



*INDEPENDENT TRANSPORT COMMISSION*  
*Britain's independent research charity for transport and land use policy*

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03 February 2015

Dear Sir Howard

**ITC response to the Airports Commission consultation**

The Independent Transport Commission (ITC) is pleased to respond to the Airports Commission's latest consultation. The ITC is an independent and apolitical research charity which provides evidence-based research in order to inform better policy-making. We welcome the work of you and your team to find the best solution for improving UK aviation connectivity, particularly in the south-east. You might recall that we have, over the course of the past 18 months, submitted 3 research reports. This letter and the two new documents enclosed provide an overview and update which I hope will be helpful as you reach your final conclusions and recommendations.

Our aviation industry and the connectivity it brings are of vital importance to the economic health of the nation. The ITC's report *Flying into the Future* demonstrated that good aviation connectivity helps sustain economic growth, attracts inward investment and supports trade, tourism and the quality of social and family life in an increasingly globalised world. For London particularly, but also for the UK regions, this connectivity helps to maintain our commercial attractiveness.

The new report I enclose, authored by Peter Hind of RDC Aviation, broadly welcomes the analysis in the Commission's consultation documents and highlights some of the central issues they raise. It is focused on the choice between expansion at Gatwick or Heathrow, and does not undertake an assessment of the rival strengths of the two Heathrow shortlisted options. I would highlight the following key points which emerge:

- it confirms that the aviation industry's two business models - hub and spoke, and lower cost point to point - have both developed strongly in the last decades and are both likely to flourish in future. They have different strengths and generally suit different markets. For the sake of good connectivity the UK needs both models to flourish;
- low cost, point to point, works well for short-haul traffic, and for some "thick" longer-haul routes (eg to popular leisure destinations or foreign hubs). Hub and spoke underpins most long-haul routes (which require greater aggregation of passengers, and often freight, to be commercially viable), and has been reinforced by the recent growth of global hubs in Europe and particularly the Middle East;
- as evidenced in the ITC's previous reports and in the Airports Commission's consultation documents, strengthening the UK's only existing hub airport (i.e. Heathrow) will do more to develop our global connectivity especially in terms of new routes to emerging markets. The new report illustrates that even where non-hub airports open routes, they are rarely new for the UK and are usually to holiday rather than business destinations;

- this leads to the conclusion that if the UK's prime connectivity requirement is simply better links to Europe and/or to foreign hubs, options such as making greater use of below-capacity regional airports (including Stansted) and potentially expanding Gatwick would make sense. But if the prime need is to protect and expand the UK's direct connectivity with global destinations, so that individuals and freight are able to fly directly between world cities and London, the Heathrow options are clearly to be preferred;
- the report analyses the costs and pricing implications of the options, highlights the challenging issues these raise for investors and addresses some implications for airlines and the airports. Based on the Airports Commission's estimates (which we understand the promoters consider to unnecessarily high), any of the short-listed schemes would require very substantial new capital investment - highest in absolute terms at Heathrow but higher in relation to the airport's existing capital base at Gatwick;
- this will lead to much higher charges at whichever airport is selected. On the Commission's estimates, they could increase by nearly half at Heathrow but between two thirds and double at Gatwick. The report considers the potential impact on demand and concludes that Gatwick would face the greater commercial risk. This is because airport charges are a larger proportion of the overall costs of low cost airlines; their customers are generally more price-sensitive; and because they would have more alternative options should they conclude that Gatwick had become too expensive. Potential investors would therefore need to assess the risk of Gatwick falling between stools - too expensive for its traditional low cost customers but not sufficiently globally connected to compete with Heathrow, Paris, Amsterdam etc as a true hub. Although Heathrow charges are already high by international standards and would rise significantly further, the report suggests that this would be unlikely to choke off demand sufficiently to put the investment at risk.

The overall conclusion is that the Heathrow options are to be preferred, primarily because they address the UK's connectivity challenge more successfully but also because - despite the cost - they appear to hold fewer risks in terms of being financially deliverable and commercially successful. We also note the Commission's finding that in terms of wider economic benefits to the UK expansion at Heathrow could provide benefits ranging from £101-214bn in comparison with benefits of £42-127bn from an expanded Gatwick. However, if Heathrow is expanded we would reiterate a point made in previous reports that Gatwick should be freed from economic regulation

The ITC recognises, of course, that environmental issues are also important and highly sensitive. The ITC noted in our initial report that noise was the biggest single obstacle to expanding capacity, affecting those living near all airports and impacting, numerically, much more on London. We recognised that measuring noise is not simple - different people have different sensitivities, and a given level is more or less disruptive at different times and against different "background" noise levels. We noted that, as aviation develops, there are swings and roundabouts: more flights, but also much quieter planes and better noise management techniques. However, we observe that constricted airport capacity can itself worsen noise (and fuel burn) as aircraft wait for slots. In the case of Heathrow, the extended runway option offers the prospect of accommodating the early morning flights, which cause the most severe noise disruption, by shifting these further west away from the London suburbs. It also provides an easier pathway to develop a fourth runway which, as identified in our second report, might be required by 2050.

We regret that the noise analysis in the Commission's most recent consultation document appeared somewhat opaque and would request that the final report explains the swings, roundabouts and net balance extremely clearly. We do not believe that noise and environmental challenges are insurmountable, given the marked improvements in aircraft technology and the opportunities to improve flight paths, access



heights, noise mitigation and compensation measures. It will also be important to obtain better noise collection data – at present our data is insufficiently granular and would benefit from a wider range of observations. We support the work of the Commission to seek a sensible balance between the legitimate concerns of those near any airport and the wider strategic needs of London and the UK.

The ITC's 3rd report, prepared by Dr Tim Ryley of Loughborough University, focussed on the crucial importance of surface transport to and from whichever airport is chosen for expansion. We welcome the attention that the Airports Commission has given to this in the most recent consultation document. There has been insufficient time to commission a detailed review of the latest proposals but I attach a brief note by Dr Ryley in which he welcomes the broad thrust but highlights some continuing concerns which we hope the Commission will be able to consider further as it reaches its conclusions. In particular, the modal shift targets remain very ambitious and it is hard to see how so many car-users will be persuaded to move to public transport without strong incentives or deterrents such as charging. His note also flags concern that, if Heathrow is chosen for extension, the Commission may be cooling on the case for a HSR spur and a Heathrow Airport Hub station. We have not been able to review these issues in detail but would highlight again the need for easy and seamless journeys to and from the airports, as in some other European cities (Paris and Amsterdam come to mind) where airports and railways are truly integrated. It would be tragic if the UK continues to plan its major transport infrastructure as a series of *ad hoc* projects with no serious attempt at integration.

Above all, we believe that it will be crucial for the Government of the day to act on the Commission's recommendations for improving UK aviation capacity. We remain committed to encouraging the Government to avoid any further delays, and will consider undertaking further research on the economic consequences of doing nothing.

I hope that this submission and the enclosed reports will be of assistance you and your colleagues at the Commission. If you or your team would like to discuss any of the findings in greater detail please let me know and we would be delighted to meet. In the meantime we wish you well with the remainder of your work and look forward to reading your final report in the summer.

Yours sincerely

[Redacted signature]

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# Delivering airport capacity:

The cost and impact of airport user charges for the  
Airports Commission's shortlisted options





## Executive Summary

This study forms part of a series of papers that the ITC is commissioning in response to the Airports Commission consultation documents. In this report, we examine the cost estimates put forward by the scheme promoters compared to those of the Commission and examine how these might change the outlook for passenger forecasts and air connectivity for the country.

The Commission has proposed a number of future demand scenarios which it has applied to the proposed expansion schemes at Heathrow and Gatwick and we see merits in this flexible approach. We also find that, while the argument has often been positioned as a choice between the low-cost and hub-and-spoke business models, there is no compelling evidence to suggest either will replace the other. The last two-decades have seen low-cost carriers provide very strong connectivity in the short-haul point-to-point markets of Europe, the Middle East and Asia while hub carriers from bases in Turkey and the Middle East have developed extensive route networks using the hub-and-spoke model. Thus, our long-term view of the aviation industry is one in which low-cost and hub-and-spoke exist side-by-side, with the bulk of long-haul routes being operated by network airlines supplemented by limited long-haul low-cost services.

This is because we believe that long-haul will almost always require some level of passenger (and freight) aggregation which is best achieved by operating a route network serving a mix of direct and connecting passenger flows. Our analysis suggests that there is scope for long-haul low-cost, but it is more likely that the evolution of this model will follow that of its short-haul counterpart in starting on very thick, city-to-city destinations such as London to New York; followed by key leisure destinations – Caribbean, Florida, Indian Ocean islands; then follow the same pattern from regional airports. This will bring competition, but it will not bring new connectivity for the UK.

Our study shows that Heathrow attracts airlines serving key business destinations and consequently has a higher proportion of business travellers, particularly within the inbound business market, as we explored in our previous report. Multiple studies suggest that long-haul international business travellers display the least *elastic* behaviour when it comes to changes in the cost of travel. Gatwick has a more leisure-focussed passenger base. It is a more seasonal airport and the growth in its route network in recent years has been characterised by European leisure destinations and that there has been little new business connectivity generated by new routes at Gatwick in the last decade.

The Commission forecasts show that, in all cases, expansion of Heathrow will lead to the same or a greater number of passengers using the London system. It also suggests a greater number of destinations will be offered from the London airports with an expanded Heathrow. Our findings support this. We have taken the Commission forecasts as the basis for our elasticity modelling, in which we show how increases in charges might suppress future demand. Based on the profile of passengers in the Commission forecasts for Heathrow and Gatwick, and using industry-standard elasticity of demand for different passenger types, the results show that the Heathrow traffic base is more resilient to price increases than Gatwick.

The estimates of the Commission are that user charges at Gatwick may have to double to cover the cost of expansion and at Heathrow increase by 50% from current levels. In the case of Gatwick this would mean taking substantial multipliers of its current debt levels, requiring an additional £14b of debt compared to £1.5b today. We see evidence that borrowing of this size can be achieved, though note observations of independent commentators in highlighting that the level of financing required is significantly more than the airport has today. This brings market uncertainty. The Commission analysis shows charges at an expanded Gatwick would be close to those at Heathrow and significantly higher than those at Stansted and Luton, both of which compete with Gatwick for short-haul low-cost passengers.



Heathrow already has a substantial level of debt, £11.7b, and is forecast to require an additional £27b (the mid-point of the two schemes), a much lower multiple of current debt than Gatwick but almost double in absolute terms. This would raise the balance sheet at Heathrow to similar levels as Network Rail and financing would be at the highest end of infrastructure projects in the UK. We have found evidence to show that financing on this scale would be possible, but also examples of where it has been highly challenging. Charges would rise by around 50% compared to today, putting Heathrow at the top of international peers and with clear distance between it and the rest of the London airports.

We have examined a report by Frontier Economics that suggests the lack of runway slot availability within the London system leads to higher air fares for UK passengers, and agree with these findings. Whilst the airport charges are regulated at Gatwick and Heathrow, airline ticket prices are not. As in any market, when demand outstrips supply, prices rise. We see evidence that this could happen with fares at Gatwick in the summer peak, and year-round at Heathrow, leading to super-profits for the airline operators at those airports. This may infer that once new capacity is fed into the system, ticket prices will remain stable even if charges are increased.

Finally, our limited resources mean we are unable to re-model any of the noise and environment impacts from the shortlisted schemes. We recognise that this is a highly contentious area requiring thorough analysis and difficult choices.



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## 1. Background

- 1.1. This paper has been commissioned by the Independent Transport Commission (ITC), Britain's leading research charity focussed on transport, land-use and planning issues, and written by the independent consultancy firm RDC Aviation Ltd (RDC). RDC is a UK-based consultancy and software business with expertise in network planning and long-term demand forecasting for airport, airline and investor clients across the world.
- 1.2. Following its previous studies<sup>1</sup>, the ITC concluded that improved long-haul air connectivity is more likely to arise through the hub model, and that the UK needs a minimum of a three-runway hub to meet future demand projections. Since publication of the last of those reports, we see nothing that changes these conclusions as to how future connectivity will be maximised, though we understand there are differences of opinion here, with some seeing a long-haul low-cost model being a key driver of inter-continental growth.
- 1.3. In this report, we build on the previous work by reviewing the options for expansion at Heathrow and Gatwick airports, shortlisted by the Airports Commission; look at the cost analysis of each scheme as proposed by the promoters and the Commission; and model how the costs for each scheme might change the level of demand, and connectivity, for London and the UK.
- 1.4. The complexity and depth of analysis required to produce new passenger demand and infrastructure build-cost forecasts is beyond our resources, so in writing this report we have made use of the extensive work undertaken by the Airports Commission, looked at stakeholder responses to that work and considered the views of the scheme sponsors. However, to maintain a fair and equal analytical platform, we have taken the work of the Commission to be our baseline<sup>2</sup>.

## 2. Understanding the Options

- 2.1. The five major London airports, Heathrow, Gatwick, Stansted, Luton and London City, make up the largest air travel market in the world by most measures. In 2013, the London system offered almost 176m seats to global markets.
- 2.2. The AC identified three shortlisted schemes for the new runway development. Two are at Heathrow (Heathrow New North Runway by Heathrow Airport Limited and Heathrow Extended Runway by Heathrow Hub Limited) and one is at Gatwick proposed by Gatwick Airport.

### The Airports Commission Core Scenarios

- 2.3. Airports Commission's five 'future airline industry' scenarios are outlined in the Consultation Document and are based on five future scenarios that were analysed to come to a conclusion for the shortlisted proposals. The purpose of the scenarios are to highlight the forecasting risk in the aviation industry and give a fair framework for appraising the options. Instead of reflecting historical trends or focusing on a 'central' scenario they have provided a broad range of different outcomes.

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<sup>1</sup> 'Flying into the Future: Key issues for assessing Britain's aviation infrastructure needs', 'The Optimal Size of a UK Hub Airport' and 'Surface Connectivity: assessing the merits of the Airports Commission options for UK Aviation'

<sup>2</sup> We note that Gatwick Airport disputes the methodology used by the Commission in modelling traffic allocation between the London airports





1. Assessment of need	The scenario is consistent with the forecasts underpinning the Commission's assessment of need. Future demand is primarily determined by central data projections (for example GDP and global oil prices).
2. Global growth	This scenario sees higher global growth in demand for air travel in the future, coupled with lower operating costs.
3. Relative decline of Europe	There is higher relative growth of passenger demand in emerging economies in the future, compared to growth in the developed world.
4. Low-cost is king	High levels of global growth in demand see the low-cost carriers strengthening their position in the short-haul market and successfully capturing a substantial share of the long-haul market
5. Global fragmentation	This scenario sees lower global growth and economies closing themselves off by adopting more interventionist national policies

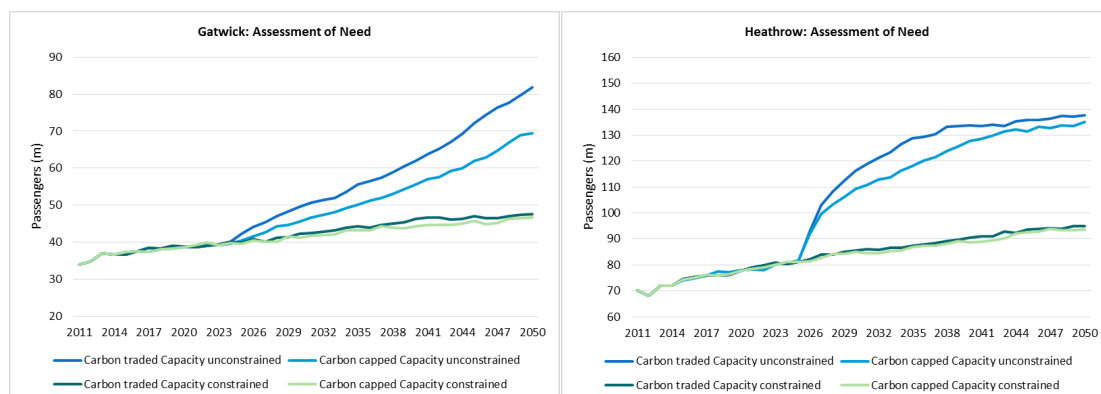
Source: Airports Commission

### Case 1: Assessment of need

This is the baseline forecast used in the Airports Commission's Consultation Document published in November 2014, it is broken down into four core forecasts as follows:

- a) Carbon traded, capacity unconstrained  
In this scenario the aviation industry operates under the Emissions Trading System (ETS), the model assumes that the UK will function under EU ETS up to 2020 and then under the global carbon market from 2020 onwards. There are no constraints on airport capacity or a cap on gross emissions from the sector. This shows how demand would evolve if there were no restrictions on emissions or capacity.
- b) Carbon traded, capacity constrained  
Again the industry is under the ETS but the assumption is that there is no capacity expansion and the UK airport capacity remains unchanged throughout the forecast.
- c) Carbon capped, capacity unconstrained  
There are no limitations on capacity, however the carbon level is consistent with Climate Change Act 2008 – emissions to be reduced to 2005 levels by 2050. In order to induce the emissions to the target level, the model raises the carbon price included in fares to induce the emission forecasted market equilibrium to 2005 levels by 2050.
- d) Carbon capped, capacity constrained  
This scenario is a combination of 0% growth in UK airport capacity and emissions' target of 2005 levels by 2050. This assists the Commission in analysing what would happen if no further development happened in UK airports and further policies were introduced leading to aviation emissions returning to their 2005 levels by 2050.

**Table 1: Airports Commission Interim Report Forecasts**



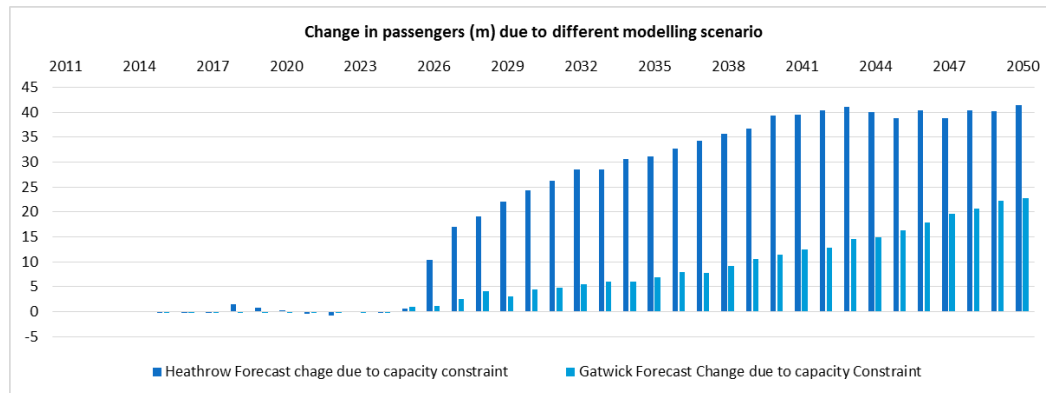
Source: Airports Commission

In 2011, the forecast base year, Heathrow has already exceeded capacity whereas Gatwick was operating at 93% of runway usage.



Focussing on the major impacts on future growth, as shown in Table 1, we see how Heathrow's passenger growth is impacted significantly more by whether or not capacity remains at its current rate through to 2050, whereas Gatwick's growth is more sensitive to how CO<sup>2</sup> is modelled in the forecast.

**Table 2: Illustration of Capacity Impacts on Forecast at Heathrow and Gatwick**



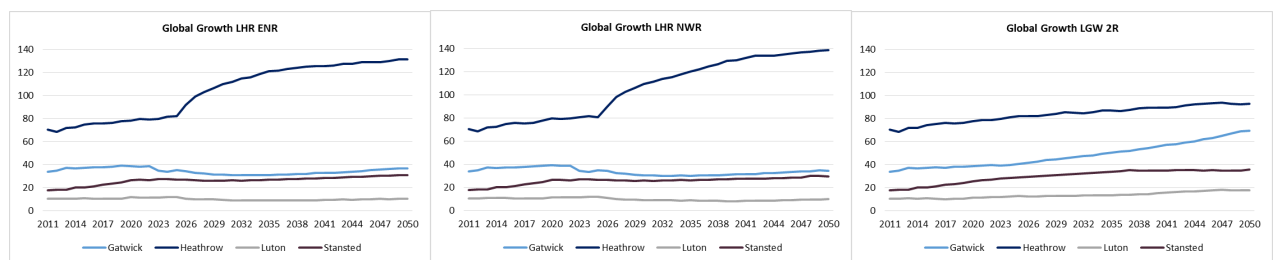
Airports Commission Forecasts: AoN Carbon Capped, AoN Carbon Traded 20-Jan-15  
Note: Heathrow forecast is an average of both schemes

The graph above shows the difference in passengers between carbon capped capacity *unconstrained* and capacity *constrained* for Heathrow and Gatwick, with Heathrow showing a larger impact when additional capacity is added to the airport.

### Case 2: Global Growth

This scenario is based on the hub-to-hub business model with greater international transfer passengers and the impact, for example, of the expansion of Dubai and other Middle East hubs on the industry. Newly industrialised countries (NICs) and less developed countries (LDCs) are assigned GDP growth of 2% per annum. In this scenario the carbon emissions constraint lies within the carbon traded and carbon capping range at 70% of the 2005 level by 2050. The forecasts under this scenario by Airports Commission shows that the Heathrow North West Runway, looking at the more conservative forecast, carbon capped, would result in the greatest percentage increase of 98% in annual passengers and absolute rise in passengers.

**Table 3: Global Growth Forecast Scenarios**



Source: Airports Commission, Global Growth Carbon Capped

### Case 3: Relative Decline in Europe

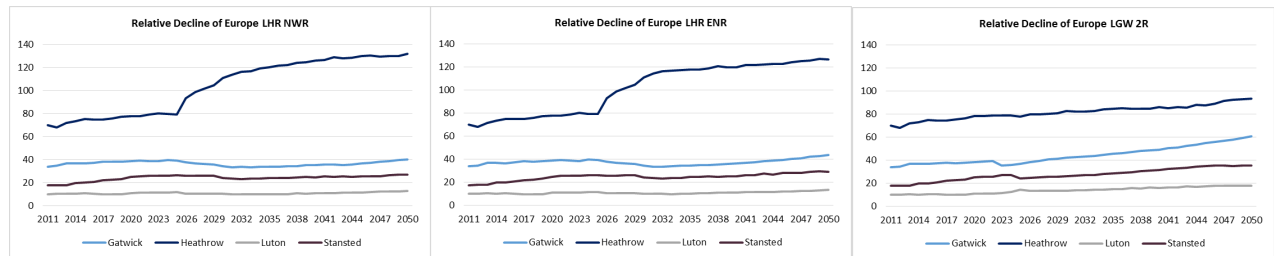
This scenario sees declining passenger flows in and through Europe which leads to the consolidation of European hub capacity, and in the Airports Commission's scenario they have assumed activity would be focussed on one European hub for modelling purposes, Amsterdam. International transfer passengers gravitate towards Amsterdam Schiphol and Dubai. The impact on the UK has been modelled and is expected to be limited as capacity constraints have resulted in little international transfer traffic in the UK compared to the 'assessment of needs' scenario, the baseline. As in scenario 2, NICs and LDCs are assumed to have higher GDP growth rates. The carbon capped scenario shows emissions to be reduced to 2005 levels by 2050. Heathrow



Airport NW Runway would provide a greater change in number of passengers, and produce the biggest percentage change.

We would propose that within this scenario, for the Airports Commission to get a more representative view, a sensitivity should be run whereby the assumption is that London Heathrow becomes Europe's largest hub. The Commission has not outlined specific pull factors that would cause Amsterdam to be Europe's hub. If 'relative decline in Europe' scenario was to materialise it is realistic to consider what the impact would be on both Heathrow and Gatwick compared to the AC forecasts under their current assumptions if Heathrow fulfilled the European hub role.

**Table 4: Relative Decline in Europe Forecast Scenarios**



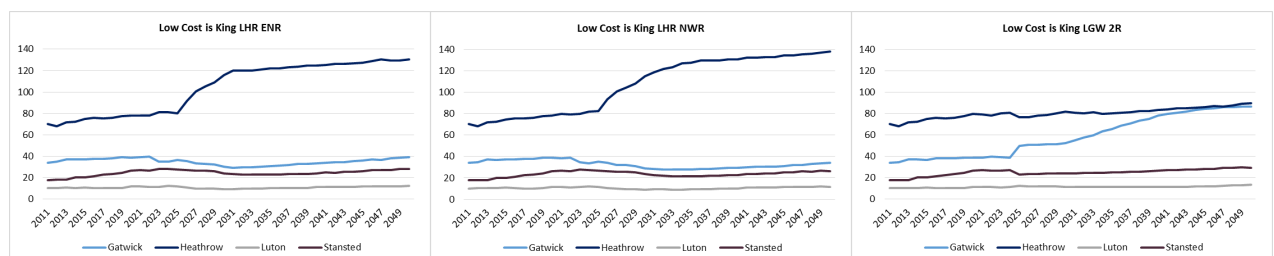
Source: Airports Commission, Relative Decline of Europe Carbon Capped

#### Case 4. Low-Cost is King

In this scenario it is assumed that there is a predominance in the point-to-point business model. Consequently, low-cost and charter carriers increase market share to capture over half of the market. From the baseline forecast they have a combined market share of 38% in 2040, which rises to 52% in this scenario. CO<sup>2</sup> emissions are modelled as being fully capped. This scenario reduces the UK's runway utilisation slightly, compared to baseline forecast, there would be 25% lower international–international transfer passengers. Although Heathrow Airport North West Runway development will have the largest increase in absolute passenger numbers, Gatwick sees approximately 150% increase from 2011 to 2050. This follows the scenario's logic where the reduction in the dominance of the hub and spoke business model leads to Heathrow becoming less significant while Gatwick grows its current low-cost carrier network and attracts new entrants.

The end result of this scenario, when applied to each runway case, is that any of the schemes deliver a similar number of passengers by 2050, although it seems surprising that traffic at Stansted remains static given its current low-cost airline focus.

**Table 5: Low-Cost is King Forecast Scenarios**



Source: Airports Commission, Low-cost is King Carbon Capped

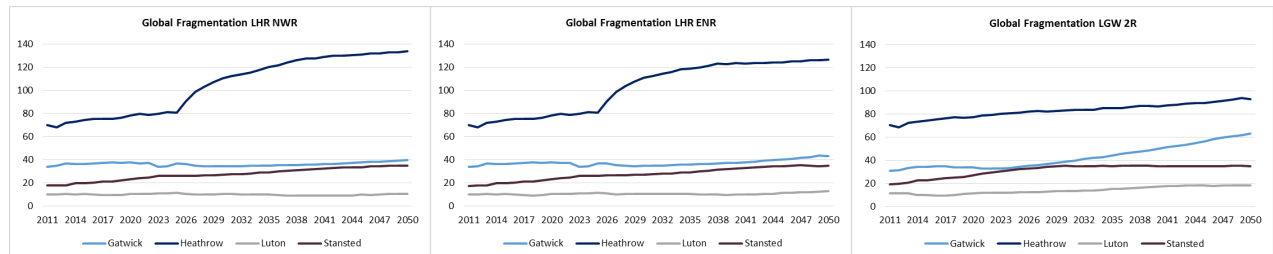
#### Case 5: Global Stagnation and Fragmentation

This scenario outlines the reversal of globalisation where economies become more insular resulting in lower GDP growth. For the UK the assumed GDP is 0.5% lower than used in baseline forecasts and for other countries it is lowered by 1%. As GDP growth is positively correlated with passenger demand growth, there is lower capacity usage relative to baseline forecasts. However, Heathrow has an increase in international transfer



passengers due to a lower fare premium calculated based on the level of congestion. As total demand has been reduced this pricing mechanism can attract more price sensitive international transfer passengers. Carbon emissions are under the carbon trading regime. Although there is lower growth in the overall aviation market Heathrow's North West Runway still grows by the greatest percentage in this scenario. This could be due to airlines synergising and using the most efficient operational model of hub to hub as volumes of passenger travelling from individual countries are insufficient to operate dedicated point to point scheduled flight.

**Table 6: Global Fragmentation Forecast Scenarios**



Source: Airports Commission, Global Fragmentation Carbon Capped

### Relating the Forecast Scenarios to Runway Case

2.4. The scenarios suggested by the Commission cover the most likely possible future outcomes for the industry, though we expect a combination of these to prevail in the long term. The table below summarises our views on the four main cases alongside how we feel these fit in relation to the two airports.

	GLOBAL GROWTH	RELATIVE DECLINE IN EUROPE	LOW-COST IS KING	GLOBAL FRAGMENTATION
<b>POTENTIAL FUTURE OUTCOME</b>	Heathrow already operates as a relatively successful hub, albeit constrained by lack of runway slots. In the event development of the industry is dominated by hub-to-hub operations, the most efficient use of new resources would be to further develop UK hub capacity.	If Europe becomes a single-hub system, there are two outcomes. One is that the hub for Europe is Heathrow; the other is that the hub is in mainland Europe and both Heathrow and Gatwick have the potential to develop point-to-point networks.	This scenario would see a diminished role for hub operations and increases in the number of point-to-point routes, on both short and long-haul.	In this model, an increasingly insular industry probably favours the hub model, particularly if there is a degree of re-regulation. Any increase in the efficiency of airlines' business models would narrow the gap between low-cost and network carriers, and the overall demand for thinner secondary routes diminishes without feed traffic.
<b>CONCLUSION</b>	<b>Heathrow</b> , as the airport hosting a hub network, would be the logical choice. Competition would arise from a second <b>Gatwick</b> runway – it would need to capture a hub carrier to maximise the benefits	With a third runway, <b>Heathrow</b> would be well placed to act as Europe's hub for east-to-west traffic flows. If the UK did not host the hub, <b>either</b> airport would benefit. Cost is a major factor in this case.	<b>Gatwick</b> is the obvious runway location choice though competition will intensify from other London airports.	<b>Heathrow</b> would be the more logical location for additional capacity though the increase in user charges may be a strong deterrent to growth
<b>LIKELIHOOD</b>	We expect the <i>Assessment of Need</i> basis combined with <i>Global Growth</i> and an element of <i>Low-cost is King</i> to characterise the future industry. We see some scope for long-haul low-cost offering alternatives to the network airlines on major markets; challenging charter airlines to key leisure destinations; and involving limited self-interlining. However we do not foresee this business model putting an end to hub-and-spoke, nor do we see it bringing significant <i>additional</i> connectivity to key business destinations, beyond that already offered			



## Overview of the Commission Cost Estimates

2.5. The capital expenditure cost considered by the Airports Commission for its assessment are based on Scheme Cost, Core Cost and Asset Replacement Cost.

**Scheme Cost**- the cost attributed to the new runway development.

**Core Cost** – underlying investment required irrespective of the new runway development.

**Asset Replacement Cost** – the ongoing cost of replacing current asset and the new asset

2.6. Additionally the Airports Commission also considered the surface access cost that is required to support the development of the schemes. The cost are assessed within the period of 2014-2050.

**Table 7: Cost Assessment 2014-2050**

2014-2050 Cumulative Total (£m 2014 price)	Gatwick Airport	Heathrow New Runway	Heathrow Extended Runway
<b>Scheme Cost</b>	£7,387	£18,583	£13,539
<b>Core Capex Cost</b>	£3,224	£13,069	£13,069
<b>Asset Replacement</b>	£4,408	£16,784	£16,535
<b>Surface Access</b>	£787	£5,728	£6,282
<b>Total Cost</b>	£15,806	£54,164	£49,425
<b>Scheme as % of total Cost</b>	47%	34%	27%

Source: Airports Commission, Assessment of Need Scenario, Carbon Capped

2.7. The Commission's Cost Estimates include allowance for *risk* and mitigated *optimism bias*, in general accordance with the HM Treasury's "Green Book - Appraisal and Evaluation in Central Government." The exact quantum is hard to break-down but the inclusion of these leads to the Airports Commission's cost estimates being over 20% higher than the estimates provided by the scheme promoters. We asked each of them for their comments on the cost estimates and subsequent charges arising from their own and the Airports Commission figures. All are confident in the deliverability of their own proposals within the cost calculations stipulated in their submissions and observed that use of the standard public sector project methodology, with the introduction of an *optimism bias*, leads to increased cost estimates. Whether this is the correct approach for private sector financed investments is disputed, as the market will ultimately determine its appetite for risk. The Airports Commission has incorporated both *risk* and *optimism bias* in its scheme and user-cost calculations for all three shortlisted propositions on exactly the same basis, without differentiated risk profiles, construction programmes or efficiency measures; nor has it taken into account experience in delivery of very significant, complex infrastructure projects such as Heathrow Terminal 5 and the new Queen's Terminal.

2.8. Additionally, to assess the level of airport charges and funding required, the Airports Commission developed its projections of non-aeronautical revenue and operating expenditure throughout the assessed period of 2014-2050.

**Table 8: Assessment of non-aeronautical income 2014-2050**

2014-2050 Cumulative Total (£m 2014 price)	Gatwick Airport	Heathrow New Runway	Heathrow Extended Runway
<b>Non-Aero Revenue</b>	£12,296	£43,589	£43,049
<b>Operating Expenditure</b>	£14,521	£49,884	£49,631

Source: Airports Commission, Assessment of Need Scenario, Carbon Capped



### 3. The Airports Commission Options: Impacts on Financing

- 3.1. Three bodies have commented on the impacts of the prospective runway expansions on financing. The **Airports Commission** itself has scaled the estimated scale of borrowings and balance sheet inflation which would be required to implement the changes (based on their figures); these need to be set against the current scale of Gatwick and Heathrow:

**Table 9: Additional Finance Requirements**

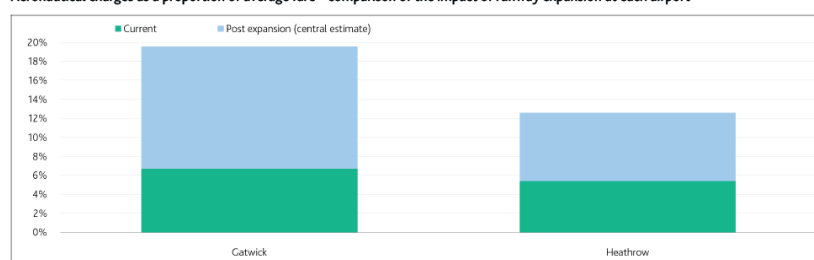
	Today*		Additional**	
	Equity	Debt	Equity	Debt
<b>Gatwick</b>	£0.34b	£1.5b	£3.7b	£14.3b
<b>Heathrow (runway extension)</b>	£2.7b	£11.7b	£5.1b	£24.9b
<b>Heathrow (new runway)</b>	£2.7b	£11.7b	£8.4b	£29.9b

Sources: \*PwC report dated November 2014 for the Airports Commission  
 \*\*Airports Commission consultation document dated November 2014

- 3.2. They point out that raising this level of finance would be challenging for all schemes (in the case of Gatwick, borrowing is likely to be “significantly larger than the company’s financing to date”, and in the case of Heathrow that this would put it “at the highest end of the range of financing for infrastructure projects in the UK”). They observe that this needs to be seen in the context of aeronautical charges that would be rising significantly which would have to be seen in a competitive environment. They make clear that the competitive environment in the context of Heathrow’s charges will be global – implicitly for Gatwick where fees, after expansion, would be comparable to those of Heathrow’s, the competition would be within the London system. The risk for Gatwick, with its current focus on low-cost airlines, would be loss of airline traffic to other London airports. The risk for Heathrow, with its emphasis on long-haul and alliance member carriers, is losing traffic to overseas hubs
- 3.3. **PWC** produced a report for the Airports Commission (No 13) in which they observed that airports have had difficulties (based on case studies in The Netherlands and Spain – as well as Manchester and Stansted) in pricing up to their regulated price caps. They raise the threat of demand risk referring to those costs as a proportion of the ticket price and single out Gatwick as being particularly at risk because it “currently caters for more low-cost traffic (which might be assumed to be relatively price sensitive) and is currently in less of a state of excess demand than is Heathrow”.
- 3.4. PWC goes on to point out that aeronautical charges are currently 6.8% and 5.1% of the average fare at Gatwick and Stansted respectively. **Moody’s** have separately highlighted the competitive similarities between Gatwick and Stansted and the commercial risk for the former if its charges rose significantly due to expansion.

**Table 10: Airport Charges as a Proportion of Average Fare (Moody’s)**

Aeronautical charges as a proportion of average fare – comparison of the impact of runway expansion at each airport



This exhibit compares the proportion of an average fare represented by aeronautical charges at Heathrow and Gatwick  
 Source: Moody's calculations using PwC and Airports Commission data



- 3.5. They go on to comment that “we think the wholesale moves from Heathrow to Gatwick by [other than BA] full service scheduled airlines are unlikely”. In summary, they assume the proposals from the Airports Commission are credit neutral for Heathrow, credit negative for Gatwick Airport Limited and positive for Stansted. The reason for it being positive for Stansted is because it would be the natural place to “exert additional competitive pressure on an expanded and more expensive Gatwick”.
- 3.6. Both Heathrow and Gatwick are owned by infrastructure funds; Gatwick, in particular, is owned predominantly by a closed end fund – in other words it has to have sold on its investment significantly before the expansion is undertaken. Both, therefore, have to access the financial markets in order to finance any expansion; such markets have a history of very large projects in the infrastructure sector.
- 3.7. When BAA built Terminal 5 it negotiated a 0.5% capital return premium for five years across the totality of its capital base (not just the T5 investment); this was for an investment of around £5b on the back of a balance sheet of £12b.
- 3.8. The owners of Thames Water (a £12b business) decided it could not fund the new relief sewer called Thames Tideway, and an independent company has been set up to commission around £3b of expenditure. In part, this may be because that project required deep tunnelling, regarded with some suspicion by financiers, despite the relative success of Crossrail and HS1.
- 3.9. Neither of the above two examples contained any real long term volume risk (we have to pay our water bills and airlines feel they have to fly into Heathrow which was “full”). Financiers often take a very cautious approach to such risks and these will be only exacerbated by “issues” such as the future of aviation in a world which is becoming increasingly concerned about the environment – aviation is the only significant human activity (apart, possibly, from animal husbandry) for which there is no currently known technical solution to eliminating man-made greenhouse gas emissions. Indeed the volume risk has been in part accommodated into the regulatory structure for NATS which was so impaired by 9/11 and its impact upon trans-Atlantic traffic on which it so heavily depends. But CAA can do this for the regulated aspect of NATS<sup>3</sup> which is a true monopoly – airlines have to buy its services (even if it adds marginally more to flying; there is no alternative); that is not true for airports where alternatives exist, including those across the channel (CDG and Schiphol) charging about half what Gatwick and Heathrow might prospectively charge after their expansion.
- 3.10. Clearly Gatwick and Heathrow have continued with their own associations of cost and construction. In particular, the current owners of Gatwick have commented that the new runway will be built and that its charges would not rise to above £15, citing a probable range of £12-£15.
- 3.11. These are very difficult issues and we would urge the Airports Commission to consider, in addition to the impact on the economy and destination mix, the very real “challenges” (to use their own words) in financing these expensive options.

### **Commission Estimate of Changes in Airport Charges**

- 3.12. A review of the composition of passenger charges associated with each of the three shortlisted options for runway expansion underpins our understanding of how these charges will impact passenger demand and airline operations.
- 3.13. The AC estimate of aeronautical charges is based on cash flow modelling. The level of aeronautical charges during this period of major capex is set such that the total revenue (including non-aeronautical

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<sup>3</sup> NERL (NATS En-Route Ltd) is the part of NATS that is licenced and regulated as a monopoly provider



revenue) meets all operating costs, asset replacement and financing costs. During each phase of major capex, at the point where aeronautical charge increase and peaks, the charge is held constant at the escalated price in real terms until the next phase of major capex programme.

- 3.14. Further refinement is then undertaken, where the profile of the aeronautical charges are sized through an iterative process to provide the minimum level of aeronautical charges that meets the required return to equity over the assessment period (blended cash nominal return (pre-shareholder tax) of 10% for Gatwick and 9% for Heathrow).

### Airport Charges

- 3.15. The Airports Commission's consultation document outlines what the current charges are at each airport and what their model forecasts for future charges would be if the runway development proceeds.

- 3.16. The per-passenger aeronautical charges are expressed in 2014 (real) prices (implying yearly nominal charges increasing in line with inflation). It is worth noting that while the per-passenger charges are expressed based on total passenger throughput at the airport (total revenue / total passengers), in practical terms, the airports would probably structure their charges in one of two ways. One is to use privately negotiated contracts, specific to each airline customer. These may be based around the volume of passengers carried from the airport and contain various incentives and commitments. They are therefore often expressed as a value (£) per departing passenger, thus a figure quoted as £9 per passenger is achieved by levying an £18 charge to each departing passenger and no charge for arriving. This is more likely to be the approach adopted at Gatwick, which already uses a "contracts and commitments" approach to its airline clients.

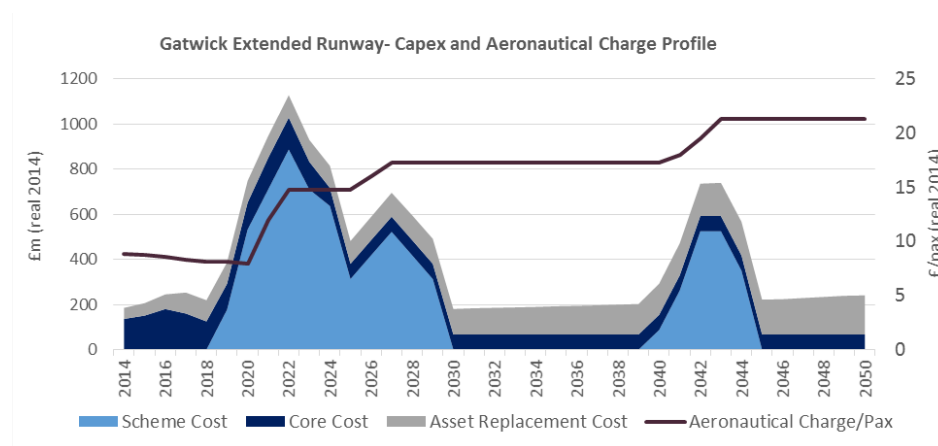
- 3.17. The second is through publishing a set of airport "user charges" which are common to all airlines using the airports. Income is derived in two ways, one being a set of per-passenger charges levied on departing passengers, and the other being a 'landing charge' which is generally a cost per ton of aircraft on landing. Airlines typically pass on the passenger charge element to the passenger as an above-ticket cost and absorb the landing charge into their operating costs.

### Gatwick

**Table 11: Gatwick Airport Second Runway Charges and Investment Profile**

Per Passenger Charges in real 2014 prices	
Initial	£9
GAL projected estimate	£12-15
Commission's Analysis	£15-18, peak charge £23

Source: Airports Commission: Consultation Document







Source: Airports Commission, Assessment of Need Scenario, Carbon Capped

3.18. Phasing of the Gatwick scheme, particularly the final investment post 2040, potentially reduces some of the risks associated with traffic growth. We assume that if demand does not materialise as forecasted, this stage of development will be deferred meaning the aeronautical charge would remain flat from 2040. In any event, aeronautical charges will almost double from current levels as a best-case. On the basis that the full scheme as proposed in built, the Commission forecasts charges to fall within the range of £15.36 to £23.48 per passenger as shown below. These are well above the £12-£15 range that the airport has suggested, but as all of the scheme costs have been increased by the AC, we have based our analysis on the AC numbers rather than those of the promoters.

**Table 12: Gatwick passenger Aero Charges across the Commission's Four Demand Scenarios**

Scenario	Assessment of need – Carbon Capped	Assessment of need – Carbon Traded	Low-cost is king	Global fragmentation
Charge peak	£21.34	£23.48	£16.46	£22.31
Weighted avg (2019-2050) <sup>4</sup>	£18.76	£19.28	£16.33	£18.29
Weighted avg (2014 - 2050) <sup>5</sup>	£16.95	£17.55	£15.36	£16.19

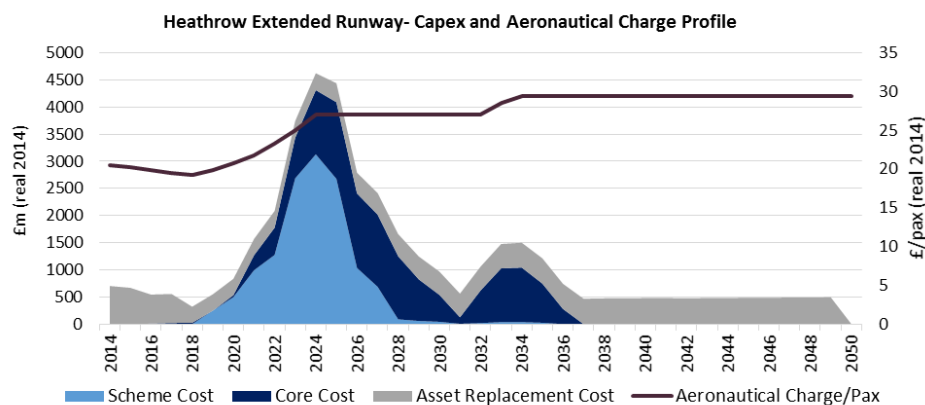
Source: Airports Commission: Interim Report (Appendix 3: Technical Appendix)

## Heathrow

**Table 13: Heathrow Airport Extended Northern Runway Charges and Investment Profile**

Per Passenger Charges in real 2014 prices	
Initial	£20
Heathrow Hub projected estimate	£24*
Commission's Analysis	£27-28, peak charge £30

Source: Airports Commission: Consultation Document. \* Note: AC Report shows £22 but this reflects 2011-2012 prices. £24 is in 2014 prices



Source: Airports Commission, Assessment of Need Scenario, Carbon Capped

3.19. The profile of investment at Heathrow in the extended runway case leads to a spike in costs and with this development profile there is less scope than Gatwick to defer capex costs. The proportional increase in airport charges resulting from the expansion at Heathrow is lower than Gatwick, but the starting point significantly higher, as Heathrow is currently twice the price of Gatwick. With the various demand scenarios, the Commission estimates a narrower range of charges at Heathrow, ranging £26.64 to £30.38.

<sup>4</sup> Average aero charge weighted by forecast passenger volumes

<sup>5</sup> Average aero charge weighted by forecast passenger volumes including the Q6 (2014 – 50) regulatory period



**Table 14: Heathrow Passenger Aero Charges across the Commission's Four Demand Scenarios**

Scenario	Assessment of need – Carbon Capped	Assessment of need – Carbon Traded	Global Growth	Global fragmentation
Charge peak	£29.43	£28.04	£28.05	£30.38
Weighted avg (2019-2050) <sup>4</sup>	£27.95	£27.49	£27.32	£28.55
Weighted avg (2014-2050) <sup>5</sup>	£27.17	£26.76	£26.64	£27.70

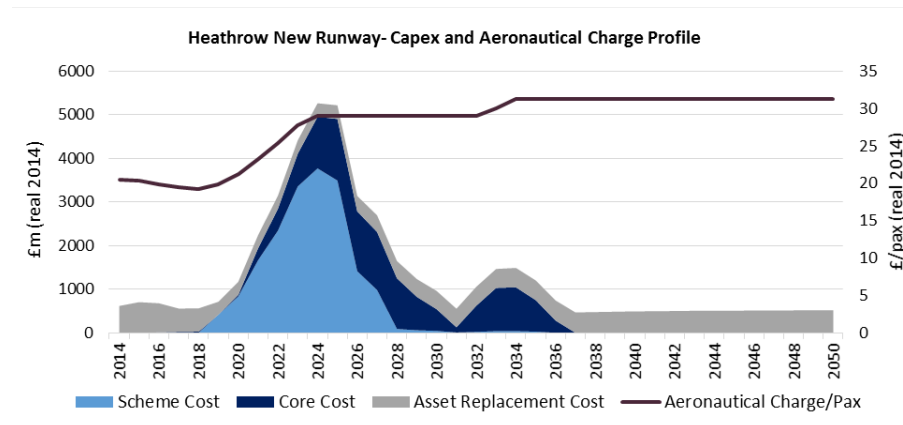
Source: Airports Commission: Interim Report (Appendix 3: Technical Appendix)



**Table 15: Heathrow Airport North West Runway**

Per Passenger Charges in real 2014 prices	
Initial	£20
HAL projected estimate	Peak at £27 and return to approx. current levels by 2050
Commission's Analysis	£28-29, peak charge £32

Source: Airports Commission: Consultation Document



Source: Airports Commission, Assessment of Need Scenario, Carbon Capped

3.20. The profile of investment at Heathrow in the North West runway case has a similar profile to the extended runway option with costs incurred in a relatively short window. The proportional increase in airport charges resulting from the expansion at Heathrow is lower than Gatwick, but the starting point significantly higher, as Heathrow is currently twice the price of Gatwick. With the various demand scenarios, the Commission estimates this scheme to have the narrowest variance in charges, ranging £28.35 to £31.88

**Table 16: Heathrow Passenger Aero Charges across the Commission's Four Demand Scenarios**

Scenario	Assessment of need – Carbon Capped	Assessment of need – Carbon Traded	Global Growth – Carbon Traded	Global fragmentation – Carbon Capped
Charge peak	£31.31	£30.29	£30.03	£31.88
Weighted avg (2019-2050) <sup>4</sup>	£29.87	£29.53	£29.17	£30.33
Weighted avg (2014-2050) <sup>5</sup>	£28.91	£28.64	£28.35	£29.33

Source: Airports Commission: Interim Report (Appendix 3: Technical Appendix)

3.21. Looking at the current charges at Heathrow and Gatwick from their latest full year financial statements, year ending December 2013 and March 2014 respectively, shows aeronautical revenue per passenger at £21.07 for Heathrow and £8.85 for Gatwick. The Airports Commission has calculated the actual allowable yield per passenger in the year ending March 2014 at Gatwick to show initial charges of £9. Heathrow charges of £20 are taken from the recent review of the economic regulatory framework to set regulation for the sixth quinquennium (Q6) covering the period 2014/2015 to 2018/2019 (see below). Gatwick's review by CAA looked at analysis over both 5 and 7 year periods although attaching greater weight to the 5 year period it is expected that Gatwick's license will run for 7 years, given the commitments it has negotiated with its airlines.

**Table 17: HAL's Q6 Price Control in CAA's Proposed Licence (Real 2013/2014 Prices)**

	2013/14	9 months 2014	2015	2016	2017	2018
<b>Yield per passenger</b>	£20.60	£20.40	£20.13	£19.86	£19.46	£19.10

Source: CAA (Economic regulation at Heathrow from April 2014: final proposals)

3.22. Allowable aeronautical revenue is based on the agreed return on regulatory asset base (RAB) as determined by the CAA. Based on the 'single till' approach, all projected non-aeronautical revenue is subtracted to determine allowable aeronautical revenue which is used to calculate per passenger charges, based on inbound and outbound passengers. The regulation differentiates between GAL and HAL as the CAA judges GAL to have less market power. The calculated revenue per passenger is to be treated as a backstop or fair price for Gatwick so it is seen as a benchmark instead of a licence cap. GAL is able to set prices with airlines which are similar to the regulated price and is obligated to provide a given level of service. Both service level and prices will be constantly monitored by CAA to ensure GAL doesn't greatly deviate from its service obligation and regulated price. For Heathrow, the RAB regulated price is just the permitted price to charge to airlines per passenger.

#### Airport Charges Components

3.23. Within the regulatory accounts for the year ending 31<sup>st</sup> March 2014 aeronautical revenue is stated as consisting of the following:

**Table 18: Airport Charging Structure, 2014 - Published Charges**

Heathrow Airport Limited	2014	Gatwick Airport Limited	2014
Passenger charges based on no. of departing passengers	£29-£41	Passenger charges levied on passengers on departure	£9-£12
Aircraft landing charges levied according to noise, emissions and weight on landing	£836-£2,934	Aircraft landing charges based on weight, noise chapter and season	£0-£1,669
Aircraft parking charges based on a combination of weight and time parked as provided	£21-£51 per ¼ hour	Aircraft parking charges	£2.8-£8.5 per 5 mins
Other charges levied for passenger and baggage operations when these services are rendered	various	Other charges levied (e.g. fixed electrical ground power) when these services are rendered	various

Source: Airport Conditions of Use documents; airportcharges.com

3.24. The charging structures at airports are generally such that smaller aircraft pay less in runway charges; domestic and EU passengers are charged at lower rates than international; and freight carried in the aircraft hold is included in the runway charges. This means that whilst the figures are often quoted as a set amount *per passenger*, the reality is that this is merely a convenient measurement unit.

3.25. Dividing total aeronautical revenue by total passengers results in figures of around £21 for Heathrow and £9 for Gatwick today. If calculated as a figure per ton of aircraft, which is a measure used by some airlines to compare airport charges, our estimates are £20 for Heathrow and £14 for Gatwick.

## International Benchmarks

#### International Comparison

3.26. The Airports Commission's terms of reference state that it should report on "its assessment of options for meeting the UK's international connectivity needs". The outcome of the Airports Commission's final recommendation will aim to maintain the UK's aviation global competitiveness. Heathrow is currently the world's third busiest airport as measured by Airport Council International (ACI) in 2014. In order for the



UK to maintain competitive with its peer group, it is important to examine where Gatwick and Heathrow rank in terms of airport size and charges.

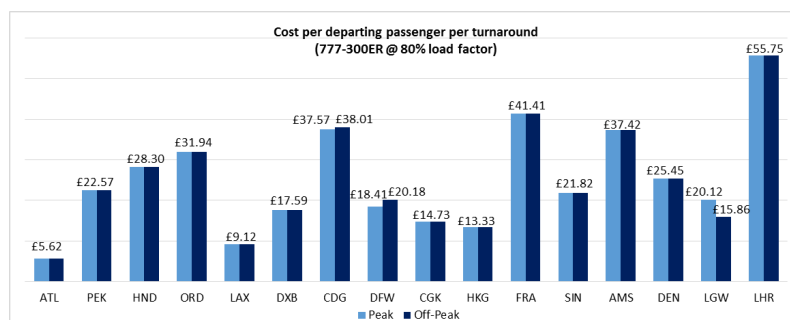
**Table 19: List of the world's busiest airports by passenger number, 2013**

Rank	Airport	Annual passengers (m)
1.	Atlanta (ATL)	94.4
2.	Beijing (PEK)	83.7
3.	London (LHR)	72.3
4.	Tokyo (HND)	68.9
5.	Chicago (ORD)	66.8
6.	Los Angeles (LAX)	66.7
7.	Dubai (DXB)	66.4
8.	Paris (CDG)	62.1
9.	Dallas/Fort Worth (DFW)	60.5
10.	Jakarta (CGK)	60.1
11.	Hong Kong (HKG)	59.6
12.	Frankfurt (FRA)	58.0
13.	Singapore (SIN)	53.7
14.	Amsterdam (AMS)	52.6
15.	Denver (DEN)	52.6
16.	Guangzhou (CAN)	52.4
17.	Bangkok (BKK)	51.4
18.	Istanbul (IST)	51.2
19.	New York (JFK)	50.4
20.	Kuala Lumpur (KUL)	47.5
21.	Shanghai (PVG)	47.1
22.	San Francisco (SFO)	44.9
23.	Charlotte (CLT)	43.6
24.	Incheon (ICN)	41.7
25.	Las Vegas (LAS)	40.9
26.	Miami (MIA)	40.6
27.	Phoenix (PHX)	40.3
28.	Houston (IAH)	39.8
29.	Madrid (MAD)	39.7
30.	Munich (MUC)	38.7
	Gatwick (LGW)	34.2

Source: ACI

3.27. In the section above the current and projected airport charges have been outlined to show the charged levied on a one-way journey. Table 20 provides an operating example of airport charges at the top 15 airports plus Gatwick, assuming an international flight turnaround operated by a Boeing 777-300ER at 80% load factor, showing both peak (April - October) and off peak (November – March) charges. The breakdown of charges includes movement charges (runway, noise, infrastructure, air navigation, parking charges etc.) and passenger charges (passenger service charge, security, PRM etc.).

**Table 20: Example of Airport Costs on a Specific International Service, Wide-Body Aircraft**



Source: AirportCharges.com

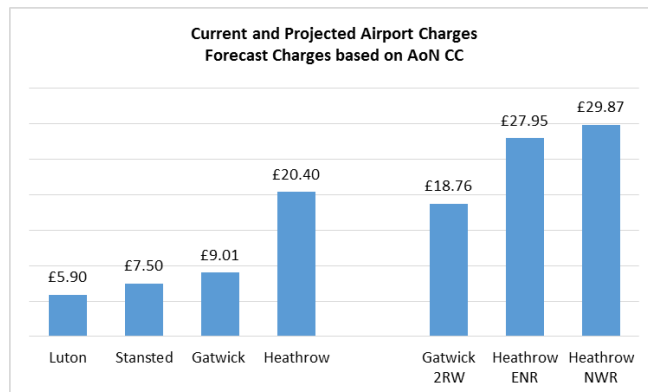
3.28. Heathrow achieves the highest charges across the peer-group, with fees almost 10 times higher than the cheapest airport, Hartsfield-Jackson (Atlanta). Despite the charges, Heathrow remains in the top 3 busiest airports, suggesting that the combination of high demand and strong passenger yields makes operators



consider the high cost of operating to Heathrow a manageable expense. At the opposite end of the cost spectrum to Heathrow is the busiest airport in the world, Atlanta. As with most of the airports in the US, it is in public ownership and therefore subject to different investment and cost-recovery drivers.

3.29. The majority of these airports have flat rate year-round charges, though Paris CDG, Dallas-Fort Worth and Gatwick offer a winter season discount. The price differential at Gatwick of approximately £5 is the largest, which should provide additional incentive for carriers to operate at Gatwick during the off-peak months.

**Table 21: Comparing London Airport Charges**



Source: Annual Reports, Airports Commission

3.30. Comparing the current airport charges at Heathrow and Gatwick to alternative airports within London shows that in addition to Gatwick becoming less price competitive on a global scale it also becomes less comparable to its closest competitors in London: Luton and Stansted Airports. With all three airports serving the low-cost airline sector, the relative increase in price if Gatwick's airport charges rise sharply poses a threat to the prospective growth in passengers. As a result of building a second runway, it may price itself out of some segments of the London LCC market.

3.31. Gatwick's charges become more comparable to Heathrow under the scenario where Gatwick is chosen as the preferred option for expansion and Heathrow remains constrained. Without the ability to expand runway capacity there is unlikely to be any major infrastructure upgrade expenditure at Heathrow, leading to the airport having no scope to increase charges in real terms. With less than £2.00 price differential between the two airports it removes the cost incentive for legacy carriers to move their operations to Gatwick as Heathrow will still provide all the non-price advantage, including better connectivity and facilities for network carriers.

3.32. With a second runway, Gatwick may find itself trying to compete at both ends of the airline market – low-cost, price sensitive and network capable long-haul - whilst having to recover its investment costs. This may lead to its proposals being harder to finance than currently it believes. We should also not underestimate the level of debt Heathrow will need if either of the proposals are selected. Although the airport is significantly larger than Gatwick on all financial and air traffic measures, the sizeable increase in borrowing and balance sheet resulting from a third runway development put it on a par with some of the country's largest assets. Nonetheless, the appetite for risk amongst the large-scale commercial investors and banks will almost certainly weigh in favour of Heathrow.



## 4. Impact of Price Changes on the Forecast Scenarios

4.1. There has been extensive literature published on how changes in price affects demand but when looking at Heathrow and Gatwick Airports as their customer base is so broad there isn't a uniform response to the price change. In order to develop a balanced response a number of perspectives are analysed in this section.

### Literature Review, Elasticity of Demand and Air Travel

#### IATA Economics Briefing No. 9

##### Air Travel Demand and the Impact of Price

A paper written by IATA examines the impact of the cost of air travel on demand. The main conclusions are:

Passengers are becoming increasingly sensitive to price, led by the boom in low-cost travel, the transparency brought by the Internet and the intense competition on deregulated markets.

All of the studies reviewed found that there was a significant demand response to changes in air travel prices. This indicates that any policy action that results in higher air travel prices (e.g. passenger taxes, increased landing fees) will result in a decline in demand.

The extent of that decline will depend on a number of factors:

- Business vs. Leisure Passengers. In general, all else being equal, business travellers are less sensitive to price changes (less elastic) than leisure travellers. Business travellers generally have less flexibility to postpone or cancel their travel than leisure travellers.
- Short-Haul vs. Long-Haul Travel. Price elasticities on short-haul routes were generally higher than on long-haul routes. In part, this reflects the opportunity for inter-modal substitution on short-haul routes.

Price elasticity is a measure used to capture the sensitivity of consumer demand for a good or service in response to changes in the price of that particular good or service.

The price elasticity is defined as:

$$\text{Price Elasticity} = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Price}}$$

The quantity demanded generally decreases when the price increases, so this ratio is usually expected to be negative. For example, if a 10% increase in the price of good 'A' results in a 6% fall in the quantity demanded of that good, its own price elasticity is -0.6. By contrast, if a 10% fall in the price of good 'B' leads to a 12% increase in the quantity demanded of good B, its own price elasticity is -1.2.

The IATA report references a study by Gillen, Morrison and Stewart which found demand elasticities ranging from -0.1 to -1.7, depending on the relevant market. It identified various elasticity estimates for several distinct markets for air travel, such as:

#### Long-Haul Price Elasticities

International Business -0.3  
International Leisure -1.0

#### Short-Haul Price Elasticities

Business -0.7



### PWC study – November 2014 – Impact of Airport Charges

In Report 13 published by the Airports Commission in November 2014 title “Cost and Commercial Viability: Funding and Financing” produced by PWC the impact that higher charges at Heathrow and Gatwick was evaluated.

The report states that:-

“The impact of increased aero charges could be significant when considered in the context of operating margins of the airlines which use the airports. The schemes (LGW 2R, LHR NWR and LHR ENR, respectively) are likely to require aero charge funding in their first full year of operation that is equivalent to £270m, £1,180m and £970m (in 2014 prices) greater than is generated in 2014. The way in which this will be funded is likely to depend on a number of factors such as: the price elasticity of demand of passengers; the underlying efficiency of airlines; the commercial flexibility of the airports; government policy; and the operating models of different airlines. The analysis also suggests that aero charges as a proportion of fare revenue is larger for airlines which operate shorter average sector lengths.”

“Evidence from the case studies that we considered (in the Netherlands and Spain), as well as historic difficulties that Manchester and Stansted had in the past in pricing up to their then regulated price caps, suggest that the impact on demand of changes in aero charges can be significant. The position on demand risk is finely balanced. On the one hand, current pricing is a relatively small component of overall fares, and the current demand levels might be expected to prompt a very limited demand response. On the other hand (e.g. based on the size of these charges compared to low margins and evidence from case studies), demand risk may be more significant. This could be particularly important at Gatwick which currently caters for more low-cost traffic (which might be assumed to be relatively price sensitive) and is currently in less of a state of excess demand than is Heathrow.”

“For example, current aero charges at each airport are £9.01 for Gatwick and £20.40 for Heathrow. Based on ticketing data from Milanamos Planet Optim Future, the current estimated average one-way fare in 2013/14 (including Air Passenger Duty) for passengers at Gatwick and Heathrow are £132 and £401, respectively. This implies that aero charges are currently up to 6.8% and 5.1% of the average fare at Gatwick and Heathrow, respectively.”

“Ultimately it seems likely that the increase would need to be funded through a combination of sources:

- Passengers (e.g. through increased fares);
- Airlines (e.g. through reduced costs or margins);
- Airports (e.g. by generating higher commercial or non-aeronautical revenues, or by greater cost efficiency); or
- Government policy – it would be a matter for the Government of the day to consider whether any public sector involvement was appropriate and, if so, what form it might take.”

“The precise manner in which the increase in aeronautical charges will ultimately be funded will therefore likely depend on factors such as:

- The price elasticity of demand of passengers;
- The underlying efficiency of airlines;
- The commercial flexibility of the airports;
- Government policy; and
- The operating models of different airlines.”

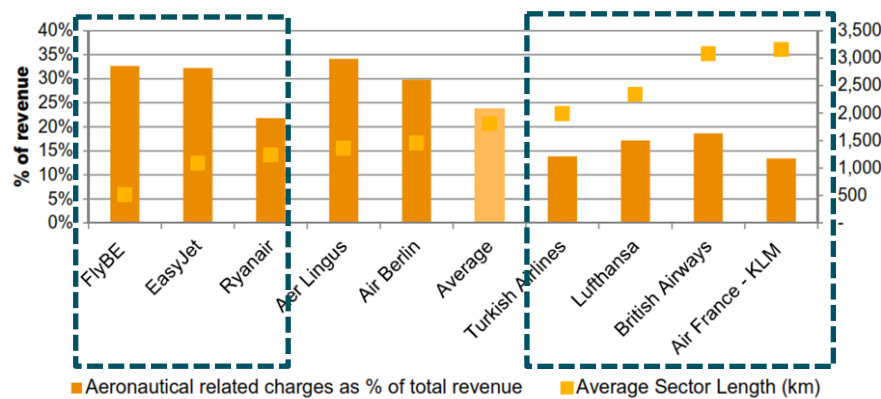
The report shows the proportion of average seat revenue which is accounted for by aeronautical related charges. This shows that the aeronautical related charges are proportionally almost twice the cost impact for





the low-cost carriers operating with shorter average sector lengths and would imply “that these carriers could be more sensitive to changes in aero charges.”

**Table 22: Aeronautical related charges as a proportion of total seat revenue and average sector length**

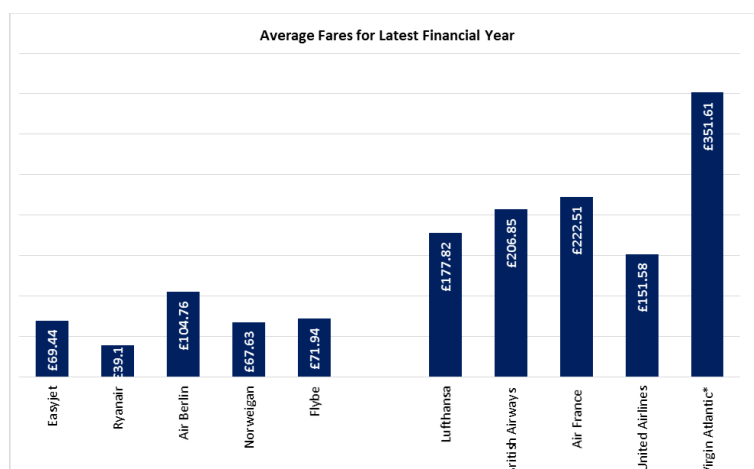


Source: Report 13 published by the Airports Commission in November 2014 title “Cost and Commercial Viability: Funding and Financing” produced by PWC. Data taken from airline annual reports and airline schedules.

## Airline Revenues Today

4.2. There is little reliable data showing airport-specific average fares for individual airlines and so our analysis is based on system-wide average fares for a group of airlines that operate a major proportion of capacity at each airport, supplemented by some illustrative data for easyJet. For Gatwick we have used a selection of low-cost carriers whose operations account for 53% of total seats. At Heathrow, British Airways and Virgin Atlantic also operate around 53% of available seats and we have included a selection of other network carriers. The chart shows network average fares rather than Gatwick v Heathrow, although it is clear that there is a very strong yield premium for airlines that operate long-haul services. Within this group, only Virgin Atlantic is a pure long-haul carrier – all others operate a short-haul network that will dilute the system-wide average fare. British Airways, for example, only operates from London and so its network average fare of £206 will be a blend of Heathrow and Gatwick, long and short-haul routes. easyJet on the other hand operates a pan-European network that generates an average of £69 one way. From our group of representative airlines, those using Gatwick give an average fare of £77.03, which is approximately £100 less than the network airlines.

**Table 23: Average Fare for Representative Group of Airlines Operating from Gatwick and Heathrow**



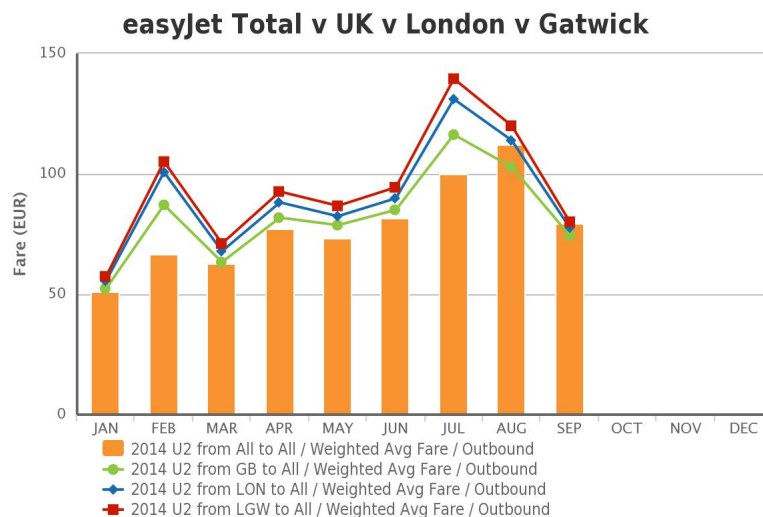
Source: Airline Annual Reports

\*Virgin Atlantic average fare is for Financial Year Ending Feb 2013



- 4.3. Given the fare differential between the two business models, the airport charges have a smaller impact on network carriers where it accounts for a lower proportion of total fare. Heathrow's most important operator is BA, with approximately 50% of seat capacity. For Gatwick, it is easyJet, operating about 40% of the traffic. The airlines' reliance on the respective airports is very different - easyJet has only 12% of its system capacity at Gatwick compared to British Airways which has 87% of its seats originating from Heathrow. This suggests that British Airways would be more reluctant to reallocate its operations, whereas easyJet is a more agile carrier that might consider alternative options.

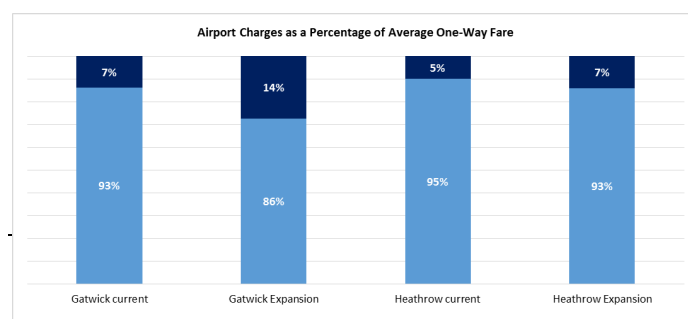
**Table 24: The Importance of Gatwick to easyJet**



Source: rdcapex.com

- 4.4. Using sampled fare data for 2014 as shown in table 24, we have looked into the importance of Gatwick to easyJet by comparing the monthly average fares across all routes; all UK routes; all London routes and then all Gatwick routes. The analysis suggests that the average fare from the UK is above its network average by about 5%, while the London airports' average fare is above that of the UK. Finally, the average fare achieved at Gatwick sits above London in importance to the airline. The Jan-Sep average for Gatwick is around EUR9 higher than the UK-wide average fare and EUR16 above its system average – although these prices include government tax, which for the UK is significantly higher than any other country. Nonetheless, in the summer months we see a price-premium of up to 39% over network averages whilst in the off-peak months, with the exception of February, Gatwick premium is less obvious, particularly once the effects of UK APD (EUR17 on a one-way ticket) are stripped out.
- 4.5. Table 25 below shows the effect of projected increases in airport charges to the levels proposed by the Commission, as a proportion of current average fares at Gatwick and Heathrow. Based on our current estimates for average fares, and assuming that these remain constant in real terms, the doubling of charges at Gatwick sees charges accounting for around 14% of the average one way fare versus 7% at Heathrow, reflecting the higher yield and proportionately lower increase in charges. These figures differ from those presented in the Moody's report for both Gatwick and Heathrow expansion scenarios reflecting different source data.

**Table 25: Airport charges as a percentage of average one way fare**

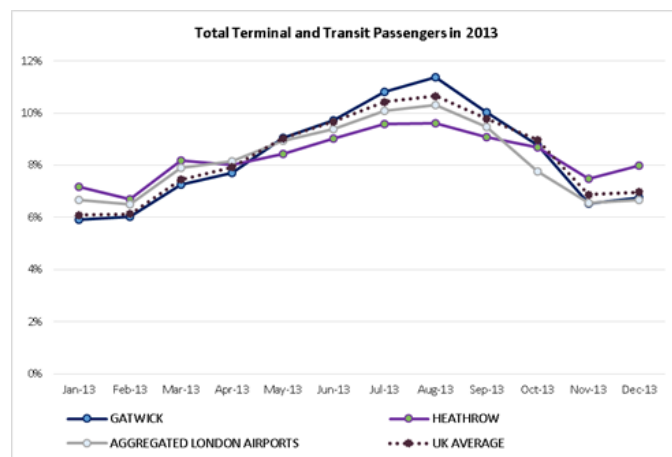




Source: Ticketing data from Milanamos Planet Optim Future, Charges data from Airports Commission: Consultation Document

- 4.6. In the summer months, both airports are essentially full, with very few slots available. However, when comparing the seasonality of passenger throughput between the two airports, Gatwick has greater variability in monthly passenger traffic, due to the seasonality of its demand. This reflects the traffic mix at the airport, where there are many more flights to ‘holiday’ destinations for which traffic is, by nature, peaky.
- 4.7. The table below shows the proportion of annual passengers carried in each month for Heathrow, Gatwick, the London system (aggregated) and the UK average. By comparison, the range at Heathrow is far less pronounced. Indeed, Gatwick is a more seasonal airport than the UK average, with a lower proportion of passengers carried in the winter and higher in the summer months.

**Table 26: Passenger traffic at London Airports 2013**



Source: Civil Aviation Authority

- 4.8. The seasonal mix in traffic at Gatwick highlights the difference in route structure between the two airports. A comparison between the slot allocation charts for Heathrow, Gatwick and Stansted shows that whilst Heathrow is full throughout the year, Gatwick has some available capacity in the winter<sup>7</sup> and Stansted has year-round slot availability. This reinforces the evidence shown by the variability in passenger traffic as a proportion of total annual passengers for London, Heathrow and Gatwick. If this trend remains consistent in future years then an expansion at Gatwick may risk unused capacity during the winter season whilst relieving excess demand in the summer season. This differentiation of capacity use is not reflected in the annual forecasts presented by the Commission but we think it is an important factor to be considered if new capacity is to be utilised efficiently.
- 4.9. Over the last ten years, Gatwick has increased the number of destinations with daily or greater flights from 74 to 96, whereas in the same period at Heathrow, there are four fewer destinations flown. Almost all of this growth has occurred to European points, which account for 92% of departures at Gatwick, up from 87% a decade ago. The network overlap between the two airports shows a stark variance in the type of destination served, as shown below. Destinations unique to Gatwick tend to be leisure-orientated in Europe and the Caribbean, whereas Heathrow has major global cities as its unique points. Analysing the overlap between the two networks<sup>8</sup> leads us to conclude that filling additional capacity at Gatwick and/or the rise of a long-haul low-cost model would be very likely to begin by replicating destinations already served from Heathrow, rather than bring additional connectivity to the UK.

<sup>7</sup> See appendices for slot allocation tables from ACL (Airports Coordination Limited)

<sup>8</sup> See appendix 1 for full list of network overlap and unique destinations



4.10. Our analysis of published airline schedules data shows that, in the last decade, Gatwick has added 47 new destination cities, of which 29 are not served at Heathrow. Over the same period, Heathrow has lost four.

**Table 27: New Routes at Gatwick, 2014 v 2004 – Annual Flight Frequency >355**

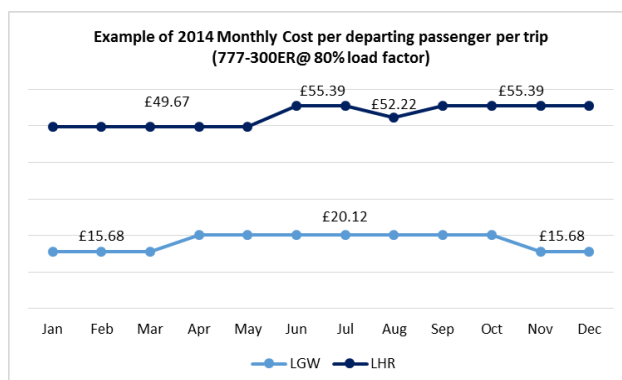
	Gatwick	Of these, which were flown at Heathrow:		
	New v 2004	in 2004	in 2014	Not Served
Primarily Leisure	26	1	2	24
Primarily Business	10	10	10	0
Mix	11	5	6	5
Total	47	16	18	29

Source: Innovata, RDC Analysis

4.11. Of the new routes from Gatwick, over half (26) are to ‘leisure’ destinations. Of the 10 new ‘primarily business’ points, all were already flown from Heathrow in 2014 – and 2004, meaning that the last decade has seen no net gain in business destinations served from Gatwick that weren’t already flown from Heathrow.

4.12. Gatwick is being proactive in finding solutions to the seasonality issue and has reduced airport charges during the winter season (November to March), in which it offers a reduction from summer pricing equivalent to around 25%. It is also one of the fastest growing airports in the country, having transformed its traffic base under private ownership, and we would expect growth to accrue to the peak summer months at any growing airport so it is perhaps unsurprising that the current traffic mix is more seasonal in nature.

**Table 28: Seasonality example - Gatwick’s airport charges**



Source: airportcharges.com

4.13. However, seasonality is a function of demand and the summer spike in traffic coupled with the passenger mix and route profile of today shows that there will need to be an evolution in the route network to achieve year-round utilisation. The current published winter discounts do not appear to provide the incentive for airlines to pick up some of the available slots, although these are notoriously harder to fill once the balance of airline operations moves away from being consistent year-round. If airport charges were to increase during the winter season due to the building of the second runway, there may be a detrimental effect on winter slot utilisation similar to that which was observed at Stansted between 2008 and 2011, when Ryanair simply parked aircraft in the off-peak months, claiming it was cheaper than flying from the ‘most expensive airports’<sup>9</sup>.

<sup>9</sup> <http://www.theguardian.com/business/2008/jul/18/ryanair.theairlineindustry>

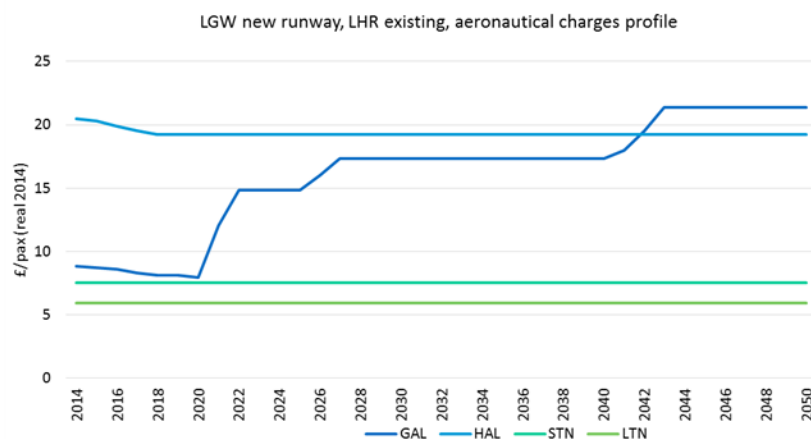


- 4.14. It is also implementing *Gatwick Connect*, an airport-hosted product enabling passengers to transfer between low-cost airline flights using an airport-backed scheme. This initiative may help divert traffic over Gatwick in the off-peak months and promote greater confidence in price-sensitive travellers to try self-connecting. It is a unique concept and one that will certainly bring additional passenger benefit to the airport while reducing the risk for passengers of missed flight connections.
- 4.15. We see this as a great example of competition-led innovation on the part of Gatwick though note that the decision to offer an interline product is fundamentally an airline strategy, backed by complex sales and revenue management systems. Whether an airport connecting product is a concept that is strong enough to force change across the industry remains open to question but, if it gains traction, may be widely adopted in the future.

### How Increases in Airport User Charges Might Impact Demand

- 4.16. Airport charges at Heathrow are currently the highest of its peer group of comparable airports, while Gatwick is more in line with the peer group and at the lower end of the spectrum. In the case of Gatwick, the charges are passed through to passengers as part of their air-fare, whereas at Heathrow many of the carriers will also have a freight component to their traffic to which part of the airport charges will accrue. However, for the purposes of our modelling we have assumed that the full value of charges is passed on to passengers at both airports.
- 4.17. The rise in airport charges as estimated by the Airports Commission suggests that Heathrow will retain its position as one of the world's most expensive airports in terms of passenger charges if the expansion takes place here. If Gatwick is selected it would become less price competitive as its charges would be more comparable to Heathrow's.
- 4.18. Based on the AC assessment, a new runway at Gatwick would increase per passenger aeronautical charges from £8/passenger in the short term to £17/passenger in the medium term and £21/passenger in the long term (at 2014 prices), although the airport has consistently maintained that it can deliver the runway and retain charges within a £12-£15 range. Assuming Heathrow is unable to expand, and charges remain the same in real terms as projected by the end of Q6 level, the relative attractiveness of Gatwick's charges would diminish over time. Currently, its charges are 57% lower compared to Heathrow. However, with the new runway in place, this differential could reduce to just 10% and in the long term could actually be 11% higher than at Heathrow.

**Table 29: Charges Profile - Gatwick New Runway, Heathrow Existing Charges**



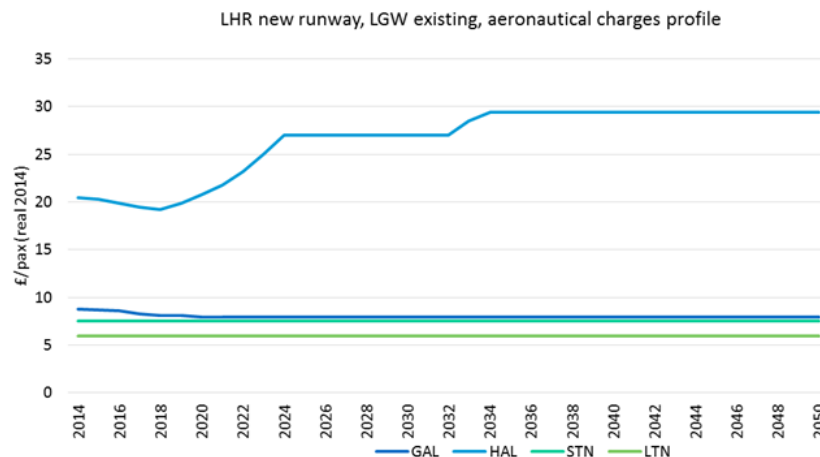
Source: Airports Commission: Cost and Commercial Viability: Funding and Financing



Note: LGW new runway charges based on Airports Commission scenario AoN CC. LHR (do nothing) charges assume to remain flat in real terms.

- 4.19. Conversely, an expanded Heathrow could see its differential set against Gatwick airport widen to 73%. This would put Heathrow into a completely different price bracket compared to other UK airports, and probably at the top of the global chart for user access charges.

**Table 30: Charges Profile - Heathrow New Runway, Gatwick Existing Charges**



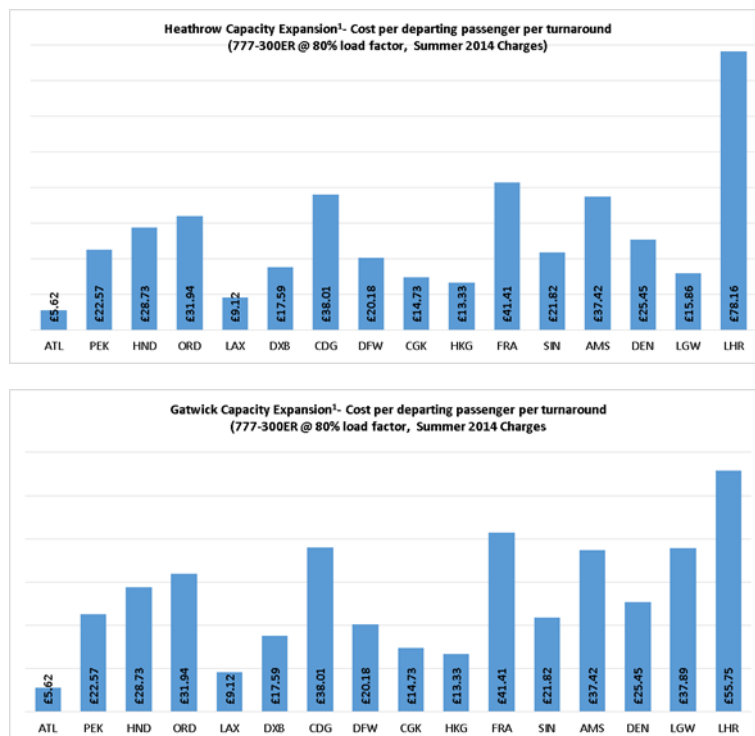
Source: Airports Commission: Cost and Commercial Viability: Funding and Financing

Note: LHR new runway charges based on HHL scheme (extended runway) Airports Commission scenario AoN CC. LGW (do nothing) charges assume to remain flat in real terms.

- 4.20. The charts below show the impact of an identical percentage change in airport charges as shown in the Airports Commission's report, on airport charge per departing passenger on a long-haul return trip. Under an expansion at Heathrow taking an average of the two proposals would result in charges per-passenger per-trip increasing from £55.75 to £78.16. For Gatwick the cost per-passenger per-trip would rise from £15.86 to £29.86



**Table 31: Example of Change in Airport Charges applied to an International Service, Wide-body Aircraft at Heathrow and Gatwick**



Source: Airportcharges.com, Airports Commission

<sup>1</sup>Percentage change in airport charges is calculated based on the scenario: Assessment of Need-Carbon Capped.

4.21. Although among European airports Heathrow has the highest airport charges, this hasn't acted as a deterrent to airlines operating at the airport as free slots are a rare commodity and it was the busiest airport by passenger throughput in Europe in 2014. Looking at five of the relevant factors that will determine the responsiveness of demand to price changes as proposed by economic theory will assist in determining the impact of these potential changes.

#### Nature of Goods

This identifies whether the good is a necessity for human life or is simply a luxury or comfort good. Where it is a necessity elasticity of demand tends towards being inelastic, for luxury and comfort goods, consumers are more responsive to price changes making it elastic.

Although approximately 60% of Heathrow passengers are leisure travellers, a key driver behind operating at Heathrow for airlines is to capture business passenger traffic. For business travellers, air travel can be seen as an integral part of their job. Hub transfer passengers could also see their flight routing through Heathrow as a necessity as it is a compulsory part of their journey instead of a choice for some routes.

As Gatwick is characterised by short-haul leisure passengers, overseas holidays would be seen as a luxury item, which could be forfeited if prices were to rise.

#### Availability of Substitutes

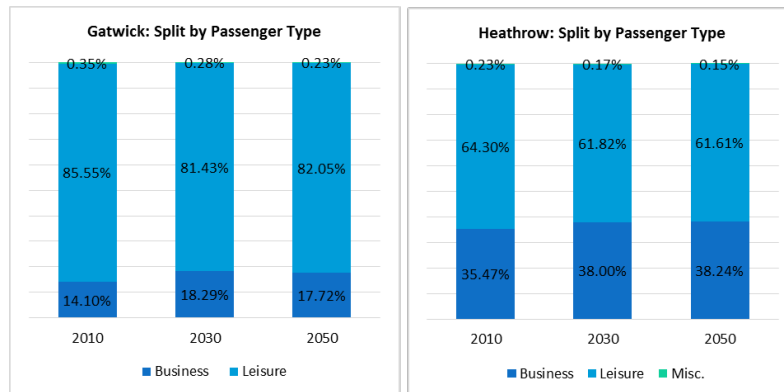
If there are close substitutes, demand is more elastic, as a rise in the price of one good/service encourages change in consumption to the substitute.

Heathrow, operating as the UK's only hub airport, has a higher presence of alliance-member carriers offering extensive options for passenger transfers. Its long-haul route network surpasses that of any other UK airport, making it difficult for there to be a viable close alternative within the UK. Outside the UK, substitutes within



Europe exist including Paris CDG, Amsterdam Schiphol and Frankfurt. Although these European airports act as potential substitutes for transfer passengers, around 70% of Heathrow's throughput has London as its final destination/origin. Within the UK the closest substitute would be Gatwick, although it doesn't offer the same range of frequency and range of long-haul flights.

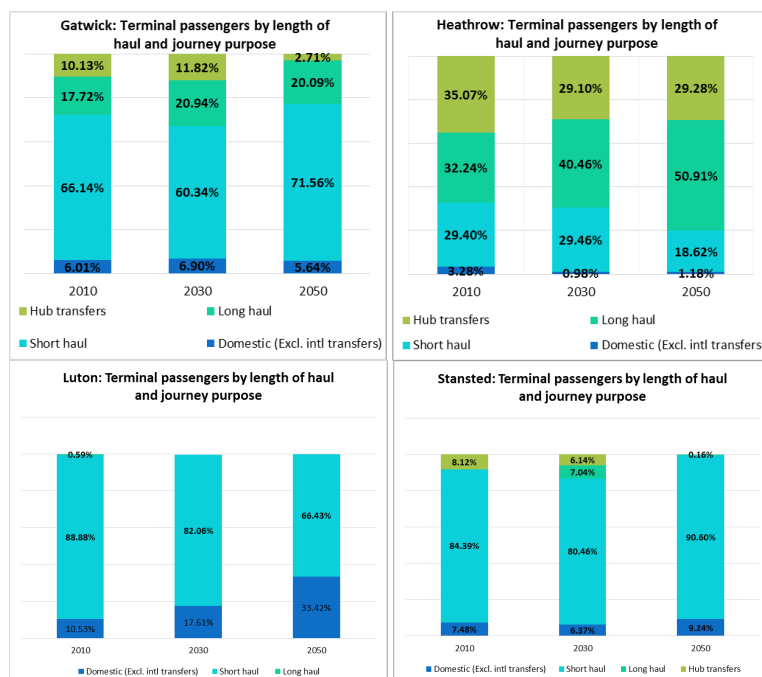
**Table 32: Passenger Profile, Gatwick and Heathrow**



Source: Airports Commission forecasts: data annexes

Gatwick has some closer substitutes, including two alternatives within the London system - Stansted and Luton which also offer leisure short-haul flights operated by low-cost carriers. These airports aren't exact substitutes as Gatwick offers a greater variety of long-haul destinations and has some transfer traffic, whereas Stansted and Luton have very little in the way of long-haul and transfer traffic.

**Table 33: Terminating Passenger Profiles, Gatwick and Heathrow**



Source: Airports Commission forecasts: data annexes

### Possibility of Postponing

The demand for goods or services when consumption isn't immediate and can be postponed for a significant period of time is said to be "elastic". If the choice to postpone isn't a viable option the demand for that good/service is "inelastic".

If business passengers are determined to be a main driver of growth:





- At Heathrow, it wouldn't be possible to postpone their trip for a significant period of time as the timing of their trip would have longer term implications.
- At Gatwick if passengers' purpose is categorised as being leisure, then if prices rise, postponing the trip would be more realistic as they have less restrictions to the timing of their trip.

### **Proportion of Income Spent**

The demand for the goods which account for a negligible amount of a consumer's total income is deemed inelastic. The greater the proportion of income spent on a good the more responsive the consumer is to a change in price, as the price change will account for a greater outflow from their disposable income.

If we assume that the proportion of business travellers from Heathrow do not include air travel as an outflow from their individual income, perfectly inelastic demand could be assigned to these travellers. However for the leisure proportion, a flight from Heathrow which is on average more expensive than flights from other London airports would be a significant percentage of a holiday maker's income, especially if they are travelling as a family. This would make them very responsive to price changes.

30% of traffic from Gatwick is accounted for by LCCs causing average fares at Gatwick to be a smaller proportion of total income when compared to flights departing from Heathrow, based on the average UK income.

### **Force of Habit**

As a habit cannot be avoided in the case of a price rise, the consumer continues to purchase the good/service and is unresponsive to incremental changes in price, therefore making its demand fairly inelastic.

Both business passengers and leisure passengers can consider their flying as habitual, elasticities are more dependent on the nature of the individual flyer. Long-haul leisure flights tend to be more infrequent and would therefore be more responsive to price changes. Business travel could be seen as a habit as it cannot be avoided and is done frequently as seen by the numerous incentive schemes and frequent flyer packages offered to business travellers.

### **Summary**

4.22. Airport user charges are one element of airline operating costs and, as we have seen, usually represent between 10% and 30% of total revenue. They are seen by network carriers as an inevitable consequence of their operations into major airports, whereas low-cost carriers generally see them as a negotiating opportunity for cost reduction.

4.23. It remains the case for network carriers that they are involved in many more passenger itineraries than their low-cost counterparts – our experience suggests a factor of at least ten times more. This gives a much wider scope for network carriers to fill their aircraft in periods of low demand by selling a few cheap seats in many markets, rather than many cheap seats in a few markets. They also have the benefit of freight revenues to offset some of the landing charge costs, meaning the theoretical charge-per-passenger arising from changes in charges may not be the actual charge passed on to passengers

4.24. As already stated, we have insufficient resources to undertake price-point elasticity modelling bearing these considerations in mind and have relied on a simpler approach as outlined below. We have made no assumption about the possibility that increased competition may break or change habits.

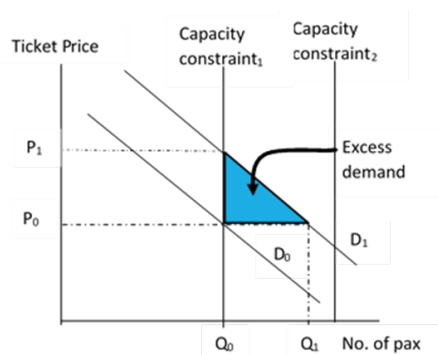


## Elasticity of demand modelling

### Frontier Economics Report

- 4.25. Frontier Economics published a report in April 2014 that proposed expanding Heathrow would provide greater benefits to passengers than expanding Gatwick Airport. This conclusion was derived using basic demand and supply theory which found that the monetary benefit in 2030 due to expansion at Heathrow could benefit society by £300 per person in ticket prices, compared to £4 if expansion took place at Gatwick.
- 4.26. In the report it is assumed that airport capacity is fixed and changes in price do not influence passenger numbers as they are ultimately constrained by the airports' capacity limits. The findings suggest that the constraints at Heathrow are leading to consumers being charged higher prices because the supply of airline capacity (seats) is lower than demand.
- 4.27. On further analysis we believe the impact of Gatwick's benefit is understated as the Frontier report bases its analysis on aggregate passenger data. The capacity assumption for Gatwick doesn't take into consideration the variability in the airport's seasonal capacity, constraining the airport in the summer. As Gatwick is full during the summer and carriers don't seek to occupy slots during the winter season, the airport is, effectively, operationally capacity constrained. Due to the fact that both Heathrow and Gatwick are operationally constrained, the 'supply and demand' modelling should look similar, so that any additional capacity would remove excess demand that artificially pushed up the price which should, in turn, lead Gatwick to showing a greater monetary benefit that Frontier Economics has suggested.
- 4.28. That said, we do not dispute that Heathrow is absolutely full, whereas Gatwick has slot availability during the winter season. It probably holds true that with both airports full in the summer, consumers – particularly those travelling in the school holidays – are facing higher fares than they would if the system was less constrained. Implicit within this, therefore, is the possibility that the release of new airport capacity would feed through to additional airline seat availability to the destinations with greatest demand, leading to a fall in absolute fares - even with increased charges.

**Table 34: Modelling of impact of capacity expansion on constrained airport**



Source: Frontier Economics, RDC

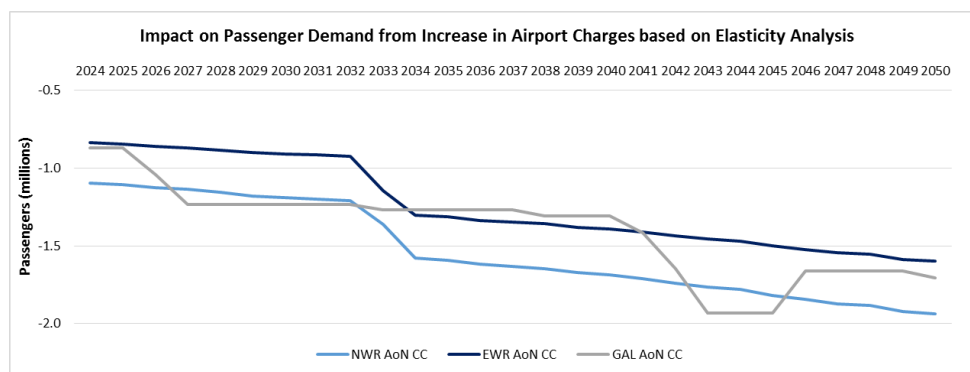
- 4.29. The table above shows that when an airport is capacity constrained, as in the case of Heathrow (year round) and Gatwick (summer), if there is an increase in demand ( $D_0$  to  $D_1$ ) then because the airlines are unable to increase the number of passengers in order for there to be an equilibrium between supply and demand, the ticket price charged to passengers is pushed up ( $P_0$  to  $P_1$ ) to regulate demand. By increasing airport capacity (capacity constraint<sub>1</sub> to capacity constraint<sub>2</sub>) an increase in demand doesn't automatically lead to price increase and passenger numbers increase ( $Q_0$  to  $Q_1$ ).



## RDC Modelling

4.30. In order to quantify the potential impact of increasing airport charges on traffic growth, we have applied different elasticities to leisure and business travel and worked on the assumption that the increase in charges is passed through to consumers. The analysis is based on the 'ceteris paribus' assumption so that the percentage change in the price that is viewed by a consumer is only caused by a rise in airport charges. The change in airport charges has been modelled to commence in 2025, the first full year when new charges in relation to the expansion would probably be introduced. The elasticities have been applied to the Airports Commission's baseline forecast (carbon capped capacity unconstrained). The graph below shows the fall in demand based on percentage change in fares, on the assumption that 100% of airport charge increases are passed through to the customer and all other fare components remain constant.

**Table 35: Changes in passenger demand through increased charges**



Source: RDC analysis

4.31. The smallest impact is from the Heathrow Extended Runway proposal. The fluctuation in the proposal that gives rise to the greatest change in passenger demand, between Heathrow's new runway and a new runway at Gatwick is due to the airport charges profile. From 2042-2043 airport charges are forecast to increase by approximately 9% at Gatwick while Heathrow remains constant, explaining the greater jump in reaction by passengers at Gatwick during this period. Cumulatively, the extended runway proposal results in the loss of approximately 33.6 million passengers compared to 41.5 million and 61.1 million for the Heathrow North West Runway and Gatwick's Second Runway respectively.

## 5. Closing Observations

- 5.1. By shortlisting three schemes and with only one to be chosen, we are left with a binary choice between Heathrow and Gatwick where, given long-term uncertainties, it would seem more sensible to allow either or both to expand as and when it felt justified by the commercial case. Our views are that Heathrow offers both the lowest-risk and highest-benefits outcome given its position within the global aviation industry; with its mix of carriers, proven ability to deliver sustainable, intercontinental services and lower risk of securing financing.
- 5.2. At the heart of the debate remains the nature of the additional connectivity needed by the UK over the next 30 years plus and how this relates to the fundamental business models which drive the aviation industry. If the aim is simply to develop connectivity with Europe (still Britain's main trading partner) and with a few long-haul "thick" routes where demand is particularly strong, the point-to-point model, operating from a range of local and regional airports, has worked well. However, for global connectivity the fundamental need to aggregate people and freight has remained extremely powerful, as evidenced by



the growth of hubs not just in Europe but in the Middle East. The key issue is whether, in the decades ahead, the UK wishes to maintain and expand its direct connectivity with a broad range of global destinations, and not depend on people and goods having to transit through other hubs, whether in Europe or the Middle East. If so, it would need to ensure that London continues to host one of the world's major hubs itself.

### Short Summary of the Airline Industry

- 5.3. Airlines provide a supply of capacity to accommodate the underlying demand, within the bounds of their commercial objectives. How to account for shifts in strategy over the long term is difficult, and supply failure is a key risk for any airport seeking to expand. The debate is often expressed as a choice between low-cost and hub-and-spoke, but what is striking about the last ten years is the strength of both models. In the same way as twenty-years ago it would have been hard to foresee the impact low-cost airlines were to have on short-haul travel, a decade ago it would have been difficult to model the rapid rise of hub airports in Middle East. Yet today, there are four new hubs<sup>10</sup> that are changing the very nature of European air travel – and the level of competition between airlines. There is no convincing evidence that either model will displace the other; it is much more plausible that each will play to their strengths.
- 5.4. Within Europe, it is unsurprising that airlines support lower airport charges, and a competitive environment that enables them a choice between airports. This is particularly noticeable with short-haul and low-cost carriers, for whom as we have seen, airport charges account for a far higher proportion of total ticket price than they do for long-haul. Looking to the UK, and London specifically, the low-cost segment appears to favour expansion across the London system, not just at one airport, because this avails competition and choice.
- 5.5. Anecdotal and actual evidence shows there is a cautious interest from some low-cost airlines in long-haul, although they are presently seeking the right business model. The limited number of services operated by Norwegian to the US and Asia include connections between their own flights at their 'hub' airports; and Michael O'Leary has recently observed that network carriers may start using low-cost airlines to feed their long-haul flights – at the same time, claiming Ryanair will eventually fly long-haul itself<sup>11</sup>.
- 5.6. There is an implicit acceptance within these examples of the need for some level of passenger aggregation to make long-haul viable, i.e. the hub model. How to re-invent this, in a multilateral system that already binds together network and regional airlines from across the world, is the heart of the challenge – one that has yet to be conquered. Whether facilitated by solutions like Gatwick Connect or low-cost carriers working with the incumbent airlines, nothing has yet taken a foothold to replace what is a highly complex system.
- 5.7. The success of the low-cost airlines to date has been in offering a product for the price-sensitive traveller, stimulating demand and growing markets. They don't yet offer solutions for the high-yield long-haul business traveller, or carry freight which makes an important revenue contribution. As of today, the few long-haul routes opened by low-cost carriers have been to destination cities that are already served by the network model. It is following the same trend as we initially observed when the low-cost short-haul services began. The next evolution, if the model works, will be to new leisure destinations – pushing out charter airlines in the process; and finally, new business connectivity could be realised although again, turning to the evidence from today, the balance of new connectivity in the last decade has not been to business destinations.

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<sup>10</sup> Abu Dhabi; Doha; Dubai/Dubai World Central; Istanbul Ataturk/Third Airport

<sup>11</sup> <http://www.reuters.com/article/2015/01/21/ryanair-european-short-haul-idUSL6N0V04CB20150121>



5.8. In our earlier work, we stressed the underlying strengths of the network, or hub-and-spoke, model in supporting additional long-haul connectivity, recognising that for short-haul, point-to-point is preferable. The fundamentals of long-haul commercial viability remain strong: aggregation of passengers; differential markets; the ability to maximise price through different classes of service (first, business, premium economy, economy); the power of global alliances and loyalty programmes; and belly-hold freight. These we see as being at the core of most long-haul routes for the foreseeable future. Maximising long-haul networks is achieved by maximising hubs. We therefore agree with the Commission's findings that, in most cases expansion at Heathrow brings the greater number of additional destinations.

### Customers of Heathrow, Gatwick and UK Plc<sup>12</sup>

- 5.9. British Airways and easyJet both caution whether runway expansion plans at Gatwick are viable and favour expansion at Heathrow instead. They both have a vested interest in this argument, British Airways would likely benefit from additional capacity at Heathrow, whilst easyJet enjoys a powerful position as Gatwick's largest customer and, our analysis suggests, enjoys a price-premium through operating in a constrained environment.
- 5.10. Norwegian favours expansion at Gatwick and Heathrow, Ryanair suggests expansion at Heathrow, Gatwick and Stansted. Both easyJet and Ryanair also discuss the potential to operate from Heathrow in the future. We view the withdrawal of Flybe as being an over-reaction to the price increases at Gatwick. If the long-term forecasts are robust, the airline was sitting on slots that have significantly more value than it sold them for; however, it is notable that these slots were purchased by easyJet, enabling it to increase its footprint at the airport.
- 5.11. Moody's expects that Gatwick will be more vulnerable to competition if Heathrow were to build a new runway as it would be at risk of losing scheduled airline traffic to Heathrow, where carriers can typically earn more per passenger mile. Conversely, the construction of a Gatwick runway would almost double aeronautical charges at the airport, putting it at a huge competitive disadvantage to Stansted, which is its main competitor in the low-cost airlines segment. We understand the sentiment in this report although note that Moody's does not rate Gatwick's debt and the other two rating agencies have not published similar papers.
- 5.12. As outlined in our previous work, we do not see London supporting two high-yield hub airports and therefore find it unlikely that Gatwick can sustain charges that are close to, or exceed Heathrow, particularly if it loses short-haul traffic to an alternative London airport. We should not underestimate the risk posed by significant increases in user charges. It is foreseeable that within a dual airport, high-cost operating environment, there is market failure on the airline side, in not providing growth in flights at Gatwick.
- 5.13. The same argument applies at Heathrow, though here we feel the risk is that the UK will lose traffic to overseas hub airports if it is either priced-out of Heathrow or unable to obtain slots. However on balance, we suggest that Heathrow, as the preferred airport for high-yield traffic, would be in a position to incentivise airlines to switch key routes from the other London airports, mitigating some its financial risk.
- 5.14. Although we are neutral on the merits of the two Heathrow schemes, linking back to our previous findings which suggested that an additional (fourth) runway may be required by the late 2040s, the extended runway proposal can be more easily converted into a four-runway airport than the north west runway option.

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<sup>12</sup> See appendices for further detail



## Noise and Environment

5.15. We are, again, limited in our ability to produce meaningful analysis on these issues and acknowledge their importance to those effected. As would be expected, there are substantial differences in the noise and environmental impacts of expansion at Heathrow and Gatwick, from the number of 'new' people under flight paths to local air quality.

5.16. One area in which we can be certain is that aircraft technology will improve markedly over the duration of any forecast period. The table below shows the change in noise between new generation of long-haul aircraft (A380, B787) and aircraft types that flew regularly in the 1980s and 1990s (DC10, B747-200). Similar changes would be observed if looking at short-haul types

**Table 36: Examples of aircraft noise improvements**

Aircraft	Engine	Lateral	Lateral Max	Lateral Margin	Flyover	Flyover Max	Flyover Margin	Approach	Approach Max	Approach Margin	Noise Chapter
A380-800	Trent 972-84	94.8	103	8.2	93.2	106	12.8	98	105	7	4
B747-200	JT9D-7R4G2	101.3	102.8	1.5	102.4	105.9	3.5	106.6	105	-1.6	3
B787-8	Trent 1000-G	91.7	100.9	9.2	89.1	98	8.9	96.8	104.3	7.5	4
DC-10-10/15	CF6-6D	98	101.5	3.5	98.6	101.8	3.2	106	104.8	-1.2	3

Source: CAA (except Approach Margin)

5.17. The Chapter 4 standard required all new aircraft type designs to have a cumulative margin of 10 EPNdB or more as of 1 January 2006. In other words, the Chapter 4 limit represents an increase in stringency of 10 EPNdB (cumulative) relative to the Chapter 3 limit. Chapter 2 aircraft were banned from European airspace in 2002 and it is not unforeseeable that Chapter 3 will face a similar fate at some stage in the future. With airlines having to renew their aircraft in order to meet with the certification requirements, it can be assumed that the noise footprint at either Gatwick or Heathrow will not increase at the same rate as passenger demand.

5.18. Noise is normally the biggest concern with airport expansion, and particularly so at Heathrow since it affects so many people. On the other hand, aircraft noise is not a new issue and has been falling since the days of the early jumbo jets and Concorde. The ultimate judgement - which will be difficult and controversial - is whether the future of UK global connectivity should be decided on this issue, or whether a combination of further reductions in engine noise, better flight patterns, improved mitigation and compensation for those most immediately affected can be found which enables a fair balance with the wider needs of London and the country.



## Appendices

### Route Additionality at Gatwick 2014 v 2004

The analysis below shows new destination cities (as defined by IATA) flown from Gatwick with flight frequency greater than 355/year categorised by primarily business (B), primarily leisure (L) and mix (M), showing the overlap with Heathrow. For example, Enfidha, Hurghada, Marrakech and Sharm el-Sheikh are new to Gatwick, not flown from Heathrow and primarily leisure destinations; Moscow is new to Gatwick, was already flown from Heathrow and is primarily a business route.

Yr	From	Continent	To	Additional in 2014 over 2004		
				LGW Unique	LHR Overlap	Route Type
2014	LGW	AF	Enfidha	Y		L
2014	LGW	AF	Hurghada	Y		L
2014	LGW	AF	Marrakech	Y		L
2014	LGW	AF	Sharm el-Sheikh	Y		L
2014	LGW	AS	Moscow		Y	B
2014	LGW	CB	Saint Lucia	Y		L
2014	LGW	EU	Antalya	Y		L
2014	LGW	EU	Basel/Mulhouse		Y	B
2014	LGW	EU	Berlin		Y	B
2014	LGW	EU	Bodrum	Y		L
2014	LGW	EU	Budapest		Y	B
2014	LGW	EU	Catania	Y		L
2014	LGW	EU	Cork		Y	M
2014	LGW	EU	Dalaman	Y		L
2014	LGW	EU	Dubrovnik	Y		L
2014	LGW	EU	Dusseldorf		Y	B
2014	LGW	EU	Fuerteventura	Y		L
2014	LGW	EU	Gran Canaria	Y		L
2014	LGW	EU	Hamburg		Y	B
2014	LGW	EU	Helsinki		Y	B
2014	LGW	EU	Ibiza	Y		L
2014	LGW	EU	Innsbruck	Y		L
2014	LGW	EU	Irakleion	Y		L
2014	LGW	EU	Istanbul		Y	M
2014	LGW	EU	Kerkyra	Y		L
2014	LGW	EU	Kiev		Y	M
2014	LGW	EU	Knock	Y		L
2014	LGW	EU	Lanzarote	Y		L
2014	LGW	EU	Larnaca		Y	L
2014	LGW	EU	Lyon		Y	M
2014	LGW	EU	Menorca	Y		L
2014	LGW	EU	Montpellier	Y		M
2014	LGW	EU	Murcia	Y		L
2014	LGW	EU	Oslo		Y	B
2014	LGW	EU	Reykjavik		Y	M
2014	LGW	EU	Riga	Y		M
2014	LGW	EU	Salzburg	Y		M
2014	LGW	EU	Sevilla	Y		M
2014	LGW	EU	Sofia		Y	B
2014	LGW	EU	Split	Y		M
2014	LGW	EU	Stockholm		Y	B
2014	LGW	EU	Tenerife	Y		L
2014	LGW	EU	Thessaloniki	Y		L
2014	LGW	EU	Valencia	Y		L
2014	LGW	EU	Vienna		Y	M
2014	LGW	NA	Cancun	Y		L
2014	LGW	NA	Las Vegas		Y	L



## Slot Availability at Heathrow, Gatwick and Stansted







## Literature Review and Case Studies

There have been a number of publications and press releases in the lifetime of the Airports Commission from some of the key players in the airport expansion discussion. Our review of these concentrates on the following:

- Airline views on runway expansion at Heathrow and Gatwick (British Airways, easyJet, Ryanair and Norwegian)
- Credit rating agency standpoint (Moody's)
- Case studies of the impact of higher charges on traffic at various airports (AENA, Belgrade, Gatwick and Stansted)

### Ryanair stance on Heathrow, Gatwick and Stansted

Briefings and interviews given by Michael O'Leary, CEO of Ryanair – January 2015

Interviewed about Ryanair's future business strategy, Michael O'Leary set out radical plans to fly British Airways and Virgin Atlantic passengers to European and domestic destinations on Ryanair aircraft. His 'pitch' to British Airways and Virgin is to fly their long-haul transfer passengers into Heathrow, Stansted and Gatwick using his own Ryanair planes for short-haul connecting flights.

He stated that the plan could apply to other major international airlines in transatlantic flights and those to the Middle East and Asia – and predicted that budget airlines acting as feeder flights would in future become the norm.

O'Leary pointed out that a constraint to the proposal could be the passenger liability if flights were delayed and connections missed. O'Leary said major carriers would have to pick up the tab. He said: 'We don't have a lot of funding available for compensation. We would expect that the long-haul planes would accept the passenger liability issue.' The plan would also be an interim measure as Ryanair itself one day plans to enter the long-haul market but has found it hard to acquire the right planes. Ryanair wants 30-50 aircraft over five years to enter the long-haul market.

O'Leary predicted that within five years other low-cost airlines will follow this model and added: 'Low-cost carriers can do a lot more of the feeding of long-haul flights.' Ryanair is undergoing a makeover to become a 'nicer' airline with a focus on customer service. O'Leary said: 'We were maybe a little bit cheap and nasty. We have spent a lot of time and effort trying to be cheap and a little bit better.'

On London's expansion, O'Leary claimed the best solution to expansion issues for London's airspace would be to build new runways at all three London airports and residents 'shouldn't be able to block expansion... it is ridiculous' he said.

Another point of potential entry for Ryanair to operate from Heathrow could come as a result of the bid by International Consolidated Airlines Group (IAG) to acquire Aer Lingus. O'Leary has signalled his company could buy any Heathrow landing rights that are put up for sale as remedy slots if IAG makes a successful bid.

O'Leary believes that if such a deal were to go ahead EU competition regulators could demand that IAG offload some of its routes between Ireland and Heathrow airport, as both its subsidiary British Airways and Aer Lingus operate these services. "We would be willing to participate in that," he said, adding that BA was prepared to take similar steps when Ryanair made its third bid to buy Aer Lingus in 2012. At that time BA agreed to buy 20 of Aer Lingus's 24 landing slots at Heathrow to allay the European Commission's concerns that a Ryanair takeover would reduce competition on flights between Ireland and Britain.

It is worth noting Ryanair appears to be actively ruling-in the prospect of entering the long-haul market with enough aircraft to offer a range of European origins. At present, they are the only other low-cost airline to



state this ambition, although it is not new. O’Leary has made similar claims several times in recent years. The airline suggests it would not rule out operating from Heathrow, while supporting expansion at all airports. The idea that long-haul carriers would pick up compensation for missed connections could be replaced by an airport-funded connecting guarantee like the Gatwick Connect service.

There seems to be some contradiction between the claim that low-cost carriers will feed long-haul airlines in the future *and* the aspiration to fly long-haul themselves.

#### **Norwegian views on Gatwick and Heathrow<sup>13</sup>**

Norwegian has said it would consider opening long-haul routes from Asia to London Gatwick to feed traffic onto its planned transatlantic operations if the UK airport can secure approval to build a second runway. Bjorn Kjos, chief executive of Norwegian, said Gatwick could be used as a mini hub for long-haul Asian routes connecting to its services to New York, Fort Lauderdale and Los Angeles which begin this summer.

“Gatwick is ideal for long-haul, low-cost operations because there are so many low-cost carriers in Gatwick; Ryanair, EasyJet and Norwegian, people can self-connect so it is ideal for a low-cost operation.

Kjos warned that this could only happen if Gatwick was allowed to build a new runway as the current one is at almost full capacity and much of the demand from emerging economies in Asia will come from those wishing to fly long-haul, low-cost.

“I think it [preventing Gatwick’s expansion] will really have an impact on everybody. What we fear will be the big impact on London is especially impact on passengers coming from the Far East, actually you are talking about such a high number of passengers you need more than one airport to take care of those passengers,” he said.

Kjos noted that both Gatwick and Heathrow have been shortlisted as candidates for a new runway to deal with the lack of capacity around London, but it is expected that only one will be given permission to grow.

Kjos concluded that both airports should be allowed to expand. “Six times as many people living in the Far East as they do in the West, China and India are growing and as the global economy starts to even out we will reach a point where they will have the chance to fly, you already have 100 million people today flying out of China on vacation for instance.”

In common with Ryanair, Norwegian sees competition between airports as a key driver of reducing airport charges. The airline already operates some low-cost long-haul from Gatwick and is a clear supporter of the Gatwick Connect concept whereby the airport facilitates connections between carriers.

#### **Wizzair at Belgrade Airport**

In April 2014, Wizz Air, the largest low-cost airline in Central and Eastern Europe said that it would halve its capacity in Belgrade by closing routes to Oslo (Torp airport) and Brussels (Charleroi airport) and reducing the number of flights to other destinations. Wizz Air said the decision was made after airport costs were increased by 40%, which made the Belgrade airport the most expensive in the Wizz Air’s network of flights. The aircraft from the Belgrade base were transferred to the Latvian capital of Riga. The airline stated that “if Belgrade airport reduces costs and becomes competitive with other less expensive airports in the region, it will be possible to compensate for the loss resulting from halving Belgrade capacity”.

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<sup>13</sup> Flight Global article – January 17<sup>th</sup> 2014



Willie Walsh: 'No business case' to support a second runway at Gatwick

Willie Walsh, the head of British Airways' parent company IAG, ruled out supporting a second runway at Gatwick, even if it is given the go-ahead by policymakers, arguing that he doesn't believe there is a business case to support expansion at Gatwick, suggesting there is insufficient demand from airlines for extra capacity at Gatwick. Walsh said, "I would not support a runway at Gatwick because I don't think there is a business case to support it," the airlines boss said.

Mr Walsh said his objections are "principally based on the demand environment" but he warned that BA would also strongly resist any increase in charges to fund expansion, either at Gatwick or at Heathrow. "I don't think it [demand] is as strong as Gatwick would argue," he said. He warned both airports that they would have to demonstrate "how charges [for airlines] will reduce rather than increase".

British Airways has stayed largely 'under the radar' since the Airports Commission was established. Having fully backed Heathrow expansion before the 2010 general election and seen Government reject the expansion approval, it is perhaps unsurprising. Recent moves to acquire Irish carrier Aer Lingus<sup>14</sup> could be seen as a contingency move to safeguard its transatlantic business in the long term. In the event that it is unable to grow from its London Heathrow hub, we would see the Heathrow network being primarily point-to-point into London, and connecting traffic being pushed over an enlarged Dublin network.

easyJet questions case for new runway at Gatwick airport<sup>15</sup>

easyJet Chief Executive, Carolyn McCall, called into question Gatwick's push for expansion by saying that customers wanted extra capacity at Heathrow, Britain's largest airport. Ms McCall said easyJet was "quite concerned" at the prospect that airport landing charges could rise at Gatwick to cover the costs of a second runway.

"We make £8 profit per seat and our average price is just £60," she said. If Gatwick's charges doubled to an average of £15 to £18 as predicted by an independent commission examining the case for expansion, "that is quite worrying in terms of our economic case."

Passengers seemed to favour Heathrow, Ms McCall added. "This whole issue should be [decided] where the demand is," she said. "The congestion we have does predominantly appear to be around Heathrow."

Moody's Global Credit Research<sup>16</sup>

A new runway will have mixed credit implications for London's airports

Moody's issued a credit research report which argued that adding a new runway at either Heathrow or Gatwick would have conflicting credit implications for London's three largest airports.

The Moody's report said that "A new runway will have mixed credit implications for London airports. A runway at Heathrow would allow the airport to benefit from growth in future traffic volumes, and a new runway at Gatwick would not take significant traffic from Heathrow. Gatwick, on the other hand, would be vulnerable to airlines switching to an expanded Heathrow, whilst a new runway at Gatwick would increase its airport charges and could alienate its price-sensitive airlines."

A runway at Heathrow would allow the airport to accommodate expected growth in London passenger traffic. By 2050, Heathrow would be able to accommodate between 133 and 149 million passengers, which is almost

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<sup>14</sup> <http://www.bbc.co.uk/news/business-30978683>

<sup>15</sup> Financial Times – November 18<sup>th</sup> 2014

<sup>16</sup> December 10<sup>th</sup> 2014



double current traffic levels. While Heathrow's hub airport status could come under pressure from a new runway at Gatwick, it would remain London's largest airport as it would still be expected to handle around 20 million more passengers per annum than Gatwick by 2050.

Moody's expects that Gatwick will be more vulnerable to competition if Heathrow were to build a new runway as it would be at risk of losing scheduled airline traffic to Heathrow, where carriers can typically earn more per passenger mile. Conversely, the construction of a Gatwick runway would almost double aeronautical charges at the airport, putting it at a huge competitive disadvantage to Stansted, which is its main competitor in the low-cost airlines segment.

Moody's notes that a Heathrow runway would not affect Stansted, as it is unlikely to experience significant competition from Heathrow, given its specialisation in servicing low-cost carriers, which are entirely absent from Heathrow.

It is worth noting that Moody's doesn't rate Gatwick Airport's debt and the other two rating agencies, Fitch and Standard & Poors, have not published on Gatwick. However, we tend to agree with the themes identified within their report.

#### **AENA: high airport charges deter traffic at Spain's airports.<sup>17</sup>**

CAPA examined traffic trends at AENA and considered whether they have been affected by higher airport charges. The analysis suggests that there is a clear link and so action to reverse falling traffic numbers through lower charges seems a logical step.

Data from CAPA's Airport Charges Database (supplied by Air Transport Research Society) show that combined landing and terminal charges across a range of aircraft types at Madrid, Spain's largest airport, increased by around 60% or more in 2013 versus 2012. Airlines at Barcelona, Spain's second largest airport, saw increases of 50% or more in these charges in 2013.

The 5.0% drop in passenger numbers at AENA airports in 2012 compared with an increase of 4.4% at the world's airports (source: Airports Council International). Although Europe's growth was slower than the global average, reflecting the EU's economic weakness, Europe's airports still handled 1.8% more passengers in 2012 than in 2011.

Spain's airport passenger decline made it by far the worst performer among Western Europe's five biggest countries. The 5.0% drop in Spanish airports compares with a 1.2% fall in Italy and positive growth in the UK, Germany and France.

The CAPA report concludes "In this context, it becomes apparent that AENA's airport charge increases have hit passenger numbers hard".

Ryanair closed 11 routes to Madrid and four to Barcelona El Prat following the Spanish Government's decision to double taxes at the two airports. "Ryanair objects to the Spanish government's decision to double airport taxes at both Madrid and Barcelona airports," said Michael O'Leary, Ryanair chief executive. "Sadly, this will lead to severe traffic, tourism and job cuts at both airports this winter."

easyJet decided to close its Madrid base from the winter 2012/13 season following the increase in charges and moved the eight aircraft stationed at Madrid to other locations in Europe which "will deliver higher returns for the airline". easyJet said returns from the Madrid operation were "below" those of all its other bases, blaming over-capacity in the Spanish market and high airport charges levied by operator AENA. easyJet cut capacity to Madrid by 20% though continued to serve the airport from other bases.

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<sup>17</sup> November 8<sup>th</sup> 2013, CAPA



#### Flybe announces withdrawal from Gatwick following increase in charges

Following an increase in charges at Gatwick, Flybe announced in May 2013 that it has sold its arrival and departure slots at the airport, to easyJet for a cash sum of £20 million. The seven axed Flybe routes – Newcastle, Jersey, the Isle of Man, Inverness, Guernsey, Belfast and Newquay – flew 550,000 passengers to and from Gatwick in the last financial year of operation.

Flybe said the decision was as a result of the pricing regime applied by the airport's owners to the operators of smaller, regional aircraft which, in Flybe's case, has resulted in a 102% rise over the last five years. Despite Flybe using the Airports Act 1986 to argue to the Civil Aviation Authority (CAA) in 2010 that Gatwick was acting in an anti-competitive and discriminatory manner, the CAA ruled in September 2012 that Gatwick was within its rights to raise their landing fees for smaller aircraft, thus paving the way for Flybe's withdrawal.

Commenting on the departure from Gatwick, Jim French, Flybe's Chairman and Chief Executive said: "No business can swallow such a massive increase in such a short period of time and it is with real regret and some anger that we have made this decision". He added "No business can swallow-cost increases of more than 100% over five years and Flybe simply cannot bear such punitive rises. We have therefore taken the very difficult decision to withdraw our services from London Gatwick from 29 March 2014, because of the airport's policy of year-on-year above inflation rises in landing fees for operators of smaller regional aircraft."

This decision was particularly significant for Flybe, as at the time it signalled an end to its operations from the London system.

#### Ryanair case study – Stansted Airport - Response to increase in airport charges

Stansted passenger traffic fell for four successive years after reaching a peak of 23.8m passengers in 2007. The decreases were driven to a large extent by Ryanair downscaling its operation at the airport. In 2007, Ryanair's 10 year agreement with Stansted, under which they were receiving substantially discounted rates, expired. Stansted moved Ryanair onto rack rates signed in 2007, which effectively doubled the airline's charges.

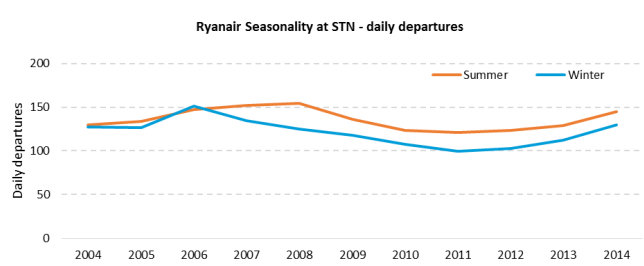
**Table 37: Ryanair Passengers at Stansted 2007-2013**

Year	Annual passenger (m)	Annual change
2007	23.78	0.4%
2008	22.36	(6.0%)
2009	19.96	(10.7%)
2010	18.57	(6.9%)
2011	18.05	(2.8%)
2012	17.47	(3.2%)
2013	17.85	2.2%

Source: CAA

In response Ryanair reduced its offer by, effectively, 25%. Based aircraft fell from 40 in 2008 to 28 in 2011 and the airline also parked more aircraft over the winter period arguing the increased charges meant routes were no longer profitable over the winter months.

**Table 38: Seasonal profile of Ryanair at Stansted**



Source: Capstats.com

In September 2013, following the sale of Stansted to Manchester Airports Group (MAG), the new owners agreed a deal with Ryanair to boost its passenger numbers at the airport by 50% over the next 10 years in exchange for lower airport charges and better facilities. Under the terms of the agreement, which began in April 2014, Ryanair has targets to grow its passenger numbers from 13.2m in 2013 to more than 20m a year by 2023.

This increase represents a quarter of Ryanair's planned growth over the next five years. Ryanair said it would increase the number of aircraft based at Stansted from 37 to 43.

The notable point from the Ryanair case at Stansted is that where the balance of power lies with airlines, they can and will use their strength to secure improved terms with airport operators. This is particularly prevalent where one airline is operating the majority of capacity at an airport, and that airport is within a competitive system. Arguably, easyJet is currently in a similar position at Gatwick whereas British Airways, although operating at a highly constrained site, has less scope to move from Heathrow, where it has a much greater physical footprint.



## 6. Disclaimer

Data for this report has been obtained from a number of sources including the UK CAA, Innovata and Airports Commission documentation and submissions to the Commission. We may adjusted data in order to maintain integrity and consistency. We have checked external information for obvious discrepancies or errors, however we are not responsible for the accuracy of any data provided by or obtained from third parties.

The company will be pleased to explain the basis of any supporting grounds pertaining to the statements herein, in the event that these are not clearly shown.

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### **Response to Airports Commission Consultation, 3.2.15 Further comments on surface access by Dr Tim Ryley**

#### **Response on the surface access elements – Dr Tim Ryley, Loughborough**

**University:** [T.J.Ryley@lboro.ac.uk](mailto:T.J.Ryley@lboro.ac.uk) (from April 2015 Professor of Aviation and Discipline Head at Griffith University, Brisbane: [t.ryley@griffith.edu.au](mailto:t.ryley@griffith.edu.au))

This response on the surface access elements follows on from the ITC report: Ryley, T.J. and Zanni, A.M. (2014). Surface Connectivity: assessing the merits of the Airports Commission's options for UK aviation. Report for the Independent Transport Commission, October 2014

<http://www.theitc.org.uk/wp-content/uploads/2014/10/ITC-Airport-surface-connectivity-Oct-14.pdf>

It is pleasing to see from publication of the various Airports Commission documents associated with the consultation that surface access is a key component of the appraisal process, and that passenger experience is strongly emphasised. The core and extended baselines are an appropriate approach to funding commitments.

The recent publication concerning strategic fit with wider spatial and socio-economic development strategies is welcome. It is good to see wider issues are being considered, particularly given the finding from the ITC report that high population growth in London and the South East will place stress on surface access to airports regardless of whether new runways are built.

I would re-stress the finding from the ITC report that airport targets for modal shift are ambitious. Proposals for expansion at Heathrow and Gatwick have focused on public transport improvements, particularly for rail travel to-and-from the airports. The investment in rail infrastructure is welcome, but I remain to be convinced that the resultant scheme can take the predicted large numbers of extra travellers accessing the airports. For many passengers accessing the airports public transport is not an option, and it is hard to envisage that private car access will not increase if a new runway is built.

As highlighted in the ITC report literature review, there is a particular issue with drop-off / pick-up surface access trips, the largest contributor to emissions and congestion. It is to be recommended that some form of charging could help to reduce this activity and technological innovations could also be used to reduce the need for these trips.

The two surface access reports by the consultancy firm Jacobs on the HSR spur and the Heathrow Airport Hub station do not provide convincing evidence to take these elements forward, which is disappointing. The former states that there will not be enough passenger number impacts from the HRS spur to make it viable, and that other HS2 uses should be prioritised. The latter states that although the Hub station would provide benefits for some users, these positive elements would be outweighed by dis-benefits, including cost and difficulties with interchange. Evidence from these two reports reinforces the difficulties in ensuring that much of the extra demand generated by a new runway will travel by met by new rail-based schemes.

03 February 2015

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# Surface Connectivity: assessing the merits of the Airports Commission's options for UK aviation

Dr T J Ryley & Dr A M Zanni

October 2014



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October 2014



# Foreword from the ITC Project Chairman

The Airports Commission will shortly decide whether to recommend expanding airport capacity at Heathrow or Gatwick. The aim - which the ITC welcomes - is to improve the UK's global connectivity. However, decisions on runways have big implications for surface transport: how people and goods get to and from the airport itself. Expanding an airport without an adequate surface access strategy would deliver only half the solution.

This issue has attracted far less public scrutiny than other dimensions of the aviation debate. The ITC has therefore commissioned this report which highlights the importance of surface access and raises a number of challenging issues that we believe must be addressed:

- a) A good surface access strategy must reflect not just the additional airport-related journeys but also the underlying increase in transport needs from rapid population growth in SE England. This will place stress on access networks to airports regardless of new runways and makes the need to upgrade this infrastructure essential.
- b) The targets for modal shift, from private cars to public transport, are ambitious, and investment as well as a range of policies will be required to achieve them. Could forms of pricing support both?
- c) Several major surface improvements to both Gatwick and Heathrow are already planned or proposed. It remains unclear, however, just how much additional capacity will be needed once underlying population growth, the additional demand (from passengers, staff, freight, etc.) from an expanded airport, and a significant switch to public transport are all factored in. Robust modelling of these combined effects is urgently needed to test the adequacy and cost of surface transport proposals.
- d) Good integration between the airport and surface transport modes, including rail, tube, road, coach and taxi, will be critical for passengers. Achieving this raises issues such as integrated ticketing, local transport 'hubs', and ensuring that airports are well integrated with the national transport network, including HS2. The ITC's parallel work on High-Speed Rail has shown the importance of joined-up planning - noting that rival airports, such as CDG and Schiphol, have integrated their HSR stations within the airport.
- e) Planning and then operating "joined up" transport to and within major airports is complex. It involves a host of organisations, including planning authorities, property owners, infrastructure providers and service operators. The report questions whether enough attention has been given to the governance arrangements for successful delivery. Who has the strategic leadership role and can ensure that plans are aligned across all modes, thereby providing a service that is more than the sum of the parts?

Surface access fit for purpose is the essential corollary of any major airport expansion. We fear that these issues have not yet received the public attention they deserve. As the Airports Commission approaches its final conclusions and recommendations, it is essential that it addresses them transparently and robustly.

**Dr Stephen Hickey**  
**Chairman of the Aviation working group**  
**Independent Transport Commission**







# Surface Connectivity: assessing the merits of the Airports Commission's options for UK Aviation

Dr T J Ryley and Dr A M Zanni

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# Executive Summary

## Introduction

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1. The ITC welcomes the work of the Airports Commission and the ensuing lively public debate on how best to meet the UK's aviation connectivity needs over the next few decades.
2. In its previous reports *Flying into the Future* (May 2013) and *The optimal size of a UK hub airport* (February 2014) the ITC highlighted the key issues and challenges, including the importance for the UK itself in continuing to host one of the world's prime hub airports.
3. Understandably, much of the public debate has been around specific aviation issues, such as future demand and the ways in which the industry could develop in future years. The impacts of aviation on local communities - particularly noise and other environmental impacts - have attracted widespread attention.
4. By contrast, the question of what needs to happen to surface transport - road and rail - if either of the remaining short-listed airports is to expand significantly, has received less attention. Yet this is a vital issue. No-one simply flies: all airline journeys start and end with surface journeys from the individual's home (or other place of origin) to their final destination. So expanding the airport itself only addresses part of the problem of improving UK connectivity.
5. The Airports Commission will reach its final conclusions and recommendations in the summer of 2015. The ITC welcomes its recognition of the importance of surface transport but has a number of major concerns:
  - these key issues have not yet received the attention they deserve in the public debate;
  - on the evidence of our work so far, the information and data publicly available on the scale of the surface transport implications, challenges and how they might be resolved remains worryingly limited and inconsistent;
  - aviation passengers (and staff) want and need seamless, easy, "joined-up" end-to-end journeys, embracing both the surface elements of their journey (train, coach, tube, bus, car, taxi etc) and the flights themselves. But it is unclear whether we have the capacity to ensure this happens.

We are, therefore, publishing our report with the aim of highlighting more widely the importance of this under-researched aspect of the aviation debate; and have addressed our recommendations primarily to the Airports Commission, since it is now essential that these issues are transparently addressed as it develops its final recommendations to Government.

6. The report raises four main issues: the scale of the surface access challenge; the importance of the "last mile"; the challenges of delivery; and a broader concern about integrated transport planning in the UK.



## The scale of the surface access challenge

7. The report highlights the potential scale of the surface access challenge and the limitations of the currently available information and data:
- the backdrop to the aviation debate, and its surface transport implications, is that the population of London and South-East England is rising anyway. London's population is expected to grow by 13% by 2022 alone. So surface transport capacity would need to expand regardless;
  - expansion at either Gatwick or Heathrow will add many new passengers on the ground as well as in the air. Gatwick estimate that their total passenger numbers could rise from around 34 million in 2013 to perhaps 60 million in 2030 and 87 million in 2050. Heathrow expect that their passenger numbers would rise from around 72 million (of whom around 45 million use surface transport - others are transferring flights) to around 100 million by 2030. The numbers using surface transport would rise from 45 million to around 68 million;
  - in addition, however, both airports rightly want to see a significant shift of passengers from road to public transport (primarily rail and tube). Gatwick aims to increase the proportion of passengers using public transport from around 42 per cent (2011) to around 60 per cent by 2040, or in absolute terms from around 14 million to possibly 40 million. Heathrow estimates that the numbers using public transport would rise from around 19 million to around 34 million (or at least 50%). Delivering such a shift will be a major challenge in itself requiring, for instance, better public transport to and from airports outside normal hours; and perhaps controversial measures such as charges for "kiss and drop" car trips, with the income used to subsidise public transport improvements;
  - expansion would also have implications for staff travel and freight (both goods serving the expanded airport itself and air freight). Staff journeys form a surprisingly large proportion of total journeys. Both airports want to encourage staff to switch to greater use of public transport. There appears to be little published data on the potential freight implications.

8. Modelling the *combined* impact of all these factors in a comprehensive, consistent and robust way for both airport options is difficult with the information currently available. But it is clear that the aggregate increase in the number of journeys, on both public transport and the roads, is potentially very significant.
9. The other side of the coin is how the increased demand for surface transport would be met, and at what cost. Here the available data has proved even more fragmentary.
10. Both airports suggest that most of the increase can be satisfied through existing and already planned additional capacity, such as improvements to Thameslink, Gatwick Express, the opening of Crossrail and other schemes. It appears that both airports envisage investing around £800-900 million in surface access, largely in local motorway adjustments, but recognise that this assumes no need for more far-reaching (and expensive) schemes beyond those already planned. It is not clear from the available data how far the planned new capacity would simply meet population growth and other existing pressures, and how far it will create genuine, adequate headroom for large numbers of new airport passengers and people switching modes.
11. We note the lack of publicly available transparent and comparable data as a matter of concern, and hope that the Airports Commission will publish such data before it reaches its final conclusions. Expanding an airport without sufficient clarity on the adequacy and affordability of associated surface transport improvements would be a major failure.
12. We therefore recommend that the Commission publishes clear and transparent estimates both of the cumulative extra demand which would follow from expansion, and also whether the currently planned or proposed surface transport improvements will be sufficient for the next 30+ years. We note that some airports (but not Heathrow or Gatwick) already use financial incentives to discourage private vehicles, and that this also creates potential new funding streams for improved public transport. We recommend the Commission includes this issue in its proposals.

## The last mile

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13. As well as raising questions about surface transport capacity, the report highlights the importance of the “last mile” (to or from the airport), in terms of design, customer experience, and the potential for innovative technology. All passengers want an easy, straightforward, fast “last mile” (or “first mile” for arrivals), but depend on a host of organisations responsible for particular elements of their experience, including airlines, airports, border controls, bus, coach, tube and train companies, as well as rail and road infrastructure providers.
14. Technological solutions might include simple but comprehensive information and advice; integrated ticketing across modes; innovative transport between terminals or between terminals and car parks; and “virtual” meetings to greet or say farewell to passengers. We recommend that these solutions are considered.





## Organising to deliver

15. The report highlights not just the issues and opportunities airport expansion could raise in relation to surface transport but also the challenges of design and execution. Even at the local level, these issues cross the roles and responsibilities of a wide range of public and commercial bodies and are not within the straightforward control of the airports themselves. If the full benefits of airport expansion are to be realised by customers and by the UK more broadly, it is essential that all the players – including the airports and the airlines; local and national roads authorities; those responsible for both rail and tube infrastructure and services; and those developing coach and taxi services – all align their plans and collaborate effectively on delivery.
16. We therefore recommend that the Airports Commission addresses not only where airport expansion should take place but also whether the governance infrastructure is adequate to ensure that the full benefits for passengers are realised during the planning and execution stages.

## National infrastructure planning

17. A feature of this review, prompted particularly by the Heathrow options, has been the way in which the UK's major transport infrastructure issues appear to be addressed in distinct silos. Arguably the two biggest transport projects currently under consideration - a new runway and High Speed 2 (HS2) - have potentially significant interrelationships and opportunities; but the remits for both are being considered separately and are not well integrated.
18. From the ITC's research on High Speed Rail it is clear that in many other countries - including Holland, Germany and France - airport and high-speed rail projects are considered in tandem. Airports at Schiphol, Paris and Frankfurt, for example, incorporate major stations into the airport design, with direct services to multiple destinations, expanding connectivity for all and increasing the access and appeal of the airport for domestic users.
19. We understand the history and the particular issues in the UK context. But it is nonetheless disappointing that even the *possibility* of ensuring true integration between an enhanced hub airport and the UK's major new railway spine appears to have been lost, reflecting the way in which each project has been handled through separate mechanisms and on separate timetables. Integrating the two in the manner common elsewhere may or may not have been the optimal solution in the UK: but the apparent absence of deep analysis and debate - comparable to the separate debates about both HS2 and a third runway - reflects poorly on the UK's approach to major infrastructure planning. We recommend that the Government reflects on this experience and considers what better mechanisms might be needed to strengthen cross-modal planning for major infrastructure proposals.

20.

Finally, there is a longer-term issue about aviation business models and national surface infrastructure. The airlines' normal business model - as we reported in *The optimal size of a UK hub airport* - makes it cheaper today to get from (say) Manchester to (say) Singapore by flying to Heathrow (or another global hub) to connect to the long-haul leg than to get there by train. Once HS2 is established many more places will be quickly connected to Heathrow; and it will be quicker for those in the South East to access airports in the Midlands and North. Looking ahead, therefore, new opportunities will appear for airlines to develop new business models, embracing surface transport as well as domestic flights. We recommend that the Airports Commission considers the scope to encourage or provide incentives to airlines to develop such new business models.



# I. Introduction

- 1.1** In May 2013, the ITC (Independent Transport Commission) produced a report on the issues surrounding the UK's aviation infrastructure needs entitled: *Flying into the Future. Key issues for assessing Britain's Aviation infrastructure needs*. The ITC considers that one of the key elements necessary for good 'connectivity' to a hub airport is surface transport<sup>1</sup>. As part of the next phase of their aviation research, the ITC has commissioned this report.
- 1.2** The aim of this report is to assess the surface transport aspects of each of the proposals short-listed by the UK Airports Commission in its interim report published in December 2013<sup>2</sup>. It should be noted that this report primarily uses publicly available information.
- 1.3** The Airports Commission's Interim report set out the nature, scale, and timing of steps needed to maintain the UK's status as an international hub for aviation, alongside recommendations for making better use of the UK's existing runway capacity over the next five years. The short-listed options (from the 52 received) selected for further analysis and assessment, in accordance with their potential to deliver the needed capacity, flexibility and resilience, were:
- 1.** Gatwick: A new runway over 3,000m in length located south of the existing runway to permit fully independent operation (proposed by Gatwick Airport Ltd).
  - 2.** Heathrow (i): A new 3,500m runway to the NW of the existing airport to permit fully independent operation (proposed by Heathrow Airport Ltd).
  - 3.** Heathrow (ii): An extension of the existing northern runway to the west, lengthening it to at least 6,000m, enabling it to be operated as two separate runways: one for departures and one for arrivals (proposed by Heathrow Hub Ltd).
- 1.4** The Airports Commission originally included a Thames Estuary proposal in their December 2013 document, supported by the Mayor of London. It involved the construction of a new hub airport East of London on the Isle of Grain. This proposal was rejected in September 2014 following further feasibility and impact studies<sup>3</sup>.
- 1.5** The general objectives the Commission set up, in terms of surface access, to guide the submission of proposals are<sup>4</sup>:
- To maximise the number of passengers and workforce accessing the airport via sustainable modes of transport;
  - To accommodate the needs of other users of transport networks, such as commuters, intercity travellers and freight;
  - To enable access to the airport from a wide catchment area.

1 ITC, *Flying into the future - Key issues for assessing Britain's aviation infrastructure needs*. (London: Independent Transport Commission) 2013. Section 4.1, p.48.

2 AIRPORTS COMMISSION 2013. Interim Report - 17 December 2013.

3 AIRPORTS COMMISSION 2014. Inner Thames Estuary Airport: Summary and decision paper. September 2014.

4 AIRPORTS COMMISSION 2014. Airports Commission: Appraisal framework consultation. Airports Commission. Section 4. Surface Access, pp.50-54.

## 1.6

All organisations that submitted a proposal to the Airports Commission were asked to include details of their surface access strategies<sup>5</sup>. The Commission's report contains a number of proposals for surface access improvements to airports in the South-East that could, although not a substitute for increased capacity in the long-term, improve short-term constraints by making a more efficient use of existing capacity. These are:

- The enhancement of Gatwick Airport Station (as well as improvements to the Gatwick Express service).
- The development of a strategy to improve road and rail access to Gatwick Airport.
- The development of a proposal to improve the rail connection between Stansted Airport and London.
- The provision of direct rail access into Heathrow from the south.
- The provision of smart-ticket facilities at airport stations.

## 1.7

On 26 November 2013, Sir Howard Davies, Chairman of the Airports Commission, sent a public letter to the UK Chancellor George Osborne urging him to take particular consideration of surface access improvements to airports in England. The letter presented a number of recommendations for surface access investments across a number of airports in the UK, and would require more than £2bn of investment. In particular, Sir Howard stated:

"In the interim there is a strong case for attaching a greater strategic priority to transport investments which improve surface access to our airports. Surface transport improvements can encourage more use of airports which currently have spare capacity, improve the passenger experience, and make airports more attractive to airlines... There are also environmental benefits to be gained through surface access investment. If we are to reconcile the twin objectives of meeting aviation capacity needs and remaining on course to meet the UK's environmental goals, we need to do more to support a shift towards the use of public transport, particularly rail."<sup>6</sup>

## 1.8

The assessment in this report of the surface access aspects of these proposals is undertaken in the following sections:

2. A review of the surface connectivity needs of any major airport
3. The current surface access situation at Gatwick and Heathrow
4. Future surface access developments
5. Surface access implications
6. Conclusions and recommendations

5 AIRPORTS COMMISSION 2014. Airports Commission: Appraisal framework consultation. Airports Commission.

6 Sir Howard Davies to The Rt Hon George Osborne MP, 26 November 2013, accessed at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/263208/surface-access-letter.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263208/surface-access-letter.pdf)



## 2. A review of the surface connectivity needs of major airports

- 2.1** The task has primarily involved desk research reviewing the surface connectivity needs of major airports, using a range of academic and industry sources. Much of this builds upon a recent UK surface access project undertaken by the research team (the ABC project<sup>7</sup>).

### Introduction to surface access and connectivity

- 2.2** For airports, facilitating surface connectivity means receiving more travellers and therefore increasing profitability. It is known that airlines take surface connectivity into account when choosing between different airports. From the passengers' point of view, the journey to the airport (surface access) represents the first stage of their trip, and a very important one, given the issues they may face if they miss their flight, and the monetary and psychological consequences incurred. Similarly, arriving passengers want to get to their final destinations quickly and easily. A traveller is subject to constraints for surface access, in particular luggage and the departure time of the flight. For flight departures, passengers must allow necessary time to walk from either the parking or the public transport terminal to the main airport building.
- 2.3** It should be noted that hub airports have different surface access requirements to non-hub airports, given the different operations taking place on their premises. In particular, hub airports normally have a larger proportion of passengers transferring from one flight to another than non-hub ones. These passengers put less pressure on the surface access infrastructure.
- 2.4** Airports therefore need to integrate effectively in the multimodal transport network in order to survive and prosper. Intermodal integration describes a system in which passengers can complete a journey connecting different modes in a safe and efficient (seamless) way<sup>8</sup>. This is particularly complicated in the UK as even the same mode is often provided by different organisations, sometimes with conflicting interests, making the integration efforts even more challenging.
- 2.5** It is necessary to define good surface access. Ideally, each airport should be reachable in the quickest and most convenient way by those who want to use it. This would mean fast, direct, public transport services from a large number of locations. Public transport services need to be designed to meet air travellers' needs, so that there is space for luggage, step free access and provision of information. In situations where non-road-based public transport is unfeasible then a goal should be congestion-free road access, with a preference for more sustainable travel, such as by coach, to access the airport.

<sup>7</sup> The Engineering and Physical Sciences Research Council (EPSRC) project (EP/H003398/1): Airports and Behavioural Change (ABC): towards environmental surface access project. The project, conducted between 2009 and 2012, had a focus of encouraging better environmental behaviour for surface access journeys, together with the development of sustainable transport solutions.

<sup>8</sup> VESPERMANN, J. & WALD, A. 2011. Intermodal integration in air transportation: status quo, motives and future developments. *Journal of Transport Geography*, 19, 1187-1197.

## 2.6

Vesperman and Wald<sup>9</sup> interviewed a number of airport managers across the world (including at Heathrow, Stansted and Manchester) about intermodal integration for surface access travel. Based on these interviews, the authors categorise airports based on the following main motives behind offering (or boosting if already present) a multimodal surface access system:

- Increase catchment: for a number of airports (generally situated in densely populated areas), an improved and integrated surface access system will above all increase the airport's current catchment area.
- Enable growth: for some other airports (generally mid-size European airports), general growth is the main focus; for some it is the increase in the pool of possible clients; for others it is the provision of a better service to their customers.
- Alleviate congestion: this is the main motive for (generally US but also at London Stansted) other airports in the sample, where car is the most dominant mode for surface access.
- Target customers: the attention of these airports (mostly European, including Heathrow and Manchester) is addressed to their customer needs, since they believe a good offer of multi-modal access options is what their customers prefer. Remote baggage check-in facilities are also offered by some of these airports.

## Surface access modes of transport

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### 2.7

We can categorise the different modes of transport for surface access to airports as follows:

#### Public transport options (*could be a dedicated airport service or not*):

- Rail longer distance (normal or high speed train)
- Rail shorter distance
- Metro or light rail, generally shorter distance
- Local bus
- Express busway
- Coach



### Private car options:

- Car as a driver  
(short-stay, medium or long-stay parking, or meet-and-greet parking services)
- Car as a passenger, with the driver also flying
- 'Drop-off/pick-up' (also known as 'kiss & drop', 'kiss & fly' or 'meet & greet'), with car as a passenger and the driver not flying. The driver (and other people not traveling by air) may drop-off the air travellers and drive away, or decide to park their car.
- Lift-share scheme, i.e. driving to the airport together with other travellers who are not necessarily on the same flight (but most probably on a similarly-timed one). These schemes, and relevant computer or smartphone applications, already exist across Europe, generally for long distance travel, and could be adapted for airport users.

### Hybrid options:

- Taxi and minicabs
- Private shuttle bus from hotels or conference centres
- Private coach services from tour operators or other organisations
- Demand Responsive Transport (DRT) services. These are a hybrid between a taxi and a bus<sup>10</sup>

**2.8** It is estimated that 65% of journeys to airports in Europe and the US are made by private cars, with this figures rising to 99% for certain smaller regional airports<sup>11</sup>. In general, the travel method that has the greater impact on traffic and congestion, and consequently on both air quality and carbon emissions, is 'drop-off/pick-up' since this generally involves four trips. Taxi and minicabs also involve four trips although they may well be transporting other passengers somewhere on the return trip. Some airports in the UK charge drivers for drop-off/pick-ups (London Luton is an example). Trying to reduce these journeys can be difficult, however, as drop-off/pick-up trips provide direct connectivity between home and airport, and is also attractive to those who wish to be seen off or welcomed at airports by family members or close friends. Detailed modal data for UK airports are not available, however Table 1 reports information for the public/private split for the UK airports included in the latest (2012) CAA Passenger Survey.

10 Airport surface access trips have been highlighted as a possible DRT market niche for development in a recent DRT research project. For further information see [www.drtfordrt.co.uk](http://www.drtfordrt.co.uk) and the paper: RYLEY, T.J., STANLEY, P., ENOCH, M.P., ZANNI, A.M. and QUDDUS, M.A. (2013) An evaluation of Demand Responsive Transport as a form of sustainable local public transport. Paper accepted for publication in the 'Research in Transportation Economics' journal.

11 BUDD, T., ISON, S. & RYLEY, T. 2011. Airport surface access in the UK: a management perspective. *Research in Transportation Business & Management*, 1, 109-117. See also VESPERMANN, J. & WALD, A. 2011. Intermodal integration in air transportation: status quo, motives and future developments. *Journal of Transport Geography*, 19, 1187-1197.

**Table 1.** Mode of transport used by departing passengers – 2012

Airport	Terminating passengers	Private %	Public %	Other %	Total %
Gatwick	31,467,000	56.1	43.6	0.3	100.0
Heathrow	43,950,000	59.2	40.6	0.2	100.0
City	2,950,000	49.5	50.0	0.5	100.0
Luton	9,365,000	66.2	33.1	0.7	100.0
Stansted	16,645,000	48.8	50.9	0.2	100.0
Birmingham	8,483,000	80.2	19.2	0.6	100.0
East Midlands	4,024,000	90.7	9.0	0.2	100.0
Manchester	18,978,000	84.2	15.5	0.3	100.0
Bristol	5,805,000	81.6	18.1	0.3	100.0
Cardiff	985,000	91.1	8.9	0.1	100.0
Exeter	675,000	95.0	4.8	0.2	100.0

**Source:** CAA (2013)<sup>12</sup>, Tables 7.1 & 7.2. 'Other' category includes walking and cycling

**Note:** Percentages have all been rounded to 100.

**2.9** Table 1 shows a clear distinction between London airports, where the share of travellers using public transport reaches as high as 51% for Stansted, and the non-London airports, where this share at best reaches 19.1% at Birmingham Airport.

**2.10** Of the surface access modes, it is the drop-off/pick-up trips that contribute the most in terms of CO<sub>2</sub> emissions, as estimated by Miyoshi and Mason<sup>13</sup> using 2009 Manchester Airport data. Their carbon calculations showed that drop-off/pick-up passengers constituted 37% of surface access travellers, but contributed 44% of CO<sub>2</sub> emissions. It was estimated that the marginal cost of the damage caused by CO<sub>2</sub> per person using drop-off/pick-up trips to-and-from Manchester airport was £0.72 per person (based on a price of carbon at £51 per tonne).

<sup>12</sup> CAA 2013. CAA Passenger Survey Report 2012. London: Civil Aviation Authority (CAA).

<sup>13</sup> MIYOSHI, C. & MASON, K. J. 2013. The damage cost of carbon dioxide emissions produced by passengers on airport surface access: the case of Manchester Airport. *Journal of Transport Geography*, 28, pp.137-143.





## Factors affecting surface access mode choice

- 2.11** The Civil Aviation Authority (CAA) asked respondents (in a 2011 survey) to indicate the main reason why they had chosen to fly from a particular airport<sup>14</sup>. Surface access was generally the main reason. 'Nearest to home' was the top reason chosen by 31% of UK leisure passengers at the four major London airports, and 'route network' as the third one by 18% of leisure passengers (33% and 20% were the respective figures for UK business passengers).
- 2.12** In general, access time and travel cost appear to be the most important determinants of surface access choice. Access time is defined as the time necessary to reach the airport from the airport users' home or workplace. Then, it is necessary to add to the access time the service time: the latter includes time from the airport transport terminal or parking to the main terminal building, check-in, passport and security control as well as walking to the gate for boarding<sup>15</sup>. The service time is often overlooked and the perception of airport transport interchanges not being situated close enough to the check-in areas can play a role in determining travellers' resistance to use public transport.
- 2.13** Passengers will apply to their decision of departure time a safety margin, in order to accommodate possible delays, if travelling by car or public transport. Frequency (and waiting times) and departure times of public transport services therefore become another important determinant<sup>16</sup>. In addition, the number of interchanges has an important role. It has been estimated that adding an interchange to a rail service, while keeping the journey times constant, would reduce demand by 40% of the initial level<sup>17</sup>. Business travellers assign a higher value to this safety margin than leisure ones<sup>18</sup>.

## Family & friends drop-off

- 2.14** As part of the ABC project, we analysed the results of a survey carried out in 2012 among more than 1,000 people in the North of England about their surface access travel to airports (some did use London airports, but the majority of their trips were to Manchester Airport, followed by a number of smaller regional airports). Almost 30% either tend to agree or strongly agree with the statement "It is important for me to be welcomed by my family/friends/partner at airports". We also asked respondents whether airports should charge people who drive to an airport to pick-up or drop-off other passengers, and 70% disagreed with the idea.

14 CAA 2011. Passengers' airport preferences. Results from the CAA Passenger Survey. Working paper November 2011. London: Civil Aviation Authority (CAA). pp. 21-22.

15 KOSTER, P., KROES, E. & VERHOEF, E. 2011. Travel time variability and airport accessibility. *Transportation Research Part B: Methodological*, 45, pp. 1545-1559.

16 KEUMI, C. & MURAKAMI, H. 2012. The role of schedule delays on passengers' choice of access modes: A case study of Japan's international hub airports. *Transportation Research Part E: Logistics and Transportation Review*, 48, pp. 1023-1031.

17 LYTHGOE, W. F. & WARDMAN, M. 2002. Demand for rail travel to and from airports. *Transportation*, 29, pp. 125-143.

18 TAM, M. L., LAM, W. H. K. & LO, H. P. 2009. Incorporating passenger perceived service quality in airport ground access mode choice model. *Transportmetrica*, 6, 3-17. See also KEUMI, C. & MURAKAMI, H. 2012. The role of schedule delays on passengers' choice of access modes: A case study of Japan's international hub airports. *Transportation Research Part E: Logistics and Transportation Review*, 48, pp. 1023-1031.

## The problems with public transport

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- 2.15** Public transport has an added difficulty over private car/taxi in that it involves an additional two stages in a return journey in order to access the bus/tube/train station to and from home. A range of transport modes are used by passengers to access these stations.
- 2.16** Difficulties are often faced by elderly passengers when accessing airports in general and by public transport in particular. Given the projected ageing of the population in the UK, it is important to meet the needs of elderly (as well as any other passenger with mobility difficulties). Perceived safety, the presence of convenient places for storing luggage and user friendliness have been identified as the most important factors determining public transport use to reach the airport<sup>19</sup>.
- 2.17** Luggage has been identified as one of the principal constraints for a greater use of public transport and as such air travellers tend to take up more space on public transport than other users. Step-free access services and stations, storage facilities and appropriate luggage racks on board can help, but there remains a segment of travellers for whom luggage will always be the main determinant in seeking alternatives to public transport. Remote check-in facilities in transport terminals might ease this issue for some.

## Improving the 'last mile'

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- 2.18** Even with the best surface access options to the airport terminal(s), the ultimate challenge remains to make the 'first and last miles' as easy and convenient as possible for all types of passengers the airport intends to serve. One example is the development of the PRT system from the business car park in Terminal 5 at Heathrow Airport. The Ultra personal rapid transit (PRT) is an innovative on-demand system with small, driverless, electric vehicles run on a designated guideway from the Terminal 5 business car park to the main terminal<sup>20</sup>. It began operation in 2011 and is the world's first Ultra system.

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<sup>19</sup> CHANG, Y. C. 2013. Factors affecting airport access mode choice for elderly air passengers. *Transportation Research Part E – Logistics and Transportation Review*, 57, pp.105-112.

<sup>20</sup> See <http://www.heathrowairport.com/about-us/partners-and-suppliers/retail-travel-services>



## Ticketing improvements

- 2.19** It is important to consider that a significant proportion of surface access trips in the UK are undertaken by foreign nationals. While 'seamless' travel to/from airports is of critical importance for all people involved, it gains even greater importance for travellers who are in a foreign country, and who therefore have less familiarity with its language and transport network. The Airports Commission suggests paperless tickets for surface access rail travel. This would make much simpler for travellers to organise their surface access trips to and from the airports in the UK, although some people still like to have a paper ticket and some groups, such as the elderly and those not familiar with the concept, may struggle with the idea of ticketless travel. There is a particular issue, recently highlighted by the consumer magazine *Which?*<sup>21</sup>, but played down by rail operators, about the complexity of ticket machines at UK railway stations. Some airlines do help their passengers by selling rail or coach tickets on board for various destinations around the airport. Paperless on-line tickets (which are available for most coach operators) can help<sup>22</sup>, as well as a greater interaction between ticketing for flights and surface access (code sharing between air and rail).
- 2.20** There is an issue normally facing arriving passengers who wish to buy an advance (normally longer-distance) rail fare from UK airports. Uncertainty over the actual arrival of the flights makes it very difficult to decide at which time it will be possible to catch a train service and this often puts travellers off the public transport option, especially when walk-in fares are particularly expensive. The constraints around advance tickets also apply to onward travel, especially for those who have to travel further away to reach the relevant rail station.

21 WHICH? 2013. Train ticket machines aren't working. Which? - 13 Feb 2013 - <http://www.which.co.uk/news/2013/02/train-ticket-machines-arent-working--310742/>.

22 The Gatwick Express now allows customers to buy ticket online and either print them or show them on their smartphone (<http://www.gatwickexpress.com/en/tickets-and-fares/buying-tickets/>). The same options now apply to the Heathrow Express service (<https://www.heathrowexpress.com/tickets-deals>). This is, however, not available for other services from/to the airports, although a number of rail companies are introducing smartcard ticketing for some of their tickets or for part of their routes. This would, though, only have an impact on UK, or frequently visiting foreign passengers.

## Airport management

- 2.21** Ensuring high quality end-to-end surface access involves a wide range of organisations, of which the airports themselves are only one. Airports generally only own the land they are built on, but in terms of surface access decision-making they have to deal with a range of stakeholders, including local and national authorities, and a wide array of transport operators. Nonetheless, airports are doing intense work to create partnerships with providers and are aided by the statutory role of the Transport Forum in delivering Airport Surface Access Strategies.
- 2.22** Airlines are the airport's main customers and can play a key role influencing airport management and operations. Major airlines, for example, are particularly keen to use airports that are well connected with city or business/employment centres through a range of options.
- 2.23** Although all the players are ultimately interested in promoting seamless, integrated, surface access for passengers, ensuring this happens in practice is difficult with multiple players, each with their own constraints and commercial priorities. Even airports can face conflicting pressures: for instance, an increase in public transport connectivity may generate a rise in profitability due to more passengers, but might also be detrimental to other important sources of income such as car parking fees, and may dissuade an airport to promote more sustainable modes of surface access transport.

## The resilient airport

- 2.24** Importantly, while last winter (2013/14) was relatively mild in the UK in temperature terms, it was the wettest since 1910<sup>23</sup>, and a number of storms hit various regions in the UK causing considerable disruptions to transport infrastructure. The winters of 2009/2010 (the coldest for 31 years) and 2010/2011, were particularly severe in the UK, as well as across Europe, and travel disruptions, in particular, were estimated to cost £280m per day to the UK economy during those periods<sup>24</sup>. It is therefore agreed that airports need to maintain a high level of resilience towards extreme weather conditions, which often cause delays as well as cancellations, especially at airports operating close to full capacity as is the case of Heathrow<sup>25</sup>. Flooding, as an outcome of extreme weather conditions, can also affect airports, as demonstrated by the disruption at Gatwick Airport on Christmas Eve 2013<sup>26</sup>.
- 2.25** Resilience has, of course, to be extended also to surface access operations, since guaranteeing flights under very uncertain conditions is not particularly useful if passengers cannot reach the airport. As noted already, the issue of surface access is a challenge since it falls under the control of the airport in a very limited way, and therefore airports need to liaise with the relevant authorities in order to maintain and boost resilience.

23 PRESS ASSOCIATION. 2014. UK suffers wettest winter on record.

24 PRIOR, J. & KENDON, M. 2011. The disruptive snowfalls and very low temperatures of late 2010. *Weather*, 66, 315-321.

25 PEJOVIC, T., WILLIAMS, V. A., NOLAND, R. B. & TOUMI, R. 2009. Factors affecting the frequency and severity of airport weather delays and the implications of climate change for future delays. *Transportation Research Record: Journal of the Transportation Research Board*, 2139, 97-106.

26 GATWICK AIRPORT. 2014. Disruption at Gatwick Airport. Christmas Eve 2013. Report by David McMillan to the Board of Gatwick Airport Limited. Available at: [http://www.gatwickairport.com/PublicationFiles/business\\_and\\_community/all\\_public\\_publications/2014/McMillan\\_report\\_Feb14.pdf](http://www.gatwickairport.com/PublicationFiles/business_and_community/all_public_publications/2014/McMillan_report_Feb14.pdf)



## Other airport users

**2.26** It is important to note that travellers are not the only airport users whose needs impact upon surface access infrastructure. Decisions on airport location or expansion also need to take into consideration surface access trips by airport staff as well as by the staff of those businesses located around airport areas. Research using data from Surface Access Strategies of the large UK airports shows that employee travel often has a higher proportion of private car trips than passenger trips for journeys to-and-from airports.<sup>27</sup> The high proportion of airport employees travelling by private car is attributed to shift-working, which makes the planning of public transport services for them more complicated. Other factors that may contribute to this may be the free car parking available to staff, the dispersal of employee locations across the airport site, and the lack of control of the airport on staff travel given that the majority of them do not work directly for the airport.

**2.27** A further important user of surface access to airport infrastructure is freight transport. First of all, airport facilities and businesses do receive a considerable amount of supplies every day. Second, air freight needs to be transported to and from airports in order to reach their destinations. As indicated in the Airport Commission's interim report, freight transport growth or decline is generally directly linked with passenger trends. Any increase in airport capacity, and consequently in passenger numbers, is then likely to bring about an increase in freight transport as well. Currently, Heathrow is the UK's most important origin of freight transport (1.422 million tonnes, 63% of freight from UK airports in 2013), most of which is carried as belly-hold (95% of freight in 2013) and long-haul routes (93% of freight in 2013 was on international flights outside the EU region)<sup>28</sup>.

27 HUMPHREYS, I., ISON, S., FRANCIS, G. & ALDRIDGE, K. 2005. UK airport surface access targets. *Journal of Air Transport Management*, 11, 117-124.

28 Civil Aviation Authority. UK airport statistics 2013. Tables 13.1, 14 & 15. Available at: <http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&sglid=3&fld=2013Annual>

## Is technology the answer?

- 2.28** Technological advances will have a major impact on surface transport in the coming years. Examples include alternative fuel vehicles and the development of autonomous vehicles, as promoted by the UK Government (e.g. through OLEV – Office for Low Emission Vehicles - and the newly-formed Transport System Catapult), which will impact the way in which individuals travel by motor car<sup>29</sup>.
- 2.29** In the ABC survey we looked at the potential of technological developments to reduce the impact of 'drop-off/pick-up' trips. Among the technologies reviewed, three-dimensional television-based communication (so-called telepresence systems) could play a role in the future. This could take different forms with, for example, travellers using small pods to see off their families through video connection, just before boarding a plane. Results from the ABC project North of England survey showed that while 25% said that a telepresence system would not make any change to their willingness to be dropped-off or picked-up at airports, about 20% said it could, with 50% not sure. 35% said that an electronic tagging system for their luggage would make them more willing to use public transport to travel to-and-from airports. 30% also said they would be likely to use a lift-share system to travel to-and-from airports.



## Summary

**2.30** This review of surface connectivity has generated the following key points:

- i. Factors affecting passenger surface access transport mode choice include luggage and early departures.
- ii. Air travellers want quick, direct, easily-accessed, affordable journeys between their start/end points and the airport; they also want convenient facilities for their luggage.
- iii. Airports and airlines also want good surface connectivity for commercial reasons.
- iv. Historically, airports have largely relied on car-based travel (and taxis), with buses and trains seen as supplementary, but this is becoming less sustainable for environmental and capacity (congestion) reasons. The challenge now is to increase simultaneously the numbers going to/from (expanding) airports and to shift modes to public transport.
- v. Public transport facilities are important for good surface connectivity, particularly in relation to interchange, the 'last mile' and associated access time to the airport terminal.
- vi. There is a particular problem with drop-off/pick-up trips to-and-from airports since these have the greatest negative environmental impacts, such as on CO<sub>2</sub> emissions and congestion.
- vii. There is a need for the integration of surface access ticketing (e.g. addressing the problem of inflexible advance rail tickets when passengers do not know flight arrival times at the airport).
- viii. In addition to passengers, surface connectivity is important for airport staff and air cargo companies.
- ix. There are a range of associated stakeholders involved: airlines, other organisations on-site at the airport, transport operators and policy-makers.

**2.31** This raises a host of complex challenges, including:

- The potential need for major new investment, especially in public transport infrastructure but also in car-based facilities such as roads and parking.
- The need to convince passengers (and staff) actually to switch behaviour to public transport, achievement of which will depend on ease of access, ease/simplicity of payment, and ease of connectivity not just at the airport but with the broader national and local transport networks.
- Organisational challenges since the stakeholders (e.g. airlines, airports, surface infrastructure, bus and rail operating companies, and local authorities) all have key roles but no-one actually owns the relevant assets or controls what happens – and many fail to see it as “their” problem.

## 3. The current surface access situation at Gatwick and Heathrow

**3.1** This section presents the current surface access situation at Gatwick and Heathrow; the two airports included within the Airports Commissions' shortlist. It includes an examination of journey times using catchment data for the two airports. The purpose of this section is to provide background statistics for the two airports using policy documents (e.g. Surface Access Strategies) and to develop a baseline of surface transport modes for subsequent analysis. As shown in Section 2.9 (Table 1), both airports have a public transport modal share for passengers (43.6% Gatwick, 40.6% Heathrow) for the year 2012 that is high in comparison with other large UK airports but similar in proportion to the other London airports.

### Gatwick Airport

**3.2** Gatwick is the second busiest airport in London and the UK with 34.2 million passengers in 2013<sup>30</sup>, the vast majority of them origin/destination, and therefore travelling to and from the airport rather than transferring to another flight.

**3.3** In terms of surface access, Gatwick airport has direct rail services to over 120 UK stations. An additional 700 stations are accessible with just one interchange. Gatwick Airport Station has undergone a major enhancement programme, with the recent addition of a new platform. In December 2013, the UK Government announced a £50m contribution to help develop the railway station concourse, which is not dependent on a second runway being built<sup>31</sup>. Through this scheme, planned for implementation in 2020, the station would become more user-friendly, especially for passengers with reduced mobility or carrying heavy luggage.

**3.4** There are currently 360 daily rail services between the airport and London, used by 13 million passengers annually (10% more than in 2009). These services include: the premium Gatwick Express, connecting the airport to London Victoria in 30 minutes with a non-stop 15-minute frequency (this represent 50% of services passing through Gatwick Airport Railway Station); Southern Trains to Victoria via East Croydon and Clapham Junction, as well as to London Bridge; Thameslink services to London Bridge, Blackfriars, Farringdon (where Crossrail passengers will be able to interchange for services to Gatwick); and St. Pancras International (interchange with HS1) on the Thameslink route. There are also good connections to other cities in the wider South-East area, as well as to Luton and Bedford to the north of London, Reading to the West and Brighton, and other important centres on the South Coast. In addition, there are between 450 and 500 bus and coach movements daily (currently operated by 3 main companies), with direct services to about 30 destinations in England and Wales, including Victoria Coach Station.

30 CAA 2014. Passenger numbers at UK airports increase for the third year in a row - CAA news 13 March 2014. Civil Aviation Authority (CAA) . Available at: <http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2342>.

31 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Section 2.3, p34.





### 3.5

There are direct coach services to Heathrow and Stansted airports. In total there are 16 Express coach services from Gatwick Airport (which have between 2 and 22 daily departures)<sup>32</sup>. Seven local bus services connect Gatwick with centres in its immediate vicinity, including the Fastway bus services (by Metrobus) between the airport and Crawley, Redhill, and Three Bridges (which have between 2 and 134 daily departures)<sup>33</sup>. These are buses running on a combination of dedicated lanes and guided busways, with improved infrastructure and information systems. Finally, in terms of road connections, the airport lies right next to the M23 and connects to the M25 through it, while the A23 connects it with Croydon and Central London.

### 3.6

Table 2 shows a steady increase in public transport share over the 4 years between 2007 and 2011, with rail contributing the most to this. There has been a steady decline in the proportion of private car trips, down from 47.7% in 2007 to 42.4% in 2011. However, the total number of passengers at Gatwick, as at most UK airports, dipped following the recession but is now increasing, hence the reduction from 35.2 million passengers in 2007 to 32.0 million in 2009 and then the increase to 33.3 million in 2011. The total number of passengers has subsequently continued to grow but the distribution by surface access is not currently published.

**Table 2: Mode share of passengers using Gatwick 2007-2011**

Method	2007		2009		2011	
	Number	%	Number	%	Number	%
1 Private car	16,774,182	47.7	14,746,929	46.1	14,107,752	42.4
2 Car rental	703,320	2.0	543,813	1.7	598,914	1.8
3 Taxi/ Minicab	5,204,568	14.8	4,574,427	14.3	4,425,309	13.3
4 Bus/ Coach	2,145,126	6.1	1,983,318	6.2	2,229,291	6.7
5 Rail	10,198,140	29.0	9,980,568	31.2	11,811,915	35.5
6 Other	105,498	0.3	127,956	0.4	99,819	0.3
<b>Total</b>	<b>35,166,000</b>	<b>100</b>	<b>31,989,000</b>	<b>100</b>	<b>33,273,000</b>	<b>100</b>
Total public transport (categories 4 & 5)	12,343,266	35.1	11,963,886	37.4	14,041,206	42.2

**Source:** Percentages from Gatwick Airport Limited (2012)<sup>34</sup>. Total passenger numbers from the CAA reports for the year. Mode share numbers have been calculated from these figures. **Note:** The total percentages have been rounded up to 100.

32 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 4, p83.

33 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 5, p83.

34 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 1, p83.

- 3.7** Of the 21,109 people who work at the airport, 65% travelled to it as car drivers in 2011, 4.5% as a passenger, 11.4% by rail, 11.8% by bus and coach, and the remaining by taxi, walking or bicycle (1.6% was the figure for cycling). The figure for car drivers was as high as 78% in 1997<sup>35</sup>.
- 3.8** It is estimated, assuming that staff on average worked 220 days per year (full-time – no estimate is available for the proportion of part-time workers), then the 21,109 staff would have made 9.28 million return journeys per year, 27.9% of all trips to the airport (including 33.27 million passenger trips).

## Heathrow Airport

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- 3.9** Heathrow Airport is a major aviation hub and the UK's largest airport in terms of passenger numbers (72.3 million in 2013)<sup>36</sup>, 45 million of them using the surface access infrastructure (the remainder were passengers connecting between flights). It is, however, operating near capacity, and the situation will worsen if the predicted increase in air travel demand takes place.
- 3.10** Heathrow Airport has a range of public transport options for access, with a railway station, London Underground stations, and bus and coach stations. As stated in the Sustainable Transport Plan for Heathrow<sup>37</sup>, Heathrow Express provides a direct, premium-rate service to central London, with trains running every 15 minutes to Paddington, supported by Heathrow Connect, an economical stopping service that serves staff and passenger catchments in west London. The underground service is the Piccadilly Line which directly connects the airport (three terminal stops) to central London.
- 3.11** It is estimated that there are more than 500,000 bus and coach movements in and out of Heathrow every year<sup>38</sup>. Around 25% of bus and coach passengers are just passing through the Central Bus Station without catching a flight. The importance of the bus and coach hub is seen in a route network serving over 75 major towns and cities with 31 bus routes having a combined frequency of over 80 buses an hour. The Sustainable Transport Plan also states that Heathrow Airport has direct access from the M25 and M4 and is within 10 miles of the M40 and M3 (p17).

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35 GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. Appendix 1, Table 3, p83.

36 CAA 2014. Passenger numbers at UK airports increase for the third year in a row - CAA news 13 March 2014. Civil Aviation Authority (CAA) <http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2342>.

37 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, p17.

38 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, p17.



### 3.12

Table 3 shows the modal split of Heathrow Airport non-transfer passengers for surface access trips. As with surface access trips to Gatwick, there has been a steady decline in private car use, but more of a reliance on tube and bus/coach travel than Gatwick, which is more rail dependent. Interestingly, there has also been an increase in taxi / minicab use to-and-from Heathrow Airport.

**Table 3:** Surface access at Heathrow: modal split trends 2003-2013

	2003		2008		2013	
Non-transfer passengers						
	Number	%	Number	%	Number	%
1 Private car	14,414,666	35.9	13,292,216	30.9	11,757,889	26.4
2 Hire car	1,244,720	3.1	1,204,473	2.8	1,257,304	2.8
3 Taxi / Minicab	10,158,525	25.3	11,227,405	26.1	13,112,354	29.4
4 Bus / Coach	5,059,186	12.6	6,065,380	14.1	5,645,257	12.7
5 Tube	5,621,318	14.0	6,882,701	16.0	8,165,409	18.3
6 Rail	3,573,552	8.9	4,172,637	9.7	4,494,505	10.1
7 Other	120,457	0.3	129,051	0.3	116,928	0.3
<b>Total</b>	<b>40,152,273</b>	<b>100</b>	<b>43,016,879</b>	<b>100</b>	<b>44,549,646</b>	<b>100</b>
Total public transport (categories 4-6)	14,254,057	35.5	17,120,718	39.8	18,305,171	41.1

**Source:** Surface Access Team at Heathrow Airport.

**Note:** The total percentages have been rounded to 100.

- 3.13** From just over 76,000 Heathrow staff travelling to work (2013 Travel to Work survey), 50.9% travel as 'car driver alone', 25.0% by public bus/coach and 9.4% use the Underground<sup>39</sup>. There has been, however, a longer-term decline in car driver alone travel (from the 2008 survey), with an increase in the number of staff using the car share system, as well as using the cycle hub. The Heathrow Cycle Hub initiative provides free cycling training (both riding and maintenance), improved cycling parking facilities, information about best cycling routes to and from the airport, and a bicycle shop within the airport offering subsidised bikes, accessories and parts, as well as free servicing for staff members.
- 3.14** It is estimated that, assuming staff on average worked 220 days per year (full-time – no estimate is available for the proportion of part-time workers), then the 76,000 staff (an exact value is not in the Sustainable Transport Plan report) would have made 33.44 million return journeys per year, 42.9% of all trips to the airport (including 44.42 million passenger trips).

## Catchment analysis

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- 3.15** Airports need to be able to define their catchment area which shows where passengers are travelling from. In Europe, the catchment area is assumed to be comprised of all statistical regions whose centre was located within 100 kilometres (62.5 miles) from the airport<sup>40</sup>. Travel times are naturally important and in the case of London, a large and often congested city, it appears that a considerable segment of passengers do accept a travel time to an airport of about 90 minutes<sup>41</sup>.
- 3.16** An interesting analysis of catchment areas and surface access travel times for the four main London Airports is given in a recent report by the Civil Aviation Authority (CAA)<sup>42</sup>. Figures 1 and 2 below illustrate the catchment areas for Heathrow and Gatwick respectively. It shows visually that Heathrow Airport has more of a catchment area spreading westwards, whilst Gatwick Airport has more of a catchment spreading southwards from London

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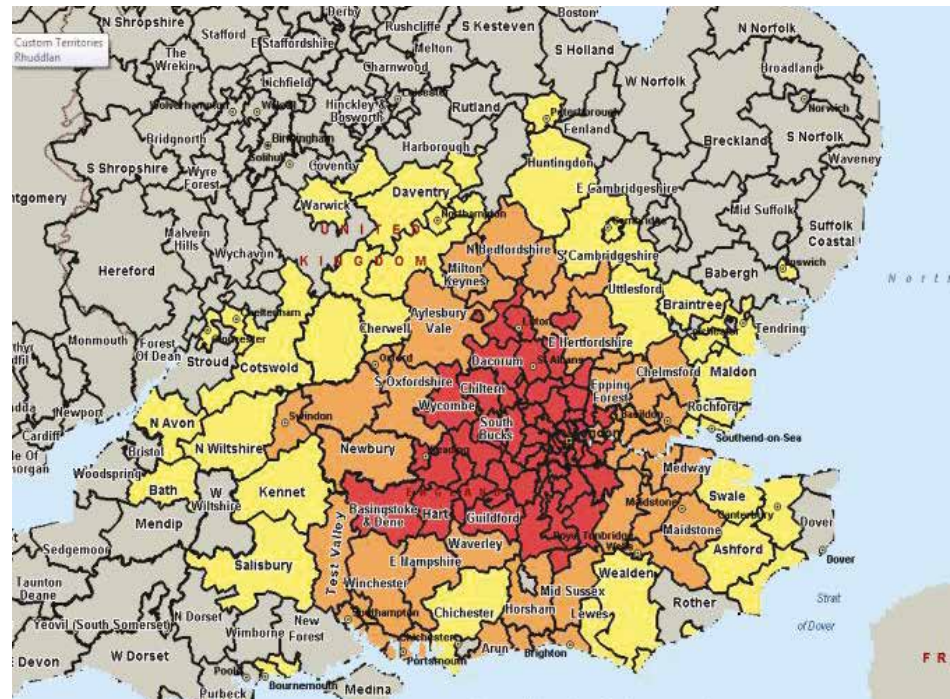
39 HEATHROW AIRPORT 2014. Sustainable Transport Plan 2014-2019, pp. 20-21.

40 MAERTENS, S. 2012. Estimating the market power of airports in their catchment areas - a Europe-wide approach. *Journal of Transport Geography*, 22, 10-18.

41 CAA 2011. Catchment area analysis. London: Civil Aviation Authority.

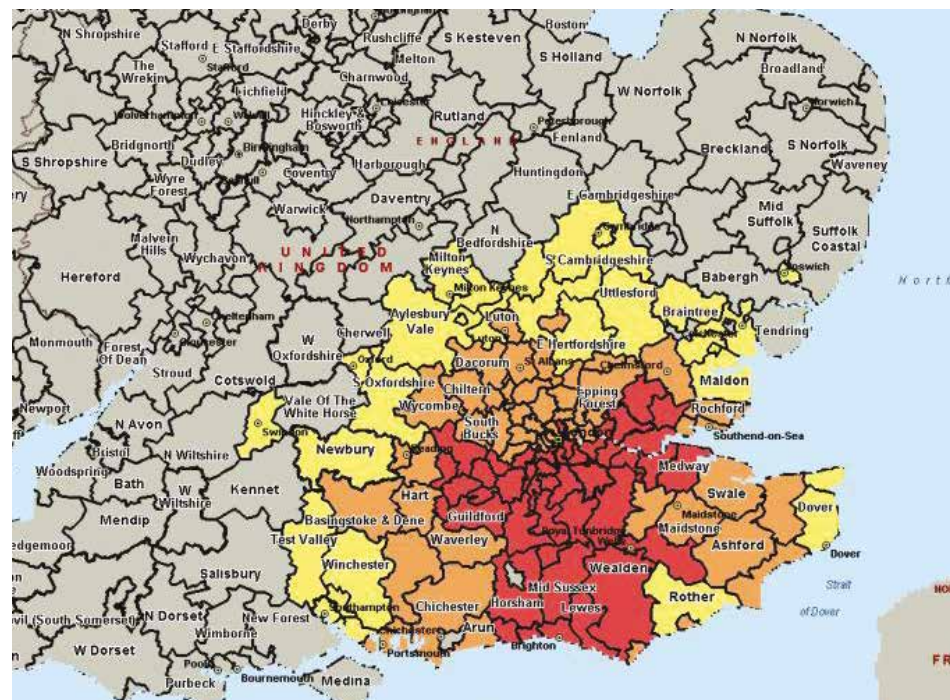
42 CAA 2011. Catchment area analysis. London: Civil Aviation Authority.

Figure 1. London Heathrow surface access travel time map



Source: CAA (2011). Red: 60 minutes; Orange: 90 minutes; Yellow: 120 minutes

Figure 2. London Gatwick surface access travel time map



Source: CAA (2011). Red: 60 minutes; Orange: 90 minutes; Yellow: 120 minutes



**3.17** Table 4.1 shows this catchment area for the two airports by origin / destination based on 2012 CAA data at a United Kingdom level, and then Table 4.2 shows the sub-area details for the majority coming from the South-East England region (number 6 in table 4.1).

**Table 4.1** Origin / destination data to-and-from Gatwick and Heathrow airports from locations across the UK (CAA data, 2012)

Region	Gatwick		Heathrow	
	000's	%	000's	%
<b>UNITED KINGDOM</b>				
1 East Midlands	544	1.7	1,301	3
2 East of England	2,671	8.5	3,654	8.3
3 North East	57	0.2	101	0.2
4 North West	174	1.0	297	0.7
5 Scotland	64	0.2	101	0.2
6 South East	25,299	80.4	32,953	75.0
7 South West	1,521	4.8	3,008	6.8
8 Wales	400	1.3	824	1.9
9 West Midlands	466	1.5	1,206	2.7
10 Yorkshire and the Humber	228	0.7	466	1.0
11 Ireland	26	0.1	11	0.0
<b>Total</b>	<b>31,449</b>	<b>100</b>	<b>43,923</b>	<b>100</b>

**Note:** Percentages have been rounded to 100.



**Table 4.2** Origin / destination data to / from Gatwick and Heathrow airports from locations across the South East of England region (shown as number 6 in Table 4.1)

Region	Gatwick		Heathrow	
	000's	%	000's	%
<b>SOUTH EAST OF ENGLAND PLANNING REGION</b>				
1 Bracknell Forest	89	0.4	159	0.5
2 Buckinghamshire County	319	1.3	742	2.3
3 City of Portsmouth	293	1.2	193	0.6
4 City of Southampton	268	1.1	538	1.6
5 East Sussex County	767	3.0	240	0.7
6 Greater London	13,861	54.8	22,602	68.6
7 Hampshire County	1,005	4.0	995	3.0
8 Isle of Wight	70	0.3	67	0.2
9 Kent County	2,212	8.7	804	2.4
10 Medway	274	1.1	91	0.3
11 Milton Keynes	75	0.3	229	0.7
12 Oxfordshire County	484	1.9	1,270	3.9
13 Reading	209	0.8	574	1.7
14 Slough	57	0.2	330	1.0
15 Surrey County	2,145	8.5	1,880	5.7
16 The City of Brighton and Hove	961	3.8	296	0.9
17 West Berkshire	90	0.4	194	0.6
18 West Sussex County	1,819	7.2	949	2.9
19 Windsor and Maidenhead	169	0.7	574	1.7
20 Wokingham	132	0.5	227	0.7
<b>Total</b>	<b>25,299</b>	<b>100</b>	<b>32,953</b>	<b>100</b>

**Source for both tables:** CAA report: Tables 4.3a, 5.6 & 5.7

**Note:** Percentages have been rounded to 100.

- 3.18** Looking at the catchment areas, both Gatwick and Heathrow airports have the majority of their passengers from London and the South East of England. Passengers from London and the South East are greater in number for Heathrow Airport (32,953,000 passengers compared to 25,299,000 passengers for Gatwick) but higher in proportion for Gatwick Airport (80.4% compared to 75.0% for Heathrow).
- 3.19** For areas outside London and the South East, the next three highest areas in order of proportion are the same: first the East of England, second the South West, and third the East Midlands. For all three areas Heathrow Airport has more passengers, although Gatwick Airport has a slightly higher proportion of passengers travelling from the East of England (8.5% compared to 8.3% for Heathrow Airport).
- 3.20** Of passengers from the 'South East of England' region, most come from London, particularly for Heathrow Airport (68.6% compared to 54.8% for Gatwick Airport). Gatwick also has a strong catchment area (all over 5.0%) for Kent, Surrey and West Sussex. Heathrow Airport's next largest catchment areas are Surrey and Oxfordshire.
- 3.21** The surface connectivity varies from different locations in the London and the South-East. The ITC '*Flying into the Future*' report includes journey time assessments, by car and public transport, from four locations in London (Wimbledon, Lewisham, Walthamstow & Wembley Central) to Gatwick and Heathrow<sup>43</sup>. These are shown below in Table 5.

**Table 5.** Travel times from various London locations to Gatwick and Heathrow airports

Station of origin	Fastest time to Gatwick airport	Fastest time to Heathrow Airport (T5)
<b>PUBLIC TRANSPORT</b>		
Wimbledon Rail Station (SW London)	43 minutes (Train) – 1 change	51 minutes (Tube & Train) – 1 change
Lewisham Rail Station (SE London)	50 minutes (Train) – 1 change	1 hour & 5 minutes (Tube & Train) – 3 changes
Walthamstow Central station (NE London)	1 hour & 4 minutes (Tube & Train) – 1 change	58 minutes (Tube & Train) – 2 changes
Wembley Central station (NW London)	1 hour & 15 minutes (Train) – 1 change	51 minutes (Tube & Train) – 1 change
<b>CAR</b>		
Wimbledon Rail Station (SW London)	56 minutes (28 miles)	49 minutes (18 miles)
Lewisham Rail Station (SE London)	1 hour & 7 minutes (41 miles)	1 hour & 0 minutes (23 miles)
Walthamstow Central (NE London)	1 hour & 33 minutes (37 miles)	1 hour & 7 minutes (29 miles)
Wembley Central (NW London)	1 hour & 24 minutes (55 miles)	37 minutes (14 miles)

**Source:** derived from ITC '*Flying into the Future*' report (2013), Figures 4.1 and 4.2, updated data for September 2014, travel times set at 13:00 hours (based on National Rail Enquiries/Transport for London journey planner and AA Route Planner).





- 3.22** The travel times for both public transport and car travel are all between 37 minutes and 1 hour 33 minutes, which means that travel from all four locations to-and-from the two airports is relatively competitive between public and private transport. For public transport, Gatwick Airport is quicker to access from SW and SE London, but Heathrow is quicker from NW London. For car travel, Heathrow Airport is much quicker to access from NW and NE London; for the other two locations, the timings are very similar.
- 3.23** For both airports, time-wise from all locations the public transport options are competitive with car travel. However, all of the public transport services require at least one change, and this analysis does not take into account the trip from origin location (e.g. home) to the initial public transport stop or station.

## Summary

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- 3.24** This section has provided a baseline for the subsequent analysis. Passenger numbers making surface access trips, once inter-lining passengers are taken out, have been determined for the two airports: around 34 million per year at Gatwick Airport, and 45 million at Heathrow Airport.
- 3.25** There is an underlying surface access trend for Gatwick and Heathrow of public transport increasing from around 40%, whilst car travel is reducing. It would be interesting to know how much higher this could rise to, given that for many surface access trips public transport is not an option.
- 3.26** Rail connectivity to-and-from Heathrow and Gatwick airports is not easy for those outside London. Road connectivity for both airports is affected by the M25 and other nearby motorways
- 3.27** For many trips there is not a currently public transport choice between modes, apart from that part of London where competition exists between Heathrow Express (and Heathrow Connect) and the Underground for passengers. It is thought that, given the faster and more expensive service by Heathrow Express, this option attracts more business than leisure travellers. Conversely, the Underground is more likely to attract leisure travellers. Having a range of modal choices improves resilience and convenience for travellers.
- 3.28** Staff travel represents a significant proportion of journeys to and from both airports, particularly Heathrow. It is not clear from the data the proportion of staff working directly for the airports or for other related firms, and their precise work location on the airport site.

- 3.29** Both airports currently draw around three-quarters of their passengers from London and the South East, which generally have more public transport options. Most parts of this area can access the two airports within 90 minutes.
- 3.30** For many passengers, Gatwick is quicker to reach by public transport than by car, particularly from South London, whereas the opposite is true for Heathrow, demonstrating how public transport upgrades are particularly needed to access Heathrow airport.
- 3.31** The publically available data raises further questions. For example, it is not clear how many of the private car trips are by the less sustainable drop-off / pick-up trips. In addition, it would be useful to know more about the specific reasons for the recent increases in public transport usage (rail for Gatwick, tube for Heathrow), as well as the increase in taxi use at Heathrow Airport. The catchment analysis has provided some useful insights, and a further analysis would be to examine areas by population and economic activity.



## 4. Future surface access developments

- 4.1** This section presents the proposed future surface access developments for the three options under consideration by the Airports Commission: Gatwick Airport, Heathrow Airport and Heathrow Hub. Section 4 also examines the links with interconnecting infrastructure.

### Surface access options for a short-listed proposal: Gatwick

- 4.2** The Gatwick proposal (**Option 1**) that the Airports Commission is considering is for a new 3,000m runway built to the south of the existing one, but far enough (at least 1,035m) from it to allow for the two runways to be operated separately. New terminal facilities and taxiways would link the two runways. As the current single runway is predicted to reach capacity within the next ten years, an enlarged Gatwick could also accommodate a possible further growth in point-to-point traffic and, according to the Commission's forecast, operate at 70% capacity in 2030, and up to 95% in 2050.
- 4.3** The cost of this option is estimated by the Airports Commission to be £10-13 billion in the period to 2030 (taking into account enhanced surface access), and it is lower than the two Heathrow options short-listed by the Commission. With current local noise impacts considerably lower than Heathrow, this expansion would not adversely affect a large number of people living in the adjacent areas, and certainly less than at Heathrow.
- 4.4** In their proposal<sup>44</sup>, Gatwick Airport states that the surface access needs generated by the increased number of passengers (60 million in 2030 and up to 87 million in 2050) would be absorbed by the already planned increase in capacity generated by the various rail and road projects already planned or proposed, which would be needed irrespective of the expansion. The airport has surface access targets by the year 2040 for 60% of passengers to travel to or from the airport by public transport, and for 50% of staff to travel to work by sustainable modes. Table 6 shows the current modal split for 2011 (shown in Table 2) and two hypothetical future modal splits, based on the 2030 (60 million) and 2050 (87 million) passengers. For both hypothetical scenarios, the surface access modes are fixed at 2011 levels, apart from rail transport which increases in order to account for the remaining passengers.

**Table 6.** Current and projected future modal split data for Gatwick Airport

Year	2011		2030		2050	
Summary	Current situation (Table 2)		Set target as 60 million passengers – fix 2011 numbers & new passengers all rail travel (5)		Set target as 87 million passengers – fix 2011 numbers & new passengers all rail travel (5)	
	Number	%	Number	%	Number	%
1 Private car	14,107,752	42.4	14,107,752	23.5	14,107,752	16.2
2 Car rental	598,914	1.8	598,914	1.0	598,914	0.7
3 Taxi/Minicab	4,425,309	13.3	4,425,309	7.4	4,425,309	5.1
4 Bus/Coach	2,229,291	6.7	2,229,291	3.7	2,229,291	2.6
5 Rail	11,811,915	35.5	38,538,915	64.2	65,538,915	75.3
6 Other	99,819	0.3	99,819	0.2	99,819	0.1
<b>Total</b>	<b>33,273,000</b>	<b>100</b>	<b>60,000,000</b>	<b>100</b>	<b>87,000,000</b>	<b>100</b>
Total public transport (categories 4 & 5)	14,041,206	42.2%	40,768,206	67.9%	67,768,206	77.9%

**4.5** Table 6 shows that rail has around three times (2030) and six times (2050) the current number of passengers. Public transport as a whole makes up over three-quarters of the mode share for 2050. Table 2 shows that the mode share of private car travel is currently falling for surface access trips to-and-from Gatwick Airport, but it could be argued that this would be off-set by the road developments in the proposals, and that many of the passengers would not be able to access the new rail services.

**4.6** The expansion will certainly put extra pressure on the surface access infrastructure, despite the improvements already suggested by the Airports Commission. The development of Gatwick Airport railway station will make it more suited to air passengers and the situation will also be enhanced by improvements on the Brighton mainline. There would be Gatwick Airport connectivity to HS2 via Old Oak Common, plus a possible future link to HS1 Ashford. More details are included in the airport surface access strategy plan<sup>45</sup> (Figure 3 below shows the enhanced Gatwick Airport connectivity):

- Thameslink upgrade: this will provide 50% additional capacity by 2018, as well as a new half-hourly direct connection to Cambridge and Peterborough (committed and ongoing).
- Improvement works to Redhill station: this enhancement will also add capacity on the Gatwick to Reading link, with services then going up to Oxford. This is part of the Great Western franchise and will increase Gatwick Airport connectivity westwards (committed and planned).
- New services to Milton Keynes via Clapham Junction and Old Oak common (to link in the future with HS2): this enhancement, together with the previous one would increase the number of rail stations with a direct service to Gatwick to 175 (proposed).

- Improvement to East Croydon, Victoria and London Bridge railway stations as well as improvements on the Brighton mainline (planned): this will also add capacity and increase the resilience of the network.
- Better connections to Kent and South Coast with more direct services (planned).
- Gatwick railway station enhancement: improve the station concourse, increase platform capacity, and improve accessibility (committed and planned).
- Retention of premium non-stop Gatwick Express service with the new Thameslink franchise (planned).

**Figure 3.** Gatwick Airport future rail connectivity (in 2018, direct and via one change)



**Source:** Gatwick (2014)<sup>46</sup>. Key: Blue = direct rail connections; Yellow = existing network accessible via one change; Green = proposed network accessible via one change; Purple = Crossrail.

- 4.7** A number of bus and coach improvements are also planned, including new and better services to Kent, Surrey, South and East London and the South Coast. The Surface Access Strategy also mentions in general terms improving the bus/ coach passenger experience and facilities, and enhancing and expanding infrastructure provision<sup>47</sup>.

<sup>46</sup> GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Figure 6, p.35.

<sup>47</sup> GATWICK AIRPORT LIMITED 2012. Access Gatwick - Our surface access strategy 2012-2030. Gatwick Airport Limited. p.60.

**4.8**

In terms of road links, the following improvements would, according to the airport, provide the surface access network with extra capacity, safety and reliability<sup>48</sup>:

- 1.** Free flow crossing at Dartford on the M25  
(to be completed in Spring 2015 – cost £48 million - £62 million)
- 2.** Smart motorway junctions 5-7 on the M25  
(completed in 2014 – cost £129 million)
- 3.** Controlled motorway between junctions 7-8 on the M25 (completed in 2019)
- 4.** Smart motorway junctions 8-10 on the M23 (completed in 2021)
- 5.** A23 carriageway widening between Handcross and Warninglid  
(to be completed in late 2014 – cost £77 million)

**4.9**

Other improvements to the road network in the immediate vicinity of the Airport would be provided in an expanded scenario. These would include new access roads to both the current North and South terminals, and a new junction to link to the A23. Car parks will be added next to the M23 junction in order to make them more accessible. New walking and cycling routes will also be built.

**4.10**

In terms of the road network, again the Airport believes that improvements already funded and elsewhere (and listed above) would be able to absorb extra capacity, given that the Airport contributes less than 10% of total peak traffic at the M25 and 15% of the traffic beyond 3km from the Airport on the M23<sup>49</sup>. Similar to the case of public transport, extra traffic from the London area, given the vast majority of travellers use public transport, could be absorbed with the planned improvements. More complicated would be the situations for travellers using the wider M25 coming from the M3, M4 and M40, as well as those coming from Kent and the East, although the removal of toll stations at Dartford crossing could certainly help by adding capacity and reduce travel time uncertainties.

**4.11**

An important part of the Gatwick proposal, relating to passenger experience and connectivity, is the construction of a multi-modal transport hub, the 'Gatwick Gateway', from which a circular train will link the different terminals (the existing North and South and an additional one) with transfer times of about 3-4 minutes for each terminal. The new transport interchange will also integrate road access to the Airport, bus and coach services as well as walking and cycling routes<sup>50</sup>.

48 HIGHWAYS AGENCY 2014. Highways Agency's major road schemes programme. <http://www.highways.gov.uk/our-road-network/managing-our-roads/improving-our-network/major-projects/highways-agencys-future-delivery-programmes/> for 2 and 5. Also <http://www.highways.gov.uk/roads/road-projects/dartford-crossing-remote-payment-scheme/> for 1; <http://assets.highways.gov.uk/our-road-network/route-strategies/London%20Orbital%20and%20M23%20to%20Gatwick.pdf> for 3 and 4 (no cost information)

49 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014 Runway Options Consultation. Section 2.3, p38.

50 GATWICK AIRPORT LIMITED 2013. Airports Commission: Proposal for providing additional runway capacity in the longer term - Gatwick Airport Limited response p.24.



- 4.12** The Airport aims to achieve a service quality rating for surface access of 4.5 out of 5 when the airport reaches 40 million passengers a year. In particular, it would like to collaborate with the new Thameslink franchise to improve the Gatwick Express service<sup>51</sup> with more user friendly and accessible trains, an extended timetable and fewer services continuing or departing from Brighton in order to avoid capacity conflict between airport users and commuters at peak times.

## Surface access options for a short-listed proposal: Heathrow Airport

- 4.13** Projected costs for Heathrow expansion (under the two shortlisted runway configurations) are an estimated at £15.6bn, of which £11.1bn is airport infrastructure, £0.9bn is surface access, and £3.6bn is community compensation and environmental mitigation<sup>52</sup>. The £15.6bn would be privately funded with Government support for other surface access improvements also required, estimated at £1.2bn. We first discuss the shortlisted (**Option 2**) consideration of a new runway to the north-west, with increased capacity of up to 260,000 ATMs a year, as proposed by Heathrow Airport Ltd.<sup>53</sup>.

- 4.14** Heathrow Airport Ltd. makes its case for expansion in terms of surface access travel by pointing to a number of schemes and improvements (Figure 4 below shows the enhanced Heathrow Airport rail connectivity):

- *Crossrail* (operating from 2019)
- the upgrade of the *Piccadilly line* (a committed improvement)
- the *Western rail link* (expected by 2021)
- the *Southern rail link* (gaining political support)
- HS2 (with Heathrow connected by 2026 and services to the North starting from 2032).

The Heathrow Airport proposals also include improvements to the M25 between J14 and J15 to improve the flow of through traffic using new collector distributor roads to carry M4 and Heathrow traffic. Bus improvements include increasing the number of 24-hour bus routes serving Heathrow and increasing frequency of routes to the south of the airport. There is an interesting proposal to explore the introduction of a congestion charging zone with hypothecation of funding towards major infrastructure and local sustainable transport projects<sup>54</sup>.

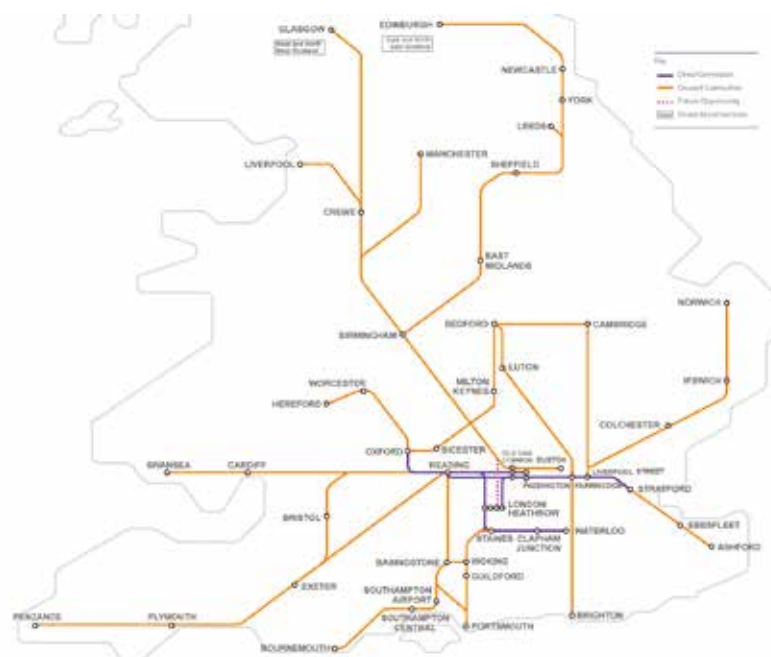
51 Gatwick Express was recently named as the worst airport rail service in the UK in a survey run by the consumer magazine Which?, while Virgin Rail operated connection to Birmingham Airport was rated as the best WHICH? 2014 - 25 Feb 2014 - <http://www.which.co.uk/news/2014/02/gatwick-express-bottom-in-airport-trains-survey-355799/>..

52 HEATHROW AIRPORT LTD 2014. Taking Britain further. Heathrow's plan for connecting the UK to growth, May 2014, p8.

53 HEATHROW AIRPORT LTD 2014. A New Approach - Heathrow's options for connecting the UK to growth, January 2014, p22.

54 HEATHROW AIRPORT (2014). Taking Britain Further. Heathrow's plan for connecting the UK to growth. Submission to the Airports Commission in May 2014.

**Source:** Heathrow Airport Ltd



**4.15** The Airport claims that such improvements would upgrade connectivity by bringing a further 3 million people within a 60-minute public transport journey time from the airport. In their proposal, Heathrow Airport Ltd also highlight demand management strategies to increase public transport share for surface access travel. These include further developments to Heathrow Airport's importance in terms of a coach and bus hub, information technology for real time information, marketing and incentives for public transport use, more efficient taxi use, the Heathrow Cycle Hub, an expansion of the staff car sharing schemes (already the largest in the world) as well as a reduction in the number of car parking spaces for employees. Initiatives to boost a further consolidation of freight vehicle movements in and around the airport are also under preparation. Table 7 shows some examples of the travel time savings that these schemes should deliver<sup>55</sup>. It shows considerable travel time savings.

**Table 7.** Journey times to Heathrow Airport from some areas of London and UK cities – journey times expressed in minutes

Origin	Current journey time (minutes)	Journey time with new infrastructure (minutes)	Saving (minutes)
Birmingham	130	49	81
Glasgow	333	218	115
Edinburgh	325	218	107
Manchester	190	68	122

**Source:** adapted from Heathrow Airport submission to Airports Commission<sup>56</sup>

55 HEATHROW AIRPORT 2013. Airports Commission: Long-term hub capacity options - Heathrow Airport  
Limited response. London: Heathrow Airport p.14.

56 HEATHROW AIRPORT 2013. Airports Commission: Long-term hub capacity options - Heathrow Airport  
Limited response. London: Heathrow Airport p.14.





#### 4.16

Table 8 shows the current modal split for 2013 (shown in Table 3) and two hypothetical future modal splits to years 2030 and 2040, using data from Heathrow Airport submitted to the Airports Commission in May 2014<sup>57</sup>. As with the situation for Gatwick Airport, Table 8 demonstrates the large increase in the number and proportion of those travelling by public transport to-and-from Heathrow Airport between now and 2040, up from 18.2 million passengers per annum (40.9%) to 48.8 million passengers per annum (58.0%). Much of this increase will come from passengers traveling by train. Even though there is a rise in the number of passengers travelling to the airport by car, from 13.1 million passengers per annum to 20.5 million passengers per annum, the modal share falls from 29.5% to 24.3%.

**Table 8.** Current and projected future modal split data for Heathrow Airport

Year	2013 (shown in Table 3)			2030		2040	
	Number	%		Number	%	Number	%
1 Private car	11,681,167	26.3	1 Kiss & fly	11,100,000	17.1	12,900,000	15.3
2 Hire car	1,421,283	3.2	2 Park & fly	6,100,000	9.4	7,600,000	9.0
3 Taxi / Minicab	13,058,034	29.4	3 Taxi	13,700,000	21.1	14,800,000	17.6
4 Bus / Coach	5,596,300	12.6	4 Bus / Coach	8,500,000	16.8	14,500,000	17.3
5 London	8,127,960	18.3	5 London	6,700,000	10.4	9,000,000	10.7
6 Rail	4,441,508	10.0	6 Rail	16,500,000	25.5	25,300,000	30.0
7 Other	133,245	0.3					
Total (non-transfer passengers)	44,415,082	100	Total (non-transfer passengers)	62,600,000	100	84,100,000	100
Total car (1-2)	13,102,450	29.5	Total car (1-2)	17,200,000	26.5	20,500,000	24.3
Total public transport (categories 4-6)	18,165,769	40.9	Total public transport (categories 4-6)	31,700,000	52.7	48,800,000	58.0

**Note:** Percentages have been rounded to 100

**Source:** Heathrow Airport Limited

## Surface access options for a short-listed proposal: Heathrow Hub

- 4.17** The other Heathrow shortlisted proposal, put forward by Heathrow Hub Ltd (**Option 3**) would extend the northern runway to the west, with an increased capacity of up to 190,000-210,000 in phase 1 (by 2034)<sup>58</sup>. It also involves the construction of a new multi-modal transport hub terminal just north of the Airport, the Heathrow Hub (as proposed by Heathrow Hub). This would be on the Great Western Mainline, providing, in the eye of the proposers, 'seamless connection' between rail, Crossrail, HS2, road and air. This new facility, located on a 200 acre site about 3.5km north of Terminal 5, with direct connection to the M25 (and possibly with the M4), would have a number of passenger services, including secure baggage storage and handling, as well as a direct connection to the different airport terminals<sup>59</sup>. Car parks, bus stops and other facilities could also be relocated around the Hub.
- 4.18** The original Heathrow Hub proposal also envisaged altering the route of HS2 so that it ran through the new Hub, rather than requiring a separate spur; and a direct link to HS1 (enabling, amongst other benefits, a direct link to the Eurocarex: the proposal for a Europe-wide overnight freight network)<sup>60</sup>. This configuration is illustrated in Figure 5. Since then the original proposals planned for HS2 has moved on, and it is not clear whether these options remain viable. However, the hub concept would remain under this option, even if HS2 was linked by a spur rather than a through-service<sup>61</sup>. A decision on the Heathrow spur will not be taken until after the Airports Commission reports in 2015<sup>62</sup>.
- 4.19** Both of the Heathrow Airport proposals require adaptation to the M25 that will cause some disruption to road users. Heathrow Airport Ltd proposal requires tunnelling under the M25, Heathrow Hub requires deviations of the M25 and construction of 10 kms of new motorway.

58 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Gleed, p9

59 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Gleed.

60 LOW, J. & BOSTOCK, M. 2013. Double up on Heathrow. Report, Centre for Policy Studies.

61 HEATHROW HUB LTD 2013. Submission to Airports Commission – Long Term Options - By Heathrow Hub Ltd and Runway Innovations Ltd. Report prepared by URS, Aviation Economics and Gleed.

62 HOUSE OF COMMONS LIBRARY. Railways: high speed rail (HS2). Available at: [www.parliament.uk/briefing-papers/sn00316.pdf](http://www.parliament.uk/briefing-papers/sn00316.pdf)

**Figure 5.** Heathrow hub connectivity with the railway and underground network



**Source:** <http://heathrowhub.com/how-it-works/>

## Interconnections with potential transport infrastructure projects: Crossrail and High Speed Rail

- 4.20** In the case of the UK, it will be very important that whichever option is short-listed, it will also part of a national integrated transport plan, linking to other projects such as the London Crossrail schemes (1 and 2) and the High Speed Rail network (HS1 and HS2).
- 4.21** Crossrail 1 will be a new railway line through central London, due to begin operations in late 2018 (with the full route operational from late 2019). Its main purpose is to increase rail capacity by 10% and connect the east to the west of the city. A north to south route, Crossrail 2, is currently being consulted upon by Transport for London<sup>63</sup>.
- 4.22** The Crossrail 1 route will run over 100 kilometres from Reading and Heathrow in the West, to Shenfield and Abbey Wood in the East. New tunnels for 42 kilometres are being built underneath central London and nine new stations will be built. Crossrail estimates that 95% of journeys will have a step-free origin and destination station<sup>64</sup>. Crossrail 1 will impact airport surface access in London and the South-East as it will add a connection from Heathrow to various locations in central London, with additional links to the underground and rail networks. In particular, Crossrail 1 will directly connect Heathrow Airport with the City, through Liverpool Street and another important major employment centre in Canary Wharf. Crossrail 1 will also improve surface connectivity to the West of Heathrow Airport, particularly to Maidenhead and Reading. It should also be noted that Crossrail could also affect surface access to Gatwick, since it will pass through Farringdon station, where passengers will be able to change to the Thameslink line in order to reach Gatwick Airport.

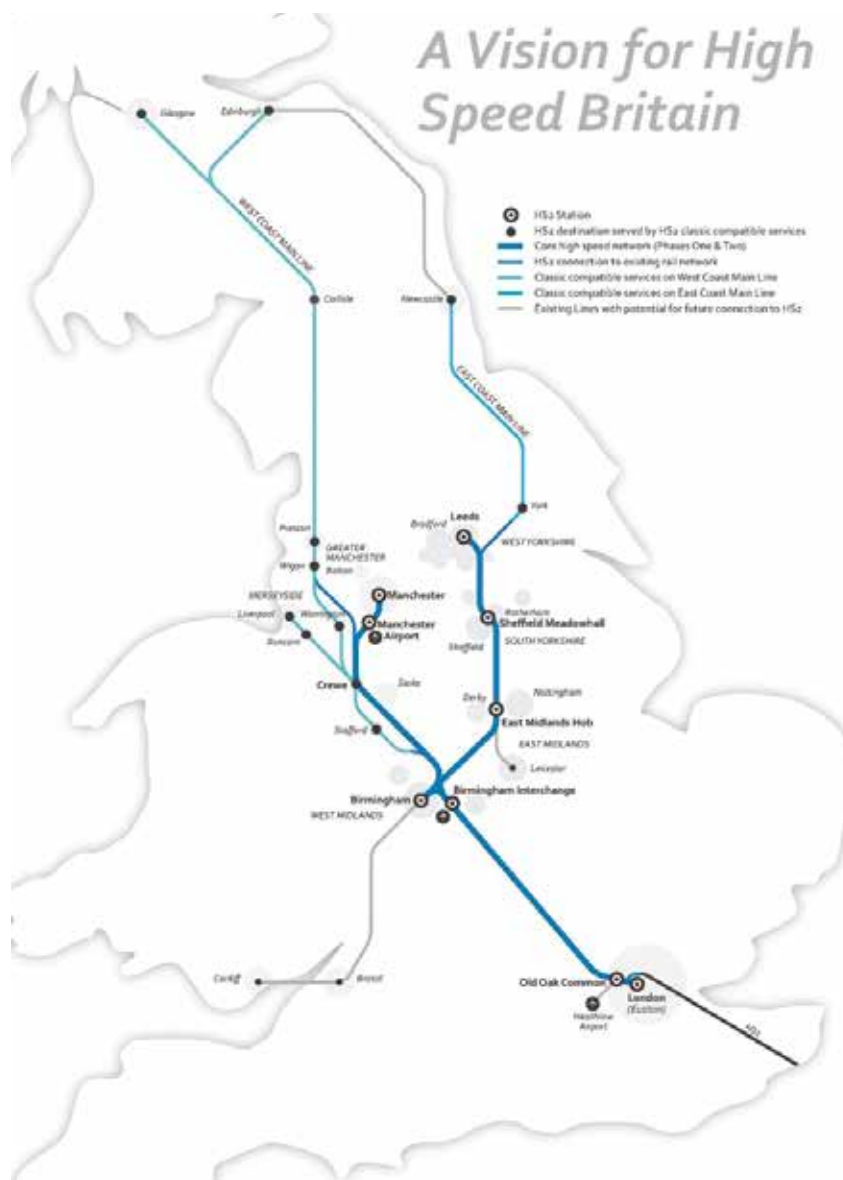
63 TRANSPORT FOR LONDON. Crossrail 2. Available at: <https://www.tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/crossrail-2>

64 CROSSRAIL. Crossrail in numbers. Available at: <http://www.crossrail.co.uk/benefits/crossrail-in-numbers>

#### 4.23

High Speed 2 (HS2) represents a planned high speed train line between London Euston and Birmingham (Phase 1 – expected to open in 2026), with a new station built at Curzon Street and subsequently Manchester Piccadilly via Manchester Airport and Leeds (Phase 2 – expected to open in 2032) in a Y-shaped route (see Figure 6). Phase 1 will also involve the construction of two new stations, one at Old Oak Common in west London, and another in the proximity of Birmingham Airport. HS2 aims to improve both journey time and capacity on the existing network. Journey times from London to Birmingham would be reduced from 1hr 21 minutes to 49 minutes, to Manchester from 2hrs 8 minutes to 1hr 8 min, and to Manchester Airport from 2hrs 24 minutes to 1hr and 3 minutes. One of the main purposes of the line would also be to free space on the existing congested rail network for both passengers and freight.

**Figure 6.** Proposed route for the High Speed 2 rail network



**Source:** DfT Policy Paper (2013)



**4.24** In operation, with the spur, Heathrow Airport will be 53 minutes away from the Birmingham Interchange (down from the current 2 hrs 13 minutes), 1 hr 28 minutes away from Manchester, and 1 hr 18 minutes to Manchester Airport (down from the current 3 hrs 8 minutes, and 3 hrs 24 minutes, respectively) and 1 hr 38 minutes from Leeds (down from the current 3 hrs 12 minutes), opening an important market in the Midlands and North of England. Reductions in journey times to the North will also be enjoyed by Gatwick through the link at Old Oak Common to HS2.

## Summary

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**4.25** Proposals to ensure adequate surface access for an expansion of either Gatwick or Heathrow Airports have focused on public transport improvements, particularly for rail travel to-and-from the airports. The investment in rail infrastructure is welcome, but we remain to be convinced about where it can take the predicted large numbers of extra travellers accessing an airport. In addition, the ease of travel from some origins when interchange is involved, and the role of frequency and the time of services that are important for surface access trips, need to be considered. It is also important that any increase in freight use is transferred using rail-based rather than road-based surface travel.

**4.26** All of the proposals have a commendable focus on the design of surface access 'hubs' for the important last quarter mile of passenger journeys in terms of integration of the various transport modes and the accessibility of passengers from the surface transport to the check-in facility. In particular, the Heathrow Hub is a novel and welcome proposal. It would have benefited from a direct link to HS2, although the spur remains a viable option.

**4.27** Given the lack of the data that is publically available on some of the aspects associated with the surface access, it is hoped that a rigorous analysis of the surface access options will be undertaken by the Airports Commission based on their appraisal framework<sup>65</sup>.

## 5. Surface access implications

### 5.1

This section discusses the overall surface access implications of the proposals, bringing together the current with the proposed, with some context and questions following the literature review (**Section 2**), current conditions (**Section 3**), and the various proposals (**Section 4**). The key issue in this Section is to explore how realistic and adequate the current plans are to handle the increased (and mode-shifted) number of surface journeys. It is split into the following sections:

- Background trends in population and travel demand
- The validity of the public transport targets: the case study of Gatwick Airport
- The validity of the public transport targets: the case study of Heathrow Airport
- The impact of HS2 on surface access connectivity
- Achieving a modal shift away from the private car and towards public transport

### Background trends in population and travel demand

#### 5.2

Changes to surface access travel need to be viewed against background trends in population and travel demand. The UK population was 63.2 million at the time of the 2011 Census<sup>66</sup> and is predicted to rise to 67.2 million in 2020<sup>67</sup>. London, the East and the South East regions are all projected to grow at a much faster rate than other English regions; London in particular is set to grow by 13% over the 10 year period to mid-2022<sup>68</sup>.

#### 5.3

In transport terms, the number of passengers from UK airports increased over the previous year (2013)<sup>69</sup>, following a dip caused by the recent recession, but it is set to grow over the coming years. For surface transport, there has been a significant rise in rail travel in London and South East of England, and a corresponding stagnation in car driving since the late 1990s in London<sup>70</sup>. This has been reflected in the recent modal shift trends in surface access at Gatwick and Heathrow airports (Section 3). We believe it is important that the Airports Commission makes clear its assumptions about a) the underlying growth in surface access travel and b) what is additional element that would be generated by airport expansion. In turn, we also urge the Commission to be clear about the likely costs of surface access solutions and the appropriate balance between financing these from the public purse and by the airports.

66 ONS, 2011 Summary: UK Population Projected to Reach 70 Million by Mid-2027. Available at: <http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2010-based-projections/sum-2010-based-national-population-projections.html>

67 ONS, 2011 UK Censuses, in, Office for National Statistics. Available at: <http://www.ons.gov.uk/ons/guide-method/census/2011/uk-census/index.html>.

68 ONS, 2014 Statistical bulletin: 2012-based Subnational Population Projections for England. Available at: <http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2012-based-projections/stb-2012-based-snpp.html>

69 Civil Aviation Authority 2014. Aviation trends. Quarter 1. 2014. London. Available at: [http://www.caa.co.uk/docs/80/AviationTrends\\_Q1\\_2014.pdf](http://www.caa.co.uk/docs/80/AviationTrends_Q1_2014.pdf)

70 JONES P., and Le VINE S., 2012. On the Move: making sense of car & rail travel trends in Great Britain (Independent Transport Commission et al.). Available to download at [www.theitc.org.uk/docs/47.pdf](http://www.theitc.org.uk/docs/47.pdf)



## Validity of the public transport targets: the case study of Gatwick Airport

- 5.4** The stated objective of the airport surface access strategy is to achieve 45% share of public transport in a single runway scenario, and 50% in a two runway scenario. However, Gatwick's CEO declared recently that 60% should be the target by 2040<sup>71</sup> and this target was then confirmed by the latest consultation document made public by the airport - 10% would be the specific target for bus and coach (20% for staff) by 2040 and 15% would be target for private car usage<sup>72</sup>.
- 5.5** Importantly, Gatwick Airport's management considers that the additional number of passengers in the expanded scenario, and the consequent increase in surface access trips will be absorbed by the planned enhancement to both the rail and road network without requiring major additional investment, such as, the construction of a new rail link. The improvements to the Thameslink route will certainly add considerable capacity, with more frequent services and longer carriages and this, together with an enhanced Gatwick Express service could very possibly absorb at least the initial extra passengers travelling from Central and South London (Gatwick currently contributes to 4% of current peak demand into London with this percentage predicted to increase to 5% in an expanded scenario). Whether the added capacity will be enough in a 2030 scenario is debatable given the magnitude of the passengers that will come from Central London (26 million in 2030 if the proportion of London passengers remains the same – 22 million of which would come by public transport, again if the proportion remains the same). This is open to debate. For example, passengers from central London will double requiring an extra 100% capacity: Thameslink could provide 50% of this but whether the rest would be covered by other services from London Victoria, as well as buses and coaches, is difficult to say.

71 Stewart Wingate speech at the Gatwick for Growth event, London, Tuesday 25 March 2014  
The Shard, London

72 GATWICK AIRPORT LIMITED 2014. A Second runway for Gatwick - Our April 2014  
Runway Options Consultation.

## 5.6

In relative terms, it has to be noted, that currently the vast majority of travellers coming from Central London travel by public transport (82.1% was the figure in 2011) and while it is possible this figure is going to increase, it is more likely to stay approximately the same. The increase in absolute terms will however be substantial. What the improved rail connection would probably do is to increase public transport share from other areas. These include Brighton and Hove, whose share of public transport users is currently at 46%, and could certainly be improved given that it has been declining in recent years, the rest of the Sussex Coast whose share is currently at 29%, and especially Kent, whose public transport share is currently as low as 9% given the lack of fast direct services. For travellers coming from the M4/M40 corridor (Thames Valley and beyond) the current public transport share of the market is 29% of passengers, and this could certainly improve given the enhancements of the rail link between Gatwick and Reading. Whether a considerable extra number of passengers from that region and beyond (for example, in the scenario of reduced operations at Heathrow) could be absorbed is, however, debatable, since trains wanting to avoid London would pass through Reading and Guilford, while trains from the wider South-West could go through Salisbury, Horsham and Crawley reaching Gatwick via the South. It should be noted that connections from the west and south-west to Gatwick are a rather complicated. There used to be a direct connection between Brighton to Reading and beyond going to Gatwick, and other services from Brighton to Bristol via Salisbury. Some of these routes could be reinstated but it is quite difficult to achieve. The links not through London could also face problems given their limited capacity to accommodate passengers who would like to use an expanded Gatwick as a result of the extra destinations it serves.

## Validity of the public transport targets: the case study of Heathrow Airport

### 5.7

Before (see Table 3) we noted that the current (2012) share of public transport users at Heathrow is 40.8%. With about 45 million passengers currently arriving at Heathrow via the surface access infrastructure, this means that more than 18 million of them are arriving by public transport. In an added capacity scenario in 2030 with 100 million passengers, Heathrow Airport indicated that an additional 15 million passengers will use the surface access public transport infrastructure, bringing the total to 34 million and raising the share of public transport users to 50%<sup>73</sup>. In particular, the following infrastructure developments as well as demand management measures discussed above are predicted to contribute to an increase of 10% in public transport mode share by 2030, broken down as follows:

- 2.3% - new coach routes
- 1.2% - 'enhanced Crossrail'
- 0.7% - Western rail connection
- 0.7% - Southern rail connection
- 1.2% - demand management initiatives listed above
- 3.7% - 'background change to 2030'





## 5.8

New and enhanced coach and local bus connectivity will also contribute towards modal shift. In the view of the proposers, these initiatives, together with the infrastructural development will help to achieve a 'more than' 50% share of public transport usage by 2030<sup>74</sup>. These figures have to be read by taking into consideration the predicted passenger number increase as a result of expansion. The magnitude of these changes would be considerable, especially for Central London, currently the origin and destination for more than 50% of Heathrow passengers. TfL has questioned the assumption that extra demand can be absorbed with minimal investment, since even an upgraded Piccadilly Line would only see crowding reduced but not eliminated, and the same would apply to the Great Western mainline (which will be used by Crossrail for some of its approach)<sup>75</sup>. It should also be noted the TfL has similar concerns for absorbing extra demand with minimal investment from the Gatwick Airport proposals, in this case relating to the Brighton mainline.

## 5.9

In terms of traffic around the airport, the Heathrow Airport proposal states that the increased public transport share, increased car occupancy rate, and limited staff car parking supply would make the predicted increase in passenger related traffic (due to the increased number) offset by the reduction in staff travel. The proposal also states that surface access management should have the objective to maintain current traffic levels beyond 2030 under their expanded scenario. This is also repeated in the latest airport proposal document (p.7) where it is stated that "Heathrow will be able to deliver more flights without increasing the traffic on the road"<sup>76</sup>. This is a sensitive issue, because Heathrow is situated next to one of the most congested sections of the UK motorway network. Heathrow Airport and TfL have expressed differing views on the contribution of the Airport to the traffic around it, as well as over the possibility of increasing public transport usage and reducing private car usage in an extended scenario<sup>77</sup>. TfL believe that Heathrow expansion could generate a significant increase in vehicle trips on the surrounding road network, possibly on a scale requiring extra lanes on extended sections of the M4 and M25<sup>78</sup>. It should be noted that surrounding traffic is also a sensitive issue for Gatwick Airport which, like Heathrow, is situated close to congested sections of the national motorway network.

74 HEATHROW AIRPORT LTD 2014. Taking Britain further. Heathrow's plan for connecting the UK to growth, May 2014. Volume 1. Technical submission p207.

75 TfL 2013. Airports commission response. Long and short to medium term proposal. The Mayor of London's review of submissions. London: Transport for London.

76 HEATHROW AIRPORT LTD 2014. A New Approach - Heathrow's options for connecting the UK to growth - January 2014.

77 BOURN, R. 2013. Heathrow and surface transport stress. London: Campaign for Better Transport.

78 TFL 2013. Airports commission response. Long and short to medium term proposal. The Mayor of London's review of submissions. London: Transport for London.

## The impact of HS2 on surface access connectivity

**5.10** It is important to note that, according to a recent publication<sup>79</sup>, given the growth in rail travel demand from large international airports, they could be considered equivalent to, or even larger than, cities in terms of demand generation, strengthening the case for connecting them much more closely to the (possibly high speed) national rail network. Connecting the important European airports to the (preferably) high speed network is also one of the objectives in a recent EU transport strategy white paper<sup>80</sup>. In an earlier paper<sup>81</sup>, the same authors argued that connecting Heathrow to the High Speed rail network could replace about 20% of landing and take-off slots. This is higher than the figure of 10% quoted by Transport for London (TfL) in their proposal to the Airports Commission<sup>82</sup>. It is not, however, straightforward to predict the impact of international high speed services on modal choice, especially for an insular country like the UK (with routes to Europe limited by capacity constraints in the Eurotunnel).

**5.11** High Speed Rail becomes very competitive with aviation for journeys below 4 hours, although its potential to substitute for air travel depends on a number of factors<sup>83</sup> and is worthy of further investigation. It is also interesting to note that Eurostar has just announced the addition of longer trains to boost capacity as well as a number of new direct routes not only to new destinations in France, but also in the Netherlands, Germany and Switzerland. The Eurostar monopoly on routes through the Channel Tunnel is also due to end with the German state railway company DB set to start running services through the tunnel in the next two years<sup>84</sup>.

79 BANISTER, D. & GIVONI, M. 2013. High-Speed Rail in the EU27: Trends, Time, Accessibility and Principles. *Built Environment*, 39, 324-338.

80 EUROPEAN COMMISSION 2011. White Paper - Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system, Brussels.

81 GIVONI, M. & BANISTER, D. 2006. Airline and railway integration. *Transport Policy*, 13, 386-397.

82 TFL. 2014. A new hub airport for the UK - Available: <http://beta.tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/a-new-hub-airport-for-the-uk#on-this-page-6>.

83 For an interesting and recent review of high speed potential to alter mode share on certain routes please see BORJESSON, M. 2012. *Forecasting Demand for High Speed Rail* Centre for Transport Studies, Stockholm.

84 ODELL, M. & MARRIAGE, M. 2014. Eurostar lifts capacity to enter new markets. *The Financial Times* - 5 March 2014 - <http://www.ft.com/cms/s/0/09860196-a44a-11e3-9cb0-00144feab7de.html?ftcamp=crm/email/201436/nbe/Transport/product&siteedition=uk#axzz2vArv5ZNN> (require subscription).



- 5.12** Heathrow surface connectivity would have greatly benefited from being located directly (or at least as close as possible) on HS2 rather than served by a spur<sup>85</sup>. This is assuming that there would have been easy (as short as possible, well signed-posted and step-free) connectivity between the High Speed Rail services and the shuttles to the different terminals. Any rail services should be as frequent as possible in order to reduce to a bare minimum the time (as well as the potential psychological and monetary) costs of passengers failing to catch a particular service. A spur would in fact add an interchange: a particular penalty for passengers with reduced mobility or carrying heavy luggage, as well as increasing travel times. In particular, a spur could make planning for passengers even more complex since they will have to match their arrival time at the Old Common station with the times for the services on the spur (assuming they will be not as frequent as the services from Heathrow Hub to the different terminals). This will therefore increase uncertainty as well as the appeal of using rail to reach the airport. The perceived ease of transfer will be of particular importance to increase public transport modal choices because, as we have seen in Section 2, passengers normally using the car often cite complexity, uncertainty, lack of reliability, number of interchanges, as well as costs, as the main deterrents from using public transport to reach the airports.
- 5.13** Interestingly, the proposed HS2 network will link three major UK airports - Heathrow, Birmingham and Manchester - with relatively short travel times between them, and therefore create the possibility of new forms of competition in UK aviation. Gatwick will not be located directly on this network. The way in which HS2 might encourage competition between Birmingham, Manchester and Heathrow airports, and potentially attract airport passengers northward as well as southward along the route might be a new and significant factor in the future geography of UK aviation, mitigating fears of overly influential airports in the southeast.
- 5.14** A further issue in relation to HS2 is the possible effect of 'landhubbing', whereby travellers from other parts of Britain might use an improved rail system to get to Heathrow and Gatwick airports (rather than fly to Schiphol, and hub from there, for example). This kind of behavioural shift would depend not just on engineering (fast and easy surface access to a UK hub from other parts of the country) but - importantly - on the pricing policy of the airlines themselves. One major attraction of travelling to global destinations via a European hub rather than a UK one is that it is commonly cheaper to do so. Adding the price of an HS2 ticket would make the UK "offer" even less competitive. However, with the surface engineering in place airlines would at least have the potential scope to develop alternative pricing options to attract passengers to their UK flights. The ITC's recent research has looked at how this works in France and the Netherlands<sup>86</sup>. We note, for example, the arrangement that SNCF and Air France have for joint rail-air tickets at Paris Charles de Gaulle airport<sup>87</sup>.

85 INDEPENDENT TRANSPORT COMMISSION 2014. Capturing the value of High Speed Rail. Lessons from Europe: The Lille Symposium 2014.

86 INDEPENDENT TRANSPORT COMMISSION 2014. Capturing the value of High Speed Rail. Lessons from Europe: The Lille Symposium 2014.

87 AIR FRANCE. Air & rail connections. Available at: [http://www.airfrance.co.uk/GB/en/common/resainfovol/avion\\_train/reservation\\_avion\\_train\\_tgvair\\_airfrance.htm](http://www.airfrance.co.uk/GB/en/common/resainfovol/avion_train/reservation_avion_train_tgvair_airfrance.htm)

## Achieving modal shift away from the private car and towards public transport

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- 5.15** There needs to be a deeper discussion on the ways in which airports can achieve the modal shift they desire, particularly given the focus on public transport developments within the airport proposals and the associated ambitious level of the targets set to increase public transport usage. To achieve this it will, in our opinion, also be important to disincentivise private car use further, possibly through increased charging on-route (congestion) or at the destination (car park). Drop-off / pick-up trips could be particularly targeted as currently happens at Luton Airport.
- 5.16** A new charge - possibly based on the London congestion charge - is an option, which would have behavioural and financial benefits. It could also be used to subsidise public transport users, although this could depend on co-operation between a variety of different operators. This report endorses the congestion charge proposals as put forward by Heathrow Airport. We urge the Airports Commission to look at this issue rather than follow the build-to-meet-demand principle so frequently adopted by transport planners.

## Summary

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- 5.17** There is much debate on the public transport targets set by the airports, and although admirable, it is at present hard to see how they will be delivered, particularly when increasing the size and capacity of an existing airport will naturally attract people from further afield: a group we know are more likely to use cars.
- 5.18** High Speed Rail has been shown to be a viable competitor with aviation in parts of Europe and perhaps there has been a missed opportunity under current HSR proposals in not having more direct and close links with the two airports under consideration.
- 5.19** It could be suggested that more dramatic measures will be required to encourage sufficient modal shift away from the private car to meet targets, perhaps through a charge for drop-off / pick-up trips.

## 6. Conclusions and recommendations

**6.1** This section presents the report's conclusions and recommendations for policy makers.

**6.2** There are a number of key messages we would like to highlight from the report:

- High population growth in London and the South East (as shown in **Section 5**) will place stress on surface access to airports regardless of whether new runways are built - this makes it important that upgrades to these surface transport networks are considered in addition to those schemes already planned and committed.
- The targets that the airports are setting for modal shift are ambitious (**Section 4**), and a range of policies will be required to achieve them (including possibly congestion charging on cars to subsidise public transport). There are wider questions about surface transport and whether the transport is demand-led or supply-driven. If it is demand-driven private car traffic will increase, and yet all of the airport proposals are expecting most new passengers to use public transport. Perhaps the Airports Commission or another body should set limits on the amount of private car traffic (perhaps limiting this to no increase on 2014 levels).
- As highlighted in the literature review (**Section 2**) there is a particular issue with drop-off / pick-up surface access trips, the largest contributor to emissions and congestion. It is possible that some form of charging could help to reduce this activity, and technological innovations could also be used to reduce the need for these trips.
- Good modal integration will be critical to achieving a successful surface access system. In this context (discussed in **Section 5**), it is notable that continental rival airports, such as Charles de Gaulle and Schiphol have integrated their HSR station within the airport, while in the UK our airport and HSR strategies do not appear to be similarly integrated.
- Complex governance issues are associated with delivering these proposals, such as the range of stakeholders involved (**Section 2**) and the Heathrow Hub difficulty of putting an interchange on land outside the airport (**Section 4**).

### 6.3

Finally, a series of “I” **recommendations** have been put forward to promote surface connectivity whichever airport proposals are developed. The following are suggested:

- i. **Investment** is provided at a scale to ensure an efficient and effective surface access system.
- ii. **Infrastructure** for surface access is planned, cost-effective and delivered on time. There is an ownership issue too. We have noted that surface access planning is complex given that most of the infrastructure is out of the control of the airports. This issue particularly affects the Heathrow Hub proposal as the hub is projected to be located on land which is not owned by the airport. This could create management problems as well as conflicts in terms of revenue from car parking facilities.
- iii. **Integration** is necessary, in order to ensure travellers have a straight-forward, easy, end-to-end journey experience. This requires all of the various authorities and companies involved to plan and operate services with this goal from the outset. It may require clearer governance structures to ensure it happens.
- iv. **Information** on surface access travel is readily available to passengers.
- v. **Interchange** is efficient to ensure that there are not time (and often cost) penalties for changing surface access transport method. This is particularly important given that many of the public transport trips to Heathrow and Gatwick airports, including with a new HS2, are not direct, involving a change of service (interchange).
- vi. **Innovation** in terms of technology is applied for surface connectivity (telepresence and baggage-tagging are covered in the Section 2 literature review).
- vii. The environmental **impact** of surface access will need to be fully accounted for, particularly from drop-off / pick-up trips. While the impact on the environment could be assessed for the area in the immediate vicinity of the airport (with difficulties concerning attribution of traffic as well as passengers to the airport rather than local traffic movements) it is difficult to give a more holistic approach of the environmental impact of surface access given the distances some travellers cover to reach the airport
- viii. Successful **implementation** of the surface access schemes is crucial so that the proposals can be delivered on time and within budget.



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