reasons outlined below we disagree with the Commission when it says of Gatwick that ‘its ability to accommodate significantly high numbers of the largest, ‘Code F’, aircraft type (e.g. A380) would be more limited’⁹¹.
- 4.740 For the reasons explained below we also disagree when the Commission says of Heathrow (both schemes) that ‘the design of the expanded airport provides flexibility to accommodate a range of different industry operating models and sizes of aircraft’⁹². Specifically we do not share the Commission’s view that the Heathrow proposals are suitable for LCC operations on any significant scale.
- 4.741 In assessing the ability of the schemes to serve different airline types, the Commission’s consultants have simply considered the extent to which different sized aircraft can be physically accommodated on the airfield. For example, for the Heathrow North West Runway scheme, the consultants simply state that ‘the stand provision is considered to be acceptable, and is sufficiently flexible to accommodate different combinations of aircraft types’⁹³. We believe a much wider range of issues needs to be considered. This is especially true for low-cost airlines which have specific operational requirements that are essential to achieving the low operating costs and high asset utilisation their business model demands.
- 4.742 In terms of the ability of Gatwick to accommodate Code F aircraft, we ask that the Commission takes into account the following points:
- Our master plan proposal contains 11 Code F stands of which 8 are pier served⁹⁴. This will enable our forecast demand to be met with comfort. We have also provided a full network of Code F taxiways⁹⁵. It is not necessary for all taxiways on the airfield to be Code F for our forecast demand to be met. The fact that not all taxiways are suitable for Code F will not impose any meaningful operational restrictions.

⁹⁰ 14th May 2014 Scheme Design Submission, SD2 Airport Master Plan

⁹¹ Airports Commission Consultation Document, Paragraph 3.46

⁹² Airports Commission Consultation Report, Paragraphs 3.99 and 3.148

⁹³ Jacobs: Operational Efficiency: Ground Infrastructure Heathrow Airport North West Runway. Section 6.1

⁹⁴ 14th May 2014 Scheme Design Submission, Appendix A5 Operational Efficiency – Master Plan, Table 4.3.1

⁹⁵ 14th May 2014 Scheme Design Submission, Appendix A5 Operational Efficiency – Master Plan, Section 4.2.2

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- We have also tested the ability of our master plan to accommodate a higher share of Code F aircraft in the event that growth of this market is materially higher than expected. The results demonstrate that our master plan can accommodate a similar share of Code F aircraft as that forecast for Heathrow (around 6.5% of the total). This has been tested with simulation modelling and no significant congestion or delays were experienced⁹⁶.

4.743 In terms of the ability of the Heathrow schemes to accommodate low-cost airlines, we ask that the Commission takes into account the following points:

- Heathrow has very little low-cost presence today. By contrast, Gatwick accommodates the full range of airline types, from low-cost short-haul to full-service long-haul. This is because Gatwick provides high-quality infrastructure for airlines and their passengers at lower cost than at Heathrow and without compromising the operational efficiency of the airfield.
- By airfield operational efficiency we mean the ability to support rapid turnarounds and the provision of short taxiing distances and minimal runway holding delays. These are the operational efficiencies that the low cost airline business model depends upon.
- By comparing the information provided by Heathrow Airport Limited⁹⁷ with our own submission⁹⁸ it is apparent that taxiing times and holding delays will continue to be significantly longer at Heathrow. This is illustrated in Figure 4.14.1 with information extracted from simulation reports for Heathrow North West runway and Gatwick. Note that Heathrow has only published results for one of the four runway operating modes and therefore we are unable to determine whether these times are representative of the other modes.
- We believe the same taxiing time and delay issues would exist with the Heathrow Extended Northern Runway scheme.
- In addition to minimal delays and taxiing times, LCCs look for infrastructure that will facilitate rapid boarding of passengers and turnaround of aircraft. Gatwick is experienced in delivering this type of service. However we have found no evidence of bespoke facilities for low-cost airlines in the Heathrow schemes. We consider that the Commission should re-consider whether it is realistic to identify the Heathrow schemes as being suited to any significant number of LCCs.

⁹⁶ Arup Operational Efficiency & Passenger Experience report – Appendix 24

⁹⁷ NATS reports: Heathrow Airport, TAAM modelling and results. June 2014

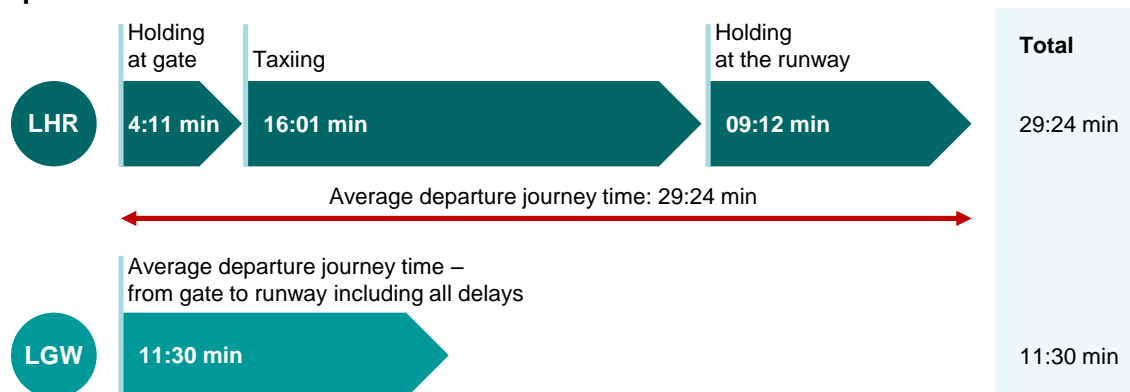
⁹⁸ 14th May 2014 Scheme Design Submission, Appendix A5 Operational Efficiency – Master Plan, Appendix A

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FIGURE 4.14.1: COMPARISON BETWEEN HEATHROW NORTH WEST RUNWAY AND GATWICK SIMULATION RESULTS. WESTERLY OPERATIONS

Departures



Arrivals



- 4.744 The Commission should therefore broaden its analysis of the schemes' ability to serve different airline types to obtain a better appreciation of how they perform in terms of operational efficiency. We think that by doing so the Commission will discover that Gatwick is best suited to meet the needs of the full range of airline business models.

Other issues

- 4.745 We note that in its consultation report the Commission has adjusted our proposed phasing strategy by bringing forward the construction of the new terminal to coincide with the opening of the new runway. Following discussions with our airlines we have proposed an alternative phasing strategy which is described in our response to Question 2.
- 4.746 We also have some observations on the Commission's analysis of minimum connection times. We believe there are some inconsistencies in the way the schemes have been evaluated and there has been some misunderstanding of our proposals for assisting 'self-connecting' passengers. Information on this is available in the Arup Operational Efficiency & Passenger Experience report – Appendix 24.

Summary

- 4.747 In our May 2014 submission we showed how the Gatwick master plan provides a highly efficient layout which is suitable for all airline business models. The straightforward dual runway operation simplifies airspace design issues and provides flexibility and resilience. The compact layout reduces taxing times and facilitates the rapid transfer of passengers between the terminals.
- 4.748 We welcome the fact that the Commission agrees with many of these points but there are areas where further analysis is needed:
- Important differences between the schemes in terms of airspace efficiency and capacity have been overlooked. We believe further work is needed to clarify the airspace design and operation to define more precisely the capacity of the Heathrow proposals and the number of people newly affected by air noise. This work also needs to take account of the movement caps/constraints that will be likely be needed to mitigate the environmental impacts at Heathrow.
 - Gatwick's capability to accommodate Code F aircraft has been understated.
 - Heathrow's ability to serve the low cost airline market has been overstated: it will be very difficult for it to meet their demanding operational requirements on a significant scale.
 - The high-level analysis of the airfield places too much emphasis on potential 'pinch points' in the Gatwick taxiway system and has overlooked genuine performance differences between the schemes.

Module 15: Operational Risk

Key points

- 4.749 Gatwick welcomes the Commission's statement that the Gatwick proposals would improve resilience of the London airports system.
- 4.750 However, the Commission should also assess the impact of an additional runway on the London Terminal Management Area. A future London airport system comprising a 2 runway Gatwick (2+2 solution), alongside Stansted, Luton and City Airports will have a significantly higher level of inherent resilience than if future increased capacity is focused on a 3 runway Heathrow (3+1 solution).
- 4.751 We consider that the Commission should complete the assessment of Operational Risks by using an industry standard approach, such as ISO 31000, which would provide a robust, reliable and complete assessment and comparison between the three schemes, making a like for like comparison of the risks and to evaluate the severity of any risks identified.
- 4.752 This response should be read in conjunction with Appendix 27 – Arup Operational Risk Report.
- 4.753 The Gatwick master plan, as submitted in May, provides the opportunity to create one of the world's leading airport facilities which will enhance the resilience of the London airport system as a whole. The new and redeveloped facilities will provide flexible, secure spaces and accommodate new and emerging technologies. This in combination with the necessary management and operational procedures will ensure resilient and safe operations of the airport appropriate for a major nationally important transport system.
- 4.754 Gatwick submitted the outcomes of a detailed risk assessment in May 2014, as required by the Commissions Appraisal Framework, Module 15, using an assessment methodology which is industry best practise. The assessment was clear and simple and utilised a RAG (Red, Amber and Green) rating system.
- 4.755 The Gatwick master plan has a number of key advantages in resilience terms. The second runway, third terminal and midfield apron area are capable of being operated independently from the existing facilities and will introduce additional resilience which improve the airport's ability to absorb shocks. When considering specific headline risks identified by the Commission in the Appraisal Framework, the Gatwick master plan performs exceptionally well for:
- Flooding
 - Power outages
 - Adequacy of Fuel supplies
 - Terrorist Attacks
 - Extreme weather events and adaptability to climate change

Response to Questions 4 and 5

Module 15: Operational Risk

- 4.756 Gatwick is developing the infrastructure and operational procedures to improve resilience, by learning from previous incidents and from other organisations to ensure Gatwick becomes a world leading airport in resilience terms, as demonstrated by its strong performance during recent exceptionally cold and snowy winters.
- 4.757 Gatwick notes that the Commission and NATS in their assessment rightly state that the addition of a second runway at Gatwick grants “a degree of additional resilience to some events which might require the closure of a single runway (such as a fire), assuming adequate operational procedures are in place”.
- 4.758 However a future London airport system comprising a 2 runway Gatwick (2+2 solution), alongside Stansted, Luton and City airports will have a significantly higher level of inherent resilience than if future increased capacity is focused in a three runway Heathrow (3+1 solution). This is because disruption at a 3 + 1 Heathrow solution, which would have a 46% share of London traffic based on our forecasts, would deliver a greater shock to the system than in a more balanced airports system, the 2+2 Gatwick solution, where no airport has more than 35% of the traffic. In addition should the Heathrow Extended Northern runway scheme be delivered and there is an incident on Heathrow’s Southern runway, which forces it to close, the airport would effectively have a single landing runway, with significant consequences for the capacity of the London system during this period.
- 4.759 We do not believe that the Commission’s and their consultants assessment of the Heathrow and Gatwick schemes provides a like for like comparison of the ability of the proposals to adapt to lower level disruption from either day to day operations or major disruptive events. The Commission’s appraisal reports provide limited evidence that a robust, reliable and complete assessment of operational risk has been undertaken for all three proposals against the disruptive events suggested. We believe that in these the Commission should complete the appraisal of Operational Risks, which they have started, by using an industry standard (ISO 31000) procedure, adopting a consistent approach, allowing for a detailed understanding and assessment of the differences between the shortlisted schemes.
- 4.760 Therefore, we believe that in these circumstances the conclusions drawn by the Commission in regard to Operational Risk should be revisited.

Other Issues

- 4.761 We note that a number of new areas of analysis were included by the Commission’s consultants as compared with the Commission’s published Appraisal Framework. While we do not disagree with the inclusion of these risks, which come from the National Risk Register, any conclusions reached by the Commission and their consultants with regard to these events have been reached using incomplete information, possibly resulting in misleading results.
- 4.762 We have identified in our response to Module 14 (Operational Efficiency) that, by combining the assessments of airfield operational risk and airspace risk, the Commission would enhance its overall risk assessment and allow for a better, like for like comparison between the schemes. Airfield operational risks and airspace operational risks are intrinsically linked and therefore a holistic approach would provide the Commission with a better understanding of the strengths and weaknesses of the shortlisted schemes in this area.

Response to Questions 4 and 5

Module 15: Operational Risk

- 4.763 In addition, the Commission should provide the findings of a detailed risk assessment for the schemes collectively, to enable a full understanding of the comparative strengths and weaknesses of each scheme.
- 4.764 The Commission has raised the resilience of surface access as an issue for Gatwick, though we note that no equivalent appraisal of the resilience of the surface access networks that serve Heathrow has been made. If the reliance of surface access networks is to be appraised and used as a basis for differentiating between schemes, all schemes should be assessed equally so that a like for like comparison can be made. See our response to Module 4, Surface Access.
- 4.765 In each of the individual airport appraisals published by the Commission there are references to the risk of bird strike. Whilst the Gatwick risk of bird strike remains unchanged, the Commission highlights the increased risks of aircraft bird strikes for the Heathrow Extended Northern Runway scheme, but makes no reference to such increased risks for Heathrow North West Runway scheme despite its proximity to large areas of open water. These risks are not consistently appraised in the Operational Risk Module resulting in the risks for both Heathrow schemes being understated.
- 4.766 Within each of the Jacobs individual airport Operational Risk appraisal reports, published by the Commission, there are references made to the risk of flooding. The Commission report and the Jacobs, Module 15, Operational Risk reports include references to the risk of flooding stating a significantly increased risk for the Heathrow North West Runway scheme and that it may not be possible to mitigate the risks for the Heathrow Extended Northern Runway scheme. By contrast the reports acknowledge that the proposed flood mitigation measures at Gatwick are achievable. However, this assessment has not been carried out in a consistent and recognised manner and does not allow a like for like comparison to be made. Nor are these risks consistently identified or appraised in the Operational Risk Module resulting in such risks being understated for the two Heathrow schemes.

Summary

- 4.767 We believe that in these circumstances the Commission should complete and thorough assessment of Operational Risks, which they have started, by using an industry standard (ISO 31000), adopting a consistent approach, thus permitting an accurate understanding and assessment of the differences between the shortlisted schemes.

Module 16: Delivery

Key points

Gatwick is the only solution deliverable by 2025

- 4.768 We agree that Gatwick is the only solution deliverable by 2025. Work undertaken since May has further increased our confidence in this date. Current growth rates suggest that capacity may be required well before 2030.
- 4.769 Gatwick has also carried out a Quantitative Programme Risk Analysis of the Heathrow schemes. This analysis demonstrates that neither of the Heathrow schemes could be operational before 2029, at the very earliest.

The Heathrow planning process has a materially higher risk of delay or failure

- 4.770 In relation to the planning process, it is clear that the complexity and local sensitivity of the Heathrow schemes are of a different order of magnitude to those of the Gatwick scheme. Any planning application or Hybrid Bill will have to resolve difficult issues relating to a wide range of environmental issues (noise, air quality, water courses, and biodiversity) disruption to the strategic road network, landfill, the relocation of a major Waste to Energy plant and how to introduce a local congestion charge. This means that the planning process for Heathrow is certain to take significantly longer and carry a much higher risk of failure than the Gatwick scheme, to the extent that a Heathrow scheme might never be approved.
- 4.771 Even if ultimately successful, the Heathrow planning process is likely to produce severe constraints on the operation of the new capacity, similar to the constraints already placed on the current two runway operation, in addition to the likely constraints on capacity resulting from the complexity of integrating a third runway (as described in our Module 14 response).

Heathrow faces a much higher degree of construction risk and complexity

- 4.772 Similarly, while the construction of a second runway at Gatwick would constitute a major undertaking, Heathrow must manage a much higher degree of construction risk related to the need for:
- enabling works, such as the diversion of the M25, the re-provision of the Waste to Energy plant;
 - wholesale redesign of airspace;
 - significant culverting of rivers, and;
 - remediation of an estimated 9 million cubic metres of landfill of which, landfill records suggest, up to 1 million cubic metres is hazardous and would likely need to be removed and disposed of offsite;
 - not to mention the challenging interface with a busy operational airport.

Response to Questions 4 and 5

Module 16: Delivery

The cost and financing challenges of the Heathrow project represent a major market risk

- 4.773 The expenditure profiles at Heathrow (annual maxima of £2.3-£2.4 billion for each scheme) reach levels that have never been achieved at a single UK site before, and have only been achieved during the Olympics on multiple sites without the constraints that would be imposed by the need to build around an operational airport and on a single site, located among the busiest part of the UK's road network.
- 4.774 This compares with realistic and manageable annual expenditure profiles at Gatwick, peaking at £0.5 billion, leading to relative construction and financing challenges on a much smaller scale for Gatwick compared to the Heathrow schemes.
- 4.775 The cost and financing challenges of the Heathrow projects represents a major market risk, compounded by a very limited ability to phase the project – all of which would lead to a very substantial increase in airport charges for airline users of Heathrow.

The Commission's assessment does not adequately recognise the differences between the schemes

- 4.776 A programme based Quantitative Risk Analysis shows that all of these considerations militate strongly in favour of the Gatwick scheme. In every major aspect, Gatwick is lower risk than the Heathrow schemes.
- 4.777 The Commission's approach to date identifies risks within many of the appraisal modules, but to only a limited extent (with the Financial & Commercial Case and within the Management Case) is any attempt made to consider risks in aggregate – and, even then, the assessments made are arguably quite superficial, and certainly do not bring out the major differences between the schemes. Given the importance of risk to any judgement as to which scheme is preferable, we consider that the Commission must complete a much more comprehensive and thorough risk assessment, and take this into account before forming its recommendations.

- 4.778 This response should be read in conjunction with Appendix 28 – Bechtel Construction Delivery Report, Appendix 29 – Bechtel Project Execution Plan, Appendix 30 – Bechtel Second Runway Construction Animation (Video), Appendix 31 – EC Harris Heathrow NWR Critique, Appendix 33 – Arup Energy and Utilities Report, Appendix 34 – ERM Geo-Environmental Report.

Gatwick is the only solution deliverable by 2025

- 4.779 The Gatwick May 2014 submission to the Commission showed that the Gatwick scheme provides the only realistic solution for delivering new runway capacity by 2030 and that the runway would be operational by 2025. Gatwick is in a much better location to accommodate another runway compared to Heathrow. Gatwick's expansion can be built more quickly, cost effectively and with less environmental impact than either of the Heathrow schemes.
- 4.780 The location of both Heathrow schemes bring with them major disadvantages in terms of adverse impacts on other existing infrastructure and the massive impacts on the local area for an extensive period of time during construction including:

Response to Questions 4 and 5

Module 16: Delivery

- Diversion into a tunnel of the most heavily used section of Europe's busiest motorway and the associated congestion this would impose on the strategic local road network.
- Diversion of major trunk roads and the associated congestion and delays, along with the likely need to re-provide lost commercial property.
- The complexity of maintaining access to Terminal 5 during construction of Terminal 6
- Impact of construction in terms of traffic, pollution, noise and replacement of rail access
- A longer construction period to runway opening than Gatwick with the associated construction effects being experienced for a longer period of time.
- Reliance on third parties who have no statutory duty to cooperate, regarding existing landfill sites, placing the twin rivers into a culvert, diverting overhead power-lines and for the North West runway the relocation of the energy from waste plant.

4.781 The Gatwick scheme provides greater certainty of delivery as a result of:

- Being a simpler project to deliver and manage than a third runway at Heathrow
- Less risk of delay and cost escalation

4.782 We agree with the Commission's conclusion that Gatwick is the only solution deliverable by 2025. Since the May submission Gatwick has worked with Bechtel and E.C. Harris to further develop the delivery programme, cost plan and risk register through the creation of a Project Execution Plan (PEP)⁹⁹, a detailed review of scope and phasing and ongoing active risk management. This has allowed us to improve our levels of confidence of delivery to meet both the revised programme, incorporating the new phasing plans, and the updated cost plan. Gatwick has also commissioned further work to investigate both the existing soil conditions and the extent of utility diversions required. These surveys will further inform the ongoing development of the PEP and the certainty of delivery.

4.783 However, we believe that the assessment by the Commission and their consultants of the Heathrow and Gatwick schemes does not, when considering the scale and complexity of the schemes, provide a realistic like-for-like comparison of the deliverability and required capital spend. Therefore, this does not present a balanced picture of the risks inherent in each scheme and how they would impact the delivery of the required additional runway capacity by 2030.

4.784 The delivery risks identified for the three schemes as set out in the Commission consultation documents are summarised below:

4.785 **Gatwick – Second Runway Scheme** – The delivery risks associated with the Gatwick scheme are assessed as relatively low, and the Commission considers an opening date in 2025 is achievable

4.786 **Heathrow – Extended Northern Runway Scheme** – The Commission considers the delivery risks associated with an extended runway at Heathrow Airport are substantial, but could be managed. The airport operator would need to work closely with local communities in order for any expansion at the site to be achievable. No allowance has been made for the

⁹⁹ Appendix 29 - Gatwick Runway 2 – Project Execution Plan, Bechtel.

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additional time that would be needed for the legal transfer of ownership of the Extended Northern Runway scheme to Heathrow Airport Ltd for delivery and for the process of completing a technical due diligence review of the design to be completed.

- 4.787 **Heathrow Airport – North West Runway Scheme** – The Commission does not comment directly about the deliverability of the Heathrow North West Runway scheme or the proposer's construction programme in its Consultation document apart from stating that 'it is less confident than the scheme promoters on the timelines for achieving the planning permission'. It does state that it 'considers the planning and construction of a waste energy plant as a substantial exercise in its own right, whose timescales are not substantially shorter than the delivery of new runway airport infrastructure'.
- 4.788 The complexity and scale of delivery of the three schemes is examined in detail in the Bechtel report titled: Review and Commentary on Airports Commission Consultation Document and Module 16: Delivery.
- 4.789 We agree with the Commission that the delivery risks associated with the Heathrow Extended Northern Runway proposal are substantial. However, there is no reference in the consultation documents on Heathrow North West Runway's delivery programme and whether it is considered achievable, and the Commission's conclusions on key risks suggest that there is little difference between the risk profiles of the three schemes, a conclusion which we consider is clearly inaccurate.
- 4.790 The Commission should to carry out a robust and standardised review of the design, planning, construction and other risks associated with all three schemes. Such a review would show that there are substantial risks inherent in the Heathrow schemes, which are set out below:

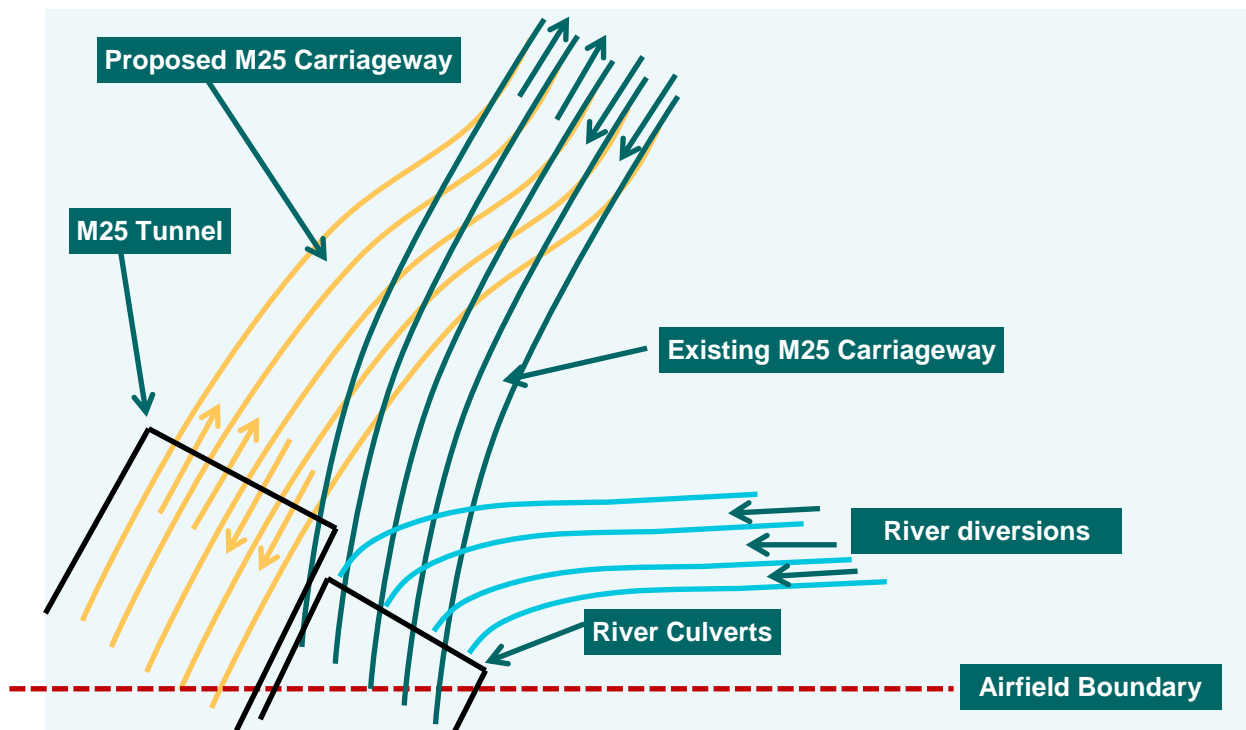
The Heathrow planning process has a higher risk of delay or failure

- 4.791 The complexity and sensitivity of the planning process for both the Heathrow schemes should be assessed to evaluate the assumptions that any planning application or Hybrid Bill could be completed in time to allow delivery an operational runway by 2026 as suggested by the Commission's consultants. The programme allowances proposed by both Heathrow schemes for obtaining a Development Consent Order (DCO) are considerably shorter than historical averages, yet both schemes are highly complex and have major adverse impacts. A number of approvals and permissions would be required by Heathrow as part of the DCO process, including Habitats Regulation Assessments, diversion of overhead power-lines, relocation of the Energy from Waste plant, M25 motorway diversion and European Water Directive Framework for river diversions, all of which could cause delays to the process. The Heathrow North West Runway scheme's programme for DCO approval is at the lowest end of the range of times taken recently to obtain approval despite the complexity and scale of their scheme and its controversial environmental mitigation proposals. Our detailed risk analysis suggests that DCO approval could delay runway opening to 2029.

Heathrow faces a much higher degree of construction risk and complexity

- 4.792 Enabling works – The enabling works on both Heathrow schemes are complex and of a much greater scale than required at Gatwick. The environmental mitigation including treatment of up to 9 million cubic metres of waste from existing landfill sites, diversion of the overhead power-lines underground, diversion of the M25 into a concrete tunnel and placing the twin-rivers into concrete culverts are consecutive activities on the critical path of the programme and are all required to enable the runway to be constructed. Each of these activities has the potential to delay the runway opening date and our detailed risk analysis suggests that overall the enabling works could delay runway opening to 2029.
- 4.793 The risks associated with the Enabling Works are described in detail below.
- 4.794 Construction of the concrete tunnel for the M25 diversion is a substantial engineering and also a traffic management challenge. It would have to be delivered without causing disruption to current traffic flows, which is the busiest motorway in Europe. The completion of the M25 diversion is a critical path activity allowing the completion of the twin rivers culverts and then the earthworks needed for the completion of the runway.

FIGURE 4.16.1: A GRAPHICAL REPRESENTATION OF THE M25 AND TWIN RIVER DIVERSIONS



Source: Bechtel, Review and Commentary on Airports Commission Consultation Document and Module 16: Delivery.

- 4.795 Relocation of the energy from waste plant, which the Commission states 'is a substantial planning design and construction exercise in its own right' is a major risk for the Heathrow North West Runway scheme. This plant currently provides local and regional waste

Response to Questions 4 and 5

Module 16: Delivery

management capabilities, including the incineration of clinical waste and will need to be re-provided to ensure continuity of service.

- 4.796 Airspace redesign is required for all three schemes. However the risk of delays for the Heathrow schemes is higher than for Gatwick due to the complexity of the airspace, proximity to RAF Northolt, and (for one of the Heathrow schemes) the untried extended runway layout. Our response to Module 14 addresses this point fully.
- 4.797 Placing the twin-rivers in concrete culverts under the runway in a manner which will comply with the European Water Framework Directive is again a major risk for both Heathrow schemes for which there is currently no suggested mitigation.
- 4.798 Remediation of the landfill sites, which are located mainly around the western end of the airport, are required for both Heathrow schemes. The volume of the landfill in the sites within the footprint of the Heathrow North West Runway is estimated at up to 9 million cubic metres of which, landfill records suggest, that up to 1 million cubic metres are hazardous waste which would likely need to be removed and disposed of offsite. To allow the overhead power-lines to be buried, the M25 and the twin rivers to be diverted and the new runway to be founded on suitable load bearing strata, the landfill sites may need to be remediated or removed and backfilled. This remediation and or removal for disposal, at suitable off site facilities, will add both programme delays and with treatment at an estimated £40/m³, additional cost.
- 4.799 Construction Activities – The complexity and quantity of concurrent construction activities for the Heathrow schemes introduces risks which could impact on the proposed runway opening dates. In addition, the exceptionally high construction spend profiles which peak at over £2.3 billion, should be used by the Commission to fully understand, the risks of achieving these high levels of construction activity on time and safely. Our detailed risk assessment of the Construction Activities shows a possible delay to completion of up to three years.

The cost and financing challenges of the Heathrow project represent a major market risk

- 4.800 The Commission should undertake a further detailed analysis of the forecast expenditure profiles. This would include analysis of the ability of project sponsors to manage and safely delivery the CAPEX spend required to meet the programme. We believe that such an analysis would result in a fundamental reassessment of the delivery risks that the Commission has identified to date.
- 4.801 For example for Heathrow North West Runway, between 2022 and 2027, the programme requires expenditure rising from £1.5 billion to a peak of approximately £2.3 billion per annum. For Heathrow Extended Northern Runway between 2021 and 2024 the annual expenditure exceeds £2.4 billion in three of these years whilst over this four year period the total expenditure is in the order of £9 billion. This level of expenditure has never been achieved on a single UK site before, and has been achieved only for the Olympics on multiple sites where there were no constraints on operations such as would exist at an operational airport.

Response to Questions 4 and 5

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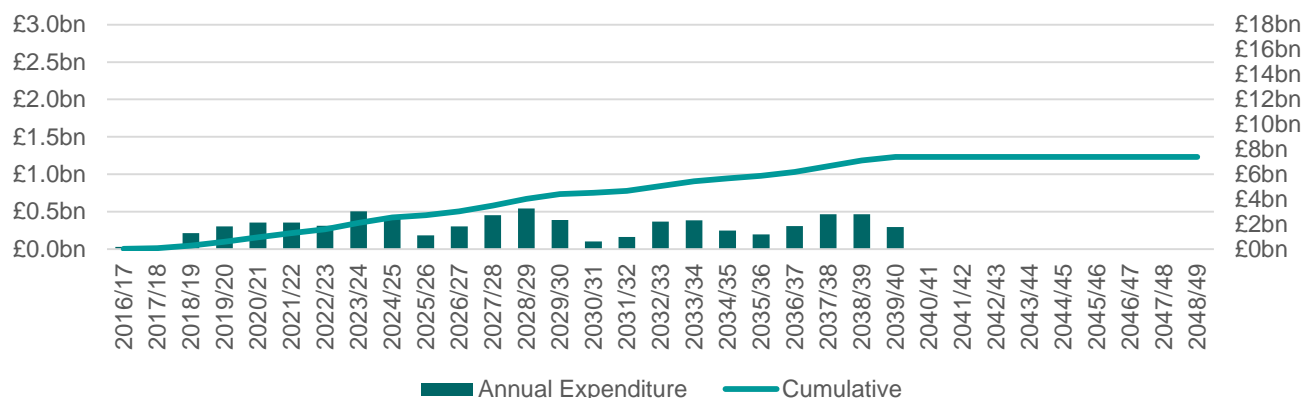
- 4.802 To understand whether this level of spend is in fact likely to be achieved, an analysis of the historic spend of major programmes of work such as the Olympics, Cross Rail, and Terminals 5 and 2 at Heathrow should be carried out. A comparison should be made of what was said publicly at the onset of each programme with what spend was actually achieved.
- 4.803 The forecast expenditure profile for each of the three schemes is set out in figure 4.16.3. It shows that the spend for Gatwick is a realistic and manageable profile with annual expenditure peaking at £0.5 billion and more evenly spread. In other words the Gatwick scheme spend is achievable whilst the Heathrow schemes include significant delivery risks and require a level of spend on a single UK site at levels never achieved before. We consider that this risk analysis reveals a fundamental basis for differentiating between the Gatwick and the Heathrow schemes.

Response to Questions 4 and 5

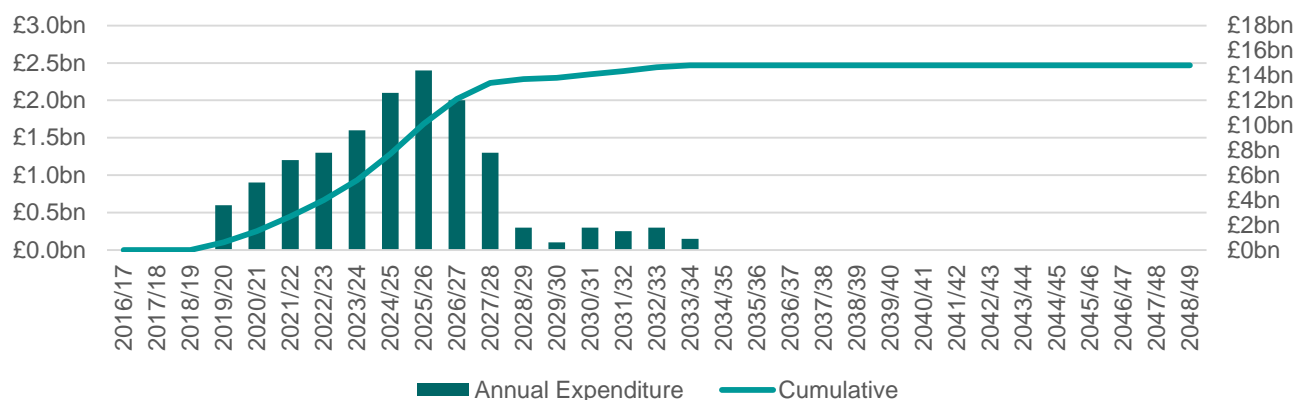
Module 16: Delivery

FIGURE 4.16.3 HEATHROW NWR, HEATHROW ENR AND GATWICK R2 SCHEME
CAPITAL EXPENDITURE PROFILES

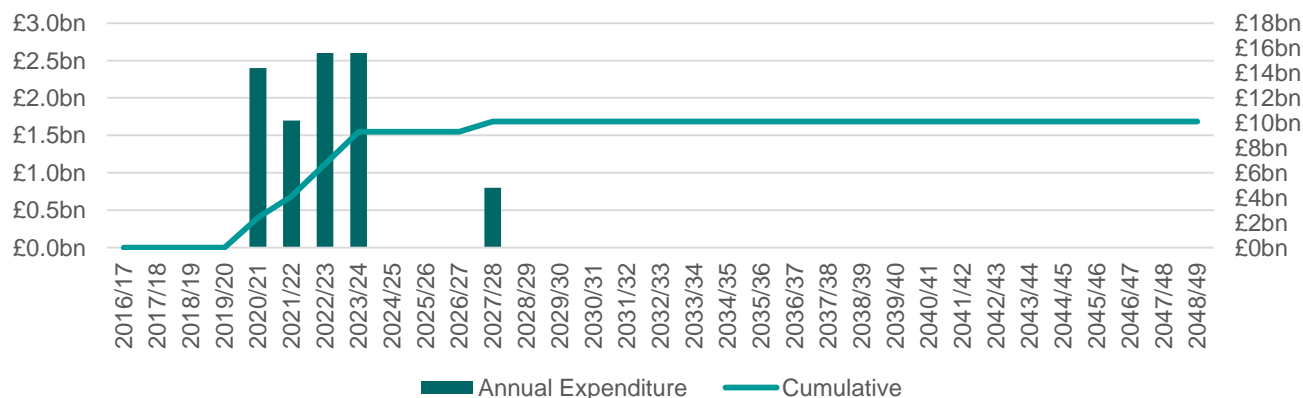
Gatwick Scheme Capital Expenditure



HAL Capital Expenditure



HH Scheme Capital Expenditure



Reference: EC Harris, Technical Report – Cost & Commercial, Appendix 23 Section 2.1 page 12.

Quantitative Risk Analysis

- 4.804 The Commission should further review and assess the delivery risks, and the underlying facts and justification relating to them, using a standardised Quantitative Risk Analysis approach. Given the substantial nature of these risks a runway opening date of 2026, for either Heathrow scheme, is open to serious question. The delays, due to the risks, within the Planning process, the Enabling Works and the Construction Activities are not necessarily cumulative, but together they have the potential to delay either of the Heathrow schemes by 4 to 5 years.
- 4.805 Gatwick has carried out a Quantitative Programme Risk Analysis of the delivery risks for the Heathrow schemes based on the published information which has, with a high degree of confidence, indicated completion dates of April 2029 for the North West Runway scheme and September 2029 for the Extended Northern Runway scheme.
- 4.806 The completion dates are based on the assumption of it being possible for the promoters to provide acceptable mitigation for the risks associated with the delivery of the Heathrow schemes, including noise, air quality, the relocation of the Energy from Waste plant, treating and/or disposing of the contaminated landfill sites, flood mitigation, placing the twin-rivers in culverts and diverting the M25.
- 4.807 These completion dates do not include any allowance for the process delays that the National Policy Statement, Judicial Reviews and unmitigated risks are likely to impose in practice. The Heathrow schemes, due to their complexity, have little programme float available to incorporate any delays, whilst the Gatwick scheme, being a relatively straightforward project, has greater capacity to absorb delays.
- 4.808 Therefore the key risks all have the potential to cause further delays to the programme and to postpone runway opening for either of the Heathrow schemes until at least 2029.

The Commission's assessment to date does not adequately recognise the differences in risk between Gatwick and Heathrow schemes

- 4.809 The Commission's approach to date identifies risks within many of the appraisal modules, but to only a limited extent (with the Financial & Commercial Case and within the Management Case) is any attempt made to consider risks in aggregate – and, even then, the assessments made are arguably quite superficial, and certainly do not bring out the major differences between the schemes. Given the importance of risk to any judgement as to which scheme is preferable, we consider that the Commission must complete a much more comprehensive and thorough risk assessment, and take this into account before forming its recommendations.
- 4.810 The scale and complexity of the planning process, and the enabling works and construction activities for the Heathrow schemes should be assessed by the Commission in order to understand the cumulative impact of risks on programme and delivering safely, and how the risks can be managed without affecting the operation of the airport, without causing major disruption to the local area and without delaying the runway opening.

Response to Questions 4 and 5

Module 16: Delivery

- 4.811 In these circumstances, to enable the assessment of programme and deliverability to be thorough and fair, and to enable a direct comparison across the schemes, the Commission should:
- re-appraise the programmes for Heathrow schemes. Given their scale and complexity the Commission should scrutinise the promoters' claims that planning approval can be delivered more quickly than recognised and average timescales, despite the projects being of exceptionally large scale and complexity;
 - undertake a comparison of the enabling works required for the three schemes, including the time allowed within the programmes for these complex and seasonal dependant activities;
 - review the delivery risks associated with the diversion of the M25, the re-provision of the Waste to Energy plant, placing the twin rivers into culverts, the remediation of landfill and the redesign of airspace;
 - further review of the deliverability of the programmed concurrent construction activities and how these can be managed safely and without causing major disruption to the local areas;
 - examine the delivery risks associated with the forecast expenditure for each scheme;
 - carry out a programme based Quantitative Risk Analysis to understand, in sufficient depth, the risks to the delivery of the schemes by the dates suggested by both the promoters and the Commission's consultants and the likelihood of achieving the additional required runway capacity by 2030.
- 4.812 Gatwick has carried out a Quantitative Programme Risk Analysis of the delivery risks for the Heathrow schemes, based on the published information which has, with a high degree of confidence, resulted in completion dates of April 2029 for the North West Runway scheme and September 2029 for the Extended Northern Runway scheme.
- 4.813 The completion dates are based on the assumption that it will be possible for the promoters to provide acceptable mitigation for all the risks associated with the delivery of the Heathrow schemes, including noise, air quality, the relocation of the Energy from Waste plant, treating and/or disposing of the contaminated landfill sites, flood mitigation, placing the twin-rivers in culverts and diverting the M25. That assumption may prove unrealistic given the scale of the risks faced by the Heathrow schemes.
- 4.814 These completion dates do not include any allowance for the process delays that the National Policy Statement, Judicial Reviews and unmitigated risks are likely to impose in practice. The Heathrow schemes, due to their complexity have little programme float available to incorporate any delays, whilst the Gatwick scheme, being a relatively straightforward project, has greater capacity to absorb delays.
- 4.815 The key risks all have the scope to cause further delays to the programme and to postpone runway opening for either of the Heathrow schemes.
- 4.816 All of this work indicates that the Gatwick scheme carries a materially lower risk than the Heathrow schemes. This should be taken fully into account in the Commission's analysis of the relative performance of the schemes.

Question 6:

Comments on Sustainability Assessment

Q6: Do you have any comments on the Commission's sustainability assessments, including methodology and results?

Key points

We have areas of concern where it appears the appraisal framework has not been followed

- 6.1 Whilst we note the large amount of work that the Commission has already undertaken on the Sustainability Assessments for each scheme, we have areas of concern relating to the methodology adopted, particularly where the Commission does not appear to have followed its own appraisal framework.

Gatwick's advantages over Heathrow are severely understated

- 6.2 In many key areas, we disagree with the Airport Commission's ratings, particularly Air Quality and Noise. It is clear that the scale of Gatwick's advantage over Heathrow has been severely understated.

Correlation of ratings shows that Gatwick is to be preferred

- 6.3 We have correlated the Commission's ratings for each module and each scheme. This demonstrates that on the basis of the Commission's work to date, Gatwick is clearly preferable overall to either Heathrow scheme.

- 6.4 This response should be read in conjunction with Appendix 34 – ERM Sustainability Assessments Review.

We have areas of concern where it appears the appraisal framework has not been followed

- 6.5 We have set out elsewhere in this Response in relation to each topic area the concerns that we have regarding the assessment methodologies adopted. We do not repeat them here. However, we consider that there are a number of areas where the assessments have not conformed to the Airport Commission's own framework or provided a robust, transparent assessment.
- The Assessment should appraise each scheme on a consistent basis.
 - The Assessment should make clear the true magnitude of the difference between schemes. The methodology adopted should be sufficiently finely grained to enable differences between the schemes to be identified.

Response to Question 6

- The Assessment should be appropriately undertaken and completed, for each module.
- The cumulative impacts of each scheme should be assessed and taken into account.
- A rating per topic for each scheme should be identified. It is not acceptable or appropriate to group topics together and provide a single rating for that group. The grouping of topics has the consequence of masking some key differentiators between the schemes. This is particularly the case with the Place and Quality of Life Topics.
- A transparent and consistent approach should be adopted as to whether the rating includes or excludes mitigation. It would be inappropriate to assume mitigation for one scheme but not another. Where mitigation is assumed this should be made clear and it also should be established that the mitigation is deliverable and likely to be effective. For example, in relation to Air Quality at Heathrow, if mitigation is to be assumed it should be established that this is likely to be effective and enforceable.

Gatwick's advantages over Heathrow are severely understated

- 6.6 Our responses to Questions 4 and 5 indicate our comments on specific modules. Within those responses a significant number of points are raised that indicate that the scale of Gatwick's advantages over either Heathrow scheme have been understated, either because:
- The impacts associated with the Gatwick scheme have been overestimated; or because
 - The impacts associated with the Heathrow schemes have been underestimated.
- 6.7 We have also raised concerns in relation to a number of areas where the Appraisal Framework methodology has not been applied fully or properly.
- 6.8 We have grouped this part of our response into two sub-sections:
- Critical issues affecting environment –air quality and noise
 - Critical issues affecting deliverability – water, place, bio-diversity and community
- 6.9 We do not intend to repeat the points that we have made elsewhere in this Response in relation to these matters. Nevertheless, we consider that it is particularly important for the Commission to address the points that we have raised in relation to Air Quality and Noise.

Key issues affecting environment

Air Quality

- 6.10 The Commission's 'high level' air quality work so far has identified the 'high risk' of exceedance of the legally binding human health based NO₂ limit values, for the short listed Heathrow schemes.
- 6.11 It would be unlawful for the UK Government to permit any runway scheme to come forward if it would result in a breach of the relevant EU Air Quality Directive (2008/50/EC) or which would delay the achievement of air quality limit values.
- 6.12 Compliance with limit values has to be assessed in order to understand whether any of the short listed schemes would be likely to cause a breach of air quality limit values or delay their

Response to Question 6

achievement compared to the position without that runway scheme. These matters cannot be assessed without undertaking detailed dispersion modelling. The Commission has acknowledged the need for this further modelling.

- 6.13 This further assessment work is essential because the Commission needs to determine, before it makes a recommendation, whether the Heathrow schemes could lawfully be approved in the context of air quality limit values and correct legal approach to them.
- 6.14 The only basis upon which a scheme can be allowed to come forward is if it is demonstrated that, during the construction and initial and mature operational phases, air quality limits would be met and that compliance with those limits would not be delayed. The Commission must avoid a situation in which a scheme is recommended only for it to be prevented from being taken forward at a later stage because it could not lawfully be consented.

Noise

- 6.15 Neither the Commission's local noise assessment of the Heathrow schemes nor its national noise assessment of all three schemes is either full or accurate.
- 6.16 This is because:
- The Commission has not attributed to the Heathrow "do minimum" two runway case further improvements in technology and operational practices which can be anticipated and which best practice would take into account;
 - The Commission has instead attributed these further improvements only to the "do something" third runway case which is not best practice;
 - The Commission assumes very significant growth in the late evening (after 22:30) for the Heathrow "do minimum" two runway case which is not credible as it would lead to very significant increases in noise in the 8 hour night time period – something which successive Governments have sought to avoid.
- 6.17 As a result of such departures from best practice, the Commission's assessment unreasonably understates the additional noise impact that is associated with a third runway at Heathrow as a result of increasing considerably the noise levels associated with the "do minimum" two runway noise assessment.
- 6.18 Equally, as a result of these departures from best practice, the Commission's national noise assessment is inaccurate as all the additional noise relating to the Heathrow "do minimum" two runway case (that will not in practice occur) is added to the national noise assessment for the Gatwick scheme. Thus, the noise impact of the Gatwick scheme in the national noise assessment is overstated.
- 6.19 Furthermore, the Commission has not complied with its own Appraisal Framework methodology. It has not assessed the noise implications of all of the traffic cases for Heathrow. This includes those that generate the highest levels of traffic and are therefore likely to give rise to the highest degree of noise impact – this means that a full appreciation of the effects of the Heathrow schemes has not been presented or taken into account in the Sustainability Assessment.
- 6.20 Even with these shortcomings, the substantial body of work the Commission has undertaken serves to demonstrate that the number of people affected by noise at Gatwick would be a

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fraction of the number of people that would be affected at Heathrow. But the overall rating of Gatwick as 'adverse' and 'Heathrow as 'significantly adverse' with 'potential to move closer to adverse' fails to convey adequately the magnitude of the differences and neither the Commission's assessment nor the Consultation Document reveals this clearly.

- 6.21 Further, the presentation of the information in the Consultation Report and Business Case and Sustainability Assessment does not enable readers to make an easy and transparent comparison of the relative performance of the schemes.
- 6.22 The nature of the presentation set out in the main consultation reports masks the very significant effects of the Heathrow North West Runway scheme, particularly the hundreds of thousands of people who would be 'newly affected' as a result of the assumed major overhaul of airspace for Heathrow North West Runway scheme under the 'T' and 'R' airspace scenarios (320,000 and 160,400 people respectively).
- 6.23 The Commission should update and complete the noise impact modelling it has undertaken and re-consult on its findings in a way that enables the impacts to be understood by those most likely to be affected.
- 6.24 The Commission appears to have penalised the Gatwick scheme on the grounds that it would have a greater noise impact on areas of countryside and areas valued for their tranquillity. The fact that Gatwick is located in a generally rural area means that the populations impacted can be minimised in accordance with the central tenet of Government noise policy. This is an important advantage of the Gatwick scheme, and should not be regarded as a detracting factor, whilst the Commission's own assessment demonstrates that impacts on National Parks and Areas of Outstanding Beauty are negligible. This criticism is therefore misplaced. Further examination indicates that, in comparison with Gatwick, the Heathrow North West scheme will affect significantly greater areas of registered parkland and gardens, and areas of valued open space. The areas affected include a World Heritage Site – The Royal Botanic Gardens at Kew, Windsor Great Park and numerous Conservation Areas and other heritage assets of significant value. Unless the Commission regards all areas of countryside as areas that should be protected for their tranquillity (which as we have explained does not in our view properly reflect Government policy), then the Commission overstates the impact of Gatwick's scheme on tranquillity.
- 6.25 The Appraisal Framework and Government objectives are 'To minimise and where possible reduce noise impacts' and 'to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise'. Even with the shortcomings of the information the Commission has presented to date, it is clear that Gatwick is the scheme that best supports these objectives by a very considerable margin. With the three schemes assessed fully and fairly, Gatwick's advantage in terms of its noise impacts would be significantly greater.

Key Issues Affecting Deliverability

Water

- 6.26 Whilst we agree with the Commission's overall conclusion that the Gatwick scheme will have no substantial impacts on flood risk as long as appropriate mitigations are in place, the Sustainability Assessment is unduly negative in terms of Gatwick, given the evidence supplied in both Gatwick's submission and the Jacobs technical review of it. We believe that application of the Appraisal Framework to the evidence presented should lead to the

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conclusion that the performance of the Gatwick scheme for the Water topic is actually “Neutral towards Supportive”.

6.27 We also consider that neither the Sustainability Assessment nor the Consultation document bring out clearly the relative performance of the three airport schemes and in particular the scale and implications of the difficulties faced by the Heathrow schemes in respect of:

- the combining and culverting of up to 12km of watercourses (affecting natural river processes and highly detrimental to biodiversity); leading to probable failure to comply with the Water Framework Directive;
- effects and acceptability of increasing flood risk;
- the relative complexity of the baseline water environment, the river diversions required and the interactions between surface and groundwater flows (potential for increased flooding risk) ;
- practical difficulties with providing mitigation for the effects above;
- the Heathrow North West promoter’s proposal to treat sewage so as to provide potable water.

6.28 We think it essential that the Commission makes public in its final report the advice it has received from the Environment Agency regarding the deliverability of the Heathrow schemes in the context of the issues described above and, in particular, their ability or otherwise to meet the requirements of the Water Framework Directive.

Place

6.29 The “Place” assessment fails to record a key difference between the Gatwick and the Heathrow schemes, namely the amount of Green Belt Land that is required to be taken; this is around 9 ha for the Gatwick scheme and about 694 ha for the Heathrow North West Runway scheme. We consider that this is a very significant point of difference between the Gatwick and Heathrow schemes which should be taken into account in the overall sustainability appraisal but which is not currently.

6.30 In May 2014 we provided a full response relating to ground conditions. We showed that the Gatwick scheme presents a low-risk profile. The amount of potentially contaminated land is limited, and there is less than one hectare of landfill within the overall landtake. There would be no loss of strategic mineral resources arising.

6.31 In the period since May 2014, we commissioned a review by RSK, a respected environmental consultancy, of geo environmental issues associated with the extensive landfills at the Heathrow North West scheme. This has identified that

- 180ha (around 37%) of the site area comprises landfills; in the order of 9,000,000m³ of waste will require remediation to allow construction; 1,000,000m³ of the extracted waste would likely be classed as “hazardous” and require disposal off-site;
- the costs of remediation of the wastes concerned could exceed £600 million;
- it is likely Heathrow would have to provide waste treatment or incineration capacity to compensate for the wastes arising;

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- some 200ha of the site is underlain by sands and gravels (up to 6,000,000m³) which have been identified as providing mineral resources for London in the London 2011 Plan
 - the operation to deal with the wastes would be of unprecedented scale, risking pollution mobilisation, bird hazard, odour, making large requirements for use of water and increasing vehicle movements within and off-site.
- 6.32 The Commission's assessment for Gatwick in the Sustainability Appraisal is that the effects to "Place" will be "Adverse" and will not reach "Neutral". The Commission does not make reference to ground conditions in its overall consideration of performance in its 'Place' topic for Gatwick (or for that matter the Heathrow schemes). Whilst we agree with the high level conclusion reached in the underlying technical reports, that the Heathrow scheme promoters have provided limited or no quantification of the historic landfill material requiring excavation, the Commission's overall analysis does not reference the costs of remediation or the risks posed to delivery as a result of ground conditions at the Heathrow sites.
- 6.33 When the Commission comes to make its final assessment of the relative performance of the schemes, it should take into account the above important factors and the additional evidence we have provided.

Bio-Diversity

- 6.34 The Commission's assessment for Gatwick in November 2014 is that effects to biodiversity will be "Adverse" and will not reach "Neutral". This conclusion is framed in the context of the effects to irreplaceable habitat and an assessment of Ecosystem Services costs.
- 6.35 We agree with conclusions reached in the underlying technical reports that:
- the Gatwick Second Runway proposals are not likely to have a significant adverse effect on any statutory designated site of international European or UK importance.
 - the extensive combining and culverting of rivers for the Heathrow schemes impacting up to 12km will have very significant adverse consequences for biodiversity and will not be compatible with the EU Water Framework Directive objectives to achieve "Good Ecological Status" in the watercourses concerned.
 - for both Heathrow schemes there will be the need to undertake Appropriate Assessment under the Habitats Regulations of potential effects to the South West London Waterbodies European Special Protection Area and RAMSAR site, and that mitigation for effects may be practically impossible or make matters worse.
- 6.36 We consider that the Commission's consultants have over-estimated the extent of ancient woodland lost at Gatwick and that the range of ecosystem services costs at Gatwick is considerably less than that for the Heathrow schemes. We also believe that application of the Appraisal Framework would indicate that the Heathrow North West scheme should be assessed as having "Adverse" effects tending towards "Highly Adverse" following mitigation, consistent with the conclusions reached for the Heathrow Extended Northern Runway scheme.
- 6.37 When the Commission comes to make its final assessment of the relative performance of the schemes it should take the above factors further into account.

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- 6.38 In addition, we consider that there has been a failure to recognise a much higher risk of birdstrike associated with Heathrow schemes than the Gatwick scheme. Yet Gatwick's rating in this regard is inferior to that of the Heathrow schemes. We strongly disagree with this element of the assessment.

Community

- 6.39 The Sustainability Assessment identifies that in comparison with the Heathrow schemes, the community impacts associated with the Gatwick scheme are significantly lower. These differences between the schemes are most significant in three areas: effects on residential property; community cohesion; and community severance. In all three of these areas, Gatwick performs significantly better than the Heathrow schemes.
- 6.40 However the Commission's ratings do not reflect this. The scoring of the Heathrow NWR scheme with mitigation does not fully reflect the scale of the impacts, highlighted by the publication of Heathrow NWR's new property compensation proposal on 1 December 2014 under which the owners of approximately 3750 homes outside the boundary of the expanded airport would have the option to sell their home at 25% above market value (in Harmondsworth, Sipson, Harlington, Cranford Cross, Poyle, Colnbrook and Brands Hill).
- 6.41 Given the potential scale of the physical impact on the local communities (and specifically the potential loss of whole communities) the score for Heathrow NWR should remain as per the base case i.e. highly adverse, and the comparative assessment should recognise Gatwick's substantially stronger performance (currently assessed by the Commission as neutral).

Correlation of ratings shows that Gatwick is to be preferred

- 6.42 We have correlated overleaf the Commission's ratings for each module and each scheme. This demonstrates that on the basis of the Commission's work to date, Gatwick is clearly preferable overall to either Heathrow scheme, with our suggested adjustment of ratings across key modules such as Air Quality and Noise, to reflect a more accurate and fair rating of our scheme, Gatwick's superiority is even more marked in terms of sustainability.
- 6.43 As befits the purpose and practice of a Sustainability Assessment, the Commission should consider what the collective performance – i.e. sustainability – of each scheme is, rather than provide ten stand-alone topic assessments. We believe when this is undertaken Gatwick will score significantly better than either Heathrow schemes. Adjustment of the ratings in line with the points made in this response will confirm that Gatwick is by far the most compelling of the three schemes from a sustainability point of view.

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TABLE 6.1: SUMMARY OF COMMISSION ASSESSMENT

Module	Gatwick R2	Heathrow NWR	Heathrow ENR
Economy impacts	Highly Supportive	Highly Supportive	Highly Supportive
Local Economy Impacts – jobs and economic growth	Supportive to Highly Supportive	Highly Supportive with potential to reduce to supportive	Highly Supportive with potential to reduce to supportive
Local Economy Impacts – surface access	Neutral	Neutral	Neutral
Noise	Adverse unlikely to become entirely Neutral	Highly Adverse potential for closer to Adverse	Highly Adverse
Air Quality	Adverse towards Neutral	Significantly Adverse to merely Adverse	Significantly Adverse to merely Adverse
Biodiversity	Adverse	Adverse towards Neutral	Adverse with capacity to increase to Highly Adverse
Carbon	Adverse	Adverse	Adverse
Water and Flood Risk	Adverse with good possibility of Neutral	Adverse could not become entirely Neutral	Adverse towards Neutral
Place	Adverse – unlikely to become entirely Neutral	Adverse	Adverse
Quality of Life	Neutral	Neutral	Neutral
Community – housing loss	Adverse to Neutral	Highly Adverse to Adverse	Adverse towards Neutral
Community – disproportionate impacts	No assessment	No assessment	No assessment

Question 7:

Comments on Business Cases

Q7: Do you have any comments on the Commission's business cases, including methodology and results?

Key points

- 7.1 The Commission has produced three parallel business cases, one for each of the three potential expansion schemes, which is contrary to standard business case practice. This complexity reduces transparency, makes a 'side by side' comparison of the three schemes more difficult, and critically appears to have introduced error instead of clarity. In particular, the Economic Case should certainly provide a 'side by side' comparison of the BCR ratios.
- 7.2 Across the 5 cases, we are most concerned about the lack of:
- Assessment of risk: Expansion at Heathrow would involve significantly greater delivery and financing risk than expansion at Gatwick, with a result that could fail to grow operational resilience in the London airports system. We are concerned that the Commission has not adequately assessed risk in its Management Case, or elsewhere in its analysis, and ask that the Commission completes this assessment;
 - Conclusions based on value for money calculations: As discussed in the response to Module 2, we consider that the Commission should follow Green Book and WebTAG guidance and to reach conclusions on the economic case on the basis of value for money calculations, which include both costs and economic benefits.

Overall methodology

- 7.3 The Commission's development of three separate business cases for each of the potential expansion schemes broadly follows a Green Book/WebTAG approach. However, we have concerns with the Commission's methodology as set out below:

Lack of side-by-side comparison

- 7.4 Presenting the three business cases independently of and separately from each other inhibits direct comparison and read-across between the schemes. This would be rectified through an overarching document comparing and contrasting the three schemes side-by-side, both quantitatively (especially in terms of the economic case) and qualitatively.

Inadequate assessment of risk

- 7.5 We are very concerned that the Commission has not analysed risk fully in its Management Case (or elsewhere, in its consultation material). The Commission should conduct a robust, reliable and complete assessment and comparison between the three schemes, making a like for like comparison of the risks, and then evaluating the severity of any risks identified.

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Incomplete value for money calculations

- 7.6 Each business case should contain a risk adjusted net present value (“NPV”) calculation appraisal and a benefit-cost ratio (“BCR”) as a value for money conclusion for each economic case, following Green Book and WebTAG guidance. Risk adjusted NPV is the best method for appraising a short list of schemes in a situation where the three schemes have competing merits.
- 7.7 The Commission’s figures show that Gatwick provides greater value for money than expansion at Heathrow for each of the Commission’s scenarios. A risk adjusted NPV comparison will further reinforce this.

Unresolved conflicts with scheme promoters’ position

- 7.8 The business cases are based on the submissions from each scheme’s promoter, but some elements have been adjusted by the Commission. There is a high degree of risk associated with adjustment and interpretation by external parties unaware of some of the underlying detail in each submission. This also prejudices the role of the Commission as independent appraiser as it is effectively both proposing and assessing the schemes.

Potential distortions from carbon emissions

- 7.9 The Commission’s analysis uses two alternative ways of addressed aviation’s carbon emissions. The carbon scenarios have a very large impact on the level of projected demand and will affect the robustness of the underlying models. It is not clear how the alternatives have been developed or whether they represent the full scope of future possibilities.

Management case

- 7.10 We have the following significant concerns with the Commission’s Management Case, in addition to our comments about the lack of assessment of risk:

Relative public opposition

- 7.11 The Commission highlights public opposition to Gatwick’s recent trials of revised flight paths, but does not refer explicitly to the much higher levels of public opposition to similar trials undertaken at Heathrow. Given that the population likely to be affected by changes to Heathrow airspace is much than that affected by changes to Gatwick airspace, airspace change at Heathrow is likely to raise much more public opposition than equivalent change at Gatwick.

Lack of assessment of engineering viability

- 7.12 Most significantly, the management cases do not analyse the engineering viability adequately, following WebTAG guidelines.

Contradictions

- 7.13 Paragraphs 4.21 – 4.24 in the Commission’s Gatwick business case assessment are contradictory. Some elements suggest that “additional traffic due to airport expansion accounts for only a marginal component of increased demand for rail” and that “the line had

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sufficient capacity to satisfy both background demand and airport expansion in 2030”, but other sections suggest that “even with the potential CP6 enhancements, the line will have more demand than they can accommodate”¹⁰⁰.

- 7.14 Paragraph 4.35 of the Gatwick case states “it is not expected that there would be particularly complicated issues in construction”. This is correct, but is inconsistent with statements made in the commercial case.

Economic case

- 7.15 The Commission has published its Transport Economic Efficiency (“TEE”) analysis, alongside a separate PwC report, which aims to calculate the wider economic benefits. The TEE report broadly follows the WebTAG recommended methodology, while the PwC report does not, instead using a new untested methodology.
- 7.16 Given the flaws in the PwC report, we do not believe that material reliance can be placed on this by the Commission.
- 7.17 We suggest the following improvements to the TEE report:
- **Remedying the limitations on the traffic forecasts:** see Module 1 (Strategic Fit) comments;
 - **Including the quantified benefits of competition,** environmental impacts and wider economic benefits: see Module 2 (Economy) comments;
 - **Reviewing the values of passenger time:** see Module 2 (Economy) comments; and
 - **Presenting the results with costs and benefits** following WebTAG guidelines: Most importantly, the Commission presents only economic benefits. This is not consistent with HM Treasury’s Green Book and the DfT’s WebTAG appraisal guidance, which advise that costs and benefits should be evaluated together, in the form of a benefit–cost ratio and net present value for money calculations. When this is done, even before the addition of other factors, the calculations show that expansion at Gatwick provides better value for money than expansion at Heathrow.

¹⁰⁰

Airports Commission. “Gatwick Airport Second Runway: Business Case and Sustainability Assessment”. November 2014. p78.

Strategic case

- 7.18 The Commission's strategic case should set out the strategic requirements for a new runway clearly and unambiguously. This should also be extended to provide more detail on innovation, flexibility and scope for future enhancement and the potential impact of Government policies. An explicit statement of strategic requirements is needed so that there is a logical basis for the evaluation of the schemes.
- 7.19 Our view on how well the Commission's assessment meets this requirement, with reference to the questions set out by the Commission is summarised below:
- 7.20 **Q1: Does the option provide additional capacity that facilitates connectivity in line with the assessment of need? What kind of connectivity may the option provide?** We are confident that the Gatwick scheme fully meets the connectivity objectives in line with the Assessment of Need, however, we have significant concerns, as expressed in response to Module 1, about the airport level traffic forecasts used by the Commission,.
- 7.21 **Q2: What kind of experience may the option offer to passengers and what kind of opportunities may it create for the freight sector?** We have the following concerns with the Commission's assessment in this area, as explained in response to Module 1:
- **Passenger experience:** The assessment pays no attention to significant passenger experience metrics, such as the time taken to pass through the terminal, walking distances and queue lengths at security and immigration; and
 - **Freight:** The Commission's assessment significantly understates the potential for growth in cargo at Gatwick, which could grow by a factor of 10 by 2050 through: increase in belly-hold cargo in passenger aircraft; an increase in the proportion of long-haul wide body aircraft and dedicated freighter operations. The scope for expansion of freight at Heathrow is more limited, especially if a proportion of addition capacity is taken up by LCCs. Congestion on the M25 and M4 is also likely to inhibit growth in air cargo, which by its very high value nature is time critical.
- 7.22 **Q3: What benefits of competition to aviation users and the broader economy may the option provide?** We believe that competition between both airports and airlines can significantly benefit the London and South East market. The Commission should quantify and include this directly within the economic case. We highlight our concerns with two reports from ITF/SEO on competition in our responses to Modules 1 and 2. In our response to Module 2, we highlight a methodology and a quantification of competition benefits that was used in the Oxera/PA Consulting economic impact assessment, which was submitted to the Commission in May 2014 which more fully reflects the benefits of competition.
- 7.23 **Q4: How may the option fit with relevant long-term strategies for socio-economic and spatial development?** The Commission's employment and housing results are presented across a very wide range. In Gatwick's case, employment impacts across the scenarios range from 200 to 23600 additional jobs by 2030 to between 7900 and 32500 additional jobs by 2050. Similarly the estimate of the need for new housing ranges from zero to 18400 dependent on scenario. As we state in response to Module 3 (Local Economy) it is difficult to make meaningful comparisons or draw conclusions from such large ranges, which further analysis should narrow.

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- 7.24 In addition, the Commission has used very different employment multipliers to relate growth in employment to jobs created at Gatwick and Heathrow. This is unusual and it results in disproportionately high employment estimates for Heathrow, compared to Gatwick. The Commission should address this inconsistency.
- 7.25 Expansion at Heathrow would conflict directly with the London Plan and the Mayor's Economic Development Strategy. In contrast there is a wealth of evidence within strategic planning documents which demonstrates that expansion at Gatwick would directly support and deliver against a significant number of the spatial and socio-economic development strategies for London. In fact, expansion at Gatwick will bring several benefits over the Heathrow schemes in key areas relating to the spatial and socio-economic vision for London.

Financial and commercial cases

- 7.26 We comment on the Commission's final two cases – the Financial and Commercial cases – in our response to Module 13.
- 7.27 According to WebTAG the purpose of the Financial Case is to assess affordability, whereas in the introduction to the Commission's Financial and Commercial case, the purpose is stated by the Commission to be cost and sources of funding. This is incorrect and should be changed to reflect WebTAG guidance.

Question 8:

Any other Comments

Q8: Do you have any other comments?

- 8.1 We have provided a comprehensive set of technical appendices which should be read in conjunction with our responses to Questions 1 to 7.
- 8.2 We have no further comments to make.

