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# ***Cost and Commercial Viability: Literature Review Update***

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Airports Commission

*July 2015*



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# Report updates

This report was originally published by the Airports Commission in November 2014 as part of its public consultation. No updates have been made to this version of report (save the inclusion of this 'Report updates' section), which will be published with the Commission's final report in July 2015.

In light of consultation responses received, it is recognised that the Commission has made some revisions to its view of the costs associated with the three short listed schemes (see Cost and Commercial Viability: Financial Modelling Input Costs Update report for further details).

Were the Commission to reflect these changes in the drafting, the 'AC Cost estimate 2014' presented in Figure 17 on pages 27 to 28 for the LGW 2R, LHR NWR and LHR ENR schemes would be updated as follows. In this table, the grey figures are those included in the November 2014 report.

	<b>Gatwick Airport Second Runway (LGW 2R)</b>	<b>Heathrow Airport Northwest Runway (LHR NWR)</b>	<b>Heathrow Airport Extended Northern Runway (LHR ENR)</b>
AC Cost estimate 2014	£7.4bn	£18.6bn	£13.5bn
AC updated Cost estimate 2015	£7.1 bn	£17.6bn	£14.4bn

In addition, the capital expenditure impact on the existing GAL and HAL RAB (based on the AC's updated view of costs) presented in figure 18 on page 29 would be updated as follows. In this table, the grey figures are those included in the November 2014 report.

<b>£bn</b>	<b>GAL</b>	<b>HAL</b>	<b>HAL</b>
RAB Value as of 1 April 2014	2.5	14.6	
<b>Options (AC cost estimate)</b>	<b>LGW 2R</b>	<b>LHR NWR</b>	<b>LHR ENR</b>
Estimated cost (2014 real prices)	7.4	18.6	13.5
Peak RAB value (2014 real prices)	8.1	28.6	24.8
<i>Increase from current to new RAB value</i>	<i>3.2 times</i>	<i>2.0 times</i>	<i>1.7 times</i>
<b>Options (AC updated cost estimate)</b>	<b>LGW 2R</b>	<b>LHR NWR</b>	<b>LHR ENR</b>
Estimated cost (2014 real prices)	7.1	17.6	14.4
Peak RAB value (2014 real prices)	7.8	32.4	29.5
<i>Increase from current to new RAB value</i>	<i>3.1 times</i>	<i>2.2 times</i>	<i>2.0 times</i>

No other updates are required to be made to this report. Where the original report used information as at a point in time, for example details on the top international airports by passenger numbers and the current financing structures for Gatwick and Heathrow airports in section 1, this information has not be updated.

Given the minor nature of the amendments and in the interest of transparency, the Commission has decided to publish the changes in this 'Report Updates' section and not change the report content from the November 2014 position.

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# *Important notice*

## *Important notice*

This document has been prepared for the Airports Commission in accordance with the terms of the Provision of Consultancy for Commercial, Financial and Economic Option Appraisal and Analysis (DfT) framework and the Contract Reference RM 2750 (650) dated 12th February 2014 and solely for the purpose and on the terms agreed with the Airports Commission within the Project Inception Document reference 13.1: Cost & Commercial Viability: Literature Review dated 8<sup>th</sup> August 2014. We accept no liability (including for negligence) to anyone else in connection with this document.

This document contains information obtained or derived from a variety of third party sources as indicated within the document. PricewaterhouseCoopers LLP ('PwC') has used industry recognised or relevant third party sources, but has not validated or verified the information/ data provided.

Should any person other than the Airports Commission obtain access to and read this document, such person accepts and agrees to the following terms:

1. The reader of this document understands that the work performed by PwC was performed in accordance with instructions provided by our client, the Airports Commission, and was performed exclusively for their benefit and use. The document may therefore not include all matters relevant to the reader.
2. The reader agrees that PwC accepts no liability (including for negligence) to them in connection with this document.

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# *Scope and context*

The Airports Commission (an independent commission) was established in 2012 by the UK Government to consider how the UK can maintain its status as an international hub for aviation in response to increasing concern over existing and future capacity requirements. Since 2012, the Airports Commission (AC or 'The Commission') has considered and evaluated a variety of options for meeting the UK's international connectivity needs, the results of which were outlined in the Airports Commission's Interim Report published in December 2013. The Interim Report outlined three firm short-listed options (one option for an additional runway capacity at Gatwick and two options relating to additional runway capacity at Heathrow). In addition, the option for a new airport development located within the Inner Thames Estuary was considered further by the Commission, with a decision in September 2014 not to shortlist. The Commission is due to publish its Final Report in summer 2015.

As part of PwC's support to the Airports Commission, we have been asked to provide a Literature Review, as part of the Cost and Commercial Viability workstream. This review, at a high level, considers:

- **Section 1:** The current financing models at Gatwick Airport Limited (GAL) and Heathrow Airport Limited (HAL), a review of other financing models from elsewhere in the UK and internationally and the existing UK regulatory regime.
- **Section 2:** A review of the key risks and challenges to deliver financing to the scale required to build new capacity.
- **Section 3:** A review of possible alternative financing models and some of the potential implications for the regulatory regime.

To note, this report was prepared in mid-2014 based on the information available at the time and, therefore may not reflect any changes or developments since that point. The analysis presented has been used to support the Commission in its understanding and thinking around potential financing models to be considered in relation to the options it shortlisted in its Interim Report. It is not the purpose of this report to:

- Propose specific options for financing each of the various short-listed options; and
- Provide a detailed assessment or critique of the short-listed submissions under consideration, although references to the submissions are made where this is relevant to support the analysis required under this scope of work.

However, the report does highlight key issues that will need to be considered when carrying out the commercial review of each of the options.

This Literature Review forms part of a wider body of work which PwC has been commissioned to undertake to support the Commission in its commercial, financial and economic appraisal of the runway capacity options.

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# *Methodology*

The methodology used to develop the Literature Review is outlined below.

## *Inputs*

The inputs used to inform the Literature Review include the following:

- Publicly available data sources (a full list of references and sources can be found in Appendix 1 of this report) on existing and future aviation infrastructure schemes (including rationale for scheme, value, cost, funding, financing, risks and challenges);
- PwC subscribed research data bases (a full list of references and sources can be found in Appendix 1 of this report);
- Discussions with internal specialists within PwC in relation to areas such as funding and financing models and the regulatory regime; and
- Scheme promoter's submissions, including clarification requests with scheme promoters prior to consultation.

## *Method*

- Undertook desktop research / analysis to collate information on existing funding and financing models both within the UK and internationally which were comparable to the scale of the schemes under consideration by the AC;
- Information sourced was supplemented by both internal discussions within PwC's aviation team and other infrastructure teams as well as with the AC; and
- Further discussions were undertaken, internally within PwC to provide insight from other similar infrastructure projects in the UK to understand challenges / risks within the market.

## *Analysis*

- Drawing on the above elements, the analysis undertaken for the Literature Review was primarily qualitative rather than quantitative.
- The analysis looked to consider, based on existing case studies and available data:
  - The different types of airport funding models currently in use in the UK and internationally;
  - A sense of the risks and challenges associated with securing funding and financing and alternative funding approaches; and
  - The models that could be utilised for the proposed schemes under consideration by the AC.

# ***Section 1: Overview of current airport financing and regulation***

## ***Introduction***

In supporting the Commission in its understanding of potential financing models for the sizeable runway developments under consideration, this section considers the current airport funding landscape. To this effect, this section:

- A. Provides an overview and comparison of the UK and international airport funding landscape with particular focus on GAL and HAL; and
- B. Outlines the current regulatory framework within which UK airports operate (specifically relevant to GAL and HAL) which is a key consideration in the context of delivering any of the proposed options.

## ***A. Overview of airport funding: UK and international UK airports***

As of 2013, the UK has 57 airports<sup>1</sup> (combination of passenger and cargo) serving 228 million passengers<sup>2</sup> annually. The London airport system is one of the largest and most congested aviation markets in the world. Of the five main international airports in the UK, London Heathrow Airport and Gatwick Airport are the two busiest, with Manchester Airport third, London Stansted fourth and Edinburgh the fifth-busiest in terms of passenger numbers.

Figure 1 provides an overview of the top 19 UK airports in terms of passenger numbers. The remaining airports were considered too small to be relevant to this review.

The UK airport sector is largely privatised, with the majority (18 out of the 19 airports outlined) privately owned and financed or part of a public/private ownership model. The two airports under consideration for future expansion (Gatwick and Heathrow) are the only two airports which are under economic regulation, due to the market power they are considered to have. Historically they have been regulated through price control reviews which have taken place every 5 years (and are therefore referred to as “quinquennia”). The sixth quinquennium (Q6) started in April 2014. Q6 will run until 31 March 2021 for GAL (reflecting the Civil Aviation Authority’s (CAA’s) decision to look beyond the 5 year period with a 7 year price commitment subject to review) and 31 December 2018 for HAL.

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<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/264102/avio109.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/264102/avio109.pdf)

<sup>2</sup> <http://www.caa.co.uk/application.aspx?catid=14&pagetype=65&appid=7&mode=detail&nid=2342>

Figure 1: Top 19 UK airports by annual passenger numbers<sup>3</sup>

Name	Annual passenger numbers December 2013 (m)	Public/Private (Ownership)	Owners	Subject to economic regulation
<b>London Heathrow</b>	72.3	<b>Private</b>	Heathrow Airport Limited (HAL), Ferrovial S.A. (25.00%), Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (GIC) (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (CIC) (10.00%) and Universities Superannuation Scheme (USS) (8.65%)	Yes (new 5 year licence commenced 1st April 2014; charges are reviewed every 5 years) <sup>4</sup>
<b>London Gatwick</b>	35.4	<b>Private</b>	Gatwick Airport Ltd (GAL), (42% Global Infrastructure Partners, 16% Abu Dhabi Investment Authority (ADIA), 12% National Pension Service of Korea (NPS), 13% California Public Employees' Retirement System (CalPERS) and 17% Future Fund of Australia)	Yes (new 7 year licence commenced 1st April 2014; charges are currently monitored on a 7 year cycle with a review of how well the License Based Commitments regime is functioning in 2016) <sup>4</sup>
<b>Manchester Airport</b>	20.8	<b>Public/Private</b>	Manchester Airports Group (64.5% Greater Manchester Boroughs, 35.5% Industry Funds Management (IFM) Investors)	No
<b>London Stansted</b>	17.9	<b>Public/Private</b>	Manchester Airports Group (64.5% Greater Manchester Boroughs, 35.5% Industry Funds Management (IFM) Investors)	No
<b>Edinburgh Airport</b>	9.8	<b>Private</b>	Edinburgh Airport Ltd. (80.9% Global Infrastructure Partners, 9.55% Future Fund Board of Guardians, 9.55% Qsuper Fund)	No
<b>London Luton</b>	9.7	<b>Public/Private</b>	Owned by Luton Borough Council (operated by private concessionaire: London Luton Airport Operations Ltd. (51%, Aeropuertos Españoles y Navegación Aérea (AENA) and 49% Ardian)	No
<b>Birmingham Airport</b>	9.1	<b>Public/Private</b>	Birmingham International Airport Ltd. (49% West Midlands Councils, 2.75% employee share ownership, 48.25% investment and pension funds – Victoria Funds Management Corporation and Ontario Teachers' Pension Plan)	No

<sup>3</sup> Data presented comes from a variety of research databases used by PwC. Please refer to Appendix 1 for details.

<sup>4</sup> Gatwick and Heathrow are subject to economic regulation under the Civil Aviation Act 2012 (previously the Airport Act 1986). Please refer to part B of Section 1 (UK regulatory framework) for an explanation of the existing regulatory regime.

<b>Name</b>	<b>Annual passenger numbers December 2013 (m)</b>	<b>Public/Private (Ownership)</b>	<b>Owners</b>	<b>Subject to economic regulation</b>
<b>Glasgow International Airport</b>	7.4	<b>Private</b>	Glasgow Airport Ltd. (Ferrovia S.A. (25.00%), Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (10.00%) and Universities Superannuation Scheme (USS) (8.65%)	No
<b>Bristol Airport</b>	6.1	<b>Private</b>	Bristol Airport Ltd. (50% Macquarie European Investment Funds, 49% Ontario Teacher's Pension Fund, 1% Macquarie Group)	No
<b>Newcastle International Airport</b>	4.4	<b>Public/Private</b>	Newcastle International Airport Ltd. (51% Newcastle International Airport Local Authority Holding Company, 49% AMP Capital)	No
<b>East Midlands Airport</b>	4.3	<b>Public/Private</b>	Manchester Airports Group (64.5% Greater Manchester Boroughs, 35.5% Industry Funds Management (IFM) Investors)	No
<b>Liverpool John Lennon Airport</b>	4.2	<b>Private</b>	Liverpool Airport Ltd. (100% Peel Holding Ltd)	No
<b>Belfast International Airport</b>	4.0	<b>Private</b>	100% ADC & HAS Airports Worldwide	No
<b>Aberdeen International Airport</b>	3.4	<b>Private</b>	Aberdeen International Airport Ltd. (Ferrovia S.A. (25.00%), Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (GIC) (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (CIC) (10.00%) and Universities Superannuation Scheme (USS) (8.65%)	No
<b>London City Airport</b>	3.4	<b>Private</b>	London City Airport Ltd. (75% Global Infrastructure Partners, 25% Highstar Capital)	No
<b>Leeds/Bradford International Airport</b>	3.3	<b>Private</b>	Leeds Bradford International Airport (LBIA) Holding Ltd. (100% Bridgepoint Capital Group Ltd.)	No
<b>Belfast City George Best Airport</b>	2.5	<b>Private</b>	Belfast City Airport Ltd. (100% EISER Global Infrastructure Fund)	No

<b>Name</b>	<b>Annual passenger numbers December 2013 (m)</b>	<b>Public/Private (Ownership)</b>	<b>Owners</b>	<b>Subject to economic regulation</b>
<b>Southampton International Airport</b>	1.7	<b>Private</b>	Southampton Airport Ltd. Ferrovial S.A. (25.00%), Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (GIC) (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (CIC) (10.00%) and Universities Superannuation Scheme (USS) (8.65%)	No
<b>Glasgow Prestwick Airport</b>	1.1	<b>Public</b>	TS Prestwick Holdco Ltd (100% state-owned by the Scottish Government)	No

*Note: all the debt financing for the airports listed in Figure 1 is raised from private sources.*

Figure 2: UK airport ownership

<b>Public/Private Operator (Ownership)</b>	<b>Name</b>	<b>Passenger Numbers December 2013 (m)</b>	<b>Public/Private Ownership</b>
<b>London Heathrow Airport Ltd (HAL).</b>	London Heathrow	72.3	<b>Private</b> – Heathrow Airport Holdings Ltd. Ferrovial S.A. (25.00%), Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (GIC) (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (CIC) (10.00%) and Universities Superannuation Scheme (USS) (8.65%)
	Glasgow International Airport	7.4	
	Aberdeen International Airport	3.4	
	Southampton International Airport	1.7	
<b>Manchester Airport Group Plc.</b>	Manchester Airport	20.8	<b>Public/Private</b> – Manchester Airports Group (64.5% Greater Manchester Boroughs, 35.5% IFM Investors)
	London Stansted	17.9	
	East Midlands Airport	4.3	

To note as of October 2014, Heathrow Airport Holdings, is in the process of agreeing the acquisition of some of its airports (Aberdeen, Glasgow and Southampton) by Spanish infrastructure firm Ferrovial, Government Investment Corporation of Singapore (GIC), and Australian bank Macquarie.<sup>5</sup>

Figure 2 demonstrates that two separate groups of shareholders own a number of UK airports (four airports and three airports owned respectively). This concentration of ownership results in just over half of the UK's 128 million passengers being served by these two groups.

Global Infrastructure Partners (GIP) also holds a significant interests in three UK airports: London Gatwick (42%), Edinburgh (80.9%) and London City (75%), through their current fund, Global Infrastructure Partners II. While they hold significant investments in these three airports, they do not manage them as part of a group unlike London Heathrow Airport Ltd and Manchester Airport Group Plc.

As can be seen from Figure 1 and Figure 2, the majority of airports in the UK are either fully privatised – raising their finance through commercial bank debt or capital market investors – or are owned through a mixture of public and private entities. In the case of the latter, the public entities are Local Authorities that retain some control over their strategic infrastructure asset and/or through an equity stake in the business; these airports are then financed through the commercial bank markets or capital market investors where appropriate.

Luton Airport is the only UK airport that operates on a concession basis, whereby the Local Authority owner (Luton Borough Council) has let a concession to the private sector (London Luton Airport Operations Limited (LLAOL)) for a period of 30 years, during which the private sector concessionaire raises finance and undertakes the capital investment required at the airport and operates the airport. The concession was extended in 2012 for a further 2 years, to end in 2031. In November 2013, the concession was sold by TBI (a joint-venture between Abertis Infraestructuras (90%) and AENA (10%)) to a consortium of AENA (51%) and Ardian (49%) for £394m.

<sup>5</sup> <http://news.sky.com/story/1346659/singapore-swoops-in-1bn-uk-airports-deal>

## International airport comparison

Figure 3 outlines the top 15 international airports by size (passenger flows<sup>6</sup>), their ownership and method of financing. In contrast to UK airport operations, the majority of the largest international airports are state owned, operated and financed.

London Heathrow Airport is unique in Figure 3, as the only airport in the top 15 to have no public ownership or financing. Sydney Airport, the 31<sup>st</sup> largest by passenger flows (38m in 2013) is the next largest airport to be fully privately owned and financed (by Southern Cross Airports Corporation Holdings Ltd).

Public financing can take a variety of forms and can include a public sector entity raising bond finance (with the explicit or implicit support of government) or direct government grant funding. For airports in countries subject to EU rules on State Aid, public funding needs to be carefully considered in the light of these rules.

Figure 3: Top 15 international airports<sup>7</sup>

Airport	Country	Passenger flows 2013 (m)	No. of Runways <sup>8</sup>	Public ownership	Publicly financed <sup>9</sup>	Private ownership	Privately financed
Hartsfield–Jackson Atlanta International Airport	US	94	5	✓	✓		
Beijing Capital International Airport	China	84	3	✓	✓	✓	
London Heathrow Airport	UK	72	2			✓	✓
Tokyo International Airport (Haneda)	Japan	69	4	✓	✓		
O'Hare International Airport	US	67	8	✓	✓		
Los Angeles International Airport	US	67	4	✓	✓		
Dubai International Airport	Dubai	66	2	✓	✓		

6 <http://www.aci.aero/Data-Centre>

7 <http://www.aci.aero/Data-Centre>

8 <http://www.world-airport-codes.com/>

9 Grant funding or public entity raising finance.

Airport	Country	Passenger flows 2013 (m)	No. of Runways <sup>8</sup>	Public ownership	Publicly financed <sup>9</sup>	Private ownership	Privately financed
Paris Charles de Gaulle Airport	France	62	4	✓		✓	✓
Dallas-Fort Worth International Airport	US	61	7	✓	✓		
Soekarno-Hatta International Airport	Indonesia	60	2	✓	✓		
Hong Kong International Airport	Hong Kong	60	2	✓	✓		
Frankfurt	Germany	58	4	✓	✓	✓	✓
Singapore Changi Airport	Singapore	53	3	✓	✓		✓
Schiphol Amsterdam Airport	Netherlands	53	6	✓	✓		✓
Denver International Airport	US	53	6	✓	✓		

In the case of Beijing, Charles de Gaulle, Frankfurt, Singapore Changi and Schiphol Airport, there is a combined public/private approach to either ownership and/or financing as described below<sup>10</sup>:

- **Beijing Capital International Airport (BCIA)** is a partially privatised airport, which is majority owned by Beijing Capital International Airport Company Ltd., a state-owned enterprise. Approximately 1/3 of the shares in Beijing Capital International Airport are privately owned. The public financing provided for BCIA in this case most likely refers to the \$600m capital injection provided to BCIA in 2004 for expansion of the airport, paid by the Chinese Civil Aviation Administration<sup>11</sup> and the National Development and Reform Commission (both of which are public entities).
- **Paris Charles de Gaulle Airport** is owned and operated by Aeroports de Paris, which was originally a state-owned company prior to its privatisation in 2005. The French Government still maintains 52% ownership of Aeroports de Paris. Aeroports de Paris group's main financing sources consist of bonds and bank loans.
- **Singapore Changi Airport** is 100% state owned but financed via the Singapore based investment company, Temasek Holdings, which raises both public and private finance to fund activities. Temasek Holdings does not publicly disclose financial information<sup>12</sup> but it is known that it was initially funded from shares in companies held by the Singapore government.

<sup>10</sup> Information detailed in relation to Beijing, Charles de Gaulle, Frankfurt, Singapore Changi and Schiphol Airport has been sourced from PwC research databases.

<sup>11</sup> The Civil Aviation Administration of China oversees civil aviation and investigates aviation incidents.

<sup>12</sup> Under Singapore legislation Temasek is not required to disclose financial information (e.g. financial statements) so a more detailed break-down of the public financing provided by this entity is unavailable.

- **Frankfurt Airport** is operated by Fraport AG, a German transport company, which has a mixture of public (31.37% of shares owned by the state of Hesse) and private ownership. Fraport's main financing sources consist of bond, equity and loan funding. Loan funding consists of both private and public (commercial) loans (via the European Investment Bank and WI Bank<sup>13</sup>).
- **Schiphol Airport** is operated and owned by the Schiphol Group N.V. This independent and commercial company is owned by the Dutch Federal Government (69.77%), the municipalities of Amsterdam (20.03%) and Rotterdam (2.2%), and Aeroports de Paris (8.00%). In addition to Schiphol Airport, the group also owns and operates other Dutch airports and operates terminals abroad. The Schiphol Group's financing comes from state funding and private financing, consisting of bond and loans (via Euro Commercial Paper programme and Euro Medium Term Notes). As the Schiphol Group is a separate company, it finances itself outside of the scope of the Dutch Treasury. Schiphol regularly attracts resources from institutional parties through private placement of loans. Recent investments (for luggage handling and a fifth runway) have been partially financed by the European Investment Bank.

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<sup>13</sup> The Wirtschafts- und Infrastrukturbank (WIBank) Hessen acts on behalf of the State of Hesse offering commercial financing at an affordable rate to support the sustainable development of economy and infrastructure for the country.

## Gatwick and Heathrow Airport

This section provides an overview of current operations, ownership and financing structures for both Gatwick and Heathrow.

### Gatwick Airport

#### Overview

London Gatwick is the UK's second largest airport and operates with a single-runway. EasyJet is Gatwick's largest customer, flying 37% of the total number of passengers at the airport. A summary of key Gatwick facts and figures is shown below.

Figure 4: Gatwick facts and figures<sup>14</sup>

Key facts and figures		Key financials as of March 2014 (end of year accounts)	
Passenger numbers	34.2m	Total revenues	£593.7m
Total size of airport	759 hectares	<i>Aeronautical revenues</i>	£317.4m
Number of runways	1	<i>Retail and other revenues</i>	£276.3m
Number of airlines	45	EBITDA	£259.4m
Number of destinations served	200 (in 90 countries)	EBITDA margin	44%
Most popular destination	Malaga, Dublin, Barcelona, Geneva and Amsterdam	Regulated Asset Base (RAB) Value	£2.5bn
Number of terminals	2		

#### Ownership

Gatwick Airport Limited (GAL) is the owner and operator of Gatwick Airport (Gatwick). GAL is wholly-owned by Ivy Bidco Limited (Ivy), a company formed to undertake the acquisition of Gatwick, which is itself owned by a consortium through a number of UK and overseas holding companies and limited liability partnerships. Ivy is ultimately controlled by funds managed by Global Infrastructure Partners (GIP).

Following an equity syndication process, GIP retains a 42% stake in GAL. The other shareholders are the Abu Dhabi Investment Authority (ADIA) (16%), National Pension Service of Korea (NPS) (12%), California Public Employees' Retirement System (CalPERS) (13%) and the Future Fund of Australia (17%).

GIP also has a 75% ownership interest in London City Airport, an 80.9% interest in Edinburgh Airport and its other UK investments include a waste management company and Great Yarmouth Port Company. Despite GIP having controlling interests in other infrastructure assets, including other UK airport assets, GAL is operated and managed separately from GIP's other investments.

<sup>14</sup> <http://www.gatwickairport.com/business-community/about-gatwick/at-a-glance/facts-stats/>

[http://www.gatwickairport.com/Documents/business\\_and\\_community/investor\\_relations/Year\\_End\\_2014/Gatwick\\_Airport\\_Limited\\_Financial\\_Statements\\_31March2014.pdf](http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf)

*Financing structure*<sup>15</sup>

Figure 5 details the current financing structure for GAL. GAL owns 100% of the share capital of Gatwick Funding Limited (GFL). GFL's main purpose is to raise external funding for GAL through the issuance of bonds, the terms of which are then replicated in a 'back-to-back' agreement with GAL.

Figure 5: GAL financing structure<sup>16</sup>



GAL's financing structure is predominantly financed by long term bonds (issued by GFL) as opposed to bank loans (commercial debt loans) (See Figure 6).

Figure 6: GAL financing arrangements<sup>17</sup>

Consolidated debt as of 31 March 2014 (All figures are in £m)	Gatwick Airport Limited
Term Facility	-
Capex Facility	-
Revolving Credit Facility	-
Authorised Credit Facility – Revolving Facility*	(2.7)
<b>Total Commercial Debt Loans</b>	<b>(2.7)</b>
<b>Total Bond Financing</b>	<b>1,523</b>
<b>Total Non-Current Borrowing</b>	<b>1,521</b>
% bond financing over total funding requirement	100%

\* Amount includes capitalised upfront costs in relation to the new bank facilities entered into during the year. These costs will be amortised over the term of the facility.

15 [http://www.gatwickairport.com/Documents/business\\_and\\_community/investor\\_relations/Year\\_End\\_2014/Gatwick\\_Airport\\_Limited\\_Financial\\_Statements\\_31March2014.pdf](http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf)

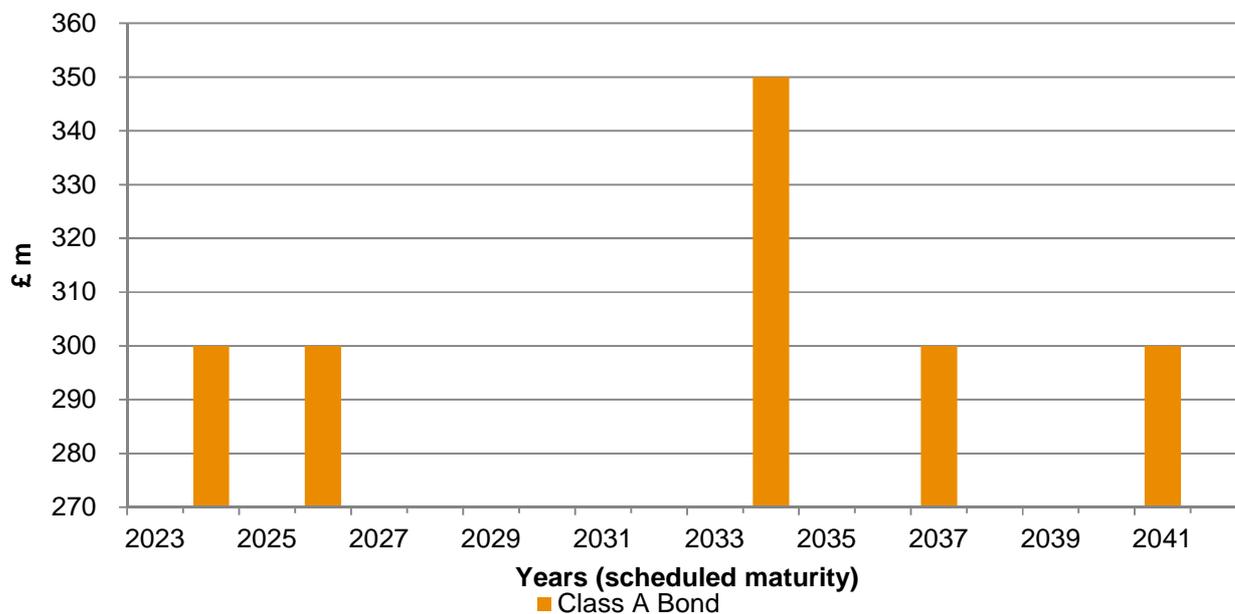
<http://www.standardandpoors.com/prot/ratings/articles/en/eu/?articleType=HTML&assetID=1245365294217>

16 An official ownership structure chart was not available. The chart presented has been developed by PwC based on the ownership information available and noted previously. The chart is a summary overview of the existing financing structure for Gatwick. It does not list all shareholders of Ivy Bid Co which are listed earlier in the document.

17 Please refer to AC Glossary of terms for an explanation of key financial terms.

In relation to the bond financing, GFL had issued £1,200m of publicly listed fixed rate secured bonds comprising of four £300m Class A bonds maturing between 2024 to 2043, with an average tenor of 19 years. On 27 March 2014, GFL issued a further £350 m of publicly listed, Class A, fixed rate, secured bonds maturing in 2036 (legal maturity). As at 31 March 2014, the total bond debt was therefore circa £1,550m (presented in Figure 7).

Figure 7: GAL Bond maturity profile as of 31<sup>st</sup> March 2014 <sup>18</sup>



GAL is predominantly financed through the bond market (typically long term loans from multiple institutional investors often used to finance long term investments). Bonds are given a credit quality rating by the rating agencies which include 'AAA' and 'AA' (high credit quality) and 'A' and 'BBB' (medium credit quality) which collectively are termed “investment grade investments”. Credit ratings for bonds below these designations are termed “sub investment grade,” i.e. of a risk and quality below that acceptable to the vast majority of institutional investors. The rating of any company’s bond issue is determined by the leading Credit Rating Agencies such as Standard and Poor’s (S&P), Fitch and Moody’s, who carry out an independent review of each major public bond issue.

The rating agencies review the airports’ operating and financial performance to assess and arrive at the rating for the bonds. The rating assigned to the bond ultimately impacts the level of appetite from investors and the pricing. This operating and financial assessment includes (but is not limited to) a review of the following:

- Passenger growth;
- EBITDA growth;
- Competitive position;
- Regulatory regime;
- Diversification of aeronautical revenues, passengers and airlines;
- Profitability;
- Capital expenditure;
- Net debt position;
- Interest cover ratios;
- Capital structure; and
- Ability to refinance.

<sup>18</sup> [http://www.gatwickairport.com/Documents/business\\_and\\_community/investor\\_relations/Year\\_End\\_2014/Gatwick\\_Airport\\_Limited\\_Financial\\_Statements\\_31March2014.pdf](http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf)

On 12<sup>th</sup> March 2014, S&P confirmed its 'BBB+' credit rating on all bonds issued by GFL, indicating that it remained comfortable with this rating in light of the revised regulatory framework confirmed by the regulator (the CAA). GAL has set out a series of seven year commitments to its airlines on price, service and investment and to ensure these are met, the CAA has further required that GAL be subject to a licence and monitoring regime. According to S&P, this framework has given GAL greater ability to adjust its pricing to account for passenger volumes year on year than under the previous regulatory framework and greater flexibility in relation to the amount and timing of capital expenditure (capex), especially in periods of passenger volume volatility. They confirmed their 'strong' business risk profile assessment of GAL reflecting Gatwick's market power and their operational efficiency.

S&P indicated that it would base their analysis from April 2014 on GAL's underlying credit quality which supported a "strong" business risk profile and was supported by their positive view of the structural enhancements that they deem to be effective in reducing the default risk of the bonds and in increasing recovery prospects for bondholders if GAL should experience financial distress or fail to refinance facilities. These structural enhancements include:

- Provisions that allow bondholders to take control ahead of an insolvency; and
- A liquidity facility whereby GAL has readily available cash that can be used to ensure repayment of the bonds.

Within their assessment, S&P estimated that GAL will maintain S&P's adjusted Funds From Operations (FFO) to debt ratio at about 9% in 2014 and 2015. This is based on their view of GAL's dividend policies. To support their current view of GAL's underlying credit quality, the company would need to maintain adjusted FFO to debt above 8%. It was viewed that adjusted FFO to debt of 11% would be commensurate with higher underlying credit quality and hence credit rating, all other things remaining equal. However, this scenario is in their view unlikely as the financial covenants in the bonds' documentation allow GFL to operate at higher leverage and the understanding is that management has a long-term leverage target of 65% net debt to RAB<sup>19</sup>. This leverage level and associated impact on rating needs to be borne in mind if Gatwick was to be the preferred option, in terms of both raising finance for the new capital expenditure and refinancing its existing facilities.

There is an existing refinancing requirement with the fact that a significant portion of GAL's debt under its current financing agreement is due to mature within the next 10 years as is to be expected in entities of this nature. However, the proposal for a runway at Gatwick would potentially require financing of more than triple the current financing in the business which could pose a refinancing risk. It will therefore be important that the financing plan associated with delivering the scheme demonstrates the capability to raise both new finance for capital expenditure and to refinance existing debts.

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<sup>19</sup> To note the current net debt to RAB ratio is not available.

## Heathrow Airport

### Overview

Heathrow Airport is the UK's largest airport. A summary of key airport facts and figures is given in Figure 8.

Figure 8: Heathrow Airport facts and figures<sup>20</sup>

Key facts and figures		Key financials as of December 2013 (end of year accounts) <sup>21</sup>	
Passenger numbers	72.3 m	Total revenues	£2.5bn
Total size of airport	1,227 hectares	Aeronautical revenues	£1.5bn
Number of runways	2	Retail and other revenues	£1.0bn
Number of airlines	82	EBITDA	£1.3bn
Number of destinations served	180 (in 85 countries)	EBITDA margin	52%
Most popular destinations	New York (JFK airport), Dubai, Dublin, Frankfurt and Amsterdam	RAB Value	£14.6bn
Number of terminals	5 (a new terminal opened in June 2014)		

### Ownership<sup>22</sup>

Heathrow Airport is currently owned and operated by Heathrow Airport Holdings Ltd. It was previously owned by BAA. HAL also owns and operates three other UK airports<sup>23</sup>, and is itself owned by FGP TopCo Limited, an international consortium led by the Spanish Ferrovial Group (25%) that also include Qatar Holding LLC (20.00%), Caisse de dépôt et placement du Québec (13.29%), the Government of Singapore Investment Corporation (GIC) (11.88%), Alinda Capital Partners (11.18%), China Investment Corporation (CIC) (10.00%) and Universities Superannuation Scheme (USS) (8.65%).

As BAA, the group also formerly owned London Gatwick Airport but this was sold in December 2009 to GIP. Following the sale of Stansted to Manchester Airport Group in March 2013, the Heathrow owning entities have rebranded, becoming Heathrow Airport Holdings Limited. The companies relevant to the financing of London airports before and after the rebranding are illustrated in Figure 9.

<sup>20</sup> <http://www.heathrowairport.com/about-us/company-news-and-information/company-information/facts-and-figures>

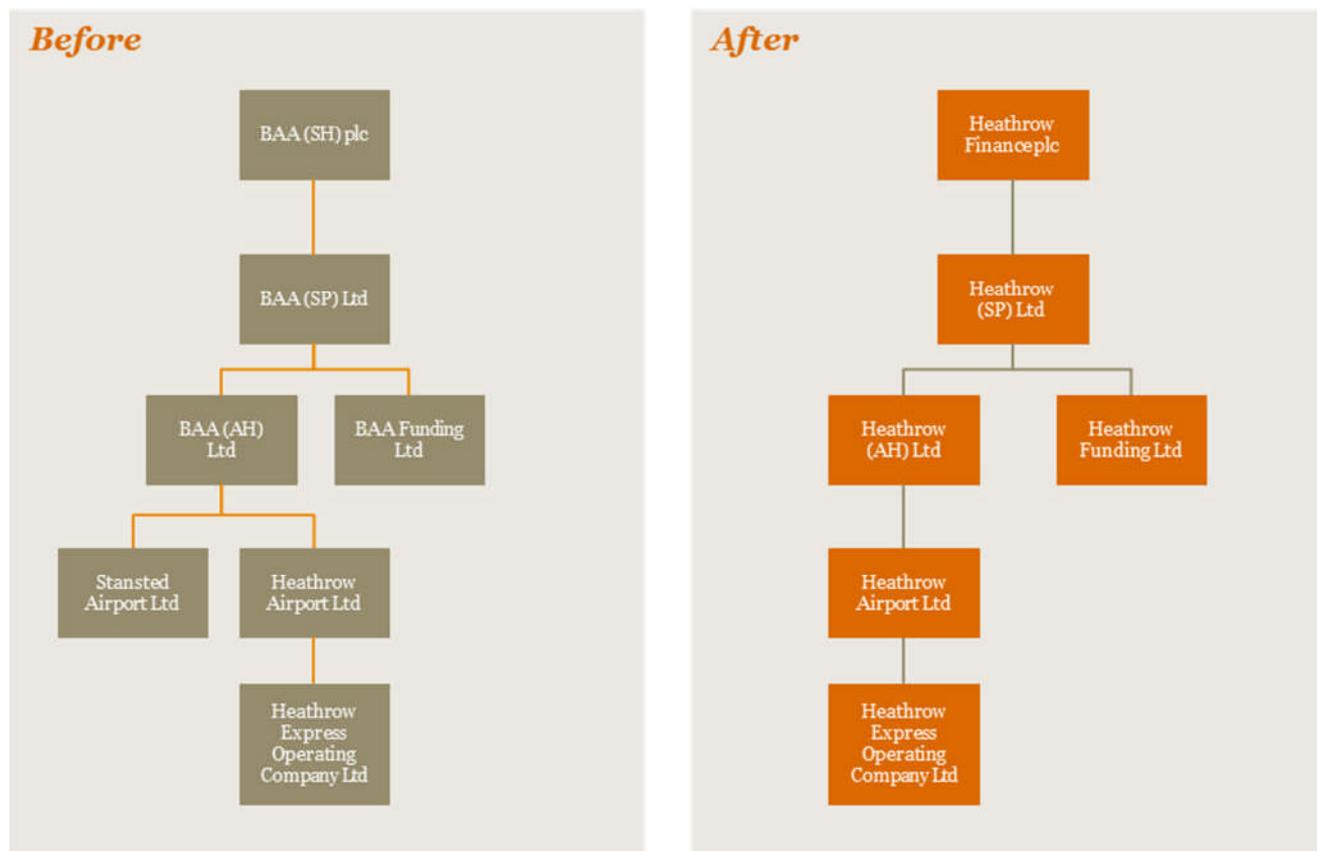
<sup>21</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Heathrow\\_\(SP\)\\_Limited\\_-\\_31\\_December\\_2013.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Heathrow_(SP)_Limited_-_31_December_2013.pdf). These were the latest set of financial accounts published.

<sup>22</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/investor-report-dec2012\\_lhr-airports.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/investor-report-dec2012_lhr-airports.pdf)

<http://www.heathrowairport.com/about-us/company-news-and-information/company-information>

<sup>23</sup> As noted previously as of October 2014, Heathrow Airport Holdings, is in the process of agreeing the acquisition of its airports (Aberdeen, Glasgow and Southampton) by Spanish infrastructure firm Ferrovial, GIC and Australian bank Macquarie.

Figure 9: HAL corporate and financing structure – previous and current



*Financial structure*

HAL is the holding company of a group of companies (outlined above) that provide, manage, fund and finance airport facilities in the UK, particularly Heathrow airport. The HAL group is also involved in airport-related property development and operates the Heathrow Express rail link between Heathrow and London Paddington station.<sup>24</sup>

At an overall group level, Heathrow Airport is financed as detailed in Figure 10. A small portion of the borrowing is allocated to the non-regulated airport activities which relate to Glasgow, Aberdeen and Southampton airports. Figure 10 highlights that the majority of the bank debt raised and all bonds issued in the debt capital markets (‘Total regulated airport loans’ and ‘Heathrow senior bonds’) are used to finance Heathrow airport.

HAL’s financing structure also includes finance from the European Investment Bank (EIB). The EIB has previously lent to HAL to support investments including the Heathrow Express rail link. The EIB was involved in the Heathrow Express project to: improve access and travel conditions for passengers at Europe’s busiest international airport; develop the ‘trans-European communications network’; and to improve London’s urban environment by helping to reduce road congestion. Any case for further financing (e.g. to support the options being considered) would depend on the alignment of the scheme benefits with EIB objectives.

<sup>24</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt\\_maturity\\_profile\\_31\\_March\\_2014.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_maturity_profile_31_March_2014.pdf)

[http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25\\_S&P\\_-\\_Heathrow\\_Funding\\_Rating\\_Affirmed.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&P_-_Heathrow_Funding_Rating_Affirmed.pdf)

*Figure 10: HAL financing arrangements*

<b>Consolidated debt as of 31 March 2014<sup>25</sup></b> (All figures are in £m)	<b>Heathrow Airport Holdings Ltd (HAL)</b>
European Investment Bank (EIB) Term Loan	207
Revolving Credit and Working Capital Facility (WCF)	2,075
<b>Total Regulated Airport Loans</b>	<b>2,282</b>
Term Loan Facility	229
Capital Expenditure, WCF and Overdraft Facilities	117
<b>Total Non-Regulated Airport Bank Debt</b>	<b>346</b>
<b>Total Heathrow Senior A and B Bonds</b>	<b>10,819</b>
<b>Total Other Debt</b>	<b>793</b>
<b>Total Finance (= Regulated + Non-Regulated Airport Debt + Heathrow Senior Bonds + Other Debt)</b>	<b>14,240</b>
% HAL senior bonds over total finance	89%

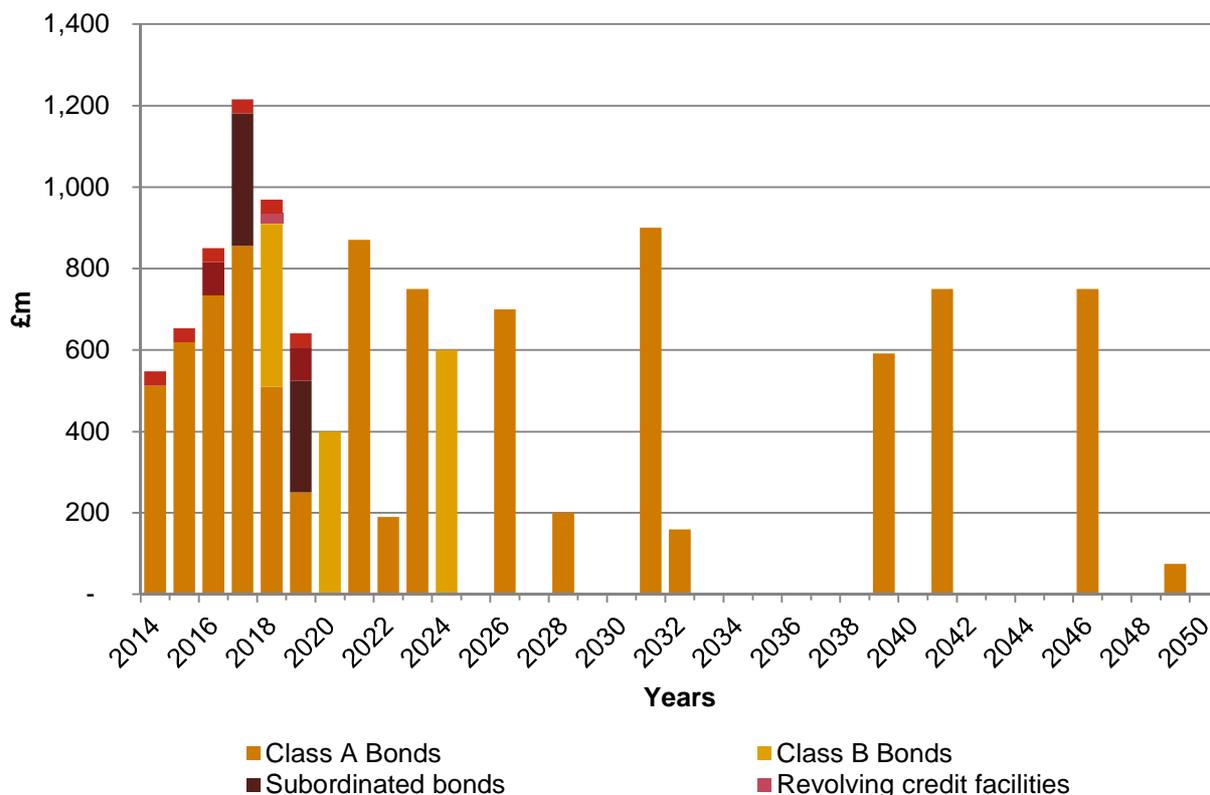
<sup>25</sup> [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt\\_information\\_31\\_March\\_2014\\_HAH.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_HAH.pdf)

[http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt\\_information\\_31\\_March\\_2014\\_Heathrow\\_Finance.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_Heathrow_Finance.pdf)

[http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt\\_information\\_31\\_March\\_2014\\_Heathrow\\_\(SP\).pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_Heathrow_(SP).pdf)

[http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25\\_S&P\\_-\\_Heathrow\\_Funding\\_Rating\\_Affirmed.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&P_-_Heathrow_Funding_Rating_Affirmed.pdf)

Figure 11: HAL airport debt maturity profile (Heathrow SP (Ltd) and Finance Plc as at 31<sup>st</sup> March 2014)<sup>26</sup>



Heathrow Airport is predominantly financed through the bond market (typically long term loans from multiple institutional investors often used to finance long term investments) as part of the wider HAL group. HAL’s bonds are investment grade, which indicates relatively low risk of default. The majority of HAL’s bonds are due to mature by 2024 (59%) with the latest maturity by 2049. These bonds are divided into two classes of bonds, Class A and B; the first of which is senior in security ranking and therefore has a higher credit rating.

As can be seen from Figure 11, a significant portion of HAL’s debt matures over the next 10 years, at a time that potentially coincides with development of the scheme proposal (if the preferred option was to be one of the Heathrow based proposals). In assessing HALs financing proposals and the impact on its credit rating, consideration will need to be given to how HAL intends to raise new finance for both the new runway and supporting infrastructure and also the refinancing of existing debt, and if this is deliverable in the context of the regulatory framework.

The Credit Rating Agencies undertake periodic reviews of the credit quality of HAL, assessing its business risks, outlook and fundamentally its ability to meet its debt obligations as they fall due. As well as a qualitative review of the business, the rating agencies will conduct a quantitative review of the business and the specific bonds being rated, assessing them against a specific set of credit measures, in order to determine the precise rating of each class of bonds.

When structuring the terms and conditions of bond financing, the ability to achieve an investment grade credit rating (“BBB” or above in rating terminology) will have a direct impact on appetite from

<sup>26</sup> <http://www.heathrowairport.com/about-us/investor-centre/debt-information/debt-summary/amounts-and-costs-of-debt/archive>

Assumptions: EIB loans are paid back evenly throughout the years till maturity at 2019 & Revolving facilities aren’t utilised further than at June 2014 levels

the investor community and pricing. Critically, there is a large investor base for investment grade bonds (particularly higher investment grade) – meaning high rated borrowers can access significant levels of financing as long as that rating can be clearly maintained. The total value of corporate investment grade bonds issued in the UK, in all currency denominations, in 2012 and 2013 amounted to £48.7bn and £30.8bn respectively. (The total bond issuance in the UK in 2012 and 2013, regardless of rating, amounted to £63.2bn and £51.5bn respectively<sup>27</sup>).

However, it is important to note that the level of financing available via the bond market will always be dependent on the specific market conditions at the time, individual investor perceptions of risk, and limits on the amount of investment investors can hold in any one bond issue.

The credit rating of a company and its bonds will be impacted both by the inherent risk of the company but also by the level of debt it has relative to those risks and its earnings. Once the level of debt exceeds a particular level, or the risk to the company is deemed to increase above credit rating agency thresholds, a company and/or a bond issue will risk being reclassified as lower investment grade. In such circumstances, both access to finance and the price of that finance can be materially worsened.

One key factor that contributes towards HAL's ability to maintain a solid investment grade rating is the CAA's role as the industry regulator. In the CAA's Q6 license document they state that, "*The CAA must have regard to the need to secure that license holders, such as HAL, can finance their provision of airport operation services when it comes to the exercise of the CAA's functions such as setting price caps.*" Therefore, when setting price caps, the CAA attempts to establish whether HAL can efficiently finance its operations, including its Capex programme. A key assumption the CAA adopts is that HAL should be able to maintain the requirements of a 'solid' investment grade rating (BBB to BBB+)<sup>28</sup>. A 'solid' investment grade means that HAL should be in a position to absorb downside risks and remain at an investment grade rating. When the CAA considers whether their licensing decisions are consistent with HAL maintaining this rating, they focus on six ratios<sup>29</sup> (as well as the same qualitative factors credit rating agencies assess).

On October 25th 2013, S&P, one of the rating agencies, rated the Class A and B bonds issued by Heathrow Funding Ltd as 'A-' and 'BBB' respectively. These ratings were provided on the basis of a review of Heathrow's performance, which showed a 3.6% traffic increase in the first 9 months of 2013 compared to the equivalent period in 2012, revenue growth of 10.7% and EBITDA growth of 22%. S&P viewed HAL's business risk profile as "excellent" reflecting its strong competitive position and supportive regulatory regime, despite uncertainties over how the ongoing price control review would conclude.

S&P noted that under the covenants of its debt financing, HAL can issue:

- senior debt (class A bonds plus any senior debt issued by the borrower group, ranking pari passu with the class A bonds), up to a debt-to-regulatory asset base (RAB) of 70.0% before April 1, 2018, and 72.5% thereafter (senior leverage ratio)
- total debt (senior debt and class B bonds plus any junior debt issued by the borrower group, ranking pari passu with the class B bonds), up to an aggregate net debt-to-RAB of 85% (junior leverage ratio).

As at the time of the rating affirmation (October 2013) HAL's senior and junior leverage ratios stood at 67.8% and 77.9% respectively. S&P anticipate that the company will continue to comply with these covenants, but do expect an increase in the net debt-to-RAB levels to circa 70% and 80%. S&P stated that in their opinion the capital structure remains aggressive, but under their stress testing the bonds

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<sup>27</sup> PwC research database.

<sup>28</sup> CAA credit rating assumptions <http://www.caa.co.uk/docs/33/CAP%201140.pdf>

<sup>29</sup> 1) Interest cover 2)FFO interest cover 3)Adjusted interest cover 4)PMICR (post maintenance interest cover ratio) 5)FFO to debt and 6)Regulatory Asset Ratio (RAR) – otherwise known as regulatory gearing.

were not exposed to default in payment, or a breach of financial default ratios at the current rating levels, nor under the current regulatory structure. In other words, the debt levels relative to the forecast earnings and risk of the company were consistent with current ratings. (Note that this does not take into account the additional uncertainty and significant finance requirement that would be associated with new runway expansion).

It should also be noted that the maximum debt-to-RAB ratios noted under HAL's funding covenants are not the same as the gearing level assumed by the CAA (at 60%) in its notional capital structure used to assess whether its Q6 proposed licence is consistent with supporting a solid investment grade rating from the rating agencies.

S&P stated that refinancing risk was a key risk but noted that this was mitigated by the fact that debt must not exceed a certain proportion of HAL's RAB under its funding covenants. Consequently, at the point where HAL needs to refinance, its continued high credit rating should mean this refinancing risk is considered low. However, since much of the existing debt is due to mature and be refinanced in 2024 around the time of significant capital expenditure if one of the Heathrow based schemes were to be the preferred solution, this must be borne in mind when assessing the financing of HAL's proposed solution. If the financing strategy for the runway expansion worsened HAL's credit rating, it would also make the refinancing of existing debt more risky and/or costly. Consequently, any financing of runway capacity would need to carefully consider the impact on existing financing arrangements.

S&P also stated that they could take a negative action should, over time, the regulatory framework substantially vary and become less supportive of HAL's ability to refinance or if the company is faced with an operational shock which leads to a significant reduction in passenger volumes.

The ratings agency, Fitch, in their rating of the Class A and B bonds in June 2013 provided a similar view to S&P, affirming the above ratings for HAL. Fitch indicated that the strong performance of HAL as a 'resilient hub airport', the certainty and transparent nature of the regulatory framework, the controlled capital improvement plan agreed with the regulator, the multi-layer debt structure which limits some exposure to hedging and financing risk, and the stable performance expected, are all factors that support the current rating.

Fitch also noted two key areas of risk: downside risk posed by the lower rate of return in the Q6 (of 5.35%) compared to the Q5 (6.2%) price control settlement; and refinancing risk. Fitch considers the downside risk to be partly offset by the good commercial and financial performance achieved by HAL in 2012 and early 2013, which has created some headroom to accommodate the lower price cap. The second risk is addressed by the stable outlook of Heathrow Funding Limited's bonds and Heathrow Finance Plc's (Heathrow Finance or the HoldCo) high-yield bonds as well as Fitch's assessment of its ability to service and refinance its issuer and Holdco debt. The refinancing risk will need to be assessed in detail if one of the Heathrow based schemes were the preferred option, as a decrease in the rating would impact both investor appetite and the pricing of the financing.

## **B. UK regulatory framework**

### *Economic regulatory bodies and regulation*

This section considers the framework of economic regulation that applies in the UK and its impact on the shortlisted options. Whilst it is not a regulatory body, the Department for Transport (DfT) plays a key role in shaping wider aviation policy framework.

Within the UK, the main regulatory bodies are as follows:

- European Commission (EC) - In terms of its role in setting regulation (Directives) in respect of aviation and in particular State Aid;
- The Civil Aviation Authority (CAA) – The regulatory framework has recently been revised and now makes use of a licence based approach to regulation, which means that the CAA is increasingly acting as a sectoral regulator along the lines of the Office of Gas and Electricity Markets (Ofgem), the Water Services Regulation Authority (Ofwat) and the independent regulator and competition authority for the UK communication industries (Ofcom)<sup>30</sup>;
- Competition and Markets Authority (CMA) - This was formally established on 1st April 2014 and replaces the Office of Fair Trading (OFT) and the Competition Commission (CC); and
- Competition Appeals Tribunal – The tribunal was created under the Enterprise Act 2002 (which came into force on 1 April 2003) to hear appeals in respect of decisions made under the Competition Act 1998 by the Competition and Markets Authority ("CMA") and the regulators in the telecommunications, electricity, gas, water, railways and air traffic services sectors.

Airports are now governed by the Civil Aviation Act 2012 (which replaced the Airport Act 1986<sup>31</sup>). Under this legislation, airports in the UK are subject to a form of economic regulation which:

- Comprises an assessment by the CAA of whether the airport has market power (the ‘market power test’ or ‘MPT’). The assessment focuses on whether:
  1. The relevant operator has, or is likely to acquire, substantial market power in a market, either alone or taken with such other persons as the CAA considers appropriate;
  2. Competition law does not provide sufficient protection against the risk that the relevant operator may engage in conduct that amounts to an abuse of that substantial market power; or
  3. For users of air transport services, the benefits of regulating the relevant operator by means of a licence are likely to outweigh any adverse effects.
- The CAA, having recently found that Gatwick and Heathrow Airports met the MPT, requires their respective operators to have a licence to operate. These licences include conditions relating to price controls, service quality and operational resilience, amongst others. The CAA found that Stansted did not meet the MPT. Its operator therefore does not require a licence and it is free from formal economic regulation in much the same way as is the case for Manchester (which was ‘de-designated’ a number of years ago).
- Makes use of a flexible form of price control. Both of the airports which passed the MPT (i.e. Gatwick and Heathrow) have recently been through a five year price control review, where a reasonable price for them to charge airlines has been assessed<sup>32</sup>. This was the first time in the

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<sup>30</sup> Airports were previously “designated” or “de-designated”, with designated airports having their prices regulated.

<sup>31</sup> To note, whilst the Civil Aviation Act 2012 replaces the Airport Act 1986 for economic regulation purposes, the Airports Act 1986 has not been completely replaced by the Civil Aviation Act 2012 for other purposes.

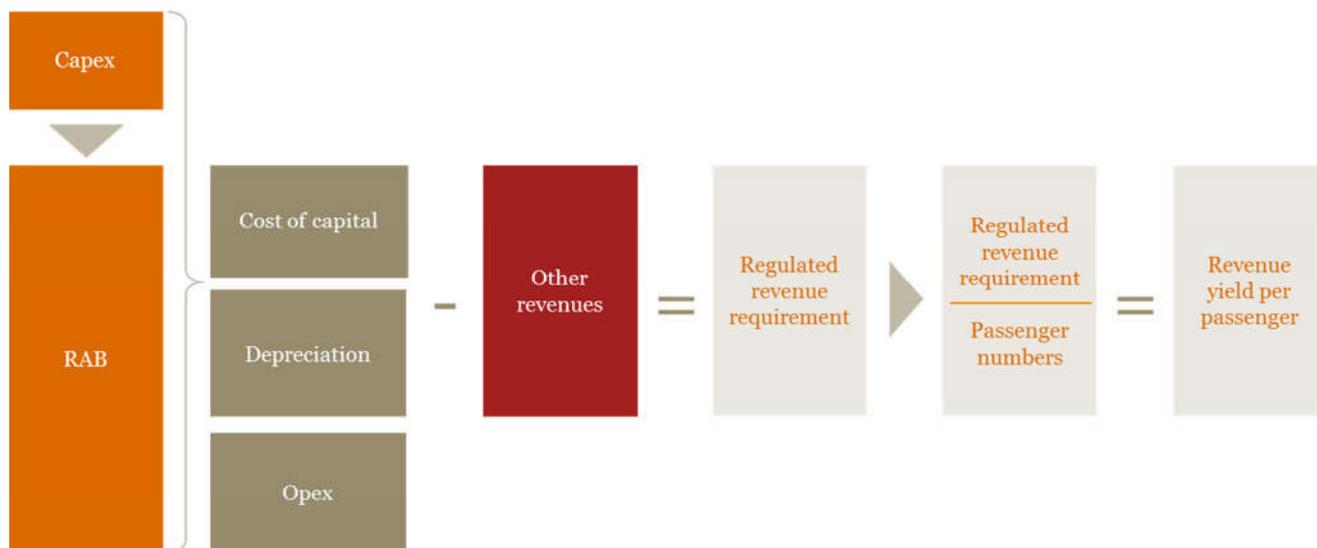
<sup>32</sup> Note that the CAA’s review of Gatwick included analysis over both 5 and 7 year periods but attached more weight to the former (which is its conventional approach to regulation) than the latter (which is the length of

sector’s history where the price control review has not included a mandatory referral to the Competition Commission (CC) i.e. in previous reviews the CAA carried out its review and this was then looked at again by the CC.

In this price control review, the prices for GAL and HAL were calculated on the basis of:

- I. A regulatory asset base or ‘RAB’. In the airports sector, the RAB is set in real prices but updated in line with inflation (more specifically the RPI);
- II. A return on this asset base is calculated based on a Weighted Average Cost of Capital (WACC) determined by the CAA<sup>33</sup>. The WACC is generally applied to the average asset balance during the course of the year, which will vary from its opening balance in any specific year in a manner that depends on new investment and depreciation (see Figure 12);
- III. A return on this asset base assessed using straight line depreciation (over periods of time which vary depending on the type of asset);
- IV. An allowance for efficient operating expenditure, which is scrutinised using a range of ‘top-down’ (e.g. econometrics and benchmarking) and ‘bottom-up’ techniques (e.g. “due diligence” type reviews);
- V. Projected revenues generated from non-aeronautical activities;
- VI. A ‘single till’ in which revenues from (V) are subtracted from the sum of (I) – (IV) in order to arrive at overall allowable aeronautical revenues; and
- VII. An average revenue yield (i.e. revenue per passenger) where allowable aeronautical revenues calculated as per (VI) are divided by a forecast number of passengers.

Figure 12: Revenue yield calculation



The resulting average revenue yield per passenger is the formal regulated price for HAL (i.e. it is the price that HAL is permitted to charge to the airlines per passenger) but, in recognition of how GAL was considered by the CAA to have less market power than HAL, it is treated as a ‘backstop’ (or fair) price for GAL. GAL has instead agreed prices with the airlines (which are similar to but not precisely the same as this revenue yield/backstop price) and has made a number of commitments in relation to

time for which Gatwick’s license is expected to run, given the commitments it has negotiated with its airline customers).

33 To note, the CAA drew on a report prepared by PwC, in the setting of the WACC. A copy of our report and its accompanying paper on the split cost of capital and asymmetric returns are accessible here: [http://www.caa.co.uk/docs/78/CAA\\_CostofCapital\\_Final\\_250413\\_CLEAN.pdf](http://www.caa.co.uk/docs/78/CAA_CostofCapital_Final_250413_CLEAN.pdf).

service provision. Its service and prices will be monitored by the CAA, to ensure that they do not diverge unduly from the commitments it has given and the price calculated by the CAA. If such significant divergences were to occur, then the CAA has reserved the right to impose more stringent licensing conditions as it has with HAL on pricing.

There are three key points to note about the above. First, is that the prices (i.e. the regulated price for HAL and the backstop or fair price for GAL) are average prices. Both airports have considerable flexibility to set different prices, provided that these prices are within certain parameters (e.g. that they are not discriminatory). Second, it is too early to say precisely how the new regime that is being applied at GAL will develop. In principle it means that GAL will have more flexibility in relation to its price and service offerings than HAL, but it is difficult to ascertain the extent to which this will be true in practice (e.g. whether, when and how the CAA might re-regulate). Third, the framework summarised above sits alongside the standard competition framework which is comprised of:

1. Market studies and investigations<sup>34</sup>. These are intended to make markets function better and are unique to the UK. It was a market investigation that ultimately resulted in the break-up of BAA;
2. Prohibitions on the abuse of dominance and restrictive agreements<sup>35</sup>. These are intended to prevent markets functioning badly and they mirror the competition regime in Europe (which does not have the market studies and investigations referred to above); and
3. European rules in relation to State Aid which are summarised in Section 3.

The key factors driving the regulated aeronautical charges are therefore:

- the prevailing value of the RAB
- net changes to this due to new investment and depreciation
- the cost of capital set by the regulator for each company
- the scale of operating expenditure
- the projected levels of other revenues
- the forecast number of passengers.

The current RAB valuations for GAL and HAL, calculated on the basis of Figure 12 above are set out in Figures 13 and 15.

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<sup>34</sup> By the CMA and/or the CAA.

<sup>35</sup> Monitored by the CMA and/or the CAA.

### *GAL RAB valuation and backstop price <sup>36</sup>*

The final forecast of RAB values following the last review undertaken by the CAA are set out in Figure 13. Note that GAL's figures are presented on the basis of financial (rather than calendar) years, and while both airports' licences commenced on 1 April 2014, Q6 will run until 31 December 2018 for HAL and until 31 March 2021 for GAL<sup>37</sup>. As previously outlined the figures presented are the 'back-stop' or fair price for GAL as determined by the CAA rather than the actual prices agreed with the airlines (which are similar to, but not precisely the same as, this revenue yield). GAL's service and prices are monitored by the CAA to ensure that they do not diverge unduly from its commitments given and the price calculated by the CAA.

*Figure 13: GAL RAB valuation*

£m (2011/12 prices)	2014/15	2015/16	2016/17	2017/18	2018/19	Cumulative 5 year impact
Opening RAB	2,471	2,476	2,518	2,552	2,549	<b>2,471</b>
Net capex	155	198	188	139	111	<b>791</b>
Depreciation	(150)	(156)	(154)	(142)	(151)	<b>(753)</b>
Closing RAB	2,476	2,518	2,552	2,549	2,509	<b>2,509</b>
Average RAB	2,474	2,497	2,535	2,551	2,529	<b>n/a</b>

The return on capital needs to be defined by applying the CAA WACC decision of 5.70% for GAL in Q6 to the estimated RAB value stated in Figure 13. Note that there are a number of reasons why GAL and HAL were considered to have different costs of capital but the most important were that GAL was considered to have: a higher exposure to demand risk (which increased its underlying systematic risk and reduced its capacity for debt financing); and a higher cost of, but lower need for, new debt (given minimal refinancing needs over Q6).

To determine GAL's backstop (or "fair") charges, forecast opex and depreciation for each year are added to the return on capital in each year. Revenues from non-aeronautical activities are deducted via the single-till arrangement in order to arrive at the net aeronautical revenue requirement. This is then divided by the forecasted number of passengers per year to obtain the backstop revenue yield.

The CAA has thus determined that the 'back-stop' allowable yields that GAL can charge per passenger for each year are as follows:

*Figure 14: GAL charge per passenger (in real 2013/14 prices)*

	Q5	Q6				
	2013/2014	2014/15	2015/16	2016/17	2017/18	2018/19
Yield per passenger (£)	£8.31	£8.19	£8.06	£7.93	£7.75	£7.62

The CAA considers this to be a real price reduction of 1.6% per year for the Q6 period. The CAA considers that, given efficiency and economy on its part, GAL should be able to finance its business and retain a solid investment grade credit rating at these yields.

<sup>36</sup> <http://www.caa.co.uk/docs/33/CAP1152LGW.pdf>

<sup>37</sup> <https://www.caa.co.uk/default.aspx/default.aspx?catid=78&pagtype=90&pageid=67>.

### HAL RAB valuation and price control determination<sup>38</sup>

The final forecast of RAB values following the last review undertaken by the CAA are set out in Figure 15. Note that the licence for Q6 commenced on 1st April 2014 and for HAL the RAB value and charge per passenger are presented on the basis of calendar years, which mean that 2014 covers a period of 9 months. This is as a result of the move from financial years to calendar years for HAL, and therefore the total price control period was four years and nine months rather than five years.

Figure 15: HAL RAB valuation

£m (2011/12 prices)	2014 (9month period from April to December)	2015	2016	2017	2018	Cumulative 4 year, 9 month impact
Opening RAB	13,816	13,788	13,812	13,805	13,661	<b>13,816</b>
Net capex	439	669	646	529	534	<b>2,816</b>
Depreciation	(467)	(645)	(653)	(672)	(676)	<b>(3,113)</b>
Closing RAB	13,788	13,812	13,805	13,661	13,519	<b>13,519</b>
Average RAB	13,802	13,800	13,808	13,733	13,590	<b>n/a</b>

To determine HAL's price control, its cost of capital is defined and calculated for each year of the new regulated period by applying a WACC of 5.35% (defined by the CAA) to the average RAB value stated in Figure 15. Forecasts for opex and depreciation for each of the five years are defined and added to the return on capital in each year. Revenues from non-aeronautical activities are removed from the total revenue requirement via the single-till arrangement before arriving at the aeronautical revenue requirement, which is divided by the forecast number of passengers per year to obtain the aeronautical revenue yield.

The CAA has thus determined that the maximum allowable yields that HAL can charge per passenger are as follows:

Figure 16: HAL charge per passenger (in real 2013/14 prices)

	Q5	Q6				
	2013/14	2014 (remaining 9 months)	2015	2016	2017	2018
Yield per passenger (£)	£20.60	£20.40	£20.13	£19.86	£19.46	£19.10

Note that the table includes the charge per passenger for the last year of the previous price control period 2013/14 (which will have been applied up to April 2014 when the new licence and price control period came into effect).

The CAA considers the above charges per passenger to be equivalent to a real reduction in prices of 1.5% per annum<sup>39</sup>. The CAA considers that, given efficiency and economy on its part, these prices for aeronautical charges should enable HAL to finance its business and retain a stable investment grade credit rating. It should be noted that financeability in this case is assessed on the basis of notional company operating efficiency and pricing does not take account of or protect inefficient performance.

<sup>38</sup> <http://www.caa.co.uk/docs/33/CAP1151.pdf>.

<sup>39</sup> Note that the CAA also carried out calculations for another 2 years (i.e. for a total of 7 years but attached less weight to these).

# Section 2: Risks and challenges

## Introduction

The risks and challenges of airport infrastructure do not differ fundamentally from those of any other major infrastructure project. However, it is in the scale of these risks, the complexity of their inter-relation, the size of those risks relative to the corporate strength of the entity undertaking the work, and the commercial and regulatory environment in which the asset will be operated that differentiate airport infrastructure. This can have a profound effect on how airport infrastructure can be financed, whether a particular finance structure will actually be the most economic and efficient, and what level of contractual or regulatory protection an entity will need to raise the finance successfully.

This section considers:

- the scale of investment and associated funding risk with respect to the options;
- key issues in respect of funding, financing and optimism bias; and
- risks and challenges in relation to successfully funding/financing infrastructure developments of this scale.

## Options overview and risk

### Overview

Figure 17 provides an overview of the three firm short-listed options along with the additional option for a new airport model located within the Inner Thames Estuary which are being considered by the Commission (N.B. in September 2014, the AC decided not to short-list the Inner Thames Estuary scheme).

The capital cost requirement provided is based on the Commission's Interim Report (December 2013) to give context to the detailed submissions provided by Scheme Promoters in May 2014 and the AC's view of scheme costs (see 13. Cost and Commercial Viability: Financial Modelling Input Costs for further detail).

Figure 17: Short-listed options

	<b>Gatwick Airport Second Runway (LGW 2R) <sup>40</sup></b>	<b>Heathrow Airport Northwest Runway (LHR NWR) <sup>41</sup></b>	<b>Heathrow Airport Extended Northern Runway (LHR ENR)<sup>42</sup></b>	<b>Thames Estuary Model<sup>43</sup></b>
<b>Description</b>	A second runway to the south of the existing runway with a separation of 1,045m which allows independent mixed mode operations (e.g.	New 3,500m runway constructed further to the northwest of the existing airport, linking to the west of the current north runway. The new runway could operate	Extension of the northern runway to the west, to a length of at least 6000m enabling the northern runway to operate as two runways, used for	New four runway Inner Thames Estuary (ITE) airport on the Isle of Grain at the eastern end of the Hoo Peninsula on the

<sup>40</sup> Section 3,

[http://www.gatwickobviously.com/sites/default/files/downloads/gatwick\\_airport\\_proposals\\_for\\_additional\\_longterm\\_runway\\_capacity19jul2013.pdf](http://www.gatwickobviously.com/sites/default/files/downloads/gatwick_airport_proposals_for_additional_longterm_runway_capacity19jul2013.pdf)

<sup>41</sup> Airports Commission: Long-term hub capacity options, Heathrow Airport Limited Response, 17th July 2013

<sup>42</sup> [http://www.heathrowhub.com/media/filer\\_public/b5/90/b5902fe9-6fda-4d8f-9f9e-1a3648227324/report\\_190713\\_rev\\_a.pdf](http://www.heathrowhub.com/media/filer_public/b5/90/b5902fe9-6fda-4d8f-9f9e-1a3648227324/report_190713_rev_a.pdf)

<sup>43</sup> Airports Commission, Isle of Grain 3 Final Sift document and

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/268620/airports-commission-interim-report-appendix-2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268620/airports-commission-interim-report-appendix-2.pdf)

	<b>Gatwick Airport Second Runway (LGW 2R) <sup>40</sup></b>	<b>Heathrow Airport Northwest Runway (LHR NWR) <sup>41</sup></b>	<b>Heathrow Airport Extended Northern Runway (LHR ENR)<sup>42</sup></b>	<b>Thames Estuary Model<sup>43</sup></b>
	one could be used for arrivals and the other for departures at the same time).	independently from the existing runways. This option includes expansion of the existing terminals plus a new Terminal 6 to the west of Terminal 5.	both arrivals and departures This option includes expansion of the existing terminals plus a new Terminal 6 to the west of Terminal 5.	north Kent Coast. On opening of the new airport Heathrow would be closed and its site redeveloped.
<b>Key additional infrastructure</b>	This proposal includes improving a number of railway interchanges, building extensions to existing railway lines, the widening of major road junctions into the airport and the reconfiguration of local roads.	Delivery of this solution would involve an improved rail access strategy, a more extensive bus and coach network and reconfiguration of roads surrounding the airport, including a tunnelled section of the M25 which would segregate airport and local traffic from the main motorway	This option would require some infrastructure changes with a new junction giving direct access off the M25 north of the M4 and capacity improvements to M25 J12-J16, M4 J2-4 and some A roads. It would also include a rail strategy connecting Heathrow to key mainline routes.	This option would require all supporting infrastructure (road and rail links, utilities, etc.) plus settlements to accommodate employees.
<b>Cost<sup>44</sup></b>	<b>Initial Proposal 2013</b> AC estimates £10-13bn (2030)  This is made up of airport costs of £3-4bn, surface access costs of £1-2bn and other costs of £6-8bn including risk and optimism bias.  <b>AC Cost estimate 2014<sup>45</sup></b> £7.4bn	<b>Initial Proposal 2013</b> AC estimates between £13-18bn (2030). This is made up of airport costs of £5-6bn, surface access costs of £2-3bn and other costs of £7-10bn including risk and optimism bias.  <b>AC Cost estimate 2014<sup>46</sup></b> £18.6bn	<b>Initial Proposal 2013</b> AC estimates £13-18bn (2030)  This is made up of airport costs of £3-5bn, surface access costs of £2-3bn and other costs of £7-10bn including risk and optimism bias.  <b>AC Cost estimate 2014<sup>46</sup></b> £13.5bn	<b>Initial Proposal 2013</b> AC estimate £82 – 112bn (2030)  This is made up of airport costs of £15-20bn, surface access costs of £24-32bn and other costs of £44-59bn including risk and optimism bias.  In September 2014, the AC decided not to short-list this scheme.
<b>Proposer</b>	Gatwick Airport Limited	Heathrow Airport Limited	Heathrow Hub Limited	AC option developed based on a combination of ITE submissions.

<sup>44</sup> Initial Proposal 2013 costs relate to the cost estimates outlined within the Airports Commission's interim report. These are comparable cost estimates produced by the Airports Commission based on the initial submissions of the promoters, which have been adjusted to include surface access costs, risk and optimism bias. Due to rounding the sum of cost breakdown will not exactly match with the total AC estimates stated. Please refer to the Long term options: sift 3 templates at <https://www.gov.uk/government/publications/airports-commission-interim-report> for the cost estimates.

<sup>45</sup> This costs estimate is based on the Assessment of Need-Carbon Capped (AoN-CC) demand scenario and excludes the phase 3 construction works (see 13. Cost and Commercial Viability: Financial Modelling Input Costs for further detail).

<sup>46</sup> These costs estimates are based on the Assessment of Need-Carbon Capped (AoN-CC) demand scenario. (see 13. Cost and Commercial Viability: Financial Modelling Input Costs for further detail).

## Scale of the proposed investment

### GAL and HAL

Figure 18 outlines the impact the additional capital expenditure could have on the existing RAB for GAL and HAL. Based on the Commission's assessment of the May 2014 scheme proposals, the proposed capital expenditure would approximately treble the size of the RAB for GAL and double the size of the existing RAB for HAL and HHL in real terms. For all of the options, the relative size of the capital cost in relation to the existing RAB suggests that successful financing will require a high degree of certainty around: capital costs; the regulatory framework; future revenues; and potential government support.

Note that Figure 18 shows the existing RAB value in 2014 prices. This will be different to the amount of finance in nominal terms required to build a new runway but it provides an indication of the absolute and relative size of investment being contemplated.

Figure 18: Capital expenditure impact on existing GAL and HAL RAB

£bn	GAL	HAL	HAL
RAB Value as of 1 April 2014	2.5		14.6
<b>Options (Initial submissions 2013)</b>	<b>LGW 2R (range)</b>	<b>LHR NWR</b>	<b>LHR ENR</b>
Estimated cost	5.0 – 9.0	16.9	12.1
Total RAB value (after runway)	7.5 – 11.5	31.5	26.7
<i>Increase from current to new RAB value</i>	<i>3 – 4.5 times</i>	<i>2 times</i>	<i>1.8 times</i>
<b>Options (AC cost estimate)</b>	<b>LGW 2R</b>	<b>LHR NWR</b>	<b>LHR ENR</b>
Estimated cost (2014 real prices)	7.4	18.6	13.5
Peak RAB value (2014 real prices)	8.1	28.6	24.8
<i>Increase from current to new RAB value</i>	<i>3.2 times</i>	<i>2.0 times</i>	<i>1.7 times</i>

## Key considerations

### Finance and funding

Given the scale of the proposed investment, any analysis of the appropriate option will need to consider the finance and funding implications for the associated expenditure:

- **Finance** – raising the debt and equity or public sector involvement to pay for the capital costs of the project and the occurrence of any of the key risks;
- **Funding** – how over the long term that asset is paid for and the finance is repaid.

In any privately financed model, the financiers will need to be comfortable that the finance is sufficient to pay for the infrastructure expenditure, with adequate provision for each of the risks described in Figure 19, and be satisfied with how in the long term that finance will be repaid (i.e. what is the source and reliability of funding that will repay that finance).

Finance cannot be raised unless the answer to the funding question is clear. The more uncertain the funding – i.e. the more uncertain the level of revenue risk – the higher the cost of financing for the project. If the funding is very uncertain the project may prove unable to raise the finance.

The way in which an airport is regulated has a crucial impact on its financeability. For example, airports which are regulated through the standard RAB approach (e.g. HAL and, prior to Q6, GAL) tend to be:

- Relatively bankable because of the certainty of revenues and cash-flows partly as a consequence of the set pricing periods which is a feature of this approach. Providers of finance understand how the RAB based approach to regulation works and they appreciate the revenue certainty that this approach provides. A key consideration though is whether, and if so the extent to which, providers expect the airport to be subject to competition and thus potentially be unable to price up to its price cap or generate its projected revenue and cashflow (in which case financing costs might rise); but
- Limited in their commercial freedom, because how an airport can set its prices is controlled on an ex ante basis and is subject to competition law (e.g. because of the market power they are considered to have, regulated airports are not permitted to set charges which would be discriminatory or unduly high or low).

By contrast, of course, airports which do not have market power and which are not regulated tend to have considerably greater flexibility in terms of the level and structure of the prices they can charge, but they are also considered to be riskier because their ability to generate revenues from their customers is less certain.

### *Optimism bias*

Optimism bias is the term that the public sector uses to describe the risk that a procuring entity's risk evaluation and pricing assumes relatively positive outcomes for a project when in practice the overall price proves to be higher. In particular, it occurs where there is interplay of risks which may be correctly priced individually, but not collectively (as the integration of the components creates risk in itself). Optimism bias means projects have a tendency to cost more than forecast.

In assessing finance and funding structures, consideration needs to be given to whether the structure itself is likely to reduce the risk of optimism bias and whether the structure is robust to outcomes when such bias proves to have occurred. Reducing the risk of optimism bias will be an ongoing consideration throughout the investment proposal process.

For example, the UK Public Private Partnership model underlying the UK's Private Finance Initiative is an example of how private sector involvement leads to optimism bias being removed from projects. At the outset of each project, primarily to satisfy the lenders and equity investors in the project, there is likely to be:

- A detailed independent engineering review of cost and design, including a risk analysis of likely outturn costs;
- A contracting strategy with fixed price sub-contracts passing cost risk to the contractors
- extensive sensitivity analysis by the financiers looking at a suite of downside scenarios to ensure the capital structure is robust to adverse changes; and
- The presence of shareholder equity (higher rate of return requirement) able to absorb the particular risks of specific projects. Early PFI transactions, for instance, were financed using 15-25% equity at rates of return between 13-20% – representative of the higher returns expected by infrastructure investors in new projects. This can be contrasted with returns in a range below 10%, typically expected by investors in long-term, stable, operational assets and utilities.

## Risks and challenges

At the highest level there are a number of broad areas of risk, which inter-relate and that will impact the appropriate funding structure for the airport infrastructure. These risks impact all airport developments and are not unique to the options being considered. The importance of each risk relative to others will be impacted by the specific circumstances of each airport.

In addition to those risks identified below, political risk will also be a fundamental factor affecting all the schemes. All the options for expanding airport capacity involve the construction of very long term assets which require significant upfront investment. Investors will require comfort that they can expect to earn a return on their investment but there is scope for this to be impacted by changes in Government policy in the future. As such, the nature of the UK's 5 year political cycle, coupled with the need to build high cost, long term assets, generates some fundamental risks for the schemes proposed and needs to be carefully considered throughout the appraisal and decision making process.

Figure 19: Key risks and challenges to financing and funding

Risk	Consideration
<b>Cost and integration risk</b>	<p>A key risk will be that the price of construction and operation of the additional runway and all of the related facilities is higher than forecast, which would materially adversely affect the economics of the investment and the overall outturn cost. Cost risk will include the capital cost of the project's components, runway, terminal extensions or new build, baggage handling, extended air traffic control and new transport links and infrastructure.</p> <p>A key infrastructure cost risk comes from integration risk, which has two parts. First, whether the various elements of a project properly integrate together – terminal with runway, with ATC, with baggage handling, etc. Second, a key risk is the integration of the infrastructure with the existing operating airport. This again has two key parts – during construction and at the point of integration as operations are merged.</p> <p>In some cases, the size and complexity of those risks means they may not be capable of being sub-contracted (see contracting risk) and will remain with the airport company. Such risks can be material and cause substantial costly delays and/or remedial expenditure during construction. At the point of integration of operations, as safety is absolutely paramount, the integration will always come second to ensuring the proper and safe running of the airport. In the event that there are problems integrating the new project, the focus will be on maintaining existing operations with any delays and cost overruns impacting the new project.</p>
<b>Contracting risk</b>	<p>How an entity contracts for the building of the infrastructure will fundamentally impact the cost risk held within the airport company itself. On smaller projects, much of the contracting can be arranged on a fixed price basis. This means that individual elements of the infrastructure can be accurately priced and their delivery is contractually underpinned (risk can be transferred via the contract).</p> <p>For larger airport infrastructure, it is likely that a large element of the infrastructure will not be contracted for on a fixed price basis, for two key reasons.</p> <p>First, the interdependency of the infrastructure means that it is difficult to transfer and price risks in separate batches as the delivery is impacted by factors out of the control of the contractor.</p> <p>Second, the size of the investment means that the risk implied in giving a fixed price contract would be too great for the balance sheet of the lead contractors. Precedent indicates that given the scale of the likely cost, these risks could not be subcontracted because the balance sheets of contractors may not be large enough to take the risk. The airport entity is therefore likely to retain a large part of the cost risks of the project and contracts will likely be on some form of risk share or target price arrangement (for instance as used on the T5 development, which had a capex cost of £4.3bn) rather than on a fixed price, turnkey basis. This will fundamentally affect the funding structure of the airport company which will need to have a finance and funding structure in place that can accommodate that level of cost uncertainty, and which may benefit from a phased development approach.</p> <p>The level of exposure to cost risk will be dependent on whether and to what extent this risk is recognised via the regulatory mechanism, which can help insulate the airport company and minimise the risk to raising funding and financing.</p>
<b>Demand risk</b>	<p>A related consideration will be the precise demand for the new capacity; its make-up, type of aircraft and passengers, and prospective growth. Each of these will have a bearing on the growth and degree of uncertainty around future revenues of each company (i.e. its long term source of funding) which will directly impact the cost and availability of finance.</p> <p>Experience suggests that demand and revenue risk will be a paramount consideration to developers and funders.</p>

**Risk****Consideration**

At the macro level it will be essential to consider whether, and if so how, the balance between demand and capacity will be affected and how this will influence the regulatory landscape. For example, will a much larger RAB at GAL be fundable through landing charges in an environment where the demand capacity imbalance will have been eased and where there might be scope for more direct competition between GAL and HAL (as competing two runway airports). Would, a new runway at Gatwick change how HAL's RAB can be funded for the same reasons? Conversely, if there were to be a new runway at Heathrow, would this lead to HAL's position in the market being further strengthened and GAL's existing RAB becoming increasingly difficult to fund?

At a micro level, the current approach to pricing is based on an average revenue yield in order to provide incentives to airports to match prices with demand but, given the change in demand risks referred to above, it will be important to consider whether this should continue to be the case going forward and what the impact would be of changes to this. For example, some providers of finance prefer revenue controls rather than price controls. However this will be for the CAA, as the regulator to determine.

**Revenue risk**

The ability of an airport owner to raise finance for infrastructure will be impacted not just by the costs of the project but also by the size and perceived volatility of the forecast revenue. This risk is closely linked to the demand risk discussed previously. The greater the risk around the size and build-up of revenue, the greater will be the cost of the debt, the larger the amount of the financing that will have to come from more expensive equity finance, or in extremis the project may be incapable of being financed without some form of public sector support.

Airport revenue is essentially from two sources. First from landing slots/airline charges (aeronautical revenue). Second from retail income, car parking, etc. from passengers (non-aeronautical revenue).

Where an airport is in a prime position, perhaps as the sole or lead provider to a city, then there may be a high degree of certainty around forecast revenues as passenger demand can be predicted with a fair degree of certainty. Indeed, in those circumstances, the concern is not one of predictability but of equity; can an airport overcharge based on its monopoly position? In this case the airport tariff is likely to be regulated, ensuring that terms are fair to the consumer. A regulated structure, coupled with the confidence that the regulated charges will be paid, provides a high level of revenue certainty to the airport owner, allowing them to raise relatively high levels of lower cost debt finance.

In contrast, where an airport is in competition with other airports, the risk of long term revenue diverging from forecasts is greater, as revenue will depend on the ability of the airport to attract airlines and maintain airport charges when faced with competition. Retail revenue will depend on the throughput of passengers that this implies as well as the airport operator's skill in increasing yield per passenger from retail sales.

The greater the increase in revenue that will result from new capacity relative to the existing operations, the greater will be that revenue uncertainty, because the incremental demand will be less proven and the step change in pricing or slots to be filled will increase the uncertainty surrounding the result. This again will have material impacts on the cost and structure of any funding model.

From a regulatory perspective, it will be important to develop a clear vision of how the airports may be regulated in the future, the setting of any future regulatory framework will be the role of the CAA. Key issues are likely to include how a new runway will affect the market power of each of the airports, how this will affect the need for economic regulation at each airport, and how the system of regulation itself will evolve (e.g. the length and flexibility of price controls, the use of price controls rather than revenue controls, how investment is included in the RAB, what safeguards can and should be put in place to maintain the financeability of airports). Some initial observations in relation to revenue risks are:

- 1 If an additional runway at GAL were to be financed through a RAB model, what would happen if it were to find itself with capacity that it is unable to fill – in part due to competition with other airports (e.g. HAL for high yield traffic and Stansted for low yield traffic)? Would it be possible and appropriate to find ways of ensuring that its RAB does not become 'stranded'?
- 2 Such risks to the funding of new investments are likely to be lower with HAL because it is currently considered to have by far the greatest amount of market power and the highest demand for its capacity. However, could its ability to raise revenue from airlines (and therefore its ability to fund its existing RAB) be constrained by competition from GAL if a new runway were developed there?
- 3 The Estuary 'option' would have required some radical thought. In simple terms, one RAB (i.e. HAL's) would have had to be bought out and replaced by another (one for the Estuary) but the question of how this could have been executed in a way that did not fundamentally undermine the certainty that is provided by the regulatory framework would need to have been considered with great care. Key issues would have included: (a) whether the value of HAL would have been immediately impaired by any decision to develop an Estuary option (because customers and investors would know that its future would be "blighted"); (b) how

Risk	Consideration
<b>Economic and efficient investment</b>	<p>Heathrow could have been run and regulated in the run-up to any Estuary being opened (i.e. during the period of this blight); (c) the sheer amount of private and public sector investment that would have been required in order to develop an Estuary option prior to any revenues being generated from customers; (d) the amount of demand risk to which the development would therefore have been exposed; and (e) the competitive distortions that would be introduced into the London airport system – with a development that would have been financed (at least in part) by the public sector competing against airports (GAL and Stansted) which are financed by the private sector.</p> <p>Under a RAB model, new capital expenditure (including expenditure that is considered beneficial to the quality of service provided) is added to the RAB and the entity can earn a return on that additional asset, at a rate that is determined by the regulator. However, this is only the case to the extent that the regulator determines that the assets have been procured economically and efficiently; inefficient expenditure may not qualify for addition (in which case it will not be rewarded).</p> <p>In order to avoid uncertainty over cash flows, the airport company may therefore have to demonstrate a procurement approach or approval process that will minimise the risk that capex will not be allowed into the RAB (otherwise this could stress the financial structure of the company).</p> <p>The submissions should therefore be reviewed as to their regulatory and procurement strategy and how the capital structure deals with this issue, either so the capital structure has the capacity to absorb that risk or the structure minimises the risk that such unavoidable costs arise (for instance through regulatory pre-clearances of major capital expenditure, which occurs in advance of the price review and can allow for the additional capital expenditure to be allowed onto the RAB subject to certain triggers or milestones being met during that period).</p> <p>It will be necessary to consider whether a pre-funded model is appropriate and how it would work. Under this approach, capital expenditure can be included in the RAB as it is incurred but well in advance of the assets actually being used by passengers. This tends to be contentious from the perspective of passengers but can be a vital way of ensuring that the airport is able to maintain its investment grade rating.</p>
<b>Cost of capital under a RAB based model</b>	<p>This is the question of whether the standard approach to, and level of, the cost of capital should be flexed to incorporate issues such as:</p> <ol style="list-style-type: none"> <li>1 The sheer scale of investment required (i.e. would this warrant a higher WACC);</li> <li>2 The demand risks referred to above (i.e. would these risks mean that a higher WACC is justified); and</li> <li>3 Whether, and if so how the cost of long-term debt should be “embedded” in price control calculations (rather than being revisited during price control reviews).</li> </ol> <p>While these issues have been debated at length in past regulatory reviews, the relative amount of investment being contemplated is very large and so the issues will be correspondingly important to address properly. Scheme promoter submissions will need to be assessed to consider whether and if so how these issues have been considered and what impact this will have on the ability to raise finance.</p>
<b>Capacity and ability to raise finance</b>	<p>A key risk at the outset of any project is whether the project company will have the capacity and ability to raise the necessary finance and at its forecast cost. As previously stated the total, corporate, investment grade, all currency denominated bond issuance in the UK in 2012 and 2013 amounted to £48.7bn and £30.8bn respectively, providing an indication of the size of the market. (The total bond issuance in the UK (regardless of rating) amounted to £63.2bn and £51.5bn respectively). The financial structure of the company and its ability to maintain a strong investment grade rating will be critical for allowing continued access to a pool of institutional debt investment. The level and price of financing available will be dependent on the market at the time and individual investor perception of risk (e.g. volume and regulatory risk). As individual investor organisations can be constrained by limits or caps in relation to their investment into one project or company, the project company will need to ensure it has access to a wide portfolio of investors to raise the investment required, thereby increasing the importance of obtaining strong independent investment grade credit ratings. On the face of it, given the familiarity of the finance markets to RAB based models and the extensive use of bond finance by regulated companies (e.g. utilities), both GAL and HAL should be capable of raising the necessary private finance under some form of RAB model. The analysis of the competing bids is therefore less about whether such RAB finance is possible, but how this would be done and at what price.</p> <p>Regulated companies are predominantly financed using longer term, high investment grade bond finance. For example, Network Rail over the last ten years, before the recent reclassification as a government entity, had £32.1bn of debt outstanding as of 31 March 2013 which was rated AA+ by Fitch, AAA by S&amp;P and Aa1 by Moody's. Their successful finance is therefore predicated on their ability to access these markets. This in turn requires clear long term investment grade ratings from the leading credit rating agencies. In determining their rating, the rating agencies will consider the project and revenue risks described above, but also</p>

Risk	Consideration
<b>Timing risk</b>	<p>the financial risks of the company. In particular, has the company sufficient equity, given the size of the investment to be made, relative to its forecast level of debt; does the projected revenue deliver the requisite debt cover ratios (inter alia the ratio of net revenue to debt service); and is the rate of return sufficient to deliver those ratios which underpin the investment grade rating. The required cover ratios will also depend on the perceived level of risk within the company, considering its contracting strategy, whether contracts are fixed or target price, whether any increased price can and will be added to the RAB and what return those additions will earn. The shortlisted submissions will need to be assessed as to whether they have included a realistic finance plan and therefore have reflected their likely true cost. Despite the familiarity with the RAB model, the overall cost of finance will need detailed analysis as it will involve a complex interplay of:</p> <ul style="list-style-type: none"> <li>• The commercial and regulatory environment within which the airport operates;</li> <li>• The market perception of cost and revenue risk;</li> <li>• The amount of finance to be raised;</li> <li>• The target levels of equity and self-finance;</li> <li>• The impact this has on debt cover ratios (e.g. revenue to debt service); and</li> <li>• The credit rating obtained.</li> </ul> <p>Consideration should also be given as to whether the finance plan represents the optimal finance approach. Could, for instance, alternative regulatory models produce better approaches to financing? These are discussed further in Section 3.</p> <p>This risk relates to how quickly the project is implemented and how fast the revenue builds up to forecast levels. In privately financed models any delay will impact the project economics because of the accruing financing costs the airport may have to bear. The cost of delays is often the way in which the risks described above manifest themselves in the project company.</p> <p>When considering the appropriate funding models, their ability to absorb each of the above risks – and the impact of their combined occurrence – is key to determining whether a particular financing structure is appropriate. This will also be influenced by the specific regulatory framework in place, which may address a number of the above risks, making the funding models more viable.</p> <p>While delays can be a major project risk, time can also be used to mitigate risk. For instance, where any airport development has inherent demand and revenue risk, a project could be phased to reduce risk, introducing the more revenue-generating elements first. For instance, the increased runway capacity could be prioritised, with accompanying facilities such as a new terminal, only being built as new revenue and higher passenger levels permit. This could reduce the finance burden substantially, although this is dependent on the robustness of the development ensuring passengers receive the appropriate level of service throughout the phased approach.</p>

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# ***Section 3: Alternative approaches to financing***

## ***Introduction***

In considering the alternative approaches to financing available, this section provides:

- An overview of significant historic aviation infrastructure investment programmes within the UK and internationally;
- A summary of the short-listed options in relation to the funding and regulatory models proposed;
- Other alternative funding models and considerations; and
- An overview of State Aid considerations.

## ***Aviation infrastructure investment: UK and international***

The section provides a summary of comparable examples (over \$5bn investment requirement) both within the UK and internationally, of major aviation infrastructure programmes from 2004 – 2013<sup>47</sup>. Figure 20 outlines the nature of the investment project, capital expenditure levels and how each has been funded/ financed. For reference, the passenger flows for each airport are included.

Figure 20 illustrates the following:

- The differences between the international context, where the majority of comparable sized airports tend to be Government owned and operated, whereas the UK market (outlined earlier in this report) is largely privatised;
- As a function of ownership and financing, large capital investment for comparable schemes undertaken around the globe (6 out of the 9 highlighted) have been or are likely to be (in the case of Hong Kong's third Runway) fully or partially publicly funded with only a few exceptions (Fraport and Heathrow's T5); and
- Given the nature of the private market which operates in the UK, different issues and risks have arisen in the UK when compared to the international context.

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<sup>47</sup> Data presented comes from a variety of research databases used by PwC. Please refer to Appendix 1 for details.

Figure 20: UK and international aviation infrastructure investment case studies

Airport	Country	Passenger flows (2013)	Ownership	Scheme description	Timeframe	Capex	Financing
<b>1. Heathrow</b>	UK (London)	72.3m	Privately owned by HAL (formerly BAA)	Development of Terminal 5 Expansion of Airport Capacity	Opened in 2008	£4.3bn (\$7.2bn <sup>48</sup> )	Privately financed through Heathrow Airport Ltd (bond financing programmes in 2001 and 2002, for \$3.4b <sup>49</sup> (£2b) and \$5.1b (£3bn) respectively). Please refer to detailed section on T5 later in this report.
<b>2. Haneda International Airport</b>	Japan (Tokyo)	68.9m	State-owned and operated by Japan Airport Terminal Co. Ltd.	Construction of additional 'D' Runway	Opened in 2010	\$7.4bn	Publicly financed through a combination of federal and local authority (surrounding municipality) financing.
<b>3. Dubai International Airport</b>	United Arab Emirates (Dubai)	66m	State owned and operated by Dubai Airports company	Third Terminal	Completed in 2008	\$6.8bn	Financed by the government of Dubai and subsequently \$634m of this project was refinanced in 2009. This \$634m was split into four 2-year loans, three from Islamic Financing and the fourth as a governmental loan.
<b>4. Hong Kong International Airport</b>	SAR of the People's Republic of China (Hong Kong)	59m	Owned and operated by the Airport Authority Hong Kong (a government – owned statutory body)	Construction of 3 <sup>rd</sup> Runway	Began in 2012	\$7.8bn	Construction of the new concourse is being financed through a combination of: <ul style="list-style-type: none"> <li>\$2.5bn of syndicate international loan financing raised by Dubai Duty Free (operator of all of the retail outlets at Dubai's airports and owned by the government-owned 'Investment Corporation of Dubai').<sup>50</sup></li> <li>US\$1.25bn Islamic bonds.</li> <li>The remaining financing of circa £4bn is still to be raised.</li> </ul> Proposals for the third runway were accepted in 2012. Current financing arrangement has yet to be determined – the 'Hong Kong International Airport Master Plan 2030' suggests substantial public financing will be required given the scale of the cost.

48 At an exchange rate of 0.60GBP(£) to USD(\$)

49 At an exchange rate of 0.59GBP(£) to USD(\$)

50 <http://www.arabianbusiness.com/dubai-duty-free-seeks-new-750m-loan-516627.html>

Airport	Country	Passenger flows (2013)	Ownership	Scheme description	Timeframe	Capex	Financing
<b>5. Frankfurt Airport</b>	Germany (Frankfurt)	58m	Publicly owned. Operated by Fraport (German transport company)	Expansion plans for increased runway and terminal capacity	Opened in 2011	\$5.5bn	Privately financed by Fraport through its financing strategy. Financing for the company includes mixture of bond, equity and loan funding.
<b>6. Adolfo Suarez Madrid-Barajas Airport</b>	Spain (Madrid)	39m	Owned and operated by the governmental public body AENA (Aeropuertos Espanoles y Navegacion Aerea). AENA is the public company which owns the airports in Spain. It belongs to the Ministry of Public Works	Improvement and expansion plan including 4 <sup>th</sup> terminal and two additional runways	Finished 2006	\$6bn	Terminal 4 financed through direct investment from AENA.
<b>7. Rome Fiumicino Leonardo da Vinci Airport</b>	Italy (Rome)	36m	Owned and operated by Aeroporti di Roma SpA (private operator)	Expansion of airport to increase capacity including new runway and new terminal	To be completed by approximately 2020	\$12bn (budget)	Project to be co-funded by the European Union, and sponsored by the Italian Ministry of Infrastructure.
<b>8. Hamad International Airport</b>	Qatar (Doha)	Currently 28m but expected to serve 50m in 2016	Owned by Qatar Civil Aviation Authority (public body) and to be operated by Qatar Airways	Construction of new airport to replace existing Doha International Airport	Partially opened (cargo flights and some passenger airlines). Full opening in 2014/15	\$15.5bn (budget)	The public/governmental funding provided during the construction of this airport was partially sponsored through the Qatar Civil Aviation Authority and the New Doha International Airport Steering Committee, both of which are public entities. Another sponsor was the Ministry of Municipal Affairs and Agriculture of the state of Qatar.
<b>9. Al Maktoum International Airport</b>	United Arab Emirates (Dubai)	Should have 160m capacity when complete	State owned and operated by Dubai Airports company	New airport build	Opened 1 runway and cargo only flights in 2010. Opened to passenger flights in 2013. Full operations likely by 2020	\$32bn (estimate)	Combination of funding by Dubai Airports Company (Government owned and funded) and Dubai Duty Free (see above, Dubai International Airport).

## Heathrow Terminal 5

The most recent comparable airport infrastructure investment in the UK relates to Heathrow itself. Since 2003, £11bn has been invested in improving Heathrow, representing one of the largest private sector investments in UK infrastructure over this period. Developments have included a new Terminal 5, refurbished Terminals 1, 3 and 4 and a new Terminal 2 which opened in June 2014. Other improvements include a £900 million investment in the world's largest integrated baggage system.

### Context

Terminal 5 at London Heathrow was a large, complex project, with a total capital value of £4.3bn which completed in March 2008. The project involved the building of terminals 5A, 5B and 5C, a new control tower for the whole airport and extensions to the Piccadilly Line, Heathrow Express and M25, as well as the rerouting of two rivers.

### Financing and funding of T5

HAL was the project client, airport owner and operator. The project was privately financed by HAL through bond financing for all its operations. As bonds were issued as part of financing for general operations, the exact financing information for T5 is difficult to breakdown. However, in July 2001 and again in June 2002, bonds of £2bn (Euro MTN programme) and £3bn respectively were issued, which reference T5 in their terms of issuance.

### Risks and challenges

Given the scale of the development, there were a number of risks and challenges which had an impact on funding and the regulatory arrangement. These are considered below:

1. **Contractual structure** – The project's contractual framework differed from standard industry practice. Given the project size and level of uncertainty, HAL deemed that risks could not be transferred in a traditional contractual way. It therefore decided that HAL (at the time BAA) would assume full responsibility for project risks in order to let contractors concentrate on delivery.
2. **Funding and regulatory** – The T5 contract was cost-reimbursable, with open-book provisions (i.e. contractors were paid actual costs for the work, plus pre-agreed amounts of overhead and profit). Further profit could be generated on the main packages through delivering savings on the (benchmarked) budgeted cost of the various phases. The CAA's decision on HAL's price cap over the period April 2003 to March 2008, allowed for full return on assets in the course of construction<sup>51</sup> – an issue pertinent to T5, as the terminal was not expected to open in that regulatory period. To incentivise BAA at the time, to deliver the capex efficiently, the CAA's decision also included terms based around performance against certain milestones (also known as triggers) in HAL's capex programme. All five of the triggers on HAL's capex programme were related to T5. These five triggers are set out below:
  - Completion date of the diversion of the twin rivers (31 March 2005) – The diversion of the Duke of Northumberland and Longford Rivers which flowed through the site was a key step important to the timely completion of Terminal Five;
  - Completion date of the early release stands (31 March 2005) – These were stands associated with the Terminal Five project which were to become available for use by the Core Terminal Area (CTA) prior to the opening of Terminal Five;
  - Handing over to NATS of the Visual Control Room (31 March 2006) – The new Visual Control Room was necessary for the operation of Terminal Five;
  - Core Terminal 5 building being weatherproof (31 March 2007); and
  - Satellite 1 being weatherproof (31 March 2007).

In the instance that one of these milestones was missed, the allowed level of maximum charges would have been reduced by an amount linked to the delay in completion. In the case of HAL's milestones, the

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<sup>51</sup> CAA (2003), 'BAA Decision 2003 – 2008' Paras 4.29 to 4.33, <https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf>

reduction of maximum charges was 2% for each total year of delay (pro-rated monthly). The reduction in price cap applied until the milestone was achieved.

HAL could not pass on construction overruns directly to customers due to the regulatory price controls and would have to pay compensation to airline operators (IAG) if the project was late or there were faults with the terminal.

The CAA therefore decided to allow some advancement of aeronautical revenues during the construction period to help mitigate against financial distress due to the significant capex spend and associated potential risk to HAL's credit rating. This also had the effect of smoothing the increase in charges from the project.

At the start of the T5 construction period in summer 2002, the RAB value<sup>52</sup> was £4.3bn. At the end of the construction period, the RAB value had increased by £4.7bn to £9.0bn (an increase of 108%). With regard to aeronautical charges; in 2002/03 (the year prior to Q4 beginning), the per passenger charge was £6.13. This increased to £9.28 initially and subsequently adjusted to £10.36 in 2007/08<sup>53</sup>. This adjustment followed the reclassification of costs into airport charges by CAA, in recognition of the additional investment into T5 to '*meet the legitimate expectations and anticipated demands of passengers and airlines for safe, well-functioning terminals and efficient airfield infrastructures, which should provide the platform for better service delivery in the coming years*'<sup>54</sup>.

3. **Programme management and delivery** – HAL separated its roles, as the client for delivering and managing the build programme on one hand, and the client holding and managing risk on the other. Both of these roles lay within the delivery entity but were led by separate Directors with different individual accountabilities and separate teams. Conflicts were resolved within the delivery entity by reference to the overall project objectives. The client role of funder and sponsor was held outside the delivery entity by the HAL main board. This structure allowed HAL to complete the T5 project within the expected timetable and on budget without any legal claims between HAL and contractors in the course of it. This programme management and delivery structure enabled roles and risks to be managed effectively, to some extent mitigating the delivery and overrun risk, which will also be important considerations for any future developments given the overall contractual and delivery risk posed by the scale of the schemes proposed.

The T5 experience has some key lessons for any future finance raising:

- A RAB structure can accommodate significant levels of new capital expenditure;
- There are limits on the extent to which cost risk can be transferred to contractors, so that for projects of this scale, some form of target pricing is likely to be more appropriate;
- The regulatory framework can be flexed in a way that allows large capital expenditure to be incurred without causing undue financial distress to the company, and incentivises economy and efficiency, but deals with possible variations in capital cost outturns; and
- The regulatory structure can pre-empt expenditure and consequently reduce the finance burden (although this gives rise to some controversy).

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<sup>52</sup> [https://www.caa.co.uk/docs/5/ergdocs/ccreport\\_appe.pdf](https://www.caa.co.uk/docs/5/ergdocs/ccreport_appe.pdf)

[http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision\\_mar08.pdf](http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf)

<sup>53</sup> <https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf>

<sup>54</sup> [http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision\\_mar08.pdf](http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf). Refer to pages VI TO VII, paragraphs 6-8 which detail the rationale for the adjusted aero charges for Heathrow.

## Possible alternative funding models

Our review of international precedents shows that the majority of projects have been publicly funded, either by way of direct grants or through public sector entities that raise publicly backed long term bond finance or municipal bonds.

Two key reasons for this are:

- Major airports remain predominantly owned by the public sector; and
- The scale, complexity and inherent risks of major airport infrastructure are likely to be beyond the capacity of private sector financiers.

However, airports in the UK tend to be privately owned and operated and – in the case of GAL and HAL – regulated. This allows for a wide range of potential delivery models. While there are variants within each model, these can be broadly divided into the following categories. For each of the options the key characteristics and risks are discussed.

Figure 21: Alternative funding models

Funding model	Description	Considerations and risks
<b>Corporate (RAB model)</b>	<ul style="list-style-type: none"> <li>• Current funding and financing model for GAL and HAL, typical use of five year price control reviews.</li> <li>• Funding and financing raised wholly via the corporate entity through a combination of bond and commercial debt financing.</li> <li>• Regulated model when airport has market power.</li> <li>• RAB models are generally considered able to attract low cost and long term finance.</li> </ul>	<p>Currently, all scheme proposers are suggesting that a RAB model, in some form, would be used to support the financing of the schemes. There are, however, a number of important factors to consider with this approach and while a RAB model may deliver a viable funding model, some changes to the existing structure may be required, given the scale of the investment need. Key issues that will need to be considered when assessing the viability of this funding model include:</p> <p><b>Funding and Financing</b></p> <ul style="list-style-type: none"> <li>• Given the scale of the investment required, relative to the existing (and augmented) capital, is there sufficient capacity in the market to raise the level of financing required and what impact could this have on pricing and conditions thereof?</li> <li>• Will it be possible to achieve the investment grade credit rating required (in the case of bond finance) given the level of financing that will need to be raised (both for the new investment and refinancing of existing facilities), and what impact could the additional debt have on existing finance covenants and credit ratings? Support packages may be required to mitigate some of these risks. How much equity will need to be raised to ensure the overall external finance/debt does not reduce the company's credit rating?</li> <li>• Does the pricing mechanism provide adequate support to recoup the investment and ensure ongoing financial stability and maintain financial ratings? RAB models work best where there is revenue certainty, so it will be necessary to consider how susceptible revenues could be to competition and whether there is adequate flexibility to be able to set charges at a sufficient level.</li> </ul> <p><b>Regulatory Framework</b></p> <ul style="list-style-type: none"> <li>• Investors understand the RAB model and generally regulators have a statutory duty to give the regulated business a reasonable prospect of being financeable.</li> <li>• The RAB model tends to be applied in a way that specifically includes bond rating analysis (i.e. the regulator carries out modelling to ensure that the price control gives the business a sufficient prospect of achieving a specific credit rating).</li> <li>• There is also provision for price controls to be re-opened in the event that costs go beyond certain levels which, depending on the type of cost variation, could increase or reduce the price chargeable (or level of the RAB).</li> <li>• Given the scale of the investment required, the regulator will need to consider whether the new runway, with its relative size and asset risks, fundamentally changes the risk profile of the company. Depending on the view taken, it may be necessary to flex or make changes to the existing regime.</li> </ul>

Funding model	Description	Considerations and risks
<b>Variations to the corporate (RAB model)</b>	Potential variations to the RAB model as typically applied to reflect and recognise the scale of development and size.	<ul style="list-style-type: none"> <li>• Whilst the work undertaken by the AC includes a high level assessment of the scheme costs and risks, a full and detailed regulatory review will be required to ensure allowable costs have been incurred economically and efficiently.</li> </ul> <p>In certain circumstances (e.g. given the scale of the investment required) it may be appropriate to vary the current RAB structure to reduce revenue risk (e.g. through longer term settlements).</p> <p>A number of other potential variations to the RAB model could be considered to recognise the scale of the development proposed. These could include:</p> <ol style="list-style-type: none"> <li>1 Whether large expenditure should be “pre-funded” (i.e. before or as incurred) which would give greater certainty and could reduce funding costs.</li> <li>2 Whether pre-approval of procurement strategy or individual contracts should be required to ensure that expenditure is economic and efficient and therefore allowed to be added to the RAB or equivalent.</li> <li>3 Whether the construction of the new capacity should be separated from the airport entity and delivered by way of an Infrastructure Provider type model with a separately regulated entity (such as the Thames Tideway Tunnel).</li> <li>4 Some funding could be provided through direct public funding or supported by Government guarantees to cover a residual risk that the market may not be able to completely meet. Any public support alongside a RAB model would need to be consistent with State Aid requirements and would have to be consistent with the considerations and risk of a publicly funded model.</li> </ol> <p><b>Key risks include:</b></p> <ol style="list-style-type: none"> <li>1 How funding and regulation could work if competition develops between two hub airports which makes it difficult for their RABs to be funded through landing charges.</li> <li>2 Whether, and if so, how to pre-fund. Based on the costs given in Figure 18, the GAL option would result in the trebling of its RAB from £2.5bn to £8.1bn, the HAL option would result in a doubling of its RAB from £14.6bn to £28.6bn and the HHL option would result in a near doubling of the HAL RAB from £14.6bn to £24.8bn . This may require significant pre-funding (increased charges before the asset is completed) to ensure ongoing financial stability and maintain financial ratings. How this could be managed with the airlines, which lack certainty over future airport slots, will need careful consideration.</li> <li>3 Whether the model can raise the scale of long term finance required.</li> </ol> <p><b>Alternative examples of RAB based approaches include:</b></p> <ul style="list-style-type: none"> <li>• T5 – This is the most direct example of where changes have been made to the existing regulatory regime to support a new project. The costs for T5 were incorporated into the RAB as they were incurred and there was a claw back mechanism in place via a charge to the aeronautical revenues for failure to meet the required milestones (refer to previous case study on T5 in this section).</li> <li>• Thames Tideway Tunnel – This provides a good example of where innovative changes have been made to the regulatory environment to accommodate the size (over £4bn) and complexity of the project. The tunnel is in Thames Water’s (TW) licence area, but the capital cost required would represent over a third of its current RAB. Given TW’s existing finance covenants, the scale of the investment required and the risks involved in the tunnelling, it was not viable for TW to finance and develop the tunnel itself. As a result the following arrangements have been put in place to support the delivery of the scheme: <ul style="list-style-type: none"> <li>- An ‘Infrastructure Provider’ (IP) model has been established whereby a separately regulated entity with its own shareholders, board and management has been set up to construct the tunnel. TW are acting as the procuring authority but not taking risk on the construction of the works being done by the IP. The IP raises debt and equity to finance the tunnel and a charge is levied on TW customers (collected via TW and paid down to the IP) to fund the investment.</li> <li>- A supportive regulatory regime has been set up whereby allowed charges (revenues) for the IP are determined according to a building block approach, with a short term unique cost of capital settlement for</li> </ul> </li> </ul>

Funding model	Description	Considerations and risks
<b>Traditional Public Private Partnership (“PPP”)</b>	<ul style="list-style-type: none"> <li>• A contractual relationship between government and private sector to deliver and finance infrastructure.</li> <li>• Private sector operator in most cases assumes substantial financial, technical and operational risk in the project.</li> <li>• In most cases the capital investment is made by the private sector on the basis of an agreed service contract.</li> </ul>	<p>the IP (potentially resulting in an increased WACC to recognise the increased cost risk posed during the construction phase). The normal regulatory regime has been adapted with the intention of achieving a risk profile for the IP entity that is consistent with other companies in the UK water sector. This should allow the IP sufficient access to debt markets (the investment is likely to be mainly financed through bonds with an investment grade credit rating). Once the construction phase is finished, it is ultimately intended that the cost of capital for the IP will be set in line with those for other water and sewerage companies;</p> <ul style="list-style-type: none"> <li>- No government guarantee is being provided but there is a Government Support Package in place during the construction phase that will provide contingent financial support to cover certain exceptional project risks. This is part of supporting the IP to obtain sufficient creditworthiness in a way that is value for money for water customers and taxpayers. For example, one of the measures would be an insurance product that protects the project against risks that the insurance market would be unable to cover; and</li> <li>- If this model were to be considered for the delivery of new airport capacity, there are a range of issues that would need to be considered including: how construction could be carved out from existing airport operations; how charges would be levied on airport users; potential reintegration of new assets into the main airport RAB once construction is complete; government support required; State Aid issues; and the competitive distortions that might arise and impact private sector competitors.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• There are a number of benefits of delivering infrastructure projects by way of a PPP. These typically include construction, financing and funding risk being passed onto the private sector and in many cases operating and lifecycle risk too.</li> <li>• However, PPPs traditionally entail the public sector contracting with the private sector to deliver infrastructure projects. Since both GAL and HAL are owned by the private sector, a fundamental issue that would need careful consideration would be who the counterparties to the PPP would be, who would have ultimate ownership of the assets in the PPP and how these would be integrated with existing airport infrastructure. Depending on the decisions made, State Aid issues would also need to be considered.</li> <li>• In addition to the key issue regarding who the counterparties to the PPP would be, the ability to deliver the schemes via a PPP, given the scale of the investment, needs to be considered. Precedents would suggest that the traditional PPP market is capable of financing up to circa £1.5bn due to both the constraints of the balance sheet strength of the PPP contractor and the depth of the PPP finance market. The capex associated with all short listed scheme proposals far exceeds this threshold, so to deliver the schemes via a PPP would be beyond current norms. At the scale of the capex proposed, there would typically be a need for the development to be phased (splitting the required investment into smaller pieces) and/or additional Government support may be required (e.g. debt guarantees), which could undermine the VfM for using a PPP model.</li> <li>• Under a PPP model, a fixed price Engineering Procurement Contract (EPC) would typically be let to construct the assets, transferring significant risks around construction to the contractor. However, given the scale of the investment required, this would be unlikely to be viable as the balance sheets of the main EPC contractors are unlikely to be able to bear the risk of the project.</li> <li>• The likelihood of there being limited ability to transfer risk to contractors may also necessitate a dependence on expensive equity financing.</li> <li>• Some form of public sector support would be likely to be required (e.g. public funding to support infrastructure and surface access costs, which provide a wider economic benefit).</li> <li>• If the airport expansion were to be delivered by way of a PPP, careful consideration would be required as to how the new assets within the PPP would interface with existing airport operations and what an appropriate exit strategy might be in the future.</li> </ul>

Funding model	Description	Considerations and risks
<b>Publicly funded</b>	<ul style="list-style-type: none"> <li>Wholly government funded infrastructure development as seen with a number of international comparative assets.</li> <li>Cost borne by the taxpayer.</li> </ul>	<ul style="list-style-type: none"> <li>Benefits of publicly funded projects include a potential reduction in delivery time, simplicity and lowest cost finance – either grant or through some form of prudential borrowing / issuance of Government bonds.</li> <li>However, there are a number of key issues that would need to be addressed in considering this option in the context of the schemes. These include: <ul style="list-style-type: none"> <li>State Aid issues (discussed later in Section 3) and market distortion for other private sector airports;</li> <li>Passing the upfront costs to the taxpayer not the users and airlines – is this equitable and value for money? A key consideration would be whether the wider level of economic benefit proposed by the scheme justifies public intervention and funding. There could however be an option to recoup the investment by selling the assets in the future;</li> <li>Government willingness to prioritise funding over other Government funding commitments; and</li> <li>The fundamental issue that HAL and GAL are currently privately owned. To consider public funding for the schemes at these airports, the Government would need to review options for either buying one of the airports (sending a clear political signal that the Government is committed to the success of the scheme) or developing a publicly owned and financed sub-asset within the airport. How the integration of any public assets and the existing airport assets would be managed, would also need to be considered.</li> </ul> </li> </ul> <p><b>An example of a publicly financed and delivered scheme is:</b></p> <ul style="list-style-type: none"> <li>High Speed 1 (HS1) – developed and financed by the public sector and then sold and managed like a concession, once operational. The approach provided a level of revenue certainty akin to the Regulatory Asset Base (RAB) approach to private investors, but without actually having a RAB. The model that was applied to HS1 was innovative in that it replaced the RAB and many of the intricacies that are involved in this, with: <ol style="list-style-type: none"> <li>A maximum Index-linked Investment Recovery Charge (IRC) from which discounts could be offered. This IRC was expressed in terms of £ per minute and was fixed for the duration of the 30 year concession;</li> <li>A protocol to allow the real value of the IRC to be increased for only one reason, which was the funding of specific upgrades. The costs of these would have to be reviewed in advance and would include reasonable financing costs;</li> <li>An Operating Maintenance and Renewal Charge (OMRC). The level of OMRC is reviewed every 5 years in a relatively standard manner and the renewals component of this charge was an annuity contribution to a sinking fund (or escrow account) that was calculated to be sufficient to cover expected future renewals activity; and</li> <li>An ‘underpin’ from DfT that provided certainty about the volume of services that would be required, and paid for, by the (Government backed) franchised operator.</li> </ol> </li> </ul> <p>HS1 provides evidence that there is an alternative to the RAB approach which is acceptable to private capital. The public sector developed and financed the project at the outset and private sector investors subsequently found the HS1 regime to be attractive, with the asset being sold for £2.1bn rather than its book value prior to the sale of £1.5bn. It should, however, also be noted that one of the keys to a successful sale was to write down the initial asset (from about £6bn to £1.5bn) to a value that made it affordable to users and therefore sustainable on an ongoing basis. The structuring and sale of HS1 was also subject to State Aid approval.</p>

## State Aid

It should be noted that using taxpayer-funded resources to provide assistance to one or more organisations in a way that gives an advantage over others may constitute State Aid and some State Aid is illegal under EU rules because it can distort competition in a way that is considered to be harmful.

It will be critical for Government to consider the State Aid implications if the Government were to provide support to any of the proposed schemes (e.g. through direct financial support to a scheme's sponsor, or more indirectly through investment in supporting surface access infrastructure). Although much will depend on the details of the options submitted, indications are that<sup>55</sup>:

- GAL states that its option can be delivered 'without recourse to public funds' but it is unclear whether this will be borne out in practice;
- HAL assumes full private sector funding for the development of Heathrow Airport for the purposes of a third runway and associated airport facilities. They have however assumed that general surface access improvements and committed rail schemes will be paid for mostly by government; and
- HHL suggests the potential use of central and local government sources of finance (e.g. HM Treasury loan guarantees, Department for Transport finance for roads and rail, rates retention, Community Infrastructure Levy (CIL) and S106 payments) to fund elements of their scheme, particularly those which are considered to deliver wider economic benefits (for example rail surface access)

State Aid is a complex area which will need to be considered more fully in other workstreams assessing scheme submissions. There are two key points to note. First, is that at a 'first principles' level, Article 107(1) of the Treaty on the Functioning of the European Union (TFEU) sets out five criteria, all of which must be fulfilled for there to be State Aid present:

- a) 'State resources' have been involved;
- b) The resources have been given to 'certain undertakings' (e.g. specific businesses) – i.e. it is selective;
- c) The effect is one of 'favouring' those undertakings – i.e. it conveys an advantage;
- d) It "distorts or threatens to distort competition"; and
- e) It 'affects trade between Member States'.

If any of these five criteria is not met then there is no State Aid. In practice criteria (d) and (e) are relatively easily met, particularly when considering investment in airport infrastructure. The definition of State resources in criterion (a) is applied widely. A direct grant or payment from Government is a relatively clear example of the use of State resources, but these could also take other less obvious forms such as interest and tax reliefs, loan guarantees, the provision of goods and services on preferential terms, or public investment into surface access infrastructure that would not otherwise have been made. We also understand that the recent judgment of the Court of Justice of the European Union in *Leipzig/Halle* found that not only the operation of airport infrastructure but also the construction of infrastructure with public funds linked to its later operation constitutes economic activity and therefore is subject to the State Aid controls of the European Commission.

Criterion (b) is intended to differentiate State Aid to 'certain undertakings' (which generally includes the construction and operation of airports but not activities like traffic control or police) from 'general measures' applied by Member States (e.g. fiscal measures such as providing tax relief to all businesses for expenditure on certain activities). As these are available to all firms they are not selective to particular undertakings and therefore cannot distort competition between undertakings.

Much may therefore turn on Criterion (c) and the so-called Market Economy Investor Principle (MEIP) test. Even if all the other criteria were fulfilled, aid would not be State Aid incompatible with the internal market if it did not favour, or convey an advantage to, the recipient undertaking.

The MEIP test assesses whether an undertaking benefited from an economic advantage. Pursuant to the MEIP principle, a transaction /investment does not involve State Aid if it takes place at the same time and under the

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<sup>55</sup> The information presented relates to the scheme promoter submission submitted in May 2014.

same terms and conditions that would be accepted by a private investor operating under normal market economy conditions. It involves a hypothetical assessment of the State support – would a private investor (the ‘I’ in MEIP) have provided such support if it were operating under a normal market economy (the ‘ME’ in MEIP) conditions?

Second, there are a number of exemptions from a general prohibition of granting State Aid that may provide justification for State Aid. These are set out in Articles 107(2) and 107(3) of the TFEU, and include aid of a social character, aid to remedy natural disasters, and regional economic development aid. It would be useful to assess whether these apply to the shortlisted options but our current working assumption is that they will not.

If the criteria of MEIP test are not fulfilled and therefore the government funding constitutes State Aid, this aid can still be considered compatible with the internal market within the meaning of Article (3) c) of the TFEU. This would require formal notification to the European Commission by the UK government. To assess whether public funding of airports and airport infrastructure is “State Aid compatible”, the European Commission use the criteria of the Guidelines on State Aid to airports and airlines. Revised guidelines have recently been adopted.

Under these new guidelines, investment in airport infrastructure is generally allowed if there is a genuine transport need and the public support is necessary to ensure the accessibility of a region (and therefore, the impact of the aid measure in reaching an objective of common interest for the EU, outweighs the potential side effects). The revised guidelines define maximum permissible aid intensities depending on the size of an airport but we note that they appear to have been designed to be applied to airports that are significantly smaller than Gatwick or Heathrow.

If the exceptions do not apply, and the definitions for State Aid as set out in Article 107(1) of the TFEU are fulfilled, then that aid is deemed incompatible with the internal market, and under Article 108(2) of the TFEU the Commission “*shall decide that the State concerned shall abolish or alter such aid within a period of time to be determined by the Commission*”, and may require the aid to be paid back with interest.

In summary, all options will need to be reviewed for the potential State Aid risks and whether/how these risks will affect the commercial and financial viability of the options. This will be important to the AC and scheme promoters because of the implications of public sector support being found to be State Aid incompatible.

Our current working assumption is that the key issue for the shortlisted options will be associated with the funding of surface access infrastructure.

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# *Appendices*

# Appendix 1: References and sources

## Websites

Footnote reference (where relevant)	Link
1	<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/264102/avi0109.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/264102/avi0109.pdf</a>
2	<a href="http://www.caa.co.uk/application.aspx?catid=14&amp;pagetype=65&amp;appid=7&amp;mode=detail&amp;mid=2342">http://www.caa.co.uk/application.aspx?catid=14&amp;pagetype=65&amp;appid=7&amp;mode=detail&amp;mid=2342</a>
5	<a href="http://news.sky.com/story/1346659/singapore-swoops-in-1bn-uk-airports-deal">http://news.sky.com/story/1346659/singapore-swoops-in-1bn-uk-airports-deal</a>
6,7	<a href="http://www.aci.aero/Data-Centre">http://www.aci.aero/Data-Centre</a>
8	<a href="http://www.world-airport-codes.com/">http://www.world-airport-codes.com/</a>
14	<a href="http://www.gatwickairport.com/business-community/about-gatwick/at-a-glance/facts-stats/">http://www.gatwickairport.com/business-community/about-gatwick/at-a-glance/facts-stats/</a> <a href="http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf">http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf</a>
15	<a href="http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf">http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf</a> <a href="http://www.standardandpoors.com/prot/ratings/articles/en/eu/?articleType=HTML&amp;assetID=1245365294217">http://www.standardandpoors.com/prot/ratings/articles/en/eu/?articleType=HTML&amp;assetID=1245365294217</a>
18	<a href="http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf">http://www.gatwickairport.com/Documents/business_and_community/investor_relations/Year_End_2014/Gatwick_Airport_Limited_Financial_Statements_31March2014.pdf</a>
20	<a href="http://www.heathrowairport.com/about-us/company-news-and-information/company-information/facts-and-figures">http://www.heathrowairport.com/about-us/company-news-and-information/company-information/facts-and-figures</a>
21	<a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Heathrow_(SP)_Limited_-_31_December_2013.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Heathrow_(SP)_Limited_-_31_December_2013.pdf</a>
22	<a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/investor-report-dec2012_lhr-airports.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/investor-report-dec2012_lhr-airports.pdf</a> <a href="http://www.heathrowairport.com/about-us/company-news-and-information/company-information">http://www.heathrowairport.com/about-us/company-news-and-information/company-information</a>
24	<a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_maturity_profile_31_March_2014.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_maturity_profile_31_March_2014.pdf</a> <a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&amp;P_-_Heathrow_Funding_Rating_Affirmed.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&amp;P_-_Heathrow_Funding_Rating_Affirmed.pdf</a>
25	<a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_HAH.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_HAH.pdf</a> <a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_Heathrow_Finance.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_31_March_2014_Heathrow_Finance.pdf</a> <a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/Debt_information_</a>

Footnote reference (where relevant)	Link
	31_March_2014_Heathrow_(SP).pdf <a href="http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&amp;P_-_Heathrow_Funding_Rating_Affirmed.pdf">http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/2013-10-25_S&amp;P_-_Heathrow_Funding_Rating_Affirmed.pdf</a>
26	<a href="http://www.heathrowairport.com/about-us/investor-centre/debt-information/debt-summary/amounts-and-costs-of-debt/archive">http://www.heathrowairport.com/about-us/investor-centre/debt-information/debt-summary/amounts-and-costs-of-debt/archive</a>
28	<a href="http://www.caa.co.uk/docs/33/CAP%201140.pdf">http://www.caa.co.uk/docs/33/CAP%201140.pdf</a>
33	<a href="http://www.caa.co.uk/docs/78/CAA_CostofCapital_Final_250413_CLEAN.pdf">http://www.caa.co.uk/docs/78/CAA_CostofCapital_Final_250413_CLEAN.pdf</a>
36	<a href="http://www.caa.co.uk/docs/33/CAP1152LGW.pdf">http://www.caa.co.uk/docs/33/CAP1152LGW.pdf</a>
37	<a href="https://www.caa.co.uk/default.aspx/default.aspx?catid=78&amp;pagtype=90&amp;pageid=67">https://www.caa.co.uk/default.aspx/default.aspx?catid=78&amp;pagtype=90&amp;pageid=67</a>
38	<a href="http://www.caa.co.uk/docs/33/CAP1151.pdf">http://www.caa.co.uk/docs/33/CAP1151.pdf</a>
40	<a href="http://www.gatwickobviously.com/sites/default/files/downloads/gatwick_airport_proposals_for_additional_longterm_runway_capacity19jul2013.pdf">http://www.gatwickobviously.com/sites/default/files/downloads/gatwick_airport_proposals_for_additional_longterm_runway_capacity19jul2013.pdf</a>
42	<a href="http://www.heathrowhub.com/media/filer_public/b5/90/b5902fe9-6fda-4d8f-9f9e-1a3648227324/report_190713_rev_a.pdf">http://www.heathrowhub.com/media/filer_public/b5/90/b5902fe9-6fda-4d8f-9f9e-1a3648227324/report_190713_rev_a.pdf</a>
43	<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268620/airport-s-commission-interim-report-appendix-2.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268620/airport-s-commission-interim-report-appendix-2.pdf</a>
50	<a href="http://www.arabianbusiness.com/dubai-duty-free-seeks-new-750m-loan-516627.html">http://www.arabianbusiness.com/dubai-duty-free-seeks-new-750m-loan-516627.html</a>
51	<a href="https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf">https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf</a>
52	<a href="https://www.caa.co.uk/docs/5/ergdocs/ccreport_appe.pdf">https://www.caa.co.uk/docs/5/ergdocs/ccreport_appe.pdf</a> <a href="http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf">http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf</a>
53	<a href="https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf">https://www.caa.co.uk/docs/5/ergdocs/baadecision200308.pdf</a>
54	<a href="http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf">http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf</a>

### ***PwC research databases***

- Project Ware (This is a PwC subscribed service. No link available.)
- Project Finance International (PFI) (This is a PwC subscribed service. No link available.)
- Infrastructure Journal (This is a PwC subscribed service. No link available.)
- Project Finance (This is a PwC subscribed service. No link available.)
- Office of Fair Trading Airport Ownership Database (This is a PwC subscribed service. No link available.)
- Dealogic database (This is a PwC subscribed service. No link available.)
- Airports Council International 2012 Economic Survey (This is a report purchased by PwC. Report is available for purchase at: <http://www.aci.aero/Publications/Full-Publications-Listing/ACI-Airport-Economics-Report-2012>)

***Documents (available online)***

- Airports Commission: Long-term hub capacity options, Heathrow Airport Limited Response, 17th July 2013: [http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/long-term-hub-capacity-options\\_LHR.pdf](http://www.heathrowairport.com/static/HeathrowAboutUs/Downloads/PDF/long-term-hub-capacity-options_LHR.pdf)
- Airports Commission, Isle of Grain 3 Final Sift document: <http://www.thamesreachairport.com/wp-content/uploads/2014/02/Airports-Commission-67-Isle-of-Grain-Sift-3-FINAL.pdf>
- Our Airport, Our Future, Hong Kong International Airport Master Plan 2030, Technical Report 2012: [http://hki3way.blob.core.windows.net/pdf/en/TR\\_24May\\_Eng\\_Full.pdf](http://hki3way.blob.core.windows.net/pdf/en/TR_24May_Eng_Full.pdf)
- Airport Financial report publications (usually available on the website of the airport in question)



