

OXFORD ECONOMICS

The value of aviation connectivity to the UK

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**A report prepared for
Heathrow**



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ECONOMICS**

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1 Introduction

1.1 Connectivity and growth

Later this month, the Government will publish a consultation on its proposed framework for sustainable aviation. The consultation will be published against a backdrop of continuing concerns about the health of the UK economy, with unemployment continuing to rise and GDP figures showing that Britain risks slipping back into recession. Such concerns are especially acute in the UK regions outside London.

In responding to the difficulties faced by the economy, and in the context of public sector austerity, the Government has made clear that growth must come from the private sector. In particular, the Government has prioritised export-led growth, and has emphasised the crucial role played by infrastructure investment in securing the new impetus that the economy requires.

A key question facing the aviation consultation will therefore be how effectively it supports the Government's ambitions to support private sector growth. This report has been commissioned by Heathrow to add to the evidence base informing that debate – in particular by examining the economic importance of aviation to tourism, foreign direct investment and international trade in terms of both contribution to GDP and jobs supported. Our work builds on that undertaken by Frontier Economics in their September 2011 report, *Connecting For Growth*.

The report concludes that decisions over the future direction of aviation policy will have a substantial economic impact in both the long and medium terms. The economic stakes of government policy are therefore high, not just in relation to long term infrastructure decisions such as the Government's position on the mooted development of a new airport in the Thames Estuary, but also in relation to policy changes which can be implemented more rapidly.

1.2 Providing Britain with a gateway to the world

Aviation plays a crucial role in supporting the British economy. It supports tourism, enabling international visitors to travel easily to and from the UK. It facilitates inward investment, making it easier for international companies to establish bases in the UK with easy access to both their home markets and other markets in Europe. And it supports exports – both directly, by transporting British-made goods in international markets, and indirectly, by enabling entrepreneurial British businesses to develop relationships with potential customers in overseas locations.

Britain's international aviation connectivity is boosted by the presence in the UK of a major international hub airport at Heathrow. Hubs provide a transit point at which passengers can transfer easily from one flight to another. Hubs benefit the country in which they are located by supporting both a wider range of routes and

greater frequency of flights to important destinations. They achieve this by pooling local demand with demand from transfer passengers passing through the hub, thereby generating sufficient demand to sustain routes and additional flights which would not otherwise exist. Britain's economy benefits from the UK's only international hub at Heathrow.

It is not just London and the south east which benefit from Britain's only international hub at Heathrow. Eighty per cent of all long haul passengers visiting Britain arrive at Heathrow. Connecting flights between Heathrow and key regional centres like Manchester, Newcastle, Glasgow and Belfast mean that businesses located in the UK regions have far better access to global markets than would be possible from direct flights alone. But limits on capacity at Heathrow mean that the regional economic benefits of the hub are not as great as they could be as capacity constraints lead to a reduction in the number of routes to domestic destinations.

It is in this context that both the Chancellor, George Osborne, and the Mayor of London, Boris Johnson, have recognised the importance to the UK economy of having a hub airport. The aviation consultation is expected to set out the Government's views on how to ensure that Britain retains an international hub over the long term. A variety of different policy options have been floated, and this report does not seek to express a view on their relative merits. Rather, the objective of our research is to inform the debate by examining the economic importance to the UK of the connectivity provided by a hub over the next ten years.

2 Main findings

2.1 About the research

This report looks at the economic impact of the UK's only international hub at Heathrow both nationally and on the countries and regions within the UK. The report examines three channels through which greater connectivity benefits the UK's countries and region: greater exports, tourism and inward foreign direct investment (FDI). It also looks at other ways in which Heathrow benefits the regional economy. These effects include the economic activity and jobs created as a result of serving the passenger and planes landing from Heathrow at regional airports and Heathrow's procurement for its capital projects and operations.

2.2 Supporting exports through greater connectivity

- In 2010, the UK is estimated to have exported £60 billion of goods by air. These were manufactured across the countries and regions. To reach the final destination a significant proportion of these exports are likely to go via Heathrow. By volume, 65% of international air freight going through UK airports in 2010 went via Heathrow.
- It is estimated that the manufacture of goods for export by air contributed £28 billion to UK GDP. The importance of exports that go by air varies across the countries and regions: they range from 5% of the North East's economic output to 1% of London's and Scotland's output.
- Exports of goods that are transported by air are estimated to employ 93,600 people in the UK. Of these, 12% are located in both the North West and South East and 11% in Yorkshire and Humber.

2.3 Supporting FDI through greater connectivity

- In the UK, 3.7 million people are estimated to work for foreign-owned firms. By analysing the country of ownership, it is possible to calculate what proportion of those jobs staff have to use a hub airport to travel to visit the parent company. This suggests 1.3 million jobs in the UK are supported by a hub airport.
- Wales has the highest proportion of employment supported by a hub (at 8.8% of total). It is followed by the North East (7.8% of employment) and Yorkshire and Humber (7.5%).

2.4 Supporting tourism through greater connectivity

- Foreign tourists that landed at Heathrow are estimated to have spent £5.6 billion in the UK. This is estimated to create £3.7 billion in GDP in the tourist industry, £1.1 billion in its supply chain and £0.8 billion due to staff's wage-financed consumer spending. Due to visitor patterns, 68% of the economic activity generated occurred in London.
- In 2010, foreign tourists that used Heathrow are predicted to have generated 152,000 jobs in the UK. Of these, 109,000 were in the tourist industry, 22,000 in its supply chain and 20,000 due to consumption effects. Most (60%) of the employment generated occurs in London.

2.5 Generating employment through regional flights

- Heathrow has direct flights to six airports in the UK. These arrivals and departures constitute between 4% and 21% of the regional airports daily plane movements. Servicing the passengers and plane turnaround generates economic activity and employment at the airport, their supply chains and at the local retail and leisure outlets where staff spend their wages. Flights from Heathrow are estimated to generate 4,500 jobs in Scotland, 1,600 jobs in the North West, 900 jobs in Northern Ireland and 700 jobs in the North East.

2.6 The impact of Heathrow's capital expenditure

- In 2010 and 2011, BAA has rebuilt Terminal 2 at Heathrow. This was largest privately funded investment project in Europe in those two years. Of this, £1.7 billion was spent on inputs of goods and services from around 1,050 UK firms. The suppliers were widely spread across the UK. Firms in all 12 countries and regions received contracts. Procurement from 8 of the 12 countries and regions was over £25 million.
- The expenditure on inputs to rebuild Terminal 2 is likely to have come at a vital time for the construction and building material industries across the UK. Since the onset of the recession demand for their products has fallen sharply. On average across 2010 and 2011, investment spending on non-housing buildings and structures stood 2% below its level in 2009 and 13% below its pre-recession level in 2007 (in real terms).

2.7 The impact of Heathrow's operational expenditure

- Heathrow does not exist in isolation. To run the airport, BAA purchases inputs of goods and services from across the UK. In 2011, this procurement was worth £0.7 billion. Goods and services were sourced from firms in all 12 countries and regions. BAA Heathrow spent over £25 million on inputs from 7 of the 12 countries and regions.

- Heathrow's procurement of the inputs it needs to operate creates economic activity and employment at the firms themselves, in their supply chain and through their staff consumer spending out of wage income. In 2011, this is estimated to contribute £775 million to UK GDP and employs 18,200 people. This impact occurs across the UK: in 7 out of the 12 countries and regions over 500 people's jobs are supported by Heathrow's operational expenditure.
- In operating Heathrow, BAA does not just purchase inputs from large firms. In 2011 it is estimated to have made purchases from 1,960 firms. Heathrow bought goods worth less than £10,000 and between £10,001 and less than £50,000 from 850 and a further 530 firms, respectively. This helps sustain small and medium-sized enterprises across the UK.

2.8 The national picture in 2021

While Heathrow delivers many benefits to the countries and regions of the UK, its ability to do so in the future is likely to be limited by restrictions on its capacity. The report estimates what the UK may lose by 2021.

- In 2021, without the requisite investment in aviation capacity at Heathrow airport, there could be up to 5.8 million fewer international tourists travelling to the UK from Long-Haul destinations every year. This will constitute a potential loss of up to £7.3 billion of tourist spend in the UK economy each year. This is estimated to equate to £3.6 billion less GDP and 78,800 jobs supported.
- A constrained Heathrow would restrict UK trade from key emerging market countries by a minimum of around £1.6 billion a year in 2021, compared to if it was unconstrained. This equates to an estimated £410 million less GDP a year and 7,300 fewer jobs supported.
- If the number of passengers arriving at Heathrow is constrained by capacity, this will lower the attractiveness of the UK as a destination for inward foreign direct investment. This is estimated to lower the size of UK GDP by £4.5 billion a year by 2021 and reduce employment by 55,300.
- In total, if Heathrow is constrained, it is likely to reduce economic activity in the UK (as measured by GDP) by 2021 by £8.5 billion each year and lower employment by 141,400.

3 Methodology

3.1 Location of foreign-owned businesses in the UK

The Office for National Statistics (ONS) publishes data at a local level on the number of foreign- and UK-owned businesses enterprises and business units and their associated employment¹. A business unit refers to a single site of operation. This information is drawn from the Inter-Departmental Business Register and Dun & Bradstreet data on foreign ownership. The coverage for March 2010 encompasses all businesses registered for VAT or PAYE.

There are a substantial number of businesses where the country of ownership is unknown. This is the case for over 90 per cent of the UK's total business stock but only 49 per cent of employment and 22 per cent of turnover at UK level. The volume of foreign-owned companies in each local area is therefore a minimum estimate.

From these data it is possible to rank UK local authority areas by the proportion of their total employment that is in foreign-owned units. The maps in some of the UK's country and regions chapters set out this analysis in terms of quintiles of this ranking².

From the published data on break down of foreign ownership by country of parentage for each of the UK's regions it is possible to estimate the share of this foreign-owned employment that is in units without frequent direct flight connections to the parent country. Getting to these countries without direct connections therefore requires transiting through a hub airport.

The process of estimation involved examining the flight destinations catered for by each of the regional airports. For example, for Scotland it involved looking at current international flight destinations from Aberdeen, Edinburgh and Glasgow airports. As rules of thumb:

- any regular direct flights to European countries were counted as offering direct connectivity for units whose parent company is located in that economy;
- for North America, the North West and the Thames Valley were classified as having direct connections, but the limited connectivity, in terms of frequency, timings and destinations, offered by direct flights for the other regions was judged insufficient to justify a direct connection categorisation.

These rules of thumb are necessarily arbitrary. For many European destinations – for example Germany – the approach is likely to underestimate the degree to

¹ ONS (2011), 'Count and Employment of VAT and/or PAYE based Foreign Owned Local Units by Districts, Counties and Unitary Authorities within Government Office Region and Country for 2010'.

² A statistical value of any ordered data that represents 20% of a given population. The first quintile represents the lowest fifth of the data (1-20%); the second quartile represents the second fifth (21% - 40%) etc.

which reaching a parent company's facilities will require transit through a hub airport. However for the US there will be links from some of the UK's regions that offer direct connectivity to parent company locations.

On balance we believe the approach that we have taken to be conservative and to be more likely to under- rather than over-estimate the extent to which travellers between the UK's foreign-owned businesses and parent company locations will involve transit through a hub airport.

3.2 Heathrow's impact on international Tourism in the UK

The first step in estimating the impact of Heathrow airport on tourism in the UK regions is to estimate the total number of international tourists entering the UK using the International Passenger Survey (IPS).³ The IPS, carried out by the ONS, is a large multi-purpose survey that collects information from passengers as they enter or leave the UK. The survey reports data on different topics including expenditure, country of origin, mode of travel and purpose of travel, at both the national and regional level. The latest available data are for the calendar year 2010. The IPS survey can therefore be used to identify the total number of foreign visitors who travelled by air by country of origin, and their corresponding expenditure (excluding that on airfares), to each region in the UK.

A significant proportion of these foreign visitors will arrive via connections with regional airports, especially from short-haul destinations. The Civil Aviation Authority (CAA) publishes statistics on the total passenger traffic flying to/from each airport in the UK, split by country of origin/destination.⁴ As the CAA statistics are not split between UK residents travelling abroad and foreign residents travelling to the UK, an adjustment is made using the IPS survey. This suggests that approximately two-thirds of total international air passenger traffic in the UK is that of UK residents travelling abroad. In addition, the figures are halved to ensure they reflect inbound passengers (based on the assumption that all flights are one-half of a return journey to/from the same airport). The net result is an estimate for the total number of inbound foreign residents flying to each of the UK's countries and regions, which can be compared to the IPS statistics on the total number of inbound foreign residents arriving by air, but not necessarily via a regional airport.

In the instances where there is a short-fall, i.e. the total number of visitors who arrived by air (IPS data) is greater than the number of actual arrivals by air via a regional airport (CAA data), it is necessary that these additional visitors arrive via a non-regional airport. These visitors are primarily from long-haul destinations, such as the USA, Australia and Canada etc. The next step in estimating the impact of Heathrow is therefore to take this short-fall in visitors and estimate the proportion that arrived via the UK's only international Hub

³ Available at www.visitbritain.org

⁴ Civil Aviation Authority, (2012), 'UK Airport Statistics'.

airport, Heathrow, as opposed to either a) another UK airport or b) a European hub airport.

In 2007, the CAA published a report on air services at UK regional airports⁵. Contained within this report the CAA illustrated results from a passenger survey conducted in 2005 on the journey patterns of passengers travelling to/from the UK regions on scheduled flights. The results suggest that 44% of passengers travelling between a UK region and a short-haul point, and 72% of passengers travelling between a UK region and a long-haul point, did so via an airport located in the South-East. The remaining passengers either travelled direct via a UK regional airport (non South-East) or connected via another European hub. The CAA conducted the same survey of passengers in 2000. By assuming the same trend in journey patterns from 2000 to 2005, estimates for the composition of journeys were made for 2010. In addition, the proportion of passengers flying to/from airports in the South East handled by Heathrow was estimated using the CAA airport statistics. Combining the survey data with the passenger data allowed us to estimate the proportion of passengers not arriving on direct flights who arrived via connections provided by Heathrow (32% from short-haul destinations and 76% from long-haul destinations).

The final step involves estimating the total spend of foreign visitors arriving via Heathrow, by identifying those visitors not arriving by direct connections and allocating a proportion of them to Heathrow based on the calculations outlined above. This expenditure was allocated to different industries (hotels and catering, retail, etc) based on an ONS (2011) report on the sub-regional value of tourism.⁶ This expenditure was entered into a regional domestic use input-output model to estimate the direct impact on Gross Domestic Product (GDP) and employment.⁷

Domestic use input-output tables are released by the ONS to provide a complete picture of the flow of products across different sectors in the UK economy, illustrating the relationships between different producers and consumers of goods and services.⁸ A primary application of domestic use input-output tables is to create multipliers that are used to illustrate how an increase in output in one sector affects the whole economy. Through the use of these tables, the indirect (the activity supported in the regional or national supply chain) and induced (the activity supported by the consumer spending of those employed through the direct and indirect channels) impacts of the visitor expenditure can be estimated as its direct contribution filters through the economy. The last available domestic use input-output table published by the ONS was for calendar year 2005.

⁵ Civil Aviation Authority, (2007), 'Air services at UK regional airports: An update on developments', CAP 775, November.

⁶ ONS, (2011), 'The Sub-Regional Value of Tourism in the UK in 2008', 20 October.

⁷ Regional input output tables and multipliers have been constructed using the technique spelt out in Flegg and Webber, (2000), 'Regional Size, Regional Specialization and the FLQ Formula'. *Regional Studies*, Vol. 34.6, pages 563-569.

⁸ ONS, (2011), 'Input-Output Analytical Tables, 2005 Edition', 02 August

3.3 Heathrow's impact on regional trade

Eurostat (2011) data show that UK air freight represents less than 1% of total UK trade by volume, but around 22% by value.⁹ Air transport is even more important for delivering exports, supporting around 28% of UK exports by value.

Eurostat (2011) data provides detail on the types of goods transported by air in both volume and value terms for the UK.¹⁰ These UK figures are applied to regional exports data from HMRC¹¹ to create estimate of volume and value of regional exports by air.

To understand the importance of a hub airport to deliver regional exports required establishing the destination of those exports and the availability of direct routes to those export markets cater for by regional airports. So for example, if a company in the South West region exports goods to Japan and there are no direct flights from a South West airport to Japan, we consider the alternative routes available. In the first instance, if flights to Japan are available from Heathrow, the UK's only hub airport, we assume the air freight is delivered via Heathrow. If the destination of the exports is to a country with no direct flight via Heathrow (e.g. The Philippines) the exports are assumed to travel via an alternative hub airport. This process continues for all regions, with further checks to reconcile the estimates with data on total cargo flows from all regional airports and Heathrow available from the Civil Aviation Authority (CAA).

This approach will mean that direct flights to each country from each region were counted as offering direct connectivity for those exports whose final destination is located in that country. The limited frequency and timings offered by those direct routes is likely to be insufficient to meet that need in full and it is likely to require transit through a hub airport to reach its final destination. According, we believe that on balance that the approach we have taken is likely to under rather than over-estimate the degree by which exports will require transit through a hub airport to reach there final destination.

The value of industry exports is translated in to Gross Value Added (GVA) terms using ONS (2011) UK Input-Output Tables. Summation of the industry GVA estimates equates to the total GDP impact of exports in each region. The final step is to translate the industry GVA estimates are in to jobs using regional industry-level productivity estimates based on ONS data.

3.4 Heathrow-related airport employment

Oxford Economics has estimated the number of jobs at each of Belfast International, Belfast City, Aberdeen, Edinburgh, Glasgow, Newcastle and

⁹ Eurostat, (2011), 'Air transport of goods'.

¹⁰ Eurostat, (2011), 'Extra EU27 trade since 1999 by mode of transport'.

¹¹ HM Revenue & Customs (HMRC) are responsible for collecting the UK's international trade in goods data, which are published as two National Statistics series - the 'Overseas Trade Statistics (OTS) of the UK' and the 'UK Regional Trade Statistics (RTS)'.

Manchester airports (direct jobs) that are supported by their connections with Heathrow.

The airports support other jobs in their regional economies through their supply chains and via the spending of incomes of those working at the airports and in the airports' supply chain. To calculate the total number of jobs supported in their home region by each of these mainland UK airports a multiplier was required to apply to the number of direct jobs at the airport. Different studies at different airports suggest a range of possible values for the size of this multiplier. Studies of the economic impact of Glasgow¹² and Edinburgh¹³ airports are particularly relevant as they couch the multiplier effect in terms of the impact on Scotland rather than the UK as a whole. These studies report multipliers of 1.7 and 1.1, respectively. For the purposes of this project the lower estimate calculated for Edinburgh airport has been applied to the other mainland UK airports.

For Northern Ireland we relied on a published figure for (direct) employment at Belfast International¹⁴ and on a figure quoted in material for Belfast City¹⁵ relating to its total employment impact – that is including its supply chain and spending of incomes. The multiplier of 1.1 was applied to the Belfast International direct employment figure.

Armed with these estimates of the total regional jobs impact of the airports, the Heathrow-related element was calculated by pro-rating this total by the share total passenger numbers through each of the regional airports to or from Heathrow.

3.5 Heathrow-related Capital Expenditure

In order to estimate the regional distribution of Heathrow's capital expenditure procurement, BAA conducted a survey of their Tier 1 suppliers engaged in projects specifically at the airport. In this survey, the Tier 1 suppliers were asked to detail all their Tier 2 suppliers, by amount purchased, by postcode and by type of product/service for the period spanning 2010-2011. The expenditure is allocated to local authorities and the UK countries and regions using mapping software, grossing up the figure using total Capital expenditure over the period.

3.6 Heathrow-related Operational Expenditure

Using data on Heathrow's operational procurement in 2011, detailed by category of spending and by post code of supplier, Oxford Economics were able to

¹² Glasgow Airport, (2011), 'Our vision: Glasgow airport draft master plan 2011'.

¹³ York Aviation, (2009), 'The economic impact of Edinburgh airport', Final Report, August.

¹⁴ Belfast International Airport, (2011), 'Belfast International Airport submission to the consultation on the draft Regional Development Strategy 2025'.

¹⁵ Belfast City Airport Watch, (2011), 'Developing a sustainable framework for UK aviation: Scoping document'.

allocate expenditure to broad industries and to the relevant UK country and region. These figures were then entered into the corresponding regional domestic use input-output models to quantify the corresponding direct, indirect and induced GDP and employment impacts.

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