

**DEVELOPING A SUSTAINABLE  
FRAMEWORK FOR UK AVIATION:  
SCOPING DOCUMENT March 2011**

**A Response to the  
DfT  
by  
MSP Solutions Ltd.**

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## **DEVELOPING A SUSTAINABLE FRAMEWORK FOR UK AVIATION: SCOPING DOCUMENT**

### **1. INTRODUCTION**

MSP Solutions is an aviation consulting practice with a wide range of highly experienced and knowledgeable people, all of who have worked in senior roles within airports and airlines. Many of our people have significant and specific experience in developing and reviewing airport and airline long term strategic development over many years. We are therefore very well versed and qualified in all the issues currently pertaining to the development of a sustainable framework for UK aviation. We also fully appreciate the key aspects related to sustainability, economic benefits, operational efficiencies and customer service, as defined in the March 2011 Scoping Document.

This document is intended to assist in defining the debate on the development of long-term policy for UK aviation. It addresses, in a holistic way, the strategic questions identified within the Scoping Document relating to aviation and the economy, aviation and climate change, and aviation and the local environment.

In compiling our submission, we have taken fully into account the Coalition Government's expression of intention to place the aviation sector on a sustainable, long-term path, with the overall goal to create a sustainable framework for aviation in the UK, improve the passenger experience at airports, and maintain high standards of safety and security for passengers and freight.

We also recognise the Coalition Government's stated position in relation to cancelling the BAA plans for a third runway at Heathrow airport and that it would refuse permission for additional runways at Gatwick and Stansted airports

The Coalition Government has indicated that it would like to reduce the need for future airport development and expansion by diverting large volumes of passenger flows from shorthaul domestic and European flights on to High Speed Rail. While being enthusiastic supporters of improved rail/airport links, we remain doubtful about the practicality of achieving such major change and that the question of additional runway capacity in SE England will remain a major issue if London and the UK is to remain a World Class Financial and Business Centre.

The Government has one way in which it could ease the pressure on scarce slot availability at LHR. Subject to approval on all aspects of safety, this would be to extend the current mixed mode trial on both runways at LHR indefinitely. This change would add around 17% extra capacity at LHR without and major investment in infrastructure. If there is to be no third runway at LHR this would be the only realistic way of easing the immediate capacity shortage at the UK's only hub airport.

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## 2. EXECUTIVE SUMMARY

SE UK aviation demand is forecast to grow beyond available capacity within some 15-20 years and there are a number of indications that UK could significantly suffer in terms of business activity and associated trade, employment and income if an inadequate aviation framework were not in-place. This concern is reinforced as European competitor airport hubs such as Paris (CDG), Amsterdam (AMS) and Frankfurt (FRA) continue to ensure surplus capacity is always available. Thus they will be capable of attracting larger numbers of UK passengers who will become increasingly dissatisfied with a highly congested UK airports system.

To remain competitive in the international aviation market, London needs at least one large airport with sufficient capacity to handle the future demand for the growing international premium/business air passenger demand for both longhaul and shorthaul routes on a single site. It should also be noted that world-wide aviation experts all agree that a single “hub” airport is by-far the best solution for major cities and there are no examples of successful two-hub city airports.

What London currently has is a distributed 5-airport system, LHR, LGW, STN, LTN and LCY with no single airport able to cope with the same number of future air transport movements (take-offs and landings) that could be handled by the major Continental European Airports such as Amsterdam (AMS), Paris (CDG), Frankfurt (FRA) and Madrid (MAD).

MSP Solutions believes that the expansion of the London Airports System with 2 new runways one each at LHR and STN as proposed by the previous Labour Government was fundamentally flawed, as a best, it only provided a medium term fix to increasing capacity at the key London airport LHR. From a hubbing viewpoint the previous BAA 3<sup>rd</sup> LHR runway proposal was far from ideal for easy flight connections. It was surprising that the scheme was supported so strongly by the airlines.

Arguably the BAA proposed new northern runway at LHR was not the best solution for developing capacity at LHR or in the London area as a whole. The Government’s support for free trade and a mercantile world means that it should actively support the development of added-value economic activity in the UK and especially in London and SE England.

To enable London to remain as the centre of financial activities and trade in Europe will require the maintenance and further development of first rate air services to all parts of the world especially the BRIC countries that are expected to grow the fastest in economic terms over the next 50 years. Providing these air services will require additional airport capacity in SE England within the next 15 years. So while the Government is unwilling to allow the approval of additional runway capacity during this Parliament, it cannot logically do so for ever. Bearing in mind the extended time needed to build new airport capacity, the Government now needs to look realistically at the options that could be undertaken during the period of the next Parliament.

For the reasons outlined earlier we believe it would be a clear mistake not to consider the relative merits and feasibility of a range of airport development options, including other close

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parallel runways at LHR, additional runways at the other main airports or even a completely new airport in the Thames estuary area or elsewhere.

Key factors that bring us to this view are

- That aviation is a key driver of the UK economy. The UK is already falling behind other countries in the development of its aviation sector and will fall even further behind if nothing is done to improve air access to the SE.
- The forecast used including in the Department for Transport Aviation Forecast are unduly conservative especially in respect of emissions reduction.
- The assumption used that carbon savings will be in a range of 0 to 5% by 2050 contrasts with the industry view that biofuels could represent 50% of worldwide aviation fuel consumption by the same date.
- This may be over optimistic, but it seems to be premature to rule out the possibility at this stage that aviation in years to come will be much greener and therefore will continue to grow, possibly at rates even greater than currently forecast.

Given that timescale for planning and construction is likely to be 10 to 15 years, to ignore the issue of runway capacity means that additional capacity will not be achieved until 2025-2030 at the very earliest.

We are of the opinion that the coming five years is the most important time window ever faced by a UK Government in relation to ensuring a robust future for both UK aviation and UK economy. A recent factor not previously taken into account is the mobility of major international companies who can now relocate with comparative ease if the business environment proves unsatisfactory. From recent studies undertaken by MSP Solutions, there is some evidence that London is already seeing a noticeable down-turn in business travellers from overseas which relates to Heathrow becoming less attractive.

The Government needs to think wisely and strategically as to the future of civil aviation in SE England. It needs a short to medium term fix to the existing airports and a long term solution as to a new strategic hub airport solution if SE England is to remain a world class gateway able to compete in international markets in the mid 21<sup>st</sup> Century. Given the extended timeframe for planning, design and development, the time for looking at these solutions needs to be now, not in 30 years when it will then be too late to take the necessary decisions.

For the last 30 years UK civil aviation has struggled with an oscillating series of short term fixes and compromises and ill-considered schemes to expand airport capacity in SE England based on what has emerged as a distributed multiple airport site policy. This has now evolved into 5 distinct airport sites LHR, LGW, STN, LTN and LCY, none of which now has sufficient capacity to develop into true hub airport to handle the premium service airlines' growing air passenger demand that is critical to future UK economic development.

With the notable exception of Stansted all of the existing sites have insufficient land availability to add enough runway capacity to go up to 4 parallel runways to match Paris (CDG) which is what London needs. However Stansted is not in a good location to meet the needs of the

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London area which explains why there that no full-service airlines operating there and there are currently no longhaul scheduled flights at the airport. This is not expected to change as even in the latest DfT forecasts, all future flights at Stansted are shown as low cost scheduled short haul flights.

The multiple airport policy has constantly led to free airport capacity in the wrong place where it was not needed or not wanted by the industry. First this occurred at Gatwick, followed by Stansted and then by London City airports. With the exception of London City Airport on each occasion secondary services in-filled most of the spare capacity, first with charter flights then full service scheduled flights and more recently with low cost operators such as easyJet and Ryanair.

London City also took years to develop services due to its very short runway, initial poor public service access to the City of London and the limited number of aircraft types certified to operate there. In recent years with the extension of the Dockland Light Railway and the realisation that for shorthaul business travellers it could be a convenient airport has led to significant increases in both frequency and choice of destinations.

The main trade-off of the multiple airport strategy has been to multiply the choice of shorthaul flights especially with the explosion of low cost airlines to give consumers much lower cost flying, but this has been at the expense of limiting longhaul flights to new destinations and low frequency on many other flights.

The multiple designation policy to licence other UK carriers to compete on longhaul routes in competition with BA has not increased the number of destination, but mainly led to cherry picking by the new entrants with increased frequency on selected destinations such as North America, South Africa and Asia. No new routes have been established to China, the Russian Federation or South America. In fact direct UK services to South America have sharply declined during this period.

While not all of this change that has been brought about by a liberal attitude of present and previous UK Governments has been bad, the problem is that that balance towards ensuring that premium passengers services also should prosper has been lost and it is ultimately these services that encourage foreign business investment in the UK not additional flights by Ryanair and easyJet to European destinations.

For the last 8 years both Ryanair and easyJet have operated a supply-led operation benefitting from huge orders of Boeing and Airbus shorthaul aircraft at prices not available to other airlines. In short the two aircraft manufacturers have subsidised the two low cost operators at the expense of higher aircraft prices for deliveries to other airlines.

One cannot blame the two low cost airlines for astute timing in their purchasing, but the UK Government needs to be aware of this situation and the distortion that it causes in the market place. Even with higher fuel prices ownership or the equivalent leasing costs still account for a significant proportion of total airline operating costs

The Government is also concerned at the rapid growth of civil aviation from an environmental viewpoint and has imposed a departure passenger tax (Airport Passenger Duty) that has now

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escalated to the extent that it now represents a significant percentage of both business and economy travel especially on longhaul flights. This unilateral tax has hit the UK aviation very significantly especially for BA and Virgin, while no Continental European airlines such as Air France-KLM and Lufthansa have such a negative drag on their cashflow.

None of this money is re-invested by the UK Government into the UK aviation industry and at the same time the structure of ADP penalises longhaul flights which are precisely the area in which the UK needs to expand services. The corollary of this situation is that current UK Government policy continues to support the growth of low cost services which are precisely the flights that give the minimum benefit to UK trade and inward investment.

Throughout the course of SE airport expansion at each new development stage the Government has sought to achieve either through the legal process or by imposition on the airport operators of a series of voluntary agreements restricting the number of take-offs and landings, restricting the usage of runways, covenants preventing or inhibiting the building of new runways. This compromised aviation policy has led to gradual, but now accelerating, loss of competitiveness in the UK civil aviation sector. Whereas 10 years ago the combination of British Airways (BA) and BAA placed the UK in the number 1 position in Europe, the UK has now declined to the number three position behind Lufthansa/Fraport and Air France/Aéroports de Paris. This has arisen as both Lufthansa and Air France were able to expand at their home base airports whereas BA has been much more constrained due to no additional slots available at LHR.

The fact that additional slots were available at both LGW and STN during this time was of little help to BA as there was no possibility of maximising connections at these airports for BA as to do so it would have to have duplicated its LHR network which was clearly uneconomic to achieve.

The Government's position to allow BAA to be sold into foreign ownership and the subsequent policy to break-up the BAA ownership of 3 of the major SE Airports (LHR, LGW and STN) has been a huge strategic mistake as the ownership and development of all the SE airports is in the hands of private equity groups whose objective is oriented on short term improvements at minimum cost to be followed by a sale in the medium term to exit with a substantial capital gain. The replacement of what was previously BAA equity capital with massive debt financing under these private equity structures has also been a huge mistake making it much more difficult and expensive to finance expansion and improvements to these airports.

There is a role for private equity schemes to enhance the improvement of management performance in poorly performing businesses. However, in the case of BAA the arrival of Ferrovial and its private equity partners has led to a sharp deterioration of management performance over recent years especially at LHR. In BAA's most recent reports placed in the public domain it claims to have made a substantial improvement in the performance of its airports. If this is true, it is most welcome, but there must still be some concerns on how effective BAA management really is after all the debacles of previous years and of the winter 2010/2011.

Private equity is generally an inappropriate structure for long term strategic businesses that require specialist expertise such as airports. We are of the opinion that the previous Labour

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Government administration has been derelict in its duty of care to the general public to have allowed BAA which controlled the key strategic airports in the UK to have been bought by a private equity organisation funded almost entirely by third party debt structures.

If the Government is committed to growth in the UK economy and a reversal of the escalating unemployment, it must make every effort to enable good access to the country with competitive air services particularly longhaul flights. These flights will be critical to attracting additional inward investment as well as ensuring that existing indigenous industries are able to compete effectively in world markets.

We believe that the current policy of an outright ban on the construction of any new runway capacity at the existing SE Airports is severely detrimental to the future growth of vital longhaul services to and from the UK and will accelerate the current decline in the competitiveness of UK civil aviation and impact negatively on the general prospects for increased economic activity. If one looks at LHR versus its main European competitor hubs the current prognosis for the period up to 2015 is as follows:

Hub Airport	No. of Runways	A/C Movements/hour	
		In 2011	In 2015
Paris CDG	4	114	120
Frankfurt FRA	4	83	126
Amsterdam (AMS)	6	110	120
Madrid (MAD)	4	99	120
LHR	2	87	87

These figure show that even in the medium term LHR will not be competitive with the major European hubs, let alone the expansion now being undertaken in the Middle East at Dubai, Doha and Abu Dhabi.

The UK Government through its attitude to taxation and prohibition or limitation of aircraft noise nuisance shows it is rightly concerned about the damage aviation does to the environment. What it fails to take properly into account is the changes that both the aircraft and aircraft engine manufacturers will bring with new and improving technology and the commitment by everyone in the industry to substitute mineral oil jet fuel with biofuels which would be much more carbon neutral.

The DfT forecasts for future use of biofuels by the airline industry show a very low penetration (2.5%), well below the voluntary commitments made by industry through IATA and other trade bodies. It appears that the DfT is deliberating taking as pessimistic a view as possible in order to defend its policy of no new runways in the SE.

What the Government has not said is denying longhaul flights out of the UK will merely lead to more European flights traversing UK airspace causing more damaging aircraft emissions in UK

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skies at high altitude, and more shorthaul flights connecting the UK to Continental Europe. All of this development also leads to more pollution in the UK skies

While the Government is entitled to show what might happen to civil aircraft emissions under a pessimistic set of assumptions, it really ought to show other scenarios reflecting a more balanced view of the aviation industry and its international commitments.

In the event that Ferrovial seeks to sell its stake in BAA and there is a further restructuring of this entity the Government may have take steps to ensure that any exit solution for existing owners does not worsen the overall financial structure of BAA with more expensive debt put in place to enable the current owners to exit with a capital gain. If this happens the new owners will once again seek to recover these extra financing costs through higher charges from the Regulator. Clearly such a situation is not in the public interest and it will once again handicap the UK industry compared to its competitors in Europe and elsewhere.

We believe that Government cannot just bury its head in the sand and say that there will be no expansion of airport capacity in the SE in the form of additional airports or runways. It has the duty to at least review the medium term options and to understand how it could meet the long term requirement for a single major hub airport for London and SE England with 4 parallel runways able to handle the future requirement of premium service flights. The Government now collects a substantial amount of tax from the aviation industry in the form of ADP and other taxes. It may be that in future it may have to look to use some of this money to support new infrastructure for the existing SE Airports or for a new dedicated hub airport.

In the end there is no such thing as “a free lunch”. At present the UK Government is having just that, extracting a huge sum of money from the aviation industry under the fond illusion that this is having no long term damage on the industry. Coupled with the current policy of no new runways in the SE the UK Government is now consigning the UK aviation industry to same fate as the UK motor industry, the UK engineering industry (including aerospace manufacturing) and eventually the UK shipbuilding industry.

High speed rail connecting into major airports can help, but cannot completely replace shorthaul flights. Longhaul flights still matter and need multiple connecting services. It is not practically possible to set up a bigger enough high speed rail net work to replace all shorthaul flights to the large number of destinations currently served by LHR.

Frequency would also be a problem and well as distance on the longer sectors. The cost of building a large High Speed rail network directly into LHR would be very expensive and we are sceptical that the Government will put up the necessary funding. As for the private sector it would only fund such a project if it were able to extract a high return. Even then it would be looking for an exit route.

The Government needs to have a much better understanding of why the UK needs a hub airport. This may require some more work. Now is the time to commission this work and the Government needs to take steps now to ensure that this happens.

BAA has already disappeared as a UK owned entity. Ownership of BA has been substantially diluted as a result of the Iberia merger. While much damage has been done to the UK aviation

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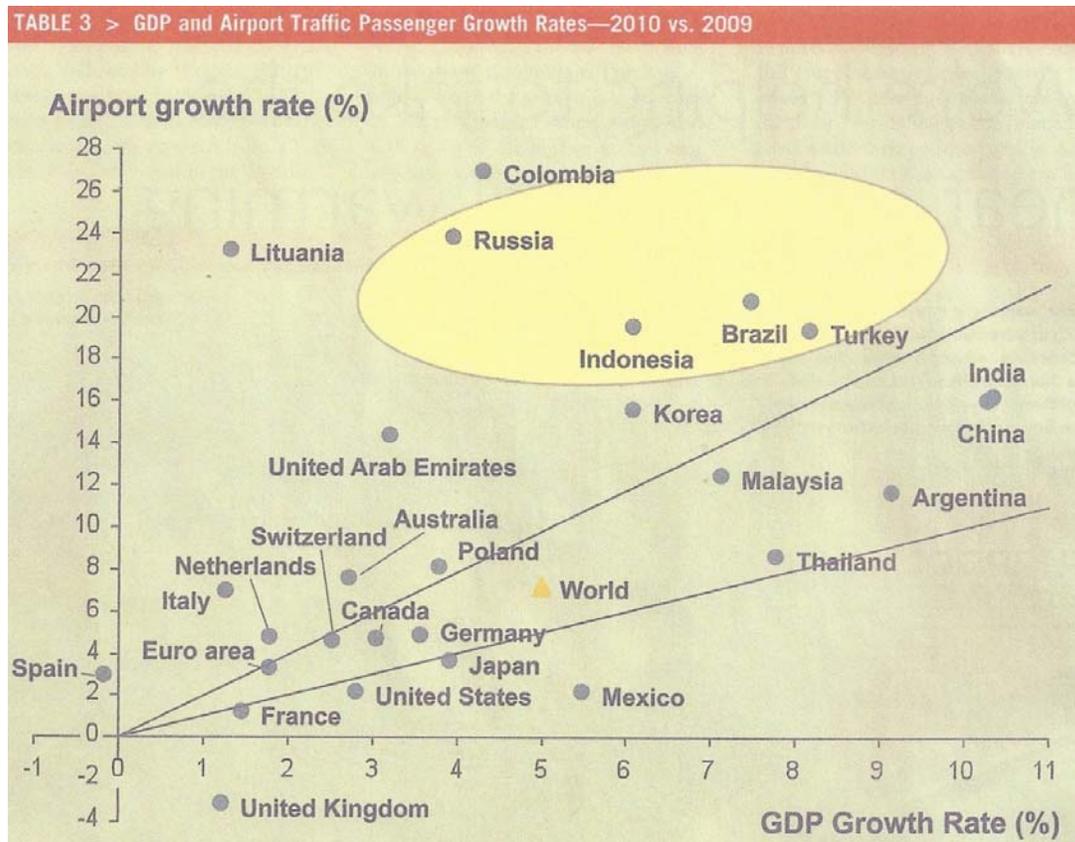
industry over the past 10 years a large part of this could still be reversed if the Government would wake up and change its approach. It is still not too late!

## 3. ECONOMIC ISSUES

### 3.1 Shorter Term Relationships between GDP Growth and Air Passenger Growth Rates.

#### How the UK is falling behind

In the table below reproduced from Air Transport World the relationship between short term airport growth rates and GDP is explored for a large number of countries. This chart shows that the UK is already bottom of the league. The decline in the UK does not seem to be totally related to the economic recession, but also due to lack of development of air services especially for longhaul flights.



### 3.2 Longer Term Relationships between Economic growth and the Growth of Commercial Air Passenger Travel

Boeing the major US aircraft manufacturer has also explored the long term relationship between GDP growth and the growth of air traffic measured by change in revenue passenger-kilometres. Boeing has a long track record in air traffic forecasting and in general their forecasts have been conservative compared to actual outcomes. They have a large

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professional research department with a very detailed knowledge of the commercial air transport market. The following is quoted from the methodology in Boeing's "Current Market Outlook" forecast for the airline industry:

*"Boeing uses the long-term forecast contained in the Current Market Outlook to guide product strategy and to develop long-term business planning. We have shared this information with the public since 1964 to help airlines, suppliers, and financiers make informed business decisions.*

*Global and regional economic cycles profoundly affect air travel demand, so it is essential to take the current phase of the economic cycle into account in developing the long-term forecast. When consumer confidence and business confidence fall, as they did during the recession that began in 2008, air travel demand follows suit. But historically, air travel has proved resilient. Perturbations from the long-term trend are typically relatively short lived, lasting about a year. As confidence rises, air travel often surges, surpassing historical average growth rates to return to the long-term trend. Adjusting for the cycle is part of the forecast process.*

*The air travel demand forecast is developed by constructing and matching both a top-down and a bottom-up approach. Traffic between individual countries is forecast based on economic predictions, growth momentum, historical trends, and projections of the relative openness of bilateral air services and domestic regulation. Government statistics on inbound and outbound tourism receipts help to identify and cross-check trends. We also factor in the potential positive or negative effects of specific developments peculiar to each region, such as population dynamics, shifts toward or away from other modes of transport, including high-speed rail, and emergence of new direct air services between countries.*

*The individual countries are grouped into 11 geographical regions that generate 63 air traffic flows between and within the regions. Next we reconcile the "bottom-up" projection, which is constructed from country-level economic, demographic, air transport, and travel data, with the "top-down" projection, which is obtained by dividing top-level global data into the same regional flows, allowing for shifts in shares between regions. The regional traffic forecasts are then used to help develop the airplane demand forecast.*

*Growth in air travel, measured in revenue passenger-kilometres (RPK), has historically outpaced economic growth, represented by GDP, by approximately **1.5 to 2.0 percent**. **This leads us to conclude that about 60 to 80 percent of air travel growth can be attributed to economic growth, which in turn is driven, in part, by international trade.***

*This is consistent with the observation that countries whose economies are tied to trade tend to have higher rates of air travel. Air travel revenues consistently total about 1 percent of GDP in countries around the world, regardless of the size of the national economy. Globally, air*

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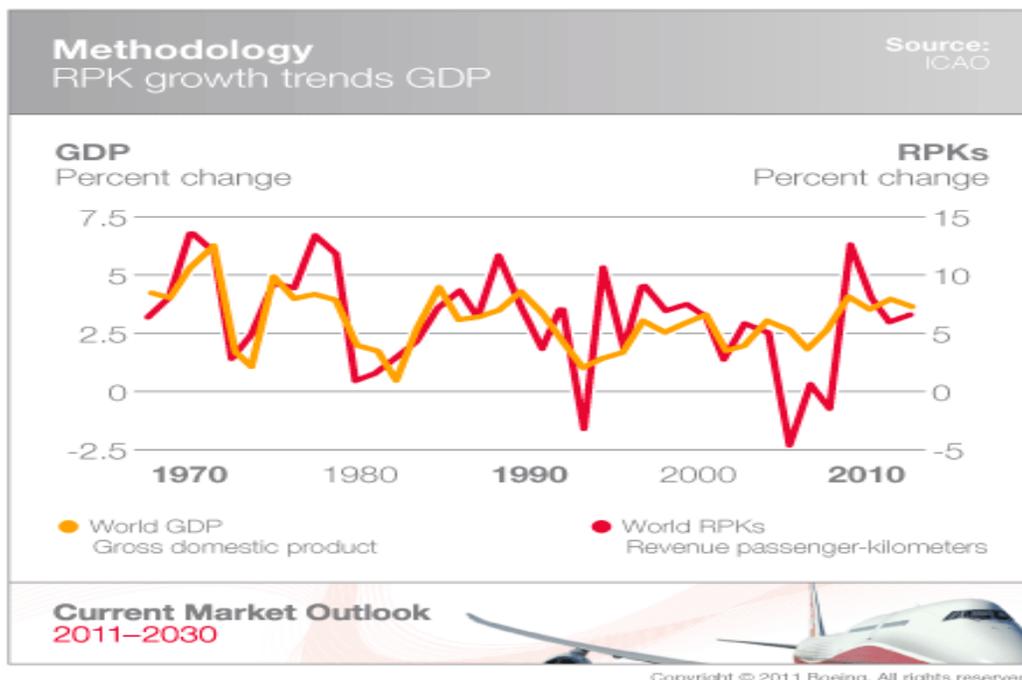
travel has historically trended toward this consistent share of GDP, such that countries that are below or above this level will generally move toward it over the long term.

**The remaining 20 to 40 percent of air travel growth results from the stimulation provided by the value travellers place on the speed and convenience that only air travel can offer.** For example, travellers value choice of arrival and departure times, routings, non-stop flights, choice of carriers, service class, and fares. Liberalisation is the primary driver enabling value creation in the global air transport network. Liberalisation typically gives rise to a "bump" in traffic demand. Studies suggest that as the relative openness of a country's bilateral air service rises from the 20th percentile to the 70th, the resulting increase in traffic can boost air travel demand by an additional 30 percent.

**Often, economic growth, induced directly and indirectly by improved air services, creates a virtuous circle that leads to further air transport growth, which in turn leads to added economic growth, and so on.**

The percentage of air transport growth that comes from economic development compared to the percentage that comes from the value of air travel services is an indicator of the maturity of an air travel market. Although individual regions may exhibit signs of slowing due to maturing markets, other regions continue to grow vigorously. Current global percentages do not indicate that the market is nearing maturity in aggregate."

In spite of the difficulties that have affected the airline industry over last 40 years this chart shows a clear relationship between GDP growth progression and air travel.



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## 3.3 Comments on the Contribution of Civil Aviation to the UK economy

### 3.3.1 Aviation Sector (airlines and airports) – Jobs and Value

The aviation sector is a significant direct contributor to the UK economy in terms of direct employment and well-paid jobs. However it is not easy to obtain reliable independent hard data on the contribution of the aviation sector to the UK economy. BAA recently commissioned a report from Frontier Economics to evaluate the contribution that LHR makes to the overall UK economy. In this report there is a section evaluating the total contribution of the aviation sector to the UK economy. The analysis shows that in 2008, 254,000 people were employed in the UK aviation sector or around 1% of total UK employment with a gross contribution of £70,000 per employee or double the national average. It is estimated that LHR accounts for about 50,000 full-time jobs and around 76,000 when employment in BA's Head Office and ancillary services such as hotels and catering are included. The table below is reproduced from the Frontier Report:

<b>Sector</b>	<b>UK Jobs</b>	<b>Gross Value-added/ employee</b>	<b>% of total UK Employment</b>
Air Transport	93,000	£58,000	0.4%
Ancillary services	49,000	£82,000	0.2%
Manufacturing	87,000	£79,000	0.3%
Maintenance	25,000	£56,000	0.1%
<b>Total Aviation</b>	<b>254,000</b>	<b>£70,000</b>	<b>1%</b>
Total UK Economy	26,000,000	£35,000	

Source: Annual Business Enquiry 2008

Frontier Economics estimate that the total value of the contribution of aviation sector in terms of employment is at least £18 billion of which not less than £6.3 billion is attributable to LHR.

### 3.3.2 Indirect contribution (supply change) - jobs and value

Economists estimate that up to 3 additional jobs are associated with each employee directly employed at an airport (both airport employees and airlines employees plus other jobs directly associated with the airport and airlines). Many of these jobs are directly related to the income streams earned and spent by the aviation employees while others arise out of re-circulating cash streams and government-related employment such as local government, schools and hospitals that are paid out of taxation receipts. In addition the Government collects a large sum estimated at around £2.3 billion from Airport Passenger Duty. If the ration of 3:1 is correct up to a further 750,000 jobs in the UK would be supported by the activities of civil aviation in the UK.

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### **3.3.3 Indirect contribution (leisure and business hospitality) jobs and value**

Analysis of the CAA data for the five London airports (LHR, LGW, STN, LTN and LCY) shows that they account for about 60% of total UK passenger demand. Of this LHR alone accounts for 35% all passengers travelling abroad from all UK airports and 70% of those travelling outside Europe. So LHR is by far the most important airport in terms of international flights especially those to the rest of the world outside Europe. In the Frontier Report it is claimed that Heathrow serves 80% of all longhaul traffic in and out of the UK and that it handle 4 million overseas visitors that spend £4.4 billion or an average of £1100 per passenger-visit.

According to the Frontier Report the CAA statistics do not identify all the stopover passengers transferring through Heathrow Airport. The report estimates that there are around 2.5 million passengers per year in this category that are not recorded and that on average spend more than £500 each which in aggregate makes an additional contribution of around £1.3 billion.

In aggregate the Frontier Report claim that spending by all overseas visitors travelling through LHR supports another 180,000 jobs in the UK. This represents an additional job creation of 3.6 per direct employee at the airport (50,000) or 2.36 if the wider employment at LHR (76,000) is considered.

Analysis of the CAA data shows that 20% of long haul passengers from overseas at Heathrow come to Britain on business. The Frontier Report states that the airlines' route networks at Heathrow help sustain the £600billion/year of trade between the UK and the rest of the world. Taking into account the importance of the City of London in UK economic activity this looks like a realistic estimate as this traffic flow is also important in other activities inward investment in industry and exports of key product from the UK.

## **4. HUB ISSUES**

The concept and value of hub airports as key generators of passenger flows and thus economic activity to countries is not generally well understood by non-aviation people including government employees, politicians as well as the general public at large. Airports are major generators of economic activity as has been demonstrated in the earlier section of this report.

Hub airports generate additional activity as they promote traffic flows over the hub by collecting traffic over a wide range of flight destinations and by connecting these traffic flows at a central point allow more passengers per flight to travel on other flights especially longhaul flights. Without the hubbing effect it is much more difficult for an airport to sustain a wide choice of destinations and high frequency of services on a given route.

Hubbing comes at a price of more flights and therefore more noise associated with additional landings and take-offs. However hubbing also allows the use of larger aircraft which can offer less noise, lower specific fuel burn and fewer emissions per passenger than smaller aircraft. Due to competition between hubs and also with direct flights hubbing typically offers passengers low fares to complete a given round trip.

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Operating flights efficiently at hubs requires generous runway capacity in terms of slot availability at commercial timings so that flights can be assembled and organised into waves. Generous runway capacity needed to achieve waves. This is singularly lacking at the UK's two busiest airports LHR and LGW which are operating close to full capacity.

Manchester Airport (MAN) also has two parallel operational runways but does not operate as a hub airport. The reason for this situation is that all the airlines that so far have tried to operate longhaul services at MAN have failed to generate sufficient economic returns and have therefore have withdrawn such operations after a short period.

For many years BA operated a Manchester-New York (MAN-JFK) service, but it always generated losses as too few premium business class passenger chose to use the service which flew once/day in each direction. Even for economy passengers the fares paid could not cover the cost of providing the service. As MAN does not currently have a hub airline and does not seem likely to do so in the foreseeable future, it means that it can only be feed airport

Lack of domestic connectivity forces all other regional airports to depend on foreign airlines to connect into their own hubs. This situation is well exploited by Air France-KLM into Paris (CDG) and Amsterdam (Schiphol), Lufthansa at Frankfurt and Emirates over Dubai. This successful hubbing of UK regional airport traffic over foreign airport hubs is ultimately exporting revenue and jobs from the UK.

## **4.1 What is an Airport Hub?**

Major airlines build their operations around hubs. The benefit of a hub is that it allows the airline, often in conjunction with partners, to participate in a greater range of markets. This is important because a carrier might not be able to justify a new route, e.g. London to Guangzhou, on point-to-point traffic alone. With the ability to connect traffic from other markets, the viability of the route becomes more attractive. In this way flyers based in the home market have access to a much wider range of destinations than would otherwise be the case. In short the customer benefits, the overall market benefits and the airline and the airport also benefit.

Many airlines owe their growth to the development of hubs: obvious and successful examples include Emirates and Singapore Airlines. In Europe KLM is an example of an airline that grew well beyond the natural size of its home market by successfully promoting traffic flows across Amsterdam Airport. In the USA, the success of developing the hub has made Atlanta the world's busiest airport.

The table below shows the multiplier effect shows the growing power of a hub.

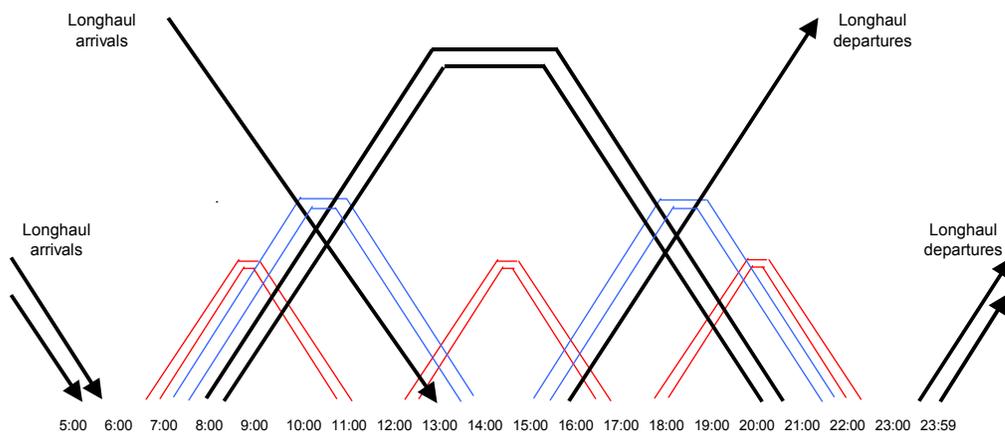
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Number of spokes (n)	Local markets to the hub = n	Connecting markets via the hub $n \times (n-1)/2$	Total markets (The sum of the previous two columns)
2	2	1	3
3	3	3	6
4	4	6	10
5	5	10	15
6	6	15	21
10	10	45	55
50	50	1225	1275
100	100	4950	5050

An airport hub is a normally deliberately planned schedule of a series of closely timed shorthaul flights connecting into each other and/or connecting into longhaul flights so as to enable the rapid and easy transfer of passengers (and their baggage) from one flight to a bank of others. There are longhaul hubs where longhaul flights connect into each other. Good examples of this type of hub are at Dubai and Singapore.

Normally a hub is created by an airline and its partner airlines by scheduling waves of arrivals and departures with quick turnarounds (typically less than 90 minutes from first arrival to last departure). These waves are created as a minimum for morning and evening banks but usually also comprise additional waves during the day.

The following diagram illustrates how a hub might operate. The example shown has five waves of departures. Major hubs such as ATL, AMS and other major hubs in America would operate with up to ten waves.



Creating an efficient hub requires multiple runway capacity and relatively free availability of landing and take-off slots to allow for a large number of destinations to be served in a short time with relatively high frequency. Heavily congested airports such as LHR can only work as partial

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hubs as the ability to tightly schedule arriving and departing flights in waves is very limited and the connecting times are typically longer than at a true hub and in addition many connections may work only in one direction or not at all for some destinations.

Hub airports also have rapid passenger and baggage transfer arrangements where aircraft cannot all be accommodated in the same terminal.

## **4.2 Impact of Hubbing on the UK.**

In practice LHR has only operated as a hub on an accidental basis – given that slot constraints do not allow the scheduling of waves, it works purely on the basis of the number of flights coming in and out. Many of the resulting connections are long, and given that the number of cities served from LHR is shrinking, rival hubs are able to offer swifter connections and more unique city combinations.

At Heathrow connections between terminals is not always an easy process especially between Terminal 1 and Terminal 5, Terminals 3 and 5, Terminals 3 and 4 and Terminal 4 and Terminal 5. The segregation of the airline alliances into specific terminals is also a negative factor for promoting cross-flows of connecting traffic between alliances at LHR.

So while LHR is often described as the UK's only hub airport, it remains at best a partial hub and for many connections the transfer times can be extended. Without providing additional runway capacity and freeing up more landing and take-off slots LHR will continue as a partial hub airport increasing becoming less competitive with the major hubs in Continental Europe and the Middle East.

If the UK does not develop an airport in the London area as a hub – most likely Heathrow, then the consequence will be that British airlines will not have the scope to participate in the wider range of markets that is available to their main European competitors. The consequence will be that the UK market will have a smaller range of destinations with direct flights and that foreign airlines will have increased opportunity to expand over their home hubs.

If even domestic connecting flights are squeezed out of Heathrow, it would mean that virtually all long haul traffic from the regions would lose the opportunity to fly on a British airline and would depend on routings via foreign hubs.

## **4.3 Does the UK need a Hub Airport?**

The argument put forward by many opponents of the expansion of major airports are often:

- Why does the UK need a hub airport anyway?
- If there is spare capacity already existing at Stansted and Luton why is it necessary to build any more runways at Heathrow and Gatwick?

This section attempts to answer these two questions.

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## **4.3.1 Why does the UK need a hub airport?**

The main reason why the UK needs a hub airport is because hubs enable two major benefits that cannot be obtained from a pure origin and destination airport. The main benefits of airport hubs are that they allow:

- More destinations and frequency to be flown on routes than at a non-hub airport. This allows passengers more choice of services and as a consequence increases demand and to some extent the level of air fares that are willing to be paid.
- More passengers to be collected to travel on a given flight which for longhaul flights adds destinations that otherwise would not be economically viable, adds frequency on routes (more per week or more per day) and allows bigger and more efficient and economic aircraft to be used reducing the cost of air fares and emissions per passenger carried.

## **4.3.2 Why not use up the existing capacity at Stansted and Luton instead of building more runways at Heathrow or Gatwick?**

Hubs require concentrations of both shorthaul and longhaul flights with timings such that convenient and speedy connections can be made between flights. Both Stansted and Luton are single runway airports. This would make hub operations inefficient as it is difficult to achieve close timings for sufficient arrivals and departures due to only one runway operation. In addition whichever airline chose to operate at these two airports would:

- Have to duplicate services and destinations that it was already serving out of LHR and/or LGW.
- Would have a much reduced catchment due to the worse location of and surface access considerations of these two airports

For these reasons additional runway capacity at Stansted and Luton will not resolve the problem of lack of runway capacity at LHR and LGW.

## **4.3.3 Why not use Manchester as Hub Airport?**

It is often suggested that if London is constrained, then Manchester could be developed as a hub. Germany has two hubs, one at Frankfurt and a second at Munich. Why could not a similar situation take effect in the UK?

In theory this could have merit, but in practice airlines decide where hubs are developed, not airports. The truth is that no airline has chosen to set up a hub at Manchester, presumably because they did not find the market benefits attractive enough. So far all attempts to establish full service scheduled long haul flights at Manchester Airport have failed. This failure must be attributed to the low premium passenger demand and the very low fares that were obtainable out of Manchester compared to operating out of the London airports system.

It seems that the Manchester traffic characteristics are markedly different from those of the Munich area in terms of ticket prices, and that at present the establishment of a conventional airport hub there is not sustainable.

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## 4.3.4 Comparison of LHR and the Other Major Continental European Hubs

The table below compares LHR with its key competitor airport hubs in Europe:

Airport	Runways	Max Hourly Movements	Future Max Hourly movements	Current Runway Utilisation	Passengers 2010 millions	Air Transport Movements in 2010 '000	Average PAX per flight	Destinations served
LHR	2	87	87	98.5%	65.9	455	145	192
AMS	6	110	120	70%	45.2	386	117	277
CDG	4	114	120 (2015)	73.5%	58.2	492	118	257
FRA	3 / 4	83	126 (2015)	74.5%	53.0	464	114	201
MAD	4	98	120	na	49.8	498	118	191

This shows that LHR with only two runways is effectively full and is not expected to increase its future air transport movements (landings and take-offs). All the other European airport hubs still have significant spare capacity at least in terms of runway movements and that they all expect to be able to grow significantly in the future. The average number of passengers per flight at LHR is 145 noticeably higher than at any of the other European hub airports. Part of this difference is explained by the importance of London as an important international destination and part is due to the scarcity of slots that has resulted in the need to put larger aircraft capacity to serve the market needs.

This table reinforces the view that it is unreasonable to expect no future runway capacity to be made available in the longer to serve the UK premium market needs currently largely met by LHR. It also shows in the longer term that if the expansion at LHR cannot be achieved then the Government need urgently to consider suitable site for a new 4-runway airport that would be able to compete with the European hubs over the next 20 years.

In the Frontier Report for BAA there is an interesting analysis of the shorthaul and longhaul operations at the key European hub airports. This is reproduced below:

	LHR	AMS	FRA	CDG	MAD
<b>Short haul</b>					
Routes	46	67	74	78	63
Seats	20.9m	15.8m	20.2m	21.4m	25.3m
+/- seats since 2005	2.0m +11%	0.3m +2%	(0.6m) (3%)	1.2m +6%	0.4m +2%
Density	12.1	7.8	8.2	8.8	10.9

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<b>Longhaul</b>					
Routes	82	64	75	77	32
Seats	25.2m	9.2m	13.4m	14.0m	5.3m
+/- seats since 2005	(2.8m) (10%)	0.3m +3%	(1.3m) (9%)	0.2m 1%	0.7m 15%
Density	4.2	3.0	2.6	2.6	2.7

The analysis shows the relative weakness and decline in shorthaul flights at LHR compared to the other hubs.

On longhaul LHR is still in leading position but AMS, FRA and CDG are catching up. With spare runway slots at all of these airports it is much easier for them to grow their longhaul routes faster than at LHR.

At Frankfurt there was also a drop in both shorthaul and longhaul seats offered

Madrid has an extensive and very large shorthaul network in terms of seats offered, but its longhaul network is much smaller than at the other European hubs.

The figures show that the density of traffic on LHR routes both shorthaul and longhaul is significantly higher than at the other European hubs. This evidence is supported by the higher average passengers per flight at LHR as shown in the earlier table.

The sharp drop in longhaul seats offered since 2005 at LHR is partly explained by the reduced seating configuration in BA's B747 and B777 fleets. Also BA has taken out of service up to 6 of their 57 B747 aircraft all of which operate at LHR.

#### **4.3.5 Key Issues related to LHR as a Hub Airport**

The sections that follow highlight a number of issues that affect the ability of LHR to function as an effective hub airport and look at ways in which its effectiveness could be improved.

##### **Introduction- Airlines**

Airlines and airline alliances create hubs not airports

- One World/BA is the only airline alliance grouping really interested in promoting connecting traffic at LHR
- Star Alliance led by Lufthansa (LH) favours Frankfurt (FRA) as its main hub not LHR. LH is a 10% shareholder in Fraport AG that owns FRA. LH also has board representation at Fraport AG. LHR is regarded by LH as an important extraction point for passengers to traverse FRA.
- Sky Team led by Air France/KLM favour Paris (CDG) and Amsterdam (AMS) which are the AF/KLM base hub airports. Like LH, AF/KLM looks at LHR as a key airport in which to extract traffic to serve their own hubs at AMS and CDG.

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- Shorthaul connections are vital to create waves feeding longhaul flights
- Current waves at LHR are suboptimal due to no free slot availability, shortage of gates and stands.
- BA has less than 50% of the shorthaul flights at LHR

Unless BA can acquire more shorthaul slots, increasing the effectiveness of LHR as a hub will be difficult unless:

- Connections between EU flights of different alliance airlines can be significantly improved.
- Additional slots can be feed up by creating “airbridge” flights on major routes
- Airlines trade-off some frequency and use bigger aircraft.

## **Airlines - Some More Detailed Considerations**

### **BA buying more slots - only BMI would be a significant ready source.**

- BMI is owned by Lufthansa. BMI is losing money for LH and LH appears not to want to develop LHR which would cause problems for its relationship with FRA.
- BMI has about 13% of the LHR slots.
- BA already has around 39% of the LHR slots.
- BA acquiring BMI would take it over 50% of the total LHR slots.
- Will BA acquire part or all of the BMI operation from LH?
- Would this be permitted by the UK Monopolies Commission?
- Would this be permitted by the EU Competition Rules?
- Probability is that the EU Commission would place some divestment obligations on BA to dispose of some of the BMI slots probably to take the BA level to less than 50% of the total LHR slots.

### **Improving connections between Different Airline Alliances at LHR**

- BAA has allowed airline alliances to migrate to separate terminals at LHR with a view to operating segregated operations:
  - One World in T3 and T5
  - Star Alliance in T1
  - Sky Team in T4
- Mixed operation is planned for new T2 under construction.
- BAA is under pressure from the airlines to improve internal alliance transfers.

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- Airlines and alliances currently have no interest in increasing/improving inter-alliance traffic.
- Greater public interest would be to promote maximum connection possibilities that the oligopolistic (alliance) free market will not deliver.
- This means that BAA would have to assume and accept the duty to improve inter terminal and inter-alliance connections (better passenger and baggage transfer arrangements and systems).
- Processing of connecting passengers especially immigration and baggage security process would have to be significantly improved.
- Alliances and airlines should be forced to offer reasonable ticketing deals on inter-alliance airlines where such arrangements offer competitive connections in terms of timing and convenience.
- Government could intervene by changing the terms of reference of the CAA as the regulator assuming that LHR remains a regulated airport.
- EU Commission could intervene to inhibit anti-competitive activity by airline alliances that result in inconvenience or excessive charges to the public.

## **Freeing-up slots at Heathrow**

- Heathrow is operating at 98.5% of capacity and there are practically no commercial slots available for additional flights.
- EU Commission's current remit is to promote competition amongst airlines rather than to promote maximum usage of the available slots.
- The new entrant rules and proposals to have a forced hand-back of a fixed percentage of the slots each year say 5% does nothing to promote better usage of the airport.
- There are a large number of flights to the same destination flying within 15 minutes of each other. Some competing flights e.g. New York have identical departure times.
- In general the size of shorthaul aircraft have been falling as airlines choose to offer more frequency.
- In longhaul some airlines, e.g. BA, have been significantly reducing seat count per aircraft type as they choose to offer more business class seating with more space per seat.
- In longhaul the relatively recent and growing number of A380 aircraft has been increasing longhaul seats per flight.
- The average number of passengers per flight at LHR has been in a range of 140 to 145 for more than 10 years.

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- Encouraging airlines to pool capacity on some short haul routes could free up over 50 slot pairs per day for other routes thus adding destinations to LHR and reversing the trend of falling destinations over the last 10 years.
- This pooling could take the form of an “airbridge” under which two or more airlines buy capacity that would be made available operating one wide-body aircraft to replace two or more narrow-body flights.
- Better connections between different alliance flights at LHR would also encourage eventual better use of slots with slightly less frequency and use of bigger aircraft.

## **Mixed Mode Operation at LHR**

Mixed mode operation of both runways at LHR would add about 80,000 (17%) additional Air Transport Movements (ATMs) to the airport taking the maximum annual capacity up from 480,000 to 560,000/annum. This change in flight management and operations would be the easiest and cheapest way to increase capacity at LHR without major investment in airport infrastructure.

MSP Solutions understands that the DfT has approved mixed mode operation as a trial for one season. If the trial proves successful, MSP Solutions believes that it should become a permanent feature of the airport with approval to raise the ceiling to 560,000 ATMs per annum. This would provide much needed additional capacity for the medium term development of the airport especially for longhaul flights to new destinations.

## **The Impact of the Middle East Airlines and Airport Hubs on LHR**

- LHR is competing significantly with 5 European hub airports (CDG, FRA, MUC, AMS, MAD) and more recently with 3 Middle-East Airports (Dubai, Doha and Abu Dhabi).
- In terms of impact the Middle East Airports are probably having a bigger impact on LHR than that offered by the European hubs.
- The Middle East Hubs impact will be felt much more in future as their airports and airlines are growing much more rapidly than the competing European Hubs and airlines.
- London and LHR is their main target source of traffic as it has by far the largest catchment.
- Competition with the Middle East Airports is increasing significantly and will continue to do so over the foreseeable future.
- The Middle East carriers have some massive cost advantages not available to European airlines. These include:
  - low fuel costs
  - low aircraft costs through a combination of massive orders and low cost finance
  - Government support in the form of state guarantees
  - No environmental levies.

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- They also have massive state of the art airport development and free airport slot availability at their home bases.
- The current incentive of the Middle East airlines is to both increase frequency and aircraft size to suck out traffic from LHR into their local hubs.
- As these carriers are increasing flights they apparently increase the number of passengers per flight at LHR.
- Actually for every hub passenger they carry, which is typically over 80% of the passenger load per flight, a similar number of passengers are taken off BA and to some lesser extent off the other foreign long haul carriers and Virgin Atlantic.
- Thus for each additional Middle East carrier flight there is a substantial fall in traffic on BA and other competing longhaul flights.
- The competitive position of the Middle East Airlines and their hubs needs to be monitored carefully by the European trade and regulatory authorities to ensure they do not completely dominate the international skies.

## **Impact of the European Hubs on LHR**

- All the European hubs airports are partially or totally controlled by local or national governments who are committed to longer term development of their assets.
- All these hub airports are committed to support their national flag carriers to preferentially develop services hub and point-to-point.
- All of these airports have or are building additional runway capacity to allow their base carriers to grow services.
- All of these airports are growing traffic and destinations compared to LHR which is static on traffic and declining in destinations.
- All of these airports and airlines are extracting significant traffic out of the UK especially the regions but also out of LHR. This traffic volume is now generally greater than the continental European traffic carried by BA and the foreign carriers out of LHR.
- The European hub airports have considerable further capability and opportunity to grow especially out of the UK regions whereas BA and LHR have little room to compete further in these markets under current conditions and circumstances.
- The European airlines especially LH and AF/KLM are financially stronger and have been growing significantly over the past 10 years whereas BA has been static or in decline.

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## **Impact of the Environmental Taxes on LHR**

- In 1999 the UK Government introduced an environmental tax on aviation in the form of Air Passenger Duty (APD). This is levied on tickets of all air passengers on commercial flights departing the UK. It does not apply to private, business or corporate flights.
- The initial rate of APD was relatively modest £5/PAX on shorthaul flights and £10/PAX on longhaul flights.
- In spite of the fact that APD was unique to the UK within the EU countries the general view is that the tax had little impact on passenger demand as the general public was prepared to pay the higher cost of fares with negligible complaint.
- Since then the UK Government has increased very substantially the level of APD and applied a more complex levy arrangement on longhaul flights that depend on distance flown and class of travel. This can add as much as £600 to the cost of a business class ticket and £120 to an economy class ticket, both for longhaul flights.
- As no other country except Germany has applied airline environmental taxes currently €10/PAX, the UK aviation industry is operating at a significant commercial disadvantage.
- The Netherlands imposed a modest tax in 2009 and 2010 but was persuaded to abandon it when KLM and Schiphol Airport protested that it was damaging their traffic to benefit other airlines and hubs in Continental Europe.
- With APD applying at its current high level there is a significant incentive for longhaul passengers to fly on a shorthaul flight out of the UK and buy a separate ticket at the hub airport for the longhaul sector.

## **Planning Regulations in the UK**

- Planning regulations in the UK for major airport developments are amongst the most complex, difficult, extended and costly in the world.
- The process consists of a formal planning inquiry process led by an independent lawyer acting as inspector.
- No other country in the EU applies such a rigorous and over-complex process.
- It took over twenty years for the completion of the last major project at LHR Terminal 5 from conception to commissioning.
- The cost of the public enquiry which lasted more than two years was over £1.2 billion including the cost of witnesses and legal fees.
- Adding another terminal or runway capacity at any SE Airport including LHR using the current planning process would take at least 10 years.
- If the UK airports system is to adapt and remain competitive, the current regulatory planning process for major projects must be radically reformed as a matter of some priority

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- It is not clear whether this has to take the form of a bill through Parliament or whether any other form of regulatory change can be applied.
- Whatever changes are implemented, dealing with the chances of judicial intervention under English Law is a major risk for any major airport project in England.

## **The Competitive Economic Position of LHR**

- BAA is owned by a private equity group led by Ferrovial of Spain.
- The private equity structure typically comprises a small amount of equity venture capital around 10% (some of which is contributed by the management team typically 5 to 10%) with the rest 90% as debt leveraged on a high coupon rate repayable at the end of 3, 4 or at the most 5 years.
- Many private equity deals require refinancing several times during the period of private equity ownership.
- The focus of private equity groups is for rapid management and business performance improvement, cost cutting and containing capital investment with the normal objective of disposal of the asset at a multiple of the purchase price within a 5-year period.
- Saturated airports such as LHR where substantial long term and sustained investment is needed to keep the business competitive are not compatible with the private equity ownership structure.
- At BAA over 90% of the assets are financed by debt in the form of medium term loans.
- LHR is by far the biggest asset and contributes over 80% of the Cashflow of the overall BAA business.
- The price paid by the Ferrovial group for the BAA assets was very high and represented a premium of over 50% on the then prevailing share price.
- The economic downturn since the acquisition and the weakness of BA as the major base operator has led to a disappointing economic performance
- Consequently the debt structure that was required to support the deal was very extensive and in excess of what was prudent for the earning power of a regulated business.
- These loans needed to regularly repaid and replacement funding secured to continue the current BAA financing structure.
- There is little possibility of financing any new developments at LHR or at any other BAA airport without increasing the debt.
- Funding new developments at LHR also requires advance application of higher aeronautical and passenger charges which is allowable under CAA regulation, but which has eroded LHR's competitive position in terms of airline operating costs compared to comparable charges at the other European hubs.

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- The financial position of the European hub airports is much better than at BAA LHR which is saddled with a debt mountain and huge financing costs.
- The current financial situation means that BAA is loss making and that current Cashflow after interest repayments is limited to partial cover of the depreciation provisions.
- The current ownership and financing structure places a major economic disadvantage on LHR compared to all of its competitor hubs whether in continental Europe or in the Middle East.
- Private equity is an appropriate structure to improve short term performance of businesses and it is not suitable for long term strategic development of businesses such as airports.
- As applied by the Ferrovial Group, where an excessive price was paid for the original BAA assets, it is now very difficult to resolve the situation as there is a spiral of:
  - Modest business performance,
  - High financing costs,
  - Low free cash and capital reserves in the business
  - An unattractive equity position,
  - High investment costs for significant development
  - Marginal investment philosophy
  - Strong public awareness of all failings and deficiencies at BAA and especially at LHR.
- With the private equity structure applying to BAA's current ownership, there is no long term commitment to sustained ownership of the business and to develop the airports business in the UK especially in respect of taking tough radical and onerous long term investment decisions.

## **UK Government Support for the Aviation Industry**

- Airports are a long term business akin to property development, but due their importance in developing trade and business, they play a critical role in the general economic development of a country.
- This is especially true of major airports that handle long haul scheduled flights to key international destinations.
- Countries having airports with a major international destination network are able to attract international companies to locate in their countries much more easily than those without such flight networks.
- Competitive modern airports require substantial long term direct investment in terminals, runways and taxi ways especially in modernisation.

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- Airports also require significant investment in improving surface access especially road and rail connections and services.
- This is an area normally covered largely by public expenditure by governments and their agencies.
- Government influence over the strategic development of major airports is therefore very important.
- The UK Government's weakness in addressing UK strategic aviation policy is due to its inability to influence events especially those arising from a divergence between the Government's long term policy and the much shorter term objectives of private equity owners of the airports.
- This is particularly true of Ferrovial and the other private interest groups owning virtually all the UK airports with the exception of the Manchester Airport Group.
- All the other competing European Hubs and those in the Middle East are in a much stronger economic position with direct and indirect strong government support to develop their businesses.
- Their governments take active measures and behind the scene steps to assist in the development of their strategic airports such as CDG, FRA, AMS and MUC.
- Unless some urgent and radical measures are taken to remedy this situation the future evolution of UK will fail to ensure that UK aviation is fully competitive in world markets.
- Leaving the industry to function under its current ownership, prevailing regulations, and current Government policy for zero development of existing SE Airports will soon relegate the UK aviation to second ranking in Europe and world markets.
- Continuing this policy will also ultimately undermine and weaken the economic and political strength of the UK in the world.

## **4.5 How do we resolve the future development of LHR for the overall benefit of the UK?**

In the earlier sections of this Paper on the future development of LHR we have pointed out a long series of issues and problems, but while being critical of the situation, we have not put forward specific solutions. In this section we put forward and examine the merits and drawbacks of some constructive ideas.

The UK Government does no longer owns LHR or the other important SE Airports, but its does have an ongoing interest in LHR (and other airports) being a success. The Government still has a role to regulate civil aviation which it does largely through the UK Civil Aviation Authority (UKCAA). LHR, LGW and STN are airports that are currently governed by the Regulations for Regulated Airports administered by the UK CAA. It seems that the current regulations that are applied here have little effect in protecting the public interest and that perhaps these should be reviewed to take into account the adverse effects of excessive debt funding of the industry using private equity structures.

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At the present time it is difficult for the Government to influence private equity owners of UK airports to take long term strategic decisions to enhance the value and performance of their airport businesses rather than to seek short term lowest cost solutions. For example at LHR the current development of Terminals 1 and 2 is suboptimal from a long term perspective in terms of land usage in a confined site.

On the other hand BAA is under pressure from the airlines to deliver additional stand capacity at LHR as soon as possible. It would argue that the current Terminal 2 development does just this. The problem is that although Terminal 2 will be built in record time and probably for the budget price, its location and layout is suboptimal for what ought to be a progressive toast rack expansion between the runways of LHR from Terminal 5 to the current BAA aircraft maintenance base to the east of the airport site.

It seems that in exchange for a change in the planning regulations making easier and quicker to modernise airports, airport owners of strategic airports such as LHR should have to submit a comprehensive long term development plan for review by the Government or one of its agencies. If these plans show developments that are suboptimal, then the right of refusal should apply allowing the Government and or its agencies from blocking the development. In this way the airport operators would have to justify their plans and satisfy oversight that public long term interest were met.

The second area that needs addressing is the succession when the existing owners decide that they want to dispose of their airport assets to any third party. At present the existing owners can sell apart or all of their assets to anyone they choose. It could be to another private equity group, to equity investors or even an initial public offering. The problem with this freedom is that a sale could be negotiated to an even less sound heavily leveraged debt structure that could be more expensive to finance than the existing structure. This risk is passed on to the airport users the passengers and cargo that is moved ultimately in the form of higher user charges which may render the airport too expensive compared to its competitors.

A change of this nature would clearly not be in the overall public interest and should as all reasonable costs be prevented. While no one wants to return to a wholly nationalised airports airport structure, a part private-part public structure would have the advantage of being more stable. The Fraport AG structure is part private and part public and has proved much more successful than BAA either in its privatised form or as a private equity vehicle dominated by Ferrovial. Perhaps the Fraport AG structure could be examined by the UK Government and/or its agencies as a possible future role model for BAA and in particular LHR.

Whether the Government appoints the UK CAA to carry out this role, retains it in the DfT or creates a new body to oversee this work is a political decision. Nevertheless such change is necessary. Without it, airport policy in the UK will continue to be in the free hands of the existing and current owners who will be able to conduct their business purely as they wish, not necessarily in the overall interest of the UK general public. Airports are critical national assets too important to be left purely in the hands of private owners who take inadequate account of the greater public interest. In the case of LHR, LGW and STN airports are a regulated industry and this regulation should be properly and diligently applied and not left until a crisis arises and it is too late to take any firm and sensible action.

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## 5. ENVIRONMENTAL ISSUES

### Comments on Environmental impact

The forecast for fuel efficiency used in the Department for Transport Aviation Forecast are unduly conservative. The assumption used that carbon savings will be in a range of 0 to 5% by 2050 contrasts with the view of ATAG that biofuels could represent 50% of worldwide aviation fuel consumption by the same date.

The DfT 2011 forecasts are assuming only 2.5% reduction in jet fuel consumption by biofuel use substitution by 2050.

### 5.1 Range of UK aviation CO<sup>2</sup> forecasts: ATAG

Below are some extracts from documents published by the Air Transport Action Group (ATAG).

ATAG a highly respected not-for-profit association that represents all sectors of the air transport industry. It is a global industry-wide body that brings together all aviation industry players and it works to promote aviation's sustainable growth. It has 60 members worldwide. Its funding members play a driving role within ATAG and devote substantive time and resources to the association. They include: Airports Council International, Airbus, Boeing, Bombardier, Civil Air Navigation Services Organisation (CANSO), CFM International, Embraer, GE, Honeywell Aerospace, International Air Transport Association (IATA), Pratt & Whitney and Rolls-Royce.

#### 5.1.1 Extracts from ATAG Guide to Aviation Efficiency

*Air transport is responsibly reducing its environmental impact. Air transport's contribution to climate change represents 2% of man-made CO<sub>2</sub> emissions and this could reach 3% by 2050, according to updated figures from the Intergovernmental Panel on Climate Change (IPCC). This evolution is based on a growth in aviation CO<sub>2</sub> emissions of 2-3% per year, with an annual traffic growth of 5%. The air transport industry is now working towards carbon-neutral growth – no increase in carbon emissions in spite of traffic growth – as a first step towards a carbon free future.*

- *Aircraft entering today's fleet are 70% more fuel-efficient than 40 years ago, consuming 3.5 litres per passenger per 100 km.*
- *The Airbus A380 and the Boeing 787 – consuming less than 3 litres/100 km – compare favourably with consumption per occupant of small family cars.*
- *25 million tonnes of CO<sub>2</sub> have been saved in 2006-2007 through the shortening of hundreds of air routes, other air traffic management (ATM) improvements and aircraft operational savings.*
- *A further 25% fuel efficiency gain is targeted for 2020.*
- *Aircraft entering today's fleet are 20 decibels (dB) quieter than comparable aircraft 40 years ago. This represents a reduction of 75% in noise.*

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- *Research programmes aim to achieve a further 50% reduction in noise and CO2 emissions and an 80% reduction in oxides of nitrogen (NOx ) by 2020.*

## **Carbon-neutral growth and the next steps**

*This Guide has looked at all the steps that the aviation industry is taking in its efforts to reduce emissions, particularly the emissions of carbon dioxide which is the most important greenhouse gas. These measures, along with the significant progress being made in developing the benefits of new types of fuel from low carbon sources, will allow aviation to continue to provide the global economy with the benefits of fast, reliable, safe and efficient connectivity. None of this work is occurring in isolation. In fact, the aviation industry is one of the few sectors that has a globally coordinated approach to reducing its emissions*

### *The Four Pillars Strategy*

*The whole aviation sector signed a declaration in 2008 that committed to what is known as the four pillar strategy for reducing emissions.*

*Of the four pillars, technology has by far the best prospects for reducing aviation emissions. The industry is making great advances in technology, many of which you have seen in this Guide. Sustainable aviation biofuels are also part of this pillar, more information on these exciting new fuels can be found in the Beginner's Guide to Aviation Biofuels – available on [www.enviro.aero/biofuels](http://www.enviro.aero/biofuels) Improved operational practices, including reduced auxiliary power unit usage, more efficient flight procedures, and weight reduction measures, could achieve further reductions in CO2 emissions.*

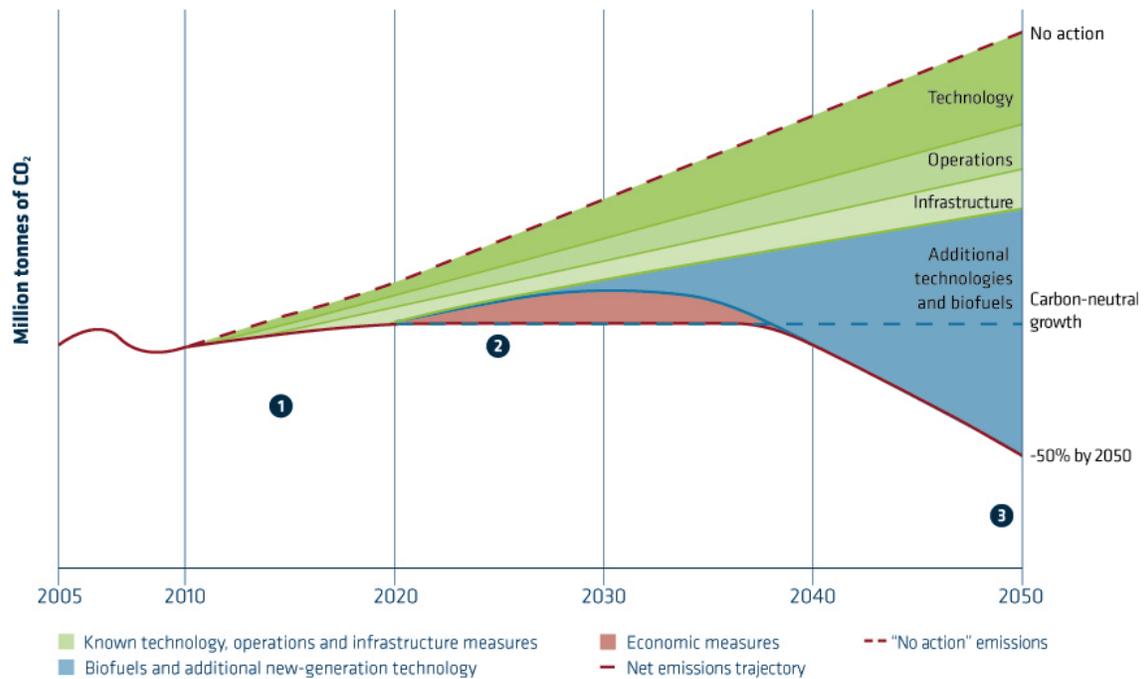
*Infrastructure improvements present a major opportunity for CO2 reductions in the near-term, many of these are described on pages 15-21 of this Guide. Full implementation of more efficient air traffic management and airport infrastructure could provide substantial emissions reductions through implementation of measures such as the Single European Sky and the Next Generation Air Traffic Management System (NextGen) in the United States.*

*While efforts from the first three pillars will go a long way to achieving the goal of carbon-neutral growth from 2020, the aviation sector may need to turn to the fourth pillar – positive economic measures – in the medium term to help close the gap.*

## **An Industry United**

*When the world's governments gathered in Kyoto in 1997 to negotiate how the global community would limit climate change, negotiators recognised the difficulties in dealing with aviation emissions. Along with international shipping, the emissions from aviation take place over international waters and are most often not confined to the borders of a single country. With this in mind and the growing need for all parts of the economy to play their role in reducing emissions, the aviation industry has taken the unprecedented step of setting three global commitments for reducing its emissions*

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## ***From now until 2020: 1.5% efficiency improvement per year***

*The industry is using a four-pillar strategy to further increase its fuel efficiency by a further 17% over the coming decade. This is outlined to the left. One of the most important parts of that strategy is the introduction of new technology – the biggest impact of which comes through replacement of older aircraft in the fleet with newer, more efficient ones. This is not cheap. To keep to the 1.5% fleet efficiency improvement target, the world’s airlines will need to purchase around 12,000 new aircraft by 2020 at an estimated cost of \$1.3 trillion.*

## ***From 2020: Capping emissions growth from aviation***

*While emissions will continue to grow until 2020, the aviation sector has agreed to cap its net emissions at the 2020 level. From this point on, any emissions the aviation industry is unable to reduce through operational, technological or infrastructure measures, or by using biofuels, will need to be offset by market based measures.*

## ***By 2050: halving net emissions based on 2005 levels***

*After 2020, the industry will start seeing some of the large emission reduction efforts made possible by the advanced technology mentioned in this Guide. By this time, sustainable biofuels will be well established and the necessary supply chain will begin to deliver large volumes of low-carbon fuel to the airlines*

*These two major factors, as well as continuing work on infrastructure and operations efficiency, will allow the industry to aim for the most ambitious goal: to ensure that net carbon emissions from aviation in 2050 will be half of what they were in 2005, or 318.5 million tonnes of carbon, despite the growth in passenger numbers.*

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## **Collaboration**

*The aviation sector has committed to these three ambitious targets and will be using the many projects and possibilities identified in this Guide to get there. \But the aviation industry can't do it all on its own. Reaching these ambitious targets is contingent on governments playing an important role – particularly in speeding up some vital infrastructure projects such as NextGen and the Single European Sky. Governments need to prioritise research and development through academic institutions into the development of new airframe and engine technologies. Most importantly, they need to make more investment in research and development in sustainable biofuels for aviation. They can also provide incentives for start-up alternative fuel suppliers for aviation.*

*This Guide has presented some of the many ways in which aviation has been working to reduce emissions. Although aviation produces around 2% of the world's man made CO2 emissions, the industry believes that this is still too much. The aviation industry is committed to the targets it has set and is proud to be one of the only global industries to have such a plan in place. The industry will continue to work with its dedicated United Nations agency, the International Civil Aviation Organization (ICAO), to develop a global plan for reducing emissions with support from the world's governments.*

*It is clear that efficiency has been a priority for the aviation industry for many years – it is at the heart of the way the industry works. But there is scope for more improvement. The measures outlined throughout this Guide need to be rolled out by all airlines, airports, manufacturers and across the world's airspace. It is fair to say that the industry is fully engaged in reducing its emissions. Governments now need to come on board too.*

## **The Next Generation**

*Aerodynamicists are exploring some radical new aircraft designs for the future. By some measures the most efficient aircraft model is a “blended wing” design where the entire aircraft becomes a lifting device, effectively a flying wing. Super lightweight materials and new systems will be required to implement the concept. The Very Efficient Large Aircraft project has already researched blended wing concepts which would deliver per-seat fuel consumption improvements of up to 32% over current aircraft designs. How these aircraft could be designed to fit into current airports and how passengers may react to a windowless journey remains to be seen and these are subjects for further research.*

*The success of first-generation winglet designs (see the “designing aircraft” section) has inspired further research into a new generation of devices, including spiroid wing tips which in tests have demonstrated 10% improvements in lift efficiency, fixed multiple winglets (a 15-20% lift to drag improvement) and actively controlled winglets that change shape in flight and could replace conventional control surfaces such as ailerons, elevators and rudders and where the efficiency savings are potentially higher still. Another European research project is looking at the possibility of a new aircraft model – the Claire Liner – for short to medium range flights which could provide very large reduction in fuel use and noise. It combines various revolutionary concepts including multi-fan embedded engines, ‘box wing’ configuration and optimised cabin capacity.*

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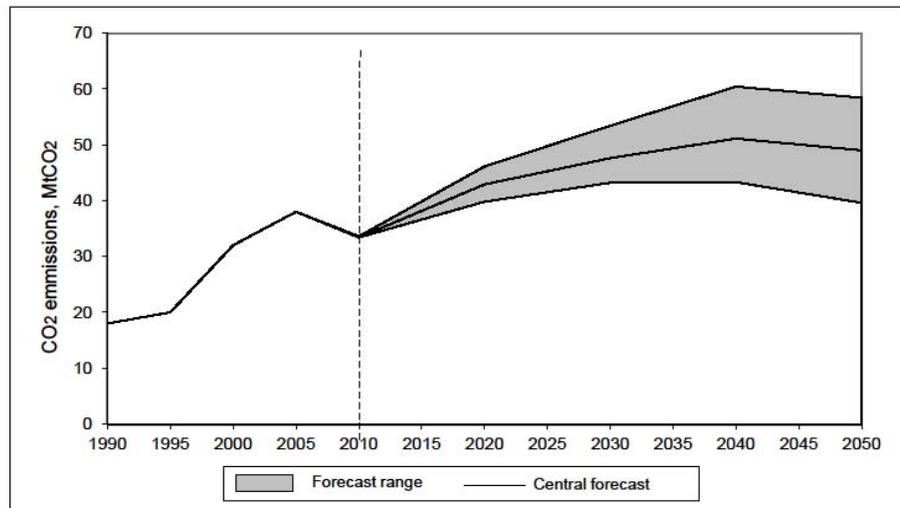
*Even if these concept aircraft don't eventually fly, research into these designs is producing a lot of the valuable innovation covered in this Guide. One thing is very clear – the next 50 years in commercial aviation are going to be just as exciting as the first 50, when we went from the Wright Brothers to intercontinental jet travel.*

## 5.1.2 Comments from DfT Aviation Forecasts 2011

The DfT Scoping Document appears to assume a much more conservative view of the development of biofuels. The DfT forecasters, according to the DfT Aviation Forecasts August 2011, are assuming only 2.5% reduction in jet fuel consumption though substitution by biofuel use by 2050.

As a consequence of this extremely conservative assumption by the DfT, the chart below that represents the DfT forecasts consequently contrasts sharply with the ATAG chart shown earlier in Section 5.1

### Range of the DfT UK aviation CO<sup>2</sup> forecasts



Source: Department for Transport UK Aviation Forecasts August 2011, Figure 3.3

- *The updated central forecasts assume that biofuels are gradually introduced in the 2020s and only make up 2.5% of all aviation fuel burnt by aircraft departing UK airports in 2050.*
- *In defining the lower bound of the forecast range, no biofuels penetration is assumed to 2050, while in defining the upper bound of the range, biofuel penetration is assumed to*

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*rise gradually to 5% by 2050. These assumptions reflect the advice of the independent experts working on the MAC curve analysis following their review of the latest evidence on future biofuels prices.*

## *Carbon intensity of fuel*

- *Once the above method has forecast the amount of fuel that is burned on flights departing each airport on each route by aircraft type, this is converted into CO<sub>2</sub> emissions on the basis that 1.00 kg of kerosene emits 3.15 kg of CO<sub>2</sub>.*
- *Where biofuel uptake is assumed, this average carbon intensity factor is reduced on the assumption that biofuels are accounted for in the transport sector as having zero emissions. For example, in the central forecast in 2050 with 2.5% biofuel take up, it is assumed that across the entire fleet 1.00kg of fuel emits 3.07kg of CO<sub>2</sub>.*

However in the previous paragraph it is noted that Thomson Airways are planning to operate aircraft with a 50% biofuel blend in both engines.

- *DfT's previous forecasts assumed no penetration of alternative fuels into the aircraft fleet during the period of the forecasts. In practice, the industry has been investigating keenly the potential for alternative fuels for some time.*
- *Test flights have shown that some forms of biofuel can successfully be mixed with kerosene. Most recently, Thomson Airways announced that, later in 2011, it will become the first UK airline to fly passengers commercially on biofuel when it begins operating one flight per week from Birmingham to Palma using a 50% biofuel blend in both engines.*

The information reported by Thomson Airways tends to support the much more ambitious biofuel penetration forecasts as proposed by ATAG rather than the ultra conservative approach of the DfT.

Table 3.10 Aviation Forecasts shows CO<sub>2</sub> emissions at LHR declining 2010-2050 from 18.9 million tonnes to 14.9 million tonnes. This is in spite an assumed increase of passenger numbers of 20 million per annum up from 65 million/annum to 85 million/annum. This assertion demonstrates an emissions saving of 40% per passenger even using the assumption of 2.5% usage of biofuel. On this basis, it could be argued that LHR should be expanded far as possible in conjunction with a policy of enforcing a slot regime that gives preference to the largest, most modern and most fuel-efficient aircraft.

## **5.2 Biofuel Production**

A criticism often directed at biofuel production is the competing need for food production. In practice biofuel production can use marginal land, thus providing a valuable cash crop in poorer communities. The following extract is from the ATAG guide Aviation Biofuels.

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## ***Bringing biofuels from feedstock to jet fuel supply***

*Now that biofuels for aviation are a confirmed viable option and the certification process is underway, one of the biggest challenges is cultivating the required quantity of feedstocks. The worldwide aviation industry consumes some 1.5 to 1.7 billion barrels of Jet A-1 annually (about 250 billion litres, or 70 billion US gallons). Analysis suggests that a viable market for biofuels can be maintained when as little as 1% of world jet fuel supply is substituted by a biofuel (or, put another way, 10% of the world's aircraft fleet is running on a mix of 10% biofuel and 90% Jet A-1).*

*So, when will the industry be able to reach that point? If the certification process goes well, it could be as early as 2015. Some parts of the industry are aiming to operate the fleet using 25% biofuel by 2025, which would be increased to 30% by 2030. However, for these targets to be reached, it is necessary to produce sustainable feedstocks in commercial-scale quantities.*

## ***Growing Biofuel Feedstock***

*Second-generation biofuels can be grown in fairly harsh conditions, requiring little or no fresh water and soil that is not at a premium for food crops. So how much land will it take to grow enough feedstock to supply the world's airline fleet with biofuel? Most of the potential biofuel feedstocks can be grown as normal crops. They just need to be planted and cared for, cultivated and harvested before being processed. *Jatropha* can be grown on the land surrounding other crops, as a natural barrier on the edge of fields. It can also be grown on wasteland and in areas where other crops would not survive.*

*While algae can grow in almost all types of water, including seawater, on wastewater ponds and in lakes, they grow fastest in algae incubators called photo bioreactors, or in special ponds to enhance the amount of carbon dioxide and sunlight they can capture to grow. Increasing the productivity through advanced methods, while decreasing the cost-to-unit ratio, is one of the major challenges facing the scaling up of algae feedstock production.*

## ***Processing***

*Once the crop has been harvested, oil needs to be extracted from its biomass. The feedstock is pressed, which produces oil and a leftover substance: the meal. In many cases this meal can also be used. The solid waste left from the processing of *Jatropha*, for example, can be used as fuel for burning on fires and in stoves. The meal from algae oil production can be used for fertiliser, animal feed and other purposes, and camelina meal can be used as animal feed.*

## ***Refining the Bio-Oil***

*The bio-oil can then be refined into renewable jet fuel using conventional hydro-processing technology applied in petroleum refineries around the world today. The process first removes oxygen from the feedstock oil. The product is then further refined through isomerisation, a process by which one molecule is cracked open and re-arranged to form another shape of molecule, to meet the specifications needed for jet fuel. #*

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## **Blending of Fuels and Delivery to the Aircraft**

*Once it is refined, the biofuel needs to get to the aircraft tank, initially as a drop-in blend with traditional jet fuel. Because the industry is pursuing biofuels that can be blended with existing fuel supplies, the industry can start using the new fuel as it becomes available, in increasing quantities, as a “drop-in” to traditional fuel. As the aviation industry and potential fuel suppliers go through the process of certification and production development, they will also be investigating how to deliver the vast quantities of fuel to the world's airports. During the years when blending of biofuel and traditional Jet A-1 fuel takes place, blending may be undertaken at a biofuel refinery, a petroleum-fuel refinery, at a separate facility, or even at the airport fuel facility itself.*

## **5.3 Biofuel Initiatives in the USA**

The US Departments of Agriculture and Energy and the Navy has recently announced that it will invest up to \$510 million over the next three years in partnership with the private sector to produce advanced drop-in aviation and marine biofuels to power commercial and military transport. The initiative, announced by President Barack Obama in August, follows the Blueprint for a Secure Energy Future, the administration's framework for reducing dependence on foreign oil. The following is an extract from the White House statement:

*The U.S. Departments of Agriculture, Energy and Navy will invest up to \$510 million during the next three years in partnership with the private sector to produce advanced drop-in aviation and marine biofuels to power military and commercial transportation. The initiative responds to a directive from President Obama issued in March as part of his Blueprint for A Secure Energy Future, the Administration's framework for reducing dependence on foreign oil. The biofuels initiative is being steered by the White House Biofuels Interagency Work Group and Rural Council, both of which are enabling greater cross-agency collaboration to strengthen rural America.*

*“Biofuels are an important part of reducing America’s dependence on foreign oil and creating jobs here at home,” said President Obama. “But supporting biofuels cannot be the role of government alone. That’s why we’re partnering with the private sector to speed development of next-generation biofuels that will help us continue to take steps towards energy independence and strengthen communities across our country.”*

*Increased use of advanced biofuels is a key component of the Administration's energy security agenda, but there is currently a lack of this manufacturing capability for next-generation drop-in biofuels in the United States. To accelerate the production of bio-based jet and diesel fuel for military and commercial purposes, Secretary of Agriculture Tom Vilsack, Secretary of Energy Steven Chu, and Secretary of the Navy Ray Mabus have developed a plan to jointly construct or retrofit several drop-in biofuel plants and refineries. This effort will help address energy security and national security challenges, and will provide economic opportunities in rural America.*

At the Paris Air Show in June, Tom Vilsack was quoted at the Paris Air Show in June as saying that there has been "extraordinary progress in the last 12 months" in understanding how biofuel blends can power flights.

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*"I think we're nearing a tipping point" in terms of building momentum toward use of biofuel on commercial flights, I think [biofuel powering airline flights] is not long-term. In the short term you'll see the benefits."*

He added that the private sector needs "just a little push" from government in the form of loan guarantees and R&D grants to mitigate the risk of moving forward.

*"I think the infrastructure is going to be there if the market is there," Vilsack said. "I'm sure if you have [airlines] interested, we'll get biofuel to airports. This is a wonderful opportunity for rural America. When policymakers are aware of potential job opportunities [that could be created by large-scale biofuel production] in rural areas that have had high unemployment, they become interested in backing biofuel development and are 'reluctant' to cut R&D funding."*

## **6. SURFACE ACCESS**

### **6.1 Heathrow Surface Access**

Surface access is already a major issue at LHR and also at most other SE Airports. This will become increasingly important for resolution over time as road congestion increases making journeys to from airports too unpredictable in terms of time requirement.

Looking at surface access requirements at LHR requires acceptance of a forecast. According to the DfT Aviation Forecasts August 2011, LHR will grow from 66 million passengers in 2010 to 80 million by 2020 and 85 million by 2030 using the constrained forecast. With existing runway capacity at LHR, it seems unlikely that traffic will grow quite so quickly, but nevertheless the number of passengers accessing LHR by surface transport road and rail will need to grow substantially over the course of time.

An increase to 80 million passengers per annum by 2020, even allowing for rounding to the nearest 5 million, indicates growth of 18-20% in ten years. This compares to less than 9% growth in the previous ten years. It seems probable that the 80 million figure would be achieved in a longer time scale than has been assumed by the DfT. With no increases in slot availability at LHR this would need a significant increase in the average passengers per flight carried from 145 to 167. Such an increase could only be brought about through a large increase in average aircraft size. Existing regulations and tariff policies applying at LHR, unless drastically changed, would not appear to be sufficiently encouraging to bring this about.

Complete replacement of mainland UK domestic air services at LHR will only represent 4.0 million passengers per annum based on 2010 figures. Currently the only UK regional points served are Manchester (MAN), Newcastle (NCL), Edinburgh (EDI), Glasgow (GLA), Aberdeen (ABZ) and Belfast (BFS)

International services to mainland Europe within 400 miles only represent 5.2 million passengers based on 2010 figures. This list includes Brussels (BRU), PAR (CDG and ORY), Amsterdam (AMS), Cologne-Bonn (CGN), Dusseldorf (DUS), Frankfurt (FRA), and Lyon (LYS). FRA is in fact just over 400 miles but Deutsche Baan has proposed to operate direct trains in the near future. This would attract some passengers who currently fly, but the likely market

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share will be relatively small given that the point-to-point journey time will be still be over 5 hours.

Together these two sets of routes represent only 14% of total LHR passengers and use only slightly more of the slots. In practice, within a competitive framework, it is unlikely that the rail would attract more than a third of this traffic, particularly bearing in mind that Brussels and Paris are already well served by Eurostar train services from St Pancras.

The UK Government seems to think that improved rail access will be achieved by using Crossrail and a less effective rail interchange at Old Oak Common for long distance trains, but still with indirect trains to LHR from the UK regions, Crossrail and Continental Europe via the St Pancras International Station. It apparently believes that large number of domestic and short haul European flights can be replaced by these train links thus releasing more slots for LHR longhaul services. It seems very doubtful that many of these flights would go unless there could be fast direct services directly to LHR. For difficulty of access and cost reasons this would appear to be a very unlikely outcome.

Rail access is the only solution to bringing an extra 15-20 million passengers per annum into the airport. However to address the additional travel volumes, local and regional rail services will be a higher priority than long distance. For relatively modest sums compared to running a direct high speed trains directly to LHR, rail surface access could be significantly improved by building rail links to the west to the Great Western line to Bristol, South Wales and the South West and also linking into the Southern South West Trains network at Feltham and Staines. This would provide convenient direct rail access to a substantial catchment currently reliant on road access and could possibly even allow a train service between LHR and LGW.

The immediate business case for these rail links may be difficult to justify in pure economics over a short time period. In the long term as road traffic continues to increase many more air passengers would choose to go by rail given sufficient frequency of train services and reasonable ticket prices. The Government may be wise to choose to pay for these links now if they are to be built, as delay will only make such a scheme more expensive and difficult to achieve as building and development around the western periphery of London continues.

The existing and likely planned rail links still do not make LHR fully competitive in rail access terms compared to the major European hub airports such as Amsterdam (AMS), Paris (CDG) and Frankfurt (FRA) all of which have direct TGV/ICE services.

As LHR grows, assuming this can be done according to the Government forecasts, further up grading of the M25 motorway would be required by adding a fifth lane from Junction 7 (M23) to Junction 12 and a sixth lane from Junction 13 (M3) to Junction 16 (M40). This would be difficult, time-consuming and expensive to achieve. While the road works were in progress here it would lead to months if not years of disruption of traffic flows.

The costs of the roadworks improvement and the best options for new rail links to LHR need now to be carefully studied by the Government so that approval can be reached and action can be taken as soon as possible to carry out the necessary public works programme.

## 6.2 Surface Access at other SE Airports

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Rail links to LGW are much better than those to LHR, but there is still room for improvement. At LGW rail links to the east, (Kent), west (Reading and beyond) and north (especially north of London) need to be improved. The lines to Reading via Redhill and Tonbridge via Redhill could serve as much more effective routes for passenger wishing to use LGW. The Reading line could be electrified for a relatively modest cost (there are only one or two sections that would need to be electrified) and this should be studied as a matter of some urgency.

It also might be possible to reroute trains from Tonbridge and Reading through Earlswood rather than Redhill which would avoid reversing.

Running additional LGW trains to the north is more problematic because of current tortuous paths especially if these trains were to serve the Midlands and the North of England.

For Stansted the question is providing a wider choice of train destinations beyond London Liverpool Street. Better connecting rail into the midlands, Ipswich and Norwich would improve passenger flows into the airport.

At LGW road connections to the A23 and the M25 are abysmal with heavy traffic queues at a series of roundabouts due to traffic reversal between the two terminals. New access routes are urgently required for LGW even if traffic growth is relatively modest.

STN is generally well served via the M11, but for many passengers travelling from the south, north and west this still necessitates travelling along congested sections of the M25. Cross-country relief road improvement may be necessary in the medium term when passenger growth resumes at the airport. Unless Stansted becomes a multiple runway airport the case for spending large sums of money on road and rail surface access improvements is probably difficult to justify.

## **7. CONCLUSIONS AND RECOMMENDATIONS**

### **7.1 Environmental Issues: CO<sup>2</sup> emissions**

MSP Solutions believes that the current Government forecasts of the aviation industry emissions is inconsistent with the commitments of the industry and paints an unnecessarily bleak picture of overall emissions to try to sustain the Government's current argument that there should be no new SE Airports' runway capacity in the foreseeable future, If the Government wants to put the case for no additional runways. It should use plausible arguments on their merits and not extreme cases that are most unlikely to take place.

First the Government needs to revisit its forecasts of aviation CO<sup>2</sup> emissions. The calculation that bio fuels will make only a 2.5% substitution penetration into jet fuel supplies is not credible as a central forecast. The Government should seek better expertise and come up with some more realistic projections within the timescale to 2050. This is not to say that they have to accept the full ATAG objectives. There is no absolute certainty that this could be achieved, but a 15% penetration of biofuels into the jet fuel market by 2050 would be a reasonable and acceptable assumption. The Government needs to revisit the calculations here.

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Second before lambasting the aviation industry with the fact that lower growth is more desirable than trying to meet a reasonable volume of indigenous demand growth, the Government needs to take into account how many extra foreign flights from Europe will fly over the UK skies and to what extent these flights will add high level pollution to UK skies. It also need to attempt to model and measure the impact of additional shorthaul flights from all UK airports that will feed into the European hubs in the absence of a growing UK hub. Ignoring this damage is painting a distorted picture of the environmental damage sustained by additional indigenous flights at a hub airport.

The UK Government should be much more active in supporting research for biofuel production, in line with the policy adopted by the US Government. Biofuels are an area of added value and potential technical expertise that could increase the value of services exports to the UK and lead to some increase in employment.

## **7.2 Examination of Options for providing additional runway capacity in SE England**

Options to add runway and airport capacity should be properly explored without pre-conditions on existing and prospective sites in SE England and elsewhere such as the Southern Midlands and the South West. The Government's argument that no new runway capacity will be provided in the UK for the foreseeable future simply does not make sense in the long term if the UK, and London in particular, is to remain a key international aviation gateway. Even if the Government insists on no immediate new expansion at existing airport sites, it still needs to review the realistic options to eventually replace LHR as the UK's hub airport.

MSP Solutions believes that the idea put forward by Transport for London of a man-made island airport in the Thames estuary is interesting but probably too risky and too expensive to achieve given the geological nature associated with the Thames Estuary, but believes the Government should run over the costs and technical risks associated with the project before completely rejecting the idea.

MSP Solutions favours four options three of which relate to locating a completely new major 4 parallel runway hub for Southern England.

- The first would be to revisit the Cliffe site to see if the previous plans considered in 2003 could be improved to give a first rate airport well connected by rail and road to the key centres of population. HS1 and Crossrail might be able to connect into the Cliffe site for an acceptable public cost.
- The second Thames site would be to look at a site near or on the Isle of Grain to see if this offered any advantages over a modified Cliffe site for a 4 parallel runway airport.
- The third option would be to build a much bigger airport in the Severn Estuary accepting that it would have to be connected to London by a high speed rail link. Once again this would have the advantage of 24-hour operation.
- The fourth option would be to look at building STN into a Paris CDG type airport. MSP Solutions least favours this approach due to noise nuisance over land and some inhabited areas, but feels it should be properly examined against the other options.

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Building any of these major airports would necessitate the closure of at least one existing airport LHR and probably also LGW and applying the traffic distribution rules to re-direct existing airline traffic to the new airport. Implicit in construction of a new airport in the Severn estuary would also be the closure of both Bristol and Cardiff. Any other voluntary process would result in confusion with long term underutilisation of the new facility for a number of years. The existing airport operators would probably convert the airport sites into building land for housing or industry or a combination of both.

MSP Solutions would recommend that options to maximise traffic at LHR, LGW and STN be studied for several cases:

## Medium Term Options

- No new runways at LHR, LGW and STN making the best of this limitation.
- An additional parallel runway at LHR to south and adjacent to the existing southern runway.
- A new close parallel runway at LGW both close spaced and wide spaced.
- Two new parallel runways at LGW wide spaced located south of the existing main LGW runway.
- No new runways at STN
- One wide spaced new runway at STN
- Two new close parallel runways at STN wide spaced from the existing runway
- Building a new airport in the Severn estuary with two parallel runways and closing the existing Bristol and Cardiff Airports. This would be a 24 hour operation including express cargo and strategic longhaul air cargo, as well as serving passenger traffic for the South West, the Thames Corridor and for Wales.
- Looking at any other realistic options for expanding runway capacity at other airport sites or green field location in the southern midlands.

## Long Term Options

- Revisiting the Cliffe site options including a full review of surface access options.
- Looking at the Isle of Grain in the Thames estuary on similar lines to Cliffe.
- Build a much bigger airport in the Severn Estuary
- Expand STN to a 4 parallel runway airport to consider against the other long term options.

### 7.3 Improving LHR in the event of No New Runway Construction.

Some improvement of LHR, including provision of additional stand and terminal capacity is going to be necessary, whether or not a third runway is built. As LHR will remain the UK's key

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airport probably for at least the next 20 years the Government needs to ensure that the airside and landside development is not sub-optimised to save money on the part of the airport operator. This as stated before in Section 5.4, LHR is so important to the general public that it cannot be left to the industry to decide on its own. The Government needs to have some influence to ensure that the decisions that are made make sense in optimising LHR as much as is possible to ensure that it remains as competitive as possible with the other major European and Middle East hub gateways.

## **7.4 Improved rail and road access to LHR and other SE Airports**

Improved road and rail access is required for all three major SE Airports LHR, LGW and STN as the traffic continues to grow especially if no new runway capacity is added to any of these airports. At LHR while it would be nice to have an HST link this is not as important as improving local rail links. Services to the north, west, south and to Crossrail are much more important as critical future LHR rail links.

At LGW links to the east, west and north need to be improved. The lines to Reading via Redhill and Tonbridge via Redhill could serve as much more effective conduits for passenger wishing to use LGW. The Reading line could be electrified for a relatively modest cost and this should be studied as a matter of some urgency. Running additional trains to the north is more problematic because of current tortuous paths.

For Stansted the question is providing a wider choice of train destinations beyond London Liverpool Street. Better connecting rail into the midlands, Ipswich and Norwich would improve passenger flows into the airport.

Road access to LHR has improved with widening of the M25 and a separate spur to Terminal 5. However, further widening will be required to handle increased traffic flows if the Government's projected growth at LHR is realised.

At LGW connections to the A23 and the M25 are abysmal with heavy traffic queues due to traffic reversal between the two terminals. New access routes are urgently required even if traffic growth is relatively modest.

STN is generally well served via the M11, but for many passengers travelling from the south, north and west this still necessitates travelling along congested sections of the M25. Cross-country relief road improvement may be necessary in the medium term when passenger growth resumes at the airport.

## **8. NEXT STEPS**

Whatever course of action is decided by the Government, it needs to be commenced quickly in the very near future to ensure the future success of the UK's aviation industry and overall economic prosperity of the country.

Even if the Government is not convinced by all the studies to change its policy on the construction of new runways at the existing SE Airports, it must take into account the long term

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need for the UK to have a fully competitive hub airport. In the long term the LHR site is too small to fulfil this role and the site is badly located from an environmental viewpoint to take much more air traffic. This inevitably leads to the conclusion that another new site must be found to replace LHR. Bearing in mind the lead times for planning and construction of this facility the Government must accept that the initial planning for this facility needs to be done within the current Parliament.

MSP Solutions would be pleased to take part in any future debates and to assist the Government on this important issue.'