

INTRODUCTION

Airports have come to symbolize progress, freedom, trade and the aspirations of their host nation on a global stage. At the same time they represent pollution, noise and fear to a world waking up to global warming. Airports are often loathed and opposed by the very people who demand cheap flights to their favourite holiday destinations.

Heathrow airport is a unique place, still holding its own as the busiest international airport in the world. Flying passengers to over 180 different destinations, Heathrow is a melting pot for all nationalities and backgrounds. The Queen and Prince Philip are regular users, and over the years such luminaries as the Beatles, Marilyn Monroe, Diana Ross, Nelson Mandela, Mikhail Gorbachev, Posh and Becks, George W. Bush senior and junior and the 2003 world cup-winning England rugby side have all passed through its gates; the Spice Girls' reunion in 2007, saw them opening the newly refurbished T3. Less welcome guests are also very interested in Heathrow – in 2004 Scotland Yard's flying squad swooped on

seven robbers trying to grab gold and cash valued at £80 million near the cargo area (BBC News, 2004). They are not the first and won't be the last to spot a financial opportunity at the world's busiest international airport.

And yet for so many the experience of today's Heathrow is not positive. The facilities strain under the pressure of running at over 99 % capacity at all times, with no room for manoeuvre even in these troubled times of security alerts. Dealing with 68 million passengers in a facility designed to handle 45 million has been less than ideal for BAA, the airlines and sadly the passengers as well. As T5 opens in March 2008, over 22 years from the initial White Paper consent, there will be many who think that not getting the T5 facility open for the travelling public four or five years earlier was a real missed opportunity. If planning permission and regulatory settlements had played out differently, the UK could have built, and had open, both T5 and Heathrow East (tied to a third runway and first considered in response to a 2003 White Paper), which would have meant that by now 80 % of the facilities at Heathrow would have been new and providing a world-class experience.

T5's opening date of 30 March 2008 was set in 2001 and a budget of £4.3 billion established in 2003. When the T5 Programme started, the predictions were that the terminal would open a year late and be a billion pounds overspent, an alarming prospect for the board of any plc. This is the tale of how leaders over time, from BAA, BA and some of the 20 000 suppliers who have been involved in T5, worked together in a different environment, with the tone set by a ground-breaking contract, the T5 Agreement, in which the client held most of the risk. This was a fundamentally different approach that in turn allowed 50 000 people working in integrated teams to deliver on time, on budget, safely and with care to the environment a good design and an even better passenger experience.

The planning, design, construction and opening of T5 have been a winding path that will be explored in some detail in this book.

The longest *planning inquiry* in UK history, which sat for 525 days, heard 734 witnesses, absorbed 20 million spoken words and carried

out around 100 site inspections, ultimately gave the green light to build T5 with over 700 planning conditions.

Three different *design* schemes evolved over the years as planning hurdles were overcome and world events such as the King's Cross tube fire and the 9/11 terrorist attack meant that specifications needed to change. T5 is set in a mature landscape, including the 250 000 new trees and shrubs that have been planted, and is easy to get to with Piccadilly line and Heathrow Express extensions, a spur road built from the M25 and good bus and coach connections. Passengers will be greeted by dancing fountains in a boulevard-like interchange plaza that is home to 40 mature London plane trees. The 156-metre single-span 'wavy roof' and a glass façade afford passengers views of Windsor, London and of course the aircraft, while always feeling light and spacious. The iconic design will be challenged by some as being too costly, but has the potential ultimately to stand the test of time as a facility that looks good but works even better.

T5 was *constructed* on a site of 260 hectares, the size of Hyde Park, using the ground-breaking T5 Agreement commercial contract, in which BAA held most of the risk. It was made up of 147 sub-projects, which clustered into 18 projects, and was led by four project heads, one for civil engineering, rail and tunnels, buildings and systems, and these collectively became the £4.3 billion T5 Programme. The main terminal building floor plates are the equivalent of 50 football pitches. There is 17 000 tonnes of steel in the roof of the main terminal building, which weighs the equivalent of 2800 bull elephants. To keep the workforce productive, 8000 people were being transported on 60 buses, fed in one of 18 canteens – and 18 000 000 metres of loo roll were used! As the terminal was being built it was the largest single construction site in Europe.

The *operational readiness* team has three opening events. The Queen will cut the ribbon prior to the opening date, there is an event on the actual day of opening and then the Saturday afterwards the Olympic torch will pass through T5 and the National Lottery will be hosted in the building. In preparation over three years, a joint BAA and BA team has worked to ensure that all of the people,

processes and systems will be ready and working in the new facility on day one. Typically in airports such as Hong Kong or Denver it has been systems challenges that have delayed the opening date, so meticulous planning has gone into ensuring that this doesn't happen at T5. In the last six months of the T5 Programme, 72 proving trials each involving up to 2500 people will have tested how T5 works. By 26 March 2008 about 55 % of the first phase of the BA move will have taken place. Then on the evening of 26 March the first switch activity will move over most of BA's T1 and T4 short-haul services into T5, and its long-haul flights from T1 and T3. This move on the eve of the T5 opening will include 95 full lorries of equipment from inside the buildings, 2100 pieces of ground support equipment and 35 aircraft that are on the ground at night. The second switch takes place on 30 April 2008 and moves the remaining long-haul flights from T4 into T5.

HEATHROW, AN ECONOMIC POWERHOUSE

Heathrow's history

The roots of Heathrow airport (BAA, 1995) lie in the Second World War, when the Air Ministry determined that Northolt Aerodrome, which lies some four miles to the north of Heathrow, was too small to handle heavy bombers and large transport aircraft. In 1942 a survey of possible sites around London began for a second suitable military airfield.

A piece of land bought in 1929 between Bath Road and Staines Road, which had already been used for experimental flying and development, was deemed suitable for the site of the new military airfield. In 1944 work began on the construction of Heathrow, with initial plans outlining nine runways, three of which were to be to the north of Bath Road forming a triangle, and six to the south of the A4, which were designed to provide three parallel pairs of runways that would allow aircraft to take off and land into the wind irrespective of its direction.

By 1945 the first runway and some buildings on the north side of the airfield had been built and the first commercial flight took place in 1946, when British South American Airways carried 10 passengers to Buenos Aires. That year saw 63 000 passengers use Heathrow, in comparison with nearly 200 000 passengers a day now. By 1947 work had begun on a tunnel under runway one, leading to the central area, along with a control tower, office facilities, the Queen's Building and today's Terminal 2 (T2), which was opened in 1955.

In 1962 today's Terminal 3 (T3) was opened, providing a new terminal for long haul, and by 1968 Terminal 1 (T1) had opened for short haul. In the same year the cargo terminal on the south of Heathrow opened, along with a tunnel connecting it to the central terminal area (CTA). With more terminals and passengers the focus moved to surface access, with the M4 and spur road completed in 1965 and in 1971 work starting on the extensions to the Piccadilly line from Hounslow West to the central area or the airport, via Hatton Cross.

The first Boeing 747 arrived at Heathrow in 1970 and by 1977 some 13 % of passengers were being carried on this kind of aircraft. The number grew and by 1979 this put such pressure on T1 to T3 that permission to build T4 was granted, along with the construction of a dual carriageway from the terminal to the link between the A3044, Stanwell Moor Road, and the A3113, Airport Way, which now provides direct access to junction 14 of the M25. In 1986 Prince Charles and Princess Diana opened T4.

The Heathrow we broadly know today has been developing since the mid-1980s. Other nations around the world continued to develop aviation infrastructure at a pace and Heathrow was to wait for over 22 years before the next significant step forward was able to be made – T5.

A new airport for London

When T5 comes on line in 2008, it will give Heathrow the capacity to provide a service to 90 million passengers a year within the

existing runway capacity and also provide it with the breathing space to start to get back on the front foot with upgrading the other terminals. T5 has fundamentally changed the layout of Heathrow, which was originally built on a ‘star of David design’. The opening of T5 signals a move to a ‘toast rack’. This sets the shape that Heathrow East and future developments will start to follow.

Can Heathrow shake off its bad press and start delighting passengers again? Regulatory settlements allowing, there are plans for most of Heathrow to be refurbished or new by 2012 in time for the UK to host the Olympics. The new Virgin lounge opened in 2007; T5 comes on line in March 2008; additional refurbishment takes place in T1, T3 and T4; the closure and demolition of T2 and the Queen’s building will make way for Heathrow East.

New facilities are only part of the answer when aiming to create a world-class passenger experience. Having an engaged and motivated workforce who want to protect and serve passengers productively is critical and is a difficult balance to achieve at times. To deliver this ambition for both airlines and airport operator requires significant work practice changes, which given that UK aviation is riddled with longstanding ‘Spanish practices’ is tough to deliver. By no means straightforward, this requires careful management of an influential group of trade unions, who understand the global impact of industrial action at Heathrow.

Why Heathrow is an economic powerhouse

Heathrow is the UK’s only truly global hub, linking London to the rest of the world. It is the world’s busiest international airport, with 90 scheduled airlines using it, flying 68 million passengers to 180 destinations around the world, resulting in over 473 000 flights a year.

Heathrow is used by 10 % of the world’s airline traffic, the majority of this from three major worldwide airline alliances: Oneworld, Star Alliance and Skyteam, which now account for 80 % of Heathrow’s

Heathrow Airline Alliances

Heathrow Airline Alliances	2004	% at Heathrow
Oneworld BA, Qantas, American Airlines, Cathay Pacific, Aer Lingus, Iberia (BA Share:)	34.5 mppa (27.9 mppa)	51 % (41.6 %)
Star British Midland, United Airlines, Singapore, Air Canada. Lufthansa, SAS	16.8 mppa	25 %
Skyteam Air France, KLM, Alitalia	3.3 mppa	5 %
Non-aligned Airlines (Virgin share:)	12.5 mppa (3.1 mppa)	19 % (4.6 %)

Figure 1.1 Heathrow airline alliances.

passengers (see Figure 1.1). There is significant local demand, with 83 % of the direct passengers in 2004 travelling from or to locations in the South East of England. There is a strong route network when compared to its mainland European competitors, with Heathrow offering the highest number of flight frequencies to the world's major destinations (see Figure 1.2).

Heathrow's European hub status is under threat, though, as Paris's Charles de Gaulle, Amsterdam's Schiphol and Frankfurt all have more runways and a greater land take (see Figure 1.3). While Heathrow is currently the most productive airport, the forecast is that it will be superseded by its European competitors by 2010 if it does not get permission for a third runway (see Figures 1.4 and 1.5).

Number Of Non-stop Departures Per Week - Summer 2004

	LHR	CDG	FRA	AMS
NewYork	135	60	35	18
Chicago	80	21	38	16
Washington	59	21	28	14
Los Angeles	59	23	17	7
Toronto	53	20	23	20
Singapore	49	17	28	18
Tokyo	42	33	21	14
Bangkok	32	14	30	17
Hong Kong	45	14	14	12
Dubai	55	14	21	7

Figure 1.2 Number of non-stop departures.

European Hub Airports Land Take 2004

	Landtake (ha)	Pax	000 pax/ha
Heathrow*	1.227	67.1 mppa	54.7
Paris (CDG)	3.309	51.0 mppa	15.4
Frankfurt	1.397	50.8 mppa	36.4
Amsterdam	2.147	42.4 mppa	19.7
* including T5			

Figure 1.3 European airports’ land take, 2004.

European Airports Runway Capacities

	2004 R/ways	2004 ATMs	2006 R/ways	2010 ATMs (capacity)
Heathrow	2	67.1 mppa	2	54.7
Paris (CDG)	4	51.0 mppa	4	15.4
Frankfurt	3	50.8 mppa	4	36.4
Amsterdam	4	42.4 mppa	5	19.7

Figure 1.4 European airports’ runway capacities.

European Hub Airports Capacity Comparison

	Current passenger numbers mpps	Runways	Destinations served	Current flights per year	2010 flight capacity	%Full (Current flights as a proportion of 2010 capacity)
Heathrow	67.7	2	180	473.000	480.000	98.5 %
Frankfurt	51.9	3	262	490.000	660.000	74.2 %
Paris CDG	53.5	4	223	522.000	710.000	73.5 %
Amsterdam	44.1	5	222	420.000	600.000	70.0 %

Figure 1.5 European hub airports' capacities.

The 2003 Future of Air Transport White Paper reinforced the view that Heathrow is much more than just an airport for London, recognizing that it delivers significant direct and indirect benefits to the local and national economy:

- *Employment generation.* Heathrow supports around 150 000 direct and indirect jobs in the local area and 68 000 employees actually work at the airport (BAA, 2005).
- *UK competitiveness.* Nearly 3.5 million foreign business trips are made to the UK through Heathrow each year. A total of £62.7 billion of UK exports are by air (Oxford Economic Forecasting, 2006) and 56 % of all UK freight passes through Heathrow. International transport links are an important factor when companies decide where to locate. A survey of 500 of Europe's top companies found that 52 % considered transport links a vital factor in deciding where to locate, while 60 % identified access to markets, customers and clients as essential (Cushman & Wakefield Healey & Baker, 2005).
- *Tourism.* Of the 68 million passengers a year using Heathrow, over 9 million foreign visitors use the airport each year, with spending while in the UK estimated to be worth 1.5 % of the country's gross domestic product (BAA, 2005).

Heathrow celebrated its 60th birthday in 2006. It has had an illustrious history as a key global landmark in aviation and a formidable

economic force. As we look forward another 60 years, what will its fate be?

WHY SHOULD YOU READ THIS BOOK?

Written to appeal to those who enjoy both familiar and fascinating facts or an impossible challenge matched with human endeavour, and mostly for those who want to learn from a UK success story, *Heathrow's Terminal 5: History in the Making* is for those in the industry, those interested in modern history or simply those keen to explore details of how such a large-scale transformation was delivered.

We all know and have an opinion about Heathrow. The facts span all aspects of aviation and construction industry and are unashamedly used to try to share the scale of the task. It was a task that was at times predicted to be sure to fail, even after planning permission was finally granted. To design, build and open a £4.3 billion project on time and on budget was bucking the trend. Faced with failure companies and leaders can often take brave steps, and for BAA the T5 Agreement, the unique contract in which BAA held most of the risk, set a tone that permeated everything that was done on T5 and empowered key leaders from different companies to work together in integrated teams to deliver success.



Heathrow before T5



Heathrow after T5

