



Taking Britain further

Heathrow's plan for connecting the UK to growth

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Contents of A4 appendices to Technical submission

- 1 Employment impacts for growth at Heathrow
- 2 Impact of Airport Expansion options on competition and choice
- 3 The importance of air freight to the UK economy
- 4 Shaping Heathrow's north-west runway proposal report on public consultation
- 5 NATS Third party risk contours and public safety zones for three runways and 740k forecast movements at Heathrow
- 6 Heathrow Employment Survey

Note

These appendices have been supplied in their original formats so additional page numbering is deemed superfluous – with the exception of appendix 03

Appendix 1:

Employment impacts for growth at Heathrow



Employment impacts from growth at Heathrow

A REPORT PREPARED FOR HEATHROW AIRPORT

May 2014

Employment impacts from growth at Heathrow

Executive Summary	1
1 Introduction	5
1.1 <i>Background and context</i>	5
1.2 <i>What is the project's objective?</i>	5
1.3 <i>How is the report structured?</i>	7
2 Direct, indirect and induced employment	8
2.1 <i>Overview of our approach</i>	8
2.2 <i>How do we quantify direct employment?</i>	9
2.3 <i>How do we quantify indirect employment?</i>	9
2.4 <i>How do we quantify induced employment?</i>	11
2.5 <i>What are our results?</i>	12
3 Catalytic employment	14
3.1 <i>How do we quantify catalytic employment?</i>	14
3.2 <i>Catalytic effects and causality</i>	19
3.3 <i>What are our results?</i>	20
4 Conclusion	23
Annexe 1: Detailed assumptions for quantifying direct, indirect and induced employment	24
Annexe 2: Detailed assumptions for quantifying catalytic employment	28
<i>Overview of methodology</i>	28
<i>Key relationship 1: Air connectivity and passenger volumes</i>	29
<i>Key relationship 2: Passenger volumes and FDI, trade and tourism</i> ..	31
<i>Key relationship 4: Tourism, FDI, trade and productivity, GDP and employment</i>	38

Employment impacts from growth at Heathrow

Figure 1. Passenger projections under 2R and 3R scenarios	6
Figure 2. Drivers of economic value considered in analysis	7
Figure 3. DII impact of an additional runway at Heathrow	8
Figure 4. Catalytic impact of an additional runway at Heathrow	15
Figure 5. The virtuous circle between connectivity and economic value	20
Figure 6. Overview of the three key relationships in calculating the employment facilitated by having a third runway	29
Figure 7. Illustration of differences in trade barriers	32
Figure 8. Return on investment	34
Figure 9. Trade and business travel by country	36
Figure 10. Evidence on relationship between face-to-face meetings and trade	37
Figure 11. Impact of FDI on productivity	39
Table 1. Summary of direct, indirect and induced employment effects – Increments from third runway	3
Table 2. Summary of catalytic employment effects – Increments from third runway	3
Table 3. Summary of catalytic macroeconomic effects - Increments from a third runway	4
Table 4. Summary of additional direct, indirect and induced employment under the 3R compared to the 2R scenario	12
Table 5. Summary of additional GDP impact under the 3R compared to the 2R scenario	13
Table 6. Summary of catalytic employment effects- Additional employment from adding a third runway	21

Table 7. Summary of macroeconomic effects- Increments from a third runway	22
Table 8. Estimates of additional employment at Heathrow under the 3R scenario	23
Table 9. Detailed results	24
Table 10. Key assumptions in estimating direct employment	25
Table 11. Key assumptions in estimating indirect employment	26
Table 12. Key assumptions in estimating induced employment	27

Executive Summary

Project context and objective

The Airports' Commission has confirmed a shortage of runway infrastructure in London, and forecasts that Heathrow, Gatwick, London City and Luton will be full by 2030. As Heathrow Airport is already at full capacity today, there is a particular shortage of hub airport capacity. In order to meet future demand for air travel, the Commission has shortlisted both Heathrow and Gatwick as potential options for expansion.

The Commission will assess these options based on their economic, social and environmental impact. In particular, expanding airport capacity has significant impacts on employment both in the local area but also more widely. As increased employment is one of the key positive contributors to economic growth, it is important to develop a robust estimate of the employment effects of expanding Heathrow.

At the same time, increases in employment, when concentrated in a small geographic area, can create local issues for public infrastructure such as housing, transport, etc.. An accurate estimate of the employment effects of Heathrow is therefore also required to inform the assessment of local infrastructure needs.

The purpose of this report is to estimate the likely employment effects from adding a third runway to Heathrow Airport. We estimate the employment effect in 2025, 2030 and 2040. To quantify the full range of employment effects, we also estimate the output effect from additional trade, FDI and tourism that is facilitated by the new runway.

Types of employment effects and summary of results

We have considered two types of employment effects. The starting point for the first effect is Heathrow Airport as a location of concentrated employment. An additional runway would lead to an increase in the volume of passengers, which requires a greater number of people to provide airport-related services. This employment effect includes three sub-categories:

- **Direct employment** at the airport and its immediate vicinity, such as security staff, check-in desks, ground handling, retail, parking, etc.;
- **Indirect employment** in airport-related services such as catering, air-crew, etc.
- **Induced employment** that is facilitated by the spending of the directly and indirectly employed.

We have estimated that a third runway at Heathrow will add **82,300 direct, indirect and induced jobs** by 2040. This has an impact of 0.65% on the GDP in 2040.

The second employment effect is based on the benefits of air connectivity provided by Heathrow Airport. Air connectivity is an important input for international business relationships, and face-to-face meetings still play an important role in facilitating business deals. Increased air connectivity as a result of a third runway at Heathrow would facilitate increased trade and foreign direct investment (FDI) which in turn has a positive impact on long-term productivity. We call these employment effects “**catalytic**”. We have also included additional employment based on tourism in this category. We have estimated that a third runway at Heathrow will add **41,200 catalytic jobs** by 2040, with an impact of 0.16% on GDP.

In total, we therefore estimate that a third runway at Heathrow would add 123,500 jobs to the UK economy, which would represent 0.81% of GDP in 2040.

Direct, indirect and induced employment effects

Our estimates of direct jobs are based on passenger and ATM forecasts and include assumptions on economies of scale and productivity improvements. We have estimated the indirect and induced employment based on multipliers from Input-Output tables.

Table 1 provides a summary of our results on the additional employment under a scenario with 3 runways (“3R scenario”) as compared to 2 runways (“2R scenario”). It shows that the employment effects grow over time as the incremental passenger volumes between two and three runways increases. It also shows that the direct employment effect is the largest. This is to be expected as it reflects the current situation at Heathrow.

Table 1. Summary of direct, indirect and induced employment effects – Increments from third runway

Year	Direct employment	Indirect employment	Induced employment	Total
2025	3,400	2,100	2,300	7,800
2030	17,900	11,300	12,100	41,300
2040	35,600	22,600	24,100	82,300

Source: Frontier Economics estimates

Catalytic employment effects

Our estimates of catalytic employment effects include additional employment based on increases in trade, FDI and tourism. We have undertaken an extensive literature review to develop appropriate parameters to quantify the role of air connectivity in facilitating trade and FDI. Our estimates are conservative as we have selected assumptions at the bottom end of each range.

Table 2 provides an overview of the catalytic employment effects. It shows that the effect grows over time as passenger volumes from the third runway grow. It also shows that the employment related to trade and FDI is significantly larger than the tourism impact, which reflects changes in both inbound and outbound tourism.

Table 2. Summary of catalytic employment effects – Increments from third runway

Year	Trade	FDI	Tourism	Total
2025	5,100	6,600	75	12,000
2030	14,500	17,800	400	32,700
2040	17,500	23,000	720	41,200

Source: Frontier Economics estimates

The catalytic employment effects are based on the increases in output associated with higher trade, FDI and tourism. **Table 3** below provides the volumes of trade, FDI and tourism spending and their impact on GDP that underpin the employment estimates. While tourism spending has a direct impact on GDP, the impact of trade and FDI is via a range of channels including fostering innovation, competition and economies of scale.

Table 3. Summary of catalytic macroeconomic effects - Increments from a third runway

Year	Trade		FDI		Tourism		GDP
	Imports	Exports	Inward	Outward	Inbound	Outbound	
2025	£501m	£330m	£453m	£850m	£16m	£11m	£765m
2030	£1.55bn	£1.03bn	£1.49bn	£2.72bn	£96m	£68m	£2.33bn
2040	£2.28bn	£1.53bn	£2.29bn	£4.1bn	£214m	£151m	£3.59bn

Source: Frontier Economics estimates

1 Introduction

1.1 Background and context

The Airports' Commission has confirmed a shortage of runway infrastructure in London, and forecasts that Heathrow, Gatwick, London City and Luton will be full by 2030. As Heathrow Airport is already at full capacity today, there is a particular shortage of hub airport capacity. In order to meet future demand for air travel, the Commission has shortlisted both Heathrow and Gatwick as potential options for expansion.

The Commission will assess these options based on their economic, social and environmental impact. In particular, expanding airport capacity has significant impacts on employment both in the local area but also more widely.

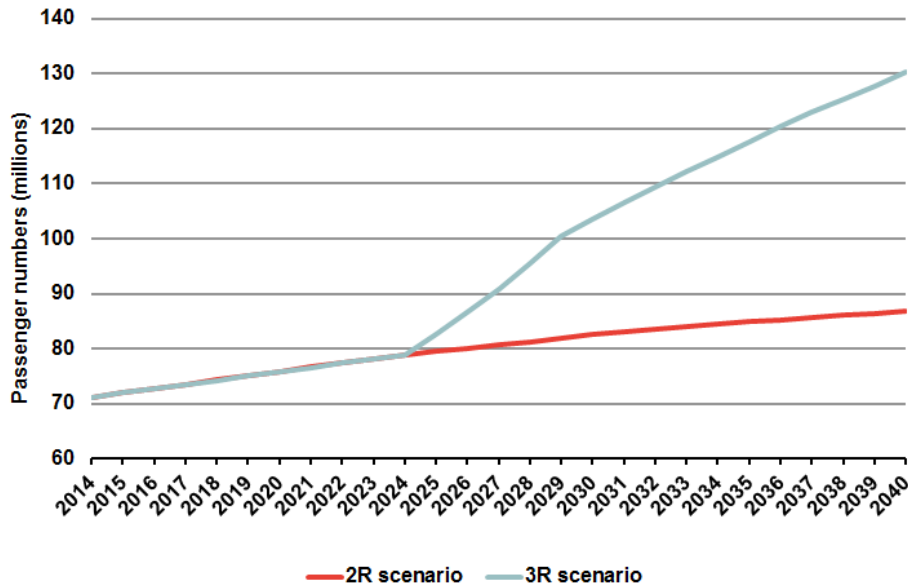
As increased employment is one of the key positive contributors to economic growth, it is important to develop a robust estimate of the employment effects of expanding Heathrow as these effects are clearly one of the key benefits.

At the same time, increases in employment, when concentrated in a small geographic area, can create local issues for public infrastructure such as housing, transport, etc.. An accurate estimate of the employment effects of Heathrow is therefore also required to inform the assessment of local infrastructure needs.

1.2 What is the project's objective?

The purpose of this project is to estimate the employment effects from adding a third runway to Heathrow Airport by comparing the employment in a two runway ("2R") scenario with a three runway ("3R") scenario. To quantify the overall employment effects, we also estimate the output effect from additional trade, FDI and tourism that is facilitated by the new runway.

We have undertaken the analysis for 2025, 2030, 2040. The analysis is based on considering the gap in traffic including passengers, ATMs and freight from moving from two to three runways. **Figure 1** provides the differences in passenger volumes in the 2R and 3R scenarios that underpin our results. It shows that the new runway is assumed to open in 2025.

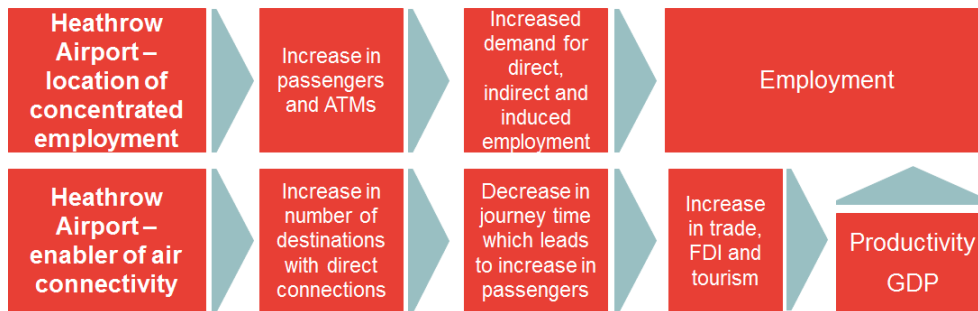
Figure 1. Passenger projections under 2R and 3R scenarios

Source: Heathrow projections

The additional runway at Heathrow has an impact on employment via two different channels illustrated in **Figure 2**.

The first channel is based on considering Heathrow Airport as a location of concentrated employment and its effect on direct, indirect and induced employment. Direct employment refers to employment generated at the airport itself. This would include security staff, check-in desks, ground handling, retail, parking, etc.. Indirect employees are those in airport-related services. For instance, catering companies that supply airlines are included in indirect employment. The wages earned by direct and indirect employees are then spent in the wider economy, and this in turn would generate more jobs. These jobs are categorised as induced employment.

The second channel is based on the benefits of air connectivity facilitated by the additional runway, as illustrated in **Figure 2** below. Additional direct connections shorten the journey time of passengers as they do not have to connect via a different hub airport now. As a result of the change in journey time, there is an incremental increase in the number of passengers, including business travel. The increase in business travel facilitates an increase in trade and FDI, which in turn has a positive impact on GDP as it improves productivity. The increase in GDP translates to an increase in employment in the UK economy. Similarly, the increase in leisure travel implies additional tourism spending which also affects GDP and therefore employment.

Figure 2. Drivers of economic value considered in analysis

In summary, our report estimates the employment resulting from the direct, indirect and induced as well as catalytic impact of an additional runway in 2025, 2030 and 2040.

1.3 How is the report structured?

The report is structured as follows:

- Section 3 provides an overall description of the types of employment effects we consider;
- Section 4 provides our methodology and results on the direct, indirect and induced employment effects;
- Section 5 provides our methodology and results for catalytic employment effects;
- Section 6 provides our conclusions.

Annexe 1 provides detailed assumptions on the estimation of direct, indirect and induced employment. Annexe 2 provides detailed assumptions on the estimation of catalytic employment effects.

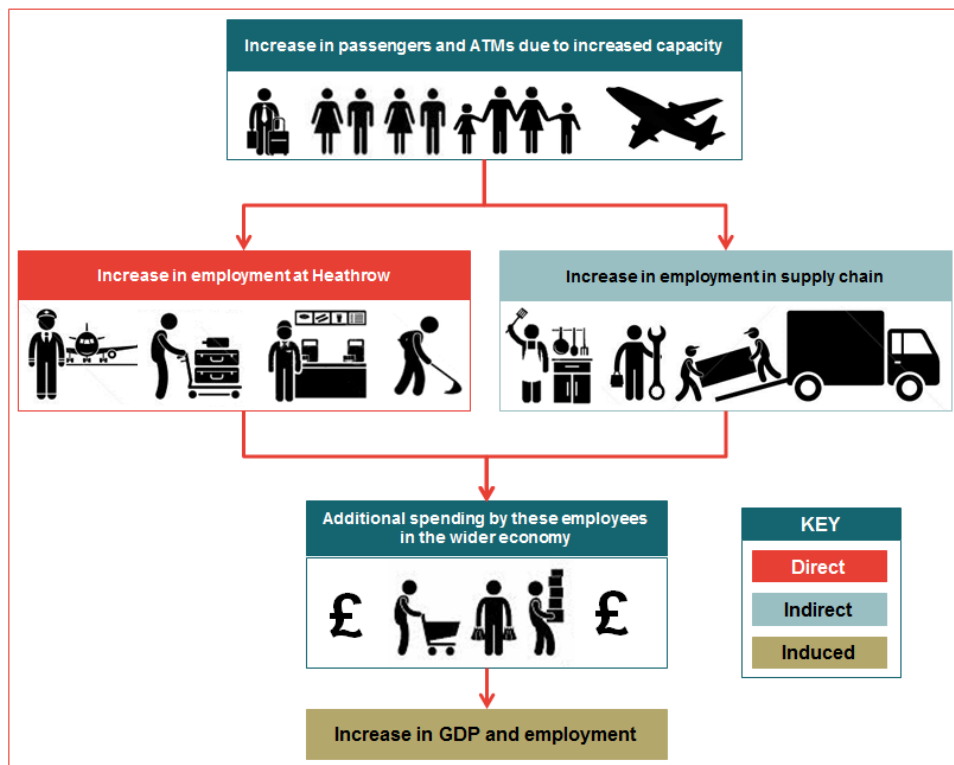
2 Direct, indirect and induced employment

This section discusses our approach and results for direct, indirect and induced (DII) employment. We first provide an overview of our approach and then discuss the methodology for each of the employment categories. We then discuss our results.

2.1 Overview of our approach

Figure 3 provides a simple illustration of the logic behind our methodology in estimating the DII impact of an additional runway at Heathrow.

Figure 3. DII impact of an additional runway at Heathrow



The additional runway permits an increase in passengers and air traffic movements (ATMs). This has a direct impact on employment at the airport and also increases indirect employment along the supply chain that supports activities at the airport (e.g. airline catering). The increase in direct and indirect employment leads to additional spending in the economy which has a positive (induced) impact on GDP and wider employment.

Direct, indirect and induced employment

The next sections describe in detail the methodology that underpins our estimates of the additional direct, indirect and induced employment at Heathrow under a 3R scenario compared to a 2R scenario.

2.2 How do we quantify direct employment?

Direct employment involves all employees whose jobs are directly related to producing the output of the airport and its immediate vicinity. As a result, we first consider what the “output” of Heathrow is, and then consider how this output drives employment in order to estimate direct jobs.

We identify two output measures of Heathrow Airport that drive changes in direct employment: passengers (PAX) and Air Traffic Movements (ATMs). Our calculations are therefore based on estimating a relationship between PAX, ATMs and direct employment. Historically, the relationship between ATMs and employment, and PAX and employment has developed in a similar way for Heathrow. Recent data for comparator airports, however, suggests different relationships for the two output measures. As a result, we use a weighted average of the growth in both ATMs and PAX as drivers of direct employment.

In addition to identifying the most appropriate drivers of direct employment, we recognise that the relationship between employment and PAX and ATMs is likely to evolve over time as Heathrow becomes more efficient. To capture this, we include an assumption on increasing labour productivity over time. In the 2R scenario, we apply productivity improvements of 0.6-0.8% p.a. which is consistent with employment either staying the same or falling slightly over time. In the 3R scenario, we assume an additional effect capturing economies of scale of 1.9-2.3% p.a. resulting from the substantial increase in PAX and ATMs. Both the productivity and economies of scale effects are based on analysis of historic data for Heathrow which, considers changes over a period both before and after the point Heathrow became capacity constrained.

The two sets of assumptions on productivity and economies of scale yield different estimates for DII employment. Our final results for each category of employment are a simple average of these estimates. Details on the employment estimates under both assumptions can be found in Annex 1.

Overall, the incremental increase in direct employment in the 3R scenario compared to 2R is therefore driven by the increase in PAX and ATMs and assumptions on economies of scale.

2.3 How do we quantify indirect employment?

Indirect employment is defined as employment along the supply chain that supports the airport. In order to estimate this type of employment we use a combination of Heathrow-specific data and national statistics.

First, we need to establish an appropriate multiplier that captures the relationships between direct and indirect jobs. The Office of National Statistics (ONS) publishes Input-Output tables which show flow of goods and services between different industries in the economy. One of the additional outputs related to these tables are multipliers. The Type I multiplier takes account of the direct and indirect effect of a one unit increase in demand for the output of an industry. While these multipliers are published at an industry level, consider the following simplified example. A Type I multiplier of 1.6 for a textbook implies that demanding the production of an additional textbook unit would lead to an increase of 0.6 units in the industries that produce inputs for the production of the textbook.

In terms of the ONS Input-Output tables, Heathrow produces several outputs. The primary output is air travel, with secondary outputs being retail and cargo. We estimate this total output using per-passenger values from Heathrow and IATA data (e.g. average ticket price and average spend per passenger at the terminal), and use passenger projections to estimate the direct output in 2025, 2030 and 2040.

Since the Input-Output tables involve classification into general industry categories, and because these outputs do not fall into a single industry, we produce a weighted average of the relevant multipliers according to the proportions of direct employment related to those categories. This gives us a single multiplier of 0.63 for the airport, which we apply to Heathrow's direct output in order to estimate its indirect output.

We assume that the multiplier remains unchanged over the time period of the estimation for two reasons. Firstly, the weighted average multiplier has not changed significantly between 1995 and 2005 (the last two years in which Input-Output tables were published). Thus, it is reasonable to assume that they will remain of a similar magnitude in the future. Secondly, our literature review has indicated that projections of multipliers are unlikely to be meaningful¹.

We therefore apply the Heathrow-specific multiplier of 0.63 to the increase in output produced directly at Heathrow as a result of the third runway. The final step involves translating the indirect output into employment figures by using an appropriate GVA-to-jobs ratio. As GVA excludes taxes² we remove a proportion of the output in each scenario to take account of taxes. This allows us to translate the output (or "GVA") into employment figures. We use a Heathrow-specific GVA-to-jobs ratio derived from the direct employment figures and the GVA

¹ Input-Output Analysis, Foundations and Extensions, Miller and Blair (2009)

² In theory, $GVA = GDP - Taxes + Subsidies$. We assume that Heathrow does not receive any subsidies and so, derive the GVA from its total output (or GDP) by removing taxes.

Direct, indirect and induced employment

figure for each scenario. Dividing output by the ratio in each scenario therefore gives us the number of induced jobs related to the activity at Heathrow.

Overall, indirect employment is therefore derived by developing Heathrow-specific multipliers that describe the effect an increase in output at Heathrow has on the wider economy and translating these effects into employment figures.

2.4 How do we quantify induced employment?

Induced employment captures the jobs created in the wider economy through additional spending by direct and indirect employees of the airport. Although Type II multipliers (another output of Input-Output tables) are suitable for calculating induced employment, these are not published by the ONS and therefore an alternative methodology is required. Our methodology for calculating induced employment in 2025, 2030 and 2040 is based on the methodology used in similar appraisals and loosely on the framework for calculating a Type II multiplier.

We consider the spending of direct employees as the average wage (post tax) at Heathrow, after removing the average proportion of income that is saved. The spending of indirect employees is estimated by using the national average wage after removing the average proportion of income that is saved. Aggregated spending by direct and indirect employees therefore provides induced GVA.

However, in order to ensure that the calculation is robust we also consider a counterfactual where these direct and indirect employees are unemployed. In this scenario, individuals that are directly or indirectly employed by Heathrow Airport as the result of the additional runway, would be spending approximately the value of Job Seekers Allowance in the base case (we assume that in this scenario they do not save any income). Therefore by subtracting GVA under the counterfactual from the GVA with direct and indirect jobs at Heathrow, we produce a conservative estimate of the additional induced GVA from the additional runway.

As for indirect employment, it is then necessary to convert the GVA values, which are produced for all scenarios based on the corresponding direct and indirect employment estimates, into employment terms to find the induced employment. We use a national GVA to jobs ratio as these jobs are likely to be spread across the whole economy.

Further details on the assumptions underpinning the direct, indirect and induced methodology can be found in Annex 1.

2.5 What are our results?

The table below shows the results for direct, indirect and induced employment. The table shows the additional employment from the third runway at Heathrow compared to the 2R scenario.

Table 4. Summary of additional direct, indirect and induced employment under the 3R compared to the 2R scenario

Year	Direct employment	Indirect employment	Induced employment	Total
2025	3,400	2,100	2,300	7,800
2030	17,900	11,300	12,100	41,300
2040	35,600	22,600	24,100	82,300

Source: Frontier Economics estimates

As we would expect, there is not a large difference in employment levels in the two runways (2R) and three runways (3R) case in 2025: we are assuming the third runway only commences operation in 2024, so in 2025 the differences in passengers and ATMs is relatively small. However, over time employment is expected to increase to a total of 82,300 additional jobs. Clearly, direct, indirect and induced employment is one of the major economic benefits from the additional runway. While direct employment will be based around Heathrow, indirect and particularly induced employment will be spread across the economy.

Table 5 below summarises the GDP impact of additional direct, indirect and induced jobs at Heathrow. We estimate that overall, there would be an addition of £7.16 billion to GDP in 2030 in the 3R scenario compared to the 2R scenario, which represents 0.37% of the GDP in 2030. In particular, additional direct employment would increase the GDP by approximately £3.9 billion in 2030. Indirect employment and induced employment would have a GDP impact of around £2.47 billion and £787 million respectively in 2030.

Direct, indirect and induced employment

Table 5. Summary of additional GDP impact under the 3R compared to the 2R scenario

Year	Direct employment	Indirect employment	Induced employment	Total
2025	£579m	367m	£148m	£1.10bn
2030	£3.90bn	£2.47bn	£787m	£7.16bn
2040	£8.05bn	£5.10bn	£1.57bn	£14.71bn

Source: Frontier Economics estimates

3 Catalytic employment

This section discusses our approach and results to estimating catalytic employment. We first discuss our methodology and then provide an interpretation of our results.

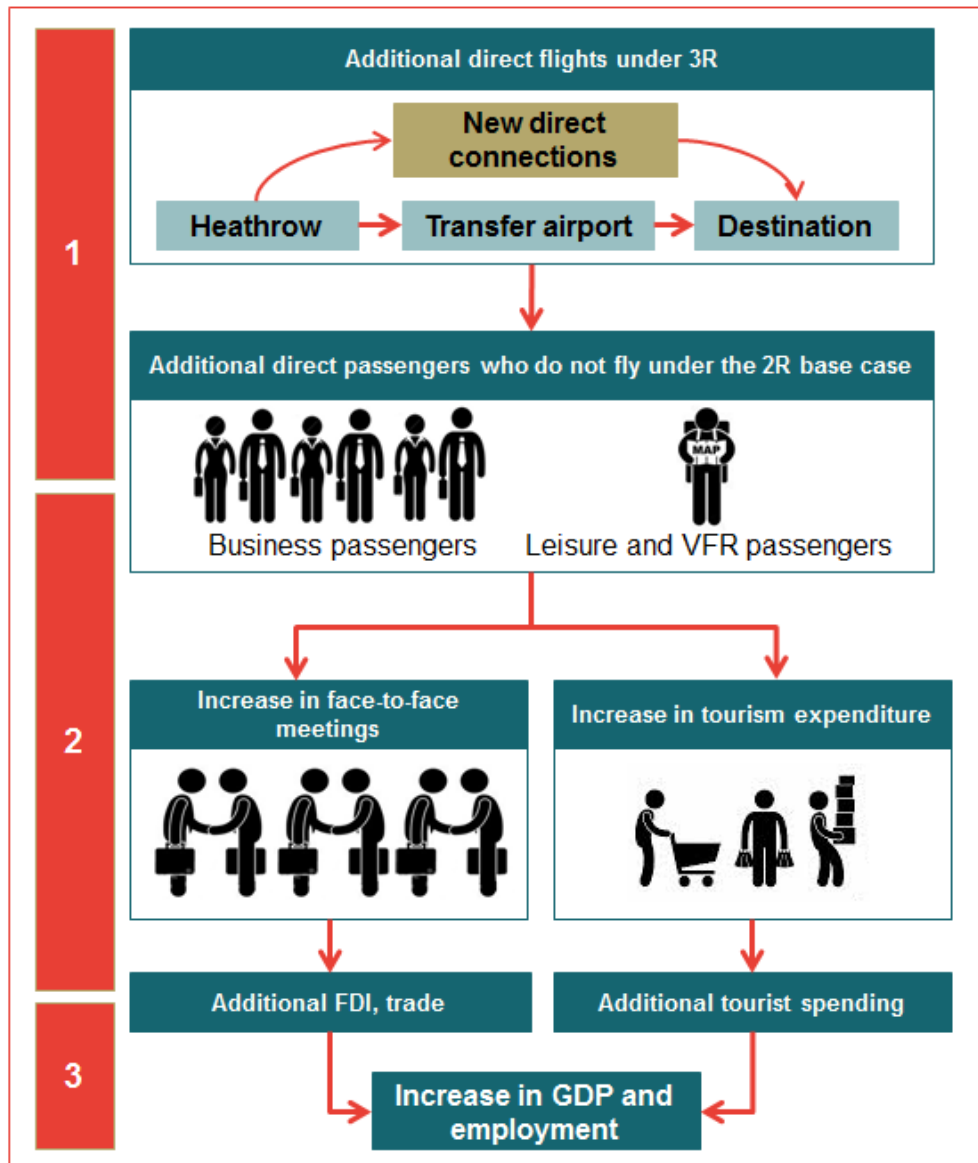
3.1 How do we quantify catalytic employment?

In contrast to the direct, indirect and induced employment, the starting point for estimating catalytic employment is the difference in air connectivity between two and three runways at various points in time. One of the key impacts from the additional runway is the ability of airlines to offer more direct connections to and from Heathrow. In order to estimate the catalytic employment impact of a third runway, we therefore focus on the routes that can be served with a direct flight under the 3R scenario but cannot be served directly in the 2R base case. Our methodology is based on three key relationships:

- Air connectivity (i.e. the number of direct routes) – passenger volumes;
- Passenger volumes – FDI, trade and tourism;
- Tourism, FDI, trade – productivity, GDP, employment. .

Figure 4 below gives a simplified outline of the logic underpinning our methodology to estimate the catalytic impact of an additional runway at Heathrow. Our methodology captures how air passenger travel affects the movements of goods and capital. As a result, it does not take into account the volume and value of increased belly hold air cargo connectivity. It also does not capture the impact of any reduced delays from the new runway.

Figure 4. Catalytic impact of an additional runway at Heathrow



In the following sections we describe each of the relationships and discuss the evidence that underpins our parameters.

Air connectivity and passenger volumes

An additional runway at Heathrow would facilitate an increase in the number of direct routes served. This implies that passengers who previously had to use an indirect flight can now access a wider range of destinations with a direct flight. The advantage of a direct connection is that it creates a saving in travel time as the in-flight time is lower and the transfer time is saved. The travel time saving

can be monetised by using a value of time. This is a common approach in land transport appraisals. The value of the time saving can then be expressed as a proportion of the generalised travel costs (the ticket price and time value). A change from an indirect to a direct connection leads to a reduction in the generalised travel costs. Applying a price elasticity to the change in generalised travel costs, we can estimate the marginal increase in passenger volumes as a result from a direct flight. Overall, an increase in the number of direct connections will therefore lead to an increase in the number of passengers as a result of reduced generalised travel costs.

Passenger volumes and FDI, trade and tourism

The additional passengers can be divided into leisure or VFR (visiting friends and relatives) and business travellers.

Additional leisure travellers lead to an increase in inbound and outbound tourism for the UK. Inbound tourists have a direct impact on the economy through the amount they spend while visiting the UK. Outbound tourists also affect the UK economy, albeit in a negative manner, via the amount they spend abroad while travelling. Tourism spending includes accommodation, food and beverages, entertainment and land transport. We apply ONS estimates for average spending by inbound and outbound tourists to the additional tourists under the 3R scenario. Because Heathrow has more inbound than outbound tourists, the net effect on GDP is positive, but being a net effect, the overall magnitude is small.

The benefit of additional business passengers is derived from the international connections they create. There is a range of literature that identifies the importance of face-to-face meetings for business in overcoming barriers to do business across countries. In particular, in cases where business partners do not share a common language or culture and where business regulations vary significantly, face-to-face meetings are essential for doing business as supported by the following examples of literature:

- A survey by the UK Institute of Directors (2008) asked about the impact on businesses if the amount of business travel by air was significantly curtailed. 30 per cent of respondents said that there would be significant adverse effect, while 44 per cent indicated small adverse effects.
- The World Travel and Tourism Council (WTTC) (2011) conducted a survey of business travellers and asked about the importance of personal contact which revealed that:
 - 28 per cent of existing business could be lost without face-to-face meetings; and

Catalytic employment

- Sales conversion rates are estimated to be 20-25 per cent higher with face-to-face meetings.
- Poole (2010) finds that business travel to the United States by non-residents, non-citizens has a positive impact on the extensive export margin.

Connectivity is also one of the factors that influence decisions on where to locate business headquarters. For example, Strauss-Kahn and Vives (2005) find that:

Headquarters relocate to metropolitan areas with good airport facilities, low corporate taxes, low average wages, high levels of business services, and agglomeration of headquarters in the same sector of activity. The effects are quantitatively significant (airport facilities in particular).

- Frankel (1997) illustrates the importance of face-to-face meetings as follows:

Consider a kind of export important to the United States: high-tech capital goods. To begin sales in a foreign country may involve many trips by engineers, marketing people, higher ranking executives to clinch a deal, and technical support staff to help install the equipment or to service it when it malfunctions.

Furthermore, the Airports Commission, in its Interim Report, conducted further research on the links between connectivity and FDI, trade and tourism. A literature review found that greater connectivity created better access to foreign markets. The Commission also made reference to the study by Poole (2010), highlighting that more easily available direct client contact plays an important role in increasing trade. Moreover, an econometric study conducted by the Commission found that a positive relationship exists between connectivity, trade and tourism and FDI in the UK. The Commission thus found that these relationships support the view that air connectivity may play an important role in enabling trade and tourism, and facilitating foreign investment in the UK.³

As face-to-face meetings are an important factor in establishing and consolidating business relationships, an increase in business passengers would lead to an increase in closing deals that support both trade and FDI. More detail on this relationship is provided in Annexe 2. Based on our literature review, we have developed business travel elasticities with respect to trade and FDI. As there is little research on the quantitative relationship between business travel and trade and FDI, we have made conservative assumptions. This is particularly relevant in two areas.

³ Section 3, Airports Commission: Interim Report, December 2013. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271231/airports-commission-interim-report.pdf

First, for Europe we have assumed that the business travel elasticities of trade and FDI are zero. Our rationale is that, the trade links between the UK and Europe are well-established so face-to-face meetings to build mutual trust and understanding are likely to have a smaller effect. Further details on the methodology and evidence supporting are provided in Annexe 2.

Second, our key assumption when modelling the catalytic impact of a third runway is that direct and indirect passengers have the same impact on trade, tourism and FDI. This is because either the origin or destination for both sets of passengers is London. We therefore only value the impact of the additional passengers that start flying as a result of the direct connection being available. As we assume that indirect connections are available in the base case, our method only values the incremental benefit from the additional passengers (i.e. those that do not fly in the base case but start flying as a result of the direct connection). We do not place a value in terms of FDI or trade on those passengers that switch from an indirect to a direct flight.

Tourism, FDI, trade and employment

Changes in trade, foreign direct investment and tourism spending have an effect on GDP and employment, but by different routes.

The net change in tourism spending has a direct (positive but small) impact on GDP. We can convert the GDP impact into employment figures by applying an appropriate GDP to jobs ratio.

Business travel has a direct impact on trade and FDI but an indirect, long term dynamic impact on GDP. From a pure accounting perspective, exports have a positive impact on GDP and imports have a negative impact in the short run. The same holds true for inward and outward investment. An equal increase in exports and imports would therefore have no impact on GDP, as the positive impact of exports would cancel out the negative impact of imports.

However, this short-term view does not take account of the long-term dynamic effects of having an open economy. A high volume of trade (both imports and exports) is indicative of an open economy. A more open economy is likely to be more productive in the long term. Productivity is one of the key drivers of GDP growth as it describes the efficiency of production. For example, if the same output can be produced with fewer inputs, productivity increases. We have reviewed a large body of academic research that investigates the positive impact of imports and exports as well as inward and outward investment on long-term productivity. Most of the literature is focused on examining the impact of trade and FDI on productivity at the firm level. The literature suggests that not only do exports and inward investment have a positive impact on productivity growth but imports and outward investment also contribute to the level of “openness” of the economy, which has a positive impact on productivity.

Catalytic employment

There are three main channels by which imports, exports, inward and outward investment can increase long-term productivity.

- a) **Innovation** – Trade is one of the key “transmitters” of innovation as it exposes companies to a wider range of products and processes in other countries. FDI can provide access to new technologies and cheaper inputs, which has a positive impact on productivity. This is particularly true for imports and outward investment.
- b) **Competition** – Competition puts pressure on companies to be more efficient. Exporting companies are faced with more competition as they compete in a larger market. Imports also put more pressure on domestic firms as they compete with a greater number of competitors.
- c) **Economies of scale** – Larger market sizes imply that production processes can benefit from economies of scale. Both trade and FDI can provide access to markets outside Ontario so that firms can reduce costs by realizing economies of scale. This is particularly true for exporting firms who can access foreign markets and therefore increase their size.

For example, the OECD, (2012) finds that:

A main channel through which trade increases income is productivity growth. Importing creates competition that forces domestic firms to become more efficient and provides access to inputs of international calibre; exporting creates incentives for firms to invest in the most modern technologies, scales of production and worker training. The combined effect is to spawn a process of continual resource reallocation, shifting capital and labour into activities with higher productivity.

This illustrates the combined effect of exports and imports. More detail on this relationship is provided in Annexe 2.

As a result, our methodology focusses on the long-term benefit that trade and FDI generate by increasing “openness” of the economy. Therefore, our conclusion is that both exports and imports, alongside inward and outward investment, have positive long-term effects on an economy.

We use FDI and trade elasticities of GDP in order to estimate the impact of the increase in total FDI and trade on the GDP in the UK in 2025, 2030 and 2040. As with estimating the employment effects of tourist spending, we apply a national GDP to jobs ratio in order to translate the increase in GDP to an increase in jobs.

3.2 Catalytic effects and causality

Studies on the relationship between connectivity and economic value are often criticised as there are a range of other factors that influence economic value. This

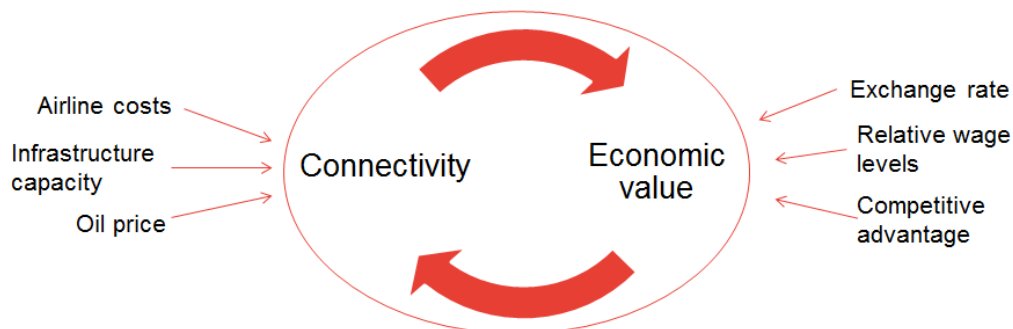
implies that connectivity should be viewed as one of the factors contributing to economic value.

While connectivity is an important factor that enables international business relationships to develop, by itself it is not sufficient to cause economic growth. Obviously, there are a range of other factors that also influence economic growth. The best way to describe this relationship is a virtuous circle (shown in **Figure 5** below). The relationship goes both ways: economic growth creates demand for connectivity, but connectivity enables growth. Both connectivity and economic value are also influenced by a range of other factors.

This reverse causality often gets ignored in studies on connectivity and economic value. We acknowledge that there is a two-way relationship between connectivity and economic value. In light of this, we interpret our results as the economic value *facilitated* by the airport rather than the economic value *generated* by the airport.

But the fact that causation works both ways does not diminish the contribution that Heathrow makes to the economy. Connectivity represents an element in a virtuous circle of economic activity and growth. While the connectivity enabled by Heathrow is not a sufficient condition for creating economic activity, the role the airport plays in the economy is a necessary condition in helping a well-functioning and open economy to achieve its full potential.

Figure 5. The virtuous circle between connectivity and economic value



3.3 What are our results?

Using the methodology described above, we estimate that a third runway at Heathrow would facilitate the addition of 12,000 jobs in the UK economy in 2025. This number is expected to increase to 41,200 by 2040.

Disaggregating the employment effect implies that additional imports and exports would be expected to add around 5,100 jobs in 2025, 14,500 jobs in 2030 and 17,500 jobs in 2040. As was described above, both imports and exports have

Catalytic employment

a positive impact on GDP and jobs as they improve the openness of the economy and thereby improve productivity.

Similarly, inward and outward FDI facilitated by improved connectivity would be expected to add 6,600 jobs in 2025 compared to the 2R scenario. This numbers would be expected to increase to 23,000 additional jobs in 2040.

Additional employment based on by tourist spending is much smaller by comparison, less than 100 in 2025, 400 in 2030 and around 720 in 2040. This is because the improved connectivity implies more inbound and outbound tourist travel. Spending by tourists to the UK is offset by tourist spending by UK residents abroad. The net effect on GDP is positive because Heathrow has more inbound than outbound tourists but the offsetting effect implies only a small level of additional employment from tourism in the 3R scenario.

Table 6. Summary of catalytic employment effects- Additional employment from adding a third runway

Year	Trade	FDI	Tourism	Total
2025	5,100	6,600	75	12,000
2030	14,500	17,800	400	32,700
2040	17,500	23,000	720	41,200

Source: Frontier Economics estimates

The employment figures are derived on the basis of the macroeconomic impact of the additional runway. We estimate that overall, there would be an addition of £2.4 billion to the GDP in 2030 in the 3R scenario compared to the 2R scenario, which represents 0.12% of the GDP in 2030. In particular, increased trade would add around £1 billion to the GDP. The impact from FDI has been estimated at £1.3 billion. As mentioned before, this takes a long term view on trade and FDI wherein both inward and outward FDI, and exports and imports have a positive impact on the economy. **Table 7** provides a breakdown of our results.

Table 7. Summary of macroeconomic effects- Increments from a third runway

Year	Trade		FDI		Tourism		GDP
	Imports	Exports	Inward	Outward	Inbound	Outbound	
2025	£501m	£330m	£453m	£850m	£16m	£11m	£765m
2030	£1.55b	£1.03b	£1.49b	£2.72b	£96m	£68m	£2.33b
2040	£2.28b	£1.53b	£2.29b	£4.1b	£214m	£151m	£3.59b

Source: Frontier Economics estimates

Our results are consistent under different scenarios

As an input for our results, we have estimated how many new direct connections a third runway at Heathrow could facilitate. In doing so, we have assumed a continuation of the current market structure – with Heathrow as a hub and Gatwick as a point-to-point airport.

It is important to check the robustness of our results with against the two additional potential market developments identified by the Airport Commission in their interim report:

- An increased adoption of lower-cost long-range aircrafts; and
- The development of Gatwick as a second hub for London.

In the first scenario, the catalytic employment effects we have estimated would be even higher. This is because an increased adoption of lower-cost long-range aircrafts would lower the passenger threshold used by airlines to assess the feasibility of a route. In turn, this would allow for a greater number of new direct connections, which would imply more additional direct passengers, increasing the catalytic impacts.

While we consider the second scenario unlikely, a new runway at Gatwick instead of Heathrow would result in much lower catalytic employment because a split hub system would be able to sustain fewer direct routes and less frequent direct connections, thus reducing the number of direct passengers.

Catalytic employment

4 Conclusion

Overall, we estimate that an additional runway at Heathrow will facilitate an additional 123,500 jobs by 2040 of which 82,300 are related to direct, indirect and induced (DII) employment and 41,200 are related to catalytic employment. **Table 8** provides the breakdown of our results.

Table 8. Estimates of additional employment at Heathrow under the 3R scenario

Type of Employment		2025	2030	2040
DII	Direct	3,400	17,900	35,600
	Indirect	2,100	11,300	22,600
	Induced	2,300	12,100	24,100
DII Total		7,800	41,300	82,300
Catalytic	Trade	5,100	14,500	17,500
	FDI	6,600	17,800	23,000
	Tourism	75	400	720
Catalytic Total		12,000	32,700	41,200
Grand Total		20,000	74,000	123,500

Source: Frontier Economics estimates

Considering the development of additional employment over time, it is in line with passenger growth. We see the biggest increase in total additional DII and catalytic employment between 2025 and 2030 as the airport starts to make use of the increased capacity available. Additional DII employment approximately doubles between 2030 and 2040. However, additional catalytic employment increases by only 26% over the same period. This is because of the drivers of the two types of employment are different as the DII employment is related to passenger volumes and ATMs whereas catalytic jobs are driven by new direct connections.

As discussed in Section 3, we have assumed that the additional direct flights to Europe from Heathrow would not have a catalytic impact. This implies that our results for catalytic jobs are conservative.

Annexe 1: Detailed assumptions for quantifying direct, indirect and induced employment

In Section 2 we discuss our approach to quantifying direct, indirect and induced employment. As we use a range of productivity improvements from 0.6-0.8% p.a. and also a range of economies of scale effects from 1.9-2.3% p.a., the ranges of results are presented in **Table 9** below. We have taken the midpoint of these results as our central results presented in the main body of the report.

Table 9. Detailed results

Direct Employment	2025	2030	2040
Totals under 2R	73,660-75,462	72,724-75,257	72,510-75,795
Totals under 3R	77,029-78,815	90,852-92,903	108,022-110,546

Indirect Employment	2025	2030	2040
Totals under 2R	46,659-47,801	46,066-47,671	45,931-48,012
Totals under 3R	48,793-49,925	57,549-58,849	69,059-70,025

Induced Employment	2025	2030	2040
Totals under 2R	49,733-50,950	49,101-50,812	48,957-51,175
Totals under 3R	52,008-53,214	61,341-62,726	73,609-74,638

Table 10 provides an overview of the key assumptions we use to estimate direct employment.

Table 10. Key assumptions in estimating direct employment

Input	Assumptions/Source
ATMs and PAX relationships with employment	Historical and comparator airport evidence suggested that both ATMs and PAX should be used to inform direct employment predictions. The weights allocated were based on a study which examines the drivers of growth in employment at hub airports.
ATMs projections	Heathrow provided projections for Air Traffic Movements under the 2R and 3R scenarios for 2025, 2030 and 2040.
PAX projections	Heathrow provided projections for Passenger numbers under the 2R and 3R scenarios for 2025, 2030 and 2040.
Labour Productivity	<p>Historical evidence from Heathrow suggests that employment is likely remain stable in constrained environment. We assume that there are no economies of scale in this scenario. Given PAX and ATM predictions a labour productivity improvement of 0.6% p.a. would keep employment stable in the 2R scenario.</p> <p>A CAA report on opex efficiency estimates a productivity benchmark for Heathrow based on adjusted TFP. The suggested range is 0.8-1.7% p.a. It is plausible that over a substantial period employment be at the lower end of this scale so a 0.8% productivity rate is also plausible. We therefore model both scenarios to produce a range.</p>
Economies of scale multiplier	<p>In the 3R scenario, due to increased capacity there are likely to be economies of scale in addition to labour productivity improvements. Our estimates are based on historic data for Heathrow over a period where capacity was not constrained. We remove pure productivity and use the PAX relationships with employment we extract the employment savings which can be associated with economies of scale.</p> <p>Using labour productivity of 0.6% p.a. results in economies of scale of 2.3% p.a. whilst using 0.8% productivity results in economies of scale value of 1.9% p.a. These economies of scale improvements are applied to the incremental growth in ATMs and PAX weighted for consistency with the 2R calculations.</p>

Table 11 provides our key assumptions for estimating indirect employment.

Annexe 1: Detailed assumptions for quantifying direct, indirect and induced employment

Table 11. Key assumptions in estimating indirect employment

Input	Assumptions/Source
Composite Type I multiplier	We construct a composite multiplier for Heathrow using the ONS 2005 Input Output tables Type I multipliers. We create a weighted average of the multipliers for the industries that apply to the output at Heathrow using proportions of employees in those categories from current Heathrow data. This provides us with a multiplier that approximately relates to the combination of outputs (and hence inputs) that Heathrow produces (uses).
Heathrow GVA/Jobs ratio	<p>To create a GVA to jobs ratio for each year, we use the estimates of direct jobs produced and combine this with estimates of Heathrow GVA. These estimates are based on considering Heathrow's outputs (based on data provided by Heathrow). Output is determined as per passenger spend (including average air fares and average retail spend) combined with PAX predictions. Average Tax is removed to convert output to a GVA figure.</p> <p>The GVA/jobs ratio in each scenario allows us to convert the indirect output found using the type I multiplier to a corresponding number of jobs.</p>

Table 12 provides an overview of the key assumptions in estimating induced employment.

Table 12. Key assumptions in estimating induced employment

Input	Assumptions/Source
Heathrow Employee Average wage	We use the figure published in the 2011 Optimal Economics report on the average wage of a Heathrow employee scaled by inflation to determine the approximate 2013 value.
National average wage	We use the most recent ONS national average wage figures and scale by inflation to find the approximate 2013 value.
Job Seekers Allowance	We use the basic 2013 value for Job Seekers Allowance published online by the government.
Savings rate	We use an average of historical savings rates produced by the ONS, to find the average proportion of income that is saved not spent. This allows us to estimate the value of employees' wages which are re-entering the economy as spending.
GVA/Jobs Ratio	We use the most recent national average GVA to jobs ratio which we scale by inflation to find the approximate 2013 value.

Annexe 2: Detailed assumptions for quantifying catalytic employment

This Annexe provides more detail on our methodology to estimate catalytic employment and the literature we reviewed to inform our assumptions. It is structured as follows:

- Overview of key steps in the methodology;
- Key relationship 1 – Air connectivity (i.e. the number of direct routes) and passenger volumes: detailed approach and evidence to underpin assumptions;
- Key relationship 2 – Passenger volumes and FDI, trade and tourism: detailed approach and evidence to underpin assumptions; and
- Key relationship 3 – Tourism, FDI, trade and productivity, GDP and employment: detailed approach and evidence to underpin assumptions

Overview of methodology

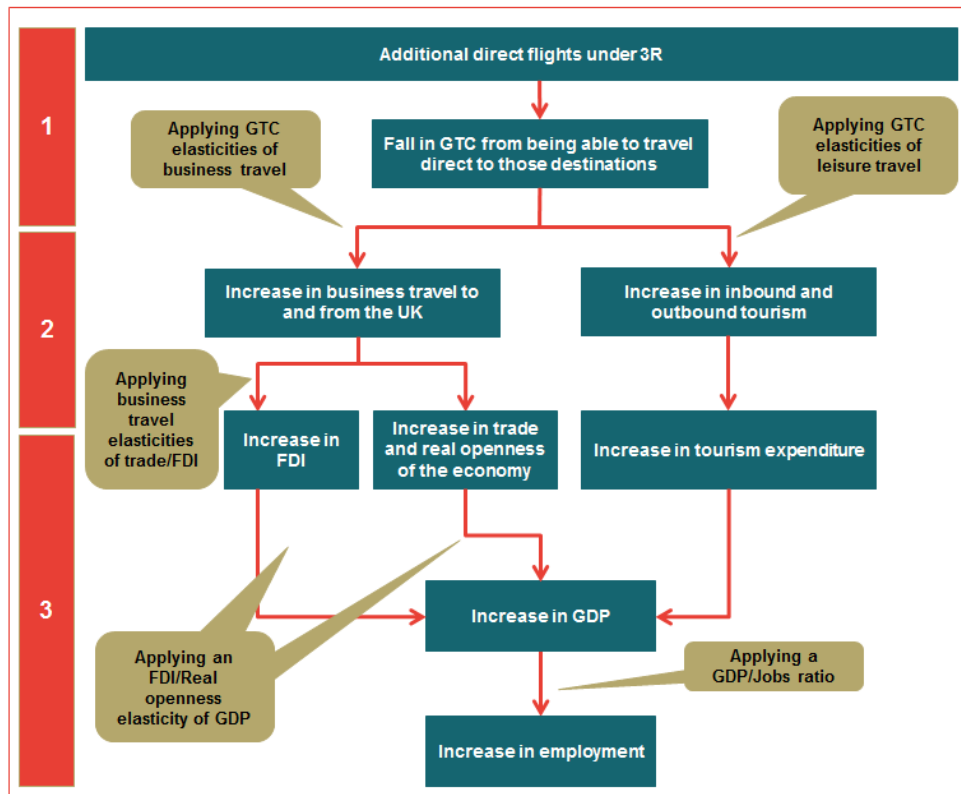
Our methodology follows the steps illustrated in **Figure 6**. Our starting point is the additional direct flights that could be added if there was a third runway in the years under consideration- 2025, 2030 and 2040. For FDI and trade, we undertake the analysis at a country level, rather than a city level, because trade and FDI data is provided at the country-level. For tourism, we carry out the analysis at a city-level.

We determine the additional travel time for the indirect connection by considering the additional distance flown and connecting time at the transfer airport. Distance is determined using a great circle route mapping tool. Switching from a direct to an indirect flight leads to a greater percentage increase in travel time for destinations that are closer to Heathrow. For example, adding 3 hours of travel time to a 5 hour journey represents a bigger percentage increase than adding 3 hours of travel time to a 12 hour journey. As a result, the impact of an indirect flight is greater for destinations that are closer.

We convert the additional travel time into a monetary value by applying the value of time derived from the Department for Transport's (DfT) analysis of values of time and hourly wage rates. The change in the travel cost is then related to the price of the original ticket to determine the percentage change in the travel cost. Using a price elasticity of demand, we can determine the change in total demand for travel to each destination. We then relate the percentage increase in passengers to a change in trade, FDI and tourism spending by using the

elasticities discussed in the sections that follow. Changes in trade, FDI and tourism spending can then be related to the impact on GDP and employment.

Figure 6. Overview of the three key relationships in calculating the employment facilitated by having a third runway



We use data on FDI flows by partner country (both inward and outward FDI) for the UK from the OECD. Data on exports and imports between the UK and the rest of the world is available from the HMRC. We used ONS data published in Overseas Travel and Tourism releases on tourist spending and purpose of visit in order to estimate the impact on tourism.

Key relationship 1: Air connectivity and passenger volumes

Additional direct connections imply that passengers will save time spent travelling by choosing to fly direct rather than indirect. By monetising the travel time saved, we can estimate the change in demand for direct travel, and hence the number of additional passengers that will fly direct. This then enables us to estimate their impact on trade, FDI and tourism.

Annexe 2: Detailed assumptions for quantifying catalytic employment

The methodology behind monetising the travel time and estimating the increase in direct passengers is outlined in the formula below:

$$\frac{((\text{Additional travel time} * \text{Value of time}) / \text{Ticket price}) * \text{Travel cost elasticity of demand}}{\text{Change in number of passengers}}$$

The change in travel time is calculated on the basis of additional travel distance multiplied with average speed. We distinguish speed for take-off and landing from the speed during the flight and use the following assumptions:

- average speed during flight: 500 mph; and
- average speed for take-off and landing: 250mph.

Distance is calculated on the basis of great circle routes. We add additional connecting time at the airport. Our results are based on an assumption of an average of 1 hour of connecting time for a short-haul flight and an additional 3 hours on average of connecting time for a long-haul flight. This implies that passengers would need 1-3 hours between landing and take-off for their connecting flights. We consider this assumption to be conservative, as this is likely to be close to the minimum rather than the average connecting time. The total additional connecting time is therefore equal to the additional flight time plus the connecting time. Our results show that the additional travel time varies from 1.1 hours to 3.5 hours.

We monetise the value of time by using hourly wage rates from the ONS and the DfT's estimates of values of time. For business travellers our value of time is £50 which is informed by the DfT's estimate of Value of Working time per person for a rail passenger (Tag Unit 3.5.6, Values of Time and Vehicle Operating Costs, October 2012). We estimate that the value of working time of an air passenger would be as much, if not more, than a rail passenger. While recent estimates suggest a working time for a rail passenger closer to £30, this is likely to be based on increased use of mobile internet access. As this does not generally apply to air travel (even though wifi is available on some flights), we use the rail passenger value of time of £50. For non-business travel, we use the hourly wage rate to estimate the value of time saved by travelling direct. We use the ONS estimate of £16 for mean hourly earnings from their analysis of Patterns of Pay⁴. We adjust wage rates for other countries using Purchasing Power Parity.

Ticket prices are based on IATA data. We reviewed a number of studies on the price elasticity of demand. The most disaggregated values are available from IATA (2007). We have used these to estimate a travel cost elasticity of -0.70.

⁴ "Patterns of Pay: Estimates from the Annual Survey of Hours and Earnings, UK, 1997 to 2013", 27 February 2014, ONS

Annexe 2: Detailed assumptions for quantifying catalytic employment

Key relationship 2: Passenger volumes and FDI, trade and tourism

In this section, we describe the link between passenger volumes and FDI, trade and tourism as follows:

- Relationship between face-to-face meetings and trade and FDI
- Relationship between leisure passengers and tourist spending

Relationship between face-to-face meetings and trade and FDI

Our analysis of the value of a third runway at Heathrow requires us to make an assumption on the relationship between face-to-face meetings, trade and FDI. Face-to-face meetings increase the likelihood of closing business deals which has a positive impact on trade and FDI. Face-to-face meetings are also important to manage increasingly globalized supply chains. This relationship is supported by qualitative literature, but it is difficult to quantify the relationship.

Concept

Despite the rise of technologies such as videoconferencing, face-to-face meetings still play an important role in developing and maintaining successful business relationships. Most relationships are built on trust between business partners and face-to-face meetings are still the most effective way to build and establish trust. In addition, in-person meetings can be used to inspect production sites and meet larger teams which cannot be done through videoconferencing.

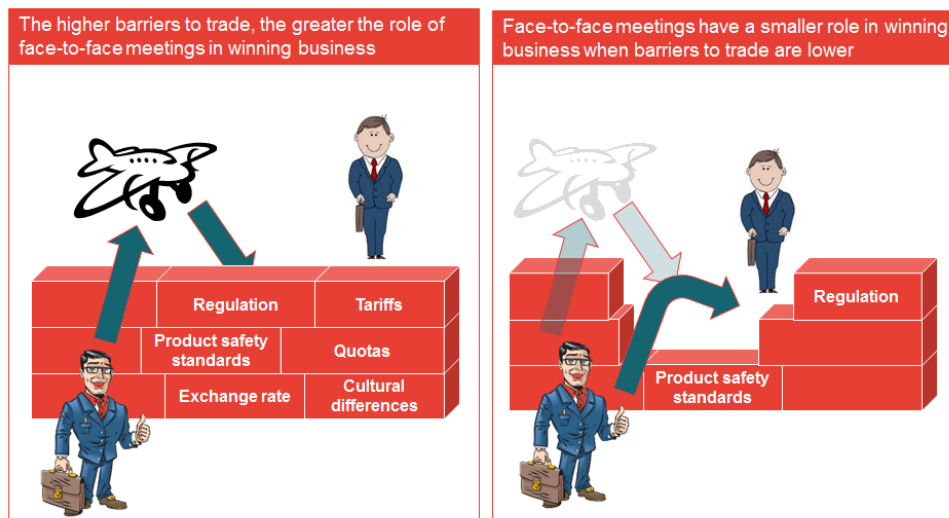
This is because face-to-face meetings play a role in overcoming trade and FDI barriers between economies. The most common barriers include:

- **Product market regulation** – a range of different types of regulation (product standards, safety regulation, etc.) can inhibit trade and FDI across borders;
- **Tariffs and quotas, local content requirements** – formal trade barriers such as tariffs also reduce the likelihood of trade;
- **Exchange rate** – the risk of changes in the exchange rate can pose a significant barrier to trade and FDI, as exchange rate volatility can increase the spread of potential returns; and
- **Cultural differences** – language differences and different business cultures can impede business relationships across cultures as it is more difficult to build trust.

Annexe 2: Detailed assumptions for quantifying catalytic employment

Business travel can reduce or overcome some of these barriers, as face-to-face meetings enable a better understanding of local product market regulation and formal trade barriers. Face-to-face meetings are also one of the key ways to build trust across cultures. **Figure 7** illustrates this concept.

Figure 7. Illustration of differences in trade barriers



These barriers are much lower when considering trade and FDI between the UK and Europe compared to other international transactions. This is because cultural differences are much smaller (for example, common language), and the trade links between the UK and Europe are well-established. Therefore, face-to-face meetings to build mutual trust and understanding are likely to have a smaller effect. For this reason, we assume that additional direct travel to and from Europe has no impact on trade and FDI.

Review of evidence

There is a range of qualitative, survey-based evidence that suggests face-to-face meetings play an important role in business relationships. We discuss these below. The importance of in-person meetings for trade facilitation is also supported by the existence of trade missions. For example, UK Trade and Investment (UKTI) helps UK-based businesses in establishing links with overseas partners. Among other events, they organise trade missions for different sectors/industries involving workshops, fairs, speakers, etc. which facilitate networking and business opportunities.

The World Travel and Tourism Council (2012) finds that sales conversion rates with an in-person meeting are 50 per cent, compared to conversion rates of 31 per cent without an in-person meeting. The results are based on surveys in Brazil,

Annexe 2: Detailed assumptions for quantifying catalytic employment

China, Germany, the UK and the USA and are consistent across these countries. In 2011, the WTTC conducted another survey on the importance of business travel and found that 28 per cent of existing business could be lost without face-to-face meetings and sales conversion rates are estimated to be 20-25 per cent higher with face-to-face meetings. This is further supported by a range of qualitative studies.

- Frankel (1997) illustrates the importance of face-to-face meetings as follows:

Consider a kind of export important to the United States: high-tech capital goods. To begin sales in a foreign country may involve many trips by engineers, marketing people, higher ranking executives to clinch a deal, and technical support staff to help install the equipment or to service it when it malfunctions.
- A survey by the UK Institute of Directors (2008) asked about the impact on businesses if the amount of business travel by air was significantly curtailed. 30 per cent of respondents said that there would be significant adverse effects while 44 per cent indicated small adverse effects.
- Poole (2010) finds that business travel to the United States by non-resident, non-citizens has a positive impact on export margins. This report has also been cited by the Airports Commission.
- Aradhyula & Tronstad (2003) find that their results support the hypothesis that both formal business exploration and casual exposure to cross-border business opportunities have a positive impact on trade.
- Strauss-Kahn & Vives (2005) find that headquarters relocate to metropolitan areas with good airport facilities, low corporate taxes, low average wages, high levels of business services, and an agglomeration of headquarters in the same sector of activity. The effects are quantitatively significant (for airport facilities in particular).
- The City of London (2008) surveyed finance and insurance companies on the importance of air travel. They found that 69 per cent of firms consider air travel to be critical for business travel by their staff, with only 2 per cent viewing it as not important.
- Boeh & Beamish (2012) demonstrate that travel time between different locations has a significant predictive power in firm governance and location decisions, as travel time could otherwise be employed for productive purposes.

Annexe 2: Detailed assumptions for quantifying catalytic employment

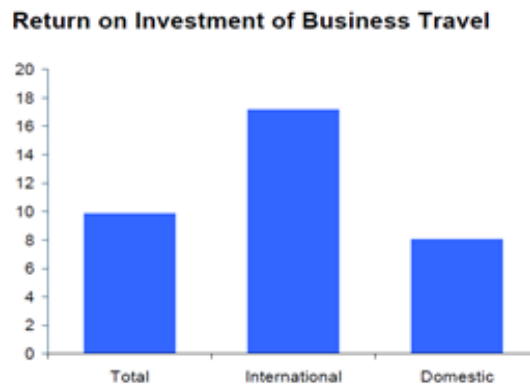
- Napier University (2004) finds that “[...] *air transport per se is not a necessary condition, but what is important are: the extent to which that area is plugged directly into other major international hubs - availability and efficiency of routes (direct, hubbed); costs and the level of competition in global transport market, and; perceived and actual interchange efficiencies. This is a key consideration in the level of foreign investment into an area and is most important for firms with international trading or contacts such as, high-tech firms, financial services and pharmaceutical firms*”.

Survey-based evidence also suggests that the importance of face-to-face meetings depends on differences between business partners. Evidence from the World Travel and Tourism Council (WTTC) and the Harvard Business Review indicates that international business travel plays a more important role in generating and sustaining business than domestic travel. The WTTC (2012) found that:

- One extra dollar invested in international business travel would generate on average US\$17 in trade; and
- One extra dollar invested in domestic US business travel by companies results in an increase in revenue of US\$9.50.

This implies that the return on investment for international travel is roughly half of domestic travel. **Figure 8** illustrates the difference in the return on investment.

Figure 8. Return on investment



Source: World Travel and Tourism Council, 2011

Similarly the Harvard Business Review (2009) confirms the role of face-to-face meetings in facilitating and sustaining business deals and also provides some evidence for the specific role of business travel to overcome barriers to trade across different cultures. For example, it found that:

Annexe 2: Detailed assumptions for quantifying catalytic employment

- 93 per cent of survey respondents agreed that in-person meetings are helpful in negotiating with people from different language and cultural backgrounds;
- One survey respondent said that “*Communicating with our Chinese partners is enough of a challenge without face-to-face, because it is very difficult to explain a difference in perspective without body language*”; and
- A number of respondents described the need to work with clients in their own environment to get a full picture of the challenges and opportunities they face.

There is a small amount of literature that supports this view.

- Cristea (2011) found robust evidence that the demand for business-class air travel is directly related to volume and composition of exports in differentiated products. The paper finds that trade in R&D intensive manufactures and goods facing contractual frictions is most dependent on face-to-face meetings. Contractual frictions are more likely to occur with higher trade barriers so this would support a conservative assumption of an elasticity of zero for trade between the UK and Europe compared to the rest of the world.
- Poole (2010) finds that business travel for the purpose of communication acts as an input to international trade. The effect is stronger for differentiated products and for higher-skilled travellers, reflecting the information intensive nature of differentiated products. The effect is driven by travel from non-English speaking countries, for which communication with the U.S. by other means may be less effective. The findings therefore also confirm our view that business travel plays a bigger role when connecting firms from different cultural backgrounds.

Selection of assumption values

Quantitative evidence on the relationship between face-to-face meetings and trade/FDI is difficult to obtain. This is because it is difficult to pick out the impact of face-to-face meetings from the other factors that influence trade and FDI.

The World Travel and Tourism Council (WTTC) performed an econometric analysis on the relationship between flights and trade/FDI for a range of countries as shown in **Figure 9**. The figure shows the correlation coefficient as well as the results of the Granger test for causality. The figure shows that the correlations vary between 0.17 for outbound business travel from Italy to 0.98 for outbound business travel from Brazil.

Annexe 2: Detailed assumptions for quantifying catalytic employment

Figure 9. Trade and business travel by country

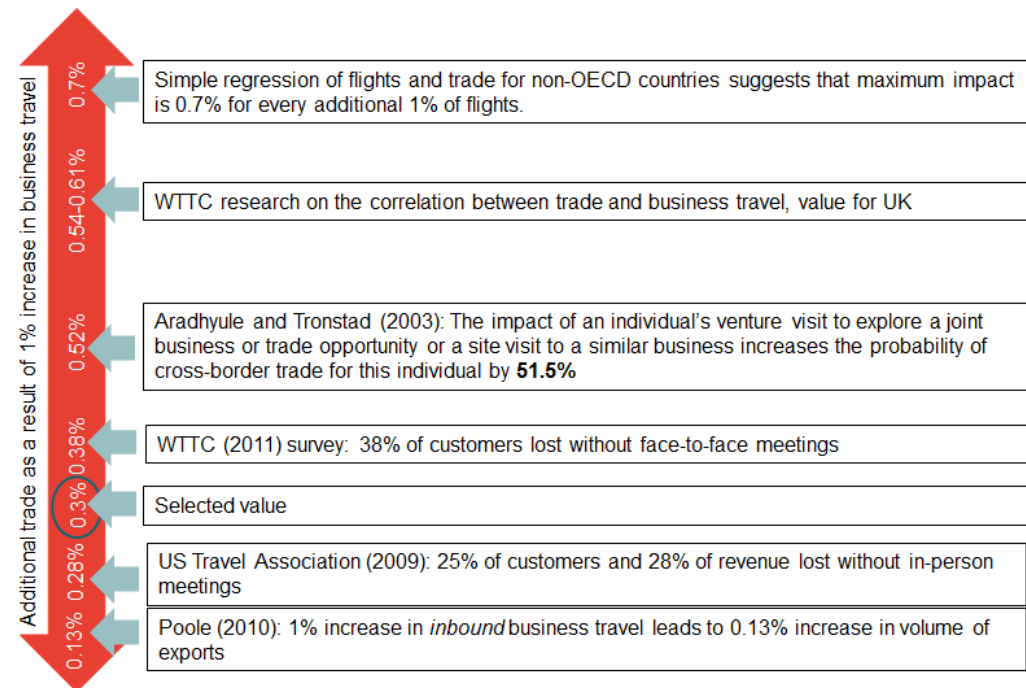
Trade & Business Travel by country						
	Inbound business travel vs imports			Outbound business travel vs exports		
	Correlation	Causality (% confidence)		Correlation	Causality (% confidence)	
		Travel causes	Trade causes		Travel causes	Trade causes
US	0.87	95%	26%	0.65	82%	86%
Canada	0.92	100%	99%	0.85	98%	87%
UK	0.54	65%	85%	0.61	95%	80%
France	0.49	57%	85%	0.63	61%	92%
Germany	0.97	90%	81%	0.69	60%	98%
Italy	0.52	99%	100%	0.17	58%	99%
Spain	0.20	75%	99%	0.74	91%	80%
Japan	0.91	97%	53%	0.40	74%	92%
China	0.32	92%	95%	0.67	90%	99%
Russia	0.83	50%	90%	0.52	100%	95%
Brazil	0.57	100%	100%	0.98	88%	87%
India	0.72	84%	66%	0.46	99%	58%
UAE	0.42	83%	49%	0.82	95%	64%
Singapore	0.70	96%	94%	0.74	83%	53%
Hong Kong	0.67	95%	100%	0.43	86%	78%

Note: causality is shown as the probability that the identified casual relationship is true

Source: WTTC, 2012

We acknowledge that it is difficult to select an appropriate estimate for the relationship between trade and business travel. We have considered a range of evidence as illustrated in **Figure 10** and have selected 0.3% as the elasticity. In the context of the available evidence, this is a conservative estimate.

Figure 10. Evidence on relationship between face-to-face meetings and trade



It is even more difficult to select an appropriate estimate for the relationship between FDI and flights as little research has been done on this topic. For example, a survey of businesses in Munich indicated that 55% of foreign businesses would not be located in the region around the airport if air connectivity was not satisfactory. Regressions of inbound passengers and inward FDI for different country/airport combinations suggest that the elasticity may be as high as 0.67. As these regressions suffer from omitted variable bias and endogeneity issues, we consider this an upper bound only. In order to select a conservative estimate, we have selected 0.3 as the elasticity of business travel to FDI.

Relationship between leisure passengers and tourist spending

The additional direct connections and travel time savings imply more tourist visits to the UK as well as more UK tourists abroad. In order to estimate the impact of connectivity on tourism spending we have obtained data on spending by purpose of visit from the ONS Overseas Travel and Tourism Quarterly Release for Q3 2013. We estimate the average spend per passenger (for overseas visitors to the UK and for UK citizens abroad), and then multiply these values by our tourist passenger increase under the 3R scenario. This provides an estimate of the value of inbound and outbound tourism spending facilitated by Heathrow. The net gain to the UK economy is obtained by subtracting outbound spending from inbound spending, and this feeds straight into the GDP for the year under

consideration. Because Heathrow has more inbound than outbound tourists, the net effect is small but positive.

Key relationship 4: Tourism, FDI, trade and productivity, GDP and employment

We break this section into separate relationships:

- Trade, productivity and GDP;
- FDI, productivity and GDP;
- GDP and employment

Trade, productivity and GDP

A large body of academic research investigates the positive impact of trade on productivity at the firm level. At the economy-wide level, there are also some studies which suggest additional trade leads to higher productivity. The key mechanisms by which trade influences productivity can be characterized in three ways:

- **Innovation** – trade is one of the key “transmitters” of innovation as it exposes companies to a wider range of products and processes in other countries. This applies regardless of whether the partner country is a developed or developing economy.
- **Competition** – as trade increases the market size companies that export or import are faced with more intense competition. Competition puts pressure on companies to be more efficient. This applies to trade with any partner country.
- **Economies of scale** – larger market sizes imply that production processes can benefit from economies of scale. This also applies to trade any partner country.

For example, the OECD, (2012) found that: *“A main channel through which trade increases income is productivity growth. Importing creates competition that forces domestic firms to become more efficient and provides access to inputs of international calibre; exporting creates incentives for firms to invest in the most modern technologies, scales of production and worker training. The combined effect is to spawn a process of continual resource reallocation, shifting capital and labour into activities with higher productivity”*.

Importantly, the impact of trade on productivity holds for both exports and imports. This is because we are considering the long-term impact on trade on productivity instead of the short-term. In the short-term import substitution can

Annexe 2: Detailed assumptions for quantifying catalytic employment

lead to structural changes in the economy that require some adjustments. However, once resources are allocated to more productive uses, imports have a long-term positive impact on productivity. The study that underpins our main assumption uses a measure of “real openness” which is the sum of exports and imports over GDP.

The OECD has undertaken a study with data from 21 high-income countries over nearly 30 years controlling for other factors: every 10-percentage point increase in trade exposure (as measured by trade share of GDP) contributes a 4-percent increase in GDP per capita. Similarly, in 2007 the European Commission stated that *“For instance, empirical analysis indicates that, on average, a 1% increase in the openness of the economy, as measured by the ratio of imports to value added, results in an increase of 0.6% in labour productivity in the following year”*. To select a conservative assumption, we have used the lower figure of 0.4 as indicated by the OECD research.

FDI, productivity and GDP

Both inward and outward FDI have a positive impact on productivity and competitiveness. Our research suggests that access to new markets, cheaper inputs and new technology or know-how boosts the scale and efficiency of domestic production. The underlying theory is similar to that applied to free trade agreements. **Figure 11** summarizes how FDI can impact on productivity.

Figure 11. Impact of FDI on productivity

	Rationale	Long term impact of FDI
Horizontal FDI	Direct access of new markets	<ul style="list-style-type: none"> • In the long run firms gain competitiveness by accessing new markets or penetrating existing ones • Productivity and hence domestic production increases
Vertical FDI	Access to cheaper inputs	<ul style="list-style-type: none"> • Firms can import intermediate goods from foreign plants at lower costs • Firms can produce a greater volume of final goods at lower costs • This new production chain is more efficient • Competitive positive improves and domestic output increases
Technology-sourcing FDI	Access to new technologies	<ul style="list-style-type: none"> • Firms acquire foreign firms or establish R&D facilities in “foreign centres of excellence” • Transfer of technological know-how, management techniques and other knowledge back to parent company • Productivity and hence domestic production increases

Evidence on the specific impact of FDI on productivity is limited. We have found the following studies:

- DIW (2009) studies the relationship between outward FDI and economic growth. They find that FDI enables firms to enter new markets, import intermediate goods from foreign affiliates at lower costs and access foreign technology. As a result the domestic economy benefits from outward FDI due to increased competitiveness of the investing companies and associated productivity spill-over to local firms. The analysis shows that for every 1 per cent increase in outward FDI stock, local GDP increases by 0.19 per cent.
- Korea Institute for International Economic Policy (2008) studies the relationship of inward FDI and productivity using Ireland as a case study. They find that FDI advances new foreign technology or import of new intermediary goods and enhances growth by accumulation of human capital by means of labour training or absorption of technology and new management techniques. Their analysis shows that for a 1 per cent increase in inward FDI stock, local GDP increases by 0.24 per cent.

Based on the quantitative analysis we reviewed, we make the following assumptions:

- a 1% increase in inward FDI increases productivity and thus, GDP by 0.24 %; and
- a 1% increase in outward FDI increases productivity and thus, GDP by 0.19 %.

GDP and employment

The relationships between trade, FDI and GDP give us a percentage change in GDP resulting from the change in trade and FDI. In order to estimate the value of this impact in money terms, we estimate GDP for the UK in 2025, 2030 and 2040 using projections of GDP growth from HSBC Bank (2012). We then convert the contribution of GDP into employment. For this, we have assumed that for every £50,000 of GDP, one full-time job is created. This is based on the average GDP per filled job from latest ONS figures. We assume that GDP per job increases by 2% per annum as labour productivity increases.

Annexe 2: Detailed assumptions for quantifying catalytic employment

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Appendix 2:

**Impact of Airport Expansion
options on competition and
choice**



Impact of airport expansion options on competition and choice

A REPORT PREPARED FOR HEATHROW AIRPORT

April 2014

Impact of airport expansion options on competition and choice

Executive Summary	1
1 Introduction	5
1.1 <i>Background and context</i>	5
1.2 <i>Project objective</i>	6
1.3 <i>Assessment framework</i>	6
1.4 <i>Report outline</i>	8
2 Impact of expansion options on ticket price	9
2.1 <i>Theory</i>	9
2.2 <i>Heathrow expansion</i>	12
2.3 <i>Gatwick expansion</i>	14
2.4 <i>Comparing Heathrow and Gatwick expansion</i>	17
3 Impact of expansion options on connectivity	19
3.1 <i>Theory</i>	19
3.2 <i>Heathrow expansion</i>	21
3.3 <i>Gatwick expansion</i>	22
3.4 <i>Comparing Heathrow and Gatwick expansion</i>	25
4 Conclusion	27
Annexe 1: Conceptual model of airport competition	29
Annexe 1.2: Modelling outputs	37
Annexe 2: Fare analysis	41
Annexe 2.2: Overlap analysis	69
Annexe 2.3: Regression results	73
Annexe 3: Connectivity model	81

Impact of airport expansion options on competition and choice

Figure 1. Overview of assessment framework	6
Figure 2. Why excess demand leads to an increase in prices	9
Figure 3. How capacity expansion benefits passengers	10
Figure 4. Summary of impact on ticket price from LHR expansion	14
Figure 5. Impact on prices of Heathrow & Gatwick expansion	17
Figure 6. Samples included in econometric analysis	45
Figure 7. Different passenger-types	50
Figure 8. Average OD fares at London airports in 2012	51
Figure 9. Average OD fares at London airports in 2010	52
Figure 10. Average OD fares at European hub airports in 2012	52
Figure 11. Short haul destination overlap London airports 2012	54
Figure 12. Long haul destination overlap LHR-LGW 2012	54
Figure 13. Long haul destination overlap European airports 2012	55
Figure 14. Short haul destination overlap European airports 2012	56
Figure 15. Short haul destination overlap European airports 2012	56
Figure 16. Distance and average fares at London airports in 2012	65
Figure 17. Fares based on distance at Heathrow & Gatwick in 2012	65
Figure 18. Differences in pricing at Heathrow and Gatwick in 2012	66
Figure 19. Forecast of excess demand	67
Figure 20. Unconstrained passengers	83
Figure 21. Types of passengers	85

Table 1. Connectivity impacts from expanding Heathrow and Gatwick for London	3
Table 2. Connectivity results for London 2030 resulting from Heathrow expansion	22
Table 3. Connectivity results for London 2030 resulting from Gatwick point-to-point expansion	23
Table 4. Connectivity results for London 2030 resulting from Gatwick point-to-point expansion with more long haul	24
Table 5. Connectivity impacts from expanding Heathrow and Gatwick	26
Table 6. Constrained modelling results	37
Table 7. Relaxing the constraint – Period 2	38
Table 8. Relaxing the constraint – Period 3	39
Table 9. Relaxing the constraint – Period 4	40
Table 10. Premium at Heathrow - range of results	41
Table 11. Coefficient estimates and their interpretation	43
Table 12. Data used for econometric analysis of fares	46
Table 13. Sample size and excluded observations	48
Table 14. Breakdown of LHR Premium in London 2012	62
Table 15. Auxiliary regression on Heathrow and Gatwick	64
Table 16. Short haul and long haul destinations London airports	69
Table 17. Destination overlap London airports in 2012	69
Table 18. Short haul and long haul destinations London airports	71
Table 19. Destination overlap London airports in 2010	71
Table 20. Short haul & long haul destinations European hubs	72
Table 21. Destination overlap European hub airports	72
Table 22. Regression results London 2012	75
Table 23. Regression results London 2010	76
Table 24. Regression results European hub airports 2012	77
Table 25. Robustness regression results London 2012	78

Table 26. Robustness regression results London 2010	79
Table 27. Robustness regression results European hubs 2012	80
Table 28. Assumptions made in model	87

Foreword

For decades the UK's network of airports has served consumers well. The choice on offer, together with competition between airlines, has benefited passengers by spurring innovation, driving service improvements and lowering prices. It has helped the UK to remain a key figure on the world stage and secured jobs, trade and economic growth.

Heathrow, the UK's hub airport, provides long-haul connectivity that could not be supported by local demand alone – providing trading opportunities for business, bringing in tourists from around the world and allowing people to visit friends and family across the globe. London City provides short-haul business flights. Gatwick offers low cost and leisure routes on a point to point basis. Airports have specialised to serve the specific needs of its customers. As a result passengers have a greater choice of competitively priced flights than they would in many comparable cities.

Lack of capacity is now threatening choice. Heathrow has been full for ten years. Gatwick is predicted to be full by 2020. London's other point-to-point airports may be full by 2040. And as airports become full, competition and choice suffer. New airline entrants find it almost impossible to enter the market and prices rise – because whilst supply is limited, demand continues to increase.

This report shows just how damaging this capacity constraint could be for consumers' pockets and the cost of living. By 2030, the un-met demand at Heathrow could mean passengers pay £300 more for a return ticket than they would do if extra capacity was added at Heathrow.

The effect on families would be even greater than for individuals. It is also a disincentive for foreign tourists to visit our country and an added cost of doing business - both for the UK's exporters and for international companies wanting to invest here.

This additional burden on families and businesses is avoidable. The private sector stands ready to invest in the infrastructure Britain needs. Politicians have it within their power to lower prices for consumers by taking a clear decision to support new runways and ending the years of prevarication that are causing higher fares.

The expansion of Heathrow could also add 40 new direct routes to London, with a large proportion of those routes going to rapidly growing economies such as Calcutta, Lima and Mombasa. Heathrow has made a commitment to work with government to ensure that expansion could mean improved air links between Heathrow and other parts of the UK – such as Liverpool, Inverness, Newquay and Humberside - so that all nations and regions would benefit from the improved connectivity.

The greatest benefits to consumers come from allowing people and businesses to be free to choose where and how to fly without a lack of capacity getting in the way. That is why Heathrow is not opposed to a second runway at Gatwick. We welcome choice and support Gatwick being allowed to grow and flourish alongside a growing and successful Heathrow.

What cannot happen is for the expansion of Gatwick to be at the expense of Heathrow. This report makes clear that if the UK chooses to expand only one airport, then the greatest consumer benefits from increased competition and lower fares are to be gained at Heathrow.



Colin Matthews
Chief Executive, Heathrow

Executive Summary

Objective

The Airports Commission interim report¹ has provided two important conclusions. First, there is a clear need for a further runway in the southeast of England by 2030. Second, the two sites that performed best against the sift criteria and have therefore been shortlisted are Heathrow Airport and Gatwick Airport. The Airports Commission has asked for additional evidence on both of these options. One of the areas that the Commission will consider further is the impact of either expansion option on passengers. These impacts need to be carefully assessed to ensure that the evidence considered in the appraisal is robust. As the Commission has emphasised the level of uncertainty around future market developments, the impacts of both expansion options also have to be considered in this context.

The purpose of this report is to assess the impact of both expansion options on passengers. We consider two main questions:

- What is the difference in benefits to passengers from expanding Heathrow or Gatwick?
- How do these impacts vary under different market developments?

Our results draw on underlying economic theory and our conclusions are supported by a significant body of empirical analysis.

Impact of airport expansion on ticket prices

We have analysed how ticket prices are affected by capacity expansion at either airport within the appropriate economic framework and we have undertaken detailed econometric analysis. We conclude that expanding Heathrow Airport provides significantly greater benefits to passengers than expanding Gatwick Airport. In particular, we demonstrate that:

- Expanding either airport is likely to have an impact on ticket prices at both. Overall, however, the reduction in ticket prices caused by expansion of Heathrow Airport is significantly larger than the impact on ticket prices of Gatwick expansion. This is because excess demand at Heathrow Airport is substantially higher than at Gatwick Airport.

¹ Airports Commission, (2013), Interim Report, Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271231/airports-commission-interim-report.pdf

- The reduction in ticket prices from expansion at Heathrow would be £95 per return ticket (or 15%) today compared to £14 (or 7%) at Gatwick. By 2030, expanding Heathrow could reduce average return fares (in today's prices) by £320 (or 38% of the average fare) because of the increasing impact of the capacity constraint. This compares to c. £40 at Gatwick (or 18% of the average fare). Our analysis controls for all other relevant impacts on ticket prices. It shows that, even after accounting for the higher cost of construction, expanding Heathrow provides greater benefits to passengers.
- In our view, it is extremely unlikely that Gatwick could expand as a hub airport because of the damage caused to hub economics from attempting to operate a split hub. But even if this scenario were to occur, the benefits to passengers would be substantially lower when compared to expanding Heathrow.

Overall, we therefore conclude that expanding Heathrow provides a much greater reduction in ticket prices for passengers than expanding Gatwick.

Impact of airport expansion on connectivity

We have also modelled the likely impact that airport expansion would have on air connectivity. We consider the impact of additional capacity on the ability to offer new direct connections from each airport, as well as the implications for London as a whole. We have also analysed the potential impact in terms of improving the frequency of existing connections.

Our results clearly show that the number of new direct connections facilitated by a Heathrow expansion are likely to be almost six times higher than the number of new connections in any likely Gatwick scenario (see **Table 1**), while frequent connections facilitated would be nearly two and a half times higher. Our analysis therefore demonstrates that passengers' choice of connections is increased to a much greater extent by expanding Heathrow when compared to expanding Gatwick.

Table 1. Connectivity impacts from expanding Heathrow and Gatwick for London

Number and type of routes	New direct connections	Of these, how many become “frequent” connections?	Existing connections that become “frequent”
Heathrow	40	15	21
Gatwick (with low-cost long-haul)	7	1	9

Our results also show that expanding Heathrow Airport would lead to a much higher level of connectivity to high growth economies than Gatwick Airport. New connections from Heathrow are mainly to high growth emerging economies such as Calcutta (India), Quito (Ecuador), Jakarta (Indonesia), Lima (Peru), Caracas (Venezuela) or Mombasa (Kenya). In contrast, new connections for Gatwick are mainly to holiday destinations.

We also consider it likely that expansion at Heathrow could facilitate improved air connectivity to UK regions. Destinations such as Inverness, Jersey and Durham, which have been crowded out of Heathrow in recent years, or new destinations like Liverpool, Humberside and Newquay could sustain connections to Heathrow’s network if the capacity were available².

The impact of Gatwick expansion on international connectivity is improved marginally if the introduction of lower-cost long-haul aircraft made long-haul flights viable at a lower passenger threshold. But even in this scenario, the network advantages at a hub airport would be at least as well placed if not better to take advantage of the opportunities created by cheaper long-haul aircraft.

Our modelling also indicates that in the unlikely event that Gatwick were to be developed as a second hub, effectively splitting the London hub between two sites, the impact on connectivity would be substantially lower than could be achieved at a single hub.

Conclusion

Given the expected level of demand for travel from both Heathrow and Gatwick, it is clear that an expansion at *both* Heathrow and Gatwick would result in a greater benefit to passengers than expanding one or the other. This is because both airports are likely to be heavily congested by 2030. However, the

² These new connections are not included the 40 shown in Table 1.

Airports Commission's interim report suggested that only one of the two airports would be expanded.

Our assessment shows that Heathrow Airport expansion provides substantially higher benefits to passengers than expanding Gatwick Airport because:

- **The reduction in ticket prices from expansion at Heathrow is substantially larger compared to Gatwick:**
 - The reduction in ticket prices from expansion at Heathrow would be £95 per return ticket today (or 15% of today's average return fare), compared to £14 (or 7%) at Gatwick. By 2030, expanding Heathrow could reduce average return fares (in today's prices) by £320 (or 38%). This compares to c. £40 at Gatwick (or 18%).
 - The reduction in ticket prices at Heathrow is substantially higher than at Gatwick. When accounting for differences in the cost of the new runway which are estimated to be £20 per return passenger at Heathrow and £36 per return passenger at Gatwick, the benefit for expanding Heathrow is even higher than the benefit of expanding Gatwick.
- **The increase in connectivity is much larger for expanding Heathrow compared to Gatwick:** Expanding Heathrow Airport would provide 40 new connections for London and could allow a further 21 connections to achieve a frequent connectivity. This contrasts with only 7 new and 9 improved connections for London from expanding Gatwick Airport. In addition, most of the new connections from Heathrow are to high growth emerging economies whereas most connections from Gatwick are to holiday destinations.

Our overall conclusions apply under all future market developments. Heathrow Airport would lead to bigger reductions in ticket prices and greater connectivity even in the unlikely case of Gatwick developing into a second hub airport.

1 Introduction

1.1 Background and context

The Airports Commission interim report has provided two important conclusions. First, there is a clear need for a further runway in the southeast of England by 2030. Second, the two sites that performed best against the sift criteria and have therefore been shortlisted are Heathrow Airport and Gatwick Airport. The Airports Commission has asked for additional evidence on both of these options. It is clear that Heathrow and Gatwick do not provide equivalent solutions to the capacity problem.

Heathrow is the UK's only hub airport and has been operating at full (practical) capacity for a number of years. In contrast, Gatwick offers mostly short-haul point-to-point services today and is only constrained at certain times of the day. It has far fewer connecting passengers and no significant network airline operations. As a result, the benefit from expanding Heathrow for today's network and point-to-point passengers is more obvious as it directly alleviates an existing constraint. Of course, by the mid-2020s it is likely that Gatwick will also be full, serving its own market of point-to-point services. So there is no doubt that expanding Gatwick at that time would also bring passenger benefits in its own market segment. But the benefits to network passengers of such an expansion are less clear.

In order to assess both expansion options further, the Commission will consider additional evidence as part of an appraisal framework. One of the areas that the Commission will consider further is the impact of either expansion option on passengers. In particular, the Commission will consider two impacts on passengers:

- changes in the ticket price due to excess demand; and
- changes to the competitive nature of the aviation market.

Both of these impacts need to be carefully assessed to ensure that the evidence considered in the appraisal is robust. The Commission has emphasised the level of uncertainty around future market developments in its interim report: “[...]given the lack of consensus around the way the sector will develop, it will be important for the Commission's final recommendation to be one whose economic and commercial case is robust in a range of different future scenarios”³. As a result, there is a need to find a solution that works best under all different future scenarios.

³ Airports Commission, Interim Report, p.134

1.2 Project objective

The purpose of this report is to assess the impact of both expansion options on passengers. We consider two main questions:

- What is the difference in benefits to passengers from expanding Heathrow or Gatwick?
- How do these impacts vary under different market developments?

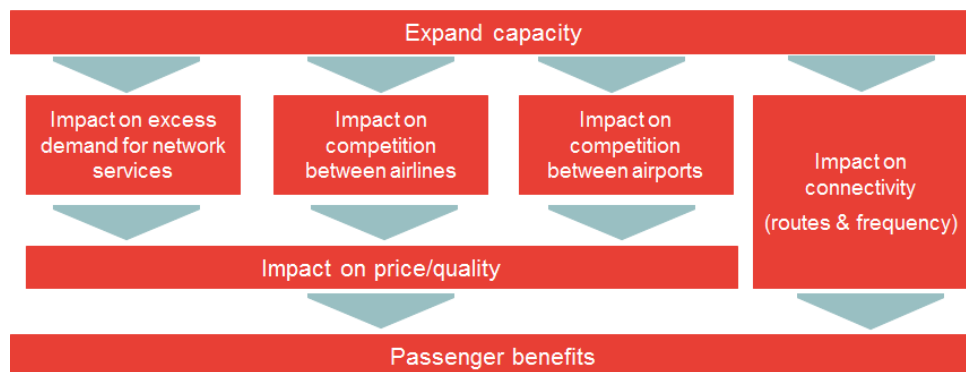
Our assessment draws on underlying economic theory and our conclusions are supported by a significant body of empirical analysis.

1.3 Assessment framework

Impacts on passengers included

Figure 1 provides an overview of our assessment framework. The positive impacts of capacity expansion on passengers include both the ticket price reduction resulting from the reduction in the cost of the capacity constraint and the improvements in connectivity for passengers facilitated by the additional capacity.

Figure 1. Overview of assessment framework



Expansion of runway capacity will impact on value to passengers in three ways. If the new runway substantially reduces excess demand that cannot otherwise be satisfied, ticket prices will fall by allowing existing carriers to expand services. Second, an increase in airline competition could put further pressure on ticket prices. Third, greater competition between airports could improve the price/quality that passengers face. However, as both Heathrow and Gatwick

Airport are regulated any impacts on quality and price from increased airport competition are likely to be relatively minor.

In addition to the effect on ticket prices, we also consider the impact that expansion of runway capacity could have in facilitating greater connectivity, measured by the number of direct connections to new destinations and improvements in the frequency of existing connections. Our analysis specifically focusses on what is happening, or likely to happen at Heathrow and Gatwick. As such it focusses on the impact of the capacity constraint on passengers that use Heathrow or Gatwick Airport currently and in the future.

Clearly, given the fact that Heathrow is already heavily constrained, there are displaced passengers today who would prefer to fly to and from Heathrow. Most of these passengers will probably fly from other airports, many connecting at another hub to reach their final destination. Some passengers may not fly at all. In all these cases the option available to these passengers is not as good as it could be and would be improved by relaxing the London capacity constraint. We have not attempted to value this additional loss to passengers.

Expansion options considered

Our assessment includes two main options: building a third runway at Heathrow or building a second runway at Gatwick. We treat these options as mutually exclusive as the Airports Commission has clearly identified the need for one additional runway by 2030 and it is unlikely the current process would support more than one additional runway by 2030. However, considering the benefits to passengers alone, it is clear that an expansion at *both* Heathrow and Gatwick would result in greater benefits to passengers. This is because both airports are likely to be heavily congested by 2030. Without creating any scenarios whereby hub traffic migrates from Heathrow to Gatwick it is evident that new capacity at both locations could be justified for the benefit of the customer groups that the airports serve individually. Nevertheless, given the current processes, for the purposes of this report we treat Heathrow and Gatwick as alternative options to solve a single problem.

While a continuation of the current market structure, with Heathrow as a hub and Gatwick as a point-to-point airport, remains the most likely outcome, there are two additional market developments identified by the Airports Commission that we consider as they could change the impact on passengers from expanding either airport. First, the Airports Commission has explicitly considered the impact of increased adoption of lower-cost long-range aircraft (such as the Boeing 787 or the Airbus A350). Adoption of these aircraft types may imply that it is economic for airlines to offer more direct long-haul point-to-point connections, with a lower passenger threshold. This could imply that Gatwick could offer more direct long-haul destinations in competition with, or as an alternative to Heathrow. Second, Gatwick Airport could develop into a second

hub airport alongside Heathrow. In our view, this scenario is very unlikely, for reasons we explain later in this report. We note that evidence presented to the Airports Commission supports this view, with airlines advising the Commission that they would not choose to use Gatwick as a hub. Nevertheless, it is important to consider how this possibility could affect our results.

1.4 Report outline

Our report is structured as follows:

- Section 2 provides our analysis of the expansion options on ticket prices;
- Section 3 provides our analysis of the expansion options on connectivity; and
- Section 4 provides our conclusion.

We provide further detail on our analysis in three annexes:

- Annexe 1 provides a discussion on the economic competition model;
- Annexe 2 provides more detail on our econometric analysis; and
- Annexe 3 provides detail on our connectivity analysis.

2 Impact of expansion options on ticket price

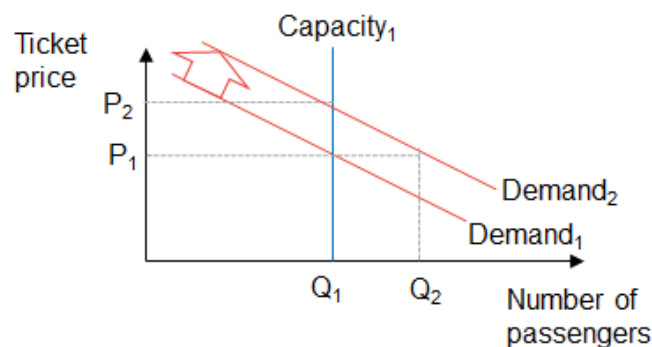
This section assesses the benefits to passengers from airport expansion in terms of the likely impact that expansion would have in reducing ticket prices. We first explain the theory of why the capacity constraint at Heathrow (and Gatwick) has an impact on ticket prices. As a second step, we present and compare the empirical evidence on the change in ticket price from a Heathrow or Gatwick expansion.

2.1 Theory

How the capacity constraint leads to higher ticket prices

When demand for flying to and from Heathrow exceeds the available capacity, ticket prices increase to “choke off” demand. **Figure 2** provides a simplified illustration of why prices have to rise when demand exceeds supply. Heathrow Airport’s capacity is limited by its two runways. The vertical blue line indicates the number of passengers Heathrow can accommodate (Q_1 in the figure). The red lines provide the demand function. It is downward sloping so more people want to fly at lower prices. Over time the demand function shifts outward as income increases and more people want to fly. Many studies have demonstrated that there is a long-run relationship between GDP growth and air travel demand. When the demand curve shifts, more people (Q_2 in the figure) want to fly to and from Heathrow at the existing price (P_1). As capacity is fixed, the number of passengers cannot increase so the price rises to ensure that demand equals capacity (P_1 to P_2).

Figure 2. Why excess demand leads to an increase in prices



Note that this is a stylised representation of demand and supply. Capacity is ultimately constrained by the number of slots Heathrow can offer while passenger numbers can increase with aircraft size. Limited slot capacity drives up the average yield per slot which is equivalent to average ticket prices.

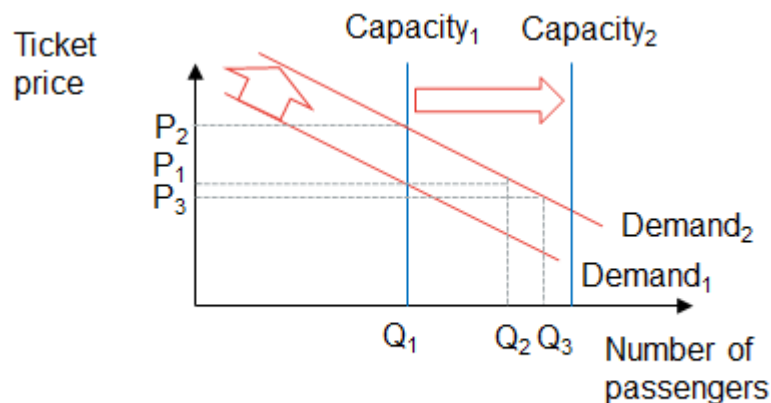
Based on the economic theory, we can identify the following relationship between excess demand ($Q_2 - Q_1$) and the cost of the constraint ($P_2 - P_1$):

- greater excess demand before the expansion leads to a higher cost of the constraint; and
- higher than average fares and a lower price elasticity lead to a higher cost of the constraint as the price needs to rise by more to reduce excess demand⁴.

The benefit to passengers from removing the capacity constraint

The benefit to passengers from removing the capacity constraint is equal to the cost of the constraint. **Figure 3** shows the same situation as in **Figure 2** but with an increase in capacity. A new runway would shift the supply curve outward as a greater number of passengers can now be accommodated (Q_3). At the new capacity level, there is no excess demand so the price falls to P_3 . The difference between P_2 and P_3 represents the benefit to passengers as on average they now pay a lower ticket price.

Figure 3. How capacity expansion benefits passengers



Note that this is a stylised representation of demand and supply. Capacity is ultimately constrained by the number of slots Heathrow can offer while passenger numbers can increase with aircraft size. Limited slot capacity drives up the average yield per slot which is equivalent to average ticket prices.

⁴ The price elasticity experienced at the airport depends both on how sensitive the market as a whole is to price (the extent to which passengers stop flying if prices rise) and the extent to which other airports are a viable substitute for the constrained airport (the extent to which passengers respond to the constraint by switching to another route).

Impact of expansion options on ticket price

As a result, the simple economic theory allows us to conclude that by 2030 a new runway at Heathrow Airport is likely to provide substantially greater benefits than adding another runway at Gatwick Airport because:

- By 2030 Heathrow Airport's excess demand is likely to be significantly higher than Gatwick's as it will have been constrained for more than 20 years while Gatwick would only have been constrained for about 10 years.
- Heathrow Airports' average fare is higher and passengers have a lower price elasticity as it offers a much greater proportion of long-haul flights.

The mechanism by which prices fall

The previous section shows that expanding capacity would lead to lower ticket prices if it releases unsatisfied excess demand. It is important to clarify the mechanism that lead to the reduction in ticket prices. We therefore consider both airport and airline pricing. Both Heathrow and Gatwick Airport are regulated and we can reasonably assume that their airport charges will continue to be regulated in the future. As a result, the airports cannot adjust their pricing to ensure that demand equals supply in the constrained case and therefore airport pricing would also not change as a result of the capacity constraint (other than the increase in prices to cover the cost of the extension).

As airports cannot capture any of the scarcity rents that result from the capacity constraint, airlines play an important role in adjusting prices so that demand equals supply. At an unconstrained airport, the conditions of entry and exit can ensure ticket prices are kept as low as possible and remain at the fully competitive level. However, with restricted access this process cannot function and the restricted capacity will lead to rising ticket prices to match passenger numbers to the seats available⁵. The extent of the increase will depend on the magnitude of the excess demand and the extent to which services from other airports are either available or represent an adequate alternative for passengers.

If the capacity constraint is removed, new airlines can enter existing routes and this increase in airline competition ensures that prices fall. The change in ticket prices at the expanded airport therefore depends both on the level of excess demand and the substitutability of alternative airports.

⁵ This process is complicated by airline price setting which is aimed at maximising profitability per movement. This determines load factors which are less than 100%. Nevertheless, ticket prices rise as a result of restricted capacity.

How competition between airports affects the benefits to passengers from expansion

The preceding discussion considers the relationship between capacity and ticket prices at a single airport. In practice, airports relate to each other in a complex structure of differentiated competition, with location and mix of traffic forming the major aspects of their differentiation. This complicates the relationship between capacity and ticket prices. Using a model of differentiated competition between airports, we have identified that:

- Capacity constraints at one airport lead to higher prices not just at the airport itself, but at other airports that compete with the constrained airport. In these circumstances, expanding capacity at an unconstrained airport has no effect on ticket prices or passenger welfare.
- If both airports are constrained, then expanding capacity at either airport will lead to a fall in ticket prices at both airports and a benefit to passengers, but the effect is much greater if the expansion is focussed on the airport with a higher level of excess demand.

The implication of this is that expanding Gatwick only generates benefits for hub passengers at Heathrow once Gatwick is also full, while the benefit to hub passengers of capacity expansion is always likely to be greatest if the expansion occurs at the more significantly constrained airport. Annexe 1 provides more detail on this analysis. The following sections provide empirical evidence that demonstrate that the impact on ticket prices is indeed bigger for Heathrow.

2.2 Heathrow expansion

The cost of constraint today

Heathrow Airport has been constrained for a number of years and since that time passenger growth has been limited to gradual increases in average aircraft size. In order to estimate the cost of the constraint at Heathrow today, we have undertaken a detailed econometric analysis of ticket prices at Heathrow compared to other London airports. Our analysis controls for all other relevant factors that influence ticket prices including journey purpose, distance, frequency, differences in airport charges and low cost carriers.

We have found that ticket prices today are on average 18% higher at Heathrow Airport compared to other London airports after controlling for all relevant

Impact of expansion options on ticket price

factors⁶. This is equivalent to £95 for a return ticket or 15% of the current average return ticket price at Heathrow of £626⁷. This demonstrates that the constraint already has a significant impact on passengers today. Annexe 2 provides detail on the econometric analysis and testing we undertook to reach this conclusion.

The benefit of expanding Heathrow in 2030

Given that demand for air travel is expected to rise over time as national incomes increase, gap between the number of people who would ideally like to fly from Heathrow and those that actually can is going to increase, which would be expected to push up fares further. However, we cannot use econometrics to estimate how high this cost is likely to be in 2030.

In order to estimate the likely cost of the constraint in 2030, we have therefore used the following steps:

- we have used the results of our econometric analysis to calculate unconstrained demand today – that is, how much higher would demand be if ticket prices were 15% lower, given accepted evidence on the sensitivity of demand to ticket prices;
- we then projected unconstrained demand up to 2030, using a combination of GDP growth rates by country (for the existing Heathrow passenger network) and income elasticities derived from existing literature on air transport; and
- as a last step, we used existing estimates of the price sensitivity of demand to calculate the implied increase in ticket prices that would be required to constrain demand to available capacity in 2030. We assumed that constrained capacity continues to grow slowly, reflecting increasing average aircraft size.⁸

Our analysis indicates that by 2030 ticket prices at Heathrow will have had to rise significantly to constrain demand to the available capacity. We estimate that the constrained price would rise by a further £225 (in today's prices). As a

⁶ These findings are supported by similar analysis we undertook to compare ticket fares at Heathrow Airport to other European hubs and by an analysis of slot values. Our findings are also similar to those published by the Airport's Commission. Annexe 2 provides further detail on our analysis.

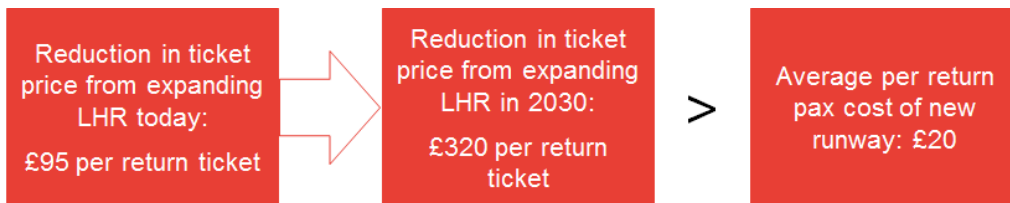
⁷ Why does 18% become 15%? Our econometrics shows that current prices are 18% higher than expected. So if the expected price is 100, the current price is 18 higher at 118. So the congestion mark up as a percentage of the current price is 18/118, or 15%.

⁸ This step also implicitly assumes that the average unconstrained ticket price, measured in today's prices, does not change from 2012 to 2030. In practice there may be factors which may push this figure up or down. These trends are outside the scope of our analysis, and would in any event be common to all 2030 scenarios.

consequence, releasing this constraint at Heathrow could reduce average fares in 2030 by c. £320 (which amounts to 38% of the fare average we estimate would result if Heathrow were not expanded). In other words, by 2030, every passenger who uses Heathrow Airport would pay on average £320 less for a return ticket if the capacity constraint was removed compared to no expansion. While we have estimated the average reduction in ticket prices, the actual reduction for each passenger would of course vary by route and travel class.

The reduction in ticket price from alleviating the capacity constraint is significantly greater than the cost of the third runway which the Airports Commission estimated as c.£20 per return passenger⁹. Even after reducing the ticket price saving by £20 per passenger, each passenger is still £300 better off compared to a constrained case. **Figure 4** summarises our finding.

Figure 4. Summary of impact on ticket price from LHR expansion



2.3 Gatwick expansion

Cost of constraint today

Gatwick Airport is currently capacity constrained at some peak times but still has spare slots for much of the day. As a result, the constraint at peak times has some costs but these are a substantially lower than the cost of the constraint at Heathrow today. We have undertaken the same econometric analysis for Gatwick Airport and found that ticket prices are on average 7.5% higher than the average fares from other London airports after controlling for all relevant factors such as trip purpose, low cost carriers, differences in airport charges and distance. This implies that the reduction in ticket prices from releasing the peak-time constraint at Gatwick is c. £14 for a return fare (which is c. 7% of the current average return fare of £200). However, the effect, being much smaller, is

⁹ Based on the Airports Commission's Appendix reference number 61 the aeronautical yield index for a new runway at Heathrow to break even is 1.5 times the Q6 settlement. Based on CAA (2014) the Q6 settlement (Figure I2, p, 291) is £19.78 per passenger so the additional cost of the new runway is c. £10 per passenger or £20 per return passenger. Available: <http://www.caa.co.uk/docs/33/CAP1151.pdf>

not statistically significant at the same level as the Heathrow effect. The capacity constraint at Heathrow Airport therefore has a cost that is approximately seven times higher than the cost of the peak time capacity constraint at Gatwick.

Benefit of expanding Gatwick as point-to-point airport in 2030

We have applied the same methodology as for Heathrow Airport to identify the impact of the constraint at Gatwick Airport in 2030. The Airports Commission has indicated that it expects Gatwick Airport to be full by 2020. Even though Gatwick Airport is already capacity constrained at some parts of the day, we have estimated the difference between unconstrained and constrained demand from Gatwick Airport from 2020 onwards. This approach is consistent with the way we have modelled the constraint for Heathrow Airport.

Using this approach, we find that by 2030, we estimate that the benefit of expanding Gatwick is c. £40 per passenger for a return ticket (or 18% of the average return ticket price that would occur without expansion). The increase between the cost of the constraint today and in 2030 is much smaller for Gatwick Airport when compared to Heathrow. This is because Gatwick Airport still has some spare capacity so the cost of the constraint is expected to rise more slowly when compared to Heathrow.

The Airports Commission estimate cost of construction to be £36 per return passenger¹⁰. The reduction in ticket prices would therefore appear to only marginally outweigh the cost of the new runway.

Benefit of expanding Gatwick under different market circumstances in 2030

The analysis so far has not explicitly considered the level of substitutability between Heathrow and Gatwick, although the evidence from the econometric analysis suggests this substitutability must be relatively low, otherwise we would not observe such a large cost of the constraint at Heathrow, compared to Gatwick. It is therefore useful to consider how market developments could change this. We consider two scenarios.

First, if the adoption of lower-cost long-haul aircraft (such as the Boeing 787) changed airline economics in a way that makes long-haul flights viable at lower passenger thresholds, then Gatwick Airport might provide an increasing number of point-to-point long-haul connections. However, in this case, the same benefits would occur at Heathrow, allowing network carriers to offer new direct

¹⁰ Based on the Airports Commission's Appendix reference number 63 the aeronautical yield index for a new runway at Gatwick to break even is 1.3 times the Q6 Heathrow settlement. Based on CAA (2014) the Q6 settlement is £19.78 per passenger at Heathrow so the yield per passenger at Gatwick would need to increase to £26 which implies an increase of c. £18 per passenger or £36 per return passenger.

connections as part of an integrated network at a lower passenger threshold. In fact, today Heathrow has nearly 10 times more 787 departures than Gatwick. More than 90% of B787 and A350 aircraft orders have been placed by network carriers¹¹ so it would appear that the adoption of lower-cost long-haul aircraft will bring benefits to both Heathrow and Gatwick.

As a result, it is unclear why airlines would choose to *move* operations from the network environment at Heathrow to the point-to-point environment at Gatwick. We would expect to see a greater range of connected destinations at both airports and a larger overlap of competed routes offered at both. This may lead to some “spill-over” of routes offered at Heathrow to be served from Gatwick as well. But simply reducing the economic threshold to achieve a connection cannot explain why airlines would choose, on a specific route, to forego the benefits of network consolidation of passenger numbers.

We conclude therefore that this scenario does not change the fundamentals of airline economics, and so it is not expected to alter the relative ranking of expansion of hub or point-to-point airport in terms of the passenger benefits they are likely to create.

Second, if Gatwick were to develop as a second hub airport it could provide a closer substitute for Heathrow. However, in this case the benefits to passengers would still lower than in the Heathrow case because:

- Provided both airports have sufficient capacity, there is no reason to think that the benefits of inter-airline competition would be greater with the split hub approach.
- Insofar as in a split hub arrangement network carriers split long haul destinations between the two hubs (rather than serving all destinations from both hubs) there will neither be benefits from inter-airline nor inter-airport competition.
- Dividing the network between two hubs materially reduces network effects and so reduces the ability of the split hub to provide increased connectivity, compared to the single hub. (More detail on this is provided in Section 3).

¹¹ Heathrow Airport, based on publicly available information from Boeing and Airbus

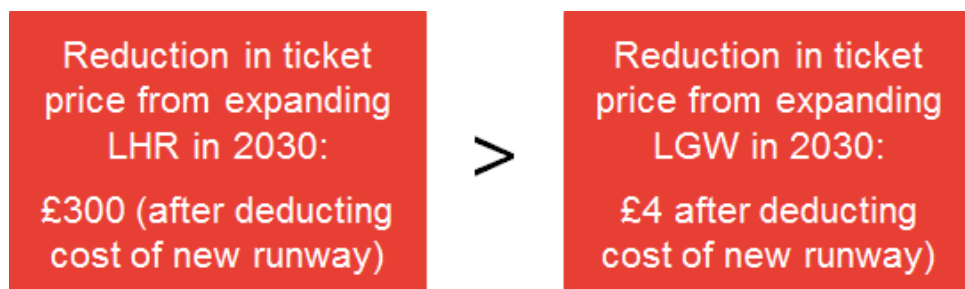
2.4 Comparing Heathrow and Gatwick expansion

We conclude that expanding Heathrow Airport would provide greater benefits to passengers than expanding Gatwick Airport. In particular, we have demonstrated that:

- While expanding Gatwick would have some impact on the prices at Heathrow, the same applies in reverse. Overall, the effect of a Heathrow Airport expansion on ticket prices is larger than the impact of a Gatwick expansion on prices.
- Releasing the capacity constraint at Heathrow today (if it were possible) would result in a reduction in average return ticket prices of £95. In contrast, additional capacity at Gatwick Airport today would reduce average return ticket prices by £14.
- Expanding Heathrow Airport in 2030 would result in a reduction in return ticket prices of c. £320 on average compared to a reduction in ticket prices as a result of Gatwick Airport expansion of c. £40.
- After deducting the cost of the new runway at each airport, the reduction in ticket prices at Heathrow is even more substantial as it is unclear that the reduction in ticket price at Gatwick will outweigh the cost of construction.
- Even if Gatwick expanded as a hub airport, the benefits to passengers would be lower when compared to expanding Heathrow.

Figure 5 summarises our key result.

Figure 5. Impact on prices of Heathrow & Gatwick expansion



3 Impact of expansion options on connectivity

This section assesses the impact of different airport expansion options on connectivity. We first consider how new connections are established in theory and then present results from our connectivity modelling. Finally, we compare our estimates of the different levels of connectivity facilitated for both airport expansion options.

3.1 Theory

What is connectivity?

Connectivity can be measured in terms of frequency of flights and number of direct connections. Greater connectivity provides benefits to passengers as they can choose from an increased range of flight times and they can access a greater number of destinations with a direct flight. Both frequency and direct connections ultimately reduce passengers travel time, which is an important benefit.

How are new connections created?

At an unconstrained airport, additional connectivity is created by airlines introducing additional frequency or new direct connections. This generally happens when airline yields indicate that additional frequency or a new connection is likely to be viable. At an unconstrained *hub* airport, connectivity is not only determined by local demand but also by the number of transfer passengers on each route. For some routes a direct connection is not viable when considering local demand. At a hub airport, airlines can pool passengers from multiple destinations so transfer passengers can make up the additional demand required to pass the viability threshold. This is why a hub airport can provide a greater level of connectivity than an equivalent point-to-point airport. This effect works within airlines and groups of airline – with passengers buying through tickets from one flight to another. But there are also network effects that operate between independent airlines. A significant proportion of passengers “self-connect”, taking advantage of the range of routes offered at the hub airport by buying two separate flights and transferring between them independently.

As Heathrow Airport is currently capacity constrained, overall connectivity cannot be easily increased. While airlines can substitute frequency and the number of direct connections they provide, overall connectivity is limited by runway capacity. Airlines can also choose to use bigger planes but again frequency and the number of direct connections remains unchanged.

Relaxing the capacity constraint at a constrained hub airport allows the network carriers there to offer new connections without having to disconnect or reduce the frequency on others.

Because Heathrow is significantly more constrained than Gatwick *and* caters for a far larger number of connecting passengers the effect of releasing the capacity constraint on connectivity is likely to be much greater at Heathrow than at Gatwick.

How can we estimate the change in connectivity from capacity expansion?

Connectivity is more than an occasional flight to a given destination. It requires a minimum level of frequency to make a connection truly valuable to passengers. When projecting connectivity into the future, we therefore have to make judgements about the level of passenger demand needed to sustain a regular service to a given destination of a certain frequency. For this reason we use a definition of connectivity that is derived from a projection of expected passenger numbers on each route. So there is a need to define a sensible threshold for these passenger numbers.

In practice we have examined two thresholds. The first equates to the number of passengers required to establish a minimum level of connectivity. For this we have chosen one flight per week for long-haul services and two flights a week for short-haul. In addition, we have also defined a higher threshold of three long-haul flights a week or six short-haul, to represent “frequent” connections. The distinction between the two levels is important because we can expect to see an expansion in capacity facilitating new connections *and* increasing frequency to existing connections.

Using these definitions, we have estimated the change in connectivity from capacity expansion for Heathrow and Gatwick Airport. Our connectivity model estimates the number of new destinations from each airport that meet these criteria under different market circumstances. A new connection (or more frequent connection) is created if the passenger demand for direct travel between Heathrow or Gatwick and the destination exceeds the relevant threshold. This could be the case for two reasons:

- between today and 2030 demand on an existing direct flight grows on the basis of income and passes the threshold; and
- the number of passengers forecast to fly to a destination *via other hub airports* rises until it exceeds the threshold so that consolidation of these passengers into a new a direct connection becomes viable.

In our modelling our first step is to identify the destinations that meet the connectivity thresholds described here. Our second step is to remove from this list, those destinations which are already served from another London airport

Impact of expansion options on connectivity

with the equivalent frequency. So if our model identifies a destination as passing the basic connectivity threshold at Heathrow in 2030, but it is already served from Gatwick, we do not credit Heathrow with facilitating a new connection for London.

It must be noted that any definition of connectivity derived in this way will correspond closely, but not exactly, to the actual pattern of flights offered from an airport at any point time. Aircraft sizes may vary somewhat from route to route. There may also be operational or commercial reasons why an airline chooses to operate a service more or less frequently than short-run passenger numbers appear to suggest is appropriate. While this sort of real-world variation can be expected always to occur, a comparison over time measured on a consistent passenger-related basis will still produce a reliable indicator of the general trend towards improved connectivity. More detail on our connectivity model is provided in Annexe 3.

3.2 Heathrow expansion

We find that expanding Heathrow Airport would facilitate 51 new direct connections. Removing those connections that are already served from other airports in London, **Table 2** provides an overview of the change in connectivity for London resulting from expanding Heathrow. We find that by 2030, the expansion of Heathrow could facilitate an increase of 40 in the number of new connections for London. A large proportion of these connections are to long-haul destinations in emerging economies including countries such as Calcutta (India), Quito (Ecuador), Jakarta (Indonesia), Lima (Peru), Caracas (Venezuela) or Mombasa (Kenya). We also find that of these 40 new routes, 15 are likely to grow sufficiently quickly to become frequent connections (3 or more long haul flights per week). In addition to the development of these new routes, there are 21 routes, currently served less frequently, which could expand to provide frequent connections by 2030 given sufficient airport capacity. All of these routes are connecting London to emerging economies and therefore demonstrate the importance of air connectivity for international business relationships.

In addition, the Airports Commission has also stated that an ongoing capacity constraint at Heathrow is likely to reduce the number of transfer passengers drop from 22.6m in 2011 to less than 4m in 2050 which is associated with a drop in the number of destinations served. So Heathrow Airport may not be able to maintain its current level of connectivity if the constraint is not removed. In this case the difference between connectivity at an expanded Heathrow Airport and a constraint Heathrow would be even larger.

Table 2. Connectivity results for London 2030 resulting from Heathrow expansion

Number and type of routes	New direct connections	Of these, how many become “frequent” connections?	Existing connections that become frequent
Total number	40	15	21
Of which, business destinations in emerging markets	18	4	21

Although not covered by our modelling (and therefore not included in our results), we also consider it likely that expansion at Heathrow could facilitate improved air connectivity to UK regions. Destinations such as Inverness, Jersey and Durham, which have been crowded out of Heathrow in recent years, or new destinations like Liverpool, Humberside and Newquay could sustain connections to Heathrow’s network if the capacity were available. A similar effect would not be expected at Gatwick, relative to today, because domestic routes have not been crowded out of Gatwick to date in the same way.

3.3 Gatwick expansion

3.3.1 Gatwick expands as point-to-point airport

We find that expanding Gatwick Airport would facilitate 8 new direct connections. Removing those connections that are already served from other airports in London, **Table 3** provides an overview of the change in connectivity at Gatwick Airport and for London from expanding Gatwick.

This shows that the additional connectivity facilitated by a point-to-point expansion of Gatwick is much more limited than that facilitated by an expansion of the network at Heathrow. We estimate that only 5 additional routes for London would be facilitated at a basic frequency. Our modelling suggests none of these routes would achieve a frequent connection, although we identify seven additional routes currently offered at Gatwick that would become frequent. Most of the new destinations are typically associated with tourism such as Bermuda or Kingston. Most of the improved destinations are of similar nature such as Bermuda or Kingston.

There is an important underlying principle to why expanding Gatwick as a point-to-point airport generates far fewer new connections. A major driver of the number of new connections at Heathrow is the ability to consolidate “beyond”

Impact of expansion options on connectivity

passengers, currently flying indirect to key destinations, together to form new direct connections. The data shows that a far smaller proportion of Gatwick passengers are connecting “beyond” to additional destinations after leaving Gatwick than is the case for Heathrow¹².

Table 3. Connectivity results for London 2030 resulting from Gatwick point-to-point expansion

Number and type of routes	New direct connections	Of these, how many become “frequent” connections?	Existing connections that become frequent
Total number	5	0	7
Of which, business destinations in emerging markets	0	0	0

3.3.2 Gatwick expands as point-to-point airport and more long-haul flights

We also considered a scenario where the viability threshold for long-haul flights decreases as new aircraft such as the Boeing 787 or Airbus A350 are adopted. In this case, a greater number of long-haul flights could be offered from Gatwick. In this scenario, direct connections from Heathrow with substantial unmet demand may also be served from Gatwick.

To identify the number of new connections in this scenario, we have modelled a hypothetical scenario where the adoption of low-cost long-haul aircraft imply that more airlines are offering direct long-haul routes from Gatwick. We use a scenario where 10% of the unmet demand at Heathrow Airport for the top 20 destinations is allocated to Gatwick. This is equivalent of 1.4m passengers and sufficient to support a number of new connections from Gatwick Airport. This could be interpreted as “spill-over” of Heathrow demand by local passengers for long-haul destination.

In addition, the introduction of cheaper long-haul aircraft implies that our definition of long-haul connectivity is lowered as fewer passengers are needed to make a new connection viable. Our results in **Table 4** suggest the impact of this scenario on connectivity is limited. The reason for this is that this scenario would indeed support more connections compared to the simple point-to-point

¹² Data on self-connecting passengers is not included for Heathrow or Gatwick. While this may understate the level of demand for direct connections, this is a consistent assumption across both airports.

scenario (16 compared to 8), but of these all but 7 are already served from other London airports. Importantly the key effect of lowering the entry level for point-to-point long haul flights would be to increase the number of frequently served routes that are now served from both Heathrow and Gatwick. There is no reason to expect that lowering this cost threshold would lead Gatwick to serve routes that would not or could not be served from Heathrow, taking advantage of the benefits created by its existing network of connections.

In this case only one new route would become a frequent connection and the existing connections that become frequent are only slightly higher than in the previous Gatwick scenario.

Table 4. Connectivity results for London 2030 resulting from Gatwick point-to-point expansion with more long haul

Number and type of routes	New direct connections	Of these, how many become “frequent” connections?	Existing connections that become frequent
Total number	7	1	9
Of which, business destinations in emerging markets	1	1	0

3.3.3 Gatwick expands as second hub

Lastly, we have also considered a scenario where Gatwick Airport expands and becomes a second hub airport even though this is extremely unlikely given the loss of network effects caused by splitting the current single hub. Nevertheless, while this is not a likely scenario, it is important to consider how connectivity would change in this case. We considered a number of ways of modelling this scenario.

A split hub scenario is unlikely to emerge as network carriers can always offer a greater level of connectivity when pooling passengers at the same hub. Given the significant level of “self-connecting” passengers, the same conclusion applies to different alliances operating at the same hub.

Nevertheless, we have modelled the change in connectivity by pooling Heathrow and Gatwick’s passenger demand in 2030 and allocating half of the demand on each route to each airport. This analysis has some limitations as alliances could focus on offering specific routes but it provides an indication of the connectivity impacts.

Impact of expansion options on connectivity

We find that the split hub would only facilitate:

- an additional 20 routes with basic connectivity, of which 5 are likely to become frequent connections;
- 4 of the additional routes are to business destinations in emerging economies so a small increase from the previous scenario; and
- 13 additional routes that already exist could also become frequent.

However, these results are potentially optimistic. We also found in our modelling that under this scenario 8 routes currently meeting our minimum connectivity threshold would cease to do so if split across two hubs. Moreover we identify twelve routes currently achieving a frequent connection that might lose that status by 2030 if divided across two airports.

In addition, the ability to “self-connect” would also be seriously undermined if the range of routes on offer were to be distributed across two separate airports. The impact on airlines from losing these network effects is not included in the analysis. Heathrow estimates that up to 9% of passengers self-connect without a through ticket. Many services, especially from carriers without an extensive network at Heathrow, may benefit significantly from this self-connection.

3.4 Comparing Heathrow and Gatwick expansion

Our results clearly show that the number of new direct connections facilitated by a Heathrow expansion are likely to be almost six times higher than the number of new connections in any likely Gatwick scenario (see **Table 5**), while frequent connections facilitated would be more than twice as high. Our analysis therefore demonstrates that passengers’ choice of connections is increased to a much greater extent by expanding Heathrow when compared to expanding Gatwick.

In addition, more than half of the new connections at Heathrow are to business destinations in emerging economies compared to only one new route at Gatwick.

Table 5. Connectivity impacts from expanding Heathrow and Gatwick

Number and type of routes	New direct connections	Of these, how many become “frequent” connections?	Existing connections that become frequent
Heathrow	40	15	21
Gatwick (with low-cost long-haul)	7	1	9

4 Conclusion

The purpose of this report is to assess the impact of both expansion options on passengers. We consider two main questions:

- What is the difference in benefits to passengers from expanding Heathrow or Gatwick?
- How do these impacts vary under different market developments?

Given the expected level of demand for travel from both Heathrow and Gatwick, it is clear that an expansion at *both* Heathrow and Gatwick would result in a greater benefit to passengers than expanding one or the other. This is because both airports are likely to be heavily congested by 2030. However, the Airports Commission's interim report suggested that only one of the two airports would be expanded.

Our assessment shows that Heathrow Airport expansion provides substantially higher benefits to passengers than expanding Gatwick Airport because:

- **The reduction in ticket prices from expansion at Heathrow is substantially larger compared to Gatwick:**
 - The reduction in ticket prices today from expansion at Heathrow would be £95 per return ticket (or 15% of today's average return fare of £626), compared to £14 at Gatwick (or 7% of today's average return fare). By 2030 the impact of the capacity constraint will have risen, adding another £225 (in today's prices) to average return fares at Heathrow. This means that expanding Heathrow could reduce prices in 2030 by c. £320 per return ticket (38% of the average fare if Heathrow does not expand). This compares to a reduction in average return fares at Gatwick of only c. £40 (or 18%).
 - The reduction in ticket prices at Heathrow is substantially higher than at Gatwick. When accounting for differences in the cost of the new runway which are estimated to be £20 per return passenger at Heathrow and £36 per return passenger at Gatwick, it is not clear if the ticket price reduction at Gatwick will outweigh the cost of the runway.

- **The increase in connectivity is much larger for expanding Heathrow compared to Gatwick:** Expanding Heathrow Airport would provide 40 new connections for London and could allow a further twenty connections to achieve a frequent connectivity. This contrasts with only 7 connections for London from expanding Gatwick Airport. In addition, new connections to business destinations in emerging economies are more than 18 times higher for Heathrow expansion when compared to Gatwick.

Our overall conclusions apply under all likely future market developments. Heathrow Airport would lead to substantially greater reductions in ticket prices and greater connectivity.

Annexe 1: Conceptual model of airport competition

Introduction

The Airports Commission has proposed alternative solutions to the shortage of runway capacity in the southeast of England at either Heathrow or Gatwick. However, from the point of view of the market for passenger air travel, these two solutions are not equivalent and so are likely to have different impacts on competition and prices.

This report adopts a number of different techniques (econometric, simulation modelling) to assess the likely different impact of the alternative solutions on competition, airline ticket prices, and the choices of destinations made available to passengers from the London area.

We find that expanding Heathrow can be expected to have a much more significant impact on ticket prices (and connectivity) than expanding Gatwick, even after 2020 when Gatwick is also forecast to be completely full. This is because the level of excess demand for services at Heathrow far exceeds the level of excess demand forecast for Gatwick.

In this annexe we present a brief, highly-stylised theoretical model of competition between air services at two airports. It articulates in somewhat more formal terms why we would expect an additional runway at Heathrow to lead to a greater drop in ticket prices than an additional runway at Gatwick given the nature of competition between air services at different airports. The model is not calibrated to the present situation, so its numerical results only have significance in terms of the relative magnitudes of price and welfare changes for different capacity expansion options. Quantification of the real effects is left to the empirical analysis in Section 2 and Annexe 2.

The model omits certain elements of competition in the airline market. This gives it the virtue of clarity and simplicity. We discuss the significance of these simplifications and what assumptions would have to be changed to alter the fundamental conclusion: expanding the constrained hub is always likely to have a stronger effect on ticket prices and welfare than expanding an alternative less constrained airport, which is not currently a hub.

In addition, the model also illustrates the simple, but obvious point that with both airports congested and differentiated in the services they offer, consumer welfare is likely to be better served by expanding both airports than by expanding only one.

Differentiated competition between airports

Airport cost structures involve high fixed costs, or rather costs that are fixed relative to the volume of traffic over the very long run (the runway and terminal capacity), and relatively low variable costs. With this cost structure it is inevitable that airport markets cannot correspond to a textbook model of perfect competition: an airport that priced at short run marginal cost would not be able to recover its capital costs and would soon fail.

To generate sufficient revenues to cover their capital costs, airports need to be differentiated in order to be able to raise their prices to the level of average cost (or perhaps long run marginal cost – the distinction is not important for this high level discussion).

The obvious differentiation is achieved by spacing airports out, so that they are not in too close proximity to each other. This has the effect of making airports imperfect substitutes for each other, at least for locally-based passengers. The greater the degree of spatial separation an airport has from its neighbours, the more market power it is likely to enjoy over its local passenger population. It takes a substantial OD market, usually consistent with a major city, to be able to sustain several viable major airports in close proximity to each other.

But differentiation does not only arise from spatial distribution. Airports also tend to create further differentiation by serving different segments of the passenger market. By way of example, London's five major airports (or strictly the airlines operating at them) offer a significantly different mix of services. Luton and Stansted offer largely intra-European point-to-point services, Gatwick a mix of (mainly short-haul and long-haul point-to-point services, London City high-frequency intra-European point-to-point services for the business market, and Heathrow a mix of point-to-point and integrated network carriers offering an extensive set of long haul destinations as well as significant intra-European coverage to an OD and transfer market.

A similar case can be made for differentiation within the airline market. Although less marked, airlines also have significant costs that are fixed in the short run (aircraft, owned or leased) relative to their variable costs. So a degree of product differentiation can be expected. This comes in choices of destinations and schedules or frequencies as well as differentiated levels of service, loyalty schemes, etc.

Airline markets of course differ from airport markets in that airlines can enter or leave a market (subject to existing Air Service agreements), or alter capacity on specific routes, with relative ease, provided airport capacity is in sufficient supply. In addition, very little of the capital involved in an airline business is genuinely sunk, unlike with airports.

Annexe 1: Conceptual model of airport competition

If we are to consider how aviation markets are likely to respond either to capacity constraints or to the relaxation of those constraints, we need to consider airports and airlines within a coherent framework for differentiated competition.

Modelling differentiated competition

Airport capacity is relatively slow and difficult to alter, while airport charging can be adjusted relatively swiftly and can reflect market conditions as they vary (e.g. with the state of the economy). For these reasons a differentiated model based on based on competition in price, with capacities fixed in the long run, seems to be the most appropriate way of modelling airport competition. This sort of model of differentiated competition is usually described as Bertrand competition.

A simple starting model suggests itself, two airports compete with each other for a market evenly distributed along a line normalised to $[0,1]$ with one airport at each end. Demand for air travel follows a standard linear demand function, per unit of population.

Passengers distributed along the $[0,1]$ line choose which airport to use based on the net benefit they could get from using either airport. That benefit is $V(p)$ the utility obtained from using that airport given that flights cost p (this is the indirect utility function associated with the linear demand function), less a transport cost which is a linear factor T of the distance from the passenger's starting point to the airport.

Hence if the passenger is located at point x from Airport A, they will choose to use Airport A or Airport B based on the larger of $V(p_A) - Tx$ and $V(p_B) - T(1-x)$.

In this model it is simple to show that the market share of Airport A equals:

$$S_A = \frac{1}{2} + \frac{1}{2T} (V(p_A) - V(p_B)),$$

which is defined as the point on $[0,1]$ where $V(p_A) - Tx = V(p_B) - T(1-x)$.

If the airports price equally they will share the market 50:50. If Airport A cuts its price it gains market share as $V(p_A)$ increases. The larger the value of T the weaker is competition between the two airports. Both airports set their price independently to maximise profits. Equilibrium prices can be identified as a Nash Equilibrium where neither airport can profitably raise or lower its price.

If there are no capacity constraints in this simple system the equilibrium market shares will be 50:50, and $p_1 = p_2$.

In this simple model the distribution of the population along a line and the transport cost T can be interpreted as representing physical distance from each airport and the cost (including time) of surface access. But this distribution (and cost) can be representative of product differentiation as well as spatial differentiation.

Solving the model

Although this system of Bertrand competition is elegant and simple, finding a closed form solution even in the unconstrained symmetric case is extremely difficult. But solving this problem numerically can be done very easily using Excel with a goal-seeking add-in like Solver.

A Nash equilibrium in prices can be found systematically by alternate optimisation of profits for each airport, given the other airport's pricing. This process converges on an equilibrium which simple diagnostics can show is a global profit maximum for each airport given the other's pricing.

By solving the model numerically it is also possible to introduce physical constraints of capacity into the equation. In this case, each airport maximises profits subject to the fact that the total demand it can serve cannot exceed a specified limit. This causes the price at that airport to rise above the unconstrained equilibrium to match demand to capacity.

For the purpose of illustration we set up a simple scenario of demand growing over four periods (that is, the demand schedule shifting outwards each period), with Airport 1 starting with a lower available capacity than Airport 2.

In period 1 both airports are unconstrained in the equilibrium. In period 2 Airport A only is constrained in the equilibrium. In Period 3 both airports are constrained, but Airport B is only constrained because of the diversion of passengers from the constrained airport. In Period 4 both airports are constrained.

We then tested the impact on prices and consumer surplus of two capacity expansion scenarios: expanding either Airport A or Airport B. In each case the capacity expansion was sufficient to completely alleviate the capacity constraint at the expanding airport. We applied this expansion in Period 2 and examined its impact in Periods 2, 3 & 4. In Period 4 each airports remain constrained in the scenario where the *other* airport is expanded. We therefore applied a third test in Period 4, expanding both airports.

For the avoidance of doubt, this simulation model contains no capital costs – so it is not used in this context to test the cost-efficiency of capacity expansion, only to test the impact of too little or sufficient capacity on the market dynamics. As capacity is fixed over the time period for which prices are set it is easy to show that prices are unaffected by capital costs. This seems a reasonable assumption in the circumstances.

Annexe 1: Conceptual model of airport competition

Outline of the results

There are a number of general observations about the behaviour of equilibrium prices in this framework.

- As stated above, capacity costs do not enter into prices.
- If both airports are unconstrained, prices are *decreasing* in the level of demand. This is because, other things being equal, higher demand increases the intensity of competition between the airports (because there is more value in winning passengers at the margin). Hence equilibrium prices fall as demand rises (i.e. as the demand schedule shifts outwards).
- Provided one airport is unconstrained, prices at both airports are increasing with marginal operating cost. If one airport is constrained, prices rise above the unconstrained level at both airports, but more so at the constrained one. Prices rise at the constrained airport to choke off demand. Prices rise at the unconstrained airport as well because the constraint at the first airport gives the second airport a greater degree of market power: its elasticity of demand falls because passengers can only respond by not flying, not by switching to the constrained airport.
- If both airports are constrained, prices are determined by demand and capacity and unaffected by marginal operating cost. Both airports have to raise prices to choke off demand to their available capacity. There is, however, still a well-defined Nash Equilibrium.

Our scenarios for expanding capacity show a clear pattern of results, which holds true regardless of the parameters used in the model.

- If Airport 1 is constrained and Airport 2 is not (Period 2), expanding capacity at the constrained airport reduces prices at both airports (to the unconstrained level) and increases consumer surplus. Expanding capacity at airport B has no effect on prices or welfare – in particular, note that Airport B's prices remain above the unconstrained level because Airport A is constrained.
- If both airports are constrained, but Airport B only because of displaced demand from Airport A (Period 3), then expanding *either* airport reduces prices at *both* airports and increases consumer surplus. **But** the reduction in prices at both airports, and increase in consumer surplus is *always* greater if the capacity expansion occurs at the more constrained airport.

- The same result holds if both airports are constrained (Period 4), that is expanding the more constrained airport has a larger impact on prices and consumer surplus.
- If both airports are constrained it is unsurprising to observe that the greatest price reduction and increase in consumer surplus is achieved by expanding both airports.

Tables with the modelling results are given at the end of this annexe. As a reminder the numbers and magnitudes are not calibrated to any real world situation. But the relative magnitudes and directions of change hold regardless of the input values used.

The model used is available on request from Frontier Economics.

Discussion of implications

In many ways the results of this modelling should not be at all surprising. We have set out a framework of two competing but differentiated airports with fixed capacity. It shows that capacity constraints come with a cost. Constraints drive up prices at the constrained airport, but also at its competitors because the constraint reduces competition between the two airports.

It also shows that building new capacity only reduces the price effect of capacity constraints if the capacity is added to a constrained airport. If one airport is constrained and the other is not, there is no reason to think that expanding the unconstrained airport will help prices.

Finally, it shows that expanding capacity has the greater benefit if the expansion occurs at the place where the constraint is most severe, *and* if both airports are constrained the greatest benefit is achieved by allowing both to expand.

All of this could be fairly simply read across to the situation of Gatwick and Heathrow. The proposal to expand either airport makes some sense in that by 2025 it is reasonable to think that both airports will be severely constrained, so we would expect an expansion at either to have a positive effect on prices and passengers. But because Heathrow is significantly more constrained than Gatwick, we would expect the price and welfare benefits to be much greater if the expansion were to occur at Heathrow (all other things being equal). This is confirmed by the results of our econometrics and simulation modelling.

Model “developments”

Recognising that this model is extremely simplistic it still, in our view, produces reasonable and credible observations about the functioning of competition between airports.

Annexe 1: Conceptual model of airport competition

Various complications could be added to make the model look more like the real situation, but these would not alter the conclusions in any way.

Making the airports different sizes

For instance the model can be adapted to make one airport larger than the other, for instance by placing it in the middle of the $[0,1]$ space. It is easy to show that this changes the equilibrium somewhat, but does not change the dynamics of the model in any way at all.

More complex market structures

Similarly it is possible to create more complicated models where the airports supply different, segmented markets, for instance to represent where they compete with each other over part of their output, but with other airports in other market segments. This could represent Heathrow and Gatwick competing on some point-to-point services, which Gatwick competes somewhat with other London airports, say for low cost carriers, while Heathrow competes with other hubs for transfer traffic. In reality such a complication is equivalent in this simple modelling framework to increasing the Transport parameter – it simply makes the two airports less close substitutes. This, if anything accentuates the observed dynamics of capacity expansion. In practice, our assumption here of two airports that provide an essentially interchangeable but geographically differentiated service actually implies a greater degree of flexibility in terms of which services can be operated from which airport than may be true in practice.

Separating airlines and airports

Clearly, treating an airport as vertically integrated between itself and its airlines is a very strong assumption and very different from reality.

However, it is unlikely to be relevant for the dynamics of the model.

If we assume, as mentioned earlier, that the airline sector is effectively competitive, with easy entry and exit of markets at an unconstrained airport, then it is reasonable to abstract from airline costs and prices and normalise these to zero in the unconstrained scenarios. In this scenario the equilibrium represents the competitive airport price (or if one prefers the price to which airport charges would be limited by the regulator, given the presence of market power.)

When a constraint bites, we observe overall prices rising. What does this mean? In the first instance it reflects an increase in the final price to passengers, because this must rise in the face of a constraint to choke off demand. But if we assume the airport cannot raise charges, because we noted its charges would be regulated to the competitive level, then this increase must reflect an increase in airline ticket prices. Such an increase can occur because the airport constraint prevents free entry of new capacity from other airlines, so reducing *airline* competition. Thus the “value” of the constraint is passed over to the incumbent airlines. We would

expect to see this reflected in higher ticket prices and slots changing hands for positive sums, reflecting the discounted value of any congestion rents.

When one airport is constrained, more airline capacity can be added at the other airport, but this is a less good substitute for the services at the constrained airport, so prices are higher than in the constrained world.

Expanding capacity at the constrained airport allows airline competition to function freely again and reduces the premium paid by passengers at both airports.

So we see that the results of this simple model are still open to a sensible interpretation when we consider the airport/airline split.

Annexe 1.2: Modelling outputs

Table 6. Constrained modelling results

	Period 1		Period 2		Period 3		Period 4	
	A	B	A	B	A	B	A	B
Airport								
Market Share	50%	50%	48%	52%	46%	54%	46%	54%
Equilibrium Price	14.53	14.53	14.72	14.12	20.53	19.54	30.53	29.54
Unconstrained Price	14.53	14.53	13.60	13.60	12.79	12.79	12.08	12.08
Capacity Mark-Up	0.0%	0.0%	8.2%	3.8%	60.5%	52.8%	152.7%	144.5%
Capacity	110	130	110	130	110	130	110	130
Demand Served	105.47	105.47	110.00	121.19	110.00	130.00	110.00	130.00
Consumer Surplus	5,187	5,187	5,999	6,611	6,253	7,393	6,253	7,393

Table 7. Relaxing the constraint – Period 2

	Period 2 - Base		Period 2 – Expand A		Period 2 – Expand B	
	A	B	A	B	A	B
Airport						
Market Share	48%	52%	50%	50%	48%	52%
Equilibrium Price	14.72	14.12	13.60	13.60	14.72	14.12
Unconstrained Price	13.60	13.60	13.60	13.60	13.60	13.60
Capacity Mark-Up	8.2%	3.8%	0.0%	0.0%	8.2%	3.8%
Capacity	110	130	160	130	110	180
Demand Served	110.00	121.19	116.40	116.40	110.00	121.19
Consumer Surplus	5,999	6,611	6,399	6,399	5,999	6,611
Change in Price from Base			-8%	-4%	0%	0%
Change in CS from Base			+1%			0%

Annexe 1.2: Modelling outputs

Table 8. Relaxing the constraint – Period 3

	Period 3 - Base		Period 3 – Expand A		Period 3 – Expand B	
	A	B	A	B	A	B
Airport						
Market Share	46%	54%	50%	50%	44%	56%
Equilibrium Price	20.53	19.54	12.79	12.79	15.43	14.03
Unconstrained Price	12.79	12.79	12.79	12.79	12.79	12.79
Capacity Mark-Up	60.5%	52.8%	0.0%	0.0%	20.6%	9.7%
Capacity	110	130	160	130	110	180
Demand Served	110.00	130.00	127.21	127.21	110.00	140.70
Consumer Surplus	6,253	7,393	7,716	7,716	6,559	8,394
Change in Price from Base			-38%	-35%	-25%	-28%
Change in CS from Base			+13%		+10%	

Table 9. Relaxing the constraint – Period 4

	Period 4 - Base		Period 4 – Expand A		Period 4 – Expand B		Period 4 – Expand Both	
	A	B	A	B	A	B	A	B
Airport								
Market Share	46%	54%	53%	47%	41%	59%	50%	50%
Equilibrium Price	30.53	29.54	12.58	13.13	15.87	13.87	12.08	12.08
Unconstrained Price	12.08	12.08	12.08	12.08	12.08	12.08	12.08	12.08
Capacity Mark-Up	152.7%	144.5%	4.1%	8.7%	31.3%	14.8%	0.0%	0.0%
Capacity	110	130	160	130	110	180	160	180
Demand Served	110.00	130.00	144.32	130.00	110.00	160.63	137.92	137.92
Consumer Surplus	6,253	7,393	9,502	8,558	7,125	10,411	9,136	9,136
Change in Price from Base			-59%	-56%	-48%	-53%	-60%	-59%
Change in CS from Base			+32%		+29%		+34%	

Annexe 1.2: Modelling outputs

Annexe 2: Fare analysis

Introduction

The Airports Commission published its interim findings in December 2013, which included a shortlist of possibilities of expanding airport capacity in London. This shortlist includes two alternative ways of expanding Heathrow and one way of expanding Gatwick.

Heathrow is currently capacity constrained. This capacity constraint will lead to excess demand which, as explained in this report, can be expected to lead to higher fares. To understand the size of this effect we have analysed empirical data.

We have found that in 2012 ticket fares at Heathrow were on average 18.0% higher than other London airports and 23.8% higher than other European hub airports, even when controlling for other factors that might affect fares. By controlling for other factors we can then infer that in 2012 the capacity constraint implied a mark-up on one way fares of about £50. Our conclusion that the capacity constraint drives the higher fares is confirmed by the fact that we do not find a significant effect for Heathrow in 2010, when the excess demand was much smaller due to the recession. These results are summarised in **Table 10**.

Table 10. Premium at Heathrow - range of results

Sample	Headline LHR Premium	Implied one-way mark-up	Range
London 2012	18.0%***	£50.11	15.7-19.0%***
London 2010	6.8%	-	3.9-6.8%
European hub airports 2012	23.8%***	£63.15	20.9-23.8%***

*** means that a result is significant at the 1% significance level. **means that a result is significant at the 5% significance level and * means that a result is significant at the 10% significance level

Source: Frontier Economics

Additionally, we find in the 2012 data that average fares at Gatwick, which is constrained at peak times, are 6.9% higher than at other London airports, which for Gatwick is equal to a £7 mark-up on average on 2012 one-way fares. Note that the on-way premium can be converted into a return premium by doubling the figures.

Methodology

We have tried to demonstrate the cost of the capacity constraint to passengers at Heathrow. We have done so by estimating an econometric model that explains the fares Heathrow. To do this we have tested a wide range of variables for inclusion in the model that could explain prices. By controlling for all these factors we can conclude that the remaining price difference between Heathrow and the other London airports and the other European hub airports is most likely due to the fact that Heathrow is capacity constrained.

Regressions

In order to estimate the premium that passengers pay at Heathrow due to the capacity constrained we ran the following regressions:

$$(1) \ln(\text{Fare})_i = \beta_0 + \beta_1 \text{Distance}_i + \beta_2 \text{Long haul}_i + \beta_3 \ln(\text{Frequency_Own})_i + \beta_4 \ln(\text{Frequency_Other})_i + \beta_5 \text{Business}_i + \beta_6 \text{VFR}_i + \beta_7 \text{Transfer}_i + \beta_8 \text{LCC}_i + \beta_9 \text{LHR}_i + u_i$$

$$(2) \ln(\text{Fare})_i = \beta_0 + \beta_1 \text{Distance}_i + \beta_2 \text{Long haul}_i + \beta_3 \ln(\text{Frequency_Own})_i + \beta_4 \ln(\text{Frequency_Other})_i + \beta_7 \text{Transfer}_i + \beta_8 \text{LCC}_i + \beta_9 \text{LHR}_i + u_i$$

We used regression (1) to estimate the price difference between Heathrow and the other London airports; Gatwick, Luton, Stansted and City airport. We used regression (2) to estimate the price difference between Heathrow and the other European hub airports; Amsterdam-Schiphol, Paris-Charles de Gaulle, Frankfurt and Madrid. The above models have been estimated using ordinary least squares (OLS) estimates and heteroskedasticity-robust standard errors.

In addition, we investigated whether the results are different for the airports by running the above regression for each airport individually. We investigated what the effect is of the constraint at peak times at Gatwick by replacing our Heathrow variable with a Gatwick variable. We also investigated whether any differences in fares were mainly driven by short haul or long haul flights.

Interpretation of coefficients

The interpretation of the coefficient estimations is shown in **Table 11**. We are particularly interested in $\widehat{\beta}_9$, which tells us on average how much more expensive fares are at Heathrow than at other London airports or European hub airports after controlling for other factors.

Annexe 2: Fare analysis

Table 11. Coefficient estimates and their interpretation

Estimated coefficient	Explanatory Variable	Interpretation
$\widehat{\beta}_0$		Constant
$\widehat{\beta}_1$	Distance	Holding everything else constant, an increase in distance of one nautical mile will increase the price by $\widehat{\beta}_1\%$.
$\widehat{\beta}_2$	Long haul	Holding everything else constant, on average, the fare for long haul flights is $\widehat{\beta}_2\%$ higher than the fare for short haul flights.
$\widehat{\beta}_3$	ln(Frequency_Own)	Holding everything else constant, a 1% increase in the number of flights to the same destination at the same airport is associated with a $\widehat{\beta}_3\%$ increase in fare.
$\widehat{\beta}_4$	ln(Frequency_Other)	Holding everything else constant, a 1% increase in the number of flights to the same destination at other airports is associated with a $\widehat{\beta}_4\%$ increase in fare.
$\widehat{\beta}_5$	Business	Holding everything else constant, a one percentage point increase in business passengers on this route would be associated with a fare increase of $\widehat{\beta}_5\%$.
$\widehat{\beta}_6$	VFR	Holding everything else constant, a one percentage point increase in passengers who visit friends and relatives on this route is associated with a fare increase of $\widehat{\beta}_6\%$.
$\widehat{\beta}_7$	Transfer	Holding everything else constant, a one percentage point increase in transfer passengers on this route is associated with a fare increase of $\widehat{\beta}_7\%$.
$\widehat{\beta}_8$	LCC	Holding everything else constant, a one percentage point increase in passengers who fly with low cost carriers on this route is associated with a fare increase of $\widehat{\beta}_8\%$.
$\widehat{\beta}_9$	LHR	Holding everything else constant, on average, the fare for a flight on this route from Heathrow is $\widehat{\beta}_9\%$ more expensive than the same flight from the other airports in the sample.

Source: Frontier Economics

Model specification

We have tested many types of model specifications for our regressions. Our final results are regressions which give us the best fit with the data and the clearest interpretation of the results. The robustness of our results with regards to model specification can be found in **Table 10** and a selection of our regression results is found in **Table 25, Table 26** and **Table 27**.

We have decided to include our independent variable Fare in a log-specification, so that the coefficients can be interpreted as percentage changes (see **Table 11**). We have also investigated different specification of distance, including log-specification and have decided to include the model with the best fit.

There are several explanatory variables which have been included in the regression model, even though their coefficients were not found to be significant. We decided to include them regression because it allows us to interpret the coefficient on other explanatory variables more clearly. For example, the coefficient on transfer passengers is not significant in many of the regressions we have performed. Nevertheless, we have decided to include it to control for the possibility that Heathrow's premium is caused by its function as a hub airport. By including transfer passengers we control for the effect of a hub on fares and are able to attribute the remaining Heathrow premium to the capacity constraint.

Robust standard errors

The errors in our regression model are not likely to be identically distributed. This can clearly be seen in **Figure 11** to **Figure 15**, as the price differences between Heathrow and the other airports differs significantly depending on the airports. This means that the errors are subject to heteroskedasticity, so we have used heteroskedasticity-robust standard errors to control for this possibility. The fact that we are using robust standard errors increases the standard errors, which in turn means that the significance levels in our results will lower, and our results therefore more conservative.

Data used in modelling

In our analysis we have covered three data samples and collected data from a variety of sources. We then applied several assumptions to create a data-set which we used to conduct the econometric analysis.

Samples

We have repeated our analysis for three different samples; for London airports in 2012 and 2010 and for European hub airports in 2012. **Figure 6** gives an overview of the samples we have used in our analysis.

Annexe 2: Fare analysis

Figure 6. Samples included in econometric analysis

<ul style="list-style-type: none"> ● London airports in 2012 □ LHR □ LGW □ LTN □ STN □ LCY 	<ul style="list-style-type: none"> ● European hub airports in 2012 □ LHR □ AMS □ CDG □ FRA □ MAD 	<ul style="list-style-type: none"> ● London airports in 2010 □ LHR □ LGW □ LTN □ STN □ LCY
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Source: Frontier Economics

Data sources

The data that have been collected come from a variety of sources. The sources of the data are shown in **Table 12**. Please note that all the data has been collected for routes, which are specific departure airport – arrival airport combinations.

Table 12. Data used for econometric analysis of fares

Variable	Description	Source
Fare	Average fare for a route from a departure airport. Calculated as $\text{Fare} = \frac{\text{Total revenue}}{\text{Total estimated passengers}}$ Excludes passenger-related airport charges	IATA Fare data
Distance	Distance in nautical miles between departure airport and arrival airport.	IATA Lookup Table
Long haul	Dummy variable: 1 if route is long haul.	IATA Lookup Table
Frequency_Own	Number of annual flights on the route at the same airport.	OAG Analyser
Frequency_Other	Number of annual flights on the route at the other airports in the sample.	OAG Analyser
Business	Percentage of passengers on the route whose trip purpose is business.	CAA Passenger Surveys
VFR	Percentage of passengers on a route whose trip purpose is visiting friends and relatives.	CAA Passenger Surveys
Transfer	Percentage of passengers on the route who are transfer passengers.	IATA Fare data
LCC	Percentage of passengers on the route on flights operated by low cost carriers.	IATA – SRS Analyser
LHR	Dummy variable: 1 if departure airport is Heathrow.	
LGW	Dummy variable: 1 if departure airport is Gatwick.	
LTN	Dummy variable: 1 if departure airport is London Luton.	
LCY	Dummy variable: 1 if departure airport is London City Airport.	
AMS	Dummy variable: 1 if departure airport is	

Annexe 2: Fare analysis

	Amsterdam-Schiphol.
CDG	Dummy variable: 1 if departure airport is Paris-Charles de Gaulle airport.
FRA	Dummy variable: 1 if departure airport is Frankfurt airport.
MAD	Dummy variable: 1 if departure airport is Madrid airport.

Source: Frontier Economics

Assumptions

In the process of data cleaning and assembly different assumptions have been made to get the most representative sample of observations. Assumptions have been made regarding which observations should be included and about the definitions of long haul flights, trip purpose, transfer passengers and low cost carriers.

In this process we have excluded 130, 201 and 382 observations for the London 2012, London 2010 and European hub airports samples respectively. The final sample sizes are summarized in **Table 13**. We have chosen to exclude certain observations because they do not constitute regular connections between the departure airport and the arrival airport, because it is a chartered flight or just an irregular flight.

Table 13. Sample size and excluded observations

Sample	Final sample size	Number of excluded observations
London 2012	582	130
London 2010	549	201
European hub airports 2012	977	382

Source: Frontier Economics

Inclusion of observations

In our analysis we have only included outgoing flights from the particular airports we are looking at. By doing so we assume that outgoing and return flights are comparable in terms of passengers and fares.

Furthermore, we only looked only at origin-destination (OD) passengers. The IATA data provides revenues for the total flight path and does not break this down for different legs of the journey. If we had wanted to include other passengers than OD passenger then we would have made extra assumptions about how the fares were distributed over the different legs of a journey, which we avoided.

Lastly, we only looked at routes which had more than 10,000 relevant passengers (see treatment of transfer passengers below). This is equivalent to 3 long haul flights or 6 short haul flights per month.¹³ This cut-off point was chosen so as to exclude chartered and irregular flights from the analysis.

For example, in 2012 2581 passengers flew from Heathrow to King Fahd International Airport in Dammam, Saudi Arabia¹⁴. This is equal to just over 10 flights a year, which cannot be considered a regular connection and therefore we did not include it in our analysis. Because we estimating our model using ordinary least squares (OLS) methods, the model would be very sensitive to outliers if we included them.

¹³ This calculations assumes that the average capacity of a short-haul airplane is 120 passengers and the average capacity of long-haul airplane is 250 passengers. This also assumes that airplanes fly 365 days a year.

¹⁴ Source: IATA 2012 data

Annexe 2: Fare analysis

Long haul flights

For our definition of long haul flights we adopted the IATA-definition, which is any flight over a distance of more than 2,200 nautical miles. For our long haul-specific analyses, we excluded airports which just operate one long haul flight (London City Airport in 2012 and Stansted in 2010).

Trip purpose

We assumed a threefold distinction between different trip purposes:

- Business
- Visiting friends and relatives
- Leisure

This does not correspond exactly to the trip purpose definition in the CAA Passenger surveys. ‘Purpose’ in the CAA data divides passengers between ‘Business’ and ‘Leisure’. We have used the ‘Business’ passengers from this category and then further divided ‘Leisure’ into our ‘Visiting friends and relatives’ and ‘Leisure’ using the information in ‘Main Purpose’ in the CAA data.

As the passenger surveys are only conducted in the UK we were not able to control for trip purpose in the analysis of the European hub airports. Moreover, in 2010 trip purpose is not available for London City Airport.

Transfer passengers

In the data we distinguish between four different types of passengers:

- Incoming passengers
- Outgoing – OD passengers
- Outgoing – Beyond passengers
- Outgoing – Transfer passengers

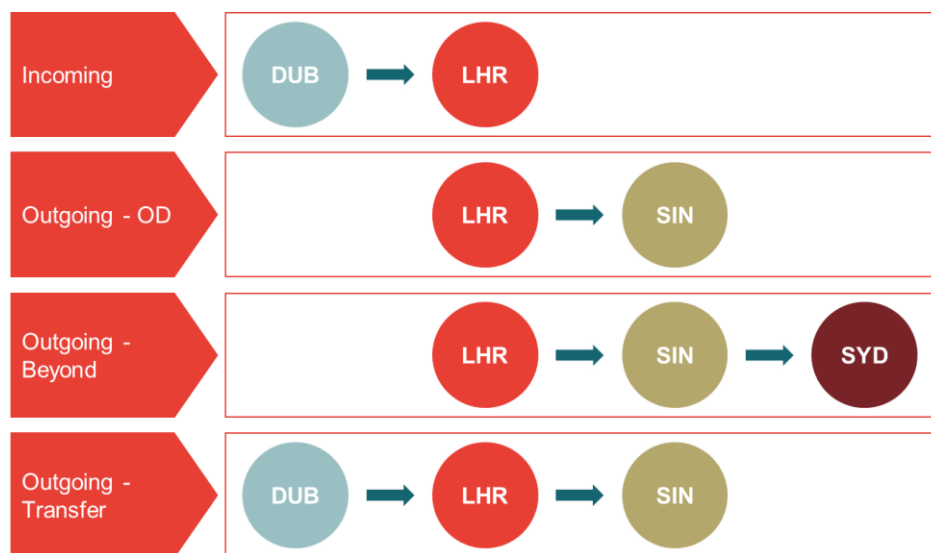
Incoming passengers are passengers who only arrive at the particular airport we are interested in and reach their destination there. OD Passengers depart from the airport of interest and travel directly to their final destination. Beyond passengers depart from the airport of interest and travel indirectly to their final destination. Transfer passengers are those passengers who depart from a different airport and travel through the airport of interest on their way to their destinations. These definitions are summarised in **Figure 7**. The presence of a high proportion of transfer passengers is one of the defining features of hub airports.

Even though our data only consists of outgoing – OD passengers, we are interested in controlling for the presence of transfer passengers on a route. As a

counting convention, transfer passengers are counted twice in passenger data for airports, as they are part of two ATMs, once on the incoming flight and once on the outgoing flight. To correct for this we divided the passenger number in the data by 2.

We constructed the number of ‘Relevant passengers’ as the sum of OD and Beyond passengers and the corrected number of transfer passengers. The number of relevant passengers is subject to a minimum passenger requirement (see **Table 13**). The percentage of transfer passenger is constructed as the corrected number of transfer passengers divided by the relevant number of passengers.

Figure 7. Different passenger-types



Source: Frontier Economics

Low cost carriers

For our analysis we counted as low cost carriers any airlines that are included in the IATA-SRS Analyser definition of low cost carriers. We then used this information to calculate the percentage of low cost carrier passengers on the routes.

Preliminary data analysis

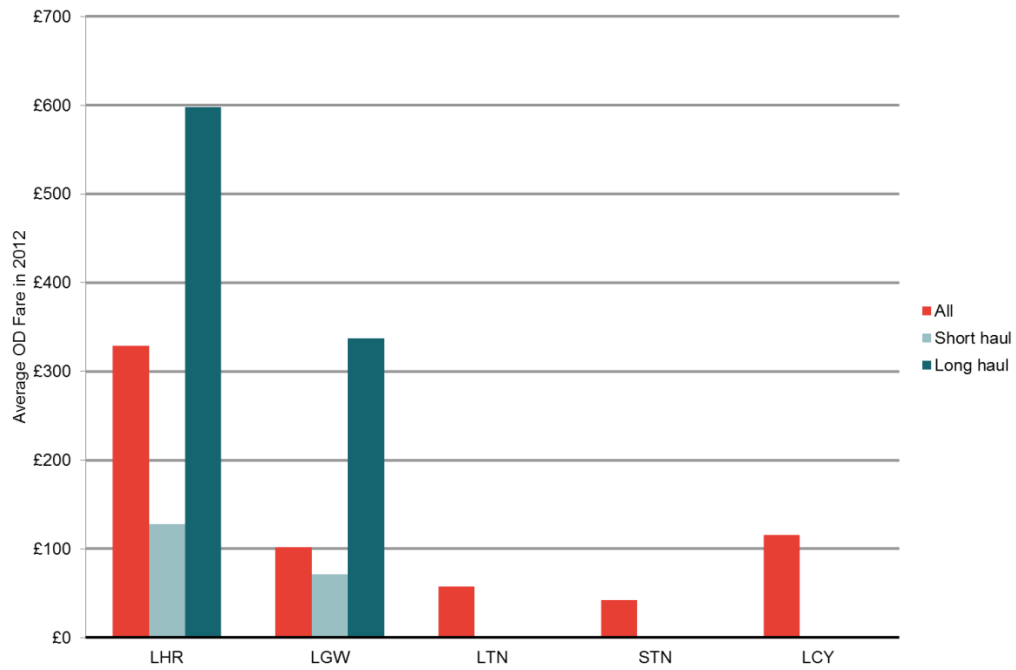
As a preliminary way of examining the data we charted the averages fares at the different airports for OD-fares and broke this down by long haul and short haul destinations. Furthermore, we looked at the destinations that Heathrow serves that are also served by other airports, so where there is a direct overlap between the routes.

Annexe 2: Fare analysis

Average fares

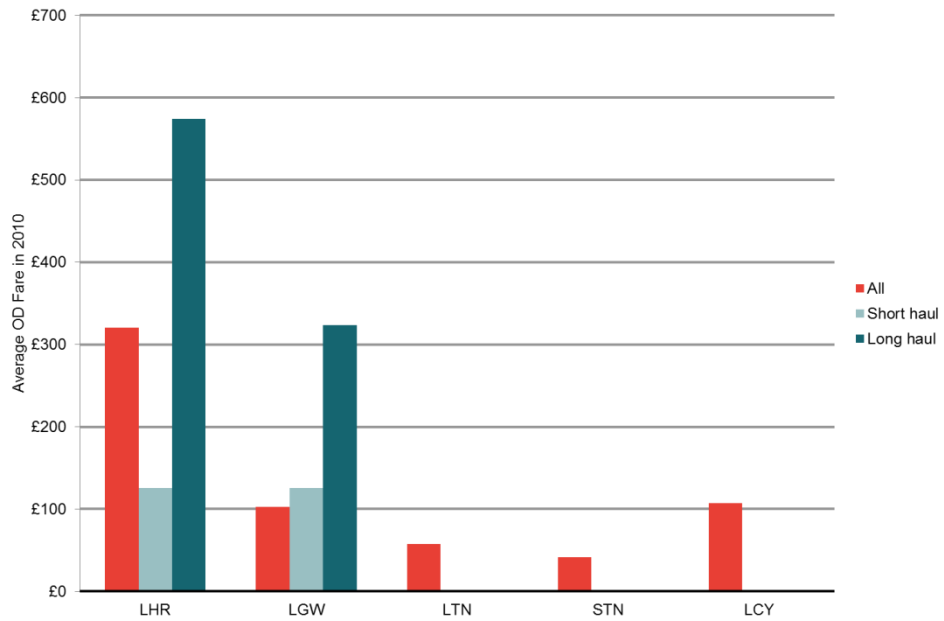
The average OD-fares for all, short haul and long haul flights at London airports in 2012 is shown in **Figure 8**. The same analysis for the London airports in 2010 is shown in **Figure 9** and the same analysis for the European hub airports in 2012 is shown in **Figure 10**.

Figure 8. Average OD fares at London airports in 2012



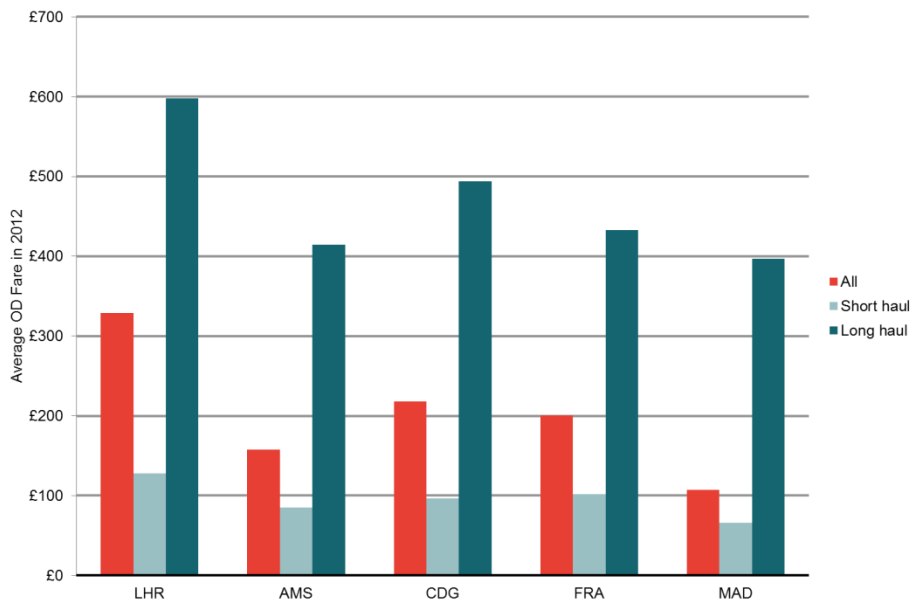
Source: IATA, Frontier Economics

Figure 9. Average OD fares at London airports in 2010



Source: IATA, Frontier Economics

Figure 10. Average OD fares at European hub airports in 2012



Source: IATA, Frontier Economics

From these figures it is clear that average fares at Heathrow are much higher than at the other London airports, both in 2012 and 2010.

Annexe 2: Fare analysis

It is also clear that the average fares at Heathrow are higher in 2012 than at the other European airports. Heathrow has consistently higher fares for both the short haul and the long haul destinations. After Heathrow, Paris-Charles de Gaulle airport is the most expensive, followed by Frankfurt, Amsterdam and Madrid.

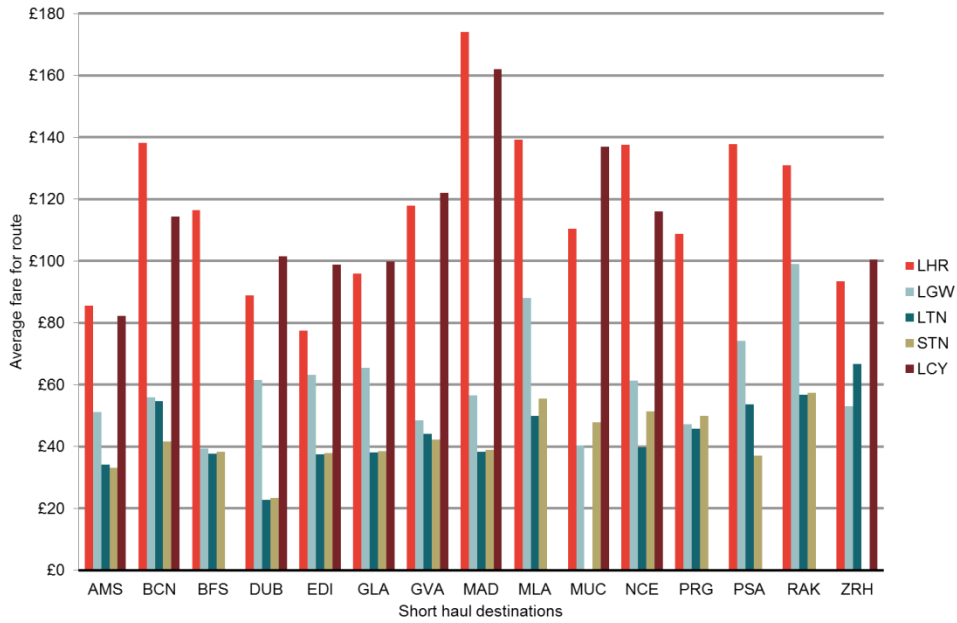
Overlap analysis

Although we will control for other control variables at a later stage of the analysis, it is informative to look at the destinations where the Heathrow routes overlap with the other airports in the sample. It is also important for the validity of our econometric analysis that overlap between the routes is present in all our samples.

The overview of overlap destinations on both short haul and long haul destinations is shown in **Table 16** to **Table 21** for all the samples.

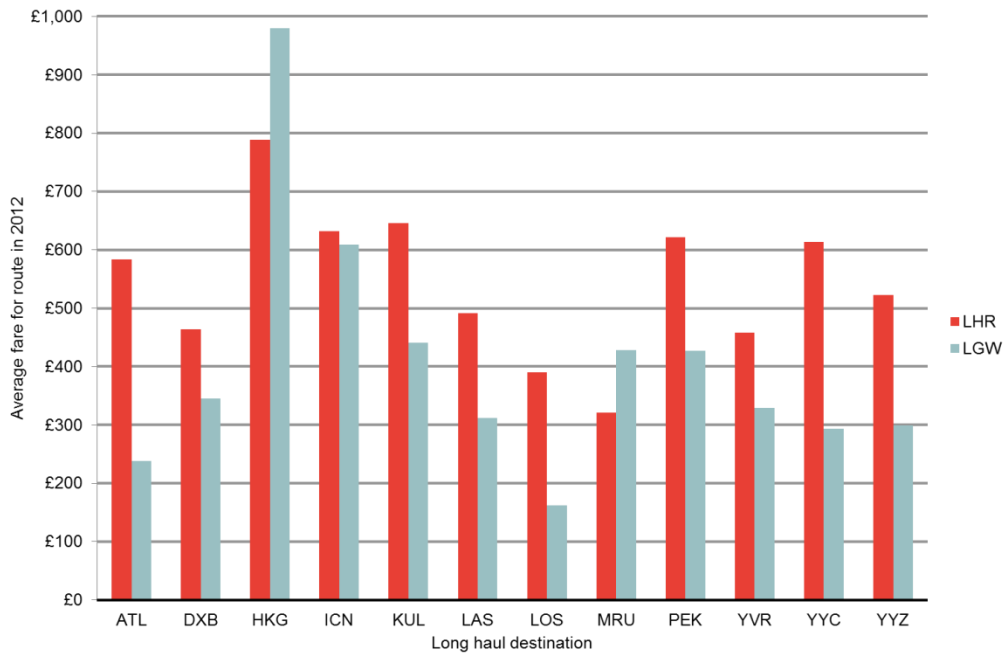
Specifically, the overlap on long haul destinations between Heathrow and Gatwick is shown in **Figure 12** and the overlap on short haul destinations between Heathrow and the other London airports is shown in **Figure 11**.

Figure 11. Short haul destination overlap London airports 2012



Source: IATA, Frontier Economics

Figure 12. Long haul destination overlap LHR-LGW 2012



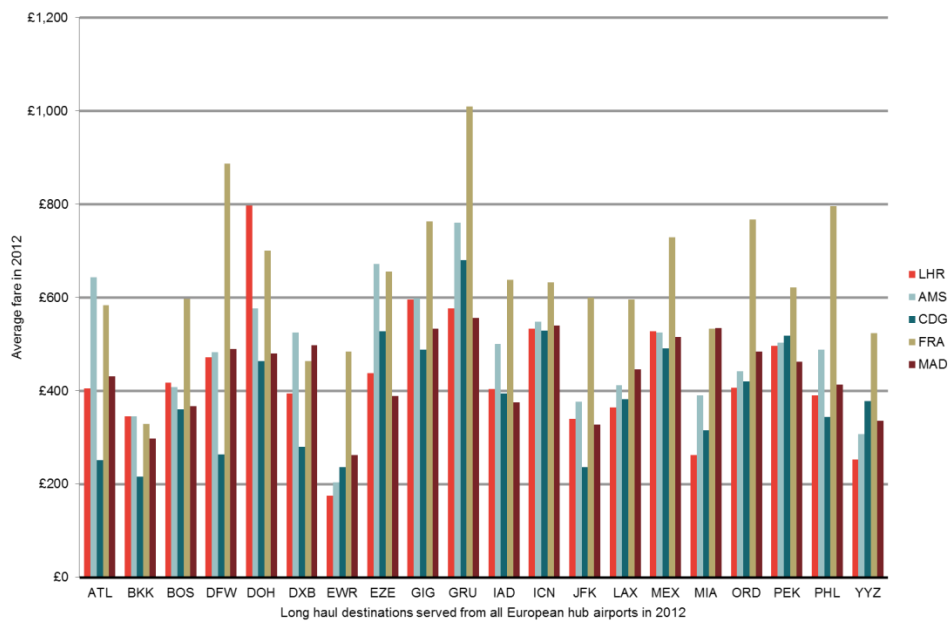
Source: IATA, Frontier Economics

Annexe 2: Fare analysis

From the overlap on the short haul destinations between the London airports in 2012 it seems to be the case that Heathrow has high fares on these destinations, and so does City airport. We can see in **Figure 12** that out of the 12 long haul destinations where Heathrow and Gatwick overlap, Heathrow has the highest fares on 10 out of 12. Nevertheless, there seems to be some heterogeneity here, as the Heathrow premium does not always have the same relative size.

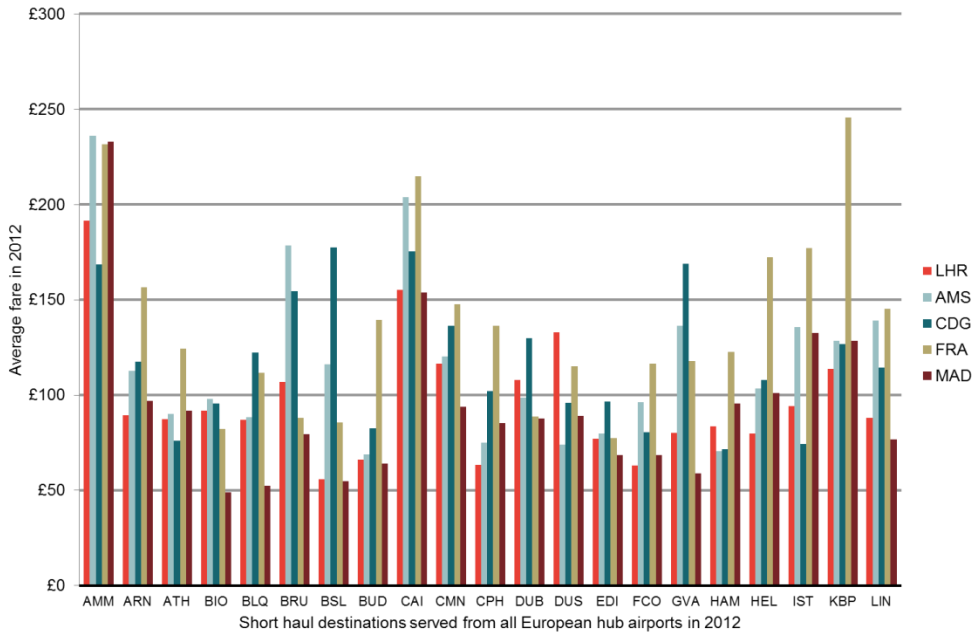
Figure 13, **Figure 14** and **Figure 15** show the average fares for the long haul and short haul destinations that are served by all five European hub airports. On most of these destinations it seems to be the case that the Frankfurt fares are very high, although **Figure 10** shows that the average at Frankfurt are lower than the average fares at Heathrow, both for short haul and long haul destinations.

Figure 13. Long haul destination overlap European airports 2012



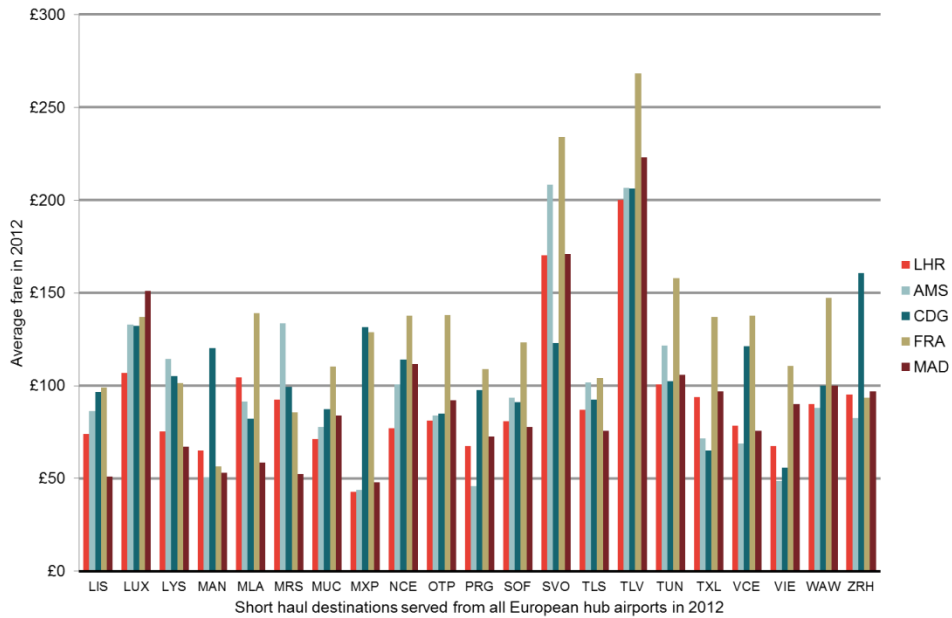
Source: IATA, Frontier Economics

Figure 14. Short haul destination overlap European airports 2012



Source: IATA, Frontier Economics

Figure 15. Short haul destination overlap European airports 2012



Source: IATA, Frontier Economics

Annexe 2: Fare analysis

Robustness and interpretation of results

In order to get a robust estimate of the effect of the Heathrow capacity constraint to passengers we ran many regressions, the results of which can be found in **Table 22** to **Table 27**.

For every sample, we ran regressions on the whole sample, the short routes, the long haul routes and each airport separately. These results can be found in **Table 22** for the London airports in 2012, in **Table 23** for the London airports in 2010 and in **Table 24** for the European hubs airports in 2012.

Furthermore, we experimented with the model specification by excluding variables that were not significant. The results of these model specification tests can be found in **Table 25** for the London airports in 2012, in **Table 26** for the London airports in 2010 and in **Table 27** for the European hub airports in 2012. In general, these results fed into the ranges provided for each estimate.

The effect of the Heathrow capacity constraint on fares

Our estimates of the effect of the capacity constraint on average fares at Heathrow in 2012 can be found in **Table 10**. The implied mark-ups on ticket prices can be calculated by taking the appropriate percentages of the average Heathrow fare in 2012. For example, if Heathrow fares are 18% more expensive than the fares at the other London airports the calculation is 18/118 times the average fare at Heathrow.

Heathrow compared to other London airports

On average, passengers at Heathrow paid 18% more than at the other London airports due to the capacity constraint. This implies approximately a £50 mark-up on one-way ticket prices.

We have not calculated an implied mark-up for the 2010 data as this result was not statistically significant. This further confirms our conclusions that the mark-up in 2012 was caused by excess demand caused by the capacity constraint, as there was limited excess demand in 2010.

Heathrow compared to other European hub airports

Our estimate for the implied mark-up of Heathrow fares compared to the other European hub airports is slightly higher at £63. The higher mark-up could be due to a difference in airport charges between the different European countries. Also, due to data constraint we were not able to control for trip purpose, which has proved to be a significant determinant of fares in the London samples.

The effect of the Gatwick capacity constraint on fares

Even though Gatwick is currently not fully capacity constrained, it could be considered constrained at peak times. Our estimates of the effect of the capacity constraint on average fares at Gatwick in 2012 can be found in **Table 10**. Average fares at Gatwick in 2012 were 6.9% higher than at other London airports, means that the one-way fare implied mark-up at Gatwick is equal to approximately £7.

Impact of other variables

Table 22 to **Table 24** show the results of the regressions, broken down for different airports, and short haul and long haul. The results give rise to some interesting conclusions with respect to the determinants of fares at airports. The interpretations below help us to further understand the fare pricing overall and at different airports.

Distance and Long haul

As can be seen in **Table 22**, the coefficient on distance is positive and significant in every case. This is a result we expected as the distance that is flown is a key determinant of the operating cost of airlines.

The coefficient on the long haul dummy variable is positive, which means that holding everything else constant, long haul flights are 43.9% more expensive according to the results in **Table 22**. This is an interesting result as this premium arises when the extra distance that is covered during the flight is already controlled for. This could, perhaps, be interpreted as reflecting the additional operational differences between long haul and short haul, including larger aircraft and over-night stops meaning longer turnaround times.

It is also interesting to note that the premiums for long haul flights are different at Heathrow than at Gatwick. Whereas at Heathrow, holding everything else constant, long haul flights are more expensive than short haul flights, at Gatwick the coefficient on long haul flights is negative. This means that at Gatwick, long haul flights are cheaper on a pure distance basis than short haul flights. It is possible that this reflects a competitive effect, resulting from the capacity constraint at Heathrow. That is, impact of capacity constraints on competition and ticket prices is particularly marked for long haul at Heathrow, because these are the routes on which additional competitive entry is not possible **and** passengers have no viable alternative option at other airports.

The difference between fare pricing at Heathrow and Gatwick based on distance is further explored in the section “Distance pricing at Heathrow and Gatwick”.

Annexe 2: Fare analysis

Frequencies

We had expected the coefficients on frequencies to be negative, as a greater supply of flights might be expected to bring down prices. Nevertheless, it could be the case that increased frequency of flights represents the higher demand for a flight, as airlines supply more flights if a particular route turns out to be profitable.

In fact, our results show mixed effects for both frequency of flights at the same airport and frequency of flights at other airports. The results tend not to be significant. The exception is the coefficient on frequency of flights at other airports, which is positive and significant for the short haul destinations at the London airports in 2012, all destinations and short haul destinations at the London airports in 2010 and all destinations at the European hub airports in 2012. This suggests that holding everything else constant, more flights to the same destination from other airports in the sample is associated with higher fares on that particular route. This could be consistent with higher yields leading to airlines increasing frequency, but this effect not being sufficient to fully eradicate the premium.

Trip purpose

Trip purposed proves to be a very significant determinant of fares, as is evident from our results. Business has consistently a positive and significant effect, at all airports. At the London airports in 2012, holding everything else constant, a 1 percentage point increase in passengers with the trip purpose of business, is associated with a 0.37% increase in average fares.

Moreover, more passengers visiting friends and relatives are associated with lower fares. This is also a significant result that is robust across many airports and sample and model specifications. This suggests VFR passengers may be the most price sensitive passenger group.

Transfer passengers

The coefficient on transfer passengers is generally positive in our results but not significant. The exception to this is the analysis of European hub airports in 2012 as the coefficient on transfer passengers is positive and significant for both short haul and long haul destinations. This means that, holding everything else constant, a 1 percentage point increase in transfer passengers on a particular route is associated with a 0.28% increase in average OD fares. This could be consistent with transfer passengers being more price sensitive, and so the market allocating a smaller share of fixed (e.g. aircraft) costs to this group.

Low cost carrier passengers

The coefficient on low cost carrier passengers is negative and significant. This is a result we would expect.

Short haul and long haul

We have investigated whether the effect of the capacity constraint at Heathrow is different for passengers who fly to short haul or long haul destinations. The results of this analysis can be found in **Table 14**.

At a first glance the results might be slightly confusing, as the pooled effect of the capacity constraint is higher than the individual effects of the capacity constraint for short haul and long haul destinations. This is due to the effects of matrix estimations and the covariances that are taken into account. Prof. Ron Smith at Birkbeck (who has assisted with this econometric analysis) explains this in the textbox below.

Average price differences

By Prof. Ron P. Smith

Department of Economics, Mathematic and Statistics

Birkbeck College, London



“One might think that the estimate of the average price difference between Gatwick and Heathrow for the total sample of all flights should lie between the estimate for short haul and the estimate for long haul. But this is not necessarily the case because what is being controlled for is different in the total sample and the two sub-samples.

Consider a firm with two factories: in both factories it pays men 10% more than women. One factory is in a high wage area, where it employs mainly women; the other factory is in a low wage area where it employs mainly men. On average, in the total sample, women get paid more than men, despite being paid less in both sub-samples; because of the large number of women employed in the high wage area. This is sometime called Simpson’s paradox.

One can get similar effects in regressions. Suppose one estimates two multiple regressions on the sub-samples, e.g. Heathrow and Gatwick, and one on the total sample. It is not true, except under very special circumstances, that the estimate of an individual coefficient from the total sample will take a value between the estimates of that coefficient between the two sub-samples. One might get the two subsamples giving negative coefficients and the total sample giving a positive coefficient. This is because of the interactions between the variables.

In the case of Heathrow and Gatwick it seems to be because the effect of distance on price is different between long haul and short haul and Heathrow and Gatwick. A formal treatment of the relationship between the total and the two samples is in Gary Chamberlain and Edward Leamer “Matrix Weighted Averages and Posterior Bounds” *Journal of the Royal Statistical Society, Series B (Methodological)* 38(1) 1976, p73-84.”

We conclude from the results that the capacity constraint at Heathrow mainly affects the fares for long haul destinations. Even though the absolute fares at Heathrow are higher as can be seen in **Figure 8**, once the other explanatory variables are controlled for short haul fares at Heathrow are not significantly different from the other London airports.

Whereas compared to other London airports the effect of the capacity constraint is mainly found in a premium on long haul flights, the effect of the capacity

constraint compared to other European hub airports seems equally divided between short haul and long haul.

Table 14. Breakdown of LHR Premium in London 2012

Sample	Haul	Estimate	Range
London 2012	Total	18.0%***	15.7-19.0%***
London 2012	Short haul only	-4.3%	-5.7- -4.3%
London 2012	Long haul only	16.8%	16.8-28.6%***
London 2010	Total	6.8%	3.9-6.8%
London 2010	Short haul only	-14.9%**	-17.9- -14.9%**
London 2010	Long haul only	-2.3%	-2.3- -0.3%
Europe 2012	Total	23.8%***	20.9-23.8%***
Europe 2012	Short haul only	22.9%***	17.5-22.9%***
Europe 2012	Long haul only	20.3%***	18.6-22.3%***

*** means that a result is significant at the 1% significance level. **means that a result is significant at the 5% significance level and * means that a result is significant at the 10% significance level

Source: Frontier Economics

Distance pricing at Heathrow and Gatwick

We have noted above that the distance pricing at Heathrow and Gatwick seems to be different as the coefficient on long haul is positive for Heathrow and negative for Gatwick in **Table 22**. To investigate the fare pricing based on distance at Heathrow and Gatwick further we have run some further analyses on the sample of London airports in 2012.

Figure 16 shows a scatterplot of the average fares and distance for the different destinations for all London airports in 2012. **Figure 17** shows a scatterplot of the log fares of the different destinations of short haul and long haul destinations at Heathrow and Gatwick. From the scatterplots it is clear that Heathrow has higher fares than Gatwick on the long haul destinations, although Heathrow has more destinations with a longer distance than Gatwick does. The price differences between the Heathrow and Gatwick short haul flights are less pronounced.

Annexe 2: Fare analysis

To investigate this issue more formally we have run auxiliary regressions on Heathrow and Gatwick separately in which we have included an interaction variable between distance and long haul, while controlling for all the other variables we have controlled for in earlier regressions. The results of this regression are shown in **Table 15**. We have charted the resulting fare pricing based on distance at Heathrow and Gatwick in **Figure 17**. It is important to note that this does not provide the best fit to the data, because the other variables that are included in the regressions in **Table 15** are not displayed in **Figure 17**.

Figure 17 clearly shows us that short haul Heathrow flights are not more expensive than Gatwick flights, in fact they seem to be slightly cheaper based on pure distance pricing.¹⁵ For long haul flights however there is a significant difference between the prices at Heathrow and at Gatwick, with Heathrow fares being consistently above Gatwick fares, especially for shorter long haul flights.

¹⁵ A possible interpretation of this result could be that in the economic model for network carriers short haul flights are discounted to increase the number of passengers on profitable long haul flights.

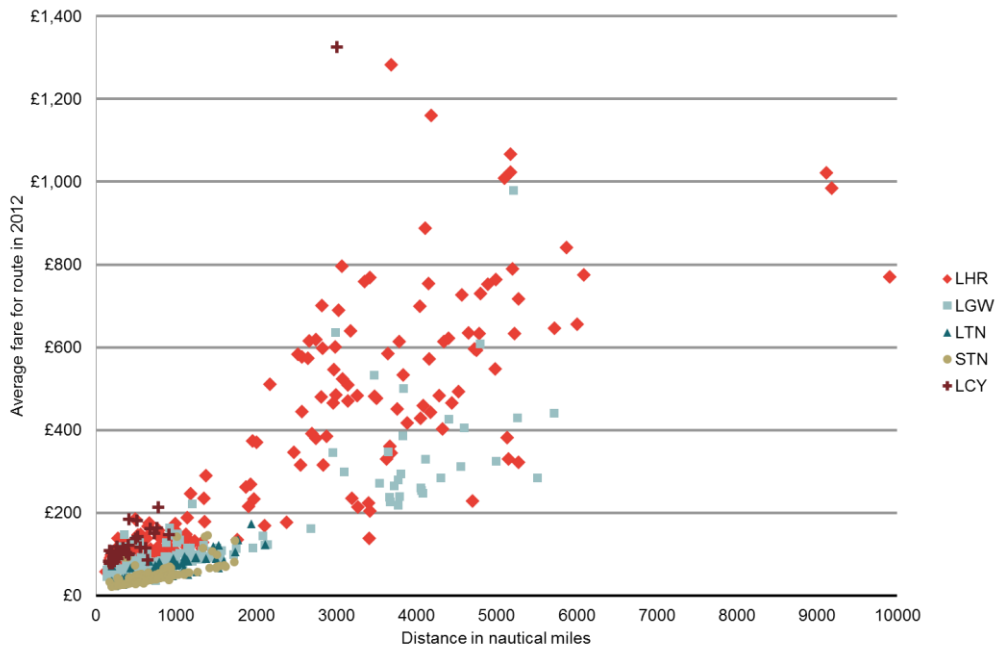
Table 15. Auxiliary regression on Heathrow and Gatwick

Haul Airports	ALL	ALL
	LHR	LGW
Dependent variable	LFare	LFare
Constant	4.385*** (0.223)	4.608*** (0.199)
Distance	0.000684*** (7.03e-05)	0.000635*** (5.74e-05)
Long Haul	1.517*** (0.120)	0.683 (0.462)
Interaction – Long Haul and Distance	-0.000562*** (7.05e-05)	-0.000406*** (0.000122)
LFrequency_Own	0.0473* (0.0268)	-0.00581 (0.0289)
LFrequency_Other	-0.0186* (0.0101)	-0.00628 (0.0108)
Business	0.681*** (0.211)	0.469** (0.181)
VFR	-0.392** (0.187)	0.0346 (0.130)
Transfer	0.167 (0.144)	1.076 (0.707)
LCC	0.00347 (0.107)	-0.493*** (0.0775)
LHR		
Observations	168	158
R-squared	0.873	0.886

*** means that a result is significant at the 1% significance level. **means that a result is significant at the 5% significance level and * means that a result is significant at the 10% significance level

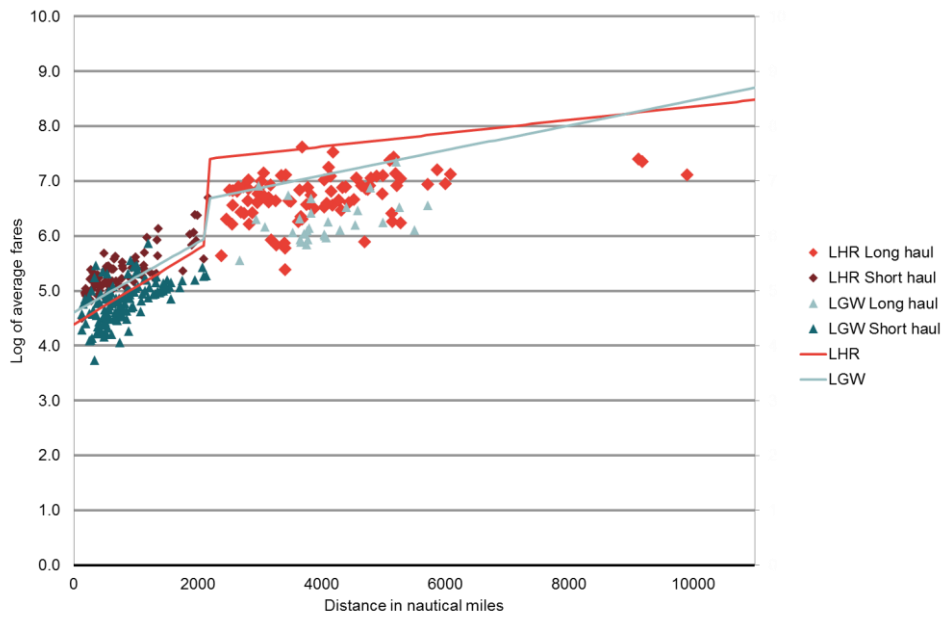
Source: Frontier Economics

Figure 16. Distance and average fares at London airports in 2012



Source: IATA, Frontier Economics

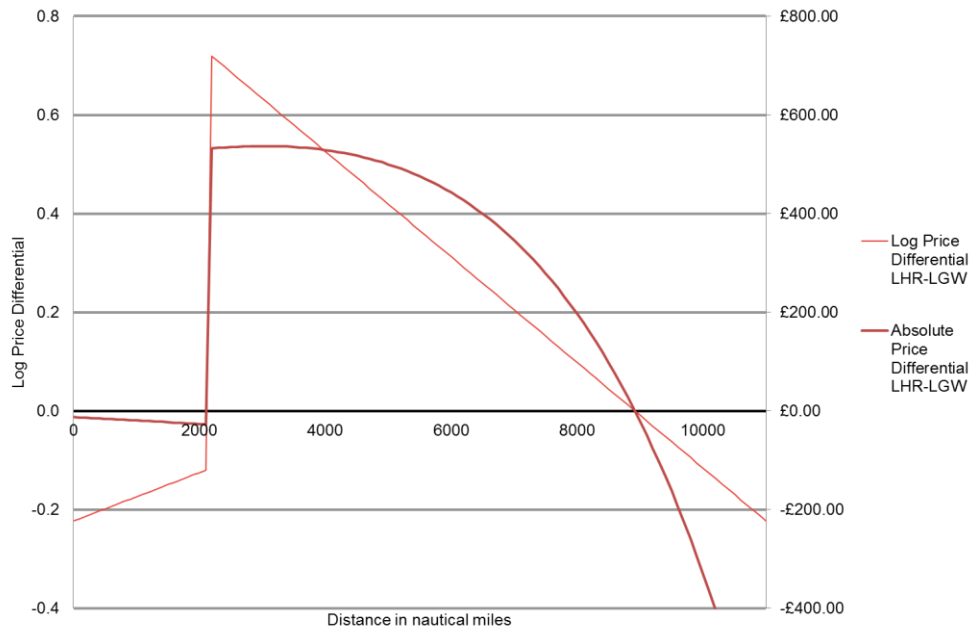
Figure 17. Fares based on distance at Heathrow & Gatwick in 2012



Source: Frontier Economics

To understand exactly how these effects translate into fares and the difference in fares between Heathrow and Gatwick, we have taken the difference between the fare pricing curves at Heathrow and Gatwick and have graphed this difference in **Figure 18**. The red line shows the difference in the log fares at Heathrow and Gatwick. As we are interested in the concrete price difference this relates we have also shown the effect in pounds as the bold red line in **Figure 18**.

Figure 18. Differences in pricing at Heathrow and Gatwick in 2012



Source: Frontier Economics

We can conclude from our analysis that short haul flights at Heathrow are marginally cheaper than at Gatwick, based on distance pricing and controlling for the other explanatory variables in the regression in **Table 15**. For long haul flights however, the premium paid at Heathrow due to the capacity constraint can be up to £500, especially on shorter long haul flights.

Forecasting the future cost of the capacity constraint

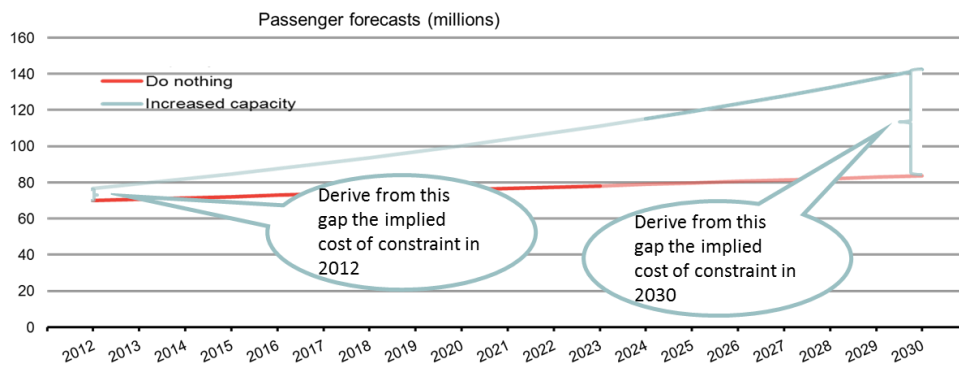
The outcome of the fare analysis is that the cost of current capacity constraint was £95 for an average return fare in 2012. We have used this result to calibrate our connectivity model (see Annexe 3: Connectivity model) to forecast the cost of the capacity constraint in the future. We find that in 2030 the cost of the capacity constraint to passenger will be c. £320 for a return fare.

Forecasting future excess demand

We have used our results from the fare analysis to calibrate our connectivity model in the sense that it produces the same results in 2012. We have forecasted both passenger levels in a world where the airport is constrained and the counterfactual passenger levels in a world where the airports is constrained in the way explained in the section ‘Projection of unconstrained passenger levels to 2030’ in Annexe 3.

The constrained passenger levels are forecasted to grow by 1% each year. The growth on the unconstrained passenger levels is dependent on the GDP growth in both the origin and destination country, and thus differs by destination. Our forecast of the excess demand is shown in **Figure 19**.

Figure 19. Forecast of excess demand



Source: Frontier Economics

Forecasting the future cost of constraint

We calculate the cost of the constraint from the excess demand by using the definition of the price elasticity of demand, which is:

$$Price\ elasticity\ of\ demand = \frac{Percentage\ change\ in\ demand}{Percentage\ change\ in\ fares}$$

The price elasticity of demand for flights is defined as the percentage change in demand resulting from a 1% change in fares. This elasticity is negative as demand will decrease if prices go up. Rearranging this equation gives us:

$$\text{Percentage change in fares} = \frac{\text{Percentage change in demand}}{\text{Price elasticity of demand}}$$

In doing this exercise we assume the values for the price elasticity of demand indicated in **Table 28**.

Alternative approaches of fare analysis

In addition to the econometric analysis, we have also used information on slot values as an alternative estimate of the cost of the constraint at Heathrow Airport. Slot values represent the increase in yield airlines expect from using Heathrow over other airports. As a result, slot values can be converted into a per passenger figure that is comparable to the cost of the constraint identified by the econometric analysis.

Limited information is available on the values of traded slots. CAPA (2013)¹⁶ provides a list of slot transactions and values. The latest data for 2013 implies a price per slot pair of c. £15m. Assuming an investment horizon of 10 years, a discount rate of 10% for a long-haul route, we have derived an implied cost of constraint of 12% of the average Heathrow one-way ticket fare. This is equivalent to c. £40 per passenger for a one-way ticket.

The analysis is subject to a number of limitations as we have to make assumptions on the investment horizon, number of passengers and discount rate. However, the analysis illustrates that a reasonable set of assumptions leads to a per passenger mark-up that is similar to the econometric analysis. As a result, slot value data supports the conclusion that the capacity constraint at Heathrow today leads to a significant cost per passenger.

¹⁶ CAPA (2013), Heathrow Airport's slot machine: hitting the jackpot again?, Available: <http://centreforaviation.com/analysis/heathrow-airports-slot-machine-hitting-the-jackpot-again-108646>

Annexe 2.2: Overlap analysis

London 2012

Table 16. Short haul and long haul destinations London airports

Airport	Total number of destinations	Number of Long haul destinations	Number of short haul destinations	% Long haul destinations
LCY	31	1	30	3.23%
LGW	158	30	128	18.99%
LHR	168	85	83	50.6%
LTN	83	0	83	0%
STN	142	0	142	0%

Source: IATA 2012 data

Table 17. Destination overlap London airports in 2012

Number of airports serving destination	Short haul		Long haul	
	Number of destinations	Number of destinations served from LHR	Number of destinations	Number of destinations served from LHR
1	111	13	90	72
2	72	30	13	13
3	41	23		
4	12	9		
5	8	8		
Total	244	83	103	85

Source: IATA 2012 data, Frontier Economics

London 2010

Table 18. Short haul and long haul destinations London airports

Airport	Total number of destinations	Number of Long haul destinations	Number of short haul destinations	% Long haul destinations
LCY	22	0	22	0.00%
LGW	154	24	130	15.58%
LHR	160	88	77	51.88%
LTN	72	0	72	0.00%
STN	141	1	140	0.71%

Source: IATA 2010 data

Table 19. Destination overlap London airports in 2010

Number of airports serving destination	Short haul		Long haul	
	Number of destinations	Number of destinations served from LHR	Number of destinations	Number of destinations served from LHR
1	128	17	86	72
2	65	23	11	11
3	37	21		
4	8	8		
5	8	8		
Total	246	77	97	83

Source: IATA 2010 data, Frontier Economics

Annexe 2.2: Overlap analysis

*European analysis***Table 20.** Short haul & long haul destinations European hubs

Airport	Total number of destinations	Number of Long haul destinations	Number of short haul destinations	% Long haul destinations
AMS	209	74	135	35.4%
CDG	218	97	121	44.5%
FRA	222	88	134	39.6%
LHR	168	85	83	50.6%
MAD	160	42	118	26.3%

Source: IATA 2012 data

Table 21. Destination overlap European hub airports

Number of airports serving destination	Short haul		Long haul	
	Number of destinations	Number of destinations served from LHR	Number of destinations	Number of destinations served from LHR
1	90	4	86	19
2	30	6	20	10
3	45	12	20	14
4	24	19	25	22
5	42	42	20	20
Total	231	83	171	85

Source: IATA 2012 data, Frontier Economics

Annexe 2.2: Overlap analysis

Annexe 2.3: Regression results

Please note that the effect that is reported is the coefficient. The number in parentheses is the standard error of the estimate.

The significance is indicated; * means that a result is significant at the 10% significance level, ** means that a result is significant at the 5% significance level and *** means that a result is significant at the 1% significance level.

Table 22. Regression results London 2012

Haul Airports	ALL LHR		ALL LGW		ALL LTN		ALL STN		ALL LCY		SH ALL		LH ALL	
	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre
Constant	5.307*** (0.228)	4.941*** (0.209)	4.791*** (0.294)	4.455*** (0.297)	4.341*** (0.554)	5.109*** (0.130)	4.611*** (0.124)	5.285*** (0.217)	5.098*** (0.131)					
Distance	0.000164*** (3.01e-05)	0.000433*** (7.09e-05)	0.000714*** (7.15e-05)	0.000924*** (8.50e-05)	0.00129*** (0.000270)	0.000289*** (4.35e-05)	0.000745*** (3.67e-05)	0.000134*** (2.04e-05)	0.000295*** (4.43e-05)					
Long Haul	0.741*** (0.121)	-0.358 (0.231)			-0.890 (0.616)	0.439*** (0.147)			0.408*** (0.151)					
LFrequency_Own	0.0199 (0.0299)	-0.0124 (0.0298)	0.0168 (0.0491)	-0.0735** (0.0354)	-0.0321 (0.0627)	-0.0259 (0.0171)	-0.00786 (0.0179)	0.0713** (0.0332)	-0.0169 (0.0176)					
LFrequency_Other	-0.0461*** (0.0143)	-0.0105 (0.0115)	-0.00902 (0.0123)	0.0155*** (0.00573)	0.00388 (0.0111)	0.00735 (0.00559)	0.0137*** (0.00466)	-0.00145 (0.0110)	0.00308 (0.00567)					
Business	0.401 (0.265)	0.250 (0.168)	0.0193 (0.254)	1.398*** (0.318)	0.780** (0.282)	0.370*** (0.125)	0.594*** (0.121)	1.327*** (0.268)	0.399*** (0.125)					
VFR	-0.450** (0.215)	-0.0486 (0.139)	-0.0785 (0.125)	-0.0772 (0.108)	0.577 (0.480)	-0.430*** (0.0790)	-0.181*** (0.0634)	-0.308* (0.167)	-0.385*** (0.0805)					
Transfer	0.0776 (0.174)	0.783 (0.721)	18.63** (9.048)	433.7** (199.9)	-1.337 (3.016)	0.0546 (0.164)	-0.00403 (0.243)	0.262 (0.183)	0.352** (0.158)					
LCC	-0.415** (0.169)	-0.533*** (0.0668)	-0.893*** (0.147)	-0.679*** (0.213)	-0.154 (0.171)	-0.663*** (0.0490)	-0.794*** (0.0492)	0.0663 (0.126)	-0.731*** (0.0422)					
LHR						0.180*** (0.0542)	-0.0430 (0.0661)	0.168 (0.108)						
LGW									0.0690** (0.0321)					
Observations	168	158	83	142	31	582	466	115						
R-squared	0.830	0.867	0.725	0.756	0.899	0.871	0.791	0.538						

Table 23. Regression results London 2010

Haul Airports	ALL LHR	ALL LGW	ALL LTN	ALL STN	ALL LCY	ALL	SH ALL	LH ALL
Dependent variable	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre	LFAre
Constant	5.464*** (0.253)	4.962*** (0.262)	3.493*** (0.726)	4.403*** (0.200)	4.944*** (0.434)	5.202*** (0.148)	4.728*** (0.142)	5.254*** (0.252)
Distance	0.000162*** (2.99e-05)	0.000458*** (7.47e-05)	0.000742*** (0.000121)	0.000736*** (8.34e-05)	0.00139*** (0.000374)	0.000275*** (4.05e-05)	0.000662*** (3.95e-05)	0.000148*** (2.28e-05)
Long Haul	0.731*** (0.116)	-0.287 (0.250)		-1.680*** (0.399)		0.518*** (0.134)		
LFrequency_Own	-0.0279 (0.0327)	-0.0340 (0.0374)	0.119* (0.0678)	-0.0229 (0.0278)	-0.0155 (0.0571)	-0.0296 (0.0212)	0.00649 (0.0221)	0.0515 (0.0362)
LFrequency_Other	-0.0397*** (0.0134)	-0.00343 (0.0120)	-0.0221 (0.0207)	0.0233*** (0.00591)	-0.0196 (0.0182)	0.0133* (0.00576)	0.0182*** (0.00572)	0.00657 (0.0108)
Business	0.682** (0.278)	0.692*** (0.229)	0.486 (0.325)	0.845*** (0.207)		0.467*** (0.129)	0.664*** (0.133)	2.001*** (0.369)
VFR	-0.237 (0.302)	-0.0285 (0.162)	0.122 (0.166)	-0.179* (0.101)		-0.455*** (0.0871)	-0.371*** (0.0791)	-0.0441 (0.184)
Transfer	-0.134 (0.252)	0.763 (1.146)	7.247 (5.115)	146.9*** (56.16)	-4.556 (3.712)	-0.120 (0.241)	-0.788** (0.358)	0.230 (0.275)
LCC	-1.328*** (0.202)	-0.556*** (0.0715)	-0.292 (0.334)	-0.793*** (0.144)	0.0104 (0.104)	-0.811*** (0.0445)	-0.924*** (0.0434)	0.206** (0.0992)
LHR						0.0683 (0.0584)	-0.149** (0.0591)	-0.0234 (0.107)
LGW								
Observations	160	154	72	141	22	549	441	108
R-squared	0.808	0.836	0.555	0.852	0.634	0.866	0.771	0.533

Annexe 2.3: Regression results

Table 24. Regression results European hub airports 2012

Haul Airports	ALL LHR	ALL LGW	ALL LTN	ALL STN	ALL LCY	ALL	SH ALL	LH ALL
Dependent variable	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare
Constant								
Distance	4.817*** (0.206)	5.393*** (0.214)	5.052*** (0.149)	4.844*** (0.390)	5.331*** (0.172)	5.082*** (0.123)	4.501*** (0.164)	5.660*** (0.144)
	0.000190*** (3.15e-05)	0.000188*** (4.43e-05)	0.000122*** (3.12e-05)	0.000229*** (3.87e-05)	0.000258*** (5.12e-05)	0.000182*** (1.70e-05)	0.000568*** (3.65e-05)	9.40e-05*** (1.47e-05)
Long Haul								
LFrequency_Own	0.810*** (0.125)	0.634*** (0.171)	1.003*** (0.126)	0.502*** (0.132)	0.499*** (0.177)	0.764*** (0.0646)		
LFrequency_Other	0.0163 (0.0322)	-0.0929*** (0.0289)	-0.00525 (0.0218)	0.0198 (0.0592)	-0.105*** (0.0223)	-0.0404* (0.0182)	0.00661 (0.0225)	0.0497** (0.0231)
Business	0.0274 (0.0204)	0.00771 (0.0102)	-0.000830 (0.0103)	-0.00865 (0.00904)	0.0292*** (0.00523)	0.0134*** (0.00499)	-0.00143 (0.00522)	0.0160** (0.00740)
VFR	0.200 (0.173)	0.461*** (0.102)	0.339** (0.147)	0.315** (0.125)	-0.0732 (0.159)	0.283*** (0.0632)	0.621*** (0.0875)	0.240*** (0.0749)
Transfer	-0.269 (0.174)	-0.266*** (0.0929)	-0.638*** (0.0780)	-0.268*** (0.101)	-0.791*** (0.0726)	-0.496*** (0.0425)	-0.429*** (0.0463)	-0.349*** (0.0504)
LCC	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare
LHR								
LGW	4.817*** (0.206)	5.393*** (0.214)	5.052*** (0.149)	4.844*** (0.390)	5.331*** (0.172)	5.082*** (0.123)	4.501*** (0.164)	5.660*** (0.144)
Observations	168	209	218	222	160	977	591	386
R-squared	0.810	0.859	0.855	0.809	0.924	0.844	0.612	0.261

Table 25. Robustness regression results London 2012

	ALL	ALL	ALL	SH	SH	SH	SH	LH	LH	LH	LH	LH	LH	LH
Airports	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL
	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare
Dependent variable														
Constant	5.109*** (0.130)	5.107*** (0.130)	5.008*** (0.0775)	5.007*** (0.0773)	4.611*** (0.124)	4.611*** (0.124)	4.611*** (0.124)	4.663*** (0.0679)	4.663*** (0.0684)	5.285*** (0.217)	5.291*** (0.221)	5.291*** (0.221)	5.709*** (0.109)	5.713*** (0.110)
Distance														
	0.000289*** (4.35e-05)	0.000290*** (4.34e-05)	0.000291*** (4.35e-05)	0.000292*** (4.35e-05)	0.000745*** (3.67e-05)	0.000745*** (3.68e-05)	0.000745*** (3.68e-05)	0.000735*** (3.53e-05)	0.000735*** (3.56e-05)	0.000134*** (2.04e-05)	0.000139*** (2.03e-05)	0.000139*** (2.03e-05)	0.000131*** (1.97e-05)	0.000136*** (1.97e-05)
Long Haul	0.439*** (0.147)	0.441*** (0.146)	0.416*** (0.146)	0.417*** (0.146)										
LFrequency_Own	-0.0259 (0.0171)	-0.0256 (0.0171)			-0.00786 (0.0179)	-0.00789 (0.0180)				0.0713** (0.0332)	0.0709** (0.0335)			
LFrequency_Other	0.00735 (0.00559)	0.00732 (0.00558)			0.0137*** (0.00466)	0.0137*** (0.00466)				-0.00145 (0.0110)	-0.00121 (0.0112)			
Business	0.370*** (0.125)	0.375*** (0.124)	0.332*** (0.123)	0.336*** (0.121)	0.594*** (0.121)	0.594*** (0.120)	0.594*** (0.119)	0.608*** (0.116)	0.608*** (0.116)	1.327*** (0.268)	1.360*** (0.270)	1.360*** (0.264)	1.385*** (0.264)	1.417*** (0.269)
VFR	-0.430*** (0.0790)	-0.431*** (0.0789)	-0.435*** (0.0782)	-0.436*** (0.0780)	-0.181*** (0.0634)	-0.181*** (0.0634)	-0.181*** (0.0634)	-0.218*** (0.0605)	-0.218*** (0.0605)	-0.308* (0.167)	-0.339** (0.168)	-0.339** (0.165)	-0.384** (0.165)	-0.414** (0.165)
Transfer	0.0546 (0.164)	0.0428 (0.162)			-0.00403 (0.243)	-0.00403 (0.243)				0.262 (0.183)	0.259 (0.194)			
LCC	-0.663*** (0.0490)	-0.663*** (0.0490)	-0.670*** (0.0490)	-0.670*** (0.0490)	-0.794*** (0.0492)	-0.794*** (0.0493)	-0.794*** (0.0492)	-0.800*** (0.0492)	-0.800*** (0.0492)	0.0663 (0.126)	0.0469 (0.122)	0.0469 (0.113)	-0.0213 (0.113)	-0.0394 (0.109)
LHR	0.180*** (0.0542)	0.190*** (0.0484)	0.157*** (0.0536)	0.165*** (0.0479)	-0.0430 (0.0661)	-0.0437 (0.0481)	-0.0567 (0.0630)	-0.0569 (0.0458)	-0.0569 (0.0458)	0.168 (0.108)	0.221** (0.0998)	0.221** (0.102)	0.235** (0.102)	0.286*** (0.0904)
Observations	582	582	582	582	466	466	466	466	466	115	115	115	115	115
R-squared	0.871	0.871	0.871	0.871	0.791	0.791	0.791	0.787	0.787	0.538	0.529	0.529	0.520	0.511

Annexe 2.3: Regression results

Table 26. Robustness regression results London 2010

	ALL	ALL	ALL	ALL	SH	SH	SH	LH	LH	LH	LH	
Airports	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	
	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	
Dependent variable												
Constant	5.202*** (0.148)	5.207*** (0.146)	5.104*** (0.0589)	5.103*** (0.0588)	4.728*** (0.142)	4.754*** (0.141)	4.903*** (0.0538)	4.888*** (0.0534)	5.249*** (0.254)	5.254*** (0.252)	5.566*** (0.143)	5.563*** (0.144)
Distance	0.000275*** (4.05e-05)	0.000274*** (4.01e-05)	0.000273*** (4.03e-05)	0.000272*** (4.00e-05)	0.000662*** (3.95e-05)	0.000661*** (3.96e-05)	0.000637*** (3.86e-05)	0.000639*** (3.87e-05)	0.000148*** (2.28e-05)	0.000152*** (2.27e-05)	0.000149*** (2.20e-05)	0.000153*** (2.20e-05)
Long Haul	0.518*** (0.134)	0.515*** (0.133)	0.486*** (0.134)	0.483*** (0.133)								
LFrequency_Own	-0.0296 (0.0212)	-0.0304 (0.0209)			0.00649 (0.0221)	9.50e-05 (0.0218)			0.0515 (0.0362)	0.0510 (0.0367)		
LFrequency_Other	0.0133** (0.00576)	0.0133** (0.00576)			0.0182*** (0.00572)	0.0181*** (0.00574)			0.00657 (0.0108)	0.00756 (0.0108)		
Business	0.467*** (0.129)	0.454*** (0.132)	0.427*** (0.124)	0.412*** (0.126)	0.664*** (0.133)	0.590*** (0.133)	0.685*** (0.129)	0.613*** (0.127)	2.001*** (0.369)	2.044*** (0.380)	2.107*** (0.352)	2.149*** (0.360)
VFR	-0.455*** (0.0871)	-0.454*** (0.0867)	-0.455*** (0.0837)	-0.454*** (0.0832)	-0.371*** (0.0791)	-0.364*** (0.0787)	-0.424*** (0.0763)	-0.413*** (0.0755)	-0.0441 (0.184)	-0.0447 (0.185)	-0.0759 (0.183)	-0.0757 (0.184)
Transfer	-0.120 (0.241)	-0.119 (0.239)			-0.788** (0.358)	-0.788** (0.357)			0.230 (0.275)	0.236 (0.288)		
LCC	-0.811*** (0.0445)	-0.809*** (0.0445)	-0.814*** (0.0448)	-0.811*** (0.0448)	-0.924*** (0.0434)	-0.906*** (0.0427)	-0.929*** (0.0436)	-0.912*** (0.0427)	0.206** (0.0992)	0.183* (0.0971)	0.251*** (0.0852)	0.230*** (0.0845)
LHR	0.0683 (0.0584)	0.0642 (0.0572)	0.0434 (0.0580)	0.0392 (0.0567)	-0.149** (0.0591)	-0.172*** (0.0582)	-0.157*** (0.0602)	-0.179*** (0.0586)	-0.0234 (0.107)	-0.0121 (0.106)	-0.0129 (0.103)	-0.00315 (0.102)
Observations	549	549	549	549	441	441	441	441	108	108	108	108
R-squared	0.866	0.866	0.864	0.864	0.771	0.768	0.762	0.760	0.533	0.528	0.522	0.517

Annexe 2.3: Regression results

Table 27. Robustness regression results European hubs 2012

Haul	ALL	ALL	ALL	ALL	SH	SH	SH	SH	LH	LH	LH	LH
Airports	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL
	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare	LFare
Dependent variable												
Constant	5.082*** (0.123)	5.159*** (0.124)	4.901*** (0.0255)	4.982*** (0.0181)	4.501*** (0.164)	4.777*** (0.160)	4.541*** (0.0405)	4.770*** (0.0245)	5.660*** (0.144)	5.722*** (0.146)	6.066*** (0.0652)	6.131*** (0.0636)
Distance												
Long Haul	0.000182*** (1.70e-05)	0.000181*** (1.69e-05)	0.000187*** (1.74e-05)	0.000186*** (1.72e-05)	0.000568*** (3.65e-05)	0.000514*** (3.67e-05)	0.000562*** (2.85e-05)	0.000510*** (2.93e-05)	9.40e-05*** (1.47e-05)	9.84e-05*** (1.45e-05)	9.19e-05*** (1.48e-05)	9.63e-05*** (1.47e-05)
LFrequency_Own	0.764*** (0.0646)	0.781*** (0.0645)	0.770*** (0.0662)	0.786*** (0.0658)								
LFrequency_Other	-0.0404** (0.0182)	-0.0370** (0.0173)			0.00661 (0.0225)	0.00514 (0.0215)			0.0497** (0.0231)	0.0502** (0.0234)		
Transfer	0.0134*** (0.00499)	0.0116** (0.00510)			-0.00143 (0.00522)	-0.00612 (0.00568)			0.0160** (0.00740)	0.0159** (0.00754)		
LCC	0.283*** (0.0632)	0.264*** (0.0613)			0.621*** (0.0875)	0.622*** (0.0898)			0.240*** (0.0749)	0.241*** (0.0794)		
LHR	-0.496*** (0.0425)	-0.576*** (0.0429)	-0.472*** (0.0385)	-0.549*** (0.0353)	-0.429*** (0.0463)	-0.629*** (0.0444)	-0.435*** (0.0428)	-0.626*** (0.0362)	-0.349*** (0.0504)	-0.387*** (0.0483)	-0.440*** (0.0395)	-0.479*** (0.0352)
Observations	977	977	977	977	591	591	591	591	386	386	386	386
R-squared	0.844	0.841	0.842	0.839	0.612	0.566	0.612	0.565	0.261	0.245	0.227	0.211

Annexe 2.3: Regression results

Annexe 3: Connectivity model

Introduction

When considering the merits of alternative airport expansion plans, an important feature affecting the service passengers get is the level of connectivity likely to be facilitated by each option. The level of connectivity is defined as the number of destinations served by regular direct flights. As with any forward-looking exercise, estimating the possible effect on connectivity of adding an additional runway at one site or the other is complicated. Many factors are at play and judgements have to be made on a range of issues.

To form a position on these matters, a number of questions have to be answered:

- how is a new connection created? and
- what market developments do we need to take into account?

Our answers to these questions are embedded in our connectivity model. This model estimates that a new runway at Heathrow could facilitate 40 new connections for London, while a new runway at Gatwick is likely to have a smaller effect on connectivity, with 7 new connections at best.

This annexe provides the methodology, assumptions, and interpretations we have used to derive these results.

Methodology

A connection for London is a destination served by a direct flight from at least one London airport, subject to a minimum frequency. We have used two connectivity thresholds:

- Our main threshold is 2 flights a week for short-haul and 1 flight a week for long-haul;
- In addition we test the number of connections that are “frequent” which is defined as 6 flights a week for short-haul and 3 flights a week for long-haul.

To model new connections if Heathrow or Gatwick were to be expanded, we followed the following steps:

- we estimated the unconstrained level of demand at each airport;
- we projected passengers levels for each route up to 2030, based on GDP growth forecasts at the origin and destination and established income elasticity estimates;
- we checked whether “consolidation” of indirect passengers is possible to facilitate a direct connection;

- we adjusted for the scenario in which Gatwick takes advantage of lower cost long-haul aircraft; and
- we adjusted for the scenario in which Gatwick develops as a second hub.

Each of these steps is described below. The assumptions and sources used in our modelling are set out in **Table 28** at the end of this annexe.

Estimating unconstrained demand

Our model is based on 2012 IATA passenger data, which provides passenger movements on every route, taking into account ultimate points of origin and destination (therefore recording transfer passengers and passengers that connect to their final destination via another airport, so-called “beyond” passengers). In our view this is, very nearly a good picture of unconstrained demand at Gatwick but not at Heathrow which has been operating at full capacity since the 2000s.

In the years in which Heathrow has been constrained, routes have not been able to develop following the underlying unconstrained demand. Existing passengers at Heathrow therefore reflect a snapshot of constrained demand.

We estimate the unconstrained level of demand at Heathrow in 2012, to provide a correct base level of what is likely to happen to demand once the capacity constraint is released. The underlying unconstrained demand is related to the economic growth of the UK and of the destination country during the years that Heathrow has been constrained. Our approach to modelling unconstrained demand is provided in the box below.

Projected unconstrained level of passengers at Heathrow in 2012

Acknowledging that 2012 passengers represent constrained demand (indicated as x_{2012}), we can derive unconstrained demand (indicated as x^*_{2012}) by using:

$$x_{2012} = x_{\text{year}_t} (1 + \text{technology growth})^{2012-\text{year}_t}$$

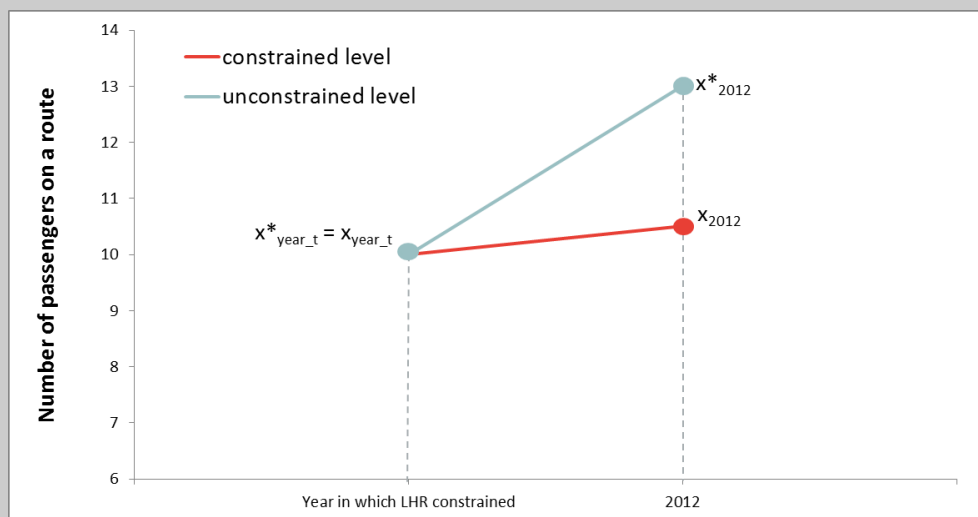
$$x^*_{2012} = x_{\text{year}_t} (1 + \text{GDP growth factor})^{2012-\text{year}_t}$$

And therefore,

$$x^*_{2012} = x_{2012} (1 + \text{GDP growth factor})^{2012-\text{year}_t} / (1 + \text{technology growth})^{2012-\text{year}_t}$$

Note that the GDP growth factor includes the GDP growth rates faced by both the UK and the country of the destination, and it is adjusted for the income elasticity of demand.

Figure 20. Unconstrained passengers



Projection of unconstrained passenger levels to 2030

Given the unconstrained base passenger levels established in the previous step, the predicted growth of passengers in the future is related to the predicted economic growth of the UK and each destination country.

Base levels for passengers on each route have been inflated by a forecast GDP growth factor. This GDP growth factor includes the forecast GDP growth rates of the UK and the country of the destination and is adjusted for the income elasticity of demand.

In this step in the model, the potential for new connections can already be identified. A good example for this is Tanger. Today a direct flight from London Heathrow to Tanger is already available; however such route is not served

frequently enough to meet the threshold we have defined as connection. However, if Heathrow was expanded, the projected unconstrained number of passengers grows sufficiently to meet the threshold. Therefore a new connection at Heathrow is created. Our model estimates that this could occur already in 2012 if Heathrow were not capacity constrained. Given that a connection to Tanger is not already present at any other London airport, Tanger also becomes a new connection for London.

Adjustment for route consolidation

In the first stage of our analysis we only considered the unconstrained number of passengers based on a projection of passengers **already** flying direct to that destination. Hence, by definition, the increase in connectivity is only due to demand rising above a threshold necessary to sustain a regular flight.

In the next step we checked whether there are enough passengers flying indirectly to each destination such that pooling them together could make an additional direct connection feasible. To better understand how this step was performed the definition of different types of passengers is useful. This definition is described in the box below.

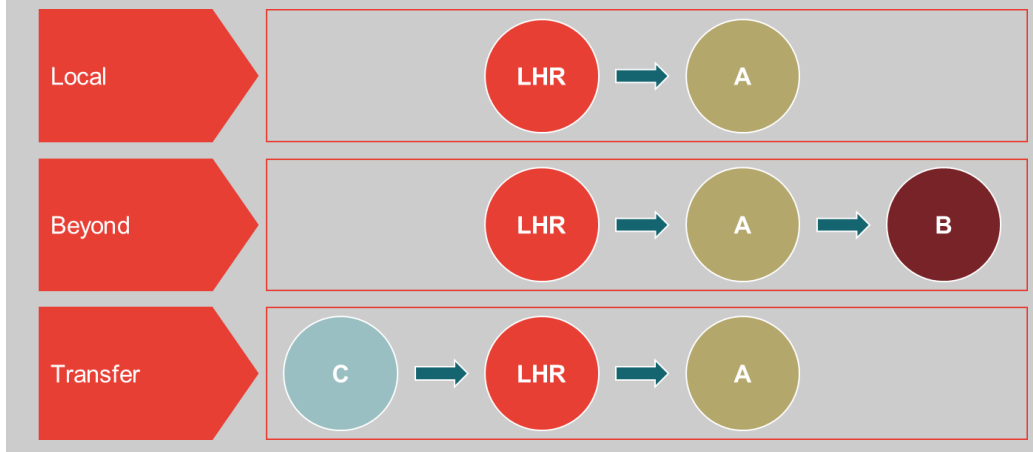
Categorisation of passengers

Given London and three other destinations (here A, B, and C) we could envisage three *types* of passengers touching London:

- A *local* passenger: flying directly from London to any of them,
- A *beyond* passenger: flying from London to A, and then onto B,
- A *transfer* passenger: flying from C to London, and then onto A.

This is illustrated in the figure below.

Figure 21. Types of passengers



This step relies on the fact that a number of destinations are only reachable from London via a connecting flight. Therefore, following the example in the box above, if a passenger wants to go from London to B, they will have to fly via A. They are then be considered a *beyond* passenger.

By looking at the number of passengers reaching each destination indirectly – i.e. all *beyond* passengers to B – we checked whether the volume of traffic, is, or is likely to become sufficient to sustain a regular direct flight to the relevant destination. This *consolidation test* is described in the following box.

Consolidation test

Destination A, which is not connected from London, passes the consolidation test in any given year if the sum of passengers flying there indirectly transferring via other airports is enough for a new connection to be established.

We make an adjustment in the potential market size to reflect the fact that, even if a direct connection is available, a proportion of passengers will continue to fly indirectly, especially for long-haul flights (note that such percentage is based on observations from 2012 IATA data – see **Table 28**). This reduces the likelihood of a connection being established for a given number of passengers making the journey.

If a destination passes the test, then passengers are *consolidated* to form a new direct flight. This is the second channel through which a connection can be established. A good example for this is Goa. Today, there is no direct flight from London to Goa. But, in 2012 over 31,000 people flew to Goa from Heathrow, connecting via other hubs such as Mumbai, Dubai, Doha, and Istanbul. Given the expected strong economic growth in India, our projection is that Goa would be able to sustain a direct connection from London by 2019, were the airport capacity to be available.

Adjustment for Gatwick exploiting lower-cost long-haul aircraft

The Airports Commission has raised the question as to whether new aircraft like the Boeing 787 Dreamliner or the Airbus A350 could change the dynamic of competition between point-to-point and network services by making it much cheaper for point-to-point operators to serve long haul destinations.

The result of this new opportunity is that some airlines could, in principle decide to exploit the additional capacity available at Gatwick by introducing point-to-point long haul routes. Following market forces, it is extremely likely that the first routes to be offered would be those with a highest point-to-point demand.

We have modelled this scenario in the following way:

- we have ranked the top twenty long haul routes by unconstrained direct passenger demand at Heathrow, which enabled to identify the destinations to which there is strong (and potentially unmet) point-to-point demand;
- we then transferred a 10% of such local passenger demand to Gatwick.

Note that transferring 10% of such direct passengers from Heathrow to Gatwick – about 1.4 million passengers – is enough to create new connections at the

Annexe 3: Connectivity model

receiving airport for all the destinations which is not already serving. However, only one of the routes passes the threshold for a new connection for London. Increasing the percentage of passengers being transferred from Heathrow to Gatwick would affect the frequency with which each destination is served by each airport, but not the number of new connections created for London.

Adjustment for Gatwick developing as a second hub for London

We have modelled Gatwick developing into a second hub airport by using the following approach:

- we have taken passengers data for unconstrained Heathrow and Gatwick in 2028 (note: not 2030 since then we would have more passengers than capacity);
- we then pooled the demand and split it in half to create two equal hubs;
- we then run the consolidation test on this new pool of passengers; and
- we have checked whether a connection is facilitated, or lost.

Assumptions

The assumptions made in the model are summarised in **Table 28**

Table 28. Assumptions made in model

Assumption	Value	Source
Year in which Heathrow starts to operate at full capacity	2006	Frontier Economics: this year is selected by cross-referencing the result found in the econometric analysis
Short haul threshold for a destination to be considered connected in 2012	11,856 passengers per year	Frontier Economics: this number is the result of assuming two flights per week on an Airbus A320 with a 75% load factor
Long haul threshold for a destination to be considered connected in 2012	13,455 passengers per year	Frontier Economics: this number is the result of assuming one flight per week on a Boeing 767 with a 75% load factor
Long haul threshold for a destination to be considered connected in 2012 – with new airline economics	11,700 passengers per year	Frontier Economics: this number is the result of assuming one flight per week on a Boeing 787 with a 75% load factor
Short haul threshold for a destination to be considered	35,568 passengers	Frontier Economics: this number is the result of assuming six flights

frequent in 2012	per year	per week on an Airbus A320 with a 75% load factor
Long haul threshold for a destination to be considered frequent in 2012	40,365 passengers per year	Frontier Economics: this number is the result of assuming three flights per week on a Boeing 767 with a 75% load factor
Long haul threshold for a destination to be considered frequent in 2012 – with new airline economics	35,100 passengers per year	Frontier Economics: this number is the result of assuming three flights per week on a Boeing 787 with a 75% load factor
Average number of passengers per short-haul ATM	106	Heathrow Airport: retrieved by 2012 passengers and ATMs
Average number of passengers per long-haul ATM	209	Heathrow Airport: retrieved by 2012 passengers and ATMs
Distance threshold for a destination to be considered long haul	2,200 nautical miles	Heathrow Airport
Percentage of short haul Origin-Destination passengers that take a direct flight is available	97%	LHR IATA data for 2012
Percentage of long haul Origin-Destination passengers that take a direct flight is available	73%	LHR IATA data for 2012
Percentage of UK passengers on flights from Heathrow	39%	2012 CAA passenger survey
Percentage of UK passengers on flights from Gatwick	74%	2012 CAA passenger survey
Trip purpose percentages at Heathrow	Business: 37% Leisure: 32% VFR: 31%	2012 CAA passenger survey
Trip purpose percentages at Gatwick	Business: 12%	2012 CAA passenger survey

Annexe 3: Connectivity model

	Leisure: 62%	
	VFR: 26%	
Price elasticity of demand – short haul	Business: -0.70 Leisure: -1.52 VFR: -1.11	Gillen D. et al, <i>Air Travel Demand Elasticities: Concepts, Issues and Measurement</i> , 2008
Price elasticity of demand – long haul	Business: -0.27 Leisure: -1.04 VFR: -0.66	Gillen D. et al, <i>Air Travel Demand Elasticities: Concepts, Issues and Measurement</i> , 2008
Income elasticity of demand	1.39	Gillen D. et al, <i>Air Travel Demand Elasticities: Concepts, Issues and Measurement</i> , 2008
Annual technology growth	1%	Frontier Economics: this assumption is used to reflect the increase in average aircraft size
Exchange rate \$/£ for 2012	0.63 \$/£	Bank of England
GDP historic growth rates for the years 2000-2012	See source	World Development Indicators
GDP forecasted growth rates up to 2030	See source	HSBC, <i>The World in 2050</i>
Price change over time	0%	Frontier Economics

Domestic routes

Our methodology for estimating the scope for new connections is based on considering “beyond” traffic from Heathrow that, with further growth and available capacity could potentially be consolidated into new direct connections.

As regards domestic routes, unsurprisingly, there is currently no “beyond” traffic to other UK destinations (e.g. passengers flying from Heathrow to Humberside, via Manchester) while the six UK cities with direct services to Heathrow already meet our criterion as a frequent connection.

Due to this limitation our model is unable to predict any change in connectivity between London and the UK regions as a consequence of runway expansion.

Nevertheless, in our view it is likely that expansion at Heathrow could result in improved regional connectivity within the UK. As Heathrow has become more congested, the number of domestic flights has dropped (from c. 32,000 in 2005

to c. 23,000 in 2012). During the last decade Inverness, Jersey and Durham Tees Valley have all lost services connecting them to Heathrow. Of these, only Inverness is connected to another London airport.

It is plausible to think that an unconstrained Heathrow could re-establish connectivity to these airports. Liverpool, Humberside and Newquay also represent plausible new cities that could connect to Heathrow's network.

Given the fact that Gatwick is not constrained in the same way there is a less strong case to argue that expansion would improve regional connectivity compared to today, as there is no reason to suppose that domestic traffic has been crowded out of Gatwick in the way that it evidently has been at Heathrow.

Interpretation of results

To interpret our results, we consider two additional questions:

- Is it a new connection for London?
- Is it a new connection to a business destination in an emerging economy?

Is it a new connection for London?

The list of new connections facilitated at each airport that is generated by the model is specific to each airport. We have then performed a cross-check to establish if these are in fact new connections for London as a whole.

To get to the final list of new connections under each option we compared the list generated by the model, with the connections that already exist at the other London airports (considering Heathrow, Gatwick, Luton, Stansted, and City). Only those new connections which were not already present at another airport were included in our final results.

Is it a new connection to a business destination in an emerging economy?

We consider each destination separately and determine whether it is a business destination in an emerging economy by looking at:

- Any country that is part of the OECD is not considered an emerging economy;
- The size of the destination country's economy, for example the Dominican Republic is an emerging economy but given its size the opportunity for business interaction is relatively small; and
- The type of destination city - capital cities are more likely to be business destinations. For example, Jakarta in Indonesia would be considered a

Annexe 3: Connectivity model

business destination whereas Bali would be interpreted as a holiday destination.

Summary of results

We analysed the options of expanding Heathrow or Gatwick, and within the Gatwick expansion, we considered three possible scenarios:

1. Gatwick is expanded and maintains its role as a point-to-point airport.
2. Gatwick is expanded and maintains its role as a point-to-point airport but with greater opportunities created by lower-cost long-haul aircraft.
3. Gatwick is expanded and develops as a second hub for London.

The main results that we obtained are shown below.

Expansion at Heathrow

In the option in which a third runway is built at Heathrow, our model demonstrates that 40 new connections could be facilitated for London. We emphasise that these connections are the ones that do not pass our passenger-based connectivity threshold today but pass the threshold in 2030 (either due to increased demand or consolidation). This implies that there are some new connections that are:

- Already connected with a direct flight today (or announced to be connected shortly) but the passenger threshold and flight thresholds are not met; so for the purposes of our analysis the frequency is not sufficient to count the destination as “connected”.
- Already have a direct flight and pass the flight thresholds but do not pass the passenger threshold – these are flights with very low load factors where airlines are trying to build a market.
- Already connected with a direct flight when considering the OAG data definition of a connection but in reality the flight involves one stop with passengers embarking/disembarking so from the passengers’ point of view this is not different from an indirect flight.

We do not exclude these destinations as any definition of connectivity based on a threshold will correspond closely, but not exactly, to the actual pattern of flights offered from an airport at any point time. Aircraft sizes may vary somewhat from route to route. There may also be operational or commercial reasons why an airline chooses to operate a service more or less frequently than short-run passenger numbers appear to suggest is appropriate. While this sort of real-world variation can be expected always to occur, a comparison over time measured on a consistent passenger-related basis will still produce a reliable indicator of the general trend towards improved connectivity.

Although not covered by our modelling, we also consider it likely that expansion at Heathrow could facilitate improved air connectivity to UK regions. Destinations such as Inverness, Jersey and Durham, which have been crowded out of Heathrow in recent years, or new destinations like Liverpool, Humberside and Newquay could sustain connections to Heathrow's network if the capacity were available. A similar effect would not be expected at Gatwick, relative to today, because domestic routes have not been crowded out of Gatwick to date in the same way.

Expansion at Gatwick

In the option in which a second runway is built at Gatwick, our model estimates that 5 to 7 new connections could be facilitated for London, depending on whether we include the introduction of low-cost long-haul. Similar to Heathrow, some of the new connections may already have a direct flight but do not pass our passenger threshold of connectivity today. As our approach is consistent between Heathrow and Gatwick it provides a robust account of the differences in connectivity from expanding either Heathrow or Gatwick.

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Appendix 3:

**The importance of air freight to
the UK economy**

The importance of air freight to the UK economy

Sky-high value

The importance of air freight to the UK economy



The importance of air freight to the UK economy

Foreword

Air freight accounts for about 40% of UK imports and exports by value. It is an essential mode of transport for many industry sectors, ranging from high end manufacturing, engineering, pharmaceuticals, retailing and the automotive sectors.

Unfortunately, the importance of air freight to the UK economy is often overlooked. The focus is almost exclusively on passenger and business travel, which so far has been the dominant theme of the current inquiry by Sir Howard Davies into airport capacity.

This document shows why continued investment in airport capacity is essential to the growth and success of the UK economy. It shows why it is smart for our nation to invest in order to support growth and lasting prosperity through enhanced competitiveness of UK businesses trading with the rest of the world.

It is imperative that we recognise the inherent advantages Heathrow has as a world-class, global air-freight hub and the unique benefits this brings, not just to the South East of England but to Britain as a whole, through enhanced connectivity to our key overseas markets.

This study shows what is at stake for some of the UK's leading importers and exporters if we fail to invest in vital transport infrastructure, which is essential for economic growth. Such a failure would impair Britain's international competitiveness and inhibit the future success of our economy.

We will continue to champion the 'sky-high' value of air freight and its vital importance to UK plc.

Ian Veitch
President, Freight Transport Association



The importance of air freight to the UK economy

Introduction

Sky-high value

Freight is a direct representation of the health of the UK economy and, while air freight may be a tiny proportion of all freight by tonnage, it nonetheless represents more than one third of the value of our total imports and exports. The highest value goods, most essential shipments and most sensitive commercial documents are flown across the world, for safety, security and essential speed. Global shippers pay the UK air-freight industry over £3bn to carry two million tonnes of goods a year.

The huge range of passenger services through Heathrow is one of the principal reasons for its success as a freight hub. Indeed while, according to Oxford Economics, it handles 30% of the passenger traffic, it dominates the UK air cargo market.

A Steer Davies Gleave report for the Department of Transport in 2010 understood that Heathrow is the lynchpin to all air-freight movements in the UK, saying: "Since belly-hold capacity on long haul passenger flights is a key driver of air freight and since 86% of UK belly-hold air freight passes through Heathrow, the volume of air-freight capacity through the UK is therefore directly linked to the quantity of long-haul aircraft movements at Heathrow."

The case for increases in connectivity leading to GDP growth has already been made elsewhere. It is essential for the ongoing health of the UK economy that we preserve and nurture the connectivity of Heathrow, so that we can maintain the high-value trade links supported by air freight and continue to allow UK businesses to access developing international markets.

Air freight also provides approximately 39,000 jobs in the UK, the majority of which

“ Air freight represents about 40% by value of UK imports and exports, and 30% of UK trade to non-EU countries is heavily dependent upon it ”

are dependent upon or are clustered around Heathrow, as the predominant air-freight hub.

91% of all jewellery shipments by value are made using air freight; 88% of aircraft and parts; 76% of medical instruments; and 62% of pharmaceuticals. For these and other high-value sectors Heathrow is the principal gateway, not only to their existing markets but to new ones. Air freight represents about 40% by value of UK imports and exports, and furthermore, 30% of UK trade with non-EU countries is heavily dependent upon air freight.

This is currently the same as saying industry is heavily dependent upon Heathrow. Reports, shippers, logisticians and UK businesses all say the same: Existing UK trade and attempts to foster growth in trade rely on Heathrow maintaining the attractiveness, breadth of service and reliability associated with the most prestigious freight hub in the world.



The importance of air freight to the UK economy

Pharmaceutical

A Home Counties-based manufacturer of diagnostic and therapeutic medical products relies upon Heathrow to ship goods to hospitals all over the world on the day they are made.

The strategic logistics manager explains: "Our products are used in scanning for, and treating, serious health conditions. However, our products decay continually, so it is essential that we can make and ship the product on the same day a clinician orders it, so that they receive a useable amount. Any delay can impact the healthcare of up to hundreds of patients at a critical time."

The company sends out up to 20 shipments a day through Heathrow, or 3,600 shipments and 16,000 packages a year to 64 destinations in 54 countries. Although it can ship in greater quantity with freighters, the number of these services available at Heathrow has contracted, and it increasingly relies upon the flexibility and frequent scheduling of passenger planes. These, however, have more stringent restrictions for hazardous materials.



Heathrow is an essential hub for this pharmaceutical company as nowhere else can offer the range of direct flights and airlines, with minimal transportation by road. If the product must be transhipped from one plane to another mid-route, its usability can be compromised. These medical products could be seen as the ultimate in just-in-time deliveries.

"We need Heathrow and we need it to be a primary hub. It is essential that it receives investment for a new runway because we will start to lose airlines and services to other countries where the hub airports are getting investment and slots are not under so much pressure," says the strategic logistics manager. "If we fail to invest, Heathrow will stop being a key hub for global aviation."

"Like many companies, we are seeing new markets in the developing world and we need to be able to reach them. We can ship through other hubs but it adds risk, complexity and, above all, time, and we do not have that time to spare."



“ We need Heathrow and we need it to be a primary hub. It is essential that it receives investment for a new runway... If we fail to invest, it will stop being a key hub for global aviation ”

Pharmaceuticals manufacturer

What we need:

- Expansion to preserve freighter services and Heathrow's range of worldwide direct flights.

The importance of air freight to the UK economy



What we need:

- We support another runway at Heathrow because currently any temporary loss of runway capacity hits European passenger flights and therefore our business.

"The specialist trucking firms used by tours, the suppliers to the music industry and the other logistics co-ordinators such as ourselves add huge economic value to the region and we rely upon Heathrow's strength," he says. "The industry demands an array of next-day services, because the distances are too great for trucks and the timescale far too short for shipping by sea."

“ Heathrow is a successful airport. We need to maintain that because it is naive to think we could easily or quickly replicate it elsewhere ”

John Corr, tour principal, Sound Moves

Sound Moves is a specialist international logistics operation supporting bands and artists on global tours. It ensures that essential equipment for artists, such as Beyoncé, U2, the Rolling Stones and Katy Perry, once dismantled after each show arrives at the next venue on time, even if the journey spans continents. It puts 70 movements a week through Heathrow, usually in consignments of 1,200 to 1,400kg, travelling on passenger flights.

"Heathrow is essential to our business," says tour principal John Corr. "It is no coincidence that suppliers to the music industry, as with other sectors such as motor sport, are clustered in the West London area. Heathrow's multiple daily departures for a huge number of international destinations are crucial to the company meeting the ever tightening time pressure on tour schedules."

Although there are dedicated cargo planes flying out of East Midlands Airport which can serve some of Corr's needs, the frequency, destination list and distance from the airport all limit their usefulness. Gatwick handles very little freight in comparison to Heathrow, and Stansted is located too far away and doesn't have wide-body aircraft passenger flights on which the majority of Sound Moves shipments fly.

"There are European airports which can offer a similar service to Heathrow and, if Heathrow does not receive the continued investment it needs to maintain capacity and frequency of flights, artists and their suppliers will relocate to Amsterdam, Frankfurt or Paris," says Corr.

Sound Moves has an annual turnover of approximately £16m, and Corr stresses that this is a fraction of the economic weight of the sector.



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The importance of air freight to the UK economy

Automotive



Frankfurt, which currently handle some of its European product.

Ford's air freight needs can vary considerably, from a handful of parts to significant volumes. These can be sent by air in response to scheduling or engineering changes and Ford can also air-freight prototype parts, urgent replacement parts for customer vehicles, and occasionally complete vehicles for auto shows or short-notice testing under different conditions.

Some shipments, such as airbags or engines, can contain hazardous material and a variety of air services will be used, including freighters and charters, where belly-hold space would not be viable.

Ford sends as much freight across its international production network by road and sea as it can. However, should contingencies arise, such as increased or short-notice demand, parts often need to be sent urgently by air.

Ford's air forwarder partners will use whichever airport is most convenient for the products, taking into account the timescale, destination and price. However, as most UK air freight, and almost all for long-haul destinations such as the US, China, South America, Canada or Asia, goes through Heathrow, the airport's capabilities are essential to Ford's service schedules.

Ford has no particular loyalty to any airport but expects its logistics suppliers to use the hub with the most competitive and comprehensive services.

Should Heathrow fail to provide the best value and service going forward, Ford's freight would be re-routed via other hubs such as Cologne and

Generally the automotive industry will use the most competitive air-freight services, which offer the best solutions in terms of price, capacity and destinations. If the best service is not found in the UK, then Ford will expect its logistics supplier to go elsewhere and will move freight by road to other European airports if necessary.

What we need:

- Ford requires Heathrow to provide quick and efficient handling and customs clearance, frequent flights to major Ford destinations, such as Detroit or Brazil, and competitive arrangements between Ford's air forwarder partners and the airlines using Heathrow.

“ Should Heathrow fail to provide the best value and service going forward, Ford's freight would be re-routed via other hubs such as Cologne and Frankfurt, which currently handle some of its European product ”



The importance of air freight to the UK economy



What we need:

- Maintained air-freight capacity levels in Heathrow to ensure a full range of services from Africa, China and the Indian sub-continent.

Asda prioritises environmentally-friendly freight movements and cost-effectiveness, so air freight is usually a contingency measure in response to unexpectedly high demand for product or supplier delays. The only exceptions to this are flowers, and some fresh produce which originates in Africa. Clothing typically comes from the Indian sub-continent and general merchandise from China.

Although Asda uses northern airports as a point of UK entry wherever this will prove more economical in terms of final-leg delivery or cost, supply chain manager for imports Lee Hodgkin says: "Ultimately Heathrow capacity does affect us. We use it on a regular basis."

Its choice of airport is determined by final destination and the services available. As Asda aims to move as much freight by sea as

“ It is important to us that the inbound capacity and service levels from our key points of origin are maintained ”

Lee Hodgkin, supply chain manager for imports, Asda

possible, or by sea-air combination, it rarely uses freighter services and consigns urgent material in the belly hold of passenger services. Its aim overall is to restock UK store shelves as efficiently and quickly as possible.

Key points of origin for Asda goods are Hong Kong, Bangladesh and Sri Lanka. "Modern retailers use air freight in different ways," says Hodgkin. "Some choose it as a strategic transport method and their price structure allows that. However, Asda uses air freight primarily when there is no other option. It is still important to us though that the inbound capacity and service levels from our key destinations are maintained at Heathrow.

"If capacity or investment levels at Heathrow fall, we would have to examine the impact of that on our business very carefully," he says.

The importance of air freight to the UK economy

Couriers

DHL uses all major modes of freight transport across its global network and operates in more than 220 countries and territories.

DHL's Global Forwarding and Express divisions are particularly reliant upon aviation to move freight internationally. DHL Express, for example, moves time-critical or high-value parcels and packages (including products such as IT, telecoms, and aerospace components, pharmaceuticals, and contract documents) predominantly from business to business, securely and efficiently. DHL sees the forwarding and express freight markets as vital to the health and growth of the UK economy.

DHL Express alone flies material on over 1,500 aircraft per week at Heathrow, as well as being the largest pure air freight operator based on the number of rotations. For the year ending April 2013, its Heathrow belly-hold air freight alone equated to in excess of 17million kilos inbound and 24million kilos outbound.

"We support airlines in wanting additional aviation and air-freight capacity at Heathrow to allow UK businesses to compete globally. Without this, DHL may potentially face challenges in achieving the connectivity needed to meet customer demand for key destinations including Brazil, Russia, India, China, South Africa, Latin America, the Far East, Indonesia, and Australia," says Danny Pedri, MD, DHL Express Hubs and Gateways, UK & Nordics.

DHL says that capacity at Heathrow should be increased to meet growing demand for freight services. DHL supports the continuation of existing inbound night-time passenger flights that also carry business critical air freight for the UK from the growing economic trading regions of the Far East and India.

DHL Express also operates a fleet of 24 inbound and outbound freighters per night at East Midlands Airport. Nonetheless, "Heathrow gives us access to countries that are not directly served by our own aircraft. Capacity constraints at Heathrow could impact on DHL's ability to move material around the world as quickly and efficiently as our customers require," says Pedri.

"We are already seeing some impact of capacity constraints at Heathrow and increased competition from European airports. These constraints are eroding Heathrow's dominance [as a freight hub] and threaten the UK's position as a key destination for air freight," says Pedri. "This poses a potential threat to the long-term viability of operations around the South East."



Capacity constraints are eroding Heathrow's position of dominance and threaten the UK's position as a key destination for air freight

Danny Pedri, MD, DHL Express Hubs and Gateways, UK & Nordics



What we need:

- Increased capacity at Heathrow and continued operation of night flights to facilitate express transport. In particular we require more flights to Latin America, China and India.

The importance of air freight to the UK economy

International

The Global Shippers' Forum (GSF) is the international body for global shippers established by the Freight Transport Association (FTA) and over 20 national shippers' organisations world-wide. It fosters best practice and lobbies international policy-makers across the globe.

In 2010 GSF joined with the global airline organisation IATA, the international federation of freight forwarders, FIATA and The International Air Cargo Association, (TIACA) to set up the Global Air Cargo Advisory Group (GACAG) to promote the sustainable and efficient air cargo services essential to international trade. Today, GACAG is campaigning on measures to lower the carbon footprint of air cargo, such as efforts to develop

alternative fuels, more efficient and quieter engines, carbon offsetting and a methodology for measuring air cargo's carbon footprint.

It is working with national and international government organisations on developing cargo security regimes and harmonising international security arrangements. GACAG is supporting the development of an e-commerce initiative, to find acceptable electronic protocols for cargo information, which will benefit the industry's commercial sustainability and security.

Underpinning all the high level policy discussion and best practice work is the need for continued investment in major Hub resources. Capacity constraints, delays and limitation of services

“ Capacity constraints, delays and limitation of services cause a loss of global connectivity, drive up costs and carbon and inhibit world trade ”

The Global Shippers Forum

cause a loss of global connectivity, drive up costs and carbon and inhibit world trade. A lack of investment in the world's major Hub airports would threaten their continuing efficiency and the efficiency of the supply chains which rely upon them.

What we need:

- Continued investment in air freight infrastructure so that sustainability, security and efficiency are enhanced, and global trade facilitated.



The importance of air freight to the UK economy

Interview

At the centre of connectivity

Heathrow is an essential hub of connectivity for passengers and freight, bringing together huge resource, expertise and opportunity in one place. Chris Welsh of the FTA explains its importance to air freight

Heathrow is an essential freight hub and its position at the heart of the international supply chain must be nurtured and developed, says Chris Welsh, director of global and European policy at the Freight Transport Association, lest we lose this vital asset for business and global shippers, and the revenue, expertise and jobs it generates.

In 2012, 1.5 million tonnes of freight passed through Heathrow, carried by half a million services to and from 191 destinations. It is the broad array of carriers and countries served which makes it so essential a centre for freight shipment, according to Welsh. When we consider that 95% of freight travels not on dedicated freighters, but in the holds of passenger jets, it is clear that the strongest airport for passenger services will also be the most cost-effective and attractive for international shippers of cargo.

"Freight and passenger services have a strong synergy at Heathrow," says Welsh. "It is the wide diversity of destinations and services which makes it such an attractive proposition for those shipping cargo. Airlines accepting freight into the belly hold of passenger planes can often make the difference between services being profitable and not."

On the surface air freight seems an expensive and environmentally challenging way to ship goods, but for many high-value and high-end

manufactured goods it is either the only, or the best way to transport them, says Welsh. "It can take a month to take goods to the Far East by ship, it takes a day by air. Once the figures are finalised, air freight is not only the safest and most secure form of freight transport, at low risk of damage or theft, but it is also the most cost-effective. Companies can save thirty days of inventory and supply chain costs, insurance costs and realise the goods' value far quicker.

"There are, of course, time-sensitive goods, such as medicines and documents which can't realistically travel any other way," he adds.

The role of the dedicated freighter has diminished to some extent but such flights are still an important part of the supply chain as they can take a range of goods which are prohibited from passenger flights or where quantities are strictly controlled. "Heathrow runs at 98% capacity and so when there is any kind of disruption, it is freight which is squeezed. This is even worse for freighters, which often leave shortly before midnight, because any delay pushes them into a no-fly period and the freight is then delayed 24 hours," he says. "Dedicated freighters are under constant pressure."

Heathrow's evolution as a hub has included developing a regional community of logistics firms, freight forwarders, manufacturers,

Essential Heathrow statistics

Tonnage handled (2012)	1.5 million tonnes
Number of destinations served	191
Number of cargo-carrying flights a year	500,000
Proportion of all UK belly-hold cargo handled	86%
Proportion of all UK passenger flights handled	30%
Proportion of runway capacity in use	98%
Number of potential continental competitors	at least 3

“ Air freight is not only the safest and most secure form of freight transport but, for some companies, it is also the most cost-effective ”



The importance of air freight to the UK economy



science parks and other specialist expertise. Welsh says this community both depends upon and enhances Heathrow but, without continued investment, the jobs, expertise, revenue and, indeed, the business of global shippers will be lost to rivals such as Schiphol, Charles de Gaulle and Frankfurt.

"Once, the Port of London was the biggest port in the world. When it lost its attractiveness to international shippers, its prowess disappeared in a generation," says Welsh. "We need to build upon the achievements of Heathrow as a hub airport so that it does not become unreliable and lose that attractiveness."

This is not to say that the air-freight sector would not equally welcome investment in the UK's regional airports or new sites, says Welsh, but these must go hand in hand with continued investment in Heathrow. "We cannot dictate which venue global shippers want to use for their goods. Heathrow has developed through market preference. If we now try to determine where an airport should be, the market may well ignore us, and its choice may not then be within the UK," says Welsh.

"Heathrow is a national asset, underpinning a large proportion of our imports and exports by value and is a key gateway to new markets. UK

“We cannot dictate which venue global shippers want to use for their goods. Heathrow has developed through market preference”

shippers are keen to access Latin America, India, China, Mexico and other emerging economies. Heathrow is ideally placed to deliver this, if it has the investment to expand its services."

Despite the global recession having suppressed air-freight figures for a time, Welsh is confident the role and value of air freight will continue to increase. "UBS Investment Research figures forecast 3.5% growth in air freight. We expect growth in all regions, and a steady increase across Europe. As our economy improves, it is more important than ever that we have our greatest freight asset primed and ready for action, and not hampered by constraints."

The importance of air freight to the UK economy

FTA special interest groups for air freight

The British Shippers' Council is a long established group in FTA and is the national forum for members with an interest in importing to or exporting from the UK by sea, air, or European road and rail services. Current members include major UK high street retailers, as well as manufacturers from a diverse range of industrial sectors including automotive, beverages, chemicals, foodstuffs and pharmaceuticals. The group is open to buyers of freight transport services and those with an interest in international supply chains. Members of the British Shippers' Council influence FTA policy and lobby for the benefit of their businesses.

The Global Shippers' Forum (GSF) is an international organisation for shippers administered by the FTA. It was created in 2006

as the successor to the Tripartite Shippers' Group, first organised in 1994. The GSF represents the interests of various national and regional shippers' organisations in Asia, Europe, North and South America, and Africa: its work is focused on the impact of commercial developments in the international freight transportation industry and the policy decisions of governments and international organisations which affect shippers and receivers of freight. The GSF was formally incorporated and registered as a non-governmental organisation in the UK in June 2011.

For further details of either group, including membership, please contact: Chris Welsh, Director of Global and European Policy, Freight Transport Association on +44 (0)1892 552384.

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Appendix 4:

**Shaping Heathrow's north-west
runway proposal report on
public consultation**

Shaping Heathrow's North West Runway proposal Report on public consultation

May 2014

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

PORTLAND PR LTD

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

May 2014

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

CONTENTS

1. INTRODUCTION

1.1 CONTEXT

1.2 BRIEF

2 CONSULTATION PROGRAMME

2.1 APPROACH

2.2 CONSULTATION PERIOD

2.3 CONSULTATION AREA

2.4 CONSULTATION SURVEY

2.5 DATA ANALYSIS AND MANAGEMENT

2.6 METHODOLOGY

3. CHANNELS OF RESPONSE

3.1 APPROACH

3.2 DIRECT MAIL TO RESIDENTS

3.3 SURVEY WEBSITE

3.4 SURVEY HOTLINE

4. PUBLIC EXHIBITIONS

4.1 PROGRAMME OF EVENTS

4.2 REPORT ON PUBLIC EXHIBITION EVENTS

5. PROMOTION

5.1 APPROACH

5.2 FORMAL MEDIA ENGAGEMENT WORK AND PAID MEDIA PROMOTION

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

5.3 LOCAL ENGAGEMENT AND THIRD PARTY PROMOTION

5.4 SOCIAL MEDIA ACTIVITY

6. CONSULTATION RESULTS

6.1 CONSULTATION SURVEY: LEVELS OF RESPONSE

6.2 RESPONDENT IDENTIFICATION

6.3 RESPONDENT LOCATION

6.4 LENGTH OF TIME THE RESPONDENT HAS BEEN RESIDENT AT THEIR
CURRENT ADDRESS

6.5 NATURE OF RESPONSE (BUSINESS OR INDIVIDUAL)

6.6 HEATHROW AND LOCAL EMPLOYMENT

6.7 LOCAL USE OF HEATHROW

6.8 QUESTION 1

6.9 REPORT ON FINDINGS

6.10 QUESTION 2

6.11 REPORT ON FINDINGS

6.12 QUESTION 3

6.13 REPORT ON FINDINGS

6.14 ADDITIONAL RESPONSES

7. CONCLUSIONS

7.1 OVERVIEW OF FINDINGS

APPENDICES

A CONSULTATION BOOKLET – 'SHAPING HEATHROW'S NORTH WEST RUNWAY
PROPOSAL'

B EXHIBITION MATERIALS

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

- C** EXHIBITION EVENT REPORTS
- D** QUESTION 3 ANALYSIS, KEYWORD CATEGORIES
- E** QUESTION 3 ANALYSIS, KEYWORD REPORTS
- F** MEDIA ENGAGEMENT
- G** WEBSITE USAGE STATISTICS
- H** ADDITIONAL RESPONSES

CHAPTER 1: INTRODUCTION

1.1 CONTEXT

1.1.1 In July 2013, and as part of the work being carried out by the Airports Commission to assess the need for additional aviation capacity in the UK, Heathrow submitted three outline proposals for additional runway capacity. The three outline proposals submitted were for a new runway to the north, the north west or the south west of the existing site.

1.1.2 The submission of these outline options to the Airports Commission was promoted through Heathrow's publication of 'A New Approach'. This detailed document, which was available to all local stakeholders and was promoted through active local and national media work, set out the details of the three outline proposals and the case for expansion at Heathrow Airport. The publication of the document was built around a detailed and ongoing programme of engagement with local residents, political stakeholders and community groups.

1.1.3 As part of its Interim Report, published in December 2013, the Airports Commission shortlisted the outline proposal for a new runway to the north west of Heathrow Airport for further consideration. The proposals for expansion to the north or south west of Heathrow were not taken forward.

1.1.4 Setting out the timetable in the 'Next Steps' section of its Interim Report, the Airports Commission requested that "refreshed scheme designs" be provided by early May 2014.¹ As part of the work towards the production of refreshed scheme designs, the Airports Commission stated that:

"...it will be important for the promoters of short-listed schemes to ensure that groups representing nearby residents and businesses, and other stakeholders such as passengers and airport users, have the opportunity to make their views known. The

¹ Airports Commission Interim Report, P208, Fig 7.1.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Commission therefore encourages scheme promoters to engage with and understand the views of these groups, and to report on this as part of their submissions²

1.1.5 In response to these recommendations Heathrow took the decision to undertake a major and wide ranging public consultation regarding the shortlisted proposal ahead of the submission of the refreshed scheme design in May 2014.

1.1.6 The decision to consult at this stage was taken in order to:

- Understand which criteria stakeholders consider most important at Heathrow when shaping the solution for expanding Heathrow;
- Refine Heathrow's options by engaging positively with local communities to understand their ideas on how they may be improved;
- Continue to develop a positive relationship with local communities;
- Support the Airport Commission process and any subsequent National Policy Statement or DCO process;
- Reflect Heathrow's commitment to ongoing, effective and meaningful consultation with local residents, businesses and stakeholders.

1.2 BRIEF

1.2.1 In December 2013, following the publication of the Airports Commission Interim Report, Portland PR Ltd was appointed to work with Heathrow on the planning, implementation and management of the public consultation programme.

1.2.2 The brief included delivery of:

- Consultation design;
- Distribution of the consultation to those residents and businesses identified as being likely to be the most impacted by Heathrow expansion;
- Promotion of the consultation;
- Engagement with existing local stakeholders and stakeholder groups;

² Airports Commission Interim Report, P209, 7.12/7.13

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- Establishing multiple consultation response channels;
- Management and promotion of public exhibition events;
- Management and receipt of consultation data, and analysis and reporting of consultation responses in a way that enabled Heathrow to incorporate the findings into the updated proposal to be submitted to the Airports Commission;
- Checking methodology with a third party to validate approach and the resulting analysis.

CHAPTER 2: CONSULTATION PROGRAMME

2.1 APPROACH

2.1.1 The programme of public consultation activity was designed to be undertaken as a continuation of Heathrow's ongoing engagement work with the local community, both around the Airport's wider role in the local area and its participation in the Airports Commission process. Portland PR Ltd is retained by Heathrow to advise on and support the delivery of this work.

2.1.2 As a major part of the community engagement work, Heathrow has established a programme of formal and informal engagement with local authorities, political stakeholders, residents, businesses and stakeholder groups. This has enabled Heathrow to engage in-depth around wider issues associated with, and sentiment towards, the expansion of Heathrow Airport.

2.1.3 In the context of the Airports Commission process and the shortlisting of the outline proposal the consultation was designed to encourage engagement with the specific, shortlisted proposal for a new north west runway at Heathrow and to measure sentiment towards associated factors and potential impacts.

2.2 CONSULTATION PERIOD

2.2.1 The window for significant and meaningful formal public consultation was limited as a result of the external Airports Commission process and the need for delivery of the refreshed scheme design report by early May 2014. Therefore, the timing and length of the consultation programme was established to ensure multiple opportunities for engagement with the maximum number of local residents and businesses across a range of platforms, whilst also ensuring that enough time was available post-consultation for a meaningful analysis of the results.

2.2.2 In this context, the formal consultation period was designed to run over six weeks, commencing on Monday 3rd February 2014 and concluding on Sunday 16th March 2014. This timescale ensured that time was available for effective analysis of the results

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

to take place and for feedback from the consultation to be considered and, where appropriate, implemented into the refreshed design scheme.

2.2.3 Throughout the consultation period, Heathrow promoted the formal and informal engagement programmes which will continue to take place ahead of the Airports Commission report in Summer 2015. This included promotion of a separate public consultation on issues around compensation, mitigation and blight and the Airports Commission's own plans for a wide ranging public consultation on all shortlisted proposals in autumn 2014.³

2.3 CONSULTATION AREA

2.3.1 In order to promote local engagement in the consultation and the work being undertaken to refine the north west runway proposal, the consultation was targeted primarily at:

- Communities identified as potentially being most impacted by the proposal for a new runway;
- Homes and businesses within the standard 57 dB Leq noise contour; the annoyance level threshold as set by the EU and the UK.

2.3.2 This primary consultation area was established in order to allow for maximum opportunities for participation amongst those most likely to be impacted by Heathrow expansion. However, the consultation was promoted beyond this area – particularly in London – and was open to all.

2.4 CONSULTATION SURVEY

2.4.1 The response form was designed to be quick and easy to complete with a specific focus on sentiment regarding the proposal for a new north west runway at Heathrow.

2.4.2 The response form was split into two sections:

³ Airports Commission Interim Report, P209, 7.8.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- A three question survey measuring sentiment towards issues and factors associated with the proposed north west runway at Heathrow Airport;
- An 'About you' section of respondent identification.

2.4.3 Questions and specific content featured on the consultation response form are detailed in Chapter 6, Consultation results.

2.4.4 In order to provide respondents with detailed information on the outline north west runway proposal and to frame the questions within the consultation's role in influencing the refreshed scheme design report, the consultation response form was accompanied by a public consultation booklet, entitled '*Shaping Heathrow's north west runway proposal*'

2.4.5 The 12 page consultation booklet contained:

- Foreword and explanatory introduction from Heathrow's Chief Executive, Colin Matthews;
- Information regarding the public consultation process;
- Information regarding the Airports Commission process, including timelines of previous and future activity;
- Detailed information and explanations regarding the questions contained within the consultation survey;
- Illustrated maps of the original north west runway proposal (as submitted to the Airports Commission in July 2013) and an indicative, post-submission 'variation' proposal produced by Heathrow which would move the proposed new north west runway further to the south;
- Indicative graphics demonstrating the current patterns of runway alternation as used by Heathrow;
- Details regarding all consultation response channels;
- Promotion of public exhibition events;
- Information regarding assistance, including language and accessibility options.

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**



Front cover of the consultation booklet, 'Shaping Heathrow's north west runway proposal'.

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Shaping Heathrow's north west runway proposal – A public consultation

Response form

1 What factors do you think are the most important when planning a new runway?

All the factors listed below are important to local residents to varying degrees. Your response to this question helps us understand your priorities.

Please rank your top five in order of importance from 1 to 5 (1 = most important)

	Rank here
Air pollution	
Aircraft noise	
Aircraft safety/risk	
Construction impact	
Flooding	
Historic buildings	
Jobs/local employment	
Loss of homes and businesses	
National economic benefits	
Public transport	
Range of national/international flight destinations	
Road-traffic congestion	
Viability of local communities	
Wildlife/ecology	

2 Which of the following statements best matches your attitude to noise relief from aircraft and the number of communities living beneath runway flight paths? Please tick one only.

a) Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath runway flight paths.	
b) Limiting the number of communities living beneath runway flight paths is more important than providing periods of significant noise relief for all communities.	
c) Don't know	

3 How can we improve our proposal for a new runway?

Please use the space below to tell us your ideas or to mention any other factors not covered by Questions 1 and 2. If you would like to continue your response to Question 3 on another sheet of paper, please send it along with this consultation response form to the Freepost address provided.

About you

To help us put your comments in context, it helps to know a bit about you – whether you're a resident or a business, where you live, if you're connected to Heathrow.

All personal information will be treated as confidential and will be used solely for the purposes of this public consultation. No personal information will be used for marketing purposes or shared with third parties.

1 What's your postcode?

2 How long have you been at your current address?
 less than 5 years between 5 and 10 years more than 10 years

3 Are you responding as an individual or a business? Individual Business

4 Do you or a member of your household work at the airport? Yes No

5 Do you or a member of your household work in a job which is dependent on Heathrow? Yes No

6 How often do you fly from Heathrow?
 less than once a year between 1 to 3 times a year more than 3 times a year

moisten and seal here

Consultation response form.

2.4.6 The full content of the consultation booklet, 'Shaping Heathrow's north west runway proposal' is included in Appendix A.

2.5 DATA ANALYSIS AND MANAGEMENT

2.5.1 All submissions made through the consultation response form were processed and analysed by a team of data analysts based at Portland PR Ltd.

2.5.2 Ahead of the commencement of the public consultation, the consultation Project Manager led a series of group and individual training sessions to ensure full understanding of the consultation response form, the system being used for data recording and the analytical methods being employed.

2.5.3 On each day of the consultation period, a team leader reviewed those responses which had been inputted, updating the team and providing guidance on the 'reading' of any subjective comment or sentiment expressed within the response form. The

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

management of responses was designed to ensure quality control and consistency, ensuring the reliability of the data used by Heathrow.

2.5.4 Alongside the recording of data provided by respondents, analysts were asked to record a number of additional factors from each form to enable more effective understanding and use of the data by Heathrow.

2.5.5 Details of this additional data analysis are recorded in Chapter 6, *Consultation results*.

2.5.6 All responses were logged and analysed via an online content management system. In order to ensure the effective use of feedback received throughout the public consultation as part of Heathrow's production of a refreshed scheme design, responses to the public consultation were accessible through a 'live' online dashboard available to the Heathrow team. This enabled emerging trends regarding the prioritisation of factors of importance and sentiment towards noise relief to be identified and considered during the consultation period, enabling findings to be built into the refreshed design at an early stage.

2.5.7 A series of formal reporting sessions were also arranged during the consultation process to allow for further analysis of consultation data. Full sets of data were provided to the team, both at key stages throughout the process and at the conclusion of the consultation period.

2.6 METHODOLOGY

2.6.1 In order to ensure the robustness of the consultation methodology and the questions being asked through the consultation response form, Heathrow commissioned polling and research consultancy ComRes to provide a comprehensive and independent review of the consultation programme.

2.6.2 The review, which was provided by ComRes on 20th January 2014 and ahead of the printing of consultation materials, provided recommendations on:

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- The scope of the survey;
- Consultation channels;
- Public exhibitions;
- Language considerations;
- Accessibility options;
- Language and materials.

2.6.3 As a result of this report, a number of recommendations regarding the accessibility options, language and phrasing and consultation scope were adopted. Heathrow contacted local authorities within the local area to request information regarding existing translation options provided to residents in order to ensure that those provided as part of the consultation surpassed local standards.

2.6.4 Local authorities contacted by Heathrow reported that, in general, they only provided translation options on request, rather than pre-printing translated materials. Heathrow worked with local authorities to establish the most popular non-English languages used in the local area using an analysis of local census data and previous translation requests.

2.6.5 As a result, Heathrow provided translation options (upon request) for the following languages and formats.

- Arabic
- Gujerati
- Hindi
- Polish
- Punjabi
- Somali
- Tamil
- Large print (in line with RNIB advice)
- Braille

2.6.6 Notification of these translation options was included within the consultation booklet in both English and in the appropriate language.

How to take part in the consultation

You can take part in four ways.

1. You can respond straight away by completing the enclosed Freepost response form. When you've finished, seal it up and post it back to us.
2. You can complete the form online at:
heathrow.com/localcommunity
Our consultation website gives you more information about our proposals. It also explains the steps in the Airports Commission process.
3. You can visit one of our public exhibitions. We're holding them across the local area throughout the consultation period. These events give you a chance to learn more about the proposals, meet some of the Heathrow team and find out how a new runway might affect you. We'll have more copies of the response form which you can complete when you're there. Visit:
heathrow.com/localcommunity
to find out when and where we're holding exhibitions or look out for ads in your local press.
4. You can take part via a phone interview with one of our team by calling **0800 307 7996**

Need more help?

If you have questions about the consultation process or need more copies of this consultation document please call us on:

0800 307 7996

This consultation document is also available in the following languages:

- Arabic
- Gujarati
- Hindi
- Polish
- Punjabi
- Somali
- Tamil
- Urdu

If you'd like one of those language versions; a large print version; or need help completing the response form, call us on:

0800 307 7996

or send an email to:

communityrelations@heathrow.com

Heathrow public consultation | Page 11

How to contact us

By post:

Freepost RTE5-LRHJ-KXBC
Heathrow Community Relations
The Compass Centre
Nelson Road
London Heathrow Airport
HOUNSLOW
TW6 2GW

Online:

heathrow.com/localcommunity

By telephone:

0800 307 7996

By email:

communityrelations@heathrow.com

heathrow.com

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This document is available in other languages and formats on request.

هذه الوثيقة متاحة بلغات وتنسيقات أخرى حسب الطلب

વિનંતી પર આ દસ્તાવેજ અન્ય ભાષાઓ અને સ્વરૂપોમાં ઉપલબ્ધ છે.

अनुरोध करने पर यह दस्तावेज अन्य भाषाओं और फॉर्मट में उपलब्ध है

Niniejszy dokument dostępny jest na Państwa życzenie w innych wersjach językowych i formatach.

ਇਹ ਦਸਤਾਵੇਜ਼ ਬੇਨਤੀ ਤੇ ਹੋਰ ਭਾਸ਼ਾਵਾਂ ਅਤੇ ਪ੍ਰਾਰੂਪਾਂ ਵਿੱਚ ਵੀ ਉਪਲਬਧ ਹੈ

Dhukumentigan waxaa lagu heli karaa afaf iyo hab-qoraalo kale marka la codsado

வேண்டுகோளின் பேரில், இந்த ஆவணமானது மற்ற மொழிகளிலும் வடிவங்களிலும் கிடைக்கும்.

یہ دستاویز طلب کرنے پر دیگر زبانوں اور فارمیٹس میں دستیاب ہے

Heathrow

Response, translation and assistance options, as provided in the consultation booklet

CHAPTER 3: CHANNELS OF RESPONSE

3.1 APPROACH

3.1.1 In order to ensure a wide range of options for participation and engagement, four main consultation response channels were made available during the consultation period:

- The direct mail out of consultation packs to homes and businesses within the consultation area;
- The establishment of a dedicated consultation phone service;
- The establishment of a dedicated online consultation platform;
- The hosting of a series of public exhibition events across the local area.

3.2 DIRECT MAIL OUT TO RESIDENTS

3.2.1 In line with the brief and in order to ensure the best chance of participation amongst those identified as being the most likely to be impacted by the north west runway proposal, the decision was made to mail copies of the consultation response form and the consultation booklet to all homes and businesses within the 57 dB Leq noise contour.

3.2.2 143,175 local homes and businesses were identified by Heathrow as being within the identified target consultation area. Consultation materials were posted by second class mail to all of these homes and businesses within the first week of the consultation period. Included in these materials was a sealable, freepost return consultation survey form.

3.2.3 A postal diversion was established in advance of the consultation period which meant that response forms, despite being addressed to Heathrow Airport, were diverted to the address of Portland PR Ltd for immediate logging and analysis. This was established to ensure rapid analysis of response forms.

3.2.4 In order to use most effectively the responses provided by those within the immediate consultation area as part of the production of a refreshed scheme design, each freepost response form featured a unique identification number which allowed analysts to record the location from which the response had originated.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

3.2.5 An advisory note appeared on the consultation response form instructing respondents that:

“All personal information will be treated as confidential and will be used solely for the purposes of this public consultation. No personal information will be used for marketing purposes or shared with third parties”.

3.2.6 A significant majority of respondents provided postcode data which allowed for geographic analysis of responses. No other personal data was used or recorded by analysts in their identification of response locations.

3.3 SURVEY WEBSITE

3.3.1 A dedicated online portal was established online at www.heathrow.com/localcommunity. For the duration of the consultation period, content regarding the public consultation took prominence over all existing material on the site, which is the permanent online hub for information on Heathrow's community relations activities.

3.3.2 An online consultation form was available through www.heathrow.com/localcommunity and was designed as the primary method by which those not within the main consultation area would be able to respond to the consultation.

3.3.3 Whilst the online consultation form was identical to that sent by direct mail to those within the consultation area, a postcode check was put in place. Respondents using the online consultation form were required to use both a letter and a number within the postcode field, both to avoid untraceable 'group' or 'spam' responses, but also to encourage respondents to provide a 'top level' postcode without forcing respondents to provide full postcodes.

3.3.4 During the consultation period, www.heathrow.com/localcommunity contained:

- Foreword and explanatory introduction from Colin Matthews, Chief Executive of Heathrow Airport;

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- Downloadable and viewable consultation booklet;
- All information regarding alternative channels of response;
- Information on the consultation and Airports Commission process;
- Heathrow collateral materials associated with the development of proposals to the Airports Commission;
- Details of all public exhibition sessions, including a searchable and interactive map;
- Online survey response form.

3.3.5 The dedicated website was designed as a 'one stop shop' for consultation respondents from the targeted consultation area and beyond, with access to all consultation materials and an easy to complete online response form.

3.3.6 A significant feature of the website was a searchable map of exhibition event venues, which allowed visitors to search the map by postcode to find their closest exhibition venue. The map was updated throughout the consultation period to reflect the addition of exhibition events.

3.3.7 In order to ensure ease of access to the online portal, Heathrow also promoted the public consultation page at its online 'home' www.heathrow.com. This featured a tile promoting the consultation which immediately diverted to the dedicated site when clicked.

3.3.8 In order to catch URL entries from those who were unaware of the correct URL for the consultation site, Heathrow also established the vanity URLs www.heathrow.com/consultation and www.heathrow.com/runwayconsultation, which immediately diverted to the online portal.

3.3.9 A full breakdown of all web traffic is provided in Appendix G.

3.4 SURVEY HOTLINE

3.4.1 A dedicated telephone response line was established to manage enquiries and to allow the completion of the survey through a telephone interview. This service was

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

provided by Heathrow community relations throughout the consultation period, operating 24 hours a day.

3.4.2 In order to link Heathrow's existing community engagement presence, and to avoid the need to promote a temporary, alternative number, Heathrow's existing community relations phone number, which is used on all related branding and materials, was used and promoted throughout the consultation period.

3.4.3 In order to provide a 24/7 service, Direct Response Ltd, a contact management service specialist, was contracted to provide cover at weekends and outside of office hours (9am – 5pm). Direct Response Ltd provide ongoing coverage of the Heathrow community relations hotline and was provided with instructions, enabling staff to give guidance to callers on methods of completion, answer basic questions regarding the consultation and to take details of callers to contact at a later date by Heathrow.

3.4.4 During the consultation period the Heathrow Community Relations team managed 223 enquiries regarding the public consultation through the dedicated hotline and email address.

3.4.5 This contact included 11 requests from local residents for language translations of all consultation materials and requests for the provision of large print and braille formats. These were provided within the timeframe of the consultation period.

3.4.6 The topic of calls and emails ranged from requests for further information on the proposal, statements of opposition to the plans, comments regarding the consultation programme and requests for hard copies of the consultation materials.

CHAPTER 4: PUBLIC EXHIBITIONS

4.1 PROGRAMME OF EVENTS

4.1.1 A key element of the public consultation programme was the hosting of 13 public exhibition events across the local area during the consultation period.

4.1.2 The exhibition sessions offered local residents an opportunity to:

- Meet with members of the Heathrow team to discuss the proposals;
- View materials associated with the consultation, Heathrow's proposal for a new north west runway and wider issues around Heathrow's role in the local area;
- Provide feedback on issues around Heathrow expansion;
- Complete and submit consultation response forms.

4.1.3 A series of exhibition boards were produced featuring information regarding the proposals, the consultation process and the Airports Commission process. Collateral materials and larger scale maps of the proposals were also available for viewing and discussion with residents.

4.1.4 These included:

- Updated copies of the A New Approach document reflecting the Airports Commission's Interim Report;
- Copies of the A Quieter Heathrow document, outlining Heathrow's work to mitigate against local noise impact;
- Boards demonstrating the current patterns of flight alternation at Heathrow and how alternation might look with three runways;
- Larger maps highlighting the proposed expansion and relevant impact areas.

4.1.5 Complete exhibition boards are provided in Appendix B.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION



Guideline visual demonstrating the public exhibition boards.

- 4.1.6 All exhibitions were staffed by Heathrow employees and managed by staff from Portland PR Ltd. Staff were provided with training in advance of the public exhibition sessions by the exhibition manager.
- 4.1.7 In advance of the first public exhibition session, a private session was held at Heathrow's staff headquarters, the Compass Centre, in the first week of the exhibition in order to address any issues or training requirements.
- 4.1.8 The original locations selected for public exhibition events were Longford, Harmondsworth, Colnbrook, Harlington, Richings Park, Windsor, Richmond, Brentford and Hounslow.
- 4.1.9 This original programme of consultation locations was designed to cover both specific communities likely to be most physically impacted by a potential new north west runway, but also to cover as wide a geographic area as possible in the most accessible way.
- 4.1.10 After further liaison with local authorities and community groups, however, Heathrow took the decision to add exhibition events in Stanwell Moor, Putney, Hammersmith and Ealing. This was to reflect Heathrow's desire to make the consultation inclusive to all those with a wish to take part.
- 4.1.11 Sessions were held at established community venues across the consultation area and were selected based on liaison with local authorities and pre-existing local engagement work by Heathrow.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- 4.1.12 As part of contact with local authorities and communities at the outset of the exhibition, Heathrow made it clear that it was prepared to add additional exhibition events in order to cover any significant local requests for additional sessions. Because of this, and to avoid any printed schedules becoming out of date, the decision was taken not to list the exhibition sessions in the consultation booklet. This decision was taken in order to allow for the addition of extra public exhibition events beyond those originally booked. Due to the tight timescales around the commencement of the consultation programme, the confirmation of exhibition events continued to take place during the initial stages of the consultation period.
- 4.1.13 Those who received the consultation booklet were advised, therefore, to view the list of exhibition events through the online portal at www.heathrow.com/localcommunity or to email and call the community relations team for further details. Exhibition events were also promoted through engagement work with local communities and through proactive local media work.
- 4.1.14 Following a request from Justine Greening, the MP for Putney, the event held in Putney on the 3rd March was also extended by an hour to close at 9pm. This allowed an extended period of time for evening attendance amongst local residents.
- 4.1.15 During the first week of public exhibition sessions, the area around Heathrow was subject to significant disruption as a result of local flooding. The community of Colnbrook was particularly affected by this. As a result, Heathrow offered to postpone the exhibition session planned for 13 February until later in the consultation period. However, after speaking with local council and community group representatives, it was requested that Heathrow go ahead with the event.
- 4.1.16 Sessions began on the 10th February, the second week of the consultation period, and concluded in the final week. The exhibition programme was planned to begin in the second week to ensure prior notification of the timetable of events through local media and community/stakeholder channels, promoting engagement and participation in these sessions. No events were planned for the half-term week, which coincided with the third week of the consultation.

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

4.1.17 Weekday sessions ran from 12-8pm, with two weekend sessions running from 9.30am – 4.30pm.

4.1.18 In total, the public exhibition sessions were attended by 1,162 residents.

Date	Location	Venue	Times	Attendance
Mon 10 February	Longford	Thistle Hotel	12pm – 8pm	36
Weds 12 February	Harmondsworth	St Mary's Church Hall	12pm – 8pm	45
Thurs 13 February	Colnbrook	Colnbrook Village Hall	12pm – 8pm	71
Tues 25 February	Stanwell Moor	Stanwell Moor Village Hall	12pm – 8pm	60
Weds 26 February	Harlington	Harlington Baptist Church Hall	12pm – 8pm	54
Thurs 27 February	Richings Park	Richings Park Sports Hall	12pm – 8pm	143
Sat 1 March	Windsor	Macdonald Windsor Hotel	9.30am – 4.30pm	177
Mon 3 March	Putney	The Putney Pantry	12pm – 9pm	74
Weds 5 March	Richmond	Duke Street Church	12pm – 8pm	199
Thurs 6 March	Brentford	Holiday Inn	12pm – 8pm	58
Sat 8 March	Hounslow	Civic Centre	9.30am – 4.30pm	56
Mon 10 March	Ealing	Doubletree by Hilton Hotel	12pm – 8pm	104
Weds 12 March	Hammersmith	Hammersmith Town Hall	12pm – 8pm	85

Attendance figures for each of the public exhibition sessions

4.1.19 The first exhibition session, held in Longford, hosted a pre-opening session from 11am-12pm, to which councillors from the London Borough of Hillingdon were invited to attend.

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Public exhibition event, Richmond, 5th March 2014

4.2 REPORT ON PUBLIC EXHIBITION EVENTS

4.2.1 In order to ensure early engagement with those residents most likely to be physically impacted by the proposed new north west runway at Heathrow, early exhibition sessions were held in the communities neighboring Heathrow – Longford, Harmondsworth and Colnbrook. Feedback at these sessions concentrated largely on issues regarding land-take, the physical impact of the proposed new runway, issues regarding blight and compensation, the impact on local communities, and the impact on local historic buildings.

4.2.2 The Richings Park event saw a particular focus on issues regarding construction impact and the potential need to reroute the M25/M4 junction immediately to the south of the area. There was widespread opposition to this amongst local residents and

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significant support for the potential variation option which moved the proposed north west runway further to the south.

4.2.3 Exhibition events that were held further away from Heathrow, in areas such as Hammersmith, Richmond, Putney and Windsor, saw a consistent focus on issues around the impact of existing aircraft noise, potential changes to flight paths and alternation patterns, air pollution and aircraft safety.

4.2.4 The informal feedback which was received from residents at these events, and which was fed back through the production of event reports and immediate debrief sessions, is in line with the prioritisation of factors expressed through the formal consultation survey.

4.2.5 Detailed reports on attendance and issues raised at each of the public exhibition events are provided in Appendix C.

CHAPTER 5: PROMOTION

5.1 APPROACH

5.1.1 In order to drive engagement and participation, the public consultation was promoted through a diverse range of channels. This included:

- Formal media engagement work;
- Paid media promotion;
- Local engagement and third party promotion;
- Social media activity;
- Direct mail to those within the primary consultation area.

5.1.2 The programme of promotion was intended to ensure that those within the primary consultation area were made aware of the public consultation, but that others who might wish to respond – particularly those outside the classification of those ‘most impacted’, but who live locally to the Heathrow area – were made aware of the consultation and given easy access to response channels.

5.1.3 All media and advertising contained information regarding channels of responses and directed visitors to the dedicated online consultation site.

5.2 FORMAL MEDIA ENGAGEMENT WORK AND PAID MEDIA PROMOTION

5.2.1 Whilst the consultation was targeted at those within the 57 dB Leq noise contour and those likely to be most impacted by Heathrow's expansion proposals, promotion of the consultation took place beyond this boundary. Proactive London-wide media work and paid media promotion was undertaken to promote the consultation beyond the boundaries of the immediate consultation boundary.

5.2.2 This media work included:

- Placement of a half page colour advert in the Evening Standard on February 3rd, the launch date for the consultation;

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- Media work with all local and London-wide media to promote the beginning of the consultation process;
- Localised promotional advertising in local newspapers throughout the consultation period promoting the programme of public exhibition events;
- Published letters to local newspapers in the last week of the consultation period notifying residents of the forthcoming closure of the formal consultation and encouraging participation.

5.2.3 The Heathrow media team also worked with local authorities to encourage promotion of the consultation programme, including local exhibition events, through local council newspapers and promotional materials.

5.2.4 The programme of local media engagement work is included as Appendix F.

5.3 LOCAL ENGAGEMENT AND THIRD PARTY PROMOTION

5.3.1 In order to establish a presence in popular local civic venues, Heathrow worked with local authorities and political representatives to ensure that copies of the survey form were placed across a range of local civic buildings within the consultation area, including town halls, libraries and constituency surgeries.

5.3.2 A series of posters, designed to promote the consultation, the full programme of exhibition events and individual local exhibition sessions, were also distributed to political stakeholders, community groups and popular local venues in order to promote participation in the consultation and raise awareness of the consultation programme.

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Consultation poster provided to local community groups and political representatives



Shaping Heathrow's north west runway proposal A public consultation – 3 February to 16 March 2014

Heathrow is consulting on its proposals for a new north west runway.

There are a number of ways for you to take part:

heathrow.com/localcommunity

Find out more about our proposal and complete the consultation form online.

0800 307 7996

Call one of our team to find out more about our proposal or request a copy of the consultation document.

Public exhibition events

Pick up a copy of the consultation document at a public exhibition event, where you will be able to meet some of the Heathrow team and learn more about the proposals. Call us or visit **heathrow.com/localcommunity** to find your nearest exhibition session.

The consultation document is available in a number of different languages and formats. If you would like further information please get in touch with the community relations team using the contact details above.

Heathrow

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Shaping Heathrow's north west runway proposal

Public exhibition

Monday 10 March 2014 from 12-8pm

**Perceval Suite
Double Tree (Hilton) Hotel, 2-8 Hanger Lane,
Ealing Common, London, W5 3HN**

Heathrow is consulting on its proposals for a new north west runway. Pick up a copy of the consultation document at one of our public exhibition events, where you will be able to meet some of the Heathrow team and learn more about the proposals.

Visit heathrow.com/localcommunity to complete the consultation response form online or to find the full list of public exhibition events.

Find out more about the consultation by calling our community relations team on:
0800 307 7996
or at communityrelations@heathrow.com




Shaping Heathrow's north west runway proposal

A public consultation – 3 February to 16 March 2014

Public exhibition sessions

Heathrow is consulting on its proposals for a new north west runway. Pick up a copy of the consultation document at one of our public exhibition events, where you will be able to meet some of the Heathrow team and learn more about the proposals.

Longford	Thistle Hotel	10 February 2014	12:00 – 20:00
Harmondsworth	St Mary's Church Hall	12 February 2014	12:00 – 20:00
Colnbrook	Colnbrook Village Hall	13 February 2014	12:00 – 20:00
Stanwell Moor	Stanwell Moor Village Hall	25 February 2014	12:00 – 20:00
Harlington	Harlington Baptist Church Hall	26 February 2014	12:00 – 20:00
Richings Park	Richings Park Sports Club	27 February 2014	12:00 – 20:00
Windsor	MacDonald Windsor Hotel	1 March 2014	09:30 – 16:30
Putney	The Putney Pantry	3 March 2014	12:00 – 20:00
Richmond	Duke Street Church	5 March 2014	12:00 – 20:00
Brentford	Holiday Inn hotel	6 March 2014	12:00 – 20:00
Hounslow	Civic Centre	8 March 2014	09:30 – 16:30

Visit: heathrow.com/localcommunity to complete the consultation response form online or to find your nearest public exhibition event.

Find out more about the consultation by calling our community relations team on:
0800 307 7996 or at communityrelations@heathrow.com

The consultation document is available in a number of different languages and formats. If you would like further information please get in touch with the community relations team using the contact details above.



Exhibition posters provided to local community groups and political representatives

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5.3.3 Direct contact focused on 10 local authorities closest to Heathrow. Contact was also made with MPs and London Assembly Members with constituencies in potentially affected areas. In addition engagement was undertaken with 'London wide' GLA members who do not have specific geographical constituencies.

5.3.4 The local authorities contacted were Ealing, Hammersmith and Fulham, Hillingdon, Hounslow, Richmond, Runnymede, Spelthorne, South Buckinghamshire, Wandsworth and Windsor and Maidenhead.

5.3.5 Separate communications were drafted for MPs, GLA members, Local Council Leaders and Deputy Leaders and for all councillors of the 10 relevant local authorities. An additional communication was also sent to the Council Leader and Deputy Leader of all 20 remaining London Boroughs. Each communication/letter was accompanied with a copy of the consultation booklet and a response form.

5.3.6 Direct contact was also made with local authorities to promote the consultation and to request that documents were placed in civic buildings in each borough. Contact was made with the communications department of each council. Following an initial approach, contacts in the communications departments in Hillingdon and Richmond councils declared their intention not to promote the consultation due to the local authority's opposition to the expansion of Heathrow.

5.3.7 Councils expressed differing preferences on how many consultation documents they thought appropriate, and whether documents should be sent to local authorities for subsequent distribution or for documents to be sent to civic venues directly.

5.4 SOCIAL MEDIA ACTIVITY

5.4.1 Throughout the consultation period, the consultation programme was promoted through the *@yourheathrow* Twitter account.

CHAPTER 6: CONSULTATION RESULTS

6.1 CONSULTATION SURVEY: LEVELS OF RESPONSE

6.1.1 13,479 consultation survey responses were received as part of the consultation programme. As part of the analysis work undertaken, analysts were able to record the channel through which the response had been submitted.

6.1.2 8,829 direct mail consultation response forms were completed and returned to the freepost address during the consultation period, representing 66% of all responses received and 6.2% of the direct mail forms delivered to homes and businesses within the consultation area.

Consultation channel	Number of responses (% of total responses)
Direct mail response	8,829 (65.5%)
Online	3,720 (27.6%)
Standard postal response	725 (5.4%)
Public exhibition response	204 (1.5%)
Phone interview	1 (<1%)
Total	13,479 (100%)

Consultation responses by channel

6.1.3 The website, which was promoted in all consultation materials (including posters, paid media and media releases) during the consultation period, was visited on 5,542 occasions during the consultation period, with 3,720 visitors completing the online response form.

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6.1.4 The exact level of response from within the immediate consultation area, where homes and businesses received a direct mail response form, is higher than suggested by this analysis as, rather than returning a postal response form, many of those residents and businesses within the local area chose to complete the survey online, increasing the participation rate amongst those within the target consultation area.

6.1.5 A total of 204 consultation response forms were analysed as having been returned at public exhibition events. This represents 17.5% completion rate amongst those who were recorded as having attended public exhibition events. Many visitors, however, took response forms away from the exhibition events and returned these via the freepost address. These make up a large number of the 204 responses recorded as 'standard postal responses', identifiable as response forms which were not printed with a unique identification number linking them to a residential or business address in the immediate consultation area.

6.1.6 Only one response was categorised as having been completed on behalf of a respondent by a member of the Community Relations team via the dedicated hotline number.

6.1.7 When benchmarked against other consultations of a similar nature, the split between postal and online responses can be seen to be in line with typical response patterns.

6.2 RESPONDENT IDENTIFICATION

6.2.1 The respondent identification section was designed to allow for the most effective use of data received during the formal consultation process. It was particularly important in allowing for results to be broken down by geographic and other social factors.

6.2.2 Completion rates for this section were high, with the majority of respondents providing postcodes and data regarding their relationship with Heathrow.

6.2.3 The section of the consultation response form sought to identify:

- Postcode of the respondent;
- Length of time the respondent had been resident at their current address;

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- Whether the response was submitted on behalf of a business or an individual;
- The reliance of the respondent, or a member of the respondent's household, on employment at Heathrow, or a position associated with Heathrow;
- The regularity with which the respondent used Heathrow Airport.

About you

To help us put your comments in context, it helps to know a bit about you – whether you're a resident or a business, where you live, if you're connected to Heathrow.

All personal information will be treated as confidential and will be used solely for the purposes of this public consultation. No personal information will be used for marketing purposes or shared with third parties.

1 What's your postcode?

2 How long have you been at your current address?
less than 5 years between 5 and 10 years more than 10 years

3 Are you responding as an individual or a business? Individual Business

4 Do you or a member of your household work at the airport? Yes No

5 Do you or a member of your household work in a job which is dependent on Heathrow? Yes No

6 How often do you fly from Heathrow?
less than once a year between 1 to 3 times a year more than 3 times a year

'About you' section, as printed on the consultation response form

6.3 RESPONDENT LOCATION

6.3.1 In order to provide a broader analysis of levels of local response, analysts were able to use postcodes provided on consultation response forms – and, where appropriate, the unique identification number printed on direct mail response forms – to categorise respondents into the following categories of location:

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

Response location category	Number of responses
London Borough of Ealing	662
London Borough of Hammersmith and Fulham	74
London Borough of Hillingdon	1,180
London Borough of Hounslow	4,186
London Borough of Richmond Upon Thames	3,540
Slough Borough Council	644
South Bucks District Council	157
Spelthorne Borough Council	556
London Borough of Wandsworth	27
The Royal Borough of Windsor and Maidenhead	1,478
Other London	191
Outside London	365
Not known	228

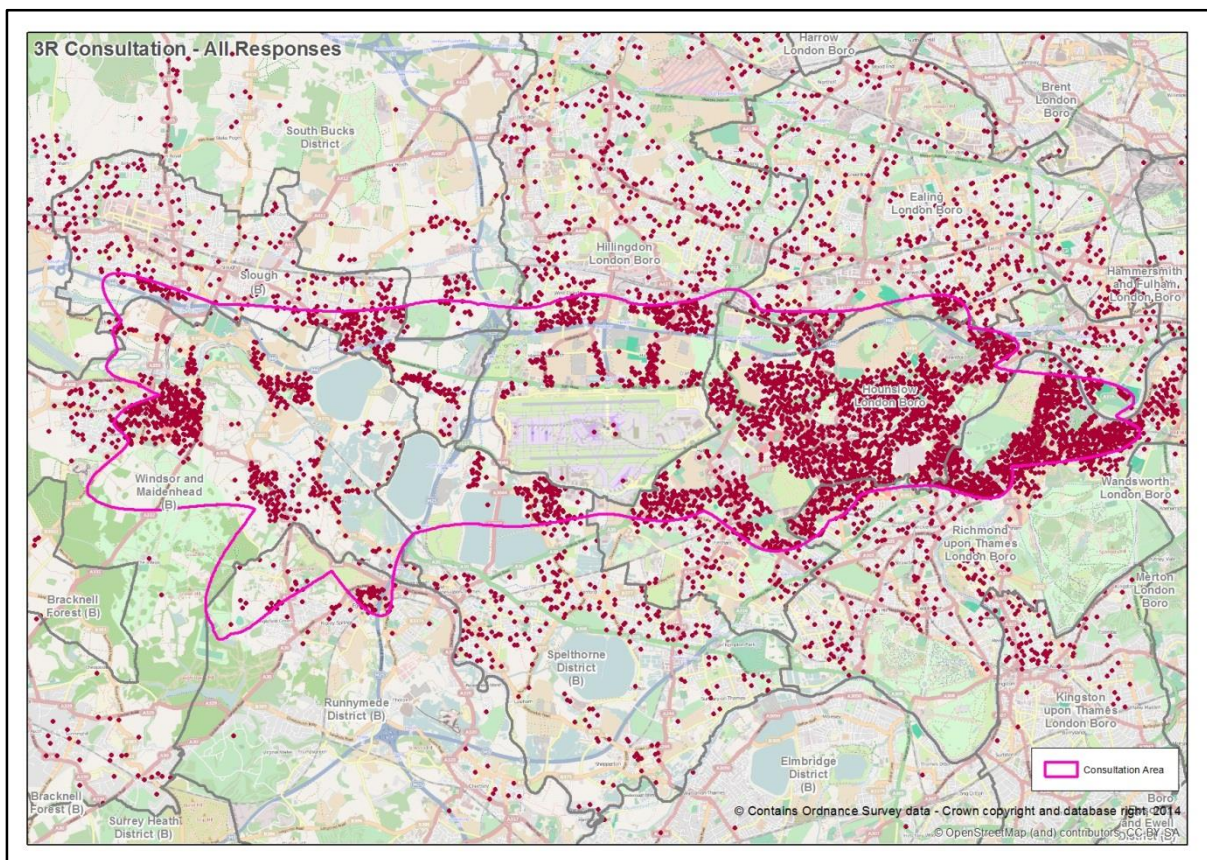
Consultation responses by location category (Data analysis provided by Comres)

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- 6.3.2 The local authority areas pre-selected expand on those within the immediate consultation area, but include all of those with whom Heathrow have an ongoing dialogue regarding expansion plans.
- 6.3.3 The category 'Other London' recorded responses from other London boroughs, whilst 'Outside London' was used to record responses from non-London local authority areas which were not already listed. A small number of online and postal responses did not include postcodes or had been spoilt, meaning identification was not possible.
- 6.3.4 By a significant margin, the majority of identifiable responses came from residents of the London Borough of Hounslow and the London Borough Richmond. Identified responses from these two boroughs totalled 7,839, 58% of all responses. There were also significant levels of response from the London Borough of Hillingdon and The Royal Borough of Windsor and Maidenhead.
- 6.3.5 The high response rate in Richmond is likely to have been driven in part by the activism of local campaigners, including that of local MP, Zac Goldsmith. Mr Goldsmith linked to the online consultation response form in a piece which he published on his website and in an email to local constituents. In the email and website piece, published on February 11th during week 2 of the consultation period, he stated:
- "It (the consultation) asks just three questions, none of which ask for your views on the principle of expansion. If you are inclined to take part in the survey, and if you oppose Heathrow expansion, may I suggest you answer the 1st question as directed, ignore the 2nd, and simply state your opposition to expansion in the 3rd."*
- 6.3.6 A measurement of the location response taken within the first two weeks of the consultation period showed a clear bias towards responses from the London Borough of Richmond and, whilst the response rate from residents and businesses within the borough remained high, the promotion of the consultation by Mr Goldsmith – and the guidance on how to respond – can be assumed to have driven a spike in online responses. This was repeated during the final week of the consultation, when Mr Goldsmith again highlighted and linked to the online response form from his own website.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

6.3.7 The grouping of responses by local authority location was designed to allow for internal measurement of levels of response and sentiment within those local authority areas most likely to be impacted by proposed Heathrow expansion. However, full data sets were provided to Heathrow throughout the consultation process, meaning that responses could be broken down to a more localised level, increasing the effectiveness by which submissions could be used in the refreshed design scheme.



Map of all responses by location from within the Heathrow area

6.4 LENGTH OF TIME THE RESPONDENT HAS BEEN RESIDENT AT THEIR CURRENT ADDRESS

6.4.1 This question was designed to assess the length of time which the respondent had been resident at their current address and levels of engagement within broad groups of residents.

6.4.2 Respondents were asked to identify themselves within the following categories:

- Less than 5 years
- Between 5 and 10 years
- More than 10 years

6.4.3 Over half of all respondents (8,405), where responses could be analysed, identified themselves as having been at their current address for more than 10 years.

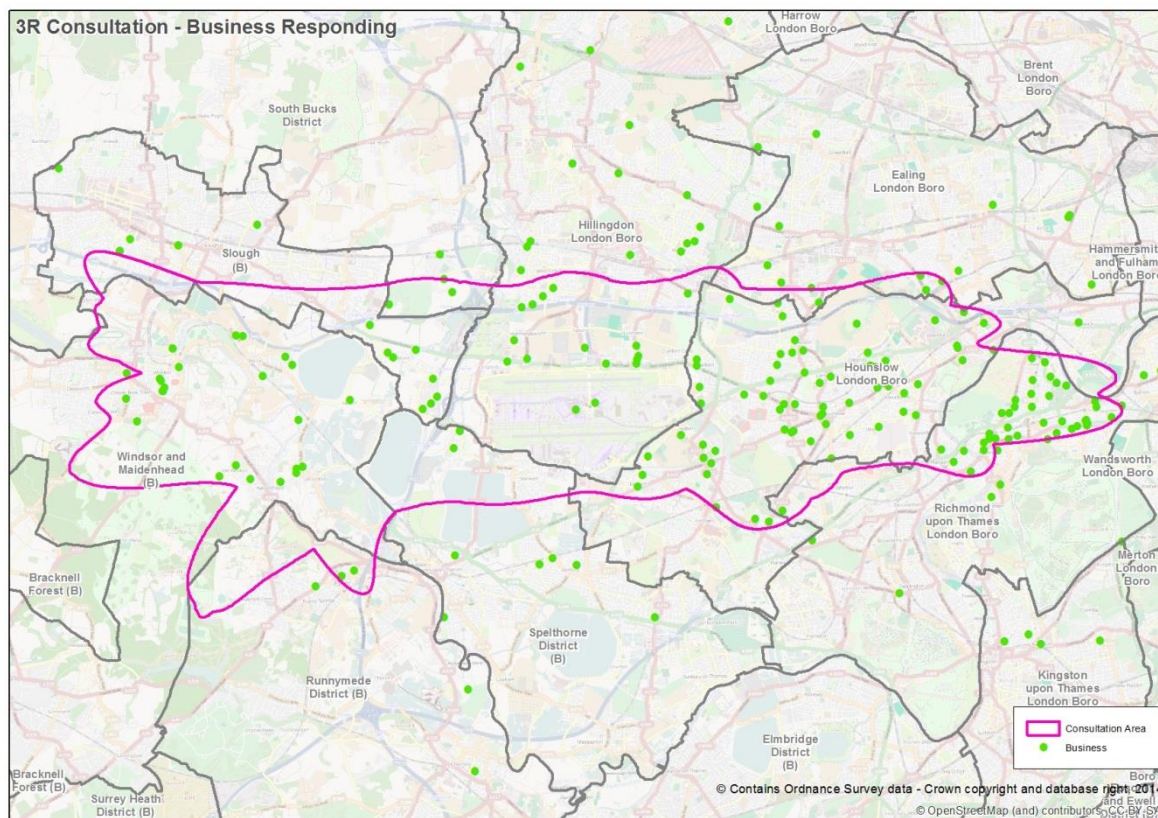
6.5 NATURE OF RESPONSE (BUSINESS OR INDIVIDUAL)

6.5.1 The third question in the 'about you' section asked whether the response was being submitted on behalf of an individual or a business. Analysts were able to record instances where both boxes had been ticked; reflecting the fact that many respondents would be responding on behalf of their own business, but also lived within the local area.

Nature of response	Number of responses
Individual	12,940
Business	260
Both	126
Not known	153
Total	13,479

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

6.5.2 By a significant majority, responses to the public consultation were returned on behalf of individuals, with responses identifiable as coming from businesses or from individuals/businesses making up just 2.9% of responses.



Responses identified as being received from business, mapped by postcode

6.6 HEATHROW AND LOCAL EMPLOYMENT

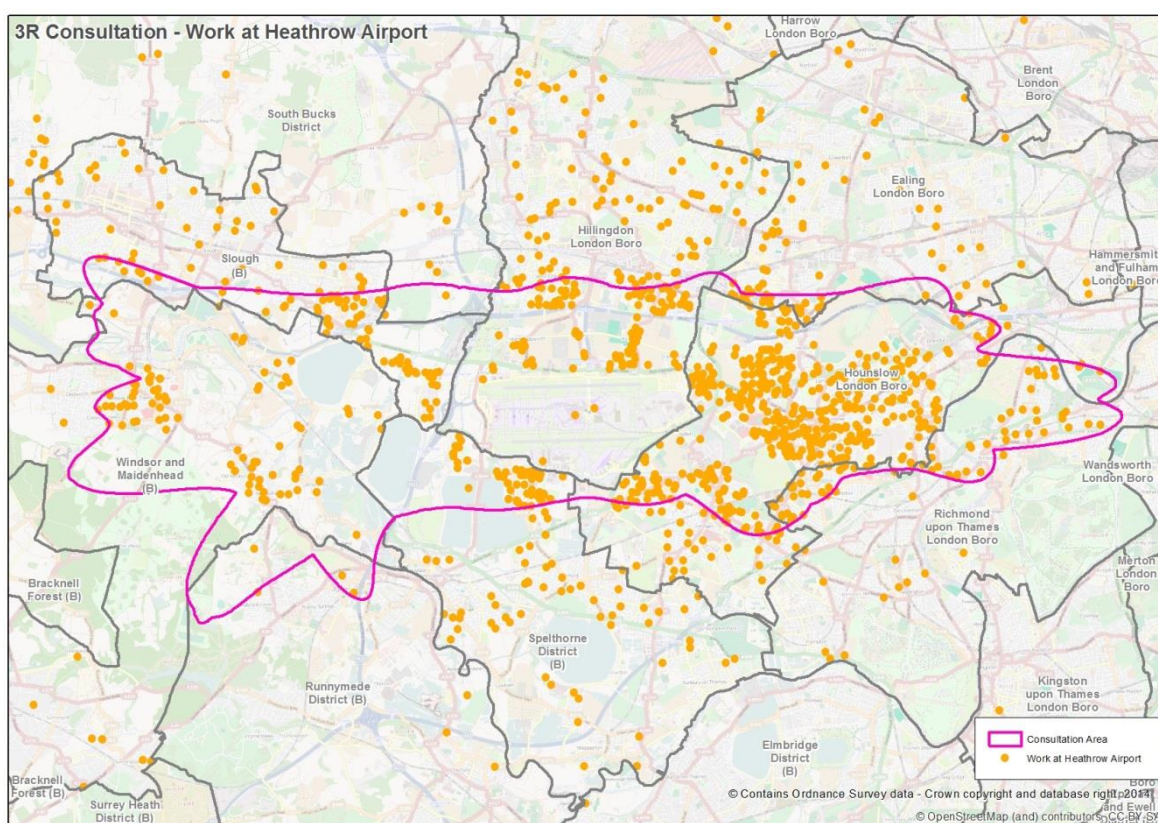
6.6.1 In order to enable a better understanding of the impact of Heathrow on local employment, questions 3 and 4 of the 'About you' section asked residents to identify:

- Do you or a member of your household work at Heathrow Airport?
- Do you or a member of your household work in a job which is dependent on Heathrow?

6.6.2 1,504 respondents said that they or a member of their household worked at Heathrow, whilst 1,955 said they or a member of their household worked in a job which is dependent on Heathrow. 1,272 respondents ticked both boxes.

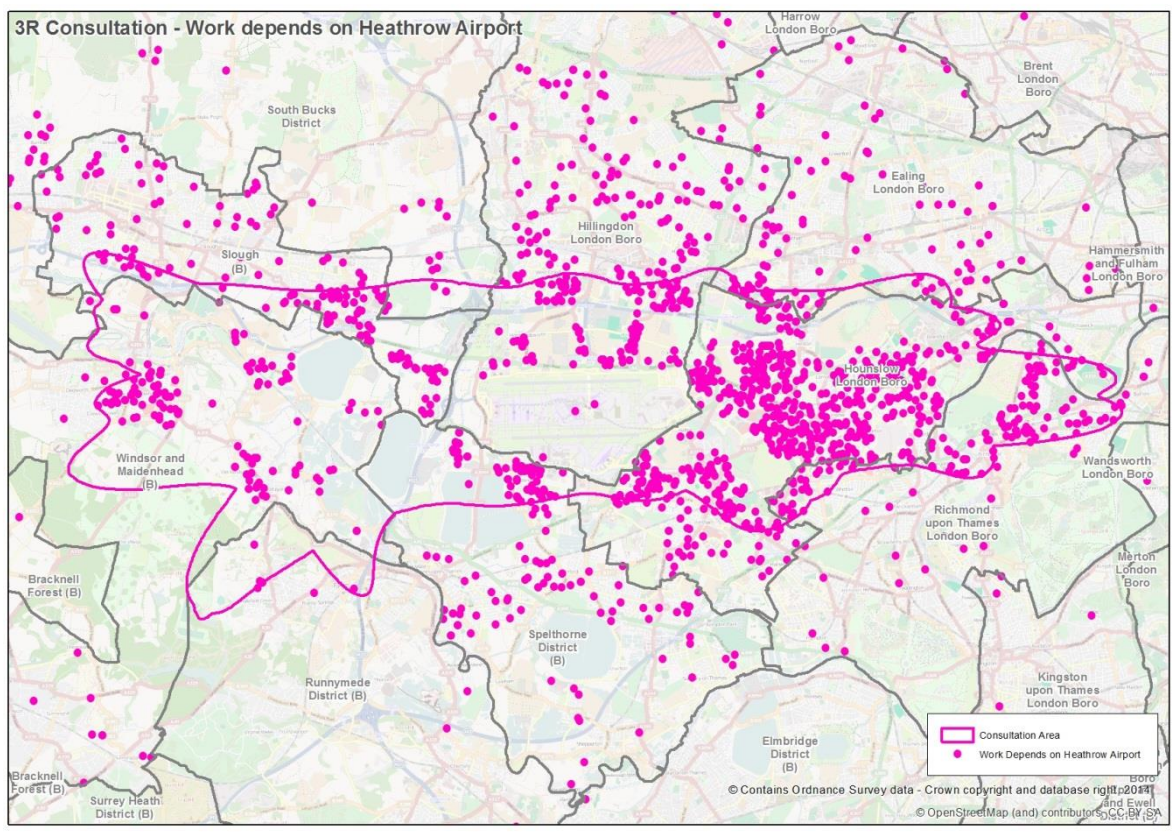
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6.6.3 This question was also designed to insulate against concern that the findings of the consultation survey would be seen as biased due to reliance amongst local people employed by Heathrow.



Respondents identified as having a household member work at Heathrow, by postcode

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Respondents who have a household member work in a job dependent on Heathrow, by postcode

6.7 LOCAL USE OF HEATHROW

6.7.1 Question 6 of the 'About you' section sought to determine the regularity with which respondents used Heathrow Airport, helping to establish the extent of the knowledge respondents would have of the 'Heathrow experience' and use of the Airport as a passenger.

How often do you fly from Heathrow?	Number of responses (% of total responses)
Less than once a year	5,604
Between 1-3 times a year	4,730
More than 3 times a year	2,678
Not known	467
Total	13,479

6.7.2 Whilst a good level of respondents used Heathrow on a regular basis, the majority of respondents (41.6%) said that they used Heathrow 'less than once a year'. Encompassed within this option were those who never fly from Heathrow.

QUESTION 1: WHAT FACTORS DO YOU THINK ARE MOST IMPORTANT WHEN PLANNING A NEW RUNWAY?

6.8 QUESTION

6.8.1 The first question identified a range of 14 factors associated with the debate around Heathrow expansion and asked respondents, in the context of the north west runway proposal, to rank their top 5 in order of importance.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

6.8.2 The factors were chosen based on historic issues of interest raised by those engaged in the debate around Heathrow expansion, both by local residents and businesses, and in the context of the national debate around Heathrow expansion.

6.8.3 Factor categories – and the issues which could be assumed to be covered by each category – were deliberately made broad in order that ‘clash’ between factors was avoided.

6.8.4 14 factors were selected from which respondents were asked to provide a ranking of 1-5, (with 1 being the most important). ComRes supported the approach of only asking respondents to rank 5 factors, as it was felt that this allowed for significant issues of interest to be recorded and registered in the most reliable way. It was felt that any ranking of 6 and over (including the potential to rank all options 1-14) would make any conclusions taken from the ranking of factors significantly less reliable.

6.8.5 Accompanying text included in the consultation booklet explained that, whilst all issues were important and would be considered as part of the proposal, resident responses would help the prioritisation of these factors.

1 What factors do you think are the most important when planning a new runway?

All the factors listed below are important to local residents to varying degrees. Your response to this question helps us understand your priorities.

Please rank your top five in order of importance from 1 to 5 (1 = most important)

	Rank here
Air pollution	
Aircraft noise	
Aircraft safety/risk	
Construction impact	
Flooding	
Historic buildings	
Jobs/local employment	
Loss of homes and businesses	
National economic benefits	
Public transport	
Range of national/international flight destinations	
Road-traffic congestion	
Viability of local communities	
Wildlife/ecology	

Question 1, as included in the consultation booklet

Q1 – What's important to you?

About Question 1

The Airports Commission says that, of the three options we submitted, our north west runway is the one to investigate further. The Commission has asked us to refine our proposal over the next few months.

We'll be looking at various locations for the runway and airport boundary within our north west option. Each of these will have different effects, for example, on the number of properties to be acquired or the number of people most affected by noise.

We have illustrated two different runway locations overleaf. There are other possible variations and understanding which one is best will depend on which most appropriately balances the effects on the local communities.

We want to produce a plan that best reflects the views of local people. To do this we need to know what concerns you most. That's why Question 1 on the enclosed response form asks you to rank the issues in order of priority.

Clearly all the issues are important. But it would help us improve our proposal if we know which ones matter most for you. For instance moving the runway further south means losing fewer properties but brings the runway closer to Colnbrook.

This consultation is your opportunity to influence how our north west option should take shape.

Please use Question 1 on the response form to tell us what you think is most important.

Heathrow public consultation | Page 5

Question 1 explanatory text, as included in the consultation booklet

6.9 REPORT ON FINDINGS

6.9.1 *Aircraft noise* stood out as the most important factor to local residents when planning a new runway, well ahead of other factors.

6.9.2 Respondents who ranked *Aircraft noise* as the most important factor accounted for more than a third (38%) of all responses. *Aircraft noise* was followed by *Aircraft safety / risk* and *Air pollution*, with 11% and 9% respectively selecting these as their most important factor (ranked 1). *Jobs / local employment* and *National economic benefits* completed the top five, being selected as the most important factor by 8% and 6% respectively.

6.9.3 An analysis of the top 3 most important factors (ranked 1-3 by respondents) shows that *Road-traffic congestion* becomes more important, being selected by 21% of respondents. However, *Aircraft noise* still stands out as the key concern, selected by around 70% of all respondents as either their 1st, 2nd or 3rd most important factor.

6.9.4 Reflecting their location in relation to current flight paths, respondents from Richmond and Windsor and Maidenhead were most likely to select *Aircraft noise* as their most important factor when planning a new runway. This was chosen by around three in five in Richmond and half of those responding from Windsor and Maidenhead.

6.9.5 At the conclusion of the consultation period, ComRes were provided with the raw dataset of responses and asked to provide a summary of conclusions from the substantive questions asked as part of the consultation survey response form.

6.9.6 In their analysis of the data, ComRes noted that those in Hillingdon were least likely to select *Aircraft noise* as their most important factor, (around one in five selected this compared to nearly two in five overall). *Jobs / local employment* came much higher in terms of important factors in this area compared to responses from other areas, indicating the dependence of the borough on Heathrow.

6.9.7 Indeed, those who have a member of their household working at Heathrow, or who have jobs dependent on Heathrow, are much less likely to select *Aircraft noise* than those who do not. Around a quarter select this as their most important factor compared

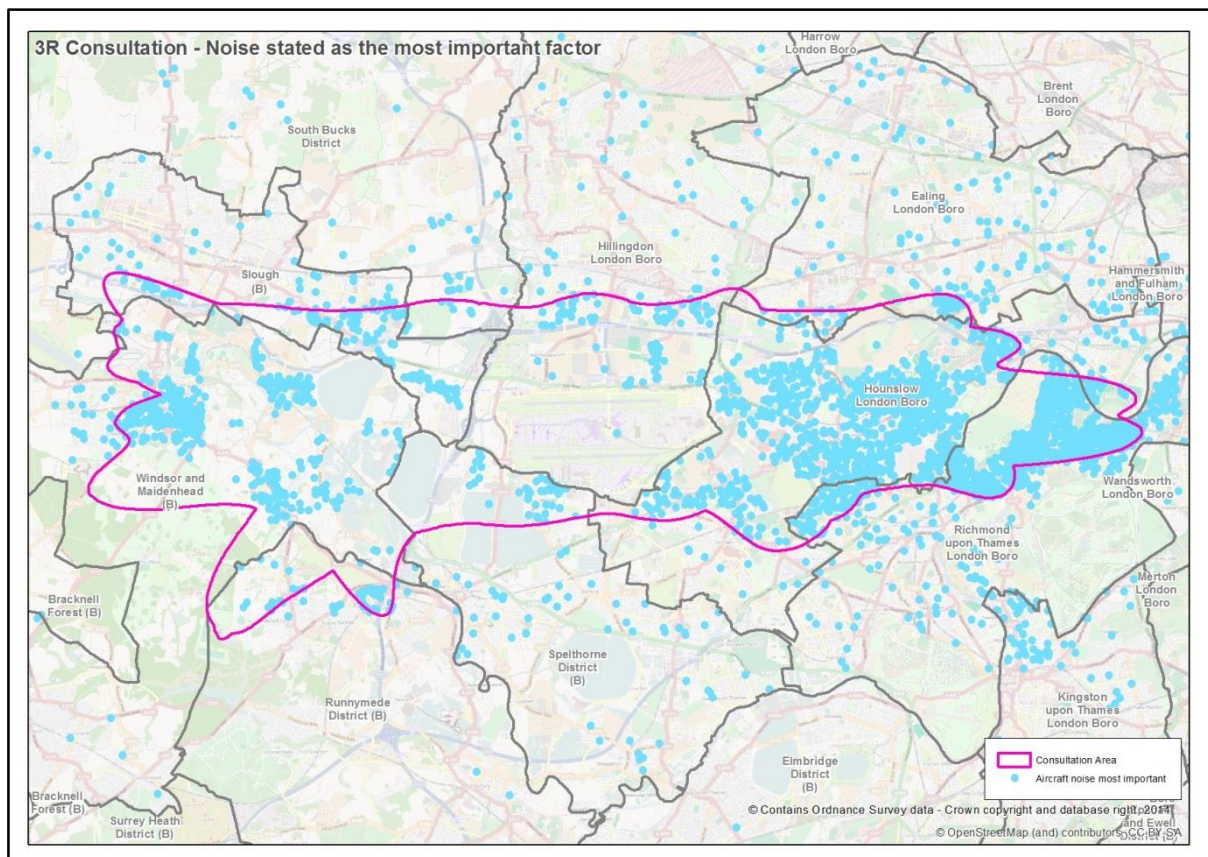
**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

to more than a third overall, and half who do not either work or have a household member dependent on work at Heathrow.

Factor	Ranked 1	Ranked 2	Ranked 3
Aircraft noise	5132	1897	914
Air pollution	1233	3073	1656
Aircraft safety/risk	1462	1174	1433
Jobs/local employment	1081	928	985
Road-traffic congestion	213	796	1380
National economic benefits	765	821	726
Loss of homes and businesses	578	701	1015
Range of national/international flight destinations	206	407	603
Public transport	99	377	627
Wildlife/ecology	169	245	531
Viability of local communities	125	282	475
Construction impact	132	241	440
Flooding	98	178	227
Historic buildings	86	171	224

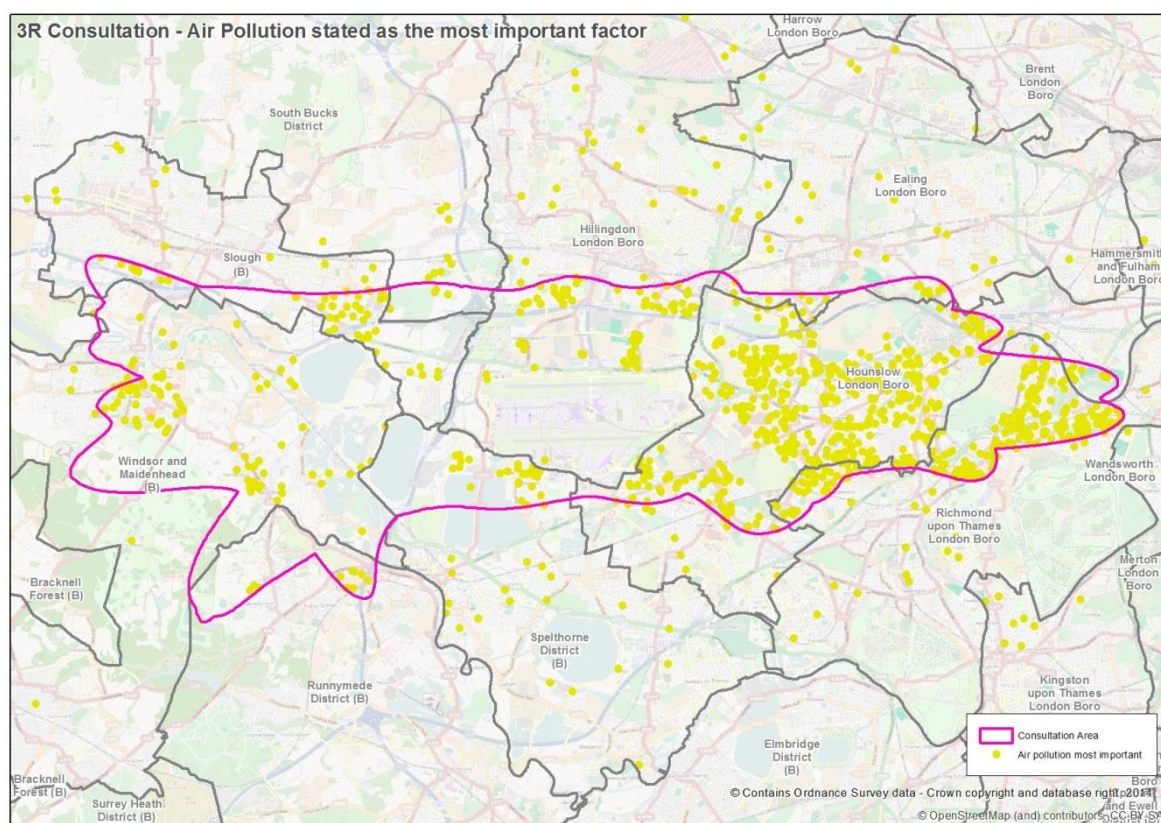
Factors as ranked 1-3 by respondents in Question 1. 1 = most important factor for consideration (Data analysed by ComRes)

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Respondents ranking Aircraft noise as the most important factor for consideration in Question 1, mapped by postcode

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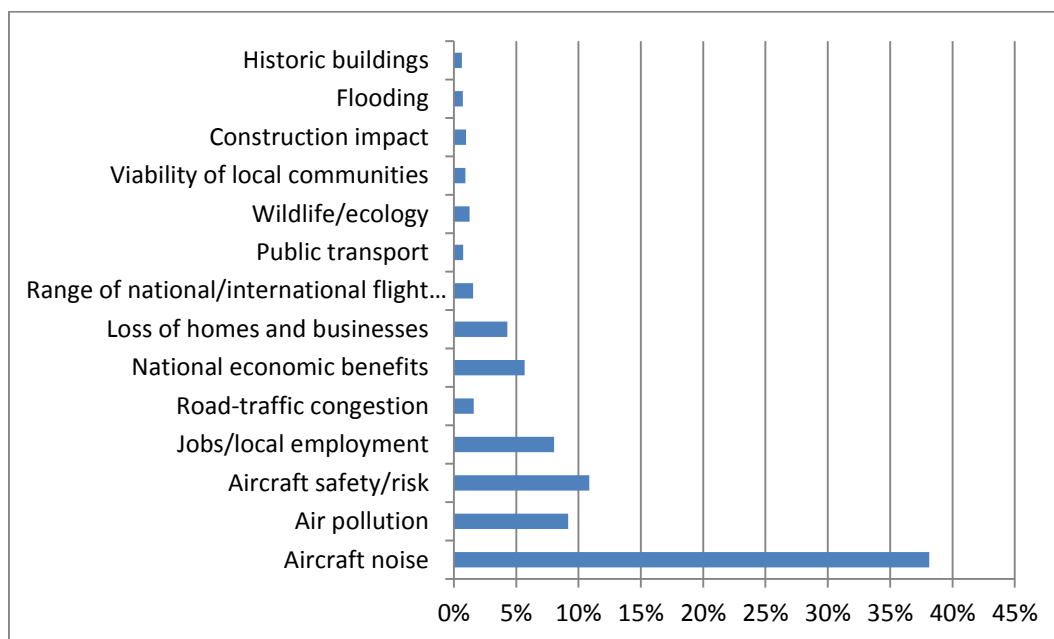


Respondents ranking Aircraft pollution as the most important factor for consideration in Question 1, mapped by postcode

6.9.8 A large number of respondents (15%) either did not complete this section or spoilt their response form. A significant number of respondents attempted to use Question 1 to rank each factor on a scale of 1-5, based on how important they believed it was, making it impossible to provide an analysis of this. A small number also attempted to rank two or more factors as 'most important' (ranking '1').

6.9.9 A significant number of respondents did not use all 5 rankings available in Question 1. For example, some respondents used rankings 1-3 and did not include rankings 4 or 5. Some respondents simply ranked a '1' most important factor. These responses were all included in the full analysis of results.

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

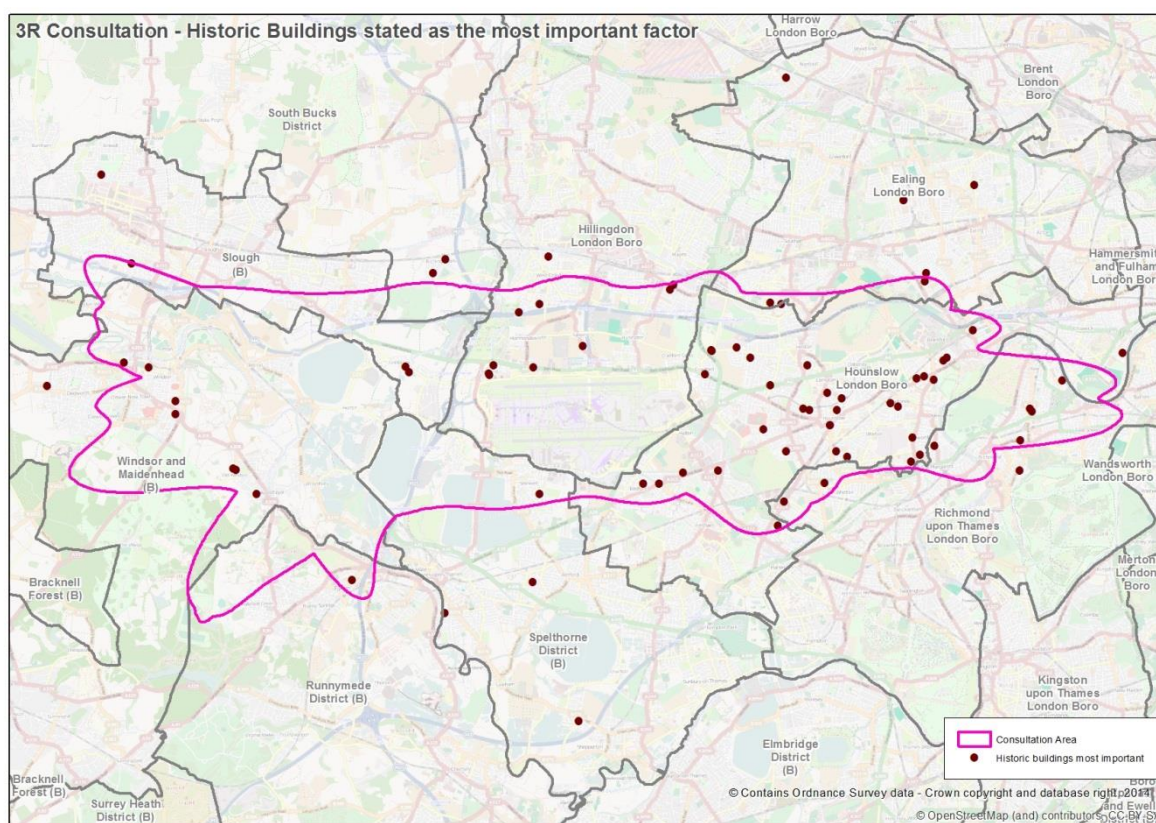


*Percentage rankings for each factor as selected as ranked 'most important' in Question 1
(above)*

6.9.10 Whilst a number of significant factors, such as *Construction impact*, *Road-traffic congestion* and *Viability of local communities* were not ranked by significant numbers of respondents as the most important factor for consideration, it was crucial in the context of planning for a refreshed design report that Heathrow understood where strong sentiment existed around these factors geographically.

6.9.11 Although not presenting an obvious pattern, when taken in the context of the small number of respondents from the villages immediately around Heathrow, such as Harmondsworth, an interest can be seen in the future of historic buildings as part of Heathrow expansion proposals.

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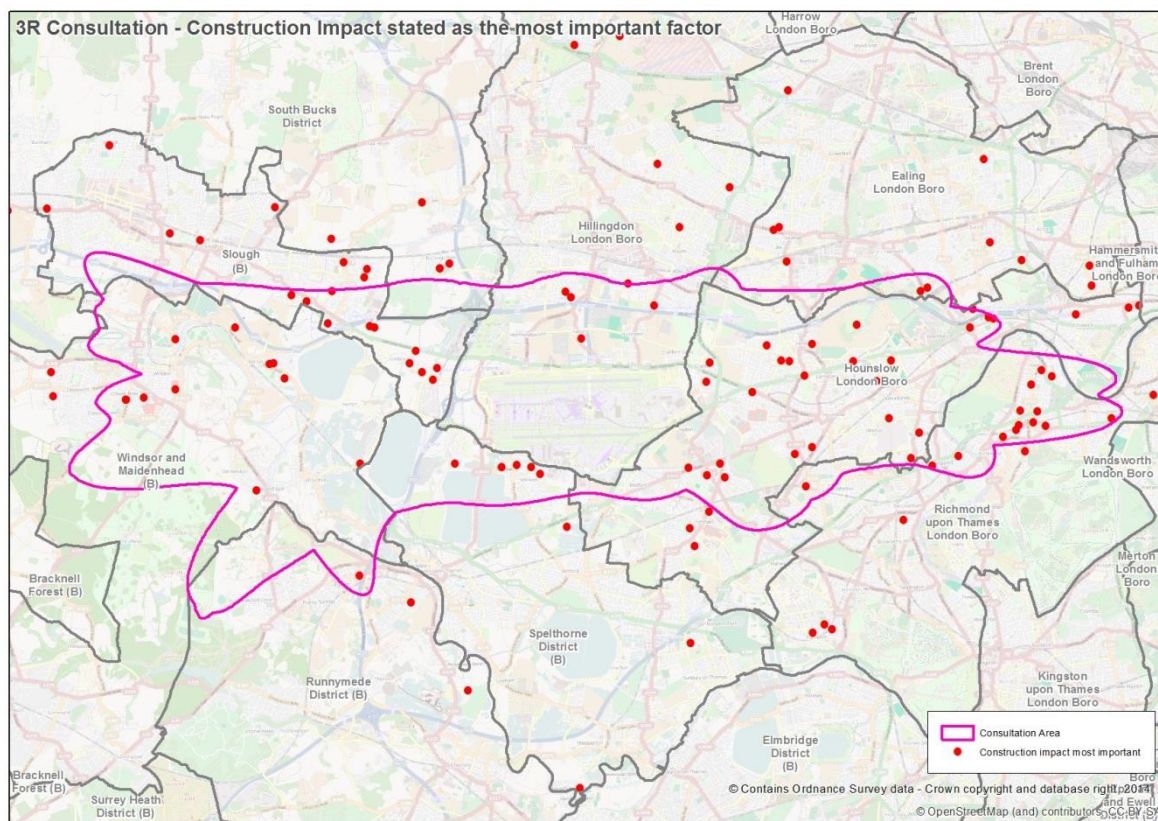


Historic buildings listed as most important factor, mapped by postcode

6.9.12 This is in line with levels of interest expressed at the exhibition events held in the second week of the consultation in Longford and Harmondsworth. However, in the case of the preservation of the Church and the Great Barn in Harmondsworth, an issue mentioned specifically in the original expansion proposal document *A New Approach* and a recognised issue of local interest, residents expressed a range of sentiment regarding the importance which should be placed on the preservation of the historic buildings.

6.9.13 On the issue of *Construction impact* and, again, in the context of the lower sample size of responses provided from communities in these areas, there is a specific interest in the impact of construction in those communities to the north west of Heathrow, where potential impact is likely to be at its greatest, and in areas such as Richings Park, where significant levels of concern were expressed with regards to the impact of any construction work on the M4/M25 junction.

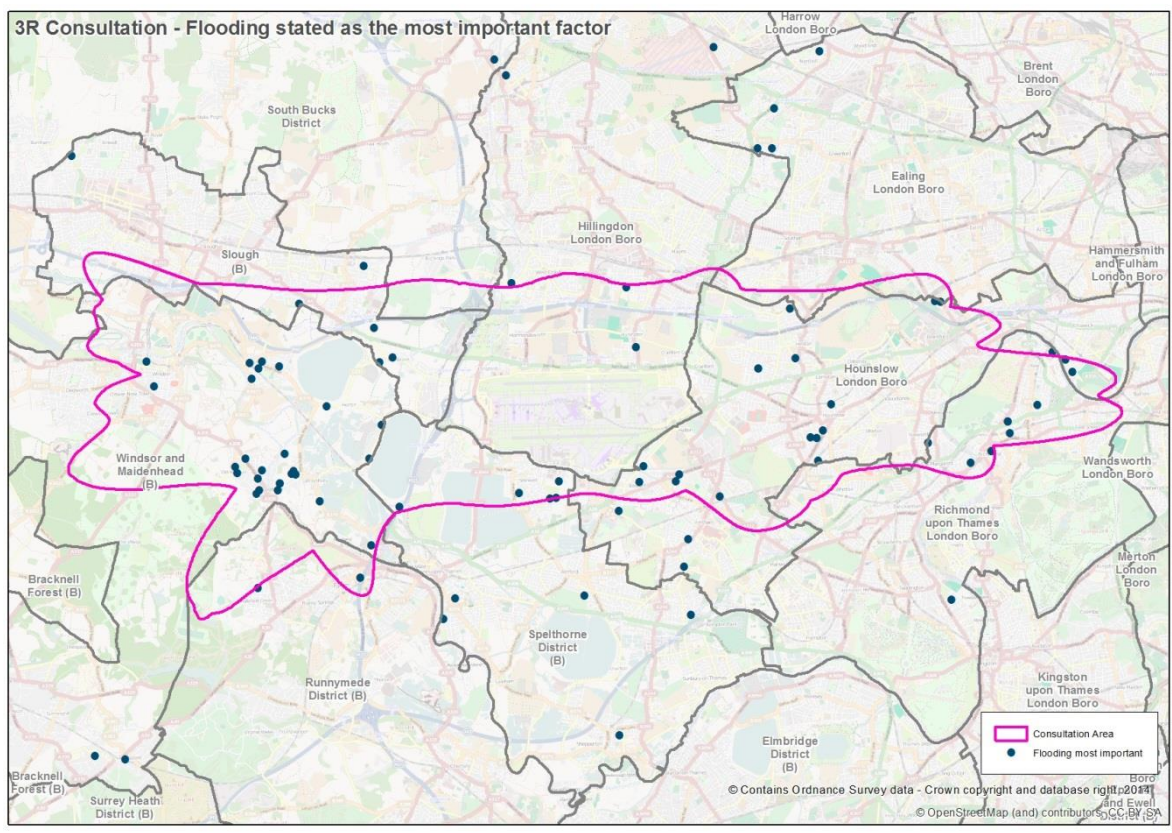
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Construction impact listed as most important factor, mapped by postcode

6.9.14 Reflecting historic issues with flooding in the local area, and the specific problems experienced by local residents during the consultation period in February 2014, analysis of the results also demonstrates a concentration of respondents from communities to the south west of Heathrow regarding the potential impact on instances of flooding, and the importance which should be placed on the issue as Heathrow plans a new runway.

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Flooding listed as most important factor, mapped by postcode

**QUESTION 2: WHICH OF THE FOLLOWING STATEMENTS BEST MATCHES YOUR
ATTITUDE TO NOISE RELIEF FROM AIRCRAFT AND THE NUMBER OF COMMUNITIES
LIVING BENEATH FLIGHT PATHS?**

6.10 QUESTION

6.10.1 Text within the consultation booklet explained that this question, in the context of Heathrow's planning of a refreshed design report, had been designed to assess the balance between delivering noise relief and the overflying of new communities.

6.10.2 The explanatory text explained the potential impact of Heathrow expansion on current patterns of alternation, likely changes to the impact of flight paths and asked respondents to choose between three statements:

- a) Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath flight paths.
- b) Limiting the number of communities living beneath flight paths is more important than providing periods of significant noise relief for all communities.
- C) Don't know.

6.10.3 In order to ensure that the questions accurately but clearly reflected the distinction which Heathrow were making between the two options, ComRes were asked to provide assistance with the drafting of the question.

2 Which of the following statements best matches your attitude to noise relief from aircraft and the number of communities living beneath runway flight paths? Please tick one only.

a) Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath runway flight paths.	
b) Limiting the number of communities living beneath runway flight paths is more important than providing periods of significant noise relief for all communities.	
c) Don't know	

Question 2, as printed on the consultation response form

Q2 – Sharing relief from aircraft noise

About Question 2

Heathrow has two runways. At any one time, we use one runway for landing and the other for taking off. Whenever possible, halfway through the day, we switch over*. By switching, we give people who live beyond the ends of the runways relief from aircraft noise.

The diagram opposite shows how it works. At any one time, only two out of the four zones beyond the runway ends have aircraft flying overhead. The other two zones (shown green) have no aircraft overhead so they experience a period of noise relief. Later, when we switch runways, the other two green zones have their share of noise relief.

This switching of runways is called 'alternation'. It gives communities that lie beneath our flight paths some relief from overflying aircraft and noise.

Noise relief continues with a third runway

To continue to provide alternation with three runways, the new runway has to be at least 1035m north of our existing northern runway. This ensures that all communities living beyond our existing and the new runway ends can experience these periods without overflying aircraft. Because we believe that all our neighbours should continue to enjoy noise relief, we've built that 1035m gap into our plans.

Page 8 | Heathrow public consultation

The new runway will of course bring new communities to the north of Heathrow under its flight path. They will experience more aircraft noise than they do at the moment. We need to consider how this impact can be made manageable but runway alternation and periods without overflight will help to ease the impact.

No noise relief with an extended runway

If we were to extend our existing northern runway, as suggested by the independent Heathrow Hub proposal, fewer new communities would fall under its extended flight path.

The downside is that runway alternation could not work in the same way. Communities living near Heathrow would not enjoy significant periods of noise relief.

Please use Question 2 on the response form to tell us what you think about the balance between delivering noise relief and overflying of new communities.

*Sometimes it's not possible to switch over. Visit [heathrow.com/noise](https://www.heathrow.com/noise) for an explanation of westerly/easterly operations and runway alternation. You can also learn more about the steps Heathrow is taking to minimise noise for local residents in its report 'A quieter Heathrow'.

Question 2 explanatory text, as contained in the consultation booklet

6.11 REPORT ON FINDINGS

Which of the following statements best matches your attitude to noise relief from aircraft and the number of communities living beneath flight paths?	Number of responses (% of total responses)
Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath flight paths.	8,384 (62%)
Limiting the number of communities living beneath flight paths is more important than providing periods of significant noise relief for all communities.	2,667 (20%)
Don't know	871 (6%)
Not completed	1,557 (12%)
Total	13,479

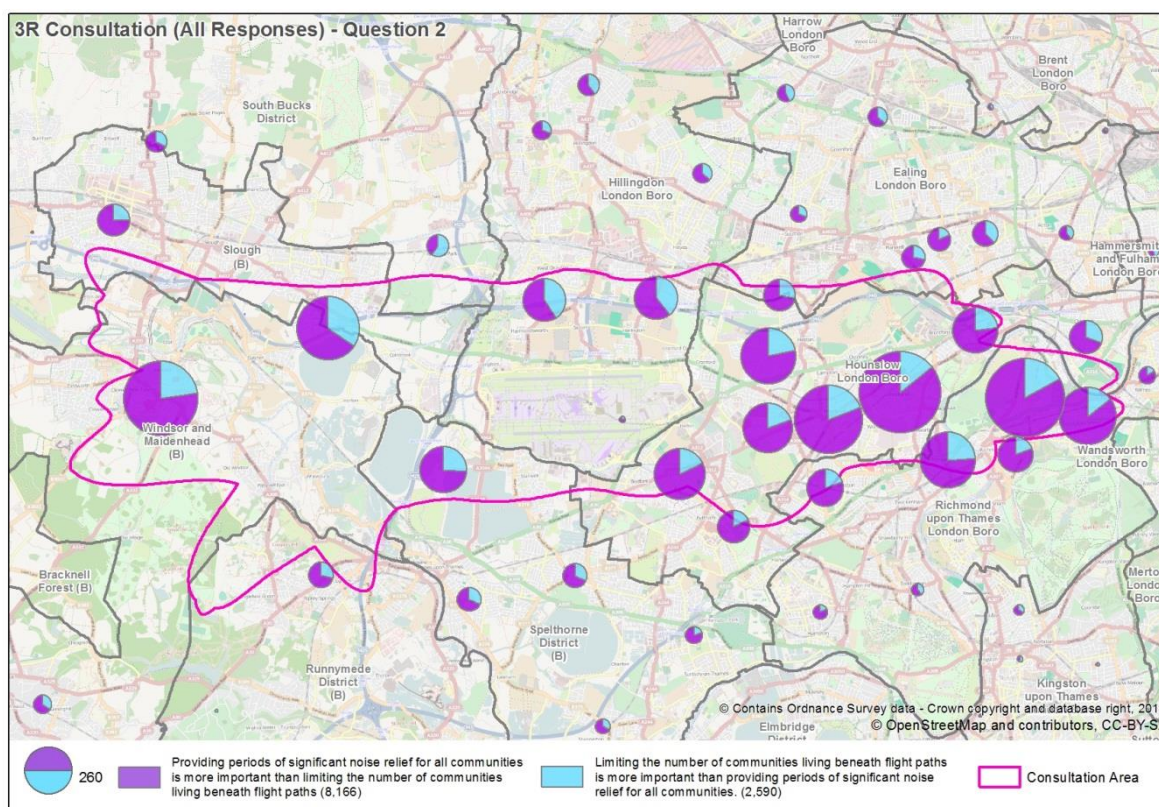
6.11.1 Analysis of Question 2 responses found that the clear majority of local residents would prefer periods of noise relief, over limiting the extent of the flight path.

6.11.2 A majority (62%) of respondents selected “*Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath flight paths.*” This compares to a fifth (20%) who say that “*Limiting the number of communities living beneath flight paths is more important than providing periods of significant noise relief for all communities.*”

6.11.3 Response rates for this question were high, with only 6% selecting the ‘don’t know’ option. 12% of respondents did not provide an answer.

6.11.4 A detailed mapping of response patterns, broken down by primary postcode (where provided) reveals that, whilst support for Option A was consistent across the primary consultation area, there was a larger volume of support for Option B in those areas likely to be most impacted by changes to flight paths as a result of a new north west runway at Heathrow.

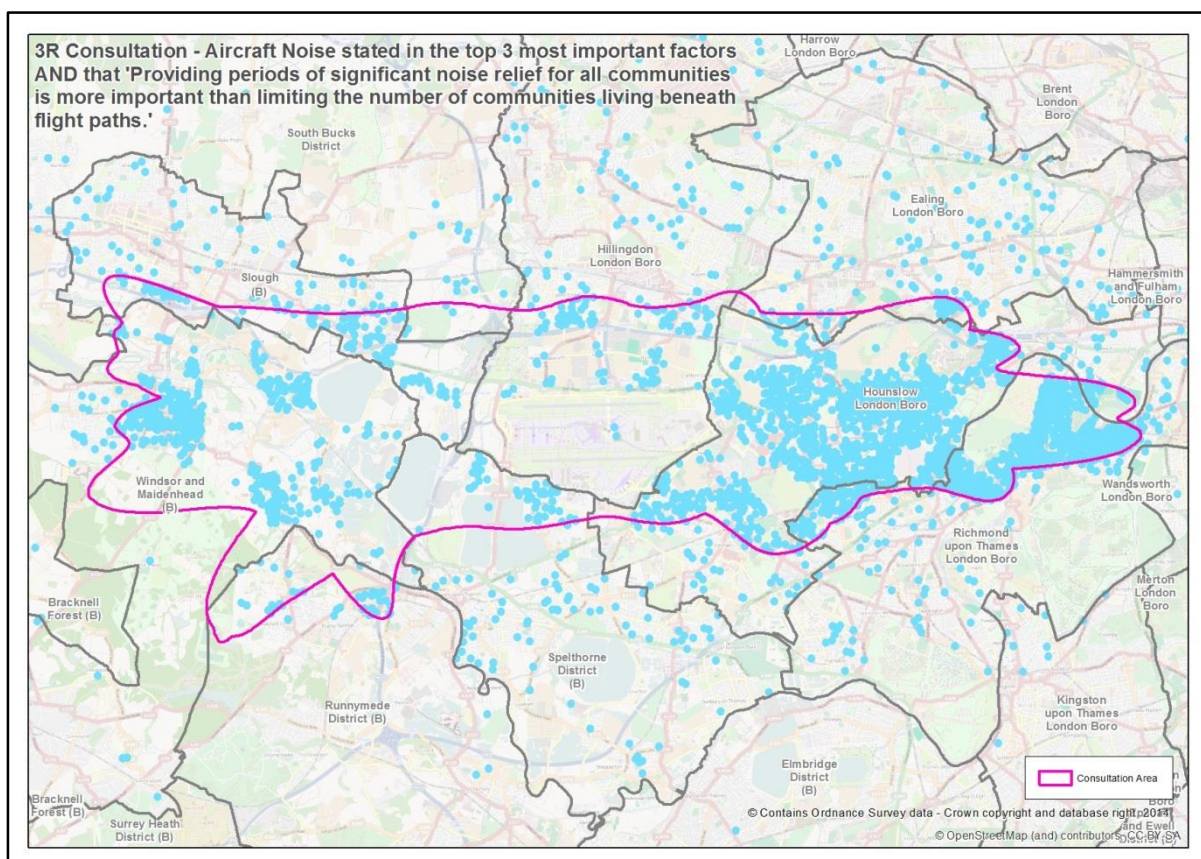
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Responses to Question 2, mapped by postcode

6.11.5 ComRes' analysis of Question 2 responses showed that respondents who selected "Providing periods of significant noise relief for all communities is more important than limiting the number of communities living beneath flight paths" were more likely to choose *Aircraft noise* as their most important factor when planning a runway at Q1 (c. 46% vs. 38% overall).

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Respondents who ranked Aircraft noise in the top 3 most important factors (Q1) and said that “Providing periods of noise relief for all communities is more important than limiting the number of communities living beneath flight paths” (Q2)

6.11.6 ComRes’ analysis also highlighted that there is little difference in Question 2 responses by those who either work or have a job dependent on Heathrow, or a member of their household who works at Heathrow, or those who have a job or have a household member whose job is dependent on Heathrow.

QUESTION 3: HOW CAN WE IMPROVE OUR PROPOSAL FOR A NEW RUNWAY?

6.12 QUESTION

6.12.1 The final question, which was presented as an open comment box, asked respondents to provide suggestions as to how the outline proposal for a new north west runway could be improved ahead of the design of the updated proposal.

6.12.2 The text of Question 3 was:

How can we improve our proposal for a new runway? Please use the space below to tell us your ideas or to mention any other factors not covered by Questions 1 and 2. (In order to accommodate lengthier responses and not place artificial restrictions on sentiments expressed in Question 3, respondents were advised of their ability to provide this answer on an additional form.)

3 How can we improve our proposal for a new runway?

Please use the space below to tell us your ideas or to mention any other factors not covered by Questions 1 and 2. *If you would like to continue your response to Question 3 on another sheet of paper, please send it along with this consultation response form to the Freepost address provided.*

Question 3, as included on the consultation response form

Q3 – Any other thoughts?

About Question 3

Please don't feel restricted to the topics covered by Questions 1 and 2. We want to hear your views on any other Heathrow runway or expansion-related topic that's important to you.

If you think we should take other issues into account as we develop our runway proposal, you can use Question 3 on the response form to let us know what you think.

About you

The last section of the response form asks six short questions about you. This is to help us put your comments in context. We want to know if you're responding as an individual or a business, as someone who lives locally or elsewhere, and whether you're connected to the airport.

All answers are confidential.

Property values and compensation

Any plans for a new runway will inevitably affect the nearby property market. Although the Government will not make a decision on a third runway at Heathrow before Autumn 2015, we know that our neighbours will want reassurance that the values of their properties can be protected.

The Commission has encouraged the Government and the promoters of new runway schemes to think about what can be done now to put minds at ease.

We want to work with people whose properties might be affected by Heathrow's expansion to develop a fair compensation scheme. The sooner we can do that, the better.

If you'd like to know how you can take part in this process, please get in touch. You can email us at

communityrelations@heathrow.com

or call our Community Relations team on:

0800 307 7996

or write to us at our Freepost address (see back cover).

Question 3 explanatory text, as included in the consultation booklet

6.12.3 In order to analyse these responses in a way which allowed them to be categorised and used effectively during the production of the refreshed scheme design, analysts recorded themes and issues mentioned in Question 3 which aligned with a series of broad factors associated with sentiment towards Heathrow expansion. This allowed for responses to Question 3 to be grouped for use around specific aspects of the project and for patterns of sentiment towards the proposal to be identified.

6.12.4 The keywords, which were established by Heathrow and used internally to identify responses to Question 3, were:

- Aircraft noise
- Aircraft operations
- Airport/aircraft security/safety
- Communications
- Community impacts

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- Compensation/mitigation
- Cost
- Economic benefits/issues
- Economic disbenefits
- Environmental impacts
- Forecasting and demand
- Heathrow expansion (oppose)
- Heathrow expansion (support)
- House prices and blight
- Land-take
- Other issues worth recording
- Passenger experience and service standards
- Runways and taxiways
- Terminals
- Transport impacts
- Transport improvements

6.12.5 Analysts were also able to register specific detailed issues within each of these categories by using a further list of associated sub-categories. This was designed to allow for immediate and easy identification of individual responses which raised particular issues so that these could be considered as part of the scheme update process.

6.12.6 The full list of categories and sub categories is provided in Appendix D.

6.12.7 Whilst the trends emerging from Question 3 were useful in terms of the measurement of sentiment towards the runway, the question was designed to solicit engaged and substantive proposals from respondents to influence the drafting of an updated proposal for the proposed north west runway.

6.12.8 **ComRes noted in their analysis of the data that, whilst it provided immeasurable value in providing detailed insight into views among local residents, there are significant limitations in analysing the data in a quantitative manner.**

6.12.9 Despite this, however, there were some common themes which could be taken from the Question 3 data. Based on the code frame generated and the analysis conducted, issues regarding aircraft noise featured heavily in responses provided by respondents, mentioned by just under one in five. This clearly tallies with the findings at Q1 in indicating that aircraft noise is a key concern.

6.12.10 This finding, and the overwhelming ranking in Question 1 of Aircraft noise as the most important factor for consideration, allows Heathrow to place significant value on the response provided to Question 2, with respondents clearly engaged and interested in noise and noise impact as an issue.

6.13 REPORT ON FINDINGS

6.13.1 Whilst keeping in mind the need to take care when drawing analytical patterns from such data, it is possible to draw some conclusions from the responses provided to Question 3.

6.13.2 Almost one in five responses to Question 3 raised issues associated with Aircraft noise including night flights, frequency of flights, and measurement of noise or noise from aircraft. In line with the findings from Question 1 and the prioritisation of issues associated with noise at Heathrow, of the responses to Question 3 which mentioned a specific impact or factor associated with the proposal, noise was by far the most popular.

6.13.3 In line with the findings of Question 1, issues associated with environmental impacts were a popular theme amongst Question 3 responses. Of those responses categorised under this keyword, two thirds mentioned issues regarding pollution in association with Heathrow operations.

6.13.4 The most notable difference between the factors ranked as most important under Question 1 and the trends emerging from Question 3 was the relatively small number of responses which mentioned issues associated with aircraft/airport safety. Of these responses, the most notable trend was broad opposition to flights over residential or built up areas.

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- 6.13.5 Over a thousand respondents used Question 3 to raise a variety of issues categorised within the Transport impacts or Transport improvements keywords. This included issues around road improvements, rail links and general public transport improvements.
- 6.13.6 There were clear geographic trends with regards to the themes raised in Question 3 responses. Respondents who raised issues regarding land-take, for example, and the physical footprint of proposed expansion at Heathrow were disproportionately from those areas likely to be most impacted by physical expansion, such as those households within the UB7 postcode.
- 6.13.7 No restrictions or guidelines were placed on Question 3 responses and, as such, many respondents used the Question to make broad statements of opposition or support for Heathrow expansion.
- 6.13.8 Response rates were inconsistent for Question 3, with 35% of respondents not completing this section.
- 6.13.9 A full breakdown of findings by keyword is provided in Appendix E.

6.14 ADDITIONAL RESPONSES

- 6.14.1 The online response form was removed from the online hub at: www.heathrow.com/localcommunity, by 7am on Monday 17th March as part of an update of the site to reflect the closure of the consultation period.
- 6.14.2 In order to allow for the delivery and inclusion of postal response forms which were returned to the Freepost address during the consultation period, however, all responses received up to and including the Thursday 20th March were processed and included within the sample.
- 6.14.3 A number of responses were received after this cut-off date. Following the end of the consultation period, a total of 280 consultation responses were received up to and including the 4th April 2014.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- 6.14.4 Top level analysis of these responses was undertaken, with the data taken into account and included in considerations around the refreshed scheme design. The analysis of these responses, specifically in terms of the results for Question 1 and 2, correlated with the themes of responses received within the deadline and included in the data set.
- 6.14.5 Despite no request being made for formal responses from local authorities or campaign groups, formal responses were provided by the London Borough of Hammersmith and Fulham; the Royal Borough of Windsor and Maidenhead; Old Windsor Parish Council and Old Windsor Residents' Association. These are referenced in Appendix H.
- 6.14.6 Responses were also made using the online response form which was noted as being on behalf of representatives from Slough Borough Council. These were included within the standard sample of responses.

CHAPTER 7: CONCLUSIONS

7.1 OVERVIEW OF FINDINGS

7.1.1 Following the six week consultation programme, during which 13,479 responses were submitted and over a thousand local residents attended a series of public exhibition events held across the wider Heathrow area, clear trends emerged regarding the issues and factors local residents believe are most important in Heathrow's planning for a proposed new runway.

7.1.2 AIRCRAFT NOISE

- Noise was clearly identified as the most important factor for consideration.
- An overwhelming number of respondents (38%) used Question 1 to tell us that aircraft noise is the most important factor for consideration as part of planning for a new north west runway.
- This finding is consistent across the consultation area.
- Issues associated with existing and potential noise from Heathrow Airport, including alternation patterns, night flights, the impact of new flight paths and noise mitigation measures were the most raised by respondents when asked how proposals for a new runway could be improved.

7.1.3 AIR POLLUTION AND AIRCRAFT SAFETY/RISK

- Aircraft safety/risk (11%) and Air pollution (9% of responses) ranked second and third respectively amongst the factors for consideration respondents believe are most important when planning a new north west runway at Heathrow.

7.1.4 JOBS AND THE ECONOMY

- There is strong recognition of the economic and employment benefits provided by Heathrow. Out of 14 proposed factors for consideration, Jobs/local employment (8% of responses) and National economic benefits (5% of responses) rank fourth and fifth respectively in respondents' rankings of what factor is most important in planning a new north west runway at Heathrow.

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- The prioritisation of local employment was particularly noticeable amongst respondents living closest to Heathrow.
- 11% of the 13,479 respondents to the consultation survey identified themselves as having a member of their household who worked at Heathrow or a member of their household who worked in a job which was dependent on Heathrow.

7.1.5 The public consultation programme undertaken by Heathrow was designed to allow for those who could potentially be most impacted by Heathrow's expansion plans to help shape the updated proposals for a new runway to the north west of the airport. In undertaking this work with local residents, Heathrow understands the importance of reporting key findings from the consultation responses, identified through analysis of the results, trends and patterns in sentiment towards the proposal and, most importantly, being seen to have acted to incorporate these findings into our updated proposal.

7.1.6 As a result of the feedback provided by those most likely to be impacted as a result of Heathrow's proposal, Heathrow believe the following:

NOISE IS THE MOST IMPORTANT FACTOR

7.1.7 The response to Question 1 overwhelmingly demonstrates that noise from aircraft is the factor that most local residents believe should be considered the most important when planning a new runway at Heathrow. Therefore, Heathrow have sought to position the proposed new runway so that as few people as possible are brought within a new 57 dB Leq noise contour around the expanded Heathrow Airport.

7.1.8 Whilst the positioning of the proposed new runway is the most effective way of impacting as few local people as possible by increased noise as result of Heathrow expansion, our work to reduce the noise impact of Heathrow on our neighbours, including action to reduce aircraft noise and offering residents periods of noise relief through alternation, will continue.

LOCAL RESIDENTS WANT HEATHROW TO CONTINUE TO HAVE THE ABILITY TO PROVIDE NOISE RELIEF

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

7.1.9 Question 2 of the consultation, which sought to understand local sentiment towards the continuation of noise mitigation measures and the extent to which residents value current noise relief patterns, overwhelmingly demonstrated that local residents, by a margin of 3:1, want Heathrow to continue to prioritise the provision of periods of significant noise relief for all communities over limiting the number of communities living beneath flight paths.

7.1.10 The extent to which local residents placed aircraft noise as the issue for greatest prioritisation, both in the formal response to the consultation and through informal feedback at exhibition events across the local area, allows Heathrow to be confident in the findings taken from Question 2 and the levels of engagement from local residents around our noise mitigation measures.

AMENDMENTS TO THE SCHEME DESIGN

7.1.11 Feedback from those residents and businesses likely to be most impacted by the proposed new runway has been used by Heathrow to help shape the revised scheme design. The details of how this has been done are set out in Heathrow's submission to the Airports Commission: "Taking Britain Further".

APPENDIX CONTENTS

- A CONSULTATION BOOKLET: 'SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL'**
- B EXHIBITION MATERIALS**
- C EXHIBITION EVENT REPORTS**
- D QUESTION 3 ANALYSIS, KEYWORD CATEGORIES**
- E QUESTION 3 ANALYSIS, KEYWORD REPORTS**
- F MEDIA ENGAGEMENT**
- G WEBSITE USAGE STATISTICS**
- H ADDITIONAL RESPONSES**

APPENDIX A: CONSULTATION BOOKLET - 'SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL'

The consultation booklet 'Shaping Heathrow's north west runway proposal' was distributed to over 140,000 local homes and businesses in the immediate consultation area during the first week of the consultation period. All copies of the booklet were sent with a Freepost consultation response form for completion.

Copies of the booklet were also made available through local authority 'hubs', civic venues and MP's offices in those local areas most likely to be impacted by the potential expansion of Heathrow. Copies were also available at each public exhibition session and were available on request during the consultation period.

The booklet was also hosted in readable and downloadable PDF format at www.heathrow.com/localcommunity throughout the duration of the consultation period.



Shaping Heathrow's north west runway proposal

A public consultation – 3 February to 16 March 2014

Heathrow

Front page

Foreword

In December 2013 the Airports Commission, an independent body set up by the Government, included Heathrow on its shortlist of options for additional runway capacity in the UK.

Of the three proposals we submitted, our option for a runway to the north west of Heathrow is the one that's been shortlisted for further detailed consideration.

There's still much work to do to refine our proposal before the Commission makes its final recommendation to Government in 2015. As part of this work, we are now consulting with residents and businesses likely to be most affected.

Since we first published our outline plans for a new runway, we have welcomed comments and feedback from local residents. We really do want to hear your views.

This consultation gives you another opportunity to say what you think about our proposal and the issues that are most important to you.

Our consultation document tells you a bit more about the next steps in the Airports Commission process and how you can help us shape our proposal.

I hope you will take this opportunity to get involved and let us know your thoughts on the future of Heathrow.

Yours sincerely,



Colin Matthews
Chief Executive, Heathrow

Why are we consulting?

Following the Airports Commission's decision to shortlist our north west runway proposal at Heathrow, we are consulting with the people and businesses most affected.

Our proposal is one of three shortlisted by the Commission. The other two are the 'Heathrow Hub' proposal submitted independently by a company not connected with us, and a proposal put forward by Gatwick Airport.

To avoid confusion, the 'Heathrow Hub' is not an option developed by us. We think our own north west option is a better solution.

The Commission has asked us to talk to local communities and other interested parties. We want to know what our neighbours think about our proposal.

Why consult now?

We have to submit our refined proposal to the Commission in early May. By consulting now we can take your views into account. The consultation runs for six weeks from Monday 3 February to Sunday 16 March.

Six weeks may not seem long for gathering opinions, but it has to fit the time frame set for the Commission by the Government.

There will be more opportunities to express your views throughout the Airports Commission process.



The Airports Commission was set up by Government to make independent recommendations on maintaining the UK's status as an international hub for aviation. The Commission will publish its final report in summer 2015. The diagram shows the key stages in the process.

Heathrow public consultation | Page 3

Who are we speaking to?

We're asking for opinions from the people and businesses likely to be most affected by our proposal for a new runway at Heathrow. That's why we've sent this consultation document to over 140,000 homes and businesses in the Heathrow area and beyond.

Because we want to gather as wide a range of views as possible, we're inviting responses from across the whole region. Anyone can take part by completing the online questionnaire at:

heathrow.com/localcommunity

If you contribute to the consultation, we will take account of what you say as we refine our proposal.

What do we want to know?

Later this year, the Commission will consider the effects of a new runway at Heathrow. It will take everything into account, including the number of jobs likely to be created, improvements to public transport and the effect of noise on neighbouring communities. The Commission's task is to balance all these aspects when it writes its final recommendation in 2015.

As we refine our outline proposal for a new runway, we'd like to know what matters most to you. Please tell us how you think we can improve our proposal to address your concerns.

We also want to hear your views on our plans to manage aircraft noise, an issue that concerns everyone who lives close to Heathrow.

And we want to give you the opportunity to help us develop future compensation proposals.

Wherever possible, we want to make sure that our plans for a new runway and any mitigation measures reflect the views of those most affected.

Q1 – What's important to you?

About Question 1

The Airports Commission says that, of the three options we submitted, our north west runway is the one to investigate further. The Commission has asked us to refine our proposal over the next few months.

We'll be looking at various locations for the runway and airport boundary within our north west option. Each of these will have different effects, for example, on the number of properties to be acquired or the number of people most affected by noise.

We have illustrated two different runway locations overleaf. There are other possible variations and understanding which one is best will depend on which most appropriately balances the effects on the local communities.

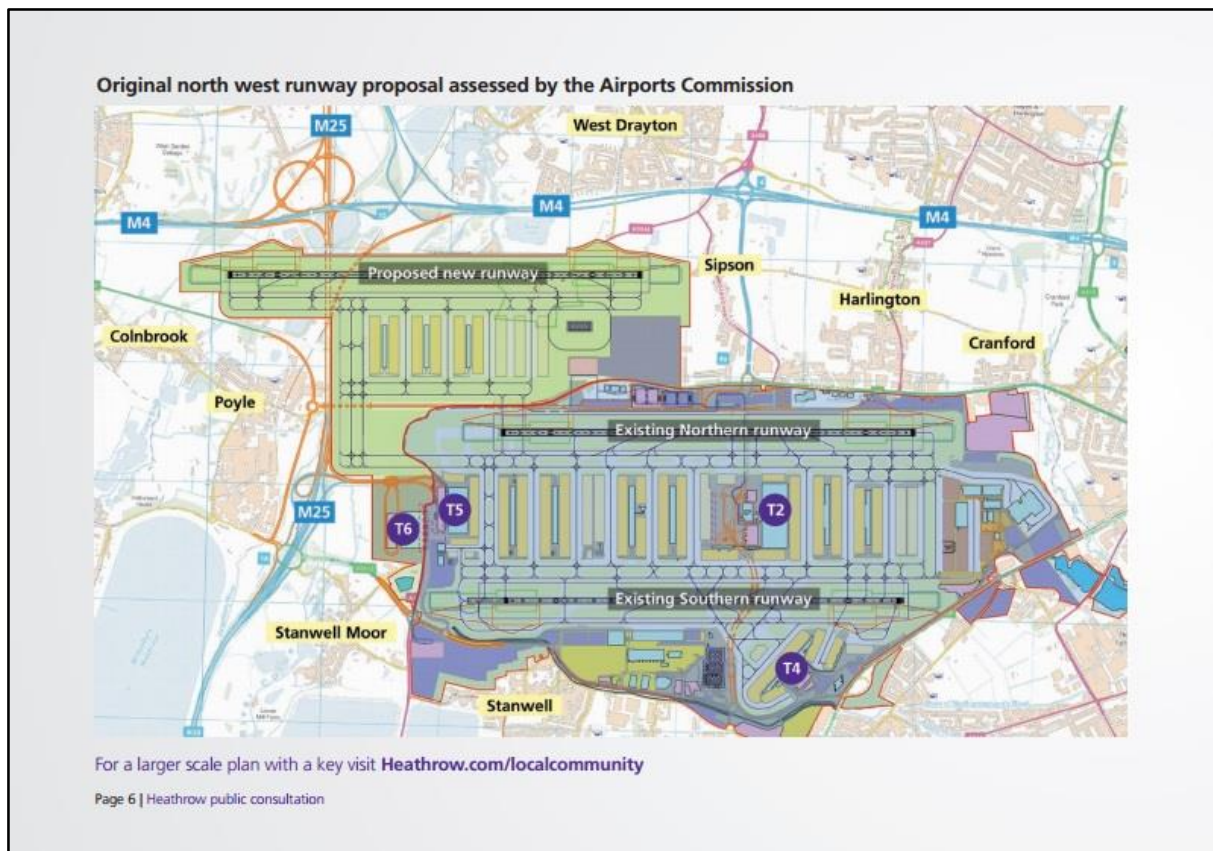
We want to produce a plan that best reflects the views of local people. To do this we need to know what concerns you most. That's why Question 1 on the enclosed response form asks you to rank the issues in order of priority.

Clearly all the issues are important. But it would help us improve our proposal if we know which ones matter most for you. For instance moving the runway further south means losing fewer properties but brings the runway closer to Colnbrook.

This consultation is your opportunity to influence how our north west option should take shape.

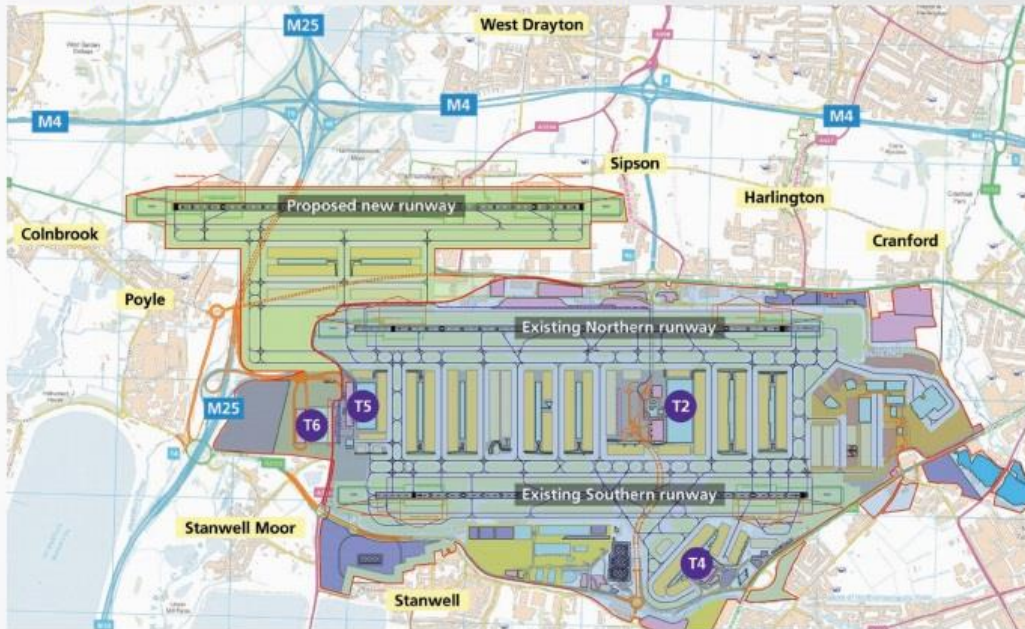
Please use Question 1 on the response form to tell us what you think is most important.

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**



**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

One example of a variation which moves the runway further south



For a larger scale plan with a key visit Heathrow.com/localcommunity

Heathrow public consultation | Page 7

Q2 – Sharing relief from aircraft noise

About Question 2

Heathrow has two runways. At any one time, we use one runway for landing and the other for taking off. Whenever possible, halfway through the day, we switch over*. By switching, we give people who live beyond the ends of the runways relief from aircraft noise.

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To continue to provide alternation with three runways, the new runway has to be at least 1035m north of our existing northern runway. This ensures that all communities living beyond our existing and the new runway ends can experience these periods without overflying aircraft. Because we believe that all our neighbours should continue to enjoy noise relief, we've built that 1035m gap into our plans.

Page 8 | Heathrow public consultation

The new runway will of course bring new communities to the north of Heathrow under its flight path. They will experience more aircraft noise than they do at the moment. We need to consider how this impact can be made manageable but runway alternation and periods without overflight will help to ease the impact.

No noise relief with an extended runway

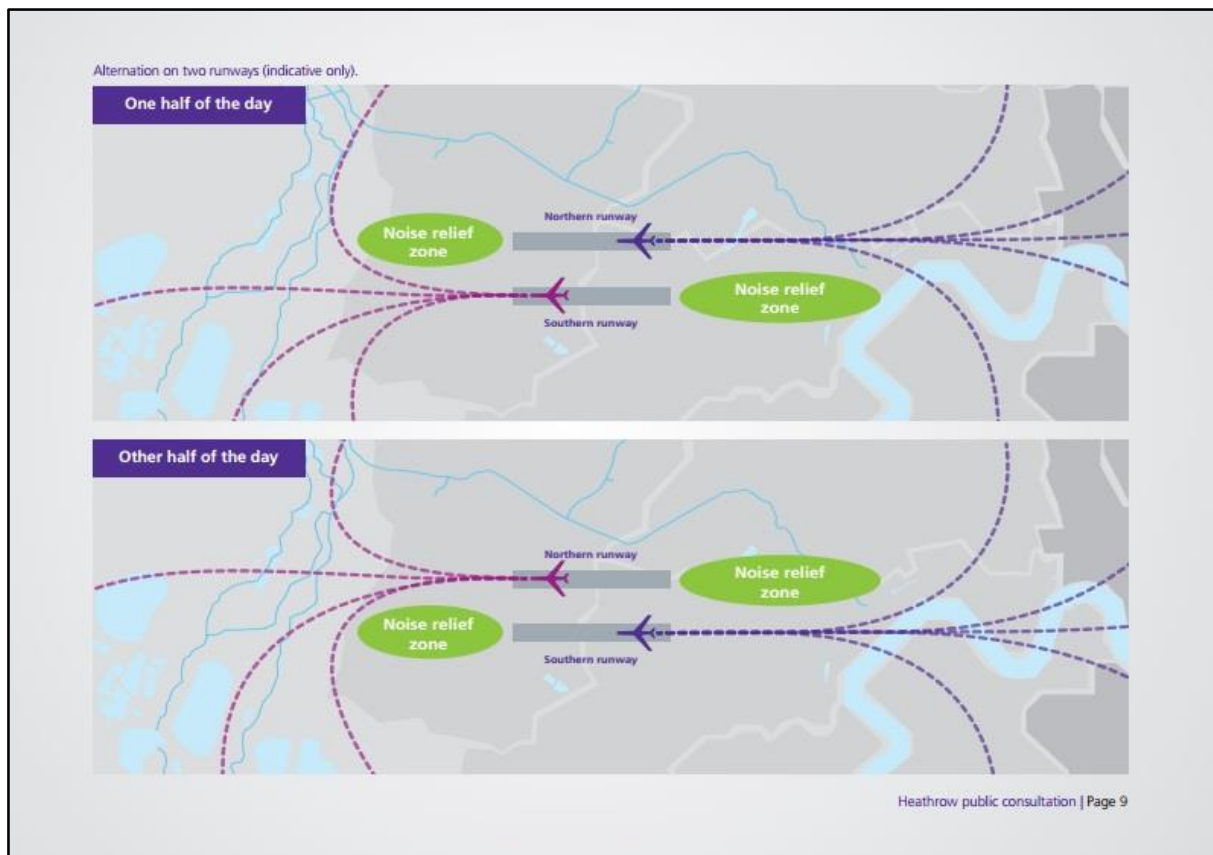
If we were to extend our existing northern runway, as suggested by the independent Heathrow Hub proposal, fewer new communities would fall under its extended flight path.

The downside is that runway alternation could not work in the same way. Communities living near Heathrow would not enjoy significant periods of noise relief.

Please use Question 2 on the response form to tell us what you think about the balance between delivering noise relief and overflying of new communities.

*Sometimes it's not possible to switch over. Visit [heathrow.com/noise](https://www.heathrow.com/noise) for an explanation of westerly/easterly operations and runway alternation. You can also learn more about the steps Heathrow is taking to minimise noise for local residents in its report 'A quieter Heathrow'.

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**



Q3 – Any other thoughts?

About Question 3

Please don't feel restricted to the topics covered by Questions 1 and 2. We want to hear your views on any other Heathrow runway or expansion-related topic that's important to you.

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communityrelations@heathrow.com

or call our Community Relations team on:

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or write to us at our Freepost address (see back cover).

How to take part in the consultation

You can take part in four ways.

1. You can respond straight away by completing the enclosed Freepost response form. When you've finished, seal it up and post it back to us.
2. You can complete the form online at:
heathrow.com/localcommunity
Our consultation website gives you more information about our proposals. It also explains the steps in the Airports Commission process.
3. You can visit one of our public exhibitions. We're holding them across the local area throughout the consultation period. These events give you a chance to learn more about the proposals, meet some of the Heathrow team and find out how a new runway might affect you. We'll have more copies of the response form which you can complete when you're there. Visit:
heathrow.com/localcommunity
to find out when and where we're holding exhibitions or look out for ads in your local press.
4. You can take part via a phone interview with one of our team by calling **0800 307 7996**

Need more help?

If you have questions about the consultation process or need more copies of this consultation document please call us on:

0800 307 7996

This consultation document is also available in the following languages:

- Arabic
- Gujarati
- Hindi
- Polish
- Punjabi
- Somali
- Tamil
- Urdu

If you'd like one of those language versions; a large print version; or need help completing the response form, call us on:

0800 307 7996

or send an email to:

communityrelations@heathrow.com

Heathrow public consultation | Page 11

How to contact us

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heathrow.com

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This document is available in other languages and formats on request.

هذه الوثيقة متاحة بلغات وتنسيقات أخرى حسب الطلب

વિનંતી પર આ દસ્તાવેજ અન્ય ભાષાઓ અને સ્વરૂપોમાં ઉપલબ્ધ છે.

अनुरोध करने पर यह दस्तावेज अन्य भाषाओं और फॉर्मट में उपलब्ध है

Niniejszy dokument dostępny jest na Państwa życzenie w innych wersjach językowych i formatach.

ਇਹ ਦਸਤਾਵੇਜ਼ ਬੇਨਤੀ ਤੇ ਹੋਰ ਭਾਸ਼ਾਵਾਂ ਅਤੇ ਪ੍ਰਾਚੂਪਾਂ ਵਿੱਚ ਵੀ ਉਪਲਬਧ ਹੈ

Dhukumentigan waxaa lagu heli karaa afaf iyo hab-qoraalo kale marka la codsado

வேண்டுகோளின் பேரில், இந்த ஆவணமானது மற்ற மொழிகளிலும் வடிவங்களிலும் கிடைக்கும்.

یہ دستاویز طلب کرنے پر دیگر زبانوں اور فارمیٹس میں دستیاب ہے

Heathrow

APPENDIX B: EXHIBITION MATERIALS

The centrepiece of each public exhibition was a banner display setting out Heathrow's proposals for a new north west runway and highlighting issues raised in the 'Shaping Heathrow's north west runway proposal' document. This included exhibition boards setting out the timeline of the Airports Commission process; Heathrow's original and alternative north west runway plans; potential changes to flight patterns and the impact on alternation schemes; and Heathrow's plans to consult around compensation schemes.

Large table maps were also provided at each session which allowed for one-on-one discussion between visitors and members of the Heathrow team regarding specific local impacts, detailed maps of the proposed expansion footprint and likely impact on neighbouring local areas.

Alongside copies of the consultation response form and the 'Shaping Heathrow's north west runway proposal' booklet, copies of the 'A New Approach' document, which set out Heathrow's expansion proposals and which was updated since first published in July 2013, and 'A Quieter Heathrow' were also available.

The images below are the banner stands which formed the basis for the exhibition materials.

Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

Welcome

On behalf of Heathrow, welcome and thank you for taking the time to attend this public exhibition session.

In December 2013 the Airports Commission, an independent body set up by the Government, included Heathrow on its shortlist of options for additional runway capacity in the UK.

Of the three proposals we submitted to the Commission in July 2013, our option for a runway to the north west of Heathrow is the one that's been shortlisted for further detailed consideration.

There's still much work to do to refine our proposal before the Commission makes its final recommendation to Government in 2015. As part of this work, we are now consulting with residents and businesses likely to be most affected.

Since we first published our outline plans for a new runway, we have welcomed comments and feedback from local residents. We really do want to hear your views.

This consultation gives you another opportunity to say what you think about our proposal and the issues that are most important to you.

I hope you will take this chance to get involved and let us know your thoughts on the future of Heathrow.



Colin Matthews
Chief Executive, Heathrow



Heathrow

Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

Why are we consulting?

Our proposal for a new runway is one of three shortlisted by the Airports Commission.

The other two are the 'Heathrow Hub' proposal submitted independently by a company not connected with us, and a proposal put forward by Gatwick Airport.

The Airports Commission has asked us to talk to local communities and other interested parties. We want to know what our neighbours think about our proposal.

We want to hear from the people and businesses likely to be most affected by our proposal for a new runway at Heathrow.

We've been in contact with over 140,000 local homes and businesses in the Heathrow area and beyond.

Because we want to gather as wide a range of responses as possible, we're inviting responses from across the whole region.



What do we want to know?

When considering the effects of a new runway at Heathrow, the Airports Commission will take everything into account, including the number of jobs likely to be created, improvements to public transport and the effect of noise on neighbouring communities.

The Commission's task is to balance all these aspects when it writes its final recommendation in 2015.

We also want to hear your views on our plans to manage aircraft noise, an issue that concerns everyone who lives close to Heathrow.

And we want to give you the opportunity to help us develop future compensation proposals.

As we refine our outline proposal for a new runway, we'd like to know what matters most to you.

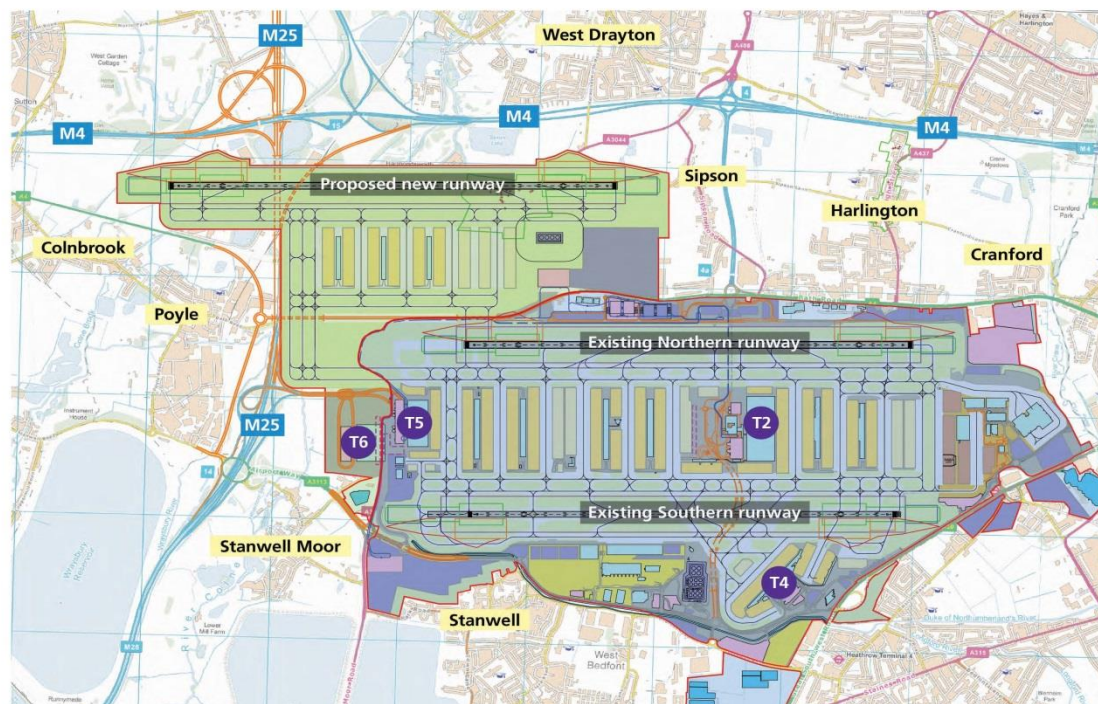


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Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

Original north west runway proposal

- assessed by the Airports Commission



The map above shows one of the options for a runway to the north west of Heathrow that we submitted to the Commission in July last year.

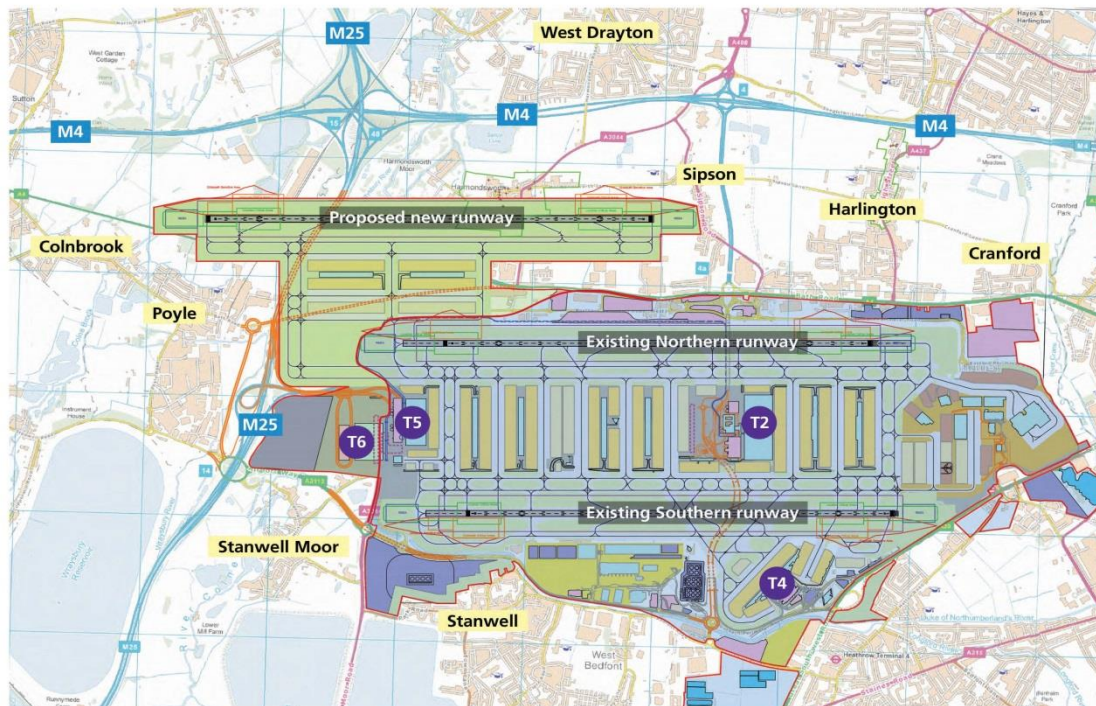
As we refine our proposal over the next few months, we'll be looking at various locations for the runway and airport boundary. Each option will have different effects, for example, on the number of properties to be acquired or the number of people most affected by noise.

We want to produce a plan that best reflects the views of local people. To do this we need to know what issues concern you most.

Heathrow

Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

One example of a variation - moving the runway further south



This map shows an alternative site for a north west runway which would see the runway moved further south.

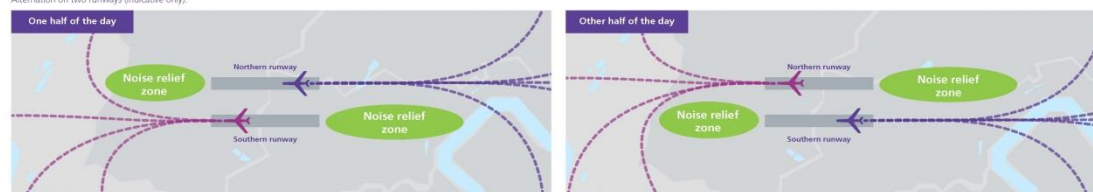
There are other possible options too and understanding which one is best will depend on which most effectively balances the effects on the local communities.

Heathrow

Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

Sharing relief from noise

Alternation on two runways (indicative only)



Heathrow has two runways. At any one time, we use one runway for landing and the other for taking off. Whenever possible, halfway through the day, we switch over. By switching, we give people who live beyond the ends of the runways relief from aircraft noise.

The diagram above shows how it works. At any one time, only two out of the four zones beyond the runway ends have aircraft flying overhead. The other two zones (shown in green) have no aircraft overhead so they experience a period of noise relief. Later, when we switch runways, the other two green zones have their share of noise relief.

This switching of runways is called 'alternation'. It gives communities that lie beneath our flight paths some relief from overflying aircraft and noise.

Noise relief continues with a third runway

To continue to provide alternation with three runways, the new runway has to be at least 1035m north of our existing northern runway. This ensures that all communities living both beyond our existing and new runway ends can experience these periods without overflying aircraft. Because we believe that all our neighbours should continue to enjoy noise relief, we've built that 1035m gap into our plans.

The new runway will of course bring new communities to the north of Heathrow under its flight path. They will experience more aircraft noise than they do at the moment. We need to consider how this impact can be made manageable but runway alternation and periods without overflight will help to ease the impact.

No noise relief with an extended runway

If we were to extend our existing northern runway, as suggested by the independent Heathrow Hub proposal, fewer new communities would fall under its extended flight path.

The downside is that runway alternation could not work in the same way. Communities living near Heathrow would not enjoy significant periods of noise relief.



Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

Property values & compensation

Any plans for a new runway will inevitably affect the nearby property market. Although the Government will not make a decision on a third runway at Heathrow before autumn 2015, we know that our neighbours will want reassurance that the values of their properties can be protected.

The Commission has encouraged the Government and the promoters of new runway schemes to think about what can be done now to put minds at ease.

We want to work with people whose properties might be affected by Heathrow's expansion to develop a fair compensation scheme. The sooner we can do that, the better.

If you'd like to know how you can take part in this process, please speak to one of our team.

You can email us at:

communityrelations@heathrow.com

or call our Community Relations team on:

0800 307 7996




Heathrow

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

The next steps




In November 2012 the Airports Commission was launched to examine the need for additional UK airport capacity and to make recommendations on how this could be met in the short, medium and long term.

In July 2013 Heathrow submitted to the Commission proposals for a new runway at the Airport. As part of the Commission's interim report, which was published in December 2013, it shortlisted our proposal for a new runway to the north west of the site.

The Commission have asked us to provide an updated proposal by May 2014. It is for this reason we are now consulting with regards to our proposal.

The Commission is expected to make its final recommendations to government in the summer of 2015.

Throughout this process we will continue to work with residents to shape the future of Heathrow.



Shaping Heathrow's north west runway proposal
A public consultation – 3 February to 16 March 2014

How you can help us

There are a number of ways for you to take part in this consultation.

You can complete the consultation form right now.
Speak to one of our team to get your copy.

If you would prefer, you can take the response form away with you and return it to the Freepost address provided.

You can also complete the consultation response form online, by visiting:

www.heathrow.com/localcommunity

If you have further questions after you have left the exhibition today, or would like help completing the consultation response form, you can contact our community relations team on:

0800 307 7996

or by email:

communityrelations@heathrow.com

The consultation document is also available in a number of different languages and formats. If you would like further information please get in touch with the community relations team using the contact details above.



Heathrow

APPENDIX C: EXHIBITION EVENT REPORTS

Longford

Thistle London Heathrow hotel

Monday 10 February 2014

12pm - 8pm

A total of 36 people visited the public exhibition. There were a wide range of issues raised during the exhibition. The most common issues discussed were:

- Aircraft noise, respite and noise mitigation measures.
- Blight.
- Compensation for businesses.
- The future of Longford and Harmondsworth.
- The compulsory purchase of houses, the processes involved and the compensation residents would receive.
- Flooding was a particular issue considering the national context of flooding and the fact that Colnbrook was flooded at that time.

A significant number of the residents in attendance whose houses would make way for the third runway expressed frustration and concern around the uncertainty they face and the timescales involved in the decision making process. However, there was a positive response from Longford and Harmondsworth residents to the pledge from Heathrow to pay above market value if houses were subject to compulsory purchase.

The exhibition session at Longford was opened an hour in advance to allow Hillingdon councillors, who had received an email invitation in advance, to view the exhibition first and to discuss the consultation with the Heathrow team. Cllr Paul Harmondsworth, the leader of the Labour group at the London Borough of Hillingdon, attended this session and discussed the proposals with Nigel Milton, Heathrow's Director of Policy & Political Relations.

Harmondsworth

St Mary's Church Hall

Wednesday 12 February 2014

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

12pm – 8pm

45 people attended the public exhibition session in Harmondsworth. The main issues raised were:

- The specific 'footprint' of the expansion;
- Compensation measures and compulsory purchase schemes;
- The physical impact on Harmondsworth village;
- The impact on the Church and the Great Barn.

Concern was expressed by some attendees who believed that – if the 'alternative' option was adopted – they would not be under the physical footprint of the expansion but would be next to the border. They were keen to get guarantees regarding their eligibility for compensation and were concerned that they would be left as part of a small section of homes left within Harmondsworth. A significant number of the residents in attendance whose houses would make way for the third runway expressed frustration and concern around the uncertainty they face and the timescales involved in the decision making process.

Some attendees at the exhibition raised local 'trust issues' between Heathrow and the community, with some attendees stating concerns that the consultation was being used to 'catch them out' and suggest support for the proposal.

Colnbrook

Colnbrook Village Hall

Thursday 13 February 2014

12pm – 8pm

A total of 71 people visited the public exhibition. A large majority of those in attendance had already submitted a response to the consultation or took one home for completion at a later date. All local residents who were spoken to confirmed that they had received a postal response form.

The main issues which were raised by attendees:

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- Flooding;
- Impact on motorway traffic;
- Impact on local traffic;
- Compensation Schemes;
- Timings for plans and construction;
- Impact of Heathrow Hub proposal;
- Local relationship with Heathrow.

The day before the exhibition, Colnbrook had been significantly impacted by local flooding and the issue of Heathrow expansion and the potential impact on the local area was raised by some attendees.

Some concern was expressed regarding the impact of expansion on the M25, with some attendees concerned about the impact of construction work caused by tunnelling. Some residents also questioned the impact the proposals would have on the A4.

There was confusion amongst some attendees about the Heathrow Hub proposal, its impact on the local area and the responsibility of Heathrow Airport for this proposal. Many residents raised the issue of previous Heathrow expansion proposals and expressed frustration at the ongoing debate around expansion.

Although a number of residents expressed concerns about the physical impact of expansion on the local area, many local residents caveated their comments with recognition of the local jobs created by Heathrow.

Of those residents who engaged in the specific proposal for expansion to the north west, there was acceptance that this was the best option of the three submitted to the Airports Commission.

Stanwell Moor

Stanwell Moor Village Hall

Tuesday 25 February 2014

12pm - 8pm

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

A total of 60 people attended the public exhibition. The majority of those who attended had already completed consultation responses, however twelve people filled in responses on the day.

The main issues discussed during the session were:

- Aircraft noise;
- Local roads, transport and surface access;
- Rail links;
- The identified ancillary areas close to Stanwell Moor;
- Terminal 6.

The general response at the exhibition was positive with the majority of the people in attendance in support of the expansion proposals.

A lot of the discussions on the day were focused on the location of the proposed ancillary areas to the south west of the airport, the location of Terminal 6 and the proposals for roads and transport links in the area around Stanwell Moor.

There were also some general discussions around rail links and the prospects of southern rail access, with several attendees referencing Airtrack and whether this or a similar scheme would be revived.

A large proportion of those who attended the exhibition had some connection to the airport with many of them having worked in the airport or with a family member who has or does work there.

Noise was raised as a significant issue, however there was a general feeling that the proposed expansion would not result in additional noise for the residents of Stanwell Moor. Several attendees also raised night flights as an issue and said they would like to see an end to these.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

The majority of the residents who attended the exhibition expressed support for the continuation of respite measures. Some residents expressed concern about the ability of the Heathrow Hub option to offer continued respite measures.

One attendee raised concerns around a nature reserve which is just off the south west corner of the airport which he said is “operated by BAA and is poorly maintained”. He also said the proposals go over the nature reserve and that there is a breed of endangered voles in the reserve which would be “wiped out” by the proposals.

Harlington

Harlington Baptist Church

Wednesday 26th February 2014

12pm – 8pm

A total of 54 people visited the public exhibition. Amongst visitors there was widespread knowledge of the consultation and many people took consultation forms, and further Heathrow literature, away with them.

Throughout the day the most regularly raised issues were:

- Air quality;
- Aircraft safety;
- Impact on local communities.

Throughout the day, there was a good flow of visitors with many staying for a considerable period of time and asking a range of questions.

The major concern expressed by most residents was the issue of air pollution. The village is situated in close proximity to the northern runway to the south and the M4 to the north.

There was also some concern about aircraft safety whilst the impact of development on the church, graveyard and barn in Harmondsworth was a prominent concern for a number of residents.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Some residents who attended suggested that Harlington is a community that has been gradually broken up and some residents were concerned that the community had been irreparably damaged.

Many local residents said that they were keen to engage with Heathrow regarding compensation.

Richings Park

Richings Park Sports Hall

Thursday 27 February

12pm – 8pm

143 people attended the public exhibition session held at Richings Park Sports Hall. The session had been promoted locally by the Richings Park Residents' Association and had been publicised at a recent residents' meeting at the Hall attended by Heathrow.

The major issues raised on the day were:

- Impact of potential construction work on the M25 and M4 junction;
- Noise from aircraft on the runways at Heathrow;
- Changes to flight paths;
- Blight and compensation.

By far the most raised issue on the day was the positioning of a new runway at Heathrow. Visitors viewed the two indicative maps provided by Heathrow (of the original north west proposal and an alternative proposal with the runway moved further south) with a clear majority favouring the 'alternative' proposal on the basis of reduced impact on the junction to the south of the village.

A number of residents expressed concern about the impact of potential construction work on the junction on houses and asked for clarification over the final proposal which would be taken forward by Heathrow.

Some attendees who lived locally raised the issue of 'ground noise' caused by aircraft on the runways at Heathrow. However this was contested by some local residents who suggested

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

that, due to the proximity of the motorway, obvious noise from Heathrow was negligible. Whilst issues regarding flight paths and increased flights were also raised, a majority of residents suggested that the impact of existing flights with regards to aircraft noise was not of significant concern in the local area.

A number of members of the local residents' association attended, including local parish councillors, and continued conversations regarding Heathrow's proposals which began at the recent residents' meeting. The Residents' Association were also holding an informal exit poll of those who had attended the exhibition in a room next door to the exhibition.

Windsor

Macdonald Windsor Hotel

Saturday 1 March 2014

9.30pm – 4.30pm

A total of 177 people attended the public exhibition. A large proportion of those in attendance had already responded to the consultation, however 23 people filled in responses during the day.

A wide range of issues were discussed during the exhibition. The main issues discussed were:

- Aircraft noise;
- Flight paths;
- Airport operation;
- Night flights;
- Roads and surface transport;
- Traffic congestion;
- Flooding.

The general response at the exhibition was mixed, with some of those in attendance in support of the proposals, but some against the proposals and against Heathrow expansion in general.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

A number of residents raised concerns around the current levels of noise from aircraft and said they did not want this to increase. There was also widespread discussion on the frequency of night flights with residents protesting about the current levels.

There were a number of conversations regarding airport operations, both how the airport operates now and how it will operate if the proposals go ahead. This included discussions around noise relief, runway use, and flight paths, as well as other issues.

Flight paths and flight plans featured in a large number of the conversations, with Windsor residents wanting to know what the flight paths would be for the proposed runway and how this would affect noise contours.

There were also a number of conversations about road and rail transport with questions around how Heathrow would address congestion issues and the additional demand on the roads and rail that a new runway would bring.

In addition, flooding was raised by several attendees as an issue of concern.

Putney

Putney Pantry Cafe & Restaurant, St Mary's Church

Monday 3 March 2014

12pm – 9pm

During the day, a total of 74 people attended the public exhibition. A large proportion of those in attendance had already responded to the consultation; however a number of people filled in responses throughout the session.

A wide range of issues were discussed during the exhibition. The main issues discussed were:

- Aircraft noise;
- Night flights;
- Flight paths;
- Noise contours;
- Airport operations;

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- Alternation;
- Pollution.

In general, there was a negative sentiment from those who attended the exhibition; however, there were some in attendance who supported the airport and the expansion proposals.

The majority of the concerns raised by Putney residents were around aircraft noise, with a number of residents complaining about the level of noise from aircraft at current operations. A large proportion of those in attendance said they did not want any increase as levels are already too high.

Night flights were also raised as a considerable issue with many residents maintaining that they did not want any increase, and that the current number is too high.

Alternation was something that was raised regularly, with residents reporting that they value alternation and that they wanted noise relief to continue.

Pollution was also raised as an issue, with some local residents suggesting that they were concerned with the current levels and any potential increase that the expansion of Heathrow would bring.

In the last hour of the session, Justine Greening, the MP for Putney, attended the session and was shown the plans.

Richmond

Duke Street Church

Wednesday 5th March

12-8pm

A total of 199 visitors attended the exhibition in Richmond. The session was held in the Duke Street Church Café, which remained open to the public throughout the day. This, coupled with active promotion from local resident groups, ensured strong attendance on the day.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

The main issues raised by visitors were:

- The impact of existing and potential new aircraft noise;
- Pollution;
- Aircraft safety and risk;
- Amended flight paths;
- Noise mitigation measures;
- Broader opposition to Heathrow expansion.

The majority of discussions with residents focused on the noise impact on Richmond as a result of flights using Heathrow. Many residents expressed their opposition to Heathrow expansion based on complaints about existing levels of noise, the potential for an increase in the number of flights, alternation and mitigation/compensation measures. There was specific concern that a potential increase in flights using Heathrow would cause a greater noise impact on the local area.

Concern was also expressed regarding the flight paths used into Heathrow and the risk caused by aircraft flying over the local area. Again, there was specific concern about an increase in flights and the impact on the local area.

The issue of pollution, and the potential health impact on residents living in the local area, was also raised by a number of residents.

Brentford

Brentford Holiday Inn

Thursday 6th March 2014

12-8pm

During the day, a total of 58 people visited the public exhibition. The layout of the room, and the provision of tea and coffee, encouraged people to stay for a long time and fill out consultation forms. In total 14 responses were received on the day.

Throughout the day, several issues were raised on multiple occasions. The three most prominent issues were:

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

- Flight paths;
- Potential for increased noise impact;
- The design of the consultation document.

Overall, sentiment was broadly positive. Brentford is currently under the Heathrow flight path and a large number of residents suggested that they were now used to the plane noise.

For the residents of Brentford, Ealing and Chiswick, noise is their primary concern with some visitors expressing concern that Heathrow was unable to provide further information at this stage in the process. Many residents asked to see plans for the new flight paths. A significant proportion of these were Chiswick residents who suggested that they are directly under a proposed new flight path.

A small number of attendees criticised the consultation as “biased” towards Heathrow.

Hounslow

Hounslow Civic Centre

Saturday 8th March 2014

9.30am – 4.30pm

A total of 56 people visited the public exhibition. In total, 15 consultation forms were completed on the day, whilst several other respondents took them home to fill out later.

The main issues raised by local residents were:

- The airport's impact on the local community;
- Potential increased noise impact of a new runway;
- Air pollution and proposed flight paths;
- The economic benefits of a new runway.

The general sentiment throughout the day was largely positive, with at least half the respondents expressing supportive views. There were many past and present airport employees who were encouraging about the local economic benefits of a new runway.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Whilst many local residents were supportive, and often critical of opponents in Richmond, there was a minority who were critical of the airport's impact on Hounslow.

There was concern about the increase in noise that a new runway could potentially cause. However some residents said they were used to the noise and unaffected by aircraft.

The lack of planned flight paths was a concern, but residents were more accepting that flight paths are still being designed and improved.

During the exhibition, Seema Malhotra, MP for Feltham and Heston attended the exhibition. She stayed for roughly 20 minutes and listened to a short explanation of the plans.

Ealing

DoubleTree by Hilton Hotel

Monday 10 March 2014

12pm – 8pm

A total of 104 people attended the exhibition. The majority of those who came to the exhibition had already responded to the consultation; however 14 people filled in responses on the day.

A large number of different issues were raised and discussed during the exhibition. The most regular discussions concerned:

- Aircraft noise;
- Flight paths;
- Alternation;
- Pollution;
- Economic benefits.

There was a mixed response to the proposals at the exhibition session.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Many of those in attendance said they were not hugely affected by current aircraft noise levels. However there was concern that the proposed runway and the new flight paths that would be required would lead to an increase in noise for local residents.

Some in attendance did say that the current levels of aircraft noise are a significant issue for them.

Alternation was viewed positively by most of those who attended the exhibition with residents saying that it was important that people living under the flight path are able to benefit from periods of noise relief.

Pollution was also raised as an issue, with some residents concerned about the current levels and the impact a new runway would have on this.

In addition, there were a number of supportive residents who visited the exhibition and raised the economic benefits a new runway would bring both locally and nationally.

Hammersmith

Hammersmith Town Hall

12pm-8pm

A total of 85 people visited the exhibition throughout the day. The session was held at Hammersmith Town Hall and, as such, a number of council officials and local representatives attended to discuss the plans. The session coincided with a Hammersmith and Fulham planning committee meeting, and so a number of planning committee members discussed the plans with the Heathrow team.

Sentiment towards the proposals was mixed, with many attendees stating their opposition to Heathrow expansion (and aviation expansion more generally). However a significant number of visitors supported Heathrow expansion as the most effective way to deliver greater aviation capacity.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

The key issues discussed on the day were:

- Impact of existing aircraft noise;
- Potential impact of 'new noise' and flight patterns;
- Airport operations;
- Aircraft safety;
- Environmental impact.

Most of those who were opposed to Heathrow expansion raised the broader issues of noise and air pollution, although this was not often linked to specific local impacts. Some local residents, however, did raise the issue of specific local impacts and expressed concerns about the potential impact of new flight patterns on the local area.

A higher than usual number of attendees also raised the issue of aircraft safety and flight patterns over central London.

A group of local residents stopped by later in the day to express their support for the proposal and fill out consultation forms. A small number of local residents, who were well informed regarding wider aviation expansion issues, also visited to discuss issues around capacity and future capacity planning with the team.

APPENDIX D: QUESTION 3 ANALYSIS, KEYWORD CATEGORIES

Question 3 analysis: keyword category	Sub-categories
Aircraft noise	Night Flights Frequency/Number of flights Measurement Noisy aircraft
Aircraft operations	Restrict night flights Steeper descents/take offs Aircraft tracks/routes/stacks Provide resilience/weather/delays
Airport/aircraft security/safety	-
Communications	Consultation Trust and transparency Information Method/approach
Community impacts	Loss of facilities and services Severance Loss of homes/businesses
Compensation/mitigation	Financial Insulation Ventilation Relocation assistance
Cost	Of air travel Of supporting infrastructure Of environmental impacts Funding of expansion/transport
Economic benefits/issues	Attracts new commerce/industry Inward investment and tourism Trade/exports/imports Connectivity
Economic disbenefits	Overheating of local economy Tourism deficit Skills deficit Labour supply/shortage
Environmental impacts	Water quality/pollution Visual impact Energy use/demand Loss of Green Belt/open space
Forecasting/demand	Methodology/accuracy Aircraft capacity/load factors Demand management/slots Transfer passengers
Heathrow expansion (oppose)	Oppose Heathrow North West option Support Gatwick option Support Thames Estuary option Support expansion of other airports
Heathrow expansion (support)	Support Heathrow North West option Support Heathrow Hub option Support mixed mode Support 4 runways

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

House prices or blight	Hardship Compensation Land safeguarding
Land-take	Avoid villages Consolidate facilities Reduce parking Move airport boundary
Other issues worth recording	-
Passenger experience/service standards	-
Runways and taxiways	Make shorter Move runway north/south Move runway east/west Move taxiways
Terminals	Move Terminal 6 Remove Terminal 6 Make existing terminals bigger Use existing terminals
Transport impacts	Parking demand Public transport Road improvements Changes to motorways/major junctions
Transport improvements	Rail link to Gatwick/other airports Stop people driving to the airport Charge people to drive to the airport Road improvements

APPENDIX E: QUESTION 3 ANALYSIS, KEYWORD REPORTS

How can we improve our proposal for a new runway?

In order to analyse Question 3 responses in a way which allowed them to be used effectively during the production of the refreshed design scheme proposal, analysts recorded the mention of themes and issues which aligned with a series of broad factors associated with sentiment towards Heathrow expansion. This allowed for responses to Question 3 to be grouped for use around specific aspects of the project and for patterns of sentiment towards the proposal to be identified.

The 21 keywords, which were identified by Heathrow and used internally to identify responses to Question 3, were:

Aircraft noise
Aircraft operations
Airport/aircraft security/safety
Communications
Community impacts
Compensation/mitigation
Cost
Economic benefits/issues
Economic disbenefits
Environmental impacts
Forecasting and demand
Heathrow expansion (oppose)
Heathrow expansion (support)
House prices and blight
Land-take
Other issues worth recording
Passenger experience and service standards
Runways and taxiways
Terminals
Transport impacts
Transport improvements

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

These keywords were designed to capture sentiment around those issues most associated with the debate around Heathrow expansion. The selection of these keywords was influenced by issues regularly raised by local residents, businesses and stakeholders during Heathrow's local engagement work.

Attached to each of these broad keywords was a more specific, related set of secondary keywords designed to enable the identification of comment and sentiment regarding more specific issues. The full list of these keywords is outlined in Appendix D.

Individual responses to Question 3 provided significant value as part of the work on the refreshed design scheme. However, caution must be exercised when trying to undertake reliable statistical analysis of such 'open' responses.

Despite this, some response patterns can be identified.

Key findings from Question 3.

Nearly one in five responses received were categorised as having used Question 3 to raise issues associated with aircraft noise including night flights, frequency of flights, and measurement of noise or noise from aircraft. In line with the findings from Question 1 and the prioritisation of issues associated with noise at Heathrow, of the responses to Question 3 which mentioned a specific impact or factor associated with the proposal, noise was by far the most popular.

In line with the findings of Question 1, issues associated with environmental impacts were also a popular theme amongst Question 3 responses. Nearly a thousand responses were categorised as mentioning environmental impacts, of which two thirds mentioned issues regarding pollution in association with Heathrow operations.

The most notable difference between the factors ranked as most important under Question 1 and the trends emerging from Question 3 was the relatively small number of responses which mentioned issues associated with aircraft/airport safety.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Over a thousand responses to Question 3 were categorised as having raised a range of issues within the *Transport impacts* or *Transport improvements* keywords. This included issues around road improvements, rail links and general public transport improvements.

There were clear geographic trends with regards to the themes raised in Question 3 responses. Responses which were categorised as having raised issues regarding land-take, for example, and the physical footprint of proposed expansion at Heathrow, were disproportionately from those areas likely to be most impacted by physical expansion, such as those households within the UB7 postcode.

No restrictions or guidelines were placed on Question 3 responses and, as such, many respondents used the question to make broad statements of opposition or support for Heathrow expansion. The failure amongst many respondents to respond to the question asked (*How can we improve our proposal for a new runway?*) contributes to the difficulty in drawing firm conclusions and analysing trends emerging in Question 3 responses.

Non-completion rates for Question 3 were high, with 35% of respondents not providing an answer.

Keyword analysis

The section below outlines key patterns and findings related to issues associated with Heathrow expansion, as categorised by the keyword used during analysis of the responses.

Aircraft noise

The keyword category *Aircraft noise* was designed to enable Heathrow to identify and analyse comment regarding noise impact and, specifically, comment and sentiment regarding night flights, the measurement of flights, the number of flights and comment on noisy aircraft.

Of the substantive issues raised in Question 3 responses (beyond broad statements of opposition/support for Heathrow), issues associated with the existing/future impact of noise

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

at Heathrow the most mentioned. 17% of responses were categorised by analysts as having used Question 3 to provide comment on issues regarding noise impact.

The level of response expressed in Question 3 regarding noise impact issues is in line with the clear majority of respondents who used Question 1 to name noise as the most important factor for Heathrow to consider when planning a proposed new runway at the Airport.

A significant majority of responses within this category were broad comments on the existing noise impact or sentiment regarding potential increases in the noise impact as a result of Heathrow expansion.

Amongst responses which were categorised under the *Aircraft noise* or *Aircraft operations* keywords were those which mentioned issues regarding the impact of night flights.

Respondents who raised this issue highlighted the existing impact of night flights; potential increases in night flights; or the need for compensation and mitigation measures to reduce the impact of night flights.

Aircraft operations

With the design of the keyword category *Aircraft operations*, Heathrow was particularly keen to measure comments and sentiment regarding whether restrictions should be placed on night flights at Heathrow.

The keyword was also used to recognise comments on steeper takeoff and descent patterns for aircraft using Heathrow, aircraft tracks/routes, the 'stacking' of planes approaching Heathrow to land and resilience against weather and delays.

Of those responses which mentioned issues associated with operations, a majority raised the impact of potentially increased numbers of flights using Heathrow and any subsequent potential impact on flight paths.

Amongst responses categorised within this group category, responses specifically mentioned the issue of aircraft 'stacking' on approach to Heathrow and the potential environmental impact.

A significant number of those responses expressing sentiment regarding Aircraft patterns used Question 3 to highlight the potential increase of flights over residential areas, raising the potential for increased noise and safety concerns.

Airport/aircraft security and safety

The keyword *Airport/aircraft security/safety* was used by analysts to record comment on the safety of aircraft using Heathrow.

As highlighted in the findings around the prioritisation of factors in Question 1, Airport/aircraft security and safety emerged as an issue of significant concern amongst respondents, with it being ranked by 11% of respondents as the second most important factor for consideration by Heathrow when planning a new runway.

It is notable, however, that a very small number of Question 3 responses specifically raised the issue of aircraft safety/risk, suggesting a lack of detailed engagement in the issue and the manner in which a new runway at Heathrow could be planned to minimise safety risk.

The majority of respondents who mentioned the issue of aircraft safety did not enter into significant detail regarding the basis for their safety concerns. A large number of these respondents used Question 3 to question the need and the practice of routing aircraft over London and the residential areas around the Airport.

Communications

This was a broad keyword category which analysts used to record any comments on the consultation itself or Heathrow's communication of its runway plans. It was one of the most used categories and was broken down into four sub-categories: consultation, trust and transparency, information and method/approach.

Many respondents used this category to urge Heathrow to communicate more about the economic benefits of expansion, both locally and nationally. An undercurrent in some of these submissions was the view that more should be said publicly about the dangers of not

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

expanding the airport. This was a consistent theme in the responses identified as coming from within the London Borough of Hillingdon in which numerous respondents expressed concerns about the impact on jobs.

Others suggested that more could be done to emphasise the positive impact a third runway could have regarding noise and air pollution. They agreed that less stacking would reduce air pollution and that more approach routes would reduce the impact of aircraft noise.

A number of these respondents also suggested that greater emphasis should be placed on the cost savings of Heathrow expansion when compared to the Thames Estuary proposal. Several suggested that Heathrow should start a television and radio advertising campaign focusing on all these positive aspects.

A significant number of residents, however, also used Question 3 to raise concerns about the extent to which their views would be taken on board as part of the refreshed design scheme process, questioning the purpose of the consultation and suggesting that the consultation should have provided an option on the response form to enable respondents to state their opposition to expansion.

A significant number of respondents asked to be kept in touch as further information was released regarding Heathrow's proposal and additional consultation periods regarding blight and compensation.

Community impacts

This keyword category was used to assess respondents' views on the likely impact of Heathrow expansion on the communities surrounding the airport. It was used frequently by analysts, with 7% of responses being categorized under this keyword by analysts. The three sub-categories – loss of facilities and services, severance, loss of homes/businesses – were used to account for more specific responses.

Many comments focused on existing and potential issues around noise and air pollution in those areas closest to the Airport and those living directly underneath flight paths.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

A number of submissions from addresses identified as being from within the London Borough of Hounslow raised the issue of the potential impact Heathrow expansion would have on the environment around local schools.

Many respondents urged Heathrow to find effective ways to minimise disruption on homes and businesses during the construction phase and to set out the full impacts of expansion on local communities as quickly as possible.

Some of those who made supportive comments regarding Heathrow expansion used Question 3 to suggest that residents in areas surrounding Heathrow were aware of existing and potential future impacts when they purchased their homes. A large proportion of these comments came from addresses identified as being from within the London Borough of Hillingdon, where much of the support for expansion was on the basis that it would create more jobs for local people.

Compensation/mitigation

The keyword category *Compensation/mitigation* was used to identify responses which highlighted issues associated with compensation measures associated with the existing/potential future impact of Heathrow. This included comment on existing/future financial compensation, noise insulation measures, ventilation and relocation assistance.

4% of responses were categorised as having specifically mentioned issues regarding compensation and mitigation measures. One in ten of these responses specifically mentioned either existing or future noise insulation schemes for local homes.

Responses which mentioned either existing or future noise insulations schemes were analysed as almost exclusively coming from addresses under the existing flight path to the east of Heathrow in Hounslow, Richmond and Brentford.

Responses categorised under this keyword which were identified as coming from addresses within the UB7 postcode (incorporating addresses in Harmondsworth, Longford, Sipson and West Drayton) focused on financial compensation and relocation packages as opposed to noise insulation and mitigation.

A significant number of responses in this category which emerged from those addresses closest to Heathrow stated the need for the decision making process regarding Heathrow expansion (including the Airports Commission process and decisions over compensation packages) to be sped up. These findings were supported by informal feedback from those exhibition sessions held in the communities likely to be most impacted by the proposed physical expansion of Heathrow.

Cost

This keyword category was designed to measure residents' views on the likely financial implications of the proposal to expand Heathrow. It was broken down into four different sub-categories which analysts used to reflect comment on everything from the cost of air travel, to putting in place new supporting infrastructure, to meeting the financial costs caused by expected environmental impacts and the financing of the expansion programme itself.

The *Cost* keyword was one of the least used categories.

The majority of positive responses focused on Heathrow presenting the Airports Commission with a more cost effective solution to the UK's airport capacity needs than the backers of a new airport in the Thames Estuary. Common themes in these responses were the benefits of expanding at a location where much of the supporting infrastructure is already in place as opposed to 'starting from scratch' and the lower costs of paying for increased environmental impacts in the event of a third runway as opposed to other options. Notably, a number of these responses mentioned Heathrow as being the most economical option available, even when high compensation costs are factored in.

In some of those responses which contained positive comments about costs were suggestions that Heathrow should aim to use local businesses, contractors and materials to carry out improvements to infrastructure.

Negative sentiment centred on a third runway being too costly to finance, with some respondents expressing concern that there would be substantial environmental costs and

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

that these would not be met by Heathrow. Others felt that the costs of financing expansion would lead to increased costs of air travel to taxpayers.

Economic benefits/issues

The keyword *Economic benefits/issues* was used by analysts to help Heathrow identify sentiment regarding economic benefits associated with Heathrow, Heathrow expansion and the debate on aviation capacity within the UK.

Analysts used this category to identify specific comment regarding the ability of aviation expansion and a new runway at Heathrow to attract new commerce and industry to the UK; to contribute towards an increase in inwards investment and tourism; issues regarding trade/exports and imports; and increased connectivity.

6% of all responses were categorised as having used Question 3 to specifically raise issues related to the economic benefits of Heathrow expansion.

Of these respondents, 21% were identified as working at Heathrow Airport whilst 37% had also used Question 1 to rank either *Economic benefits/issues* or *Jobs/local employment* as the factors which were most important in planning a new runway at Heathrow.

Respondents who specifically mentioned the economic benefits of Heathrow expansion within Question 3 were identified as being submitted from addresses from a far wider geographic footprint than nearly all other keyword categories, with responses within this category mapped as pushing further beyond the boundaries of the target consultation area.

Of respondents who were categorised as having used Question 3 to highlight the economic benefits of Heathrow expansion within Question 3, a majority also made supportive statements regarding the expansion of Heathrow.

Economic disbenefits

This keyword category enabled analysts to group together responses which raised issues associated with a potential negative economic impact as a result of Heathrow expansion.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

These issues included a potential overheating of the local economy, to fears that it would cause a tourism deficit and to concerns that it would spark a skills deficit and lead to a labour supply shortage.

Many submissions on this issue suggested that the Airports Commission should be looking to spread airport capacity across the UK.

Associated with this were concerns that expansion at Heathrow would put unsustainable pressure on already strained local infrastructure, from transport to schools and medical facilities.

Environmental impacts

The keyword category *Environmental impacts* was used to identify and analyse all Question 3 responses which raised the issue of environmental pollution, the visual impact of Heathrow expansion, energy use and demand associated with Heathrow or the loss of Green Belt land or open spaces as a result of any expansion at Heathrow.

7% of all responses were categorised as having used Question 3 to raise issues associated with either existing or potential environmental impacts associated with Heathrow. Of these responses, a majority mentioned the impact of either existing or potential pollution associated with Heathrow.

Of those responses which were categorised as having specifically mentioned environmental impacts in Question 3, less than one in five said that Air Pollution was the most important factor for consideration by Heathrow when planning a new runway. Under half (49%) listed it as one of the two most important factors for consideration.

A majority of those who mentioned issues categorised under the *Environmental impacts* keyword in Question 3 also specifically mentioned existing or future noise impact. A majority of responses received which mentioned issues categorised under *Environmental impacts* made broad statements about the existing or future impact of noise and pollution caused by Heathrow without providing further detail on the nature of the environmental impacts beyond

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

the effects of 'pollution' This repeated patterns of sentiment expressed at the public exhibition events held across the local area.

Of those respondents who did provide more detail within this category, suggestions were provided regarding the need to implement stricter regulations on aircraft emissions and the need for Heathrow to work with airlines and manufacturers to promote the need for more environmentally friendly aircraft and aircraft fuel.

A small number of those who mentioned issues associated with environmental impacts suggested that a new runway would actually reduce emissions by avoiding the need for aircraft to be 'stacked' on approach to Heathrow.

A majority of responses which specifically mentioned issues categorised under the *Environmental impacts* keyword can be mapped as originating from addresses to the east of Heathrow under existing flight paths. A third of these responses were identified as coming from addresses in the London Borough of Richmond.

Forecasting/demand

This keyword category was used to record comments relating to Heathrow's future use, flight numbers to and from the airport and demand. It was divided into four sub-categories – methodology/accuracy, aircraft capacity/load factors, demand management/slots and transfer passengers – which were all used by analysts.

A small number of responses to the overall consultation were categorised under this keyword, with most of these questioning the need for more airport capacity in the South East. Some of these respondents were skeptical that existing aircraft and flight slots are being used to their full capacity at the moment.

Heathrow expansion (oppose)

The keyword category *Heathrow expansion (oppose)* was designed to identify responses which made statements of opposition to Heathrow's proposal for a new north west runway within Question 3.

Of those who stated clear opposition to Heathrow expansion in their response to Question 3, over half (52%) used Question 1 to state that *Aircraft noise* was the factor which should be considered most important when planning a new runway at Heathrow. This is significantly higher than the 38% of all respondents who listed *Aircraft noise* as the most important factor for consideration under Question 1, confirming analysis that the existing/potential impact of noise associated with Heathrow is the biggest reason for opposition to Heathrow expansion.

A very small number of those responses which were categorised as opposing Heathrow expansion specifically stated opposition to the shortlisted proposal as opposed to broad statements of opposition to Heathrow.

Heathrow expansion (support)

Heathrow expansion (support) was used as the keyword for analysts to identify all responses which used Question 3 to express broad support for Heathrow expansion. This included all statements of support for the specific north west runway proposal; support for alternative Heathrow expansion proposals; support for increased expansion plans at Heathrow (including support for a 4 runway Heathrow) and all broad statements of support for expansion at Heathrow.

Of those responses which were categorised as having expressly supported Heathrow's proposal, a third ranked *Jobs/local employment* or *National economic benefits* as the factor which should be considered most important when planning a new north west runway at Heathrow.

Those responses categorised as being broadly supportive of the proposed expansion of Heathrow typically fell into three categories: responses which made broad statements of support for Heathrow expansion, citing the economic case for expansion; responses which cautiously stated support for Heathrow expansion but which raised the need for detailed work around impact mitigation for local residents; and responses which urged a decision to be made quickly and for Heathrow expansion to be progressed quickly.

House prices or blight

The keyword category *House prices or blight* was used to identify for analysis all Question 3 responses which expressed sentiment regarding issues associated with the impact of potential Heathrow expansion on local property prices. This included mention of property blight, compensation, hardship and land safeguarding.

A relatively small number of responses specifically mentioned blight and the impact on house prices. Significantly more residents, however, raised broad issues regarding general compensation and mitigation measures.

The identifiable origin of these responses weighted heavily towards those communities closest to Heathrow and most likely to be physically impacted by the proposed new north west runway. This includes significant numbers of responses from Colnbrook, Harmondsworth, West Drayton and Langley.

These findings reflected the pattern of informal feedback received by Heathrow during the early public exhibition sessions in those communities closest to Heathrow. Property owners in these areas overwhelmingly said that they wanted resolution on the decision whether or not to expand Heathrow. There was, however, no clear emerging trend regarding the overall package of compensation measures for those potentially impacted by the physical footprint of a new runway.

Land-take

This keyword category was designed to record specific suggestions or comment regarding the physical impact of the proposed expansion at Heathrow, in particular support for the need to avoid specific villages or locations and comment on the consolidation of new and existing facilities, the movement of the airport boundary or the reduction of parking at Heathrow.

Most submissions on this issue were associated with residents' wishes to see specific local population centres and heritage sights protected. Specific mention was made in resident responses of the impact of the proposed new runway on Harmondsworth, Colnbrook,

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

Longford, West Drayton and Sipson, whilst the impact of the potential M4/M25 restructuring on Richings Park and Iver was also raised.

The future viability of the Great Barn and St Mary's Church in Harmondsworth was also raised.

Specific mention was made in a number of responses of the impact on Harmondsworth, with concern regarding the impact on the village. However, some respondents suggested that Heathrow should purchase all land within a specific radius of the airport, with compensation being paid to existing land/property owners and a ban being placed on further residential development within the area.

Support was expressed for the alternative location placement of the proposed new runway, which moves the runway further south and would avoid the major restructuring of the M4/M25 junction. These comments were often coupled with concerns about major construction work at this junction and the impact on neighbouring villages. This support for the alternative option, and concern around the impact of construction work, mirrors conversations with residents at the Richings Park exhibition event on 27th February and at subsequent community events in the local area.

A third of responses categorised as expressing sentiment around land-take listed Loss of homes or businesses or Historic buildings as the factor they believed was most important in Question 1.

Passenger experience/service and standards

This keyword category was designed to measure respondents' views on their experiences of the airport as it is at present. Very few responses were categorised in this way.

Comments ranged from the need for a smoother interchange for passengers taking connecting flights, to better management of passport control, to a request for a better retail offering at an expanded Heathrow.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

A number of respondents suggested that a special viewing platform should be installed at the airport for aviation enthusiasts.

Runways and Taxiways

This keyword category enabled analysts to assess respondents' views on the positioning of the proposed new runway. Four sub-categories – making the runway shorter, moving it north/south, moving it east/west and moving taxiways – helped differentiate these responses.

Again, this category was not used very often and accounted for less than two percent of responses categorised under Question 3. Responses coming from addresses identified as being within the London Boroughs of Hillingdon, Hounslow and Richmond upon Thames made up the majority.

Within these responses, there was support for both the northern and southern variations of the North West runway proposal. Proponents of the southern variation cited factors such as reduced disruption to the local road network, reduced negative impacts on local communities and continued viability of the Great Barn, local cemetery and school as reasons for their support.

Some respondents stated that a new runway should be positioned to the south of the existing airport, suggesting this would reduce negative impacts on local roads and motorways during the construction phase.

Terminals

This keyword category was used to record views on the existing and proposed new terminals at Heathrow. The sub-categories were: move Terminal 6, remove Terminal 6, make existing terminals bigger and use existing terminals. All four were used by analysts.

This category was not used often. However, a general theme from respondents was that the airport – and the terminals - should be kept as compact and connected as possible to reduce difficulties in moving round the airport. Some mentioned the need for a new sixth terminal to

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

have efficient and fast rail links to Central London, while a small number suggested that if the Government allows Heathrow to go ahead with the North West runway proposal a seventh terminal might be required. Positive comments about the creation of more jobs for local people often accompanied this sentiment.

Transport impacts

This keyword category was used to assess respondents' views on the likely transport impacts in the event of a third runway at the airport. The sub-categories covered parking demand, public transport, road improvements and changes to motorways/junctions. All of these were used by analysts.

Most comments that mentioned road impacts focused on the impact of extra traffic using the M4 and M25. Many respondents expressed concern that another runway would have a significant impact on traffic movement whilst some comments stressed the need to widen both the A4 and M4.

Another common issue raised was a need for clarity around proposals to move roads and make changes to motorways during the construction of a proposed new runway. Some respondents also expressed doubts that parking facilities at Heathrow would be able to cope with the increased traffic.

There were some comments on the likely negative impacts on public transport, and in particular, capacity on the underground. These were infrequent, though, and the majority of comments regarding rail transport were about the need to improve rail links to other parts of the country.

A small number of respondents mentioned HS2 and questioned why there are no plans in place to link the line directly to the airport.

Transport improvements

This keyword category was designed to record specific suggestions or comment regarding transport improvements. The sub-categories were all used by analysts and gathered

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

opinions on a rail link to Gatwick/other airport, ways to stop people driving to Heathrow, charging people to drive to Heathrow and the need for road improvements.

The most common concern highlighted in these comments was at the scale of the improvements needed to local roads and motorways.

Many of the responses categorised within the group were broadly supportive of Heathrow expansion. A significant number wanted to see improved and reasonably priced pick-up/drop-off facilities at the airport and specifically mentioned that these were needed if Heathrow expansion gets the green light - increased park and ride facilities were also mentioned as a possibility. The need for improvements to road signage on all approaches to the airport in order to help ease congestion problems was also raised.

Some respondents raised the need for Heathrow to build a closer working relationship with Crossrail and to continue pressing for an extension to the planned HS2 line so that it connects directly to the airport.

Some responses, however, suggested that Heathrow would be unable to provide the various transport improvements needed to accompany a major expansion of the airport

Other issues worth recording

The keyword categories selected by Heathrow were selected in order to assist in the 'live' identification and analysis of resident sentiment towards Heathrow expansion during and immediately after the consultation process and, within the Airports Commission timeline, ahead of the submission of an updated proposal for a new north west runway.

Responses to Question 3 were identified and categorised for analysis using the keywords established at the outset of the consultation analysis. They were also provided as raw data to the Heathrow planning team on a 'live' basis throughout the consultation period in order to allow for the analysis of Question 3 responses and the identification and, where appropriate, potential adoption of substantive suggestions regarding how the north west runway proposal could be improved.

SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL REPORT ON PUBLIC CONSULTATION

In order for the Heathrow team to identify these substantive recommendations or comment on issues which fell outside the broad categorisation allowed through the pre-selected keywords, analysts categorised these responses using the *Other issues worth recording* keyword.

APPENDIX F: MEDIA ENGAGEMENT

A programme of media engagement was undertaken by Heathrow in order to promote the public consultation, with materials being placed across local and London-wide media in order to launch the consultation, promote public exhibition events in specific areas and to highlight the closure of the consultation period.



The advertisement is a half-page layout with a light background. On the right side, there is a small aerial photograph of the Heathrow airport terminal and surrounding landscape. The main text is arranged in two columns. The left column contains the title and introductory text, while the right column contains a message from the Chief Executive, a signature, and the Heathrow logo. A call to action is located at the bottom left of the text area.

Shaping Heathrow's north west runway proposal
A public consultation

In December 2013 the Airports Commission, an independent body set up by the Government, included Heathrow on its shortlist of options for a new runway in the UK.

Of the three proposals we originally submitted, the Commission has chosen to shortlist our option for a runway to the north west of Heathrow for further detailed consideration.

There's still a lot of work to do to refine our proposal before the Commission makes a final recommendation to Government on which is the best location for a new runway in 2015. As part of this work, we are asking residents and businesses for their views of our proposal and to tell us which issues are most important.

For more information, details of where the consultation events will take place and how you can give us your views, please visit heathrow.com/localcommunity

We know that local opinion is divided about whether Heathrow should be expanded or not, but everyone has an interest in making sure that if a third runway does go ahead, it is developed in the best way possible.

I hope you will take this opportunity to get involved and let us know your thoughts on the future of Heathrow. You can do this by visiting one of our drop-in events around Heathrow, filling in a booklet or sharing your views online.

Yours sincerely,

Colin Matthews
Chief Executive, Heathrow

Heathrow

Half-page advertisement, London Evening Standard (3rd February 2014)

**SHAPING HEATHROW'S NORTH WEST RUNWAY PROPOSAL
REPORT ON PUBLIC CONSULTATION**

Media coverage			
Publication	Type	Date	Circulation
Staines and Ashford News	print	09 01 14	1,781
Hounslow Chronicle	print	10 01 14	11,740
Richmond & Twickenham Times	Print	10 01 14	47,028
Teddington People	online	16 01 14	
Hounslow Chronicle	Print	17 01 14	11,740
Hayes and Harlington Gazette	Print	24 01 14	44,116
Richmond & Twickenham Times	Print	24 01 14	47,028
Windsor, Ascot & Eton Express	print	24 01 14	11,539
Richmond & Twickenham Times	Print	31 01 14	47,028
Uxbridge Gazette	print	07.02.14	44,116
Richmond & Twickenham Times	Print	07 02 14	47,028
Richmond & Twickenham Times	Print	07 02 14	47,028
Slough and South Bucks Express	Print	07 02 14	33,318
Richmond & Twickenham Times	Print	07 03 14	47,028
Richmond & Twickenham Times	Print	14 02 14	47,028
Slough and South Bucks Observer	Print	14 02 14	5,750
FT.com	online	24 02 14	13,600,000
Get West London	online	26 02 14	
Evening Standard	Print	10 03 14	805,309
Evening Standard	online	10.03.14	5,425,864
Local Berkshire	online	11 03 14	
Hounslow Chronicle	print	14 03 14	11,740
Maidenhead Advertiser	print		18,299
Advertising			
Evening Standard	Print	03.02.14	676,335
Gazette series (Hayes, Harlington, Heathrow Villages, Uxbridge, Longbrook)	Print	07.02.14	32,563
PutneySW15.com	Online	19.02.14	48,000
ChiswickW4.com	Online	19.02.14	48,000
ActonW3.com	Online	19.02.14	48,000
BrentfordTW8.com	Online	19.02.14	48,000
EalingToday.co.uk	Online	19.02.14	48,000
ShepherdsBushW12.com	Online	19.02.14	48,000
WandsworthSW18.com	Online	19.02.14	48,000
HammersmithToday.co.uk	Online	19.02.14	48,000
FulhamSW6.com	Online	19.02.14	48,000
Surrey Herald	Print	21.02.14	8,139
Express Series (Windsor and Eton)	Print	28.02.14	44,238
Chronicle series (Hounslow, Heston and Whitton)	Print	28.02.14	42,549
Richmond & Twickenham Times	Print	28.02.14	38,529
Slough Observer (Richings Park)	Print	05.03.14	6,238
Ealing Gazette	Print	07.03.14	49,854

Media coverage and paid media coverage received during the public consultation period

APPENDIX G: WEBSITE USAGE STATISTICS

5442 visits were made to the www.heathrow.com/localcommunity page during the consultation period. Regular reports were provided by the Heathrow web team on access and traffic levels using the site to allow for adjustments to be made to the promotion of the site and specific pages featuring information such as updated public exhibition events.

The www.heathrow.com/localcommunity site was promoted through a banner placed on the front page of the main www.heathrow.com site which clicked through to the consultation pages. The site was promoted through all paid media activity and the @yourheathrow Twitter feed.

In order to allow for incorrect URL assumptions from those attempting to access the consultation information, the vanity URL pages www.heathrow.com/localconsultation and www.heathrow.com/runwayconsultation were also established and redirected to the consultation pages. 9 visits were made to these sites during the consultation period.

During the first week of the consultation, a short outage lasting approximately 2 hours was reported on all sites access through the www.heathrow.com address. The consultation pages were still accessible through a web search as a result of the site being mirrored on the www.heathrowairport.com pages. This short redirection was highlighted on the @yourheathrow twitter feed, allowing continued access to the site during this short outage.

APPENDIX H: ADDITIONAL RESPONSES

Although formal responses – outside the mechanisms of the consultation response form – were not requested and were not included in the data analysis included in this consultation report, written responses were received from the London Borough of Hammersmith and Fulham, the Royal Borough of Windsor and Maidenhead, Old Windsor Parish Council and Old Windsor Residents' Association.

Appendix 5:

**NATS Third party risk contours
and public safety zones for
three runways and 740k forecast
movements at Heathrow**

THIRD PARTY RISK CONTOURS AND PUBLIC SAFETY ZONES FOR THREE- RUNWAYS AND 740K FORECAST MOVEMENTS AT HEATHROW AIRPORT

OA 1407
Version 1.0 FINAL
April 2014

A series of five thick, wavy, orange lines that flow from the left side of the page towards the right, creating a sense of movement and depth.

Operational Analysis

NATS PRIVATE

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1. Executive Summary

- 1.1 This report describes the results of Third Party Risk (TPR) calculations for Heathrow Airport Ltd.
- 1.2 In this piece of work NATS was tasked with calculating the risk to third parties in the vicinity of Heathrow Airport for 740K forecast movements in the proposed three-runway scenario.
- 1.3 In addition, for the above scenario, an assessment was made of the size and shape of the Public Safety Zones (PSZ) that would be applied to each runway, note that the PSZ is the region behind its landing threshold (i.e. PSZ for 09R is located at the end of the runway closest to the 09R threshold).
- 1.4 In the above scenario, only the locations in which third parties would be subject to individual risk greater than 10^{-4} (1 in 10,000 per annum) and 10^{-5} (1 in 100,000 per annum) were calculated. The 10^{-5} contour is used to determine the size and shape of PSZs in the UK. The risks were assessed by estimating the risk of death per year from aircraft crashes to a nominal individual residing permanently at a particular location. The risks to airline passengers and people whilst working at the airport have not been considered.
- 1.5 Heathrow Airport Ltd provided detailed forecast movements for the above option as well as the co-ordinates of the existing runways (09R/27L and 09L/27R) and proposed new runway (09N/27N) thresholds.
- 1.6 The risk contours and PSZ areas were created for the above option and have been compared with the current DfT 10^{-4} risk contours and PSZ which is based on 2022 forecast movements for the existing runways 09R/27L and 09L/27R.
- 1.7 This assessment is based on 740,025 forecast movements representing an increase of over 50% when compared with the 2022 forecast used for the current DfT PSZ assessment.
- 1.8 The dominance of westerly operations has resulted in 10^{-4} risk contours at the 09 thresholds, however these are smaller in magnitude than those for the 2022 DfT assessment. For runway 09R the 10^{-4} risk contour extends around 83m beyond that for the 2022 DfT assessment, the 10^{-4} risk contour for runway 09L is around 2m shorter than 2022 DfT assessment. The PSZ for 09R and 09L are also smaller than the current DfT PSZ and extend between 1563m and 1608m respectively, the PSZ for the proposed 09N extends 1861m.
- 1.9 Due to the displaced landing thresholds the 10^{-4} risk contours at the 27 thresholds are located on the runway, with the exception of 27N where a second 10^{-4} risk contour extends around 270m beyond the threshold. Again these are smaller in magnitude than those for the 2022 DfT assessment. Similarly the PSZ for 27L and 27R are also

smaller than the current DfT PSZ and extend between 1495m and 1468m respectively, the PSZ for the proposed 27N extends 1950m.

2. Methodology for Individual Risk

Calculation

- 2.1 NATS uses HM DfT approved TPR methodology and UK PSZ policy (Reference 1). This methodology is in use at 35 UK airports as part of national PSZ policy.
- 2.2 Individual risk is generally defined in safety literature as the risk of death per year to a representative or specified individual as the result of the realisation of specific hazards. For airport TPR assessment the risk considered is death as a direct result of an aircraft crash. Individual risk at a particular location in the vicinity of an airport is assessed for a nominal individual who is assumed to reside at that location for 24 hours a day, every day of the year. This clearly results in an overestimate of the risk actually experienced by a real individual although this approach is consistent with the methods used when assessing TPR from industrial activities.
- 2.3 In order to calculate the individual risk at a given location near to an airport, 3 quantities are needed:
- (i) the annual statistical expectation that an aircraft crash occurs in the vicinity of the airport (crash frequency)
 - (ii) the probability, given that a crash has occurred, that it affects a particular location (crash location model)
 - (iii) the size of the area likely to be damaged as a result of a particular crash and the proportion of people in this area likely to be killed (crash consequence model)
- 2.4 The crash frequency at an airport is determined by the number of aircraft movements that occur and the crash rates of the aircraft performing those movements. Crash rates have been calculated for generic groups of aircraft dependent upon the type of operation they are undertaking.
- 2.5 Two types of crash location and crash consequence models have been produced by NATS, one for commercial aircraft and one for general aviation (GA) aircraft. Both crash location models were produced from analysing historical crash data. The commercial model consists of Four separate mathematical location probability distributions for different types of crashes:
- landing overruns (including veer-offs)
 - landing crashes from flight

- take-off overruns (including veer-offs)
 - take-off crashes from flight
- 2.6 It should be noted that whilst every effort has been made to ensure that the modelled scenarios are as representative of real life as is possible, risk modelling can never predict future ATM operations with 100% certainty. Any business decisions made based on the outputs of such modelling need to take these uncertainties into account as well as any assumptions made during the modelling process.
- 2.7 DfT policy for the control of development in Airport Public Safety Zones is given in Reference 2.
- 2.8 The current PSZ contour data is used in this assessment with the permission of the DfT.

3. Results and Summary

- 3.1 The traffic forecast and operational assumptions provided by Heathrow Airport Ltd were used to derive the mix of traffic using a particular runway. The movement numbers modelled and aircraft types are given in Table 1a.
- 3.2 An estimation of the directional splits for the projected movement data for runways 09R/27L, 09L/27R and the proposed new runway 09N/27N was provided by Heathrow Airport Ltd. The splits are given in Table 1b. The directional split is 70% westerly, 30% easterly in all options.
- 3.3 The lengths of the risk contours differ for each end of the runway. These differences are caused by the interaction between the various input parameters to the risk model, the crash frequency, average destroyed area and the numbers and direction of the landing/take-off operations on a given runway.
- 3.4 The 740,025 forecast movements represents an increase of over 50% when compared with the 2022 forecast used for the current DfT PSZ assessment.
- 3.5 The dominance of westerly operations has resulted in 10^{-4} risk contours at the 09 thresholds, however these are smaller in magnitude than those for the 2022 DfT assessment. For runway 09R the 10^{-4} contour extends around 83m beyond that for the 2022 DfT assessment, and for runway 09L is around 2m shorter than 2022 DfT assessment. The displaced landing thresholds have resulted in a second set of 10^{-4} risk contours on the runway around the landing thresholds.

- 3.6 Due to the displaced landing thresholds the 10^{-4} risk contours at the 27 thresholds are located on the runway rather than at the runway end, with the exception of 27N where a second 10^{-4} risk contour extends around 270m beyond the threshold. Again these are smaller in magnitude than those for the 2022 DfT assessment.
- 3.7 The risk for the 09 thresholds is higher than the 27 thresholds due to the dominance of westerly operations. Three of the crash location models used (landing overruns, take off crashes and take off overruns) for the 70% of total traffic on westerly's fall at the 09 runway end contributing to the larger risk contours.
- 3.8 The PSZ for 09R and 09L are smaller than the current DfT PSZ and extend between 1563m and 1608m respectively. The PSZ for the proposed 09N extends 1861m (Table 2b). The dimensions of the current PSZ based on the 2025 DfT assessment are given in Table 2a.
- 3.9 Similarly the PSZ for 27L and 27R are also smaller than the current DfT PSZ and extend between 1495m and 1468m respectively, the PSZ for the proposed 27N extends 1950m.
- 3.10 The variations in the contours and PSZs for each of the three options are primarily caused by the different movement splits used for each runway.

4. References

1. Department for Transport: Third Party Risk Near Airports and Public Safety Zone Policy: October 1997
2. Control of Development in Airport Public Safety Zones: Department for Transport Circular 1/2010: March 2010.

5. Tables

Table 1a: 740K Schedule Total Annual Aircraft Movements

Type	Passenger
A319	95220
A320	234600
A321	58650
A332	6210
A351	4830
A359	14490
A388	47265
B772	40365
B788	63135
B789	20010
773 ER	27600
A380 equiv	54855
773 ER equiv	20010
E190	690
E195	2070
New A319	9660
New A320	18285
New A321	22080
Total	740025

Note: Movement numbers have been rounded

Table 1b: Runway Splits

Runway	Landing	Take Off	Total
09R	4.42%	4.42%	8.84%
27L	10.31%	10.31%	20.62%
09L	4.85%	4.85%	9.71%
27R	11.32%	11.32%	22.65%
09N	5.73%	5.73%	11.45%
27N	13.36%	13.36%	26.73%
Total	50.00%	50.00%	100.00%

Table 2a: Dimensions of Established Public Safety Zones – 2022 Traffic Forecast

Runway	Overall Length (L1) of modified triangle (metres)	Length (L2) from Base to 'flared' point (metres)	Width (W1) at base of triangle (metres)	Width (W2) at 'flared' point (metres)	Total Area of modified triangle (Hectares)
09R	1827	489	362	188	26.00
27L	3565	1360	390	144	52.16
09L	3375	1197	390	152	49.00
27R	3397	1412	300	124	42.17

Table 2b: Dimensions of Public Safety Zones – 3 Runway and 740,000 Movements Scenario

Runway	Overall Length (L1) of modified triangle (metres)	Length (L2) from Base to 'flared' point (metres)	Width (W1) at base of triangle (metres)	Width (W2) at 'flared' point (metres)	Total Area of modified triangle (Hectares)
09R	1563.47	477.40	256.66	140.00	17.07
27L	1495.22	1415.66	198.50	40.15	17.05
09L	1608.04	582.02	272.01	132.00	18.53
27R	1468.35	1340.11	201.42	50.01	17.17
09N	1860.88	559.08	296.58	182.70	25.29
27N	1949.83	471.88	242.60	140.38	19.41

Note: The Public Safety Zone for a runway is defined as the region behind its landing threshold. I.e. The PSZ for runway 09R is located at the end of the runway closest to the 09R threshold.

6. Figures

Figure 1: Example of a Theoretical Public Safety Zone

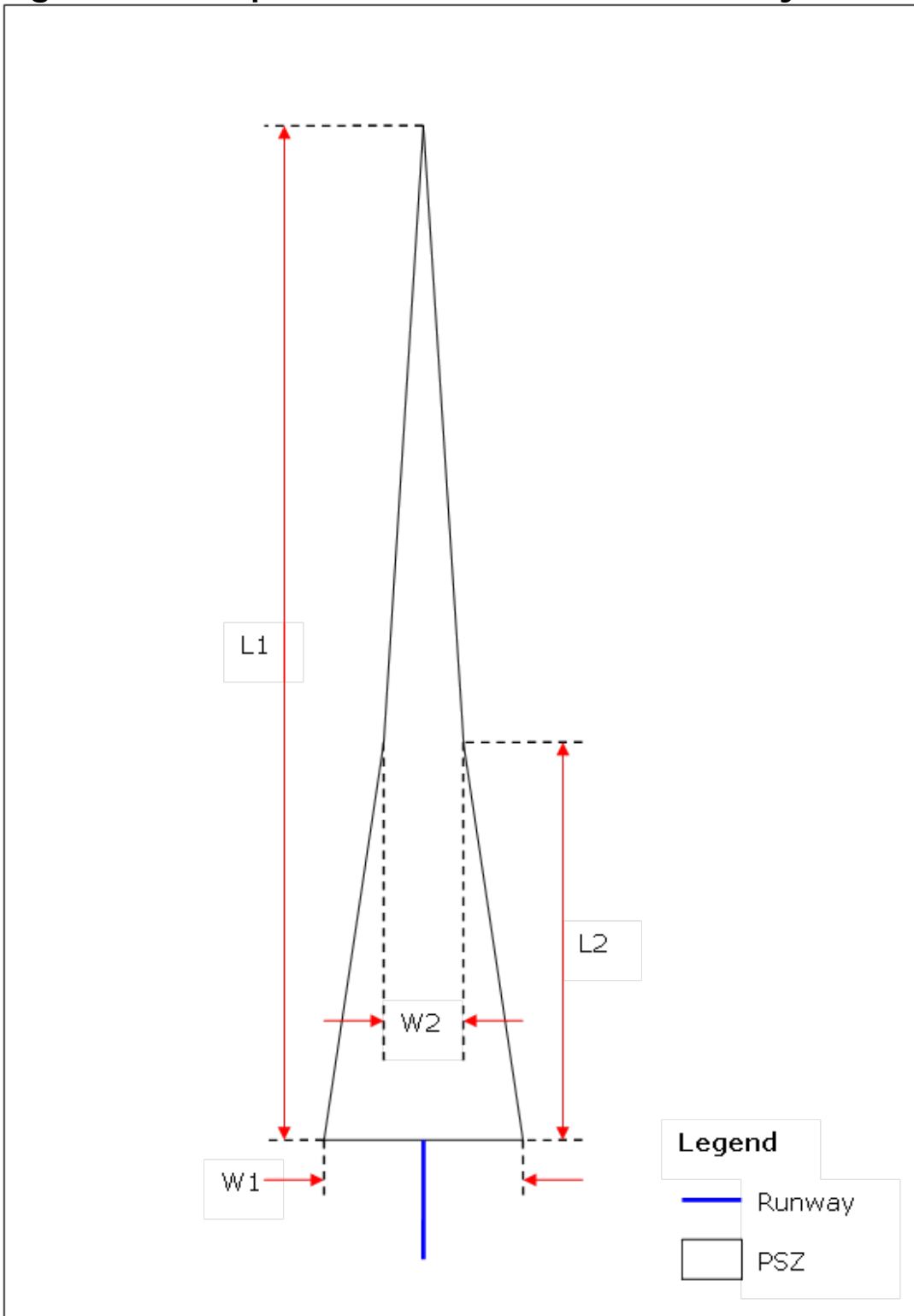


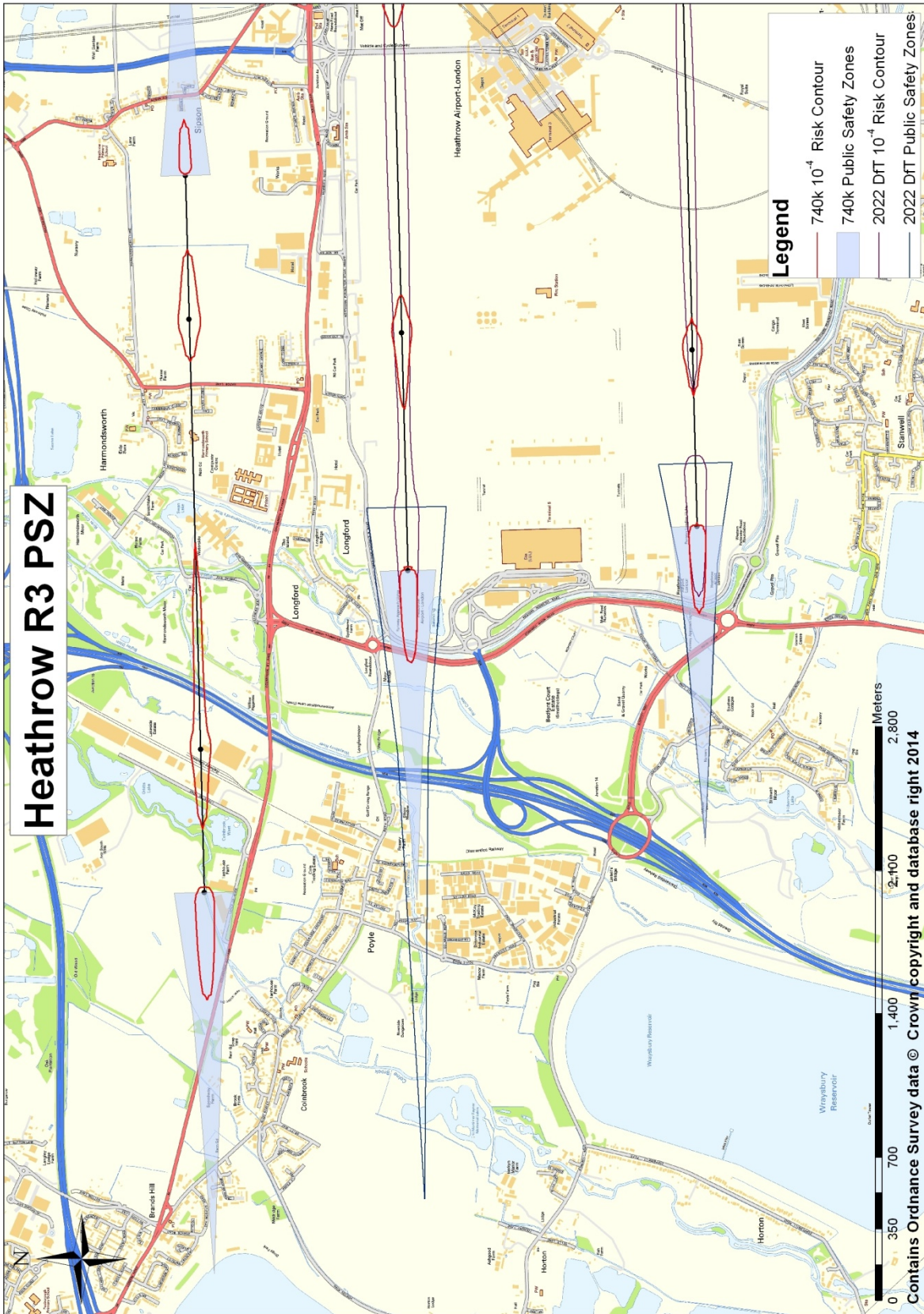
Figure 2: Map of PSZs and Risk Contours – All Runways



Figure 3: Map of PSZs and Risk Contours – 09 Runways



Figure 4: Map of PSZs and Risk Contours – 27 Runways



Appendix 6:

Heathrow Employment Survey

Heathrow



Heathrow Employment Survey 2013

Prepared by Ipsos MORI

9th April 2014

Table of Contents

Introduction	3
Workforce Population at Heathrow	5
Workforce characteristics	5
Workforce residency	10
Employment at Heathrow	17
Employment types	17
Staff based at Heathrow	18
Business focus	18
Employee contract types	19
Hours worked & length of tenure	19
Recruitment	20
Training	23
Communication	24
Transport at Heathrow	26
Employee travel	26
Employer's awareness of staff travel discount	27
Journey time to work	28
Transport to Heathrow	30
Transport within Heathrow	35
Sustainability at Heathrow	38
Employment by Local Boroughs	40
Appendix I: Detailed Expansion & Weighting Process	43
Appendix II: Invitation Emails	47
Appendix III: Employer questionnaire	48
Appendix IV: Employee questionnaire	60
Appendix V: Key data by electoral ward	60

Introduction

Ipsos MORI carried out a Heathrow Employment Survey on behalf of Heathrow Airport Limited (HAL) between 5th August 2013 and 28th February 2014, during which time Terminal 2 was closed for redevelopment. The survey consisted of two parts: an employer survey and an employee survey. The overall objective of this research is to determine and estimate the number of employees who are working at Heathrow using the reported staff number provided by all employers who are taking part in the survey. The data collected from the employee survey provide further details with regards to their demographics, areas of residency, journey and transport into work.

This was the first time Ipsos MORI conducted the research, the last wave of the survey was conducted in 2008/2009.

The employer survey

The aim of the employer survey was to determine the employment characteristic among companies which have employees reporting to work within the boundaries of Heathrow, including the airport terminals, Northern Area/Compass Centre, Southern Area, EBP/Eastern Area/Compass Centre and the Waterside area.

Based on the list of companies provided by HAL which contains those that operate in the Heathrow area, email invitations were sent to invite these employees to complete an online survey. A follow-up phone interview was conducted amongst employers that did not respond after two weeks of receiving the invitation. The majority of the completed survey was received by December 2013, with outstanding responses from a number of companies, notably from two of the biggest airlines operating at Heathrow, British Airways and Virgin Atlantic. 271 companies completed the survey and a further 25 were reached through the expansion exercise.

As a follow-up to this, an expansion exercise was conducted by Ipsos MORI in February 2014 in order to:

- 1) Reconcile findings with HAL estimates from the MAID system¹ on employee numbers for some of the companies who had not responded to the survey
- 2) Validate companies where the reported employee numbers in 2013 had a big discrepancy (+/- 100 staff) from their reported employee figure in 2008/09
- 3) Validate companies where their reported employee numbers seemed to have a big discrepancy compared to HAL estimates from the MAID system.

Further details of the expansion process can be found in the appendix.

The employee survey

The aim of the employee survey was to determine the characteristics of Heathrow's working population such as their demographics, job classification, home location, mode of transport and journey to work. The survey was conducted in the form of face-to-face interviews with employees at various locations around the airport, including airport terminals, Northern Area/Compass Centre, Southern Area, EBP/Eastern Area/Compass Centre and the Waterside area. Unlike the 2008/09 survey, all interviews were conducted landside. Each of these locations had a pre-set quota based on data gathered from the earlier phase of employer survey. Additionally, the survey was also available via a smartphone app. To incentivise participation, all respondents were given the option to enter a prize draw to win one of five iPad Minis provided by HAL. A total of 4,978 interviews were completed from 23rd September to 27th November 2013.

¹ MAID system keeps a record of the number of active staff passes in and out of Heathrow
Heathrow Employment Survey 2013

Table: Location of interviews achieved for the employee survey

Location	Shifts Completed	Interviews Achieved
Terminal 1	39	725
Terminal 2 / Central Area	18	298
Terminal 3	49	872
Terminal 4	15	306
Terminal 5	89	1591
Northern Area / Compass Centre	28	511
Southern Area	17	307
EBP / Eastern Area / Hatton Cross	18	304
Waterside	9	23
App Survey	N/A	41
TOTAL	282	4978

Weighting

The employee data reported in this report has been weighted to reflect the proportion of job type and company type reported by employers. The total number of employees has then been extrapolated to show the total population of employees working in the Heathrow area as reported by the employers. Please refer to appended section on weighting process for further details.

Workforce Population at Heathrow

Among the 413 companies that were invited to take the survey, it is estimated that 75,780 staff were based at Heathrow. This is similar to the reported figure of 76,500 in the 2008/09 survey. Employees were defined as anyone in active employment in the Heathrow area; within the airport itself and the business parks and industrial areas around its perimeter.

Workforce characteristics

Gender

Of all employees interviewed, 62% were male and 38% of Heathrow employees were female. In 2009, these figures were 57% and 43% respectively. This reflects a greater percentage of males than the national workforce, which is 53% male and 47% female.

Many job types have a fairly even gender split, however, there are some occupations where there is a significant difference. Men are more likely to work in airport/airline management, pilots/ATC/flight operations, IT, maintenance tradesmen or apron, ramp, cargo etc. occupations than women. Higher percentages of women work in passenger services/sales/clerical staff, air cabin crew and catering & retail.

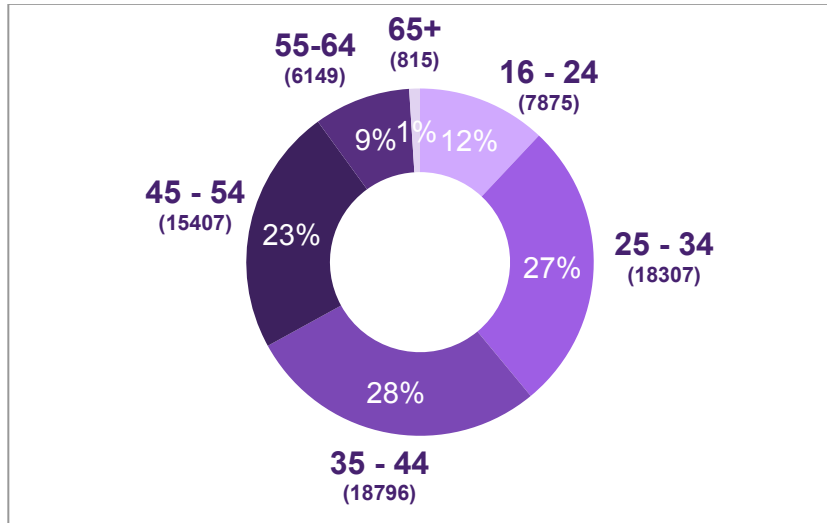
Table: Job type by gender

Job Type	Male	Female
Management/Professional: Airport/ Airline Specific	1158 3%	291 1%
Management/ Professional - General	2687 7%	1500 6%
Passenger Services, Sales and Clerical Staff	4701 12%	6712 28%
Air Cabin Crew	6327 16%	6932 29%
Pilots/ATC/Flight Operations	2594 6%	665 3%
Information Technology	677 2%	104 <1%
Maintenance Tradesmen & Other Skilled Workers	4178 10%	212 1%
Apron, Ramp, Cargo, Drivers, Baggage Staff	6512 16%	429 2%
Catering and Retail	3627 9%	3139 13%
Cleaning and Housekeeping	834 2%	473 2%
Customs, Immigration, Police and Fire	792 2%	762 3%
Security, Passenger Search, Access Control	4179 10%	2016 8%
Other	2855 7%	1400 6%

Age

The majority of employees are under the age of 45 (67%) and 90% are aged under 55. However, the number of employees over 55 years of age has increased slightly compared to 2008/09 survey, from 9% to 10%. 12% of employees are 16 - 24 years old, an increase from 10% in 2009 and 7% in 2004.

Figure: Employee age distribution



One in four of all employees between the age of 16 to 24 years old work either in the catering and retail (25%) or passenger services/sales/clerical (23%) sectors respectively. Of those aged 35 - 44, 27% work as air cabin crew. 23% of those aged over 65 work as maintenance tradesmen or other skilled workers.

Table: Job type by age

Job Type	16 - 24 years	25 - 34 years	35 - 44 years	45 - 54 years	55 - 64 years	65+ years
Management/Professional: Airport/ Airline Specific	45 1%	308 2%	534 3%	362 2%	217 4%	5 1%
Management/ Professional - General	185 2%	1528 9%	1403 8%	875 6%	351 6%	31 4%
Passenger Services, Sales and Clerical Staff	1809 23%	3660 21%	2582 14%	2137 14%	1202 20%	130 16%
Air Cabin Crew	1157 15%	3452 19%	4961 27%	3313 22%	565 9%	61 8%
Pilots/ATC/Flight Operations	127 2%	396 2%	1786 10%	935 6%	141 2%	0 0%
Information Technology	24 <1%	278 2%	173 1%	314 2%	40 1%	0 0%
Maintenance Tradesmen & Other Skilled Workers	479 6%	485 3%	1448 8%	1387 9%	680 11%	188 23%
Apron, Ramp, Cargo, Drivers, Baggage Staff	675 9%	1374 8%	1420 8%	2121 14%	1270 21%	71 9%
Catering and Retail	1968 25%	2356 13%	1284 7%	772 5%	361 6%	40 5%
Cleaning and Housekeeping	143 2%	295 2%	300 2%	414 3%	134 2%	39 5%
Customs, Immigration, Police and Fire	110 1%	405 2%	363 2%	415 3%	220 4%	27 3%
Security, Passenger Search, Access Control	625 8%	2371 13%	1379 8%	1212 8%	443 7%	84 10%
Other	582 8%	1109 6%	1039 6%	901 6%	513 9%	125 16%

Ethnicity

67% of employees are of white ethnic background, 24% are Asian/ Asian British, 5% are Black/ African/ Caribbean/ Black British and 2% are of mixed ethnicity. A further 2% belong to other ethnic groups. Ethnic minorities are more represented among employees working at Heathrow compared to the national population, which is 86% white, 7% Asian/ Asian British, 3% black, 2% mixed ethnicity and 2% of other ethnic background.

Employees of white ethnic background are more likely to work as air cabin crew (27%) or passenger services/ sales/ clerical staff (14%), while Asian/ Asian British employees are more likely to be passenger services/ sales/ clerical staff (25%) followed by security/ passenger search/ access control staff (19%).

Table: Job type by ethnicity

Job Type	White	Mixed ethnicity	Asian/ Asian British	Black	Other
Management/Professional: Airport/ Airline Specific	1156 3%	23 3%	168 1%	44 1%	30 2%
Management/ Professional - General	3532 8%	11 1%	608 4%	202 7%	26 2%
Passenger Services, Sales and Clerical Staff	6083 14%	274 30%	3861 25%	754 25%	350 22%
Air Cabin Crew	11760 27%	79 9%	449 3%	393 13%	486 30%
Pilots/ATC/Flight Operations	3174 7%	0 0%	297 2%	28 1%	15 1%
Information Technology	564 1%	0 0%	210 1%	19 1%	23 1%
Maintenance Tradesmen & Other Skilled Workers	3575 8%	53 6%	675 4%	176 6%	195 12%
Apron, Ramp, Cargo, Drivers, Baggage Staff	4036 9%	115 13%	2072 13%	483 16%	65 4%
Catering and Retail	3382 8%	79 9%	2615 17%	369 12%	169 11%
Cleaning and Housekeeping	556 1%	16 2%	629 4%	92 3%	19 1%
Customs, Immigration, Police and Fire	879 2%	27 3%	484 3%	110 4%	27 2%
Security, Passenger Search, Access Control	2731 6%	137 15%	2932 19%	200 7%	110 7%
Other	2716 6%	97 11%	1026 7%	125 4%	125 8%

Language

English is the most common first language among Heathrow employees (76%). The next most common first languages are Punjabi (5%), Urdu (4%) and Polish (3%).

Table: First language

Job Type	
English	50176
	76%
Punjabi	3233
	5%
Urdu	2523
	4%
Polish	1785
	3%
Portuguese	1483
	2%
Gujarati	1425
	2%
Spanish	1124
	2%
French	1024
	2%
Arabic	787
	1%
Chinese	263
	<1%
Bengali	63
	<1%
Other	8832
	13%

98% of employees are literate in their first language and 47% are literate in another language. There are several job types with a notably high proportion of employees who are literate in another language. These include customer facing roles such as catering & retail (67%), passenger services, sales & clerical staff (52%) and air cabin crew (47%), as well as cleaning and housekeeping (68%).

Table: Whether literate in another language, by job type

Literate in another language?	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Yes	480	1500	5854	6299	1359	320	1730	2658	4295	887	676	2869	1857
	33%	36%	52%	47%	39%	39%	38%	39%	67%	68%	47%	47%	46%
No	962	2657	5315	7117	2141	491	2856	4085	2132	415	754	3177	2176
	67%	64%	48%	53%	61%	61%	62%	61%	33%	32%	53%	53%	54%

Disability

Overall, 1% of Heathrow employees reported have a disability. There is very little variation in the proportion of disabled employees between job types. In addition, 16% of employees said they have caring responsibility for another adult.

Table: Disability, by job type

Disability	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Yes	845	46	35	167	79	0	14	0	123	117	6	27	176	28
	1%	3%	1%	1%	1%	0%	2%	0%	2%	2%	<1%	2%	3%	1%
No	64252	1387	4094	11086	12944	3528	731	4494	6701	6468	1255	1499	5629	4005
	98%	97%	99%	98%	99%	100%	94%	100%	98%	97%	98%	98%	96%	99%
Prefer not to say	256	0	5	42	14	0	34	7	19	51	14	0	55	14
	<1%	0%	<1%	<1%	<1%	0%	4%	<1%	<1%	1%	1%	0%	1%	<1%

Household status

31% of employees have children under 18 living at home. Employees are more likely to have children at home if they are working on a part-time contract or are male. People in the 35 - 44 and 45 - 54 years old age brackets are the most likely to have children at home.

Table: Whether children are living at home, by demographic factors

Children under 18 living at home?	Weighted Total	Full Time Contract	Part-Time Contract	Male	Female	16 - 24 years old	25 - 34 years old	35 - 44 years old	45 - 54 years old	55 - 64 years old	65+ years old
Yes	20373	16848	2941	13555	6305	772	3711	8833	5390	983	44
	31%	30%	38%	34%	26%	10%	21%	49%	36%	16%	5%
No	45644	39905	4821	26112	17885	6763	13843	9040	9554	4991	770
	69%	70%	62%	66%	74%	90%	79%	51%	64%	84%	95%

The majority of employees (79%) do not live with anyone else who work at Heathrow, this rises to 86% amongst those who do not live in one of the five local boroughs. Nearly a third of employees living in Slough live with one other person who works at Heathrow (29%). 4% of employees living in Hillingdon live with more than two other Heathrow employees.

Table: Number of other Heathrow workers living with, by area of residence

Whether live with other Heathrow employees	Weighted total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
No	52388	6300	5540	3535	2600	2079	22368
	79%	69%	68%	77%	62%	71%	86%
One person	11598	2203	1855	884	1199	711	3179
	17%	24%	23%	19%	29%	24%	12%
Two people	1889	443	443	152	322	104	269
	3%	5%	5%	3%	8%	4%	1%
More than two people	831	218	294	45	59	46	61
	1%	2%	4%	1%	1%	2%	<1%

Workforce residency

The five local boroughs represent 54% of the employee population.

Figure: Summary by electoral ward, numbers shown within each ward relate to tables on pages 11-16.

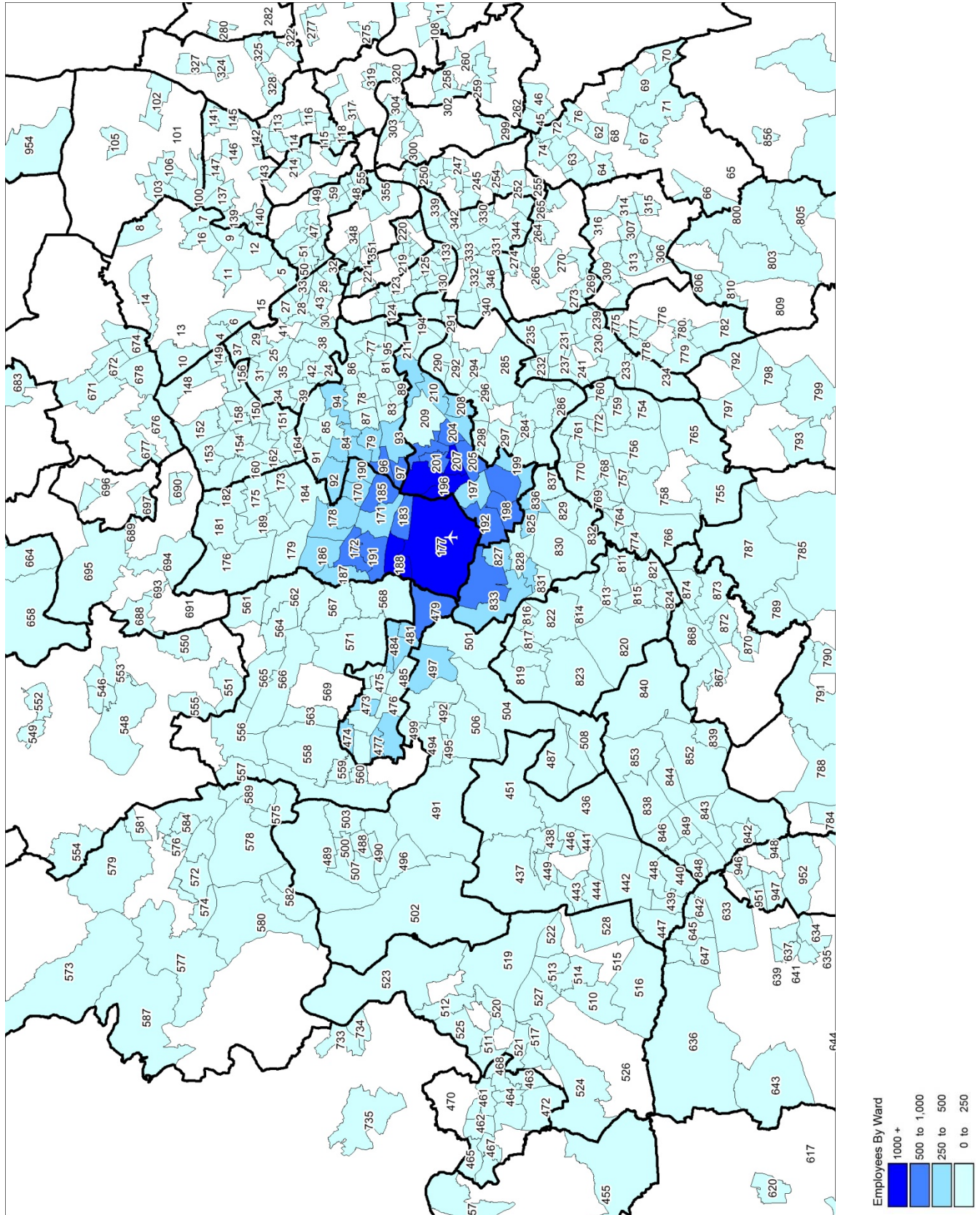


Table: The top 10 local authorities of residence by the number of Heathrow employees.

Local Authority	
Hounslow	11304
Hillingdon	10034
Ealing	5520
Slough	4914
Spelthorne	3525
Windsor and Maidenhead	1594
Richmond upon Thames	1329
Runnymede	1148
Harrow	1121
Bracknell Forest	1027
Grand total	65930

Table: Summary by electoral ward among the top ten local authorities – Hounslow. Total in 2008/09=10755, increased by 549.

Residence	Employee count	% of airport staff	Map ref.
Hounslow	11304	17.15%	
Heston West	1214	1.84%	203
Hounslow West	1050	1.59%	207
Cranford	1032	1.57%	196
Heston Central	927	1.41%	201
Feltham West	829	1.26%	198
Hounslow Central	825	1.25%	204
Hanworth Park	803	1.22%	200
Hounslow Heath	752	1.14%	205
Heston East	679	1.03%	202
Bedfont	677	1.03%	192
Feltham North	442	0.67%	197
Isleworth	437	0.66%	208
Hounslow South	312	0.47%	206
Hanworth	300	0.46%	199
Brentford	275	0.42%	193
Syon	259	0.39%	210
Osterley and Spring Grove	244	0.37%	209
Turnham Green	162	0.25%	211
Chiswick Homefields	68	0.10%	194
Chiswick Riverside	17	0.03%	195

Table: Summary by electoral ward among the top ten local authorities – Hillingdon. Total in 2008/09=8960, increased by 1074.

Residence	Employee count	% of airport staff	Map ref.
Hillingdon	10034	15.22%	
Heathrow Villages	2455	3.72%	177
West Drayton	1028	1.56%	188
Pinkwell	905	1.37%	183
Townfield	855	1.30%	185
Yiewsley	628	0.95%	191
Brunel	549	0.83%	172
Botwell	493	0.75%	171
Yeading	444	0.67%	190
Hillingdon East	432	0.66%	178

Charville	395	0.60%	174
Uxbridge North	311	0.47%	186
Uxbridge South	311	0.47%	187
Barnhill	288	0.44%	170
Harefield	212	0.32%	176
Ickenham	196	0.30%	179
Manor	119	0.18%	180
Northwood	112	0.17%	181
West Ruislip	105	0.16%	189
Cavendish	63	0.10%	173
Eastcote and East Ruislip	61	0.09%	175
South Ruislip	37	0.06%	184
Northwood Hills	35	0.05%	182

Table: Summary by electoral ward among the top ten local authorities – Ealing. Total in 2008/09=5760, decreased by 240.

Residence	Employee count	% of airport staff	Map ref.
Ealing	5520	8.37%	
Southall Green	879	1.33%	879
Southall Broadway	590	0.89%	590
Lady Margaret	471	0.71%	471
Norwood Green	409	0.62%	409
Dormers Wells	383	0.58%	383
Northolt West End	370	0.56%	370
Greenford Broadway	362	0.55%	362
Perivale	277	0.42%	277
Greenford Green	213	0.32%	213
Walpole	209	0.32%	209
Elthorne	187	0.28%	187
Northolt Mandeville	184	0.28%	184
Hanger Hill	125	0.19%	125
North Greenford	125	0.19%	125
Northfield	114	0.17%	114
Cleveland	105	0.16%	105
Acton Central	104	0.16%	104
East Acton	95	0.14%	95
Ealing Common	86	0.13%	86
Hobayne	78	0.12%	78
South Acton	61	0.09%	61
Southfield	59	0.09%	59
Ealing Broadway	34	0.05%	34

Table: Summary by electoral ward among the top ten local authorities – Slough. Total in 2008/09=4092, increased by 822.

Residence	Employee count	% of airport staff	Map ref.
Slough	4914	7.45%	
Colnbrook with Poyle	993	1.51%	479
Cippenham Meadows	486	0.74%	478
Foxborough	468	0.71%	481
Baylis and Stoke	461	0.70%	473
Britwell	425	0.64%	474
Cippenham Green	412	0.62%	477
Kedermister	359	0.54%	483
Langley St Mary's	260	0.39%	484
Chalvey	240	0.36%	476
Wexham Lea	222	0.34%	486
Upton	180	0.27%	485
Central	162	0.25%	475
Haymill	139	0.21%	482
Farnham	107	0.16%	480

Table: Summary by electoral ward among the top ten local authorities – Spelthorne. Total in 2008/09=3916, decreased by 391.

Residence	Employee count	% of airport staff	Map ref.
Spelthorne	3525	5.35%	
Stanwell North	892	1.35%	835
Ashford Common	426	0.65%	825
Staines South	323	0.49%	834
Ashford North and Stanwell South	290	0.44%	827
Sunbury Common	266	0.40%	836
Staines	255	0.39%	833
Ashford Town	221	0.34%	828
Ashford East	204	0.31%	826
Laleham and Shepperton Green	203	0.31%	830
Sunbury East	165	0.25%	837
Riverside and Laleham	123	0.19%	831
Shepperton Town	89	0.13%	832
Halliford and Sunbury West	68	0.10%	829

Table: Summary by electoral ward among the top ten local authorities – Windsor and Maidenhead. Total in 2008/09=2077, decreased by 483.

Residence	Employee count	% of airport staff	Map ref.
Windsor and Maidenhead	1594	2.42%	
Datchet	283	0.43%	497
Castle Without	237	0.36%	492
Horton and Wraysbury	166	0.25%	501
Clewer North	144	0.22%	494
Clewer East	129	0.20%	493
Old Windsor	81	0.12%	504
Park	80	0.12%	506
Clewer South	75	0.11%	495
Eton Wick	68	0.10%	499
Sunninghill and South Ascot	52	0.08%	509
Pinkneys Green	44	0.07%	507
Eton and Castle	39	0.06%	498
Maidenhead Riverside	30	0.05%	503
Oldfield	30	0.05%	505
Bisham and Cookham	23	0.03%	489
Boyn Hill	19	0.03%	490
Sunningdale	16	0.02%	508
Belmont	15	0.02%	488
Bray	15	0.02%	491
Furze Platt	15	0.02%	500
Ascot and Cheapside	13	0.02%	487
Cox Green	13	0.02%	496
Hurley and Walthams	7	0.01%	502

Table: Summary by electoral ward among the top ten local authorities – Richmond upon Thames. Total in 2008/09=2007, decreased by 678.

Residence	Employee count	% of airport staff	Map ref.
Richmond upon Thames	1329	2.02%	
Ham, Petersham and Richmond Riverside	232	0.35%	285
Hampton	160	0.24%	286
Whitton	142	0.22%	298
Heathfield	133	0.20%	289
Teddington	133	0.20%	295
West Twickenham	123	0.19%	297
Hampton North	90	0.14%	287
North Richmond	90	0.14%	292
St Margarets and North Twickenham	55	0.08%	293
Fulwell and Hampton Hill	45	0.07%	284
Hampton Wick	35	0.05%	288
Barnes	25	0.04%	283
Kew	22	0.03%	290
South Richmond	21	0.03%	294
Mortlake and Barnes Common	16	0.02%	291
Twickenham Riverside	7	0.01%	296

Table: Summary by electoral ward among the top ten local authorities – Runnymede. Total in 2008/09=1514, decreased by 366.

Residence	Employee count	% of airport staff	Map ref.
Runnymede	1148	1.74%	
Egham Hythe	247	0.37%	816
Egham Town	161	0.24%	817
Chertsey Meads	153	0.23%	813
Foxhills	96	0.15%	820
Thorpe	90	0.14%	822
Addlestone Bourneside	74	0.11%	811
Chertsey St Ann's	72	0.11%	814
Addlestone North	59	0.09%	812
Englefield Green East	48	0.07%	818
New Haw	46	0.07%	821
Chertsey South and Row Town	37	0.06%	815
Woodham	30	0.05%	824
Englefield Green West	20	0.03%	819
Virginia Water	15	0.02%	823

Table: Summary by electoral ward among the top ten local authorities – Harrow. No total count in 2008/09 available for comparison.

Residence	Employee count	% of airport staff	Map ref.
Harrow	1121	1.70%	
Roxbourne	215	0.33%	163
Headstone North	124	0.19%	154
Roxeth	106	0.16%	164
Harrow on the Hill	102	0.15%	151
Harrow Weald	78	0.12%	152
Greenhill	67	0.10%	150
West Harrow	55	0.08%	166
Pinner	54	0.08%	159
Rayners Lane	50	0.08%	162
Queensbury	45	0.07%	161
Canons	39	0.06%	148
Wealdstone	38	0.06%	165
Hatch End	36	0.05%	153
Headstone South	31	0.05%	155
Kenton East	25	0.04%	156
Kenton West	23	0.03%	157
Marlborough	22	0.03%	158
Pinner South	6	0.01%	160
Edgware	5	0.01%	149

Table: Summary by electoral ward among the top ten local authorities – Bracknell Forest. Total in 2008/09=1270, decreased by 243.

Residence	Employee count	% of airport staff	Map ref.
Bracknell Forest	1027	1.56%	
Great Hollands North	168	0.25%	443
Warfield Harvest Ride	148	0.22%	450
Priestwood and Garth	90	0.14%	449
Winkfield and Cranbourne	90	0.14%	451
Binfield with Warfield	85	0.13%	437
Crown Wood	83	0.13%	441
Owlsmoor	63	0.10%	448
Ascot	60	0.09%	436
Harmans Water	56	0.08%	446
Bullbrook	52	0.08%	438
Hanworth	45	0.07%	445
Central Sandhurst	28	0.04%	439
Great Hollands South	23	0.03%	444
Little Sandhurst and Wellington	18	0.03%	447
College Town	16	0.02%	440
Crowthorne	2	0.00%	442

Table: Job type by area of residence

Job Type	Weighted total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Management/Professional: Airport/ Airline Specific	1509 2%	167 2%	95 1%	105 2%	13 <1%	71 2%	856 3%
Management/ Professional - General	4415 7%	370 4%	452 5%	121 3%	143 3%	147 5%	2539 10%
Passenger Services, Sales and Clerical Staff	11816 18%	1988 21%	1643 20%	1040 23%	804 19%	457 16%	3278 13%
Air Cabin Crew	13601 20%	500 5%	708 9%	565 12%	551 13%	329 11%	8317 32%
Pilots/ATC/Flight Operations	3528 5%	269 3%	169 2%	15 <1%	269 6%	127 4%	1969 8%
Information Technology	829 1%	113 1%	6 <1%	19 <1%	87 2%	0 0%	371 1%
Maintenance Tradesmen & Other Skilled Workers	4732 7%	484 5%	491 6%	224 5%	400 10%	376 13%	1962 8%
Apron, Ramp, Cargo, Drivers, Baggage Staff	7113 11%	1273 14%	1094 13%	660 14%	368 9%	563 19%	2112 8%
Catering and Retail	7077 11%	1796 19%	1474 18%	771 17%	614 15%	341 12%	971 4%
Cleaning and Housekeeping	1390 2%	333 4%	215 3%	268 6%	88 2%	33 1%	164 1%
Customs, Immigration, Police and Fire	1609 2%	298 3%	82 1%	62 1%	69 2%	110 4%	658 3%
Security, Passenger Search, Access Control	6279 9%	1130 12%	1384 17%	517 11%	636 15%	259 9%	1423 5%
Other	4393 7%	762 8%	568 7%	374 8%	180 4%	139 5%	1732 7%

Employment at Heathrow

Employment types

Of all companies that took part in the survey, 28% are airlines/airline handling agents, 24% catering and retail and 14% building and maintenance contractors.

In terms of the size of these companies, 70% employ fewer than 50 staff at Heathrow, with almost a third having fewer than 10 staff on site. Just over one in ten businesses operate with more than 250 staff. Amongst employers that took part in the survey (excluding those that only responded in the expansion exercise as no detailed breakdown was provided), it has been reported that there are approximately 68968 staff working at Heathrow. One in four employees are air cabin crew, and just less than one in five are passenger services, sales and clerical staff.

Table: Employees by occupation group

Occupation group	# of staff reported in 2013	# of staff reported in 2008
Air Cabin Crew	16843	19933
	24%	26%
Passenger Services, Sales and Clerical Staff	11415	16002
	17%	21%
Catering and Retail	7829	*
	11%	*
Apron, Ramp, Cargo, Drivers, Baggage Staff, Other Semi-Skilled & Unskilled Workers/Supervisors	7425	11480
	11%	15%
Security, Passenger Search, Access Control	5995	5536
	9%	7%
Maintenance Tradesmen & Other Skilled Workers/Supervisors	5592	4421
	8%	6%
Management/Professional - General	4667	3213
	7%	4%
Pilots/ATC/Flight Operations	4307	4719
	6%	6%
Customs, Immigration, Police and Fire Staff	1707	2586
	2%	3%
Management/Professional - Airport/Airline Specific	1515	2117
	2%	3%
Information Technology	855	699
	1%	1%
Cleaning and Housekeeping	836	*
	1%	*
Total	68968	76642

* "Catering and retail" and "Cleaning and housekeeping" were combined in one code in 2008-09 for which there were 5936 staff (8%).

Staff based at Heathrow

Overall, over half of these companies base fewer than 10% of their staff at Heathrow. Conversely, 1 in 4 businesses base over 75% of their staff at Heathrow. Government services and cargo/ freight/ courier services base over half their staff at Heathrow. As expected, all staff from Heathrow Airport Limited are at Heathrow.

Table: Proportion of company's total staff based at Heathrow by company type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	246	69	6	1	60	9	8	34	58
Under 10%	132	36	2	-	44	5	1	16	28
	54%	52%	33%	-	73%	56%	13%	47%	48%
10 - 49%	33	8	-	-	8	1	1	7	7
	13%	12%	-	-	13%	11%	13%	21%	12%
50 - 74%	15	7	-	-	1	2	2	2	1
	6%	10%	-	-	2%	22%	25%	6%	2%
75%+	66	18	4	1	7	1	4	9	22
	27%	26%	67%	100%	12%	11%	50%	26%	38%

Business focus

Nearly half of the businesses operating at Heathrow see themselves as being predominantly passenger focussed. One in five are mainly focussed on a mix of passengers, aircraft operation and air cargo, whilst one in ten are mainly focussed at aircraft operation.

Table: Job type involvement by company type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo/ Freight/ Courier Services	Building and Maintenance Contractors	Other Company
Total	246	69	6	1	60	9	8	34	58
Passengers ONLY OR MAINLY	47%	46%	50%	63%	84%	67%	0%	0%	40%
Aircraft operations ONLY OR MAINLY	8%	11%	0%	25%	4%	0%	0%	7%	11%
Air cargo ONLY OR MAINLY	5%	3%	0%	0%	0%	0%	100%	1%	4%
Passengers and/or aircraft operations and/ or air cargo	18%	31%	17%	0%	8%	13%	0%	7%	22%
'Home-base' maintenance work	13%	3%	0%	0%	0%	0%	0%	68%	12%
Other, including admin. and clerical support for passengers and aircraft	10%	7%	33%	12%	5%	21%	0%	17%	10%

Employee contract types

The majority of employees work on a full time basis (88%) with 12% working part time. Passenger services/ sales/ clerical (21%) and air cabin crew (16%) are the two job types with the most substantial part-time working populations. IT, management and maintenance tradesmen & other skilled workers are overwhelmingly full-time occupations.

Table: Full/part time employment, by job type

Type of employment	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Full time	59070	1489	4051	9068	11175	3131	829	4628	6619	5845	1220	1527	5400	3770
	88%	99%	95%	79%	84%	89%	100%	99%	95%	86%	91%	96%	89%	87%
Part time	8110	15	191	2399	2097	382	0	45	354	949	116	69	688	582
	12%	1%	5%	21%	16%	11%	0%	1%	5%	14%	9%	4%	11%	13%

Only 6% of all employees are on temporary contracts. However, for those working in IT this figure is one quarter. General management/professional is the job sector with the next highest percentage of temporary employees (11%). All other job sectors have over 90% permanent employees, led by pilots/ATC/flight operations where 100% of employees are on permanent contracts.

Table: Contract type, by job type

Contract type	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Permanent	63379	1381	3820	10826	13304	3386	592	4396	6375	6285	1217	1540	6029	3770
	94%	92%	89%	94%	99%	100%	75%	94%	92%	91%	90%	98%	98%	89%
Temporary	3875	119	469	708	140	0	198	261	540	586	133	27	98	471
	6%	8%	11%	6%	1%	0%	25%	6%	8%	9%	10%	2%	2%	11%

Hours worked & length of tenure

The mean number of days employees work per week is 4.44. Employees in most job sectors work a similar number of days to the overall average. Apron, ramp, cargo, drivers and baggage staff have the highest average number of days work per week at 5.65 while air cabin crew have the lowest average at 2.96 days per week.

Table: Mean number of days worked per week, by job type

	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Mean number of days worked	4.44	4.73	4.86	4.79	2.96	3.48	4.14	4.92	5.65	4.68	4.94	5.06	4.84	4.76

Just over two thirds of employees (67%) have worked at Heathrow for more than three years. Only 8% of employees who live in Spelthorne have worked at Heathrow for less than a year.

Table: Period of time worked at Heathrow by local authority of residence

Years worked at Heathrow	Weighted total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Less than 1 year	10365	1686	1463	920	541	229	3750
	16%	18%	18%	20%	13%	8%	14%
1 to 3 years	11616	1853	1715	1043	542	311	4470
	17%	20%	21%	23%	13%	11%	17%
More than 3 years	44705	5713	4942	2543	3031	2387	17781
	67%	62%	61%	56%	74%	82%	68%

Overall, 80% of employees have worked only at their current company whilst they have been at Heathrow. 15% have worked for two different companies and 5% have worked for three or more. Customs, immigration police and fire staff and IT employees are the most likely to have only worked at their current company (94% and 93% respectively). 9% of maintenance tradesmen and other skilled workers have worked for three or more different companies, no employees in the pilot/ ATC/ flight operations sector had worked for more than two companies.

Table: Number of companies worked for at Heathrow, by job type

Companies worked for at Heathrow	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Only current company	51114	1144	3349	8326	10153	2691	678	3486	5035	5440	1028	1390	4596	3271
	80%	84%	79%	75%	80%	83%	93%	77%	76%	84%	81%	94%	79%	81%
2 different companies	9676	160	659	1951	2083	568	34	648	1087	786	137	41	869	610
	15%	12%	16%	18%	16%	17%	5%	14%	16%	12%	11%	3%	15%	15%
3 or more companies	3237	53	223	858	393	0	14	420	506	219	105	41	335	139
	5%	4%	5%	8%	3%	0%	2%	9%	8%	3%	8%	3%	6%	3%

Recruitment

Just over 1 in 4 employers indicated that they face difficulties in recruitment, and this is particularly true for employers who have 50+ staff in their companies. Almost 1 in 2 companies with over 250+ staff claim to have difficulties in this regard. Overall, the main barriers for those who experience recruitment difficulties are a lack of suitably qualified/ experienced applicants (74%), the level of security screening required (63%), competitive salaries (48%), skills gap (46%) and difficulty in targeting the right people (46%).

Table: Barriers to recruitment, by company type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	65	6	1	1	28	2	1	11	14
Lack of suitably qualified/experienced applicants	48	4	-	1	21	1	1	9	10
	74%	67%	-	100%	75%	50%	100%	82%	71%
Skills gap	30	5	-	-	13	-	-	6	6
	46%	83%	-	-	46%	-	-	55%	43%
Difficulty targeting the right people	30	5	-	1	17	-	1	3	2
	46%	83%	-	100%	61%	-	100%	27%	14%
Location	24	2	-	-	13	1	1	2	5
	37%	33%	-	-	46%	50%	100%	18%	36%
Competitive salaries	31	2	-	-	16	-	-	4	8
	48%	33%	-	-	57%	-	-	36%	57%
Cost of recruitment	13	1	-	-	5	-	-	1	6
	20%	17%	-	-	18%	-	-	9%	43%
Length of recruitment process	20	3	-	-	10	-	1	3	3
	31%	50%	-	-	36%	-	100%	27%	21%
Level of security screening required	41	6	1	-	18	-	1	7	8
	63%	100%	100%	-	64%	-	100%	64%	57%
Employer brand	5	2	-	-	1	-	-	-	2
	8%	33%	-	-	4%	-	-	-	14%
Image of the sector	7	2	-	-	4	-	-	-	1
	11%	33%	-	-	14%	-	-	-	7%
Other	12	-	-	-	8	2	-	2	-
	18%	-	-	-	29%	100%	-	18%	-

Employers use a number of channels for recruitment with recruitment agencies (61%) and websites (57%) being used most often in all types of airport businesses.

Table: Methods of recruitment, by company type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

Method of recruitment	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	234	64	5	1	57	9	7	34	56
Advertising in national press	71	17	1	1	16	3	2	14	17
	30%	27%	20%	100%	28%	33%	29%	41%	30%
Advertising in Airport press	73	28	1	1	14	2	3	6	18
	31%	44%	20%	100%	25%	22%	43%	18%	32%
Recruitment agencies	142	36	1	1	33	6	3	27	35
	61%	56%	20%	100%	58%	67%	43%	79%	63%
Head-hunters	66	14	-	1	16	3	-	13	19
	28%	22%	-	100%	28%	33%	-	38%	34%
Jobcentre Plus	73	11	1	1	24	4	1	11	20
	31%	17%	20%	100%	42%	44%	14%	32%	36%
Careers Fairs	54	9	-	1	14	4	1	8	16
	23%	14%	-	100%	25%	44%	14%	24%	29%
Graduate Recruitment Schemes	51	7	1	1	11	2	1	8	20
	22%	11%	20%	100%	19%	22%	14%	24%	36%
Heathrow Academy	73	9	1	1	34	2	1	13	12
	31%	14%	20%	100%	60%	22%	14%	38%	21%
Websites	133	26	3	1	41	5	4	19	33
	57%	41%	60%	100%	72%	56%	57%	56%	59%
Local press	5	2	1	-	1	-	-	1	-
	2%	3%	20%	-	2%	-	-	3%	-
Word of mouth	11	3	-	-	6	-	1	1	-
	5%	5%	-	-	11%	-	14%	3%	-
In house/in store/ internal	17	3	1	-	8	1	-	1	3
	7%	5%	20%	-	14%	11%	-	3%	5%
HR department/Head Office	9	5	-	-	3	-	-	1	-
	4%	8%	-	-	5%	-	-	3%	-
Other	7	2	-	-	1	-	1	-	3
	3%	3%	-	-	2%	-	14%	-	5%

In terms of recruitment by job type, 27% of employees found their job via a company website; air cabin crew (41%) and security/ passenger search/ access control employees (38%) were the most likely to have done this. 24% of all employees found their job through word of mouth with maintenance tradesmen & other skilled workers (33%) and catering and retail workers (32%) being the most likely to have found their job by this method. A small proportion (2%) found their job via the academy.

Over half of all people working in the pilot/ ATC/ flight operations sector found their job via an advert (54%) compared to 21% of employees at Heathrow overall. Nearly one third of cleaning and housekeeping staff (32%) found employment through a recruitment agency compared to 11% of the total.

Table: Method of recruitment, by job type

Method of recruitment	Weighted total	Management/Professional: Airport/Airline Specific	Management/Professional - General	Passenger Services, Sales and Clerical Staff	Air Cabin Crew	Pilots/ATC/Flight Operations	Information Technology	Maintenance Tradesmen & Other Skilled Workers	Apron, Ramp, Cargo, Drivers, Baggage Staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire	Security, Passenger Search, Access Control	Other
Company website	17670 27%	376 28%	1141 27%	2745 24%	5345 41%	709 21%	254 31%	864 20%	943 14%	1586 24%	184 14%	432 29%	2274 38%	651 16%
Word of mouth	15471 24%	306 23%	975 23%	2746 24%	1920 15%	269 8%	183 22%	1426 33%	2060 31%	2102 32%	363 29%	378 25%	1537 26%	1164 28%
Job advert	13611 21%	188 14%	900 22%	2293 20%	3596 27%	1813 54%	102 12%	808 19%	1150 17%	818 12%	63 5%	226 15%	948 16%	527 13%
Recruitment agency	6882 11%	226 17%	540 13%	1340 12%	565 4%	269 8%	68 8%	484 11%	1050 16%	674 10%	402 32%	55 4%	528 9%	624 15%
Jobcentre Plus	2025 3%	19 1%	30 1%	488 4%	79 1%	0 0%	0 0%	28 1%	429 6%	456 7%	105 8%	55 4%	114 2%	180 4%
Academy	1206 2%	1206 2%	19 1%	76 2%	321 3%	79 1%	0 0%	0 0%	108 3%	243 4%	313 5%	5 <1%	0 0%	0 0%
Other	8690 13%	225 17%	521 12%	1416 13%	1597 12%	440 13%	217 26%	592 14%	844 13%	662 10%	150 12%	339 23%	617 10%	984 23%

Training

Nearly all employers provide some forms of work-related training to employees. Regardless of company size, job specific training is the most commonly provided and training in new technology is the least commonly provided. Overall, employers spend an average of £65,735 on training their staff.

Table: Type of training provided by employers to staff by company size

Types of training	Total	1-9 staff	10-49 staff	50-249 staff	250+ staff
Total	238	72	97	43	26
Job specific	229 96%	65 90%	95 98%	43 100%	26 100%
Health and safety	224 94%	64 89%	94 97%	42 98%	24 92%
Induction	225 95%	65 90%	93 96%	42 98%	25 96%
Training in new technology	184 77%	52 72%	78 80%	34 79%	20 77%
Supervisory	191 80%	47 65%	80 82%	40 93%	24 92%
Management	187 79%	50 69%	74 76%	39 91%	24 92%
Other	30 13%	4 6%	11 11%	11 26%	4 15%
Mean annual training spending (£)	£65,735	£17,023	£27,868	£58,462	£258,571

Communication

Emails, followed by staff briefings, are the most successful way of communicating between employers and employees for businesses of all natures at Heathrow. Text messaging is also regarded the one of the most successful communication method amongst staff who work for other public passengers services and building and maintenance contractors. Notice board appears to be the least successful method of communication.

Table: Type of most successful communication method, by business type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

Types of communications method	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	241	67	6	1	59	9	7	34	57
In-house newsletter/ newspaper/ magazine	136	32	2	-	41	6	3	18	34
	56%	48%	33%	-	69%	67%	43%	53%	60%
Intranet	115	33	2	1	28	3	3	19	26
	48%	49%	33%	100%	47%	33%	43%	56%	46%
Social media	54	13	-	-	21	2	-	3	14
	22%	19%	-	-	36%	22%	-	9%	25%
Email	206	58	4	1	50	7	5	30	50
	85%	87%	67%	100%	85%	78%	71%	88%	88%
Company app	38	11	-	-	12	2	1	5	6
	16%	16%	-	-	20%	22%	14%	15%	11%
Text messaging	110	31	1	-	19	7	2	25	24
	46%	46%	17%	-	32%	78%	29%	74%	42%
Staff briefings	199	46	4	1	50	8	7	30	52
	83%	69%	67%	100%	85%	89%	100%	88%	91%
Phone calls/mobile calls	25	8	-	-	7	1	-	4	5
	10%	12%	-	-	12%	11%	-	12%	9%
Notice boards	10	2	-	1	2	1	-	-	4
	4%	3%	-	100%	3%	11%	-	-	7%
Other	14	3	1	-	1	-	-	1	8
	6%	4%	17%	-	2%	-	-	3%	14%

For smaller companies with fewer than 50 staff, emails and staff briefings are the most successful methods of communication. In-house newsletter/ newspaper/ magazine is also an effective communication method for companies with 50+ staff.

Table: Type of most successful communication method by company size

Types of communications method	Total	1-9 staff	10-49 staff	50-249 staff	250+ staff
Total	241	75	97	43	26
In-house newsletter/ newspaper/ magazine	136	28	52	36	20
	56%	37%	54%	84%	77%
Intranet	115	30	49	23	13
	48%	40%	51%	53%	50%
Social media	54	17	19	8	10
	22%	23%	20%	19%	38%
Email	206	67	85	34	20
	85%	89%	88%	79%	77%
Company app	38	11	18	5	4
	16%	15%	19%	12%	15%
Text messaging	110	33	48	20	9
	46%	44%	49%	47%	35%
Staff briefings	199	50	82	41	26
	83%	67%	85%	95%	100%
Phone calls/ mobile calls	25	11	10	3	1
	10%	15%	10%	7%	4%
Notice boards	10	2	1	3	4
	4%	3%	1%	7%	15%
Other	14	2	7	2	3
	6%	3%	7%	5%	12%

Transport at Heathrow

Employee travel

Nearly three-quarters of employers do not provide any facilities for home to work journeys. Of those who do, a season ticket loan is the most common facility provided. Nearly 1 in 10 also provide a personalised travel plan, discounted public transport or a car sharing scheme. As expected, larger business are much more likely to provide travel to work schemes, in particular season ticket loans, discounted public transport and car sharing schemes.

Table: Facilities for home to work journeys provided by employers. Over 50% participate; fewer than 10% participate

Journey facilities offered	Total	1-9 staff	10-49 staff	50-249 staff	250 staff
Total	229	67	94	43	25
None	73%	81%	81%	53%	60%
Season ticket loans	14%	10%	10%	21%	24%
Personalised travel plans	9%	10%	7%	9%	12%
Discounted public transport	9%	3%	4%	21%	20%
Car sharing scheme	9%	3%	7%	12%	24%
Company minibus	6%	3%	3%	14%	12%
Discounted taxi fares	4%	4%	2%	7%	8%

In terms of employees' awareness of travel benefits provided, nearly 2 in 3 employees are aware of the free travel zone and nearly half are aware of the car share scheme. Only 1 in 3 are aware of discounted Connect travel and the Heathrow cycle hub. Residents of Spelthorne have a higher awareness (42%) of the Heathrow cycle hub than the general population.

Table: Travel benefits awareness by borough of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	67466	9235	8391	4679	4247	2948	26173
Free travel zone	41323	6165	5690	3013	2407	1617	15046
	61%	67%	68%	64%	57%	55%	57%
Car share scheme	31670	3871	3812	1892	1759	1723	13395
	47%	42%	45%	40%	41%	58%	51%
Discounted Heathrow Express travel	27891	3426	2738	1799	1726	1186	12775
	41%	37%	33%	38%	41%	40%	49%
Discounted bus travel	23316	2605	2700	1266	2098	1422	9398
	35%	28%	32%	27%	49%	48%	36%
Heathrow cycle hub	20345	2599	2548	1299	1240	1247	8466
	30%	28%	30%	28%	29%	42%	32%
Discounted Connect travel	19525	1936	2217	1531	1221	980	8531
	29%	21%	26%	33%	29%	33%	33%
None of these	11594	1651	1527	705	621	404	4398
	17%	18%	18%	15%	15%	14%	17%

Employer’s awareness of staff travel discount

Nearly 60% of employers are aware of the Heathrow Commuter Team and associated travel discounts by business types. Employers from other public passenger services and building and maintenance contactors are the least aware of this scheme.

Table: Awareness of the Heathrow Commuter Team and associated travel discounts by business type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	242	68	6	1	59	9	7	34	57
Yes	137	45	3	1	41	4	-	11	31
	57%	66%	50%	100%	69%	44%	-	32%	54%
No	105	23	3	-	18	5	7	23	26
	43%	34%	50%	-	31%	56%	100%	68%	46%

Seven in ten employers are unaware of the Heathrow Area Transport Forum. Discounting Heathrow Airport Ltd, building and maintenance contractors are the most aware of this initiative (29%), followed by airlines/airline handling agents (27%).

Table: Awareness of Heathrow Area Transport Forum by business type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	241	67	6	1	59	9	7	34	57
Yes	58	18	1	1	12	2	-	10	14
	24%	27%	17%	100%	20%	22%	-	29%	25%
No	165	41	5	-	43	6	4	23	42
	68%	61%	83%	-	73%	67%	57%	68%	74%
No, and not interested in learning more	18	8	-	-	4	1	3	1	1
	7%	12%	-	-	7%	11%	43%	3%	2%

Similarly, most employers are not aware of the Airport Surface Access Strategy. Employers who work in other public passenger services and airline/airline handling agents are the most aware of the initiative. No Government service employers are aware of it.

Table: Awareness of Airport Surface Access Strategy by business type. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Airlines /Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo / Freight /Courier Services	Building and Maintenance Contractors	Other Company
Total	241	67	6	1	59	9	7	34	57
Yes	52	19	-	1	9	3	-	6	14
	22%	28%	-	100%	15%	33%	-	18%	25%
No	169	40	6	-	45	5	4	27	41
	70%	60%	100%	-	76%	56%	57%	79%	72%
No, and not interested in learning more	20	8	-	-	5	1	3	1	2
	8%	12%	-	-	8%	11%	43%	3%	4%

Journey time to work

The majority of commutes are under 45 minutes and only 13% of commutes are over 90 minutes.

Table: Length of employee commute

Less than 15 minutes	5900
	9%
16-30 minutes	19958
	29%
31-45 minutes	14495
	21%
46-60 minutes	11076
	16%
61-90 minutes	7676
	11%
90+ minutes	8748
	13%

Those with shorter commuting times are more likely to have worked at Heathrow for more than 3 years; 73% of those with a commute of less than 15 minutes and 70% of those with a commute of 16-30 minutes have been employed at Heathrow for this period of time.

Table: Years worked at Heathrow, by commute time

Years worked at Heathrow	Weighted total	Less than 15 minutes	16-30 minutes	31-45 minutes	46-60 minutes	61-90 minutes	90+ minutes
Total	10365	770	2637	1857	2284	1383	1272
	16%	14%	14%	13%	21%	19%	15%
Less than 1 year	10365	770	2637	1857	2284	1383	1272
	16%	14%	14%	13%	21%	19%	15%
1 to 3 years	11616	742	3151	2566	2058	1450	1483
	17%	13%	16%	18%	19%	20%	17%
More than 3 years	44705	4012	13644	9557	6381	4544	5931
	67%	73%	70%	68%	60%	62%	68%

Typically the peak hours for starting work are before 8am, and between 12pm to 2pm. The peak hours for finishing work are before 6am and between 12pm to 2pm. There are some differences in terms of time expected to finish work between full time and part time employees where part timers are less likely to finish work between 2pm to 8pm.

Figure: Employee work start times, full and part time

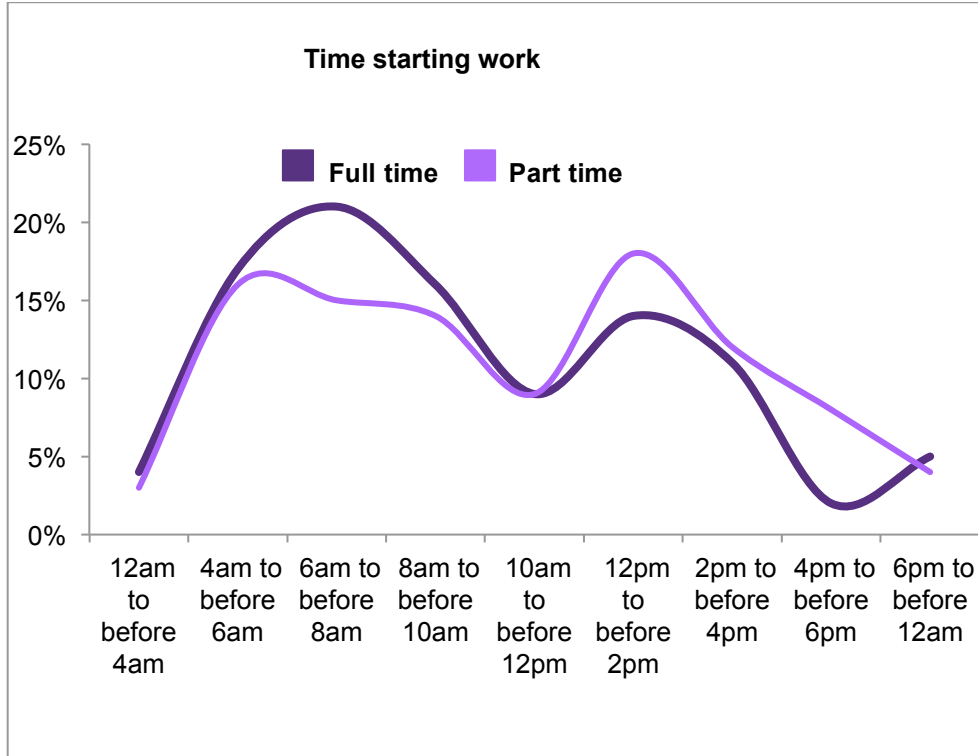
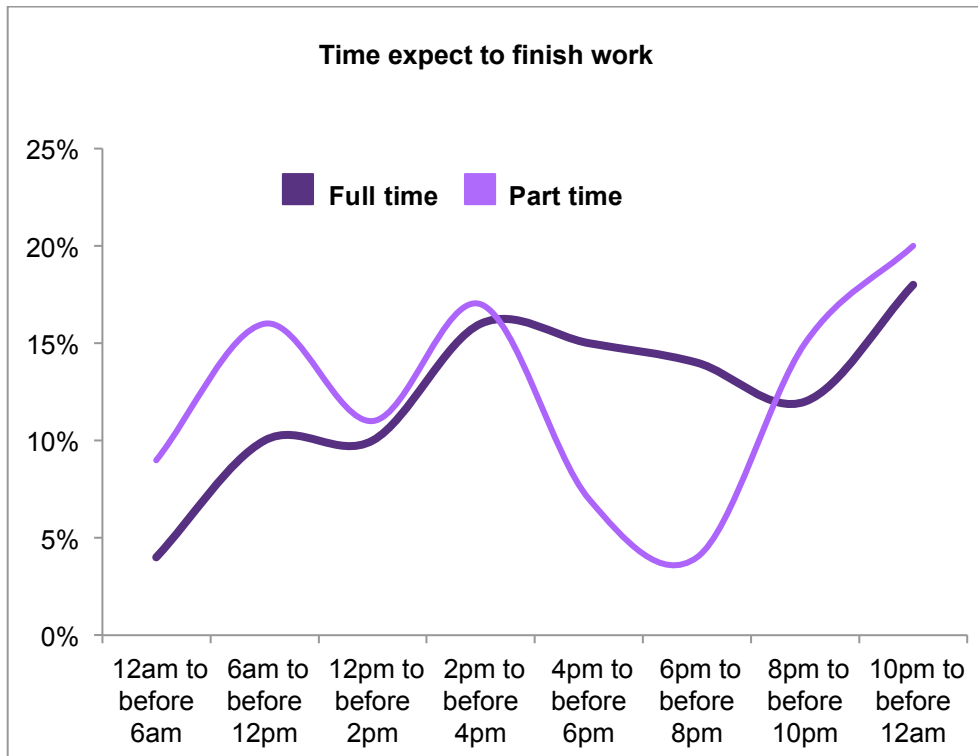


Figure: Expected employee work finish times, full and part time



Transport to Heathrow

54% of employees at Heathrow use private mode and 45% use public transport. Nearly 1 in 2 travel by car alone, which is the most popular option overall. Local buses (32%) are the most commonly used public transport.

Table: Mode of transport to work by boroughs of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	66927	9089	8268	4664	4131	2959	26174
Private mode of transport	36220	3793	3471	2030	2621	2266	16560
	54%	42%	42%	44%	63%	77%	63%
Car driver travelling alone	32746	3207	2950	1828	2162	1996	15462
	49%	35%	36%	39%	52%	67%	59%
Car driver with passenger(s)	1303	161	240	65	85	70	502
	2%	2%	3%	1%	2%	2%	2%
Car passenger	1400	183	293	144	133	59	380
	2%	2%	4%	3%	3%	2%	1%
Bicycle	739	292	42	5	21	165	199
	1%	3%	1%	<1%	1%	6%	1%
Motorcycle	946	167	46	28	267	33	287
	1%	2%	1%	1%	6%	1%	1%
Public transport	30266	5836	5034	2677	1814	1110	8155
	45%	64%	61%	57%	44%	38%	31%
Local bus	21617	4508	4623	2027	1495	735	4211
	32%	50%	56%	43%	36%	25%	16%
Work bus/ Company transport	3700	396	329	175	319	395	1450
	6%	4%	4%	4%	8%	13%	6%
Taxi/ Minicab	249	-	124	79	14	-	12
	<1%	-	1%	2%	<1%	-	<1%
Underground	7277	1664	293	534	<1%	2	3553
	11%	18%	4%	11%	<1%	<1%	14%
Heathrow Express	988	14	160	130	<1%	8	504
	1%	<1%	2%	3%	<1%	<1%	2%
Heathrow Connect	492	-	79	244	<1%	-	94
	1%	-	1%	5%	<1%*	-	<1%
Air	4806	236	79	315	-	-	2707
	7%	3%	1%	7%	-	-	10%
Walked from home	681	20	79	-	79	32	403
	1%	<1%	1%	-	2%	1%	2%
Other	1216	<1%	42	56	7	14	918
	2%	<1%	1%	1%	<1%	<1%	4%

Private transport users

Nearly 60% of employees mentioned that convenience is their main reason for travelling to work by car, this is particularly true for residents living in Hounslow, Slough and Spelthorne.

Table: Main reasons for choosing to travel to work by car, by boroughs of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Speithorne	Other
Weighted Total	33694	3267	3306	1958	2314	2068	15718
Convenience	19427	2048	1965	1147	1489	1418	8517
	58%	63%	59%	59%	64%	69%	54%
Time saving	15775	1799	1799	1150	1028	959	6652
	47%	55%	54%	59%	44%	46%	42%
Shift patterns	13006	1106	1287	859	825	868	6067
	39%	34%	39%	44%	36%	42%	39%
No alternatives	9542	347	477	339	355	374	6075
	28%	11%	14%	17%	15%	18%	39%
No reliable alternatives	5657	310	383	305	337	297	3300
	17%	9%	12%	16%	15%	14%	21%
Cheaper	4518	456	245	414	180	273	2142
	13%	14%	7%	21%	8%	13%	14%
Easy to park	4508	555	506	406	180	220	2118
	13%	17%	15%	21%	8%	11%	13%
Personal safety	3906	462	558	297	185	134	1626
	12%	14%	17%	15%	8%	6%	10%
Alternatives too far away	2451	117	144	60	156	54	1483
	7%	4%	4%	3%	7%	3%	9%
No affordable alternatives	1658	27	114	13	28	5	1114
	5%	1%	3%	1%	1%	<1%	7%
Car needed for business travel	748	101	77	6	12	80	436
	2%	3%	2%	<1%	1%	4%	3%
Carer responsibilities (e.g. school run)	660	91	73	85	38	33	288
	2%	3%	2%	4%	2%	2%	2%
Disability/health reasons	175	60	20	<1%	11	44	19
	1%	2%	1%	<1%	<1%	2%	<1%
Other	714	69	83	70	64	142	208
	2%	2%	3%	4%	3%	7%	1%

Of all drivers and car passengers, 44% indicate they would not consider using public transport. However, 32% indicate they would do so if there were more direct bus routes and 28% if there were more frequent services. A slightly higher proportion of females, and people with children living at home would not consider using public transport compared to the average.

Table: Possible initiatives to encourage drivers/car passages to use public transport by gender

	Weighted Total	Male	Female	With children living at home	Without children living at home
Weighted Total	33293	19772	12594	10754	21149
More direct bus routes	10680	6759	3565	3449	6672
	32%	34%	28%	32%	32%
More frequent services	9266	5632	3373	2545	6385
	28%	28%	27%	24%	30%
Discounted tickets or travel	8701	5348	3146	2748	5651
	26%	27%	25%	26%	27%
More reliable services	6566	4287	2027	2176	3912
	20%	22%	16%	20%	18%
More convenient drop off points	3423	2149	1159	1070	2278
	10%	11%	9%	10%	11%
None of these/ Would not consider using public transport	14685	8153	6173	5142	9149
	44%	41%	49%	48%	43%

Employees from Hillingdon and Spelthorne indicate they would be more likely to use public transport if there were more direct buses than employees in general.

Table: Possible initiatives to encourage drivers/car passages to use public transport, by boroughs of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	33293	3201	3178	1953	2269	1969	15668
More direct bus routes	10680	962	1255	558	739	773	5037
	32%	30%	39%	29%	33%	39%	32%
More frequent services	9266	1006	861	520	754	589	4070
	28%	31%	27%	27%	33%	30%	26%
Discounted tickets or travel	8701	763	865	688	623	775	3655
	26%	24%	27%	35%	27%	39%	23%
More reliable services	6566	533	525	457	405	450	3043
	20%	17%	17%	23%	18%	23%	19%
More convenient drop off points	3423	247	287	247	301	378	1379
	10%	8%	9%	13%	13%	19%	9%
None of these/ Would not consider using public transport	14685	1283	1292	736	814	664	7352
	44%	40%	41%	38%	36%	34%	47%

Amongst employees who drive to work, 13% of employees already car share on some days of the week, highest among Spelthorne residents (22%). 41% indicate they would be encouraged to car share if they received help finding others with similar work patterns who wish to car share, most notably among residents of Slough. In contrast, 39% of all employees indicated they would not consider car sharing; this was more prevalent among Hounslow residents.

Table: Possible initiatives to encourage drivers to car share by boroughs of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	31463	3045	3025	1744	2129	1949	14816
Help finding others with similar work patterns that wish to car share	12900	1165	1191	752	1016	550	6514
	41%	38%	39%	43%	48%	28%	44%
Would not consider car sharing	12227	1191	976	615	729	674	5554
	39%	39%	32%	35%	34%	35%	37%
I already car share on some days	4133	469	504	248	289	425	1518
	13%	15%	17%	14%	14%	22%	10%
Guaranteed transport home in unforeseen circumstances	4014	247	240	180	104	306	2259
	13%	8%	8%	10%	5%	16%	15%
Preferential parking closer to workplace	3661	423	512	233	183	165	1494
	12%	14%	17%	13%	9%	8%	10%

Most private car users park their vehicle at N1 (15%), N5 (14%) and PEX Parking Express (14%) while 27% park their vehicle elsewhere outside of the airport premises. One in four car passengers indicate they were dropped off at another location at the airport before the driver parked. The majority (72%) of car passengers mentioned that they are driven to work by other members of their household.

Table: Parking location

N1	4685	P4	293
	15%		1%
N5	4472	N2	252
	14%		1%
PEX (Parking Express)	4449	N6 Contingency Overflow	202
	14%		1%
N4	2862	Heathrow Point West or HPW overflow	112
	9%		<1%
E2	2457	BA Cargo	67
	8%		<1%
Compass Centre	1966	P2	43
	6%		<1%
Lithgows Rd (Southside)	1196	WBC	35
	4%		<1%
S4 Swindon Road T4	1075	P1	19
	3%		<1%
P5	411	Elsewhere	8648
	1%		27%
Waterside	365	Total	32101
	1%		

Cycling

Currently, only 1% of employees at Heathrow cycle to work. Of all non-cyclists, only 11% would consider cycling to work if there were safer cycle routes. Fewer than 10% would consider cycling if there were shower facilities, storage lockers, secure cycle storage/parking facilities or shower facilities (7% respectively), on-site maintenance and servicing of cycles (4%) or more information on cycling options (3%). Residents of Spelthorne would be more likely to cycle to work if there were safer cycle routes and storage lockers than other employees in general.

Table: Possible initiatives to encourage cycling to work by borough of residency

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	66463	8974	8280	4590	4183	2709	25864
Safer cycle routes	7120	1410	1358	699	704	521	1387
	11%	16%	16%	15%	17%	19%	5%
Shower facilities	4872	931	1002	459	463	288	1082
	7%	10%	12%	10%	11%	11%	4%
Storage lockers	4796	1095	845	242	419	377	1228
	7%	12%	10%	5%	10%	14%	5%
Secure cycle storage/ parking facilities	4393	925	773	350	574	259	859
	7%	10%	9%	8%	14%	10%	3%
On-site maintenance and servicing of cycles	2567	396	544	245	261	130	774
	4%	4%	7%	5%	6%	5%	3%
More information on cycling options	2173	466	495	217	191	45	529
	3%	5%	6%	5%	5%	2%	2%
None of these/ would not consider cycling to work	54500	6429	6216	3480	2999	1916	23064
	82%	72%	75%	76%	72%	71%	89%
Don't know	1002	248	108	86	85	70	311
	2%	3%	1%	2%	2%	3%	1%

Public transport users

One in three employees end their public transport journey to Heathrow at the central bus station, which is the most common place of arrival for employees working at T1, T2 or T3. T5 bus stations, followed by T5 underground/rail station are the next common places. Less than 5% end their public transport journey to Heathrow at Hatton Cross underground, T4 underground or T4 rail, and these are mainly people who work at T4. Only 1% arrive at CTA rail station before reporting to work.

Table: Location of work arrival by location of work

	Weighted Total	T1	T2	T3	T4	T5
Weighted Total	26813	4955	616	5295	2772	9470
Central Bus Station	9237	3847	483	3746	253	640
	34%	78%	78%	71%	9%	7%
T5 Bus Station	5702	14	27	118	200	5027
	21%	<1%	4%	2%	7%	53%
T5 Underground / Rail Station	3591	40	-	14	35	2830
	13%	1%	-	<1%	1%	30%
T1, 2 & 3 Underground Station	2249	862	39	945	93	178
	8%	17%	6%	18%	3%	2%
T4 Bus Stop	1572	54	41	55	1403	90
	6%	1%	7%	1%	51%	1%
Hatton Cross Underground Station	1118	27	-	6	113	199
	4%	1%	-	<1%	4%	2%
On-street bus stop nearest my building	1032	182	-	147	14	302
	4%	4%	-	3%	1%	3%
T4 Underground Station	692	39	-	15	570	56
	3%	1%	-	<1%	21%	1%
CTA Rail Station (Hex/ Connect)	294	47	-	32	1	67
	1%	1%	-	1%	<1%	1%
T4 Rail Station (Hex/ Connect)	212	32	7	79	88	-
	1%	1%	1%	1%	3%	-
Other	1673	47	46	222	92	253
	6%	1%	7%	4%	3%	3%

Transport within Heathrow

When employers were asked if they provided any transport for staff to get to and around work, just over one third said yes. These were primarily building and maintenance contractors. Amongst those who provide transport to staff, over half supply them with cars, a third offer vans and slightly fewer offer minibuses. Diesel vehicles are most commonly provided by all businesses.

Table: Type of vehicle provided by companies. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Heathrow Airport Ltd	Airlines	Catering and Retail	Building and Maintenance Contractors	Cargo/Freight/ Courier Services	Other public passenger services	Government Services	Other Company
Any vehicle	2436	411	282	266	228	57	31	4	1157
Petrol car	152	11	29	18	1	24	1	0	68
Diesel car	880	61	49	40	75	9	12	0	634
Electric car	3	0	2	1	0	0	0	0	0
Petrol van	3	0	3	0	0	0	0	0	0
Diesel van	621	136	73	56	124	16	6	4	206
Electric van	49	18	30	1	0	0	0	0	0
Diesel HGV	286	46	26	150	19	0	9	0	36
Diesel Bus	60	0	25	0	7	0	3	0	25
Diesel Coach	186	0	44	0	0	0	0	0	142
Diesel off-road small	28	20	0	0	0	3	0	0	5
Diesel off-road med	92	73	1	0	0	4	0	0	14
Diesel off-road large	76	46	0	0	2	1	0	0	27

Nearly half of the employers indicated that they were looking at alternative technologies (e.g. full hybrid, stop start hybrid, compressed natural gas or hydrogen) for their petrol/diesel vehicles. Companies in catering and retail, other public passenger services and other companies are more likely than average to look at alternative technologies.

Table: Whether companies are looking at alternative technologies for their petrol/diesel vehicles. Caution: some of data in contains small base sizes (<30), results should be read with caution.

	Total	Heathrow Airport Ltd	Airlines	Catering and Retail	Building and Maintenance Contractors	Cargo/Freight/ Courier Services	Other public passenger services	Government Services	Other Company
Total	94	1	27	7	22	5	2	1	29
Yes	43%	100%	30%	57%	41%	20%	50%	-	55%
No	57%	-	70%	43%	59%	80%	50%	100%	45%

Landside travel at Heathrow

Two in five employees at Heathrow are required to travel landside within the airport daily, a similar proportion are not required to make such journeys. Of those who are required to travel landside, half of these trips are made on foot. One in five use free travel on public transport. Employees who work as passenger services/sales/clerical staff make the highest proportion of on-foot journeys.

Table: Landside travel by job type

	Management/ Professional - Airport/Airline Specific	Management/Professional - General	Passenger Services, sales and clerical staff	Air Cabin staff	Pilots/ATC/Flight Operations	IT	Maintenance Tradesmen	Apron, Ramp, Cargo, Drivers, baggage staff	Catering and Retail	Cleaning and Housekeeping	Customs, Immigration, Police and Fire Staff	Security, Passenger Search, Access control	Other
On foot	12%	26%	71%	54%	16%	8%	32%	41%	53%	67%	40%	64%	47%
Public transport (free travel)	34%	33%	20%	21%	18%	37%	24%	26%	33%	22%	23%	17%	37%
Works buses	30%	25%	6%	17%	25%	51%	13%	15%	9%	5%	11%	13%	7%
Works/ pool vehicle	25%	16%	4%	9%	26%	13%	37%	21%	4%	6%	27%	6%	8%
Private car	19%	8%	3%	1%	16%	9%	2%	8%	5%	0%	9%	4%	8%
Bicycle	2%	1%	<1%	0%	0%	0%	3%	2%	0%	1%	0%	0%	1%
Other	3%	4%	2%	0%	0%	0%	0%	0%	0%	2%	6%	<1%	4%

Sustainability at Heathrow

Of all suggested environmental sustainability strategies/initiatives, environmental management policies/ strategies were the most likely to be in place with three-quarters of companies having one. Two-thirds have plans in place to reduce their waste generation, and just over 60% have some sustainability strategy/ policy in place.

Heathrow Airport Ltd participates in all environmental sustainability strategies/ initiatives except for plans to reduce waste generation. Government services have over 50% participation on most of these strategies/initiatives. However, Cargo/ Freight/ Courier service companies have fewer than 50% participation in all of these strategies/ initiatives.

Table: Environmental sustainability strategies/initiatives provided by company type. Caution: some of data in contains small base sizes (<30), results should be read with caution. Over 50% participate; fewer than 10% participate.

	Airlines	Government Services	Heathrow Airport Ltd	Catering and Retail	Other public passenger services	Cargo/Freight/ Courier Services	Building and Maintenance Contractors	Other Company
Total	62	6	1	56	9	8	34	58
Environmental management policy/ strategy	58%	83%	Yes	77%	89%	38%	91%	79%
Plans in place to reduce waste generation	56%	83%	No	70%	78%	38%	82%	71%
Sustainability strategy/ policy	48%	83%	Yes	66%	78%	13%	74%	66%
Plans in place to reduce carbon footprint	50%	83%	Yes	50%	56%	13%	71%	69%
Carbon footprint measurement	48%	83%	Yes	46%	44%	13%	65%	60%
Local procurement processes	10%	50%	Yes	11%	56%	13%	56%	34%
Greener building design	11%	50%	Yes	25%	22%	0%	32%	28%
Employee Volunteering Schemes	10%	33%	Yes	20%	33%	13%	26%	34%
Sustainable transport for staff	8%	33%	Yes	14%	22%	13%	32%	24%
Sustainable vehicles within the airport	6%	33%	Yes	2%	11%	13%	35%	24%
Community investment schemes	5%	0%	Yes	7%	22%	13%	18%	17%

The likelihood of participating in environmental strategies increases considerably with company size. For instance, businesses with 1-9 staff have a relatively smaller percentage of participation compared to businesses with higher number of staff. Eight out of ten businesses with over 250 staff have an environmental management policy or plans to reduce their waste, compared to only half of those with fewer than 10 staff.

Table: Environmental sustainability strategies/initiatives provided by company size. Caution: some of data in contains small base sizes (<30), results should be read with caution. Over 50% participate; fewer than 10% participate.

	1-9 staff	10-49 staff	50-249 staff	250 staff
Total	69	94	46	25
Environmental management policy/ strategy	57%	83%	78%	80%
Plans in place to reduce waste generation	46%	76%	76%	80%
Sustainability strategy/ policy	46%	64%	72%	76%
Plans in place to reduce carbon footprint	48%	61%	61%	68%
Carbon footprint measurement	42%	53%	59%	72%
Local procurement processes	14%	24%	41%	36%
Greener building design	22%	20%	20%	44%
Employee Volunteering Schemes	14%	21%	28%	40%
Sustainable transport for staff	9%	20%	28%	24%
Sustainable vehicles within the airport	9%	15%	20%	28%
Community investment schemes	7%	10%	17%	20%

Employment by Local Boroughs

Overall, nine in ten employees work on a full time basis at Heathrow. Compared to the other areas, there is a slightly smaller proportion (86%) of full time workers in Hillingdon. The overall proportion of employees working at Heathrow full time (88%) is higher than the average for inner London (76%), and the same is true of all boroughs. For instance, 88% of Hounslow residents work on a full time basis at Heathrow, whereas only 75% of all Hounslow residents work on a full time basis.

Table: Proportion of full time and part time worker by boroughs

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	67180	9361	8208	4609	4223	2886	26016
Full time	59070	8231	7095	4176	3829	2564	22934
	88%	88%	86%	91%	91%	89%	88%
Part time	8110	1130	1113	432	395	322	3082
	12%	12%	14%	9%	9%	11%	12%

Table: National figures of full time and part time worker by boroughs

	Inner London	Hounslow	Hillingdon	Ealing	Slough	Spelthorne
Total	1637362	127032	130290	164820	67300	50161
Full time	1252248	95160	95556	123716	50310	37632
	76%	75%	73%	75%	75%	75%
Part time	385114	31872	34734	41104	16990	12529
	24%	25%	27%	25%	25%	25%

Overall, 90% of employees are employed on a permanent basis. Ealing (90%), followed by Hillingdon (92%) have the smallest proportions of permanent staff.

Table: Proportion of permanent and temporary worker by boroughs

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	67254	9258	8276	4570	4230	2891	26182
Permanent	63379	8716	7620	4092	4049	2745	24806
	94%	94%	92%	90%	96%	95%	95%
Temporary	3875	542	657	478	181	146	1376
	6%	6%	8%	10%	4%	5%	5%

On average, employees at Heathrow travel to work 4.44 days per week. Employees who are outside of the five local boroughs tend to travel to work at Heathrow only 4.07 days per week. Five days a week is the typical number of days working at Heathrow for all employees, regardless of their residency. Only 2%, mostly residents from Slough and further boroughs, travel to work at Heathrow less than once a week.

Table: Typical number of days worked per week at Heathrow, by borough

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	67552	9371	8391	4656	4242	2927	26140
Less than once a week	1063	8	-	-	158	-	682
	2%	<1%	-	-	4%	-	3%
1 day	3982	60	1	119	14	20	2643
	6%	1%	<1%	3%	<1%	1%	10%
2 days	3891	111	500	58	25	168	2142
	6%	1%	6%	1%	1%	6%	8%
3 days	5089	796	295	314	386	46	2248
	8%	8%	4%	7%	9%	2%	9%
4 days	13145	1977	1676	982	788	749	4923
	19%	21%	20%	21%	19%	26%	19%
5 days	27181	4514	3675	2090	1496	1340	9720
	40%	48%	44%	45%	35%	46%	37%
6 days	8272	1310	1433	739	752	270	2305
	12%	14%	17%	16%	18%	9%	9%
7 days	4928	596	809	353	622	334	1477
	7%	6%	10%	8%	15%	11%	6%
Mean	4.44	4.82	4.91	4.83	4.90	4.83	4.07

One in five employees who took part in the survey are air cabin crew, with the highest proportion of these coming from boroughs outside of Hounslow, Hillingdon, Ealing, Slough and Spelthorne. Nearly one in five employees work in the passenger services, sales and clerical staff category, they are mainly residents of Ealing, Hounslow, Hillingdon and Slough. Overall, 11% work in Apron, Ramp, Cargo category, driven by residents in Spelthorne. Catering and retail staff are more likely to live in the five nearby boroughs, particularly Hounslow, Hillingdon and Ealing.

Table: Job categories by boroughs

	Weighted Total	Hounslow	Hillingdon	Ealing	Slough	Spelthorne	Other
Weighted Total	67059	9261	8229	4589	4165	2910	25964
Management/Professional - Airport/Airline Specific	1509 2%	167 2%	95 1%	105 2%	13 *	71 2%	856 3%
Management/Professional - General	4415 7%	370 4%	452 5%	121 3%	143 3%	147 5%	2539 10%
Passenger Services, Sales and Clerical Staff	11816 18%	1988 21%	1643 20%	1040 23%	804 19%	457 16%	3278 13%
Air Cabin Crew	13601 20%	500 5%	708 9%	565 12%	551 13%	329 11%	8317 32%
Pilots/ATC/Flight Operations	3528 5%	269 3%	169 2%	15 *	269 6%	127 4%	1969 8%
Information Technology	829 1%	113 1%	6 *	19 *	87 2%	* *	371 1%
Maintenance Tradesmen and Other Skilled Workers/Supervisors	4732 7%	484 5%	491 6%	224 5%	400 10%	376 13%	1962 8%
Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and Unskilled Workers/Supervisors	7113 11%	1273 14%	1094 13%	660 14%	368 9%	563 19%	2112 8%
Catering and Retail	7077 11%	1796 19%	1474 18%	771 17%	614 15%	341 12%	971 4%
Cleaning and Housekeeping	1390 2%	333 4%	215 3%	268 6%	88 2%	33 1%	164 1%
Customs, Immigration, Police and Fire Staff	1609 2%	298 3%	82 1%	62 1%	69 2%	110 4%	658 3%
Security, Passenger Search, Access Control	6279 9%	1130 12%	1384 17%	517 11%	636 15%	259 9%	1423 5%
Other	4393 7%	762 8%	568 7%	374 8%	180 4%	139 5%	1732 7%

Appendix I: Detailed Expansion & Weighting Process

Expansion exercise

In February 2014, Ipsos MORI carried out an expansion exercise on a selection of 54 companies via means of re-contacting either by email or phone to gain further insights about their number of staff who are based at Heathrow. These companies were selected based on any of the following criteria:

- 1) Appear to have a discrepancy of +/-100 staff between their reported figure in the 2008/09 survey and their reported figure in the 2013 survey.
- 2) Appear to have a discrepancy of +/-100 staff between their reported figure in the 2013 survey and the number of staff passes from HAL's MAID system.
- 3) Those who were not willing to take part in the 2013 survey but appears to have a substantial company size with a large number of employees based at Heathrow i.e. British Airways and Virgin Atlantic.
- 4) Any new companies which appear to have substantial employee population and who have been operating at Heathrow since the 2008/09 survey and had not been willing to take part in the 2013 survey earlier in the year.

The results of this exercise provided the following additional insights to the findings of the survey:

- 1) 6 companies have merged into 3 companies namely:
 - a. Air France and KLM
 - b. Penauille and Servisair
 - c. Cocoon and World Duty Free
- 2) 4 companies indicated they were no longer in operation at Heathrow namely:
 - a. Capgemini
 - b. Carillion PLC
 - c. Menzies
 - d. Vanderlande
- 3) Of the 21 companies which we managed to get a reply, 15 have confirmed that the number of their staff based at Heathrow provided in the survey was correct. 6 companies who were not willing to take part in the survey earlier provided their employee number based at Heathrow. As a result, an additional 1271 staff were added to the total number of employees based at Heathrow.
- 4) Of the companies which we were not able to get a response from the expansion exercise after endless effort of getting in touch, the number of their employees in their companies working at Heathrow was estimated based on the number of active staff passes from the MAID system. This was done by using a conservative approach by applying a factor of 80% to this number, assuming that 20% of the active passes belonged to staff that were not based at Heathrow, and also taking natural attrition into account.
- 5) With the above taken into consideration, the total number of employees based at Heathrow is reported to be 75780.

Weighting process

Overall data collected

While the expansion process identified 75780 employees are working in Heathrow based on a total of 413 employers, the detailed breakdown by job type and company type is not available for all of them. Out of that, 260 companies were able to respond to the question "What is the current breakdown of your company's staff by the following occupation groups?" (Q5), which totals to 68986 employees with classification based on the predetermined list of job type.

Data collected on weighting variables

In line with the weighting process with 2008/09, we have taken two key variables for weighting:

1. Job type
2. Company type

Weighting of the employee data is based on the total number of employees gathered in the job type question (Q5) in the employer survey, to avoid cells of “others” that contribute to a significant proportion of any company type. The classifications are based on employers’ reported information, and there are a few key differences compared to the 2008/09 data:

1. The proportion of “Other Public Services” has fallen from 10% to 4%.
2. “Catering and Retail” has fallen from 12% to 7%.
3. “Other Company” has increased from 5% to 11%.

Table: Data collected from the employer survey that was used as the population target.

	Airlines/Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo/Freight/Courier Services	Building and Maintenance Contractors	Other Company	All
Management/Professional - Airport/Airline Specific	415 1%	1 0%	397 6%	186 2%	7 0%	14 3%	143 6%	352 5%	1515 2%
Management/Professional - General	3,033 7%	25 2%	707 11%	179 2%	35 2%	42 8%	192 8%	454 7%	4667 7%
Passenger Services, Sales and Clerical Staff	7,177 17%	4 0%	501 8%	8 0%	174 8%	15 3%	68 3%	3,468 52%	11415 17%
Air Cabin Crew	16,765 41%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	78 1%	16843 24%
Pilots/ATC/Flight Operations	4,230 10%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	77 1%	4307 6%
Information Technology	744 2%	0 0%	4 0%	0 0%	4 0%	9 2%	85 4%	9 0%	855 1%
Maintenance Tradesmen and Other Skilled Workers/ Supervisors	3,691 9%	0 0%	410 7%	0 0%	17 1%	84 15%	1035 45%	355 5%	5592 8%
Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and Unskilled Workers/Supervisors	5,173 13%	0 0%	177 3%	0 0%	93 4%	346 64%	17 1%	1,619 24%	7425 11%
Catering and Retail	5 0%	0 0%	0 0%	7,754 95%	3 0%	0 0%	0 0%	67 1%	7829 11%
Cleaning and Housekeeping	4 0%	0 0%	0 0%	0 0%	0 0%	0 0%	773 33%	59 1%	836 1%
Customs, Immigration, Police and Fire Staff	0 0%	1,539 96%	91 1%	0 0%	0 0%	25 5%	0 0%	52 1%	1707 2%
Security, Passenger Search, Access Control	0 0%	30 2%	3,958 63%	0 0%	1,970 86%	7 1%	0 0%	30 0%	5995 9%
Total	41237 60%	1599 2%	6245 9%	8127 12%	2303 3%	542 1%	2313 3%	6620 10%	68986 -

Table: Data collected from the employee survey, showing the proportion of job type and company type achieved.

	Airlines/Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo/Freight/Courier Services	Building and Maintenance Contractors	Other Company	Did not specify	All (unweighted)
Management/Professional - Airport/Airline Specific	70	1	64	5	3	1	2	19	21	186
	4%	1%	11%	1%	0%	3%	1%	2%	4%	4%
Management/Professional - General	39	1	107	28	20	5	32	63	35	330
	2%	1%	18%	6%	3%	13%	10%	8%	7%	7%
Passenger Services, Sales and Clerical Staff	889	4	57	101	400	19	5	212	164	1851
	55%	5%	9%	23%	64%	48%	2%	27%	34%	37%
Air Cabin Crew	171	-	3	-	1	-	-	2	20	197
	11%	-	1%	-	0%	-	-	0%	4%	4%
Pilots/ATC/Flight Operations	30	-	3	-	-	-	1	4	3	41
	2%	-	1%	-	-	-	0%	1%	1%	1%
Information Technology	17	-	27	1	5	-	16	95	9	170
	1%	-	4%	0%	1%	-	5%	12%	2%	3%
Maintenance Tradesmen and Other Skilled Workers/Supervisors	35	-	20	4	28	-	59	39	18	203
	2%	-	3%	1%	5%	-	19%	5%	4%	4%
Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and Unskilled Workers/Supervisors	214	-	31	21	56	8	15	76	49	470
	13%	-	5%	5%	9%	20%	5%	10%	10%	9%
Catering and Retail	10	-	6	237	33	1	8	45	41	381
	1%	-	1%	55%	5%	3%	3%	6%	8%	8%
Cleaning and Housekeeping	9	-	5	10	9	2	126	35	25	221
	1%	-	1%	2%	1%	5%	41%	4%	5%	4%
Customs, Immigration, Police and Fire Staff	1	46	4	-	3	-	2	2	12	70
	0%	61%	1%	-	0%	-	1%	0%	2%	1%
Security, Passenger Search, Access Control	34	10	236	1	16	4	6	130	54	491
	2%	13%	39%	0%	3%	10%	2%	16%	11%	10%
Other/ don't know/ did not specify	115	15	54	28	61	1	39	88	39	440
	7%	20%	9%	6%	10%	3%	13%	11%	8%	9%
Total	1613	75	604	434	622	40	309	797	484	4978
	32%	2%	12%	9%	13%	1%	6%	16%	10%	-

Weighting and extrapolation

Replicating the weighting approach used in 2008/09 survey, cell weighted was used. This method attempts to match each individual cell proportion of the two variables from the employee survey to the employer survey (i.e. job type x company type = 104 cells). Effective sample size per variable was (36%). For this method, cells with missing information were given a weight of 1. The advantage of cell weighting is that there is only one simple formula used (weight = % in population ÷ % in sample), and this is in theory “purer” because each cell is weighted to “true” information.

Subsequent to that, the data is then extrapolated to represent the population size, using 68985 as the population total for extrapolation.

Table: Weighted and extrapolated employee data distribution, including all respondents (i.e. including those with missing job type or company type information).

	Airlines/Airline Handling Agents	Government Services	Heathrow Airport Ltd	Catering and Retail	Other Public Passenger Services	Cargo/Freight/Courier Services	Building and Maintenance Contractors	Other Company	Did not specify	All (weighted & extrapolated)
Management/Professional - Airport/Airline Specific	325	1	325	146	19	14	112	276	291	1509
	1%	0%	5%	2%	1%	3%	4%	4%	4%	2%
Management/Professional - General	2446	20	693	140	27	42	164	397	485	4415
	7%	1%	11%	2%	1%	9%	6%	6%	7%	6%
Passenger Services, Sales and Clerical Staff	5790	3	476	34	302	29	53	2856	2273	11816
	17%	0%	8%	0%	10%	6%	2%	43%	34%	17%
Air Cabin Crew	13194	-	42	-	14	-	-	75	277	13601
	38%	-	1%	-	0%	-	-	1%	4%	20%
Pilots/ATC/Flight Operations	3370	-	42	-	-	-	14	60	42	3528
	10%	-	1%	-	-	-	1%	1%	1%	5%
Information Technology	583	-	3	14	3	-	80	21	125	829
	2%	-	0%	0%	0%	-	3%	0%	2%	1%
Maintenance Tradesmen and Other Skilled Workers/Supervisors	2934	-	335	55	41	-	839	278	249	4732
	8%	-	5%	1%	1%	-	32%	4%	4%	7%
Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and Unskilled Workers/Supervisors	4137	-	208	291	101	347	27	1324	679	7113
	12%	-	3%	4%	3%	70%	1%	20%	10%	10%
Catering and Retail	18	-	83	6090	44	14	111	149	568	7077
	0%	-	1%	84%	1%	3%	4%	2%	8%	10%
Cleaning and Housekeeping	17	-	69	139	125	28	606	60	346	1390
	0%	-	1%	2%	4%	6%	23%	1%	5%	2%
Customs, Immigration, Police and Fire Staff	14	1234	85	-	42	-	28	41	166	1609
	0%	83%	1%	-	1%	-	1%	1%	2%	2%
Security, Passenger Search, Access Control	471	51	3199	14	1585	21	83	107	748	6279
	1%	3%	52%	0%	53%	4%	3%	2%	11%	9%
Other/ don't know/ did not specify	1594	208	748	388	845	14	540	1220	540	6098
	5%	14%	12%	5%	28%	3%	21%	18%	8%	9%
Total	34602	1489	6127	7283	2968	494	2630	6684	6708	68985
	50%	2%	9%	11%	4%	1%	4%	10%	10%	-

Appendix II: Invitation Emails

Ref: xxxxxx

Dear Sir/Madam,

Heathrow Airport Limited conducts a travel survey every five years among both businesses and their employees at Heathrow, to build an accurate picture of the working population based in or around the Airport. It plays a key role informing the provision of facilities and services for those employees, in particular:

- staff rest areas
- transport infrastructure
- help with recruitment and training of staff at Heathrow
- initiatives within the local community.

This year we have asked independent research company Ipsos MORI to survey all organisations with staff based at Heathrow, followed in the autumn by a very short survey among Heathrow workers themselves, to see how they travel to and from work. **All information provided will remain strictly confidential** to Ipsos MORI, and data will only be passed to Heathrow Airport Limited in aggregate form.

You can access Ipsos MORI's business survey using the link below; it will take no more than 10 minutes to complete provided to have the correct information to hand. If you need to leave the survey to find any additional information, you will be able to return at a later date without losing your completed answers. Please type in the reference number on the top of this email to log in.

www.ipsos-mori.com/Heathrow

Alternatively, an Ipsos MORI executive interviewer will call you from 14 August, to answer any queries you may have and to give you the opportunity to complete the survey via telephone if you prefer.

If you are not the correct person within your company to complete the survey, we hope you can forward this email on to someone better placed to respond.

Thank you in advance for your help with this important study. If you have any queries about or would like to arrange a telephone interview, please contact Sabrina Liu at HeathrowEmploymentSurvey@Ipsos-Mori.com or 020 7347 3826.

Yours sincerely

Ipsos MORI Heathrow Employment Survey Team

Appendix III: Employer questionnaire

Heathrow Airport 2013 Employment Survey Employer Questionnaire FINAL, 19 August 2013

ALL QUESTIONS ARE OPTIONAL (DO NOT FORCE ANSWER)

INTRODUCTION

ONLINE/CATI

Thank you for taking part in the Heathrow Employment Survey. This study is being conducted by Ipsos MORI, an independent research company, on behalf of Heathrow Airport Limited.

The Employment Survey is conducted every five years to help with the provision of facilities and services for people working at the airport.

All the information you give us is completely confidential and held by Ipsos MORI. All responses will be aggregated before presenting the findings.

The questionnaire should take no more than 10-15 minutes to complete.

Q1

ASK ALL

OE

ONLINE: Please enter the contact details of your company. This is for administrative purposes and your responses will not be directly attributed to you.

CATI: POPULATE INFO WHEN AVAILABLE

WHEN INFO IS AVAILABLE: Can I confirm your reference number is ...your name is...etc. **ONLY AMEND IF NECESSARY)**

WHEN INFO NOT AVAILABLE: Please tell us the contact details of your company. This is for administrative purposes and your responses will not be directly attributed to you. **(READ OUT)**

Reference number (you can find this on top of the letter): **[FORCE ANSWER] WRITE IN (DK for CATI)**

Contact: **WRITE IN (DK for CATI)**

Job Title: **WRITE IN (DK for CATI)**

Company Name: **WRITE IN (DK for CATI)**

Location: **WRITE IN (DK for CATI)**

Telephone Number: **WRITE IN (DK for CATI)**

Mobile Number: **WRITE IN (DK for CATI)**

Email: **WRITE IN (DK for CATI)**

Section 1: Company Details

ONLINE/CATI (READ OUT)

We would firstly like to ask you some questions about the size and type of your business operating at Heathrow. In all cases we are only interested in those staff that are Airport-based, that is those that work in or around the Airport.

Q2

ASK ALL

SA

ONLINE: What is the nature of your airport business?

CATI: What is the nature of your airport business? (READ OUT)

- 1 Airlines/Airline Handling Agents
- 2 Government Services
- 3 Heathrow Airport Ltd
- 4 Catering and Retail
- 5 Other Public Passenger Services
- 6 Cargo/Freight/Courier Services
- 7 Building and Maintenance Contractors
- 8 Other Company [SPECIFY]
- 9. DK (CATI ONLY)

Q3

ASK ALL

OE

ONLINE: What is the breakdown of your company's staff at Heathrow, including fixed term contract staff, by male/female and full-time/part-time workers?

CATI: I'm now going to ask you to break down your staff at Heathrow, including fixed term contract staff, please include only airport based staff. How many full time men do you employ? And women? And part-time men?... (REFER TO BRIEFING NOTE)

	Number of Staff [Reminder: Airport-based staff only]			
	Working full-time	Working part-time	Temporary/seasonal	TOTALS
Male	WRITE IN (A)	WRITE IN (C)	WRITE IN (E)	TOTAL MUST EQUAL A+B+E
Female	WRITE IN (B)	WRITE IN (D)	WRITE IN (F)	TOTAL MUST EQUAL B+D+F
TOTALS	TOTAL MUST EQUAL A+B	TOTAL MUST EQUAL C+D	TOTAL MUST EQUAL E+F	TOTAL MUST EQUAL A+B+C+D+E+F

DK (CATI ONLY)

Q4

ASK ALL

OE

ONLINE: And what proportion of your company's total staff is based at Heathrow? Please write in percentage.

CATI: And what proportion of your company's total staff is based at Heathrow? (PLEASE WRITE IN PERCENTAGE)

WRITE IN
DK (CATI ONLY)

Q5
ASK ALL
OE

ONLINE: What is the current breakdown of your company's staff by the following occupation groups?

CATI: For each of the following occupation groups, can you please tell me how many permanent staff do you employ? And how many seasonal or temporary ones? Please include only airport based staff (READ OUT)

Occupation Groups of Permanent and Temporary/Seasonal Airport Staff [Reminder: Airport-based staff only]	Number of Staff who are:	
	Permanent	Temporary/ Seasonal
Management/Professional - Airport/Airline Specific	WRITE IN	WRITE IN
Management/Professional - General	WRITE IN	WRITE IN
Passenger Services, Sales and Clerical Staff	WRITE IN	WRITE IN
Air Cabin Crew	WRITE IN	WRITE IN
Pilots/ATC/Flight Operations	WRITE IN	WRITE IN
Information Technology	WRITE IN	WRITE IN
Maintenance Tradesmen and Other Skilled Workers/Supervisors	WRITE IN	WRITE IN
Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and Unskilled Workers/Supervisors	WRITE IN	WRITE IN
Catering and Retail	WRITE IN	WRITE IN
Cleaning and Housekeeping	WRITE IN	WRITE IN
Customs, Immigration, Police and Fire Staff	WRITE IN	WRITE IN
Security, Passenger Search, Access Control	WRITE IN	WRITE IN
TOTAL - ALL OCCUPATION GROUPS	TOTAL MUST EQUAL SUM OF CLOUMNS ABOVE	TOTAL MUST EQUAL SUM OF CLOUMNS ABOVE

DK (CATI ONLY)

Q6
ASK ALL
OE

ONLINE: What percentage of your company's staff, including management, would you describe as currently being involved in handling, processing or providing services/facilities?

CATI: What percentage of your company's staff, including management, would you describe as currently being involved in handling, processing or providing services/facilities? (REFER TO BRIEFING NOTE)

[Reminder: Airport-based staff only]	%
--------------------------------------	---

(a) Passengers ONLY OR MAINLY	WRITE IN
(b) Aircraft operations ONLY OR MAINLY	WRITE IN
(c) Air cargo ONLY OR MAINLY	WRITE IN
(d) Passengers and/or aircraft operations and/or air cargo, i.e. more than one of (a), (b) or (c)	WRITE IN
(e) 'Home-base' maintenance work	WRITE IN
(f) Other, including admin. and clerical support for passengers and aircraft	WRITE IN
TOTAL	MUST EQUAL 100

DK (CATI ONLY)

Q7

ASK ALL

OE

ONLINE: Can you tell me the approximate numbers of staff earning in the following income bands? For part time staff please use their annual salary equivalent.

CATI: Can you tell me the approximate numbers of staff earning in the following income bands? For part time staff please use their annual salary equivalent. (READ OUT)

	Number of employees
Basic rate tax payers (up to £35,000)	WRITE IN
Higher rate tax payers (£35,001 - £150,000)	WRITE IN
Additional rate (over £150,000)	WRITE IN

DK (CATI ONLY)

Q8

ASK ALL

OE

ONLINE: What is the total annual wage bill for your company's staff at Heathrow? Please write in GBP.

CATI: What is the total annual wage bill for your company's staff at Heathrow? (PLEASE WRITE IN GBP)

WRITE IN

DK (CATI ONLY)

Q9

ASK ALL

OE

ONLINE: Of your employees based at Heathrow, please can you offer a breakdown by ethnic group? Please fill in all group categories, and where possible any sub-groups that apply.

CATI: Of your employees based at Heathrow, please can you offer a breakdown by ethnic group? Please fill in all group categories, and where possible any sub-groups that apply. (READ OUT) (ONLY ASK THE SUB GROUPS WHEN THE MAIN GROUP IS ANSWERED eg. White, Mixed...- PLEASE REFER TO BRIEFING NOTE)

Ethnicity	Number of employee	
WHITE	WRITE IN	DK
British	WRITE IN	DK
Irish	WRITE IN	DK
Other European	WRITE IN	DK
Any other white background	WRITE IN	DK
MIXED / MULTIPLE ETHNIC GROUPS	WRITE IN	DK
White and Black Caribbean	WRITE IN	DK
White and Black African	WRITE IN	DK
White and Asian	WRITE IN	DK
Any other mixed /multiple ethnic background	WRITE IN	DK
ASIAN / ASIAN BRITISH	WRITE IN	DK
Indian	WRITE IN	DK
Pakistani	WRITE IN	DK
Bangladeshi	WRITE IN	DK
Any other Asian background	WRITE IN	DK
BLACK / AFRICAN / CARIBBEAN / BRITISH BLACK	WRITE IN	DK
Caribbean	WRITE IN	DK
African	WRITE IN	DK
Any other black / African / Caribbean background	WRITE IN	DK
CHINESE OTHER ETHNIC GROUP	WRITE IN	DK
Chinese	WRITE IN	DK
Arab	WRITE IN	DK
Any other ethnic group	WRITE IN	DK

Q10

ASK ALL

OE

ONLINE: How many of your company's total Airport staff are registered as disabled? Please write in number.

CATI: How many of your company's total Airport staff are registered as disabled? (PLEASE WRITE IN NUMBER)

WRITE IN

DK (CATI ONLY)

Section 2: Employee Travel

ONLINE/CATI (READ OUT)

We would now like to ask you some questions about the transport provided to your employees.

Q11

ASK ALL

ONLY SHOW COLUMN B WHEN A IS SELECTED

MA

ONLINE: Does your company currently provide any of the following facilities for home to work journeys?

CATI: Does your company currently provide any of the following facilities for home to work journeys? If so, how many? (READ OUT)

	Currently provide (A)	Number of staff currently using facility (B)
Public transport season ticket loans		WRITE IN
Discounted public transport travel		WRITE IN
Car sharing scheme		WRITE IN
Company minibus		WRITE IN
Discounted taxi fares		WRITE IN
Travel planning / personalised travel plans		WRITE IN
None of these	[EXCLUSIVE]	

(DK for CATI)

Q12

ASK ALL

SA

ONLINE: Are you aware of the Heathrow Commuter Team and range of associated staff travel discounts and schemes available?

CATI: Are you aware of the Heathrow Commuter Team and range of associated staff travel discounts and schemes available? (READ OUT)

1 Yes

2 No

3 (DK for CATI)

Q14

ASK ALL

MA

ONLINE: Are you aware of either of the following initiatives?

CATI: Are you aware of either of the following initiatives? (READ OUT)

	Yes	No	No, and not interested in learning more
Heathrow Area Transport Forum			
Airports Surface Access Strategy			

(DK for CATI)

Q15

ASK ALL

MA

ONLINE: What methods of communication are most successful with your employees?

CATI: What methods of communication are most successful with your employees? (READ OUT)

- 1 In-house newsletter / newspaper / magazine
- 2 Intranet
- 3 Social media [SPECIFY]
- 4 Email
- 5 Company app
- 6 Text messaging
- 7 Staff briefings
- 8 Other [SPECIFY]
- 9 None [EXCLUSIVE]
- 10 Don't know [EXCLUSIVE]

Q16

ASK ALL

SA

ONLINE: Does your company provide transport for staff to get to and around work?

CATI: Does your company provide transport for staff to get to and around work? (READ OUT)

- 1 Yes
- 2 No (GO TO Q18)
- 3 Don't know [EXCLUSIVE]

Q17

ASK ALL CODE 1 IN Q16

MA

ONLINE: What modes of transport do you provide?

CATI: What modes of transport do you provide? (READ OUT)

1 Minibus

2 Bus

3 Coach

4 Other [WRITE IN]

5 (DK for CATI)

Q18a

ASK ALL

MA

ONLINE: How many of the following vehicles do you run at Heathrow?

CATI: I would now like to ask how many vehicles do you run mainly landside, airside or evenly used on both. How many petrol car do you use mainly airside? How about diesel car? (READ OUT LIST) How about vehicles run mainly in airside? (PROBE IN FULL AND REPEAT FOR 'Use evenly landside/airside) (PLEASE REFER TO BRIEFING NOTE)

WRITE IN NUMBER OF VEHICLES

	Use mainly landside	Use mainly airside	Use evenly landside/airside
1 Petrol car	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
2 Diesel car	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
3 Electric car	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
4 Petrol van	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
5 Diesel van	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
6 Electric van	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
7 Diesel HGV	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
8 Diesel Bus	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
9 Diesel Coach	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
10 Diesel off-road small (37–75 kw)	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
11 Diesel off-road medium (75-130 kw)	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
12 Diesel off-road large (130–560kw)	WRITE IN NO.	WRITE IN NO.	WRITE IN NO.
13 None [EXCLUSIVE]			
14 Don't Know [EXCLUSIVE]			

Q18b

ASK ALL CODING 1, 2, 4, 5, 7-12 IN Q18a

SA

ONLINE: Is your company looking at alternative technologies (e.g. full hybrid, stop start hybrid, compressed natural gas or hydrogen) for your petrol/diesel vehicles?

CATI: Is your company looking at alternative technologies (e.g. full hybrid, stop start hybrid, compressed natural gas or hydrogen) for your petrol/diesel vehicles?

1 Yes

2 No

3 Don't know

Section 3: Recruitment and Training

ONLINE/CATI (READ OUT)

We would now like to better understand what, if any, barriers you face with recruitment and progression of employees.

Q19

ASK ALL

MA

ONLINE: Are there any particular job roles you find challenging to recruit?

CATI: Are there any particular job roles you find challenging to recruit? (READ OUT)

- 1 Management/Professional - Airport/Airline Specific
- 2 Management/Professional – General
- 3 Passenger Services, Sales and Clerical Staff
- 4 Air Cabin Crew
- 5 Pilots/ATC/Flight Operations
- 6 Information Technology
- 7 Maintenance Tradesmen and Other Skilled Workers/Supervisors
- 8 Apron, Ramp, Cargo, Drivers, Baggage Staff and Other Semi-Skilled and
- 9 Unskilled Workers/Supervisors
- 10 Catering, Cleaning, Housekeeping
- 11 Customs, Immigration, Police and Fire Staff
- 12 Security, Passenger Search, Access Control
- 13 Other [SPECIFY]
- 14 None of the above – we do not struggle with recruiting staff [EXCLUSIVE]
- 15 (DK for CATI)

Q20

ASK ALL WHO CHOSE AT LEAST ONE A IN Q20

MA

ONLINE: What do you believe are the biggest barriers to recruitment?

CATI: What do you believe are the biggest barriers to recruitment? (READ OUT)

- 1 Lack of suitably qualified/experienced applicants
- 2 Skills gap
- 3 Difficulty targeting the right people
- 4 Location
- 5 Competitive salaries
- 6 Cost of recruitment
- 7 Length of recruitment process
- 8 Level of security screening required
- 9 Employer brand
- 10 Image of the sector
- 11 Other [SPECIFY]
- 12 (DK for CATI)

Q21

ASK ALL

MA

ONLINE: Which of the following sources do you use as a method of recruitment?

CATI: Which of the following sources do you use as a method of recruitment? (READ OUT)

- 1 Advertising in national press
- 2 Advertising in Airport press
- 3 Recruitment agencies
- 4 Head-hunters
- 5 Jobcentre Plus
- 6 Careers Fairs
- 7 Graduate Recruitment Schemes
- 8 Heathrow Academy
- 9 Websites [SPECIFY]
- 10 Other [SPECIFY]
- 11 (DK for CATI)

Q22

ASK ALL

MA

ONLINE: Other than statutory training (eg Fire Training, GSAT), what work-related training does your company currently provide to staff at Heathrow?

CATI: Other than statutory training (eg Fire Training, GSAT), what work-related training does your company currently provide to staff at Heathrow? (READ OUT)

- 1 Job specific
- 2 Health and safety
- 3 Induction
- 4 Training in new technology
- 5 Supervisory
- 6 Management
- 7 Other [SPECIFY]
- 8 (DK for CATI)

Q23

ASK ALL

OE

ONLINE: How much does your organisation spend on training per year?

CATI: How much does your organisation spend on training per year? And what percentage of your total operational spend does this constitute? (READ OUT)

		None	Don't know
Total training spend (£)	[WRITE IN]	[EXCLUSIVE]	[EXCLUSIVE]
Total training spend as a percentage of your total operational expenditure	[WRITE IN]	[EXCLUSIVE]	[EXCLUSIVE]

Section 4: Environment / sustainability

ONLINE/CATI (READ OUT)

Finally, we would now like to ask you some questions about your environment and sustainability initiatives.

Q24

ASK ALL

MA

ONLINE: Do you have any of the following strategies/initiatives in place?

CATI: Do you have any of the following strategies/initiatives in place? (READ OUT)

- 1 Sustainability strategy/policy
- 2 Environmental management policy/strategy
- 3 Carbon footprint measurement
- 4 Plans in place to reduce your carbon footprint
- 5 Plans in place to reduce your waste generation
- 6 Sustainable transport for staff to and from the airport
- 7 Sustainable vehicles within the airport
- 8 Greener building design
- 9 Community investment schemes in the area surrounding Heathrow
- 10 Employee Volunteering schemes
- 11 Local procurement processes
- 12 None of the above [EXCLUSIVE]
- 13 Don't know [EXCLUSIVE]

Q25

ASK ALL

OE

ONLINE: Which, if any, environmental/sustainability working groups are you involved in at Heathrow?

CATI: Which, if any, environmental/sustainability working groups are you involved in at Heathrow?

[WRITE IN]

(DK for CATI)

Q26 ONLINE ONLY

ASK ALL

SA

ONLINE: Occasionally we may need to re-contact people to ask further questions with regards to a survey they have completed. Would you be willing for Ipsos to re-contact you, with regards to this survey, within the next 6 months?

1. Yes, I am happy to be re-contacted
2. No, I do not want to be re-contacted

Q27a CATI ONLY

ASK ALL
OE

CATI:

Ipsos MORI will be conducting a second phase of research among employees of companies based at Heathrow. The results will be used to help Heathrow plan facilities and transport for staff.

Are you able to provide us with some details that would help us reach employees at your company?

(INTERVIEWER NOTE: WE CAN SUGGEST COFFEE SHOPS ON LANDSIDE AT THE AIRPORT AS LOCATIONS, E.G. COSTA, CAFÉ NERO, ETC.)

1. Yes (GO TO Q27b)
2. Yes, I can provide information at a later date (INTERVIEWER TO PROVIDE CONTACT DETAILS: heathrowemploymentsurvey@ipsos-mori.com)
3. No

Q27b CATI ONLY

ASK ALL WHO CODE 1 IN Q27a

OE

Suitable dates in October 2013 for interviewing	[WRITE IN]
Suitable times for interviewing	[WRITE IN]
Suggested location(s) at Heathrow	[WRITE IN]
Contact details of on-site manager/supervisor	[WRITE IN]

THANK AND CLOSE

