

Foster + Partners

THAMES **HUB** AIRPORT

May 2014



BRITAIN NEEDS A NEW HUB AIRPORT

Increasing hub capacity in the South East is vital in ensuring Britain has the global connectivity needed to support future growth. The global landscape has changed since the last Airports Commission submission, with major new hub airports being built and planned in Istanbul, Doha, Dubai, Beijing and Mexico City. By 2050 these next generation airports will deliver increased capacity – in order to maintain global hub status, Britain needs to compete.

24-HOUR OPERATIONS

Heathrow is simply in the wrong place, subjecting millions of Londoners to unacceptable levels of noise, pollution and risk – more than one million people will be within Heathrow's noise contour. To compete, the country's hub airport must be able to operate 24-hours a day and this is only possible in the Thames Estuary. The Thames Hub Airport has been developed since the original submission to create a more flexible layout, which further minimises aviation noise.

FAST, EFFICIENT CONNECTIONS

High capacity public transport links already exist in the Thames Estuary. By creating a short connecting spur, the Isle of Grain can benefit from high-speed rail links to the rest of the UK. The new airport will be less than 26 minutes by train from St Pancras.

NEW HOMES, NEW JOBS

There is rising demand for new homes and jobs, in line with population growth – London is growing 20% in the next 20 years and the thrust of development is to the east. The new airport can balance the economies of east and west London, unlocking sites for housing in the east and developing brownfield land rather than green belt. To the west, Heathrow is unlocked as a redevelopment site the size of an inner London borough.

NEW WILDLIFE HABITATS

If there is an overriding public need to provide hub capacity, new wildlife habitats can be found and there are successful precedents. The Environment Agency is currently identifying and funding more than 800 hectares of new habitats, which are being displaced by rising sea levels – this is work that the Thames Hub can help fund. Rather than spending £1bn to move the M25, this money could be used to protect and replace habitats already under threat.

THE LONG-TERM SOLUTION

Heathrow's third runway will cost £11 billion – a brand new four-runway airport with resilience and potential for future expansion will cost £15 billion. The planning processes for both are identical and construction time is only slightly more. A third Heathrow runway would be full within a decade of opening, necessitating a fourth runway.

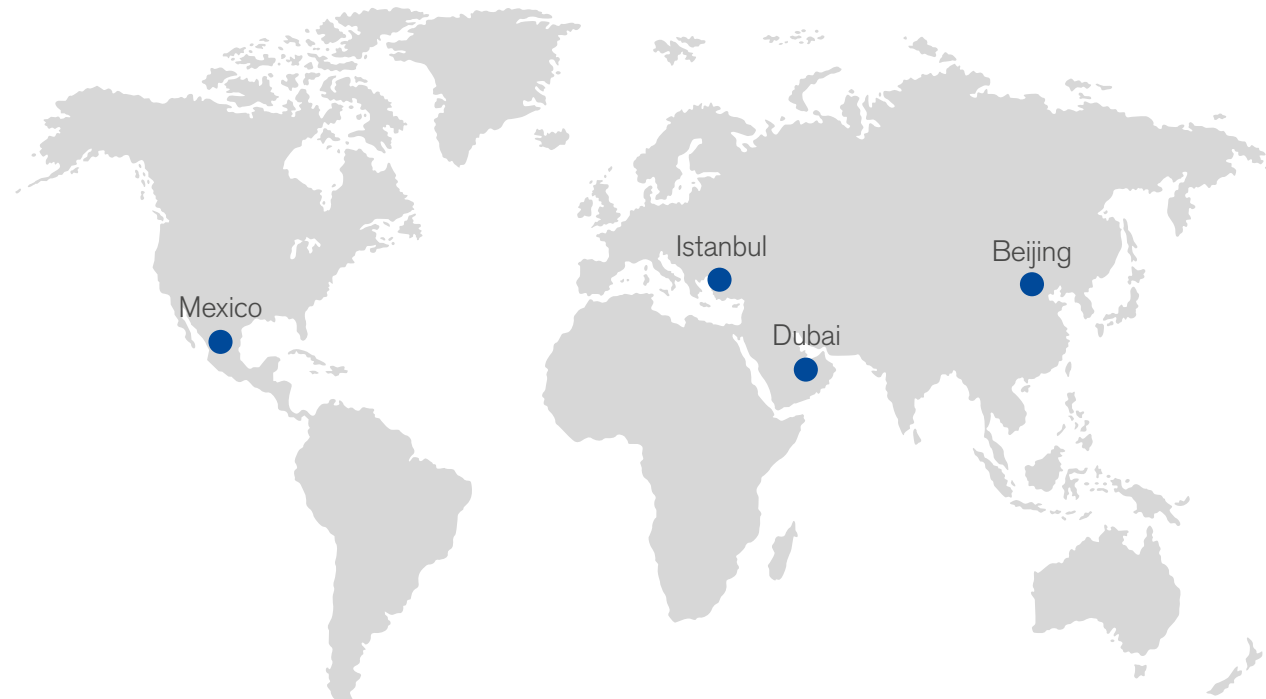
GLOBAL CONNECTIVITY: CAPACITY, RESILIENCE AND FUTURE FLEXIBILITY

Europe is the ideal location for a hub airport, because of its central location between the cities that account for 94% of global GDP. Heathrow's success proves this, but it is now full. Frankfurt, Paris and Amsterdam will soon fill up, due to growth in demand. A new hub airport offering resilience and capacity is needed for Britain's economy and for Europe.



We have got to understand where our peers are heading – Beijing, Dubai and Istanbul are charging ahead, Mexico City is building a next generation global hub. Last month we saw the opening of the new Doha Airport and the question it raises is around the need for 24 hour airports. The economy is growing. There is an understanding that we are now in global markets with global supply chains.

Huw Thomas
Foster + Partners



KEEPING PACE WITH CHANGE

In the 12 months since the Airports Commission submissions, the global aviation landscape has evolved, with major new hub airports being planned and built around the world, and passenger numbers and UK population figures continuing to rise.

The self-funded Thames Hub vision was first made public in 2011. The proposal has been advocated by Mayor of London, Boris Johnson and has been developed with the support of a number of leading organisations. Meetings have been held with over 100 different stakeholders, including national and local government, the aviation sector, transport operators, business organisations, environmental organisations and local community groups, as well as global investment groups.

May 2013

“Consortium wins Istanbul airport tender for 22.1 billion euros”

Operator chosen for the six-runway, 150mppa new airport in Turkey opening in 2017.

June 2013

“Airbus wins order battle at Paris Air Show”

Reuters report Airbus win orders for 466 planes at £45bn, outselling Boeing who sold 442 aircraft for £42bn.

“London’s Population Hits New High of 8.3m”

New data from the Office for National Statistics reveals the capital was by far the fastest-growing region of the country with a 1.27 per cent rise between mid-2011 and mid-2012 – more than a quarter of England’s total population growth happened in London.

November 2013

“London Gateway ‘super-port’ welcomes first vessel”

The development is forecast to create 27,000 jobs in London and the South East and contribute £2.4bn a year to its economy.

“UK population growing faster than any other EU country”

Britain had Europe’s fastest growing population last year, according to European Union Eurostat figures.

December 2013

“Airlines expect 31% rise in passenger demand by 2017”

IATA forecasts predict nearly 1bn (930m) extra passengers in 2017 (3.91bn) compared to 2012 (2.98bn).

“Half the world’s population now fly”

In 2012 global passenger figures were 42% of the total population. At some point in 2015 this figure will reach 50% - by 2017, with a global population of 7.4bn, this figure will be 3.91bn.

January 2014

“Expo 2020 win boosts airport investment”

Dubai wins right to host 2020 World Expo and commits up to \$43bn to infrastructure for it – the airport sector being made ‘top priority’.

February 2014

“Thames floods: Thames Barrier closed for record 19th consecutive tide”

The Environment Agency has shut the ten steel gates that protect London from flooding 41 times this winter, a quarter of all the closures since it opened in 1982.

April 2014

“Four UK firms named on shortlist for huge Mexico City airport expansion”

Shortlist for the design of a 40mppa new terminal of a 5,000 hectare site announced.

“Tony Abbott confirms Badgerys Creek as site of second Sydney airport”

A new 24-hour airport will help push capacity in Sydney to 78mppa, work to begin in 2018.

May 2014

“Global Air Transport Continues to Expand”

Worldwatch Institute report that in 1950 31m people flew, in 1986 the figure was 960m, today’s figure of 3bn is a 95-fold increase. World’s commercial air fleet has risen from 18,792 in 2003 to 25,252 in 2012. According to Boeing, the 2032 figure will be around 41,000.

“The 3rd Beijing airport confirmed”

Chinese Government has given the green light for work to start in July on a new four-runway airport planned to open in 2018, with an ultimate capacity of 72mppa and 2 million tons of cargo.

“Dubai International became the busiest airport globally for international passengers in the first quarter, overtaking London’s Heathrow”

Dubai’s main hub handled 18.36 million international passengers in the first quarter of 2014. Heathrow counted 16 million people pass through its gates during the same period.

CAPACITY FOR THE FUTURE

Heathrow claims that a third runway will provide capacity for 130mppa, but this means operating at 98% capacity with an average of 188 passengers on each flight. This is worse than Heathrow today and provides no resilience for delays and cancellations. Based on the same criteria, the 4-runway Thames Hub Airport could provide capacity for up to 221mppa. However, for resilient operations, a maximum of 85% runway use and an average 164 passengers per flight is our target, resulting in capacity of 167mppa – a figure that still far exceeds Heathrow's capacity.



98%

Heathrow currently operates at 98% runway utilisation and cannot recover from events leading to delays and the cancellation of flights

LEFT
Passenger misery
at Heathrow

Thames Hub Airport

110mppa

Opening capacity

150mppa

Flexibility to grow to 150mppa and beyond

4

Runways

24 hour

Operations round the clock










191

Potential to serve 191 long-haul destinations, compared to Heathrow's proposed 126

16

Number of UK destinations served by the Thames Hub. Heathrow and Gatwick proposals serve only 7

BELOW Capacity comparison

	Heathrow today	Heathrow: 3 runways	Thames Hub
Operation time	 17 hours	 17 hours	 24 hours
Annual transport movements (ATMs)	480,000	740,000	1,200,000
Resilient mode (85% capacity) 164 average passenger load	 67	 103	 167
Non-resilient mode (98% capacity) 188 average passenger load	 90	 136	 221

International best practice is for runway utilisation at 85%. A third runway at Heathrow will be effectively full after opening, rapidly returning to its current 98% runway utilisation and resulting in poor slot availability and a lack of resilience.

Only a new four-runway hub can maintain efficient runway utilisation below 85%

CONVENIENT FOR LONDON, THE UK AND EUROPE

With 60% of passenger journeys by rail, the Thames Hub Airport is located to take advantage of existing and planned high-speed rail links. The airport is adjacent to HS1 and close to the eastern terminus of Crossrail – by building a simple four-track rail spur, it will be connected to 20 train services an hour in either direction.

60%

The Thames Hub Airport provides for over 60% of journeys by rail

20

The airport will be connected to 20 train services an hour

26mins

Passengers will be able to reach the airport in just 26 minutes from London St Pancras

DIRECT

There will be direct services from outer London and the rest of the UK that avoid Central London, relieving congestion on the existing rail network

PARK + RIDE

New parkway stations will provide park and ride options for passengers combining bus, coach, car and rail travel





LOWER THAMES CROSSING


The project is compatible with DfT proposals for a future Lower Thames Crossing

FREIGHT CARGO

Access via rail and road links to the new DP World London Gateway Port and existing Thamesport

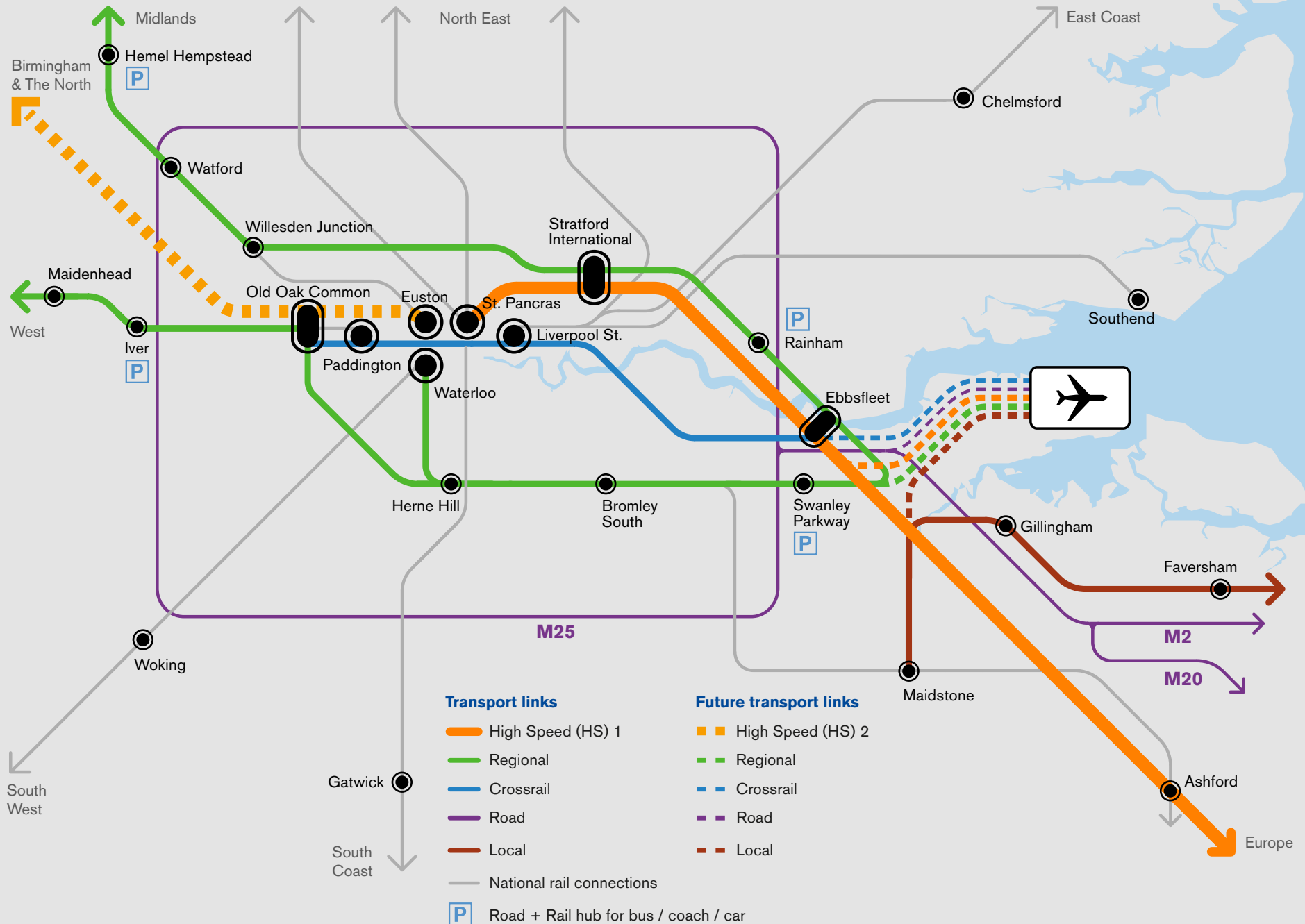
BELOW Journey time to Thames Estuary Airport

Origin	Journey time (minutes)
Ebbsfleet	15
Gillingham	15
Swanley Parkway  	14
Rainham  	20
Bromley South	25
Stratford International	26
St. Pancras 	26
Herne Hill	35
Waterloo	42
Willesden Junction	39
Canary Wharf	49
Faversham	45
Old Oak Common	49
Watford	50
Liverpool Street	56
Hemel Hempstead  	57
Iver  	61
Paddington	65
M Maidenhead	70
Milton Keynes	82
Ramsgate	80
Reading	81

 Road + Rail hub for bus/coach/car

 Check-in at station

Direct transport links to the Thames Hub Airport (selected stations shown)



FACING BRITAIN'S CHALLENGES: A CATALYST FOR GROWTH

London's population is expected to grow by 2.3 million by 2041, driven by rising life expectancy, a high birth rate and an increasing number of young people settling in the city – 10% of the population is between 25 and 29 years old. Between 2004 and 2013, an average of 21,000 houses were delivered each year – to meet demand, the rate of construction must increase to over 50,000.

RIGHT

Map showing locations in London that have significant capacity for new homes and jobs on a large-scale.

- Growth areas
- Growth corridors

NEW JOBS AND HOUSING

A new airport on the Isle of Grain will provide an important catalyst for the economic development of the Thames Estuary, creating new jobs, a new freight logistics economy and stimulating house building. Studies suggest that a new airport would add 134,000 net additional local jobs by 2050 – equivalent to £16.6bn GVA per annum – and will trigger a further 138,000 jobs across the region.

134,000

Net additional local jobs by 2050

SUPPORTING BRITISH BUSINESS

The unrivalled international connectivity of a four-runway hub airport, and the confidence and long-term security that such an investment demonstrates, will attract companies to locate close to the airport, activating the Thames corridor. 21% of Heathrow's current staff live outside the wider region and would likely have similar journey times to a new Estuary airport. The Thames Hub Airport will significantly improve the experience for passengers travelling to the UK, provide greater connectivity with regional airports and satisfy

airlines' need to expand their international routes, particularly to emerging markets. Nationally, the additional connectivity could improve productivity and result in a permanent 0.5% increase in GDP – valued at £6.9bn in today's prices.

£6.9bn

Permanent increase in GDP as a result of additional connectivity

1.4 million

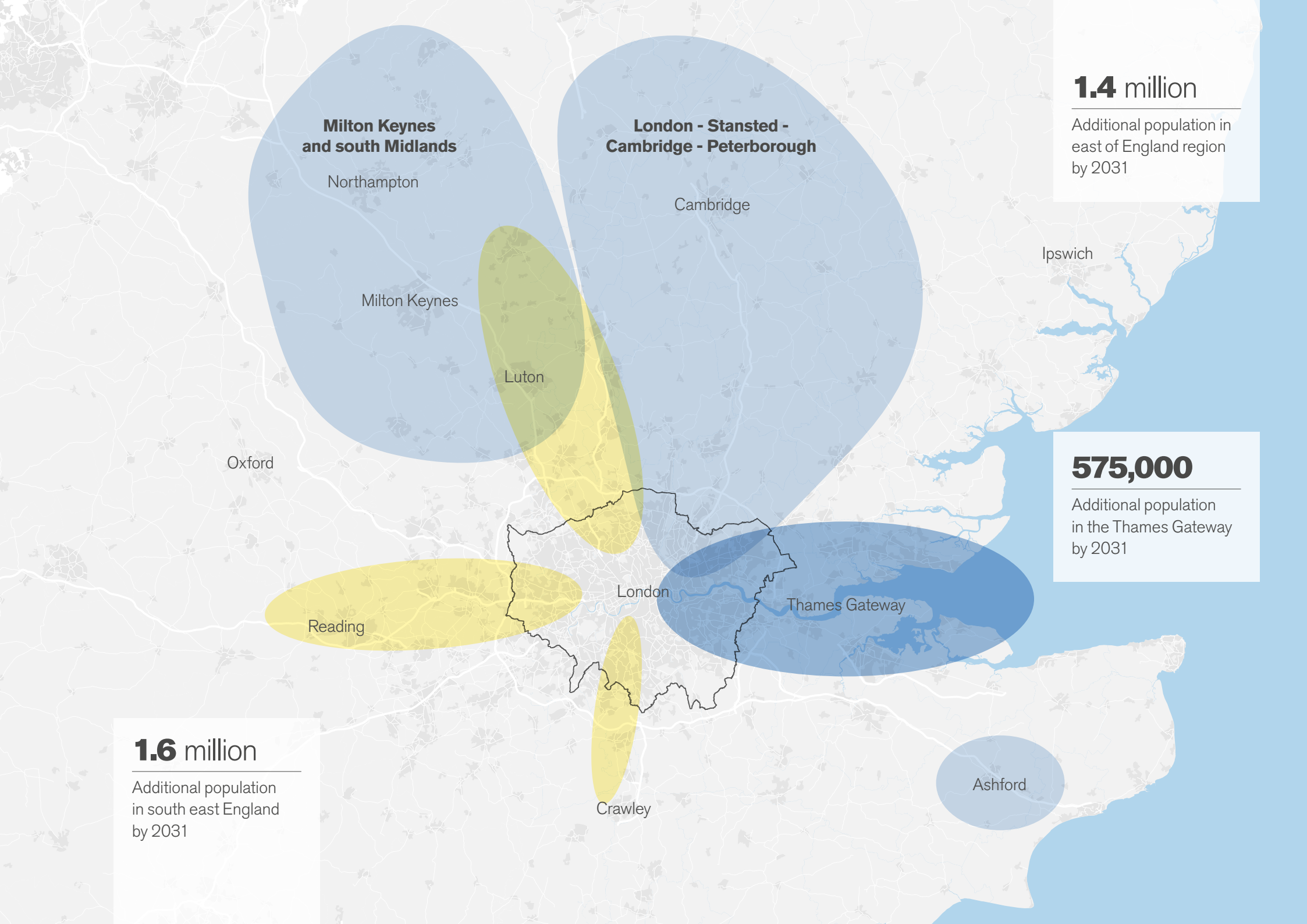
Additional population in east of England region by 2031

575,000

Additional population in the Thames Gateway by 2031

1.6 million

Additional population in south east England by 2031



Milton Keynes and south Midlands

Northampton

Milton Keynes

Luton

Oxford

Reading

London - Stansted - Cambridge - Peterborough

Cambridge

London

Crawley

Thames Gateway

Ashford

Ipswich

THE REAL OPPORTUNITY FOR HEATHROW

Building the Thames Hub Airport necessitates the transfer of services from Heathrow. The main impact of this will be to significantly improve the quality of life for the millions of people living beneath Heathrow's flight paths. London also needs to accommodate a population the size of Birmingham by 2041 – the departure of the airport to the Thames Estuary will create important new sites for housing development in West London and the Thames Gateway.



LEFT

The Foster + Partners team has developed a masterplan strategy setting out how this transformation could be achieved, in terms of planning and delivery, through private and public sector collaboration, to create a new London community.

REDEVELOPMENT

The Heathrow site can be redeveloped into a major commercial and residential hub, providing 90,000 jobs and 80,000 homes and adding £7.5 billion per year to Britain's economy.

EMPLOYMENT

In addition to the construction jobs that will be generated, the redevelopment will provide a unique opportunity to create thousands of permanent high wage and high skill jobs in West London. The economic activity and local taxes raised will benefit the local communities and it will play an important role in helping to address some of London's population pressures, as well as redressing the economic imbalance between east and west London.

90,000 jobs

80,000 homes

£7.5bn per year
to the economy



I believe there is no question that the best option for increasing our aviation capacity is now to the east of London, just as there is no question that Heathrow would then present a unique, once in a lifetime opportunity to create a new town within the capital that would supply thousands more homes and jobs. Relocating Heathrow would bring benefits to both east and west London and it is impossible to get one without the other.

Boris Johnson
Mayor of London

ADDRESSING ENVIRONMENTAL CHALLENGES

If the Airports Commission's work shows that there is public need for new long-term hub capacity and the reduction of noise impact on London, then the only solution is an inner estuary location. It is then for the proposers to show how location and design have minimised environmental impacts and that compensatory habitat can be provided. Our research shows several precedents for habitat creation on an equivalent scale in the UK, Europe and the rest of the world.

The three key tests are

1. Overriding public need
2. The only solution that meets that need
3. Satisfactory replacement habitat

COMPENSATORY SITES

Inter-tidal and marshland habitats in the estuary are already under threat and the Environment Agency is addressing this issue. It is likely that compensatory sites will need to be provided.

ENVIRONMENTAL IMPACTS

Further work will be required in a number of areas as a design is developed, for example to fully understand and mitigate potential impacts on coastal processes, and listed buildings. It is highly likely that such impacts could be effectively and efficiently managed and mitigated through the employment of tried and tested methods.

ISLE OF GRAIN

The Environment Agency is already identifying and funding more than 800 hectares of new habitats for wildlife in the estuary, which are being displaced by rising sea levels. This is work that the Thames Hub can help to fund.

BIRD STRIKES

There is no evidence to suggest an unacceptable level of risk of bird strike, but strategies can be put in place to effectively mitigate this impact.



PRECEDENTS
FOR HABITAT
REPLACEMENT

- 1
Steart Coastal Management Project
Severn Estuary, Somerset
Area: 400ha
Habitats: Intertidal, transitional brackish, coastal grazing marsh, brackish and saline lagoons
- 2
Alkborough Flats
Humber, North Lincolnshire
Area: 370ha
Habitats: Mud flats/saltmarsh, freshwater reedbed, wet grassland
- 3
Beltringharder Koog
North Friesland, Northern Germany
Area: 3,350ha
Habitats: Mud flats, sandflats and saltmarshes
- 4
South Bay Salt Pond Restoration Project
San Francisco Bay
Area: 6,100ha
Habitats: Tidal mudflats, tidal marsh, salt ponds, muted tidal/managed ponds, and seasonal wetlands

1



2



3



4

THAMES HUB AIRPORT

Building a new airport in the Thames Estuary offers a once-in-a-lifetime opportunity to plan and design an airport in the UK that is convenient for its passengers, operationally efficient, flexible in terms of use, easy to expand in phases, and resilient to industry changes.

BELOW
Aerial view of the Thames Hub Airport, with runways laid out to minimise the impact of noise



The proposed airport will be built on a platform 8.7km long, 4.2km wide and 7m above sea level, located partly on land and partly in the estuary. Aircraft can approach or depart over water, removing the impact of noise, safety and pollution from urban areas and allowing 24-hour operations, giving airlines complete flexibility in scheduling.

An independently verified report by NATS confirms that a new hub airport at Grain is unlikely to impact the operations of other London airports, and there are no prohibitive airspace issues. City and Southend airports would not have to close. While airlines have expressed concerns about the political risks in terms of costs for passengers and surface access, evidence from previous hub relocations suggests that even those most opposed to change ultimately welcome a new, more efficient hub.

The configuration of the airport terminals and their landside access roads offers unparalleled opportunities for commercial development. Over 280ha are available in the vicinity of the terminals alone for prime retail, hotels and other high-value businesses.

BELOW Airport footprint





IDENTICAL PLANNING PROCESS
TO HEATHROW'S THIRD RUNWAY

STRAIGHTFORWARD TO BUILD
ON UNCONSTRAINED SITE

AIRPORT CONSTRUCTION FUNDABLE
BY THE PRIVATE SECTOR

ELIMINATES SAFETY ISSUES, NOISE AND
POLLUTION OF FLIGHTS OVER LONDON

DESIGNED TO ACCOMMODATE THE WORLD'S
LARGEST AIRCRAFT

192 PASSENGER AIRCRAFT STANDS
IN INITIAL PHASE

FLEXIBLE AIRCRAFT STANDS ALLOW
FOR 288 AIRCRAFT OF VARIOUS SIZES

Aircraft can approach or depart
over water, removing the impact
of safety, noise and pollution
from urban areas and allowing
24-hour operations, giving
airlines complete flexibility in
scheduling.

NOISE – MORE THAN A NUISANCE

There is evidence that aviation noise has a negative impact on child development, education and public health, including an increased risk of stroke and cardiovascular disease. A five decibel increase in noise exposure has been linked to a two-month delay in reading age in children.



How best to meet commercial aircraft capacity for London and other major cities is a matter of active debate... However, policy decisions need to take account of potential health related concerns, including possible effects of environmental noise on cardiovascular health.

Prof Stephen Stansfeld
Queen Mary University of London, BMJ

Three runways at Heathrow would expose over a million people to noise above 55 decibels – 30% more than today. The Thames Estuary Airport enables a doubling of hub capacity, while reducing the number of people exposed to aircraft noise by over 95%.

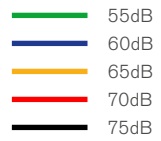
TFL STUDIES

The comprehensive studies conducted by TfL into noise impacts show the enormous benefits of an inner estuary airport location. The runway configuration has been redesigned to create a narrow footprint, which is located as far into the river as possible to reduce the impact on surrounding areas.



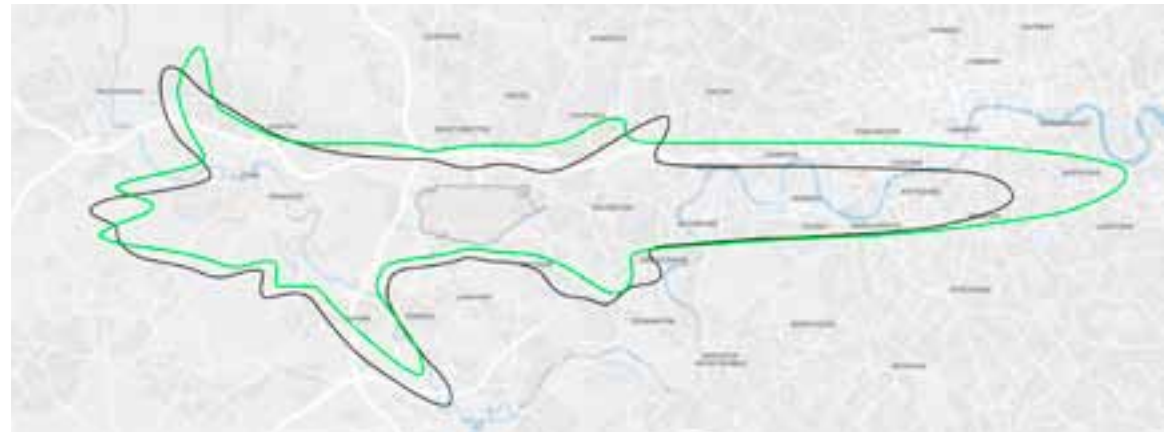
HEATHROW 2050

Noise contours for a 3-Runway Heathrow (NW),
Westerly Preference



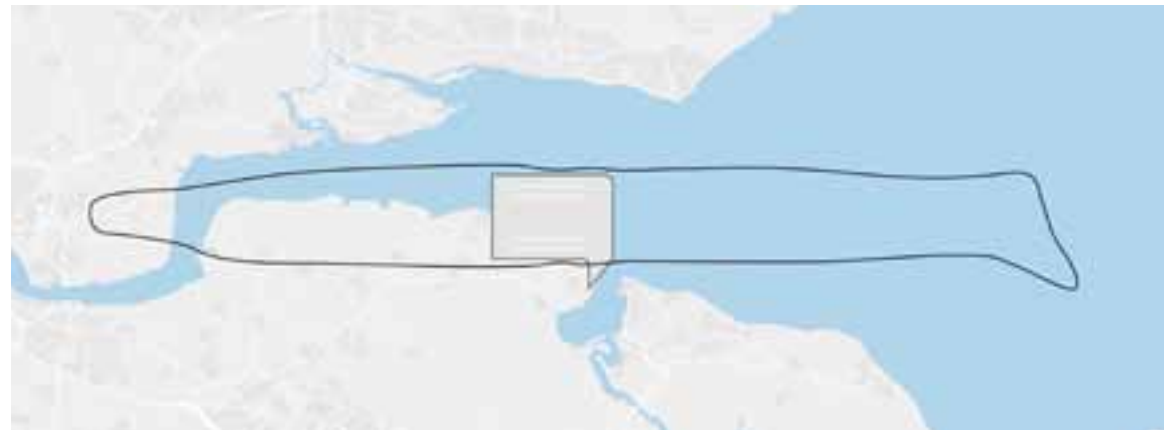
HEATHROW 2012 vs 2050

Comparison of 2012 (R2) and 2050 (R3-NW)
noise contours



INNER THAMES ESTUARY AIRPORT

Projected 55Lden dB noise contour using TfL data



THAMES HUB IN NUMBERS

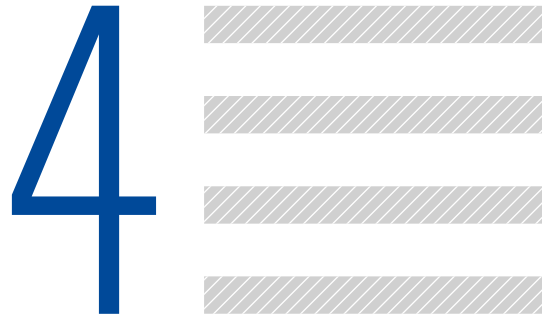
Opening capacity

110
mppa

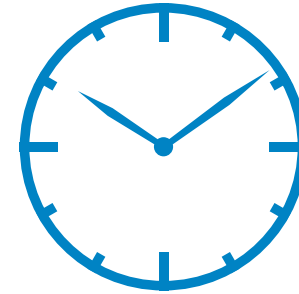
Flexibility to grow to

150
mppa

and beyond...



4 parallel runways,
all **4,000m**



24 hour operation



Terminals

each with opening capacity for

55mppa



Rapid exit taxiways



Parallel taxiways

191

Long-haul destinations



192

Aircraft stands

75% are contact stands

384

Code C (small) aircraft

Or

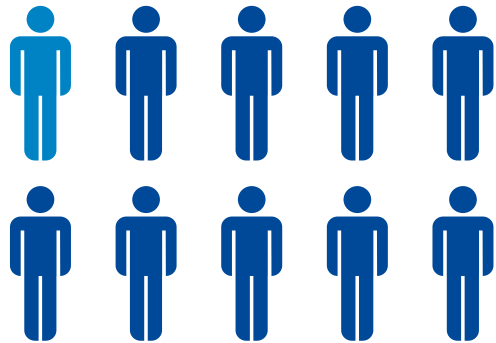
288

of various sizes

5

 years planning

7

 years construction

90% of passengers access aircraft via airbridges

Built on a platform

8.7km long

4.2km wide

7m above sea level

Total Airport site

Area

3,200

Ha

Terminal Area

1,540,000

m²

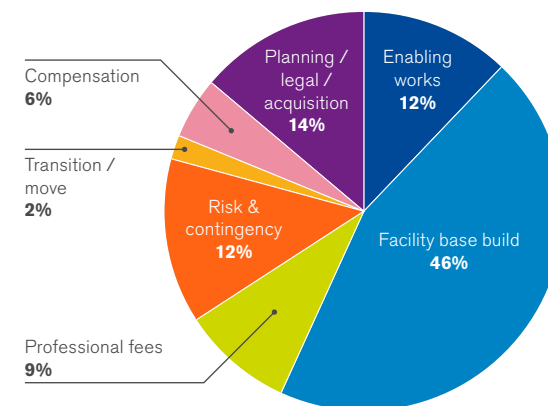
AFFORDABLE AND ACHIEVABLE

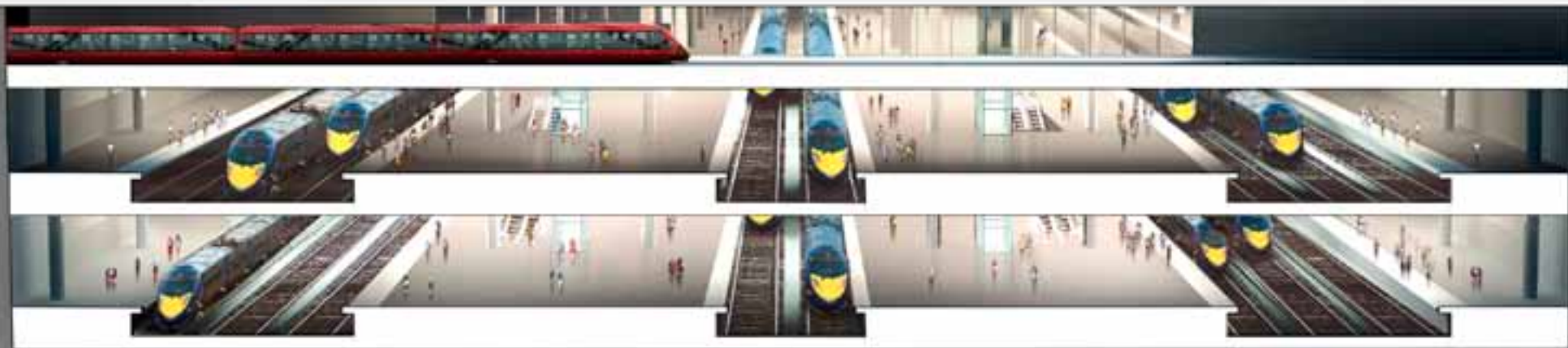
RIGHT
Section through
the new airport with
integrated public
transport connections

RIGHT
Notional facility costs

Key cost / Facility	Area	Unit	Rate (£)	Total (£)
Planning / legal fees etc	1	Item	250,000,000	250,000,000
Land reclamation & cut / fill	1	Item	1,450,000,000	1,450,000,000
Site preparation	2,775	ha	20,000	55,500,000
Terminal	1,540,000	m ²	3,302	5,085,500,000
APM station & tracks	6,000	m	100,000	600,000,000
Runways	1,040,000	m ²	155	161,200,000
Taxiways & shoulders	7,500,000	m ²	145	790,000,000
Stands	1,512,000	m ²	280	423,360,000
Aprons / roads	1,500,000	m ²	75	112,500,000
Aircraft control tower	2	Item	20,000,000	40,000,000
Navigational aids	1	Item	20,000,000	20,000,000
Multi storey car parking - short stay	750,000	m ²	350	262,500,000
Alt grade car parking - long stay & staff	500,000	m ²	150	75,000,000
Offices	500,000	m ²	1,800	900,000,000
Consolidation centre	20,000	m ²	900	18,000,000
Maintenance facilities	100,000	m ²	375	37,500,000
Ground service equipment area	200,000	m ²	300	60,000,000
Central plant facility	1	Item	100,000,000	100,000,000
Fire station	30,000	m ²	3,500	105,000,000
Access roads	500,000	m ²	150	75,000,000
Landscaping	1,500,000	m ²	35	52,500,000
Drop off area & plaza	300,000	m ²	250	75,000,000
Security fencing	20,000	m	250	5,000,000
Professional fees	—	Item	—	1,718,171,000
Risk & contingency	—	Item	—	2,508,305,600
Sub total – base build				14,980,036,600
Property purchase & demolition	1	Item	2,500,000,000	2,500,000,000
Bird Island	1	Item	1,000,000,000	1,000,000,000
Total – 3Q 2012				18,480,036,600
Inflation - EXCLUDED				0
OVERALL CONSTRUCTION COSTS TOTAL				18,480,036,600
Transition / move costs				500,000,000
Compensation (stakeholders and public)				1,000,000,000
TOTAL DEVELOPMENT COSTS				19,980,036,600

BELOW
Breakdown of key cost centres
as a % of total cost





Further details about the proposal can be obtained
from the Thames Hub website:

www.thameshub.com

Comments can be sent to:

enquiries@thameshub.com

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