A New Approach

Heathrow's options for connecting the UK to growth

July 2013

Heathrow
Making every journey better

Contents

Introduction

The UK Government has set up the Airports Commission to make recommendations on how to maintain the UK's global aviation hub status.

Capacity is constrained at the UK's only global hub, Heathrow, which has been virtually full for a decade. Other international hub airports, such as Frankfurt, Paris and Amsterdam, have spare capacity and have been able to provide more services to an increasing range of growth markets. The UK therefore urgently needs additional capacity at its hub airport to compete.

The Government's vision is for Britain to win the global race for jobs and economic growth. To do so we must be better connected to future growth markets – Asia, South America, North America – than our European competitors. Heathrow is one of the world's best connected hubs and is well placed to help Britain win the global race. Any alternative, including doing nothing or a split hub, will weaken Britain's competitiveness.

This document summarises our formal response to the Airports Commission's request for proposals for additional long-term runway capacity. Our formal response can be found at **www.heathrow.com/airportscommission**. At this stage our proposals are in outline form only and further work would need to be undertaken, including with local authorities and the local community, to develop our plans if they are short-listed by the Commission.

The Airports Commission is expected to short-list options by the end of 2013 before making its final recommendations to the next Government in summer 2015. If government accepts those recommendations it is likely to consult on a national policy statement for aviation before a planning application could be submitted. It is unlikely that final approval for any new runway development could be given before 2019.

The length of this process harms UK competitiveness by limiting our ability to connect to growth; creates unnecessary anxiety for residents whose homes may be affected; and fosters an uncertain climate for business investment. We would encourage Government to make a clear decision as soon as possible and consider how this process could be accelerated.

We have thought long and hard about the future of Heathrow. In recent months we have assessed many different options for new hub capacity, including options not based at Heathrow. In developing solutions for the future, we have listened, and we have learnt from the past. Today we are rejecting the previous proposal and we are putting forward new proposals which balance the need for growth with the impact on local communities.

As the debate on airport capacity moves to specific proposals for new runways the debate will inevitably turn towards those people most affected by individual options.

There are no easy options for building new runways. Every proposal will have its pros and cons. None will be without significant cost and disruption for individuals and communities. The decision will be among the toughest the Government has to face.

As we debate each option, we should remind ourselves why we are wrestling with this issue at all. We should keep one eye on why this decision is so important to our country.

Britain is a small island in a large ocean. If our history shows us anything, it's that we're better off connected.

For the last 350 years we've had the world's largest port or airport on our shores. Our trading connections put us at the centre of the map, literally.

Today, the world is changing. Distant economies are growing more quickly. We're more interconnected. Friends, colleagues, even family are no longer in the same village – they are all over the globe.

And yet at the same time, Britain's status as a global aviation hub is under threat. Paris, Frankfurt, Amsterdam and Dubai are all poised to overtake Heathrow as the most important hub for international passengers.

The things we depend on depend on air travel. The trade and exports that allow us to pay our way in the world, the fresh food on supermarket shelves, even the latest medicines, fashions or electronics.

Now more than ever, Britain needs to be connected. While the internet can make new connections and keep us in touch, it's the physical internet of air travel that plugs us into the global community.

With 3,500 metres of new road or railway you can travel 3,500 metres. But with 3,500 metres of new runway Heathrow can take you anywhere in the world.

Heathrow's third runway. It's not about more tarmac. It's about Britain's place in the world.

1 Our commitments

Britain needs a world-class hub airport fit for the future: a national gateway to help our country compete and win in the global race for jobs and growth.

For 50 years the debate about runway capacity has been characterised by delay, prevarication and indecision. Now, growth can't wait. We need national drive, purpose and energy to deliver a solution before it is too late.

In this document, we set out a fresh and distinctive approach to adding capacity at Heathrow. We are offering a new approach to an old problem.

We are making ten commitments that set out what Britain can expect from a third runway at Heathrow and which show the difference between our proposal today and the proposals of the past.

"These ten commitments set out what Britain can expect from a third runway"

If government supports a third runway at Heathrow, we will:

1	**Connect Britain to economic growth**	by enabling airlines to add new flights to fast-growing markets
2	**Connect UK nations and regions to global markets**	by working with airlines and government to deliver better air and rail links between UK regions and Heathrow
3	**Protect 114,000 existing local jobs and create tens of thousands of new jobs nationwide**	by developing our local employment, apprenticeships and skills programmes and supporting a supply chain throughout the UK
4	**Build more quickly and at lower cost to taxpayers than building a new airport**	by building on the strength the UK already has at Heathrow
5	**Reduce aircraft noise**	by encouraging the world's quietest aircraft to use Heathrow and routing aircraft higher over London so that fewer people are affected by noise than today
6	**Lessen noise impacts for people under flight-paths**	by delivering periods of noise respite with no aircraft overhead and providing noise insulation for people in high-noise areas
7	**Treat those most affected by a third runway fairly**	by ensuring compensation greater than market value is offered to anyone whose home needs to be purchased
8	**Keep CO_2 emissions within UK climate change targets and play our part in meeting local air quality limits**	by incentivising cleaner aircraft, supporting global carbon trading and increasing public transport use
9	**Increase the proportion of passengers using public transport to access Heathrow to more than 50%**	by supporting new rail, bus and coach schemes to improve public transport to Heathrow
10	**Reduce delays and disruption**	by further improving Heathrow's resilience to severe weather and unforeseen events

2 Executive summary

The UK is in a global race for trade, jobs and economic growth. The international economy is changing with the rise of emerging markets like Brazil, Russia, India and China. UK businesses trade 20 times more with emerging markets that have daily flights than those with less frequent or no direct service[1]. But Heathrow is slipping out of the Premier League of Europe's international hub airports. This is bad for Britain's future as a world economic power.

Heathrow is the UK's only hub airport. A hub airport is uniquely important to establishing flights to growth destinations. It is an airport where local passengers combine with transfer passengers to allow airlines to fly to more destinations more frequently than could be supported by local demand alone. Transfer passengers allow the UK to connect to countries where it couldn't sustain a direct daily flight itself. Many routes would not exist without transfer passengers. Passengers can fly to 75 destinations from Heathrow that aren't served by any other UK airport[2].

It is not possible to have two successful hubs in London because splitting the hub halves the pool of transfer passengers. Attempts to create a dual hub between Heathrow and Gatwick were tried in the 1970s and 1990s but both ended in failure because airlines could only achieve transfer benefits at the Heathrow hub. Gatwick's proposal for three competing two-runway airports in the south east would not deliver a UK hub with the size and scale to compete internationally or provide the long-haul connectivity on which future jobs and growth depend. The UK needs one Premier League airport to compete, not three second-tier airports.

Heathrow is currently one of the few Premier League hubs in the world. It has the scale, the geographic location, the local market and the capability to be the winner in a tight race to be Europe's leading hub and support the UK's economic competitiveness.

Heathrow is the best location for the UK's hub and for additional runway capacity. Compared to a new hub at Stansted or in the Thames Estuary, Heathrow is best placed for passengers, business, and jobs. For most UK passengers, a hub airport to the east of London would be in the wrong place. Travel times would increase for almost 90% of hub passengers[3]. The current centre of UK economic gravity is to the west of London.

Moving the hub airport east would be extremely difficult and risk doubling unemployment in some of Heathrow's local boroughs[4]. A new runway at Heathrow could be delivered more quickly and at lower cost than building a new hub airport.

We have thought afresh about how a new runway at Heathrow can deliver the flights Britain needs to connect to growth markets with less impact for local communities. Today we are rejecting the previous options for a short third-runway. We are offering new options for a third runway to the north-west, south-west or north of the existing airport.

While we recognise that determining the right balance between the economic and environmental impacts of additional flights is ultimately a decision for Government, we believe the westerly options offer clear advantages. They result in fewer residential properties being demolished and because these options are located further west than Heathrow's existing runways, aircraft would be higher over London, reducing the number of people exposed to aircraft noise.

Passenger benefits
Passengers will benefit from a third runway by having a greater choice of destinations, greater choice of airlines, greater choice of flights from UK regions, greater choice of onward transport and lower fares than at a new hub airport.

Economic benefits
A third runway at Heathrow would deliver greater economic benefits to the UK than any other option for new runway capacity. It will create jobs, facilitate trade, boost spending in the wider economy and improve public finances. We estimate that benefits of £100 billion present value (PV) would accrue to the UK from expanding Heathrow the majority of which accrues to the wider economy[5].

Surface access
By the time a third runway opens public transport infrastructure including Crossrail, the Piccadilly Line upgrade, Western Rail Access, High Speed 2 and Southern Rail Access could link Heathrow to the whole of the UK and allow more passengers to access Heathrow on public transport than ever before. 15 million more passengers could use public transport to access Heathrow by 2030 which would increase Heathrow's public transport mode share from 40% to more than 50% even with more passengers. Heathrow will be able to deliver more flights without increasing the traffic on the road due to the airport.

Noise
Quieter planes, quieter operating procedures, noise mitigation, and operating restrictions will continue to reduce the impact of aircraft noise at Heathrow even with a third runway. Two of our options site runways further to the west than previous proposals which means aircraft will be flying higher over London. Even with a third runway, in 2030 there will be around 10-20% fewer people in total within Heathrow's noise footprint than today[6]. Improving on the previous proposal for a third runway, all of our options will use runway alternation in order to provide periods of respite from noise with no aircraft overhead. We believe residents should receive free insulation in high noise areas or where there is a significant increase in noise, and that there should be support for residents in the highest noise areas to move house should they wish.

2 Executive summary

Climate change and air pollution

A third runway at Heathrow is consistent with meeting the UK's legally binding climate change targets. New aircraft and engine technology, operational efficiencies and sustainable biofuels will allow the UK to more than double air traffic by 2050 without increasing emissions[7]. We can add capacity at Heathrow without exceeding air pollution limits. Cleaner vehicles, an increased proportion of passengers travelling by public transport and new aircraft technology will mean that levels of nitrogen dioxide would be within EU limits. Concentrations of fine particles are already within EU limits.

Community impacts

We will ensure that compensation greater than market value is offered to anyone whose home needs to be purchased. If Government policy supports a third runway then a property market support bond scheme will also be put in place to guarantee the value of property until a new runway is constructed and address property blight resulting from exposure to new aircraft noise. We will also develop new noise mitigation schemes if a third runway is supported by Government. We will be proactively engaging with local communities on our proposals.

Cost and deliverability

A third runway at Heathrow is the fastest, most cost effective and most practical route to meeting the UK's international connectivity needs. A third runway can be delivered at less cost to the taxpayer than building a new hub airport. The options that we are putting forward could be delivered from 2025-2029 for £14-18 billion. This compares favourably with a new Thames Estuary airport which we do not believe could be operational before 2034 and which its promoters admit could cost £70-80 billion, of which at least £25 billion would need to be funded by the taxpayer[8]. Adding capacity at Heathrow avoids the transition costs and risk of moving to a new airport.

Not just a short-term fix

All of the options we are putting forward for three runways have been designed so that they are capable of evolving to four runways if ever required to do so. We believe that a third runway provides sufficient capacity until at least 2040 and demand beyond this point is very difficult to predict now. One of the advantages of the Heathrow option is that additional capacity could be added gradually as demand requires whereas a new hub airport would require most investment upfront based on uncertain future demand.

We believe there is a compelling case for growth at Heathrow. Britain faces a choice. We have one of the world's most successful hub airports in Heathrow. We can decide to build on this strength. Or we can start again from scratch. Building from our existing strength can connect the UK to growth more quickly and at lower cost. Starting again from scratch will cost the taxpayer more, take longer and will not deliver an airport that's in the right location to help the UK win the global race. Growth won't wait. With every passing year, Britain is cutting itself off from trade and jobs.

It's time for a third runway at Heathrow.


Third Runway North West option

3 Our story so far...

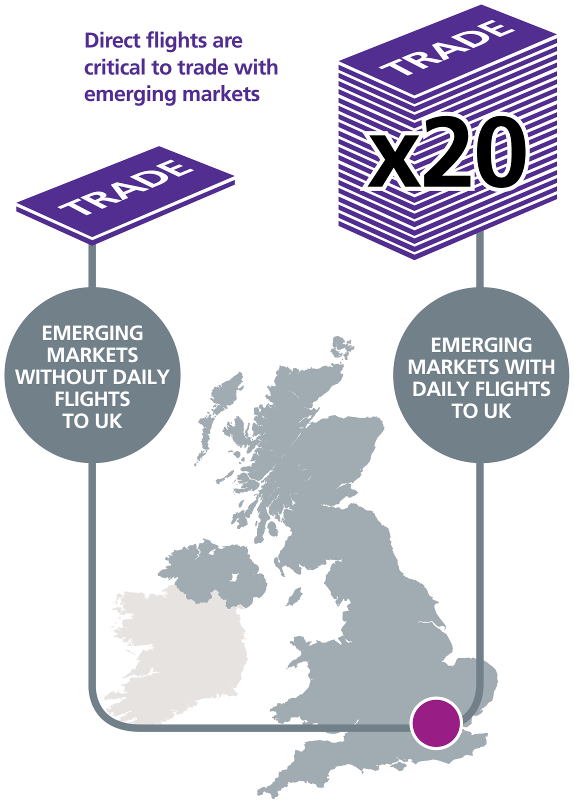
Connecting for growth

Heathrow is slipping out of the Premier League of Europe's international hub airports. This is bad for Britain's future as a world economic power.

The UK is cutting itself off from growth. We could be missing out on up to £14 billion per year in lost trade due to poor connections, rising to £26 billion a year by 2030[9]. This lack of runway capacity has particularly hurt regional growth in the UK by squeezing out regional routes.

In September 2011 Frontier Economics showed that frequent direct flights are important for economic growth in its report Connecting for Growth[10].

The UK is in a global race for trade, jobs and economic growth. The international economy is changing with the rise of emerging markets like Brazil, Russia, India and China. It is projected that by the year 2050, growth markets will represent nearly half (46%) of global GDP[11].

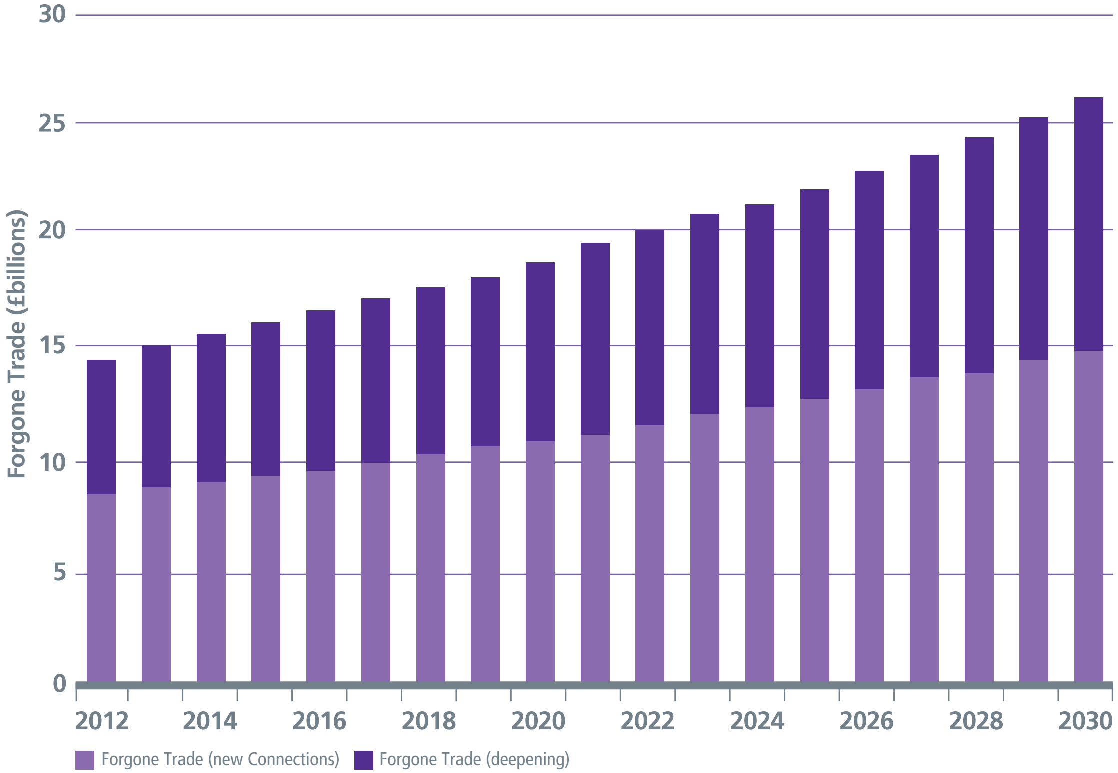


UK businesses trade 20 times more with emerging markets that have daily flights than those with less frequent or no direct service. In addition, the rate of growth in UK trade is substantially lower where daily flight connections with Heathrow are not available[12].

Not only do we need to be connected to these growth markets, if we are to win the global race then the UK needs to be better connected than our competitors in France, Germany and Holland.

Yet constraints at Heathrow – which is running at over 98% capacity – mean that the UK is unable to serve growing international demand. Heathrow is permitted 480,000 flights a year. All four of Heathrow's competitor European hub airports – Paris, Frankfurt, Madrid and Amsterdam – have enough runway capacity to serve around 700,000 flights per year each. Paris and Frankfurt already boast around 2,200 more flights to mainland China than Heathrow each year.

Forgone trade due to lack of UK hub capacity



Heathrow capacity compared to its European competitors[13]

Hub airport	Flight capacity	Flights	Percentage full
Heathrow	480k	471k	98%
Paris	700k	499k	71%
Frankfurt	700k	464k	66%
Amsterdam	650k	402k	62%
Madrid	800k	433k	54%

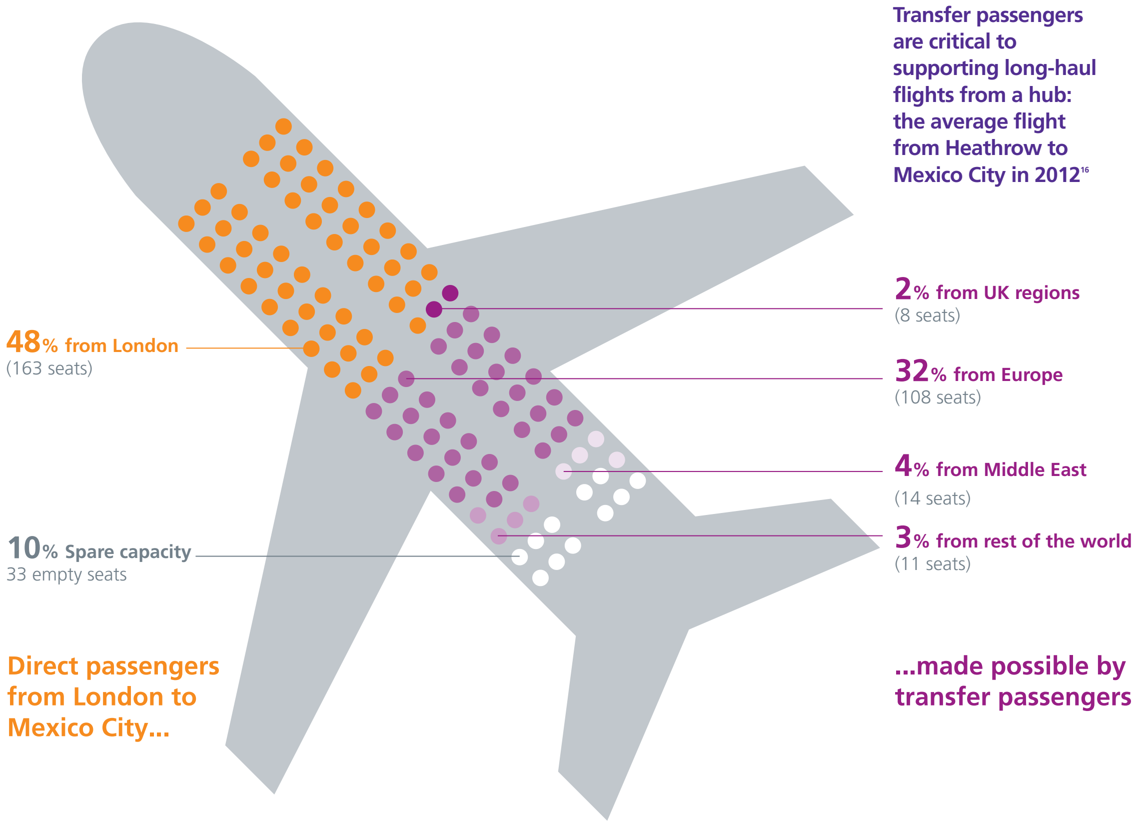
There are growth market destinations with daily flights from other European hubs that are not served daily from the UK: including destinations such as Manila, Lima, and Chongqing[14].

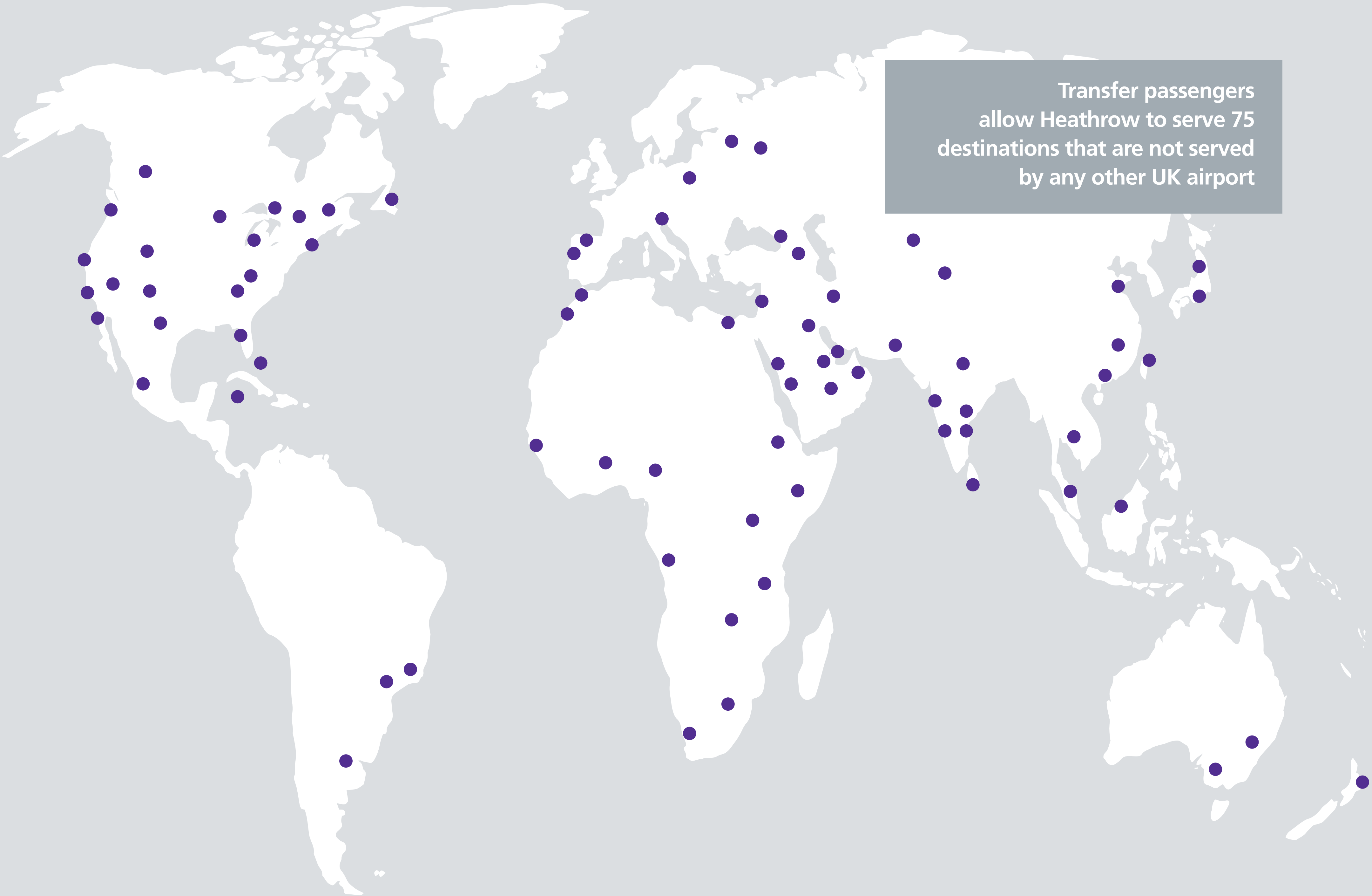
The centre of gravity in the world economy is shifting and Britain should be forging new links with emerging markets. Instead we are edging towards a future as an island cut-off from some of the world's most important markets.

One hub or none

In November 2012 we explained in our report One Hub or None why a hub airport is uniquely important to establishing flights to growth destinations. A hub airport is an airport where local passengers combine with transfer passengers to allow airlines to fly to more destinations more frequently than could be supported by local demand alone. Typically, passengers from short-haul flights combine with passengers from the airport's local area to fill long-haul aircraft.

Transfer passengers allow a hub airport to frequently serve a wide range of long-haul business destinations. They allow the UK to connect to countries where it couldn't sustain a direct daily flight itself. Passengers can fly direct to 75 destinations world-wide from Heathrow that aren't served by any other UK airport[15]. Routes such as Hyderabad, Luanda and Buenos Aires would not exist without transfer passengers.





Transfer passengers allow Heathrow to serve 75 destinations that are not served by any other UK airport

One hub or none Continued

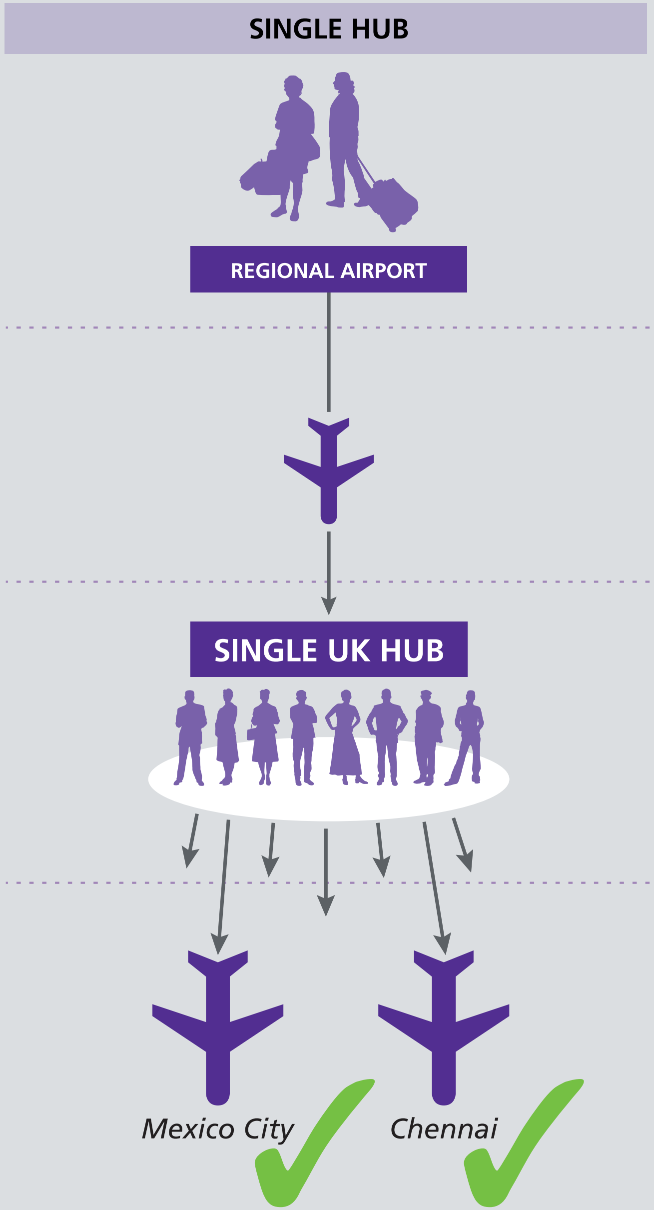
Keeping a successful hub in the UK means British passengers have a greater choice of air links. It also means that business is more likely to locate in the UK. Heathrow currently welcomes more international passengers than any other airport in the world and is one of only six airports in the world serving over 50 long haul destinations[17]. This is a competitive advantage for the UK that cannot be sustained without increased hub capacity.

It is not possible to have two successful hubs in London because splitting the hub halves the pool of transfer passengers. A successful network depends on having a central hub – the transfer passengers on every arriving flight support the viability of every departing flight. Attempts to create a dual hub between Heathrow and Gatwick were tried in the 1970s and 1990s but both ended in failure because airlines were attracted back to the main Heathrow hub where they could maximise transfer opportunities.

Gatwick's proposal for three competing two-runway airports in the south east would not deliver a UK hub with the size and scale to compete internationally or provide the long-haul connectivity on which future jobs and growth depend. There are no European countries with two major hubs. The UK needs one Premier League airport to compete, not three second-tier airports.

That leaves three options for the UK Government: Do nothing and let the UK fall behind its European competitors; add capacity at Heathrow; or close Heathrow and replace it with a new hub airport.

WHY AREN'T TWO HUBS BETTER THAN ONE?

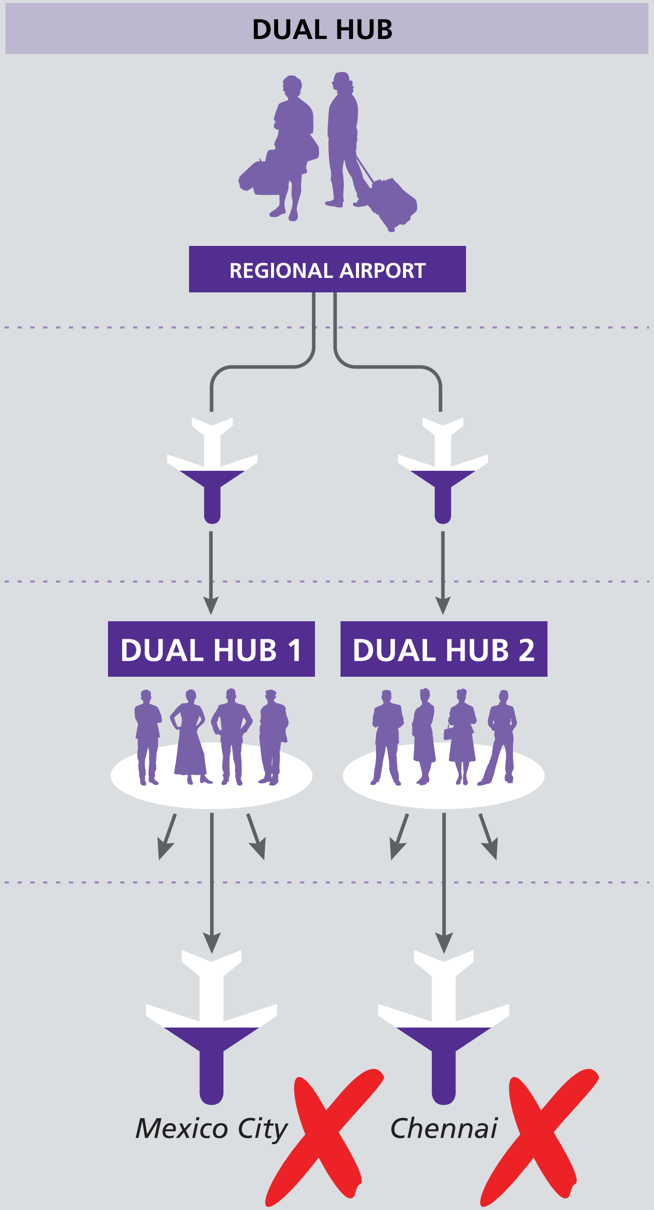


Passengers from regional airports need to fly to a hub to connect with flights to through destinations

A dual hub requires twice the number of short haul flights to operate on regional routes each with half the number of passengers

Passengers from short haul flights combine at a hub to fill long haul aircraft

Airlines need to maximise transfer opportunities. A dual hub halves the number of available transfer passengers making marginal routes unviable for airlines

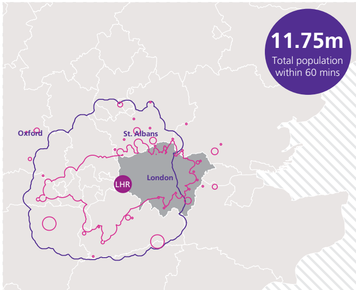


Best placed for Britain

In June 2013 we argued that Heathrow is the best location for the UK's hub and for additional runway capacity. Our report, Best placed for Britain compared Heathrow to other options for a single international hub in the UK at Stansted or in the Thames Estuary. It shows:

Heathrow is best placed for passengers

For most UK passengers, a hub airport to the east of London would be in the wrong place. Travel times would increase for almost 90% of hub passengers. Even with major new transport infrastructure for Stansted and the Thames Estuary, Heathrow would still be more convenient for passengers, with over 4.5 million more people living within a 60-minute travel time than the other options[18].



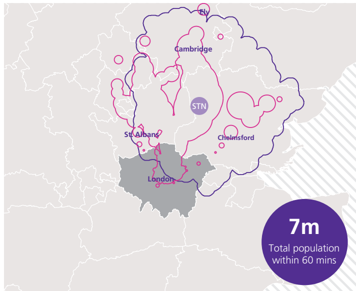
Heathrow

Population within 60mins by car

10.2 M

9.2 M

Population within 60mins by public transport



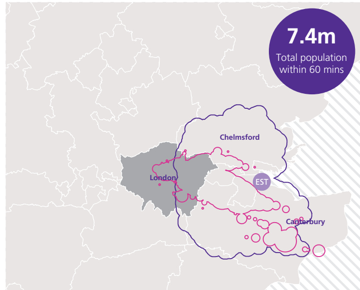
Stansted

Population within 60mins by car

5.8 M

4.7 M

Population within 60mins by public transport



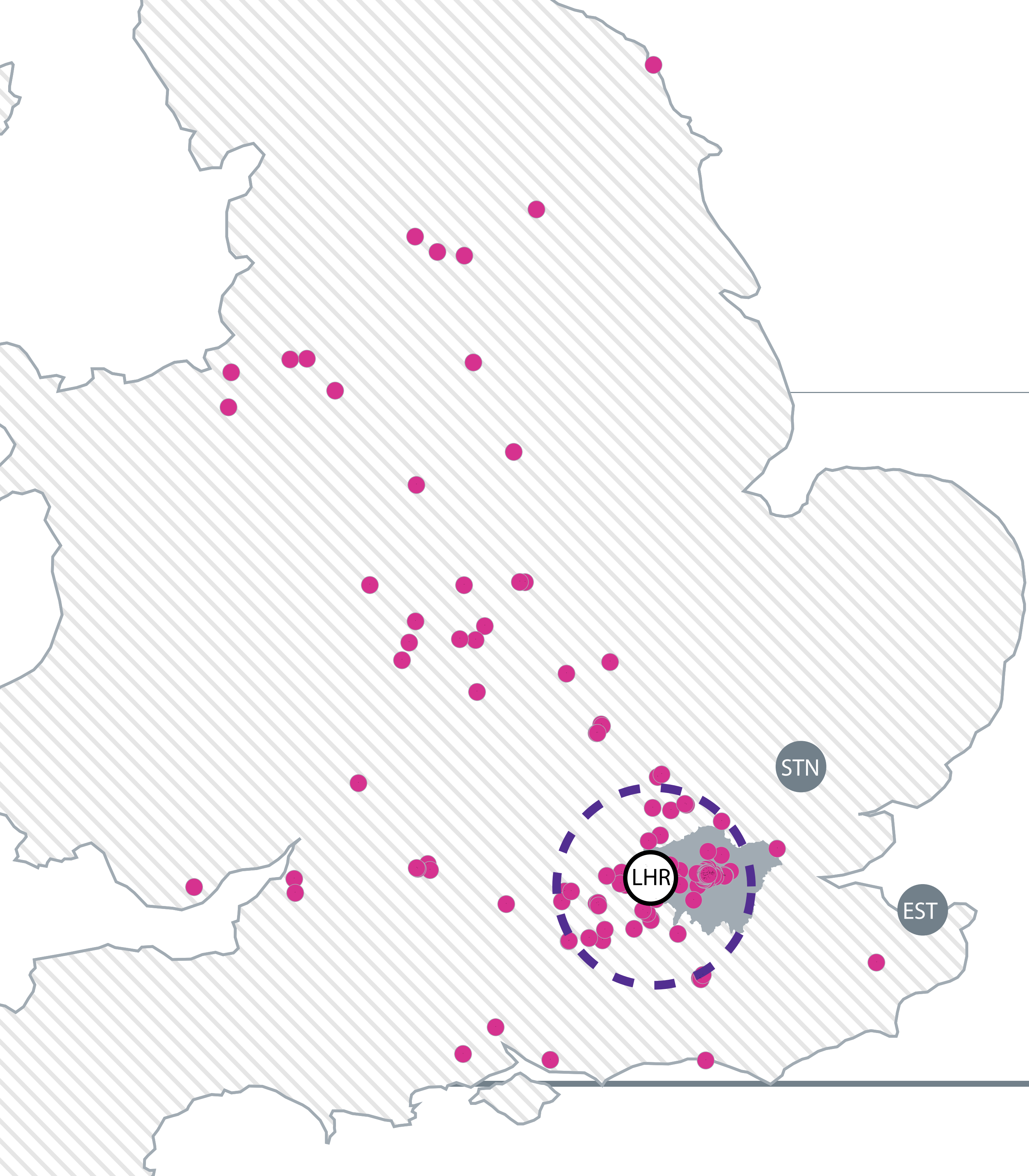
Thames Estuary

Population within 60mins by car

4.9 M

6.2 M

Population within 60mins by public transport



Heathrow is best placed for business and the economy

A hub airport to the west of London is the best location for the UK's hub. The current centre of UK economic gravity is to the west of London. 202 of the UK's top 300 company HQs are within a 25-mile radius of Heathrow. This compares to only seven around Stansted and two around the Thames Estuary. The Thames Valley has 60% more international businesses than the national UK average, 100% more US businesses and 260% more Japanese businesses[19].

Key

Company Headquarters

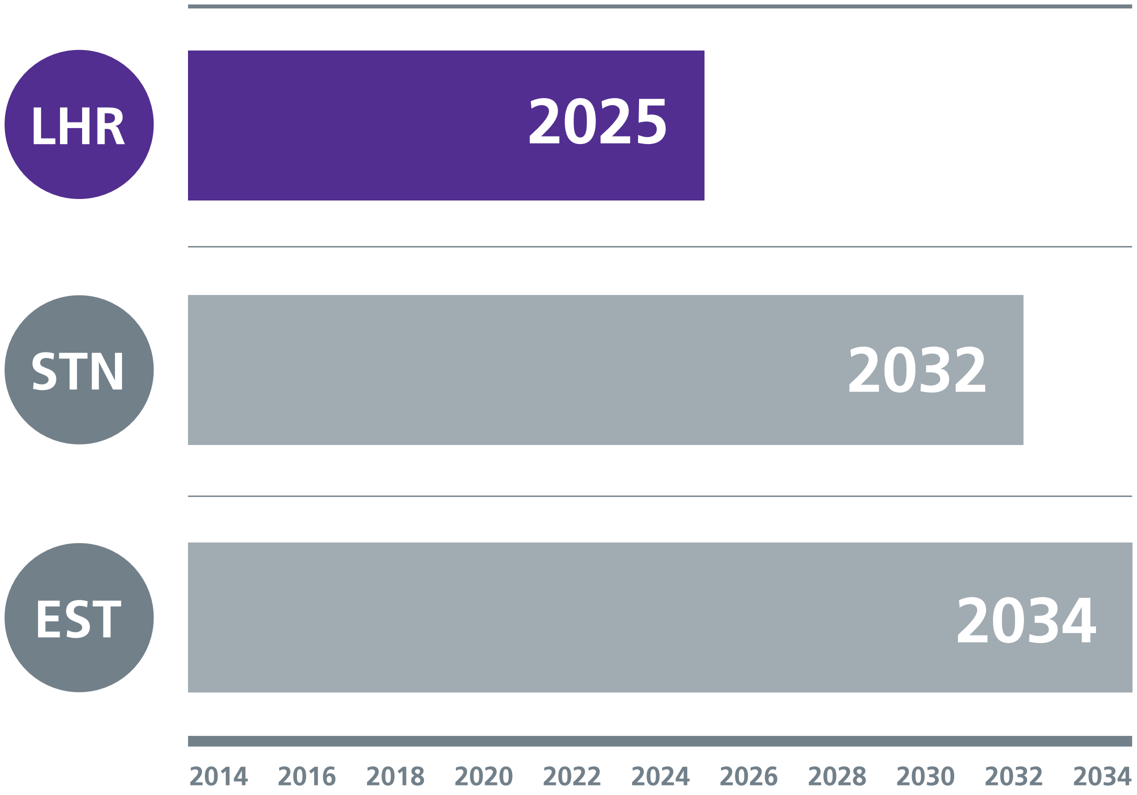
202 Companies around London Heathrow

Best placed for Britain Continued

Heathrow is best placed to help the UK compete in the global race

Additional capacity at Heathrow could be delivered at least seven years earlier than any new hub airport could be built. Any delay is critical as the UK is already losing some £14 billion a year in trade due to constraints in aviation hub capacity[20]. The UK is in a global race with our competitors for growth and jobs. Every year of delay risks the UK falling behind.

Estimated quickest speed to achieve additional hub capacity



76,600

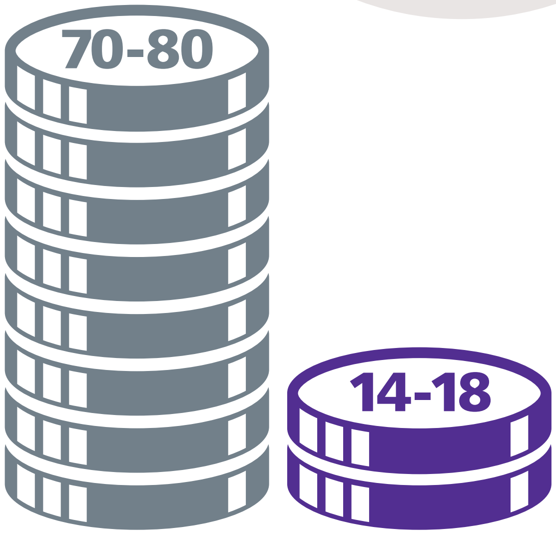
People directly employed at Heathrow

114,000

Jobs supported in the local area by Heathrow

Representing 1 in 5 (22%) of local jobs

Estimated cost of building a new Thames Estuary hub airport (£bn)



Estimated cost of adding additional capacity at Heathrow (£bn)

Heathrow is best placed for local jobs

More than 100,000 jobs in the area depend on Heathrow, and moving the hub airport east would risk doubling unemployment in some of Heathrow's local boroughs. The 76,600 people directly employed at Heathrow would have to be re-located or made redundant. This compares to the loss of 6,500 jobs when Shotton Steel closed in 1985 – Britain's biggest previous redundancy announcement on a single day.

Heathrow is best placed for the UK taxpayer

How new hub capacity can be financed is going to be a significant issue for the Airports Commission to consider. Adding capacity at Heathrow will cost the taxpayer less than any other option. *Best Placed for Britain* calculated that since the 1970s, around £20–25 billion has been invested or committed in rail infrastructure with a connection to Heathrow. Conversely, any new hub would need to build vast new infrastructure from scratch.

4 A new approach

We have thought afresh about how the new flights that Britain needs to connect to growth markets can be delivered with less impact for local communities.

Today we are rejecting the previous options for a short third-runway and we are putting forward new options which balance the need for growth with the impact on local communities.

In developing solutions for the future, we have listened, and we have learnt from the past. Some of our new options agree with the ideas of Tim Leunig whose Policy Exchange report *Bigger and Quieter* argued that moving Heathrow's runways to the west could reduce noise over London since aircraft will be higher over any given place.

We are offering new thinking and new solutions:

- that will connect the UK to the growth it needs more quickly than any other option
- that can meet the UK's long-term needs, not just the short-term
- that will continue to reduce the total number of people affected by noise from Heathrow
- that deliver periods of respite from noise for every community under a flight path
- that can be delivered within the UK's climate change and air pollution limits.

The options that we are submitting are in outline form only. If our options are short-listed by the Commission more work would need to be done with local communities, local authorities, airlines, air traffic control, and other stakeholders to refine and improve them.

These options should be about more than just what happens within the airport perimeter. There is much we can learn from the way government, local authorities, airport operators, airlines and business groups work together in other countries to develop and promote their region as a centre for inward investment. The Airports Commission gives a once in a generation opportunity to plan the UKs economic future for the next thirty years. There is an opportunity to develop a fully integrated transport hub at Heathrow, supported by hotels, distribution centres, conference centres, and head offices.


Third Runway South West option

5 Options for additional runways at Heathrow

Heathrow today

Like much UK infrastructure, Heathrow historically suffered from out-dated facilities and decades of underinvestment. Since 2003, Heathrow has invested £11 billion in the airport – one of the UK's largest private sector investments. That money has allowed us to start completely rebuilding Heathrow, providing world-class passenger facilities such as Terminal 5 and the new Terminal 2, as well as providing new baggage systems and a more efficient airfield that reduces delays and emissions. The new layout is designed to be capable of expanding to accommodate future growth.

Operational performance has improved as a result and passengers say they notice the difference. The proportion of passengers rating their journey as 'very good' or 'excellent' has increased from 48% in 2007 to 77% today[21]. For two years running, passengers have rated Terminal 5 as the best airport terminal in the world and Heathrow was voted best large airport in Europe in 2013[22]. Heathrow is already a gateway to the world of which the UK can be proud. But it is full.

Forecast demand

The maximum capacity of three runways at Heathrow is estimated at 740,000 flights per year, an increase of 260,000 flights from the current cap of 480,000. These flights might serve 130 million passengers per year. This level of traffic is not likely to be achieved until 2040 and we believe passenger numbers in 2030 will be 100 million per year.

The detailed environmental impact modelling in this document is based on Heathrow handling 100 million passengers per annum in 2030. We have also studied the effects of operating a third runway to its full capacity, and of adding a fourth runway. Our initial analysis shows that, as technology continues to improve, we can still reduce the number of people affected by noise compared to today, and meet air quality limits.

Our new options

Today we are putting forward three options for adding runway capacity from the many we have assessed. The options are in the three geographical locations at Heathrow where a third runway is feasible: to the north, to the north-west, and to the south-west. All of the options in this document are in outline format and require further development.

We believe that a third runway delivers sufficient capacity for the foreseeable future, but we are also including proposals that demonstrate how every three runway option could develop into four runways should it be required. We have the ability to add extra capacity as the need arises, which makes Heathrow a lower risk option than building a new four runway hub from scratch based on uncertain future demand.

Our investment is delivering a world-class two runway Heathrow

Option 1:
Third Runway North West

This option is to the west of the previous proposal for a short third runway at Heathrow. It performs better on noise and residential property impact than a runway to the north and can be delivered comparatively quickly and cost-effectively and without some of the wider construction challenges presented by the south-west option.

The third runway would be constructed on the site of Old Slade sewage works, Harmondsworth Moor, Harmondsworth, and Longford. The runway would be just south of the M25/M4 junction and part of the M25 would need to be reconfigured.

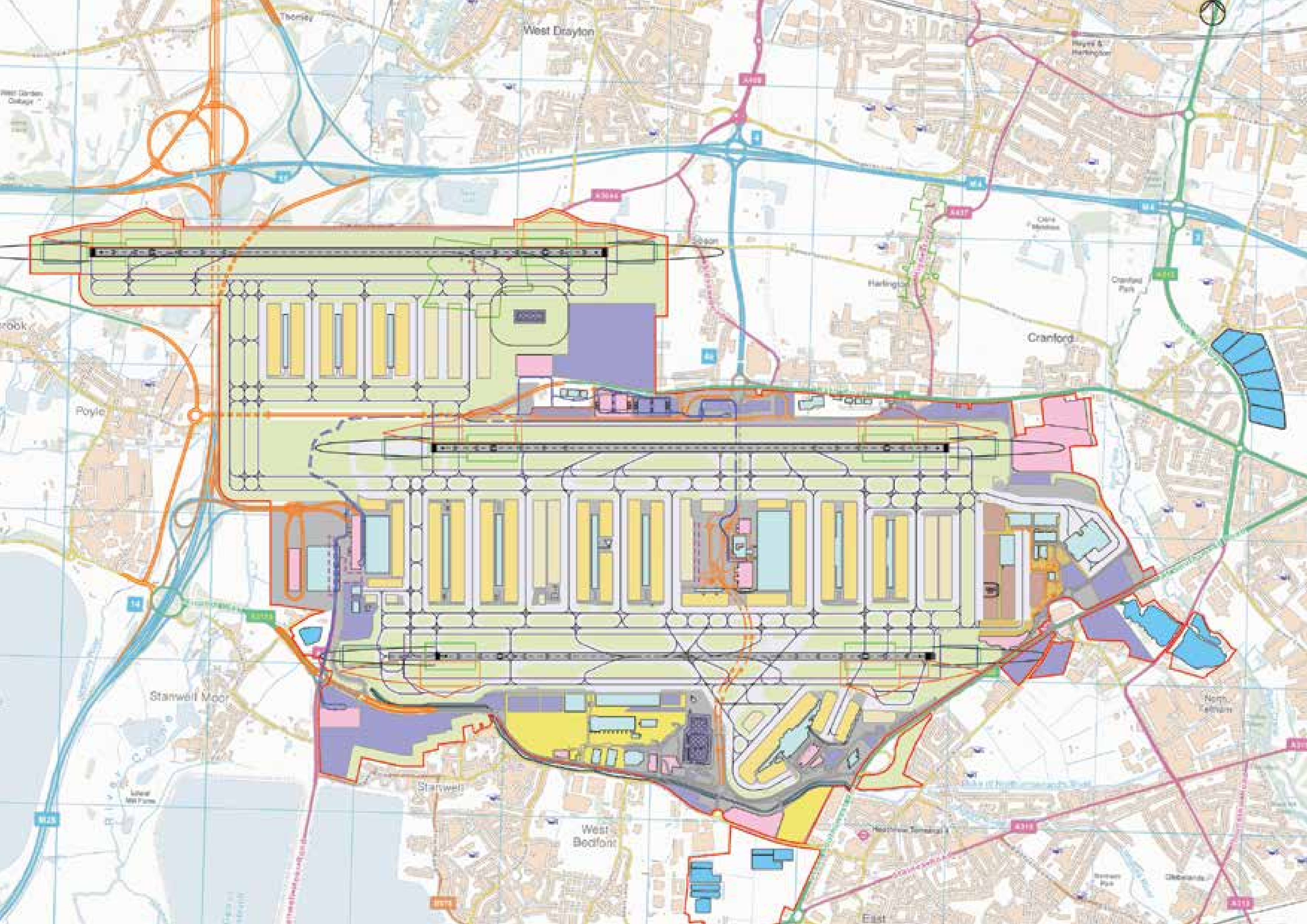
We have maintained the principle of runway alternation to provide periods of respite from noise for all communities around Heathrow. The runway is 3,500 metres, which is 1,500 metres longer than the 2003 proposal. This is a full-length runway and every type of aircraft operating from Heathrow could use it for take-offs and landings.

Passengers would travel through a new Terminal 6 and an extended Terminal 2 with satellite piers serving the new runway.

The location to the west limits the number of properties that would have to be demolished compared to building a full-length runway on the previously proposed site. Properties in Longford and Harmondsworth would be subject to compulsory purchase, but the communities of Sipson, Harlington, Cranford Cross, Colnbrook and Poyle would be preserved. In total around 950 residential properties would face demolition. We are working to see whether this option could be developed so that the Tithe Barn and St Mary's Church in Harmondsworth, which are both sites of significant heritage value, could be preserved in their current location.

Construction of the new runway could be completed in six years with an estimated operational date of 2026. Total costs are estimated to be £17bn.

The population within Heathrow's noise footprint would be around 15% lower with three runways in 2030 than with two runways in 2011, in part because of the runway's location further to the west.



Thorney
West Drayton
Harlington
Cranford
Cranford Park
Poyle
Stanwell Moor
Stanwell
West Bedford
North Feltham
East
M4
M25
A312

Option 2:

Third Runway South West

This option performs better on noise and residential property loss but takes longer to deliver and comes at a higher construction cost.

The third runway would be constructed over the King George VI and Wraysbury reservoirs with new apron and terminal facilities on the site of Stanwell Moor.

The location to the south-west results in around 850 residential properties being demolished. Properties in Stanwell Moor would be subject to compulsory purchase.

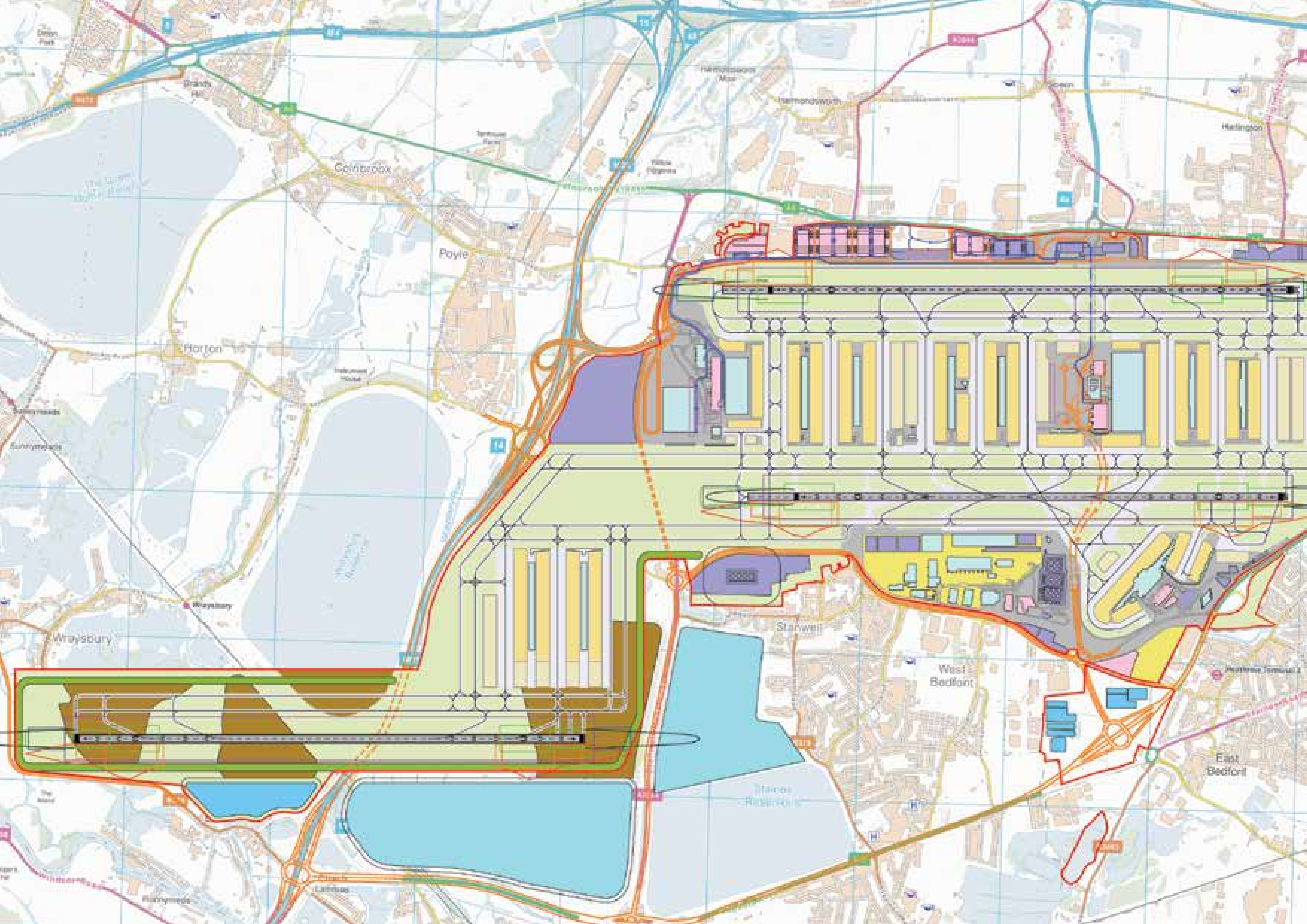
This option presents a more complex construction challenge due to the runway being constructed over a reservoir. This results in the need to re-provide wildlife habitat and flood zone storage. A larger section of the M25 would need to be tunnelled than with the north-west option and Junction 13 would need to be reconstructed.

This complex construction challenge means costs increase to £18bn and a third runway could not be operational until 2029.

We have maintained the principle of runway alternation to provide periods of respite from noise for all communities around Heathrow. The runway is 3,500 metres, which is 1,500 metres longer than the 2003 proposal. This is a full-length runway and every type of aircraft operating from Heathrow could use it for take-offs and landings.

Passengers would travel through a new Terminal 6 and an extended Terminal 2 with satellite piers serving the new runway.

The population within Heathrow's noise footprint would be around 20% lower with three runways in 2030 than with two runways in 2011, in part because of the runway's location further to the west.



M4
Brands Hill
Colnbrook
Harmondsworth
Sipson
Harlington
Poyle
Horton
Wraysbury
Stanwell
West Bedfont
East Bedfont

Option 3:

Third Runway North

This option is the quickest and cheapest option for delivering a third runway at Heathrow but has a comparatively high noise and property impact.

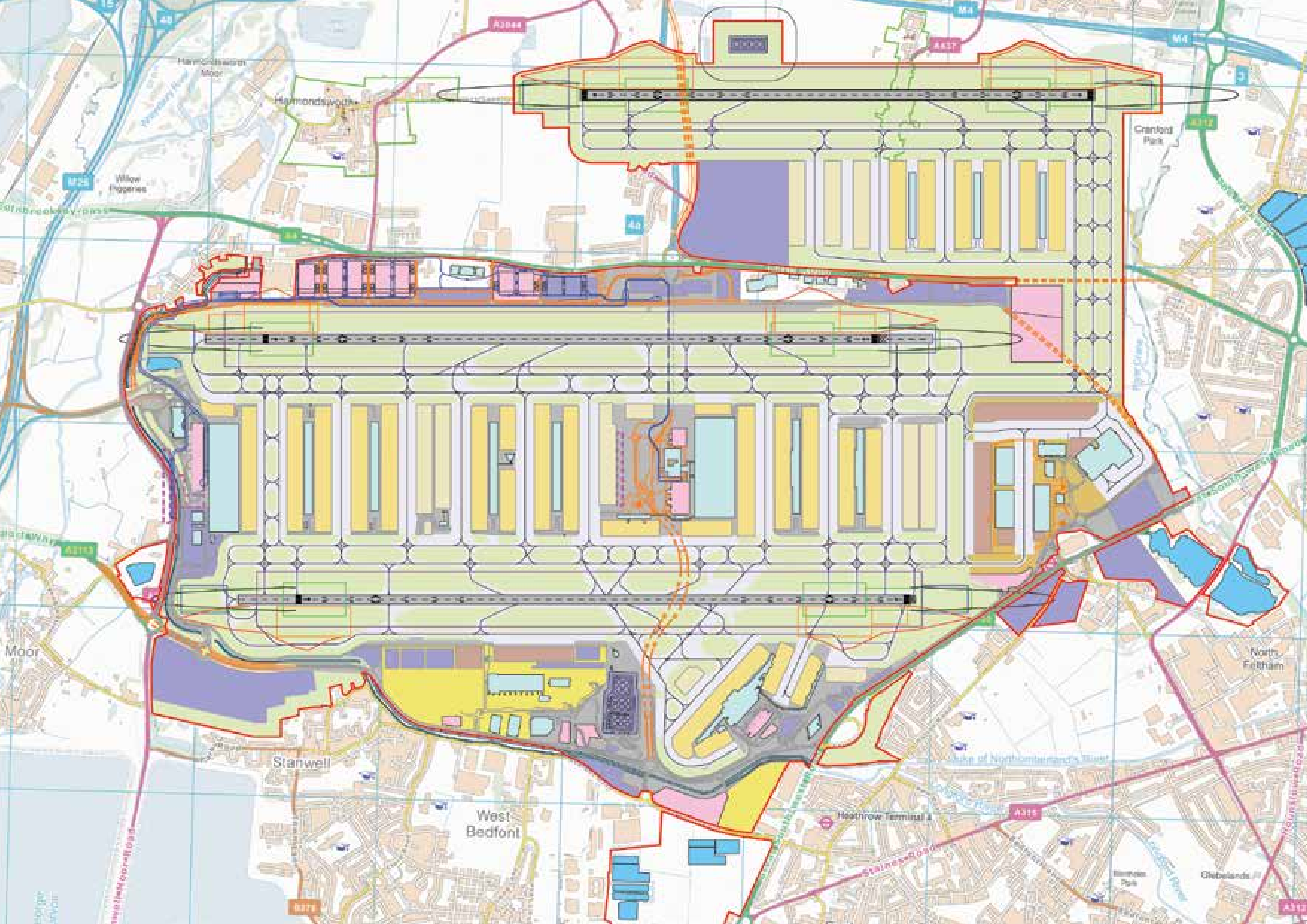
We have maintained the principle of runway alternation to provide periods of respite from noise for all communities around Heathrow. The runway is 2,800 metres in length, which is 800 metres longer than the previous proposal for a third runway but around 1,000 metres shorter than Heathrow's existing runways. This would allow any aircraft to land on the new runway, but four-engined aircraft such as the A380 could not routinely use it for take-off. This would reduce operational flexibility and limit the maximum capacity of Heathrow with a third runway to around 700,000 flights a year.

The third runway and associated facilities would be constructed over the villages of Sipson, Harlington, and Cranford Cross. Harmondsworth conservation area including the Tithe Barn and St Mary's church would be preserved in their current location. A total of around 2,700 residential properties would need to be demolished.

Construction would take five years from planning consent with an estimated operational date of 2025. Total costs are estimated to be around £14bn.

Passengers would travel through an extended Terminal 5 and an extended Terminal 2, with satellite piers serving the new runway.

The population within Heathrow's noise footprint would be around 10% lower with three runways in 2030 than with two runways in 2011.



M4
A3044
A437
Harmondsworth
Cranford Park
M25
Willow Piggeries
A4
4a
A312
Moor
A3113
North Feltham
Stanwell
West Bedfont
A315
Heathrow Terminal 4
Glebelands

How Heathrow's third runway options perform

The North West option performs better on noise and residential property impact than the North option and can be delivered more quickly and cost-effectively than the South West option, however it has a greater impact on important heritage buildings. Its full length runway gives maximum capacity, flexibility and resilience.

The South West option performs better on noise and residential property loss but takes longer to deliver, comes at a higher construction cost and has a greater impact on natural habitats and flood zone storage. Its full length runway gives maximum capacity, flexibility and resilience.

The North option is quicker and cheaper to deliver but has a comparatively higher noise and property impact. The reduced flight capacity, operational flexibility and resilience caused by a 2,800 metre runway would have implications for the competitiveness of the UK's hub compared to other options.

While we recognise that determining the right balance between the economic and environmental impacts of additional flights is ultimately a decision for Government, we believe the westerly options offer clear advantages.

	Heathrow today	North	North West	South West
Passenger capacity	80m	123m	130m	130m
Maximum flights	480k	702k	740k	740k
Cost	-	£14bn	£17bn	£18bn
Length of new runway	-	2,800m	3,500m	3,500m
Noise (population within the 57dBA Leq contour)	243k	-10%	-15%	-20%
Residential properties lost	-	2,700	950	850
Opening date	-	2025	2026	2029
Ecology impact (hectares)	0	0	0	716
Volume of flood zone 3 storage lost (m^3)	-	6k	116k	1,416k
Grade I/II* listed buildings lost	-	0	2	0
Construction complexity	-	Low	Medium	High

Passenger benefits

Greater choice of destinations
A third runway will increase the range of direct and frequent long-haul destinations available to passengers. Capacity can be delivered more quickly at Heathrow than building a new hub airport and its existing network strengths (with more long-haul business passengers, transfer passengers and network airlines than any other UK airport) mean new routes are more likely to be delivered at Heathrow than at other airports. Our route modelling suggests that the extra take-off and landing slots delivered by a third runway would provide 40 new long-haul destinations by 2030, providing Heathrow with 130 total long-haul destinations.

Greater choice of airlines
Many airlines want to access slots at Heathrow and would fly to the UK if they could. Airlines such as China Southern would have flown to the UK sooner if there had been slots available at Heathrow. Airlines that cannot access Heathrow do not automatically fly to another UK airport instead. A survey of scheduled airlines found that 53% are locating flights abroad that would have come to the UK if there was capacity at Heathrow, and 86% would put on more flights to the UK if there was capacity at Heathrow[23].

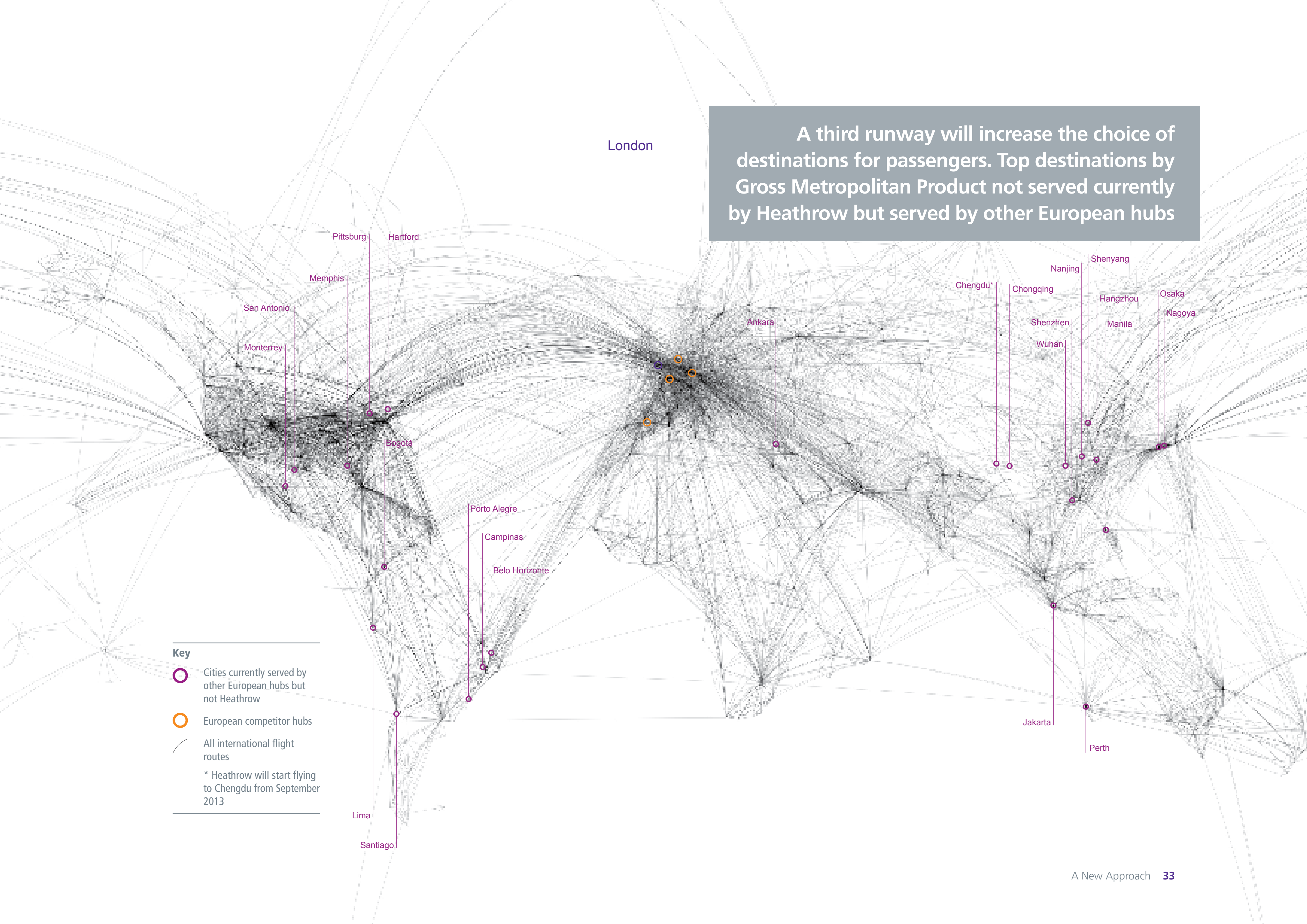
Lower fares than a new hub airport
Airport infrastructure in the UK is currently privately funded and ultimately paid for by passengers through airport charges. The lower costs of building a third runway at Heathrow compared to building a new airport will translate to lower fares for passengers.

Greater choice of flights from UK regions
Many passengers in the UK nations and regions no longer have the choice of flying via Heathrow because domestic flights have been squeezed out as capacity has become constrained. Heathrow offers flights to seven UK airports, while Amsterdam Schiphol has routes to 24 UK airports. For some UK regions the only available option is to fly to Amsterdam. Spare capacity at Heathrow would increase competition, giving UK passengers more choice and leading to lower fares and better service.

Closer to passengers' home or business
For most existing passengers, a hub airport to the east of London would be in the wrong place. Travel time would increase for almost 90% of hub passengers. Even if major new transport infrastructure was constructed for a new Thames Estuary or Stansted hub airport Heathrow would still have 4.5 million more people living within a 60-minute travel time.

Better choice of onward transport
Passengers travelling to a three runway Heathrow will have a wide choice of transport options available from the outset, while a new hub airport would need to develop a limited number of new transport options from scratch. Passengers travelling to a three runway Heathrow will have the choice of Heathrow Express, Crossrail, London Underground, mainline rail, or road transport to access the airport with a range of fares and service levels available.

A third runway will increase the choice of destinations for passengers. Top destinations by Gross Metropolitan Product not served currently by Heathrow but served by other European hubs



Economic benefits

A third runway at Heathrow would deliver greater economic benefits to the UK than any other option for new runway capacity. It will create jobs, facilitate trade, boost spending in the wider economy and improve public finances. We estimate that benefits of £100 billion present value (PV) would accrue to the UK from expanding Heathrow.

By delivering a third runway at Heathrow the current trade and investment advantages which the UK enjoys and London's status as a world city will be preserved and enhanced. The value to the UK of a third runway is driven by stimulating international trade, foreign direct investment and the local economy. Additional value is created by passengers taking extra and more direct journeys. Supply chains and the UK government also benefit from extra revenues.

Heathrow is the best location for the UK's hub. The current centre of UK economic gravity is to the west of London where highly productive clusters in industries like IT and pharmaceuticals have grown around Heathrow over the last 50 years. 202 of the UK's top 300 company HQs are within a 25-mile radius of Heathrow. Foreign owners of firms with HQs in the Thames Valley also employ up to 75,000 workers elsewhere in the UK. All of this can only be enhanced by additional capacity and connectivity at Heathrow.

Expanding Heathrow would protect the existing 114,000 local jobs that depend on the airport and create 70,000 to 150,000 new local jobs. By contrast, closing or downsizing Heathrow would result in the biggest mass redundancy in British history.

Half of Heathrow's workforce lives in the five boroughs surrounding the airport. To ensure that local people continue to have the best opportunities to access employment we will continue to work with airport companies to offer pre-employment training and apprenticeships.

The economic benefits to the UK of a third runway	3R impact to UK (£Bn PV)
Passenger and freight users	
Extra journeys	14
More direct journeys	2
Cargo	2-3
Rest of the UK economy	
Trade	5-35
Investment	0-18
Consumption	6-11
Government revenues	5
Wider economic impacts and agglomeration	16-68
Total mid-point	**£100 billion**

Heathrow is the most significant airport for freight in the UK – in fact it carries more freight each year than all other UK airports put together. Air freight is of vital importance as it serves major export industries such as electronics, telecoms, financial and business services. Air freight also serves industries where urgency is a key factor – pharmaceutical and biotech industries as well as food producers are heavy users of air freight, and UK manufacturing relies on air freight to import and export key components to keep factories working.

We estimate the direct benefits to passengers are £18-19 billion. These are comparable to the benefits estimated for Crossrail. However, the wider economic benefits to the rest of the economy, particularly from international trade and inward investment to the UK and wider economic benefits from productivity and agglomeration are much more important. Although it is not possible to quantify these effects with precision, we estimate that they will be in the range of £32-£137 billion. Even at the lower end of the range, this is well above the wider economic benefits claimed for either Crossrail (£7-8 billion) or HS2 (£5.3 billion).

Overall the benefit will be in the range of £50-156 billion, with a central estimate of over £100 billion. The benefits of a third runway will be achieved by exploiting existing or planned infrastructure (for example, with the opening of Crossrail in 2019, 75% of East London will be within 60 minutes travel time by public transport to Heathrow).

	3R impact to UK (£Bn PV)
Airlines and airports GVA	
Airline GVA	3-10
Airport GVA	5-15
Supply chain GVA	22-37
Total GVA	**£30-62 billion**

Surface access

New public transport services could link Heathrow to the whole of the UK and allow more passengers to comfortably access Heathrow on public transport than ever before. Heathrow could deliver more flights without increasing airport-related traffic on the road.

Since the 1970s, around £20-25 billion of rail infrastructure with a connection to Heathrow has been invested or committed. On top of that, the motorways that serve the airport, including the M3, M4, M40 and M25, would cost around £26 million per mile in today's prices[24].

New rail services to the Midlands, East, South and West can be delivered by the time a new runway becomes operational, with direct services to the North expected in 2032:

Crossrail: The full opening of Crossrail in 2019 will bring the heart of London's financial district and much of East London within a 60 minute catchment area for Heathrow. Journey times from Whitechapel, Canary Wharf and Stratford to Heathrow will be 36, 40, and 41 minutes respectively. This scheme is already under construction.

Piccadilly Line: Transport for London is already committed to delivering improved frequency and faster journey times.

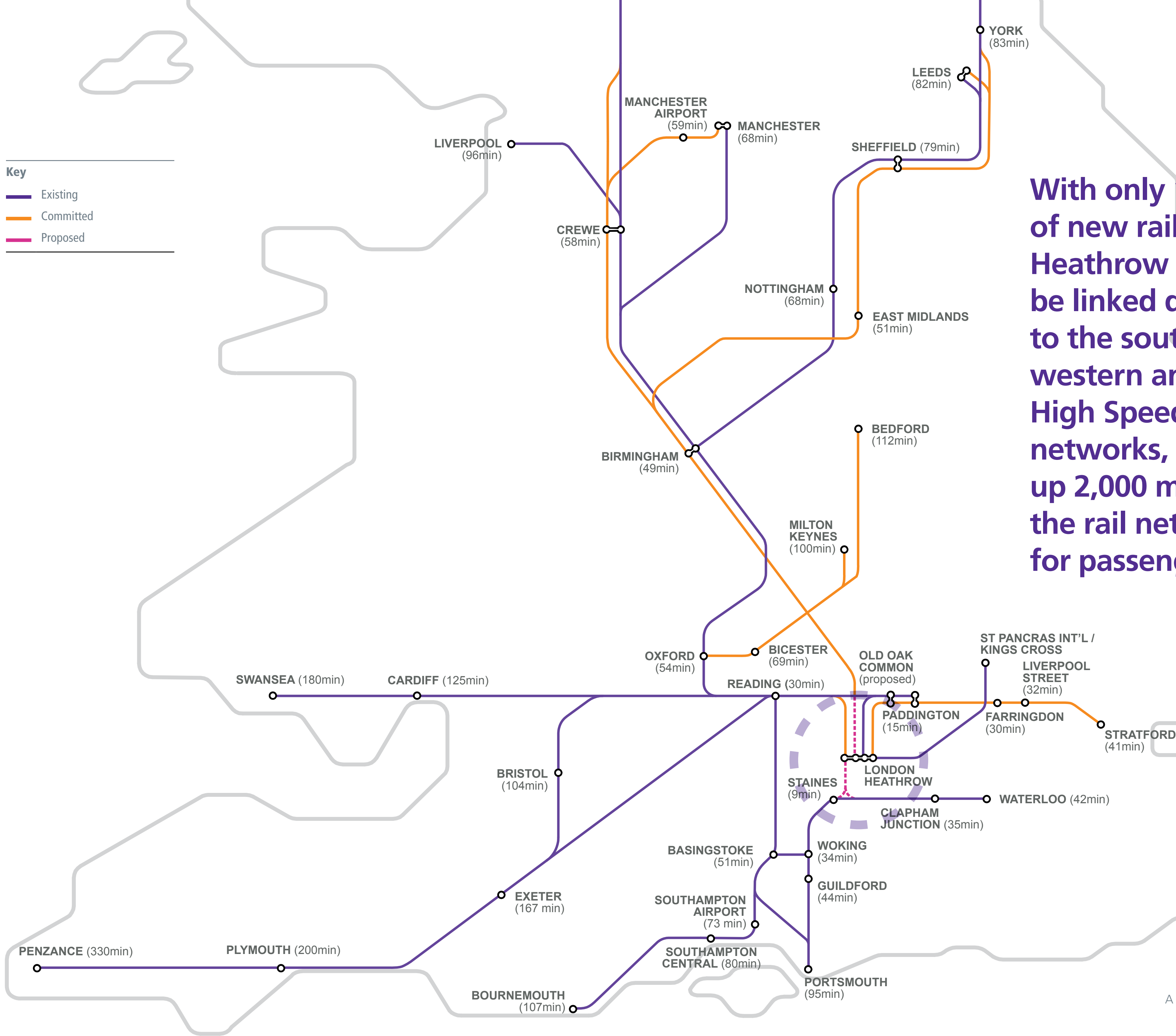
Western Rail Access: By 2021, it is expected that Western Rail Access will be delivered. This will provide fast direct access to Heathrow for passengers from Slough, Reading and the Thames Valley and further improve journey times to the South West and South Wales. This £500 million scheme is being developed by Network Rail and will connect Heathrow directly to one of the biggest business clusters in Europe.

High Speed 2: In 2026, Heathrow will be connected to the High Speed Rail network via a new passenger interchange at Old Oak Common providing fast access to the Midlands. In 2032, direct services to the North, Scotland and continental Europe could be in operation. Funding for this scheme is already committed and will connect Heathrow to the manufacturing centre of the UK.

Southern Rail Access: This would provide a new direct connection to south and south west London and reduce journey times to the south coast. This scheme was recognised in Network Rail's 2011 Route Utilisation Strategy and has strong local stakeholder support.

We will also introduce new and enhanced bus and coach services, building on the 540,000 annual movements today.

New public transport infrastructure could enable 15 million more passengers to use public transport to access Heathrow by 2030. This could increase Heathrow's public transport mode share from 40% today to more than 50% in 2030 despite the additional number of passengers using the airport. These public transport improvements will be complemented by a range of measures to encourage more sustainable travel by airport employees. These include expanding Heathrow's employee car share scheme (already the world's largest), but also reducing the number of employee car parking spaces. It is possible to deliver a third runway without increasing airport-related traffic on the road.



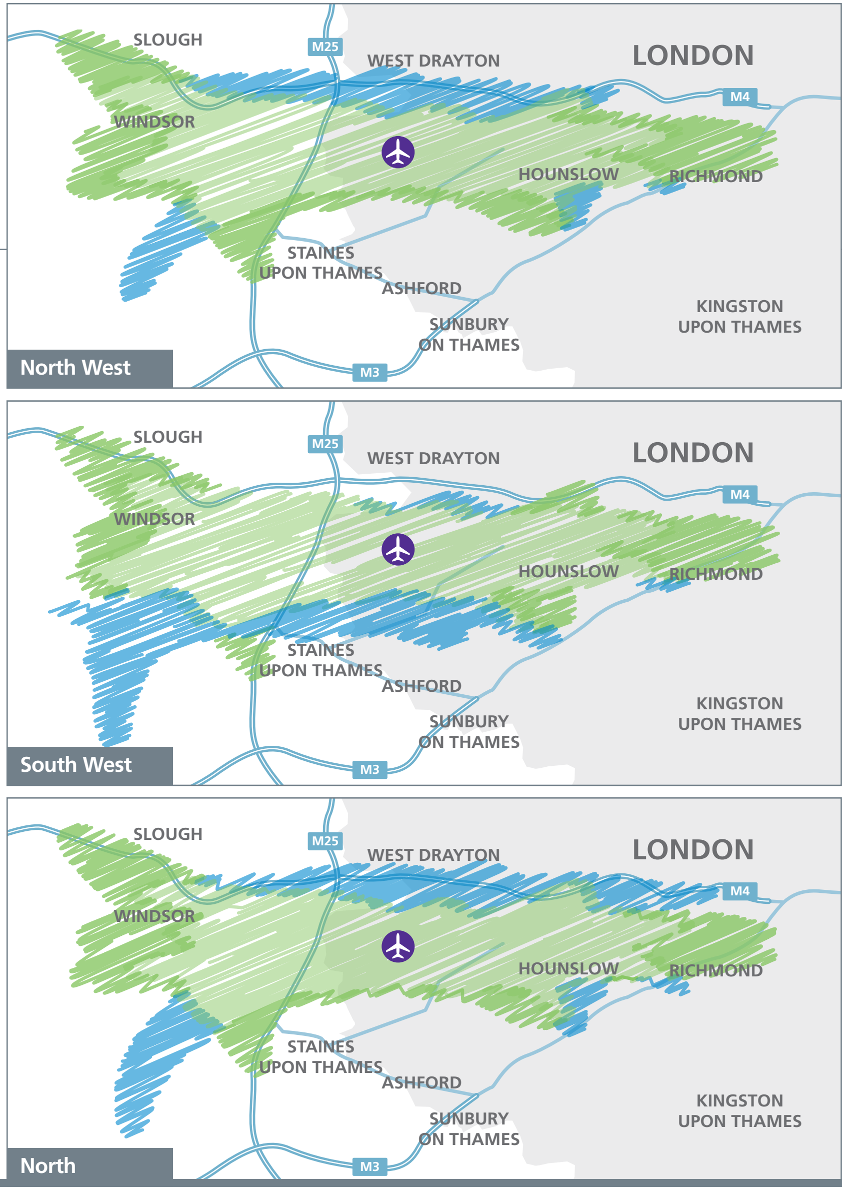
With only 17 miles of new railway Heathrow could be linked directly to the southern, western and High Speed 2 rail networks, opening up 2,000 miles of the rail network for passengers

Noise

There isn't a choice between more flights or less noise. Heathrow can deliver both.

In our recent report *A Quieter Heathrow* we showed how quieter planes, quieter operating procedures, noise mitigation, and operating restrictions are reducing the impact of aircraft noise at Heathrow. Heathrow is significantly quieter than it was in the past. Since the early 1970s both the area and the number of people within Heathrow's noise footprint have fallen around tenfold, despite the number of flights doubling.

Our proposals for a third runway at Heathrow will see noise reductions continue. Even with a third runway, in 2030 there will be around 10-20% fewer people in total within Heathrow's noise footprint than today. Our initial analysis shows that the addition of new operating procedures could further reduce the population exposed to noise.



Areas that could experience more or less noise than today for NW, SW and N proposals

Less noise. Runways and flight paths alternate to provide respite

Broadly similar noise. Runways and flight paths alternate to provide respite, cost of insulation provided for high noise areas

Increase in noise. Runways and flight paths alternate to provide respite, costs of insulation provided for significant new noise

Although the total number of people affected by noise will reduce there will be some people who experience more noise and flights overhead than today and others who experience less. The exact flight paths for any new runways would be subject to further consultation. At this stage, we have produced maps giving an indication of which areas might receive more noise or less noise and how Heathrow's noise footprint might change under each option. Some of the communities who are within Heathrow's noise footprint today such as Richmond and Putney will experience less noise in future under our proposals.

How can there be more flights but less noise?

New runway locations: Two of our options site runways further to the west than previous proposals for a third runway. Every mile further west an aircraft lands means it is flying approximately 300 feet higher over London on its landing approach.

New operating procedures: Modern aircraft navigation technology means airspace can be redesigned to avoid high population areas and we plan to use steeper landing approaches and displaced runway thresholds so that aircraft will be flying higher over London.

New aircraft: We charge noisier aircraft more to land at Heathrow and quieter aircraft less. We also believe the Government should consider introducing 'green slots' where new capacity is only given to airlines willing to operate quieter aircraft.

New noise respite: In contrast to BAA's previous proposal for a third runway, we have maintained the principle of runway alternation to provide periods of respite from noise for all communities around Heathrow.

New noise insulation schemes: While the total number of people within Heathrow's noise footprint will reduce, there will be communities under the flight paths to the new runway who will experience aircraft noise for the first time. In areas of high noise or areas experiencing a significant increase in noise we believe free noise insulation should be offered to residents. In the highest noise areas we will offer above market value compensation for anyone who wants to move house.

Night flights are an important part of operations at a hub airport but also a significant concern for local residents. Of the major European hub airports, Heathrow has the strictest limits on operations between 11pm and 6am and the fewest flights. We have assumed that restrictions at Heathrow will continue to be strict in future. We plan to operate only one runway for the small number of flights operating between 11pm and 6am. This means that local residents could benefit from significant breaks between nights when they are overflown.

Climate change and the environment

Climate change

A third runway at Heathrow is consistent with meeting the UK's legally binding climate change targets.

New aircraft and engine technology, operational efficiencies and sustainable biofuels will allow the UK to more than double air traffic by 2050 without a substantial increase in gross emissions – consistent with the UK's long term legally set climate change targets. If international carbon trading is added to these factors, emissions over time would actually be reduced, achieving the global industry's commitment to halve 2005 carbon emissions by 2050 in net terms[25].

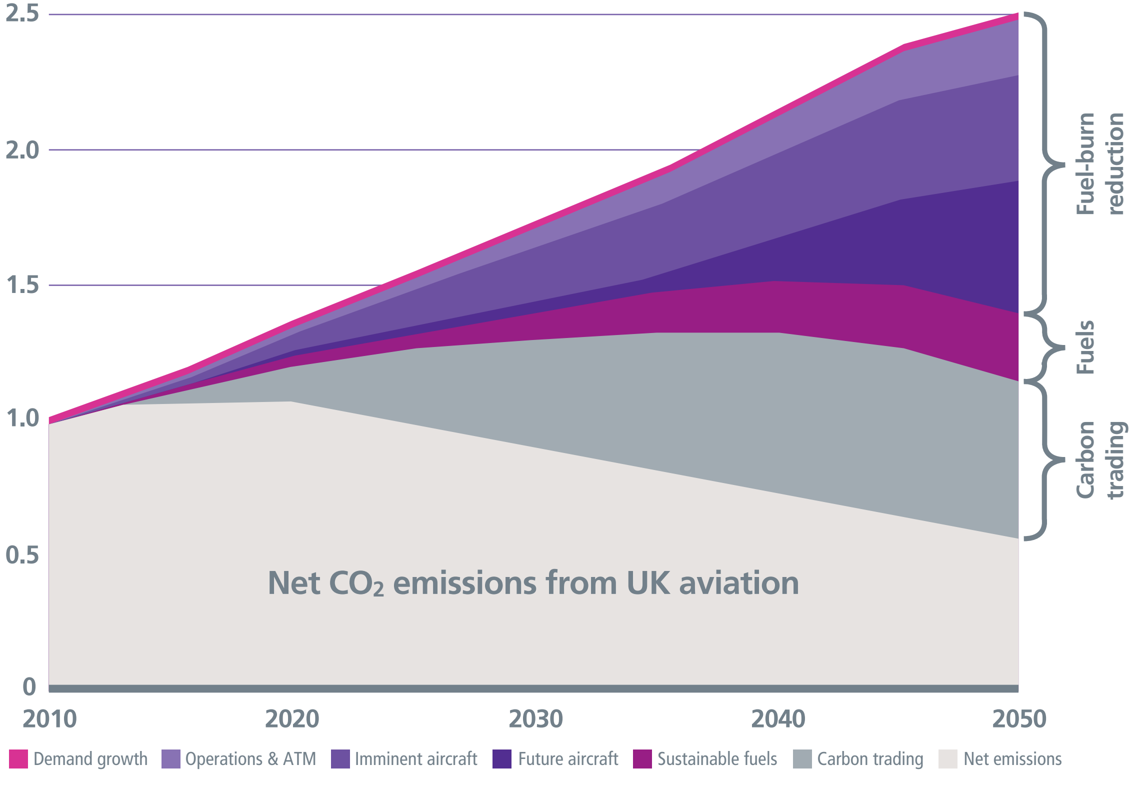
Opposing a third runway would be an inefficient way of reducing carbon emissions. Without additional UK hub capacity, passengers will still travel, but in less carbon efficient ways, so carbon will not be cut. UK long-haul passengers will have to transfer through EU hubs, adding an additional landing and take-off to each journey. Heathrow is closer to the centre of population for hub passengers and therefore a third runway at Heathrow would result in shorter journeys and less surface access carbon dioxide emissions than other hub options.

Air quality

We can add capacity at Heathrow without exceeding air pollution limits. There will be no more Heathrow-related vehicles on the roads than today and those vehicles that are travelling to the airport will be cleaner. Combined with new aircraft technology this means that levels of nitrogen dioxide (NO_2) would be within EU limits. Levels of fine particles (PM_{10} and $PM_{2.5}$) are already within the limits.

Local air quality around Heathrow is affected by the operation of the airport in addition to emissions from non-Heathrow related road traffic, local industry, domestic sources such as household gas boilers and emissions from more distant sources. European vehicle emissions standards are reducing emissions from petrol and diesel vehicles and new zero-emission technology such as electric and hydrogen vehicles are starting to enter the market. To play our part in delivering lower air quality emissions we operate a Clean Vehicles Programme to promote low and zero emissions vehicles among airport companies. In addition, we host the UK's first publicly accessible hydrogen refuelling site and are increasing the number of electric vehicle charging points at our passenger car parks.

The number of flights from UK aviation can increase without substantially increasing emissions



Aircraft today are also significantly cleaner than they used to be and we expect this trend to continue. We incentivise airlines to use the cleanest aircraft through lower charges. New capacity provides an opportunity to introduce 'green slots' where new take-off and landing slots are only given to airlines that are willing to operate the cleanest aircraft. We also provide aircraft power and air conditioning on parking stands so that aircraft do not need to run their engines.

Flood zones and the natural environment

The third runway south-west option would result in the loss of a significant volume of water storage, flood zone and wildlife habitat due to its construction over reservoirs. New wildlife habitats and flood zone storage would need to be re-provided at alternative locations as a compensatory measure. While technically feasible this adds significantly to the cost of the south-west option. Following mitigation or compensation, there will be no net loss of the natural environment.

Community impacts

A third runway would have the greatest impact on those people whose homes would need to be compulsorily purchased or would be newly exposed to high levels of aircraft noise.

Heathrow is committed to ensuring the people most affected by a third runway are treated fairly. We will ensure that compensation greater than market value is offered to anyone whose home needs to be purchased. If Government policy supports a third runway then a property market support bond scheme will also be put in place to guarantee the value of property until a new runway is constructed and address property blight resulting from exposure to new aircraft noise.

Heathrow already offers a number of noise insulation schemes covering residential property and community buildings such as schools. We also offer help for those people who want to relocate from the highest noise areas. We recognise that new schemes would need to be developed if a third runway at Heathrow was supported by Government.

We would want to consult with the local community on the nature and scope of those new schemes. Should any of Heathrow's options be shortlisted, we would seek to work with the Commission to develop compensation schemes that could be consulted on and put in place as soon as possible following a final announcement in 2015.

We also recognise the importance of working closely with our neighbours on other elements of our proposals. Our options are in outline form at this stage and do not have approval from Government. It would be premature to begin formal consultation but we will be proactively engaging with local communities to explain our proposals. If any of our proposals are short-listed by the Commission we would seek to work with local authorities and local communities to develop the plans in further detail.

The exact layout of runways, terminal facilities, and roads, as well as the extent and scope of environmental and noise mitigation are all subjects on which we would want to engage with the public.

In terms of heritage sites, the third runway north west option as currently laid out would result in the loss of the Harmondsworth conservation area including the Grade I listed Harmondsworth Tithe Barn and the Grade II* listed St Mary's Church. Both are significant community and heritage assets. We are working to see whether this option could be developed so that the Tithe Barn and St Mary's Church could be preserved in their current location.

We are conscious that the timescale set by the Government for the Airports Commission creates a period of uncertainty and anxiety for local residents. We would encourage the Commission and the Government to short-list options and make a final decision as quickly as possible to minimise this impact on local residents.

Adobe buildings – part-funded by Heathrow these are an innovative way of facilitating outdoors teaching without the disruption of aircraft noise

Cost and deliverability

Heathrow offers the fastest, most cost effective and most practical route to meeting the UK's international connectivity needs. A third runway can be delivered at less cost to the taxpayer than building a new hub airport.

The options for a third runway that we are putting forward could be delivered from 2025-2029 for £14-18 billion. This compares favourably with a new Thames Estuary airport which we do not believe could be operational before 2034 and which its promoters admit could cost £70–80 billion, of which at least £25 billion would need to be funded by the taxpayer[26]. More new runways, more new terminals and more new road and rail links would be needed at a new airport than at Heathrow.

Adding capacity at Heathrow avoids the transition costs of moving to a new airport. The developers of a new hub airport would need to compensate the owners of Heathrow and airlines and airport companies as well as build new towns, schools, and hospitals to service the new airport's workforce.

For any airport development to be privately funded there must be a clear business case that will deliver an attractive and predictable return to investors. The total cost of new infrastructure, the complexity of construction and the uncertainty of future demand are all factors that affect risk for investors. Returns need to be commensurate to risk to attract investment. The UK operates in a competitive global marketplace and investors can choose to employ their capital anywhere in the world.

Financing additional capacity at Heathrow entirely from the private sector will need an appropriate investment framework. The third runway options which have the least impact on local communities are more expensive but do not provide any additional benefit to the passengers who will ultimately pay. In developing its final recommendations to Government we encourage the Airports Commission to consult on whether the existing model for financing airport development is appropriate for such a major investment and what role public funding or government guarantees should play.

Our proposals have varying degrees of construction challenge but the risk of building a new airport in the sea would be greater than building an extra runway at Heathrow. The commercial risks of building a hub airport anywhere else is significantly higher than at Heathrow and investors would be likely to require higher levels of return, government guarantee and public funding than at Heathrow.

Indicative costs for a Heathrow third runway (£ Billions)	3R North	3R North West	3R South West
Airport infrastructure Includes runway, taxiway, apron, aircraft stand, terminal capacity and pier, tracked transit, baggage system, access road, car park and control tower costs	9.3	11	11.7
Surface access Includes road, highway, motorway, and rail costs	1.8	2.1	3.7
Environmental Includes reprovision of wildlife habitat, flood mitigation and reprovision of reservoir costs	0.01	0.13	0.7
Community Includes residential property, commercial property, and general land compulsory purchase, community facilities re-provision, community infrastructure levy, and air noise compensation costs	3.2	3.7	2.2
Total	**£14.3 billion**	**£16.9 billion**	**£17.6 billion**

6 Not just a short-term fix

Every three runway option can evolve to four runways if required

All of the options we are putting forward for three runways have been designed to evolve to four runways if ever required to do so.

We believe that a third runway provides sufficient capacity until at least 2040. The 740,000 flights that a third runway could deliver would allow Heathrow to compete effectively with other European hubs. Long-term demand forecasts are inherently uncertain. It is impossible to accurately predict demand beyond 2040 and say that a fourth runway would be definitely required. One of the advantages of the Heathrow option is that additional capacity could be added gradually as demand requires and financing allows, whereas a new hub airport would require most investment upfront based on uncertain future demand.

We have assessed several four runway Heathrow options which are shown on the opposite page.

Our initial analysis shows that it would be possible to have four runways at Heathrow while still reducing the total number of people within Heathrow's noise footprint compared to today.

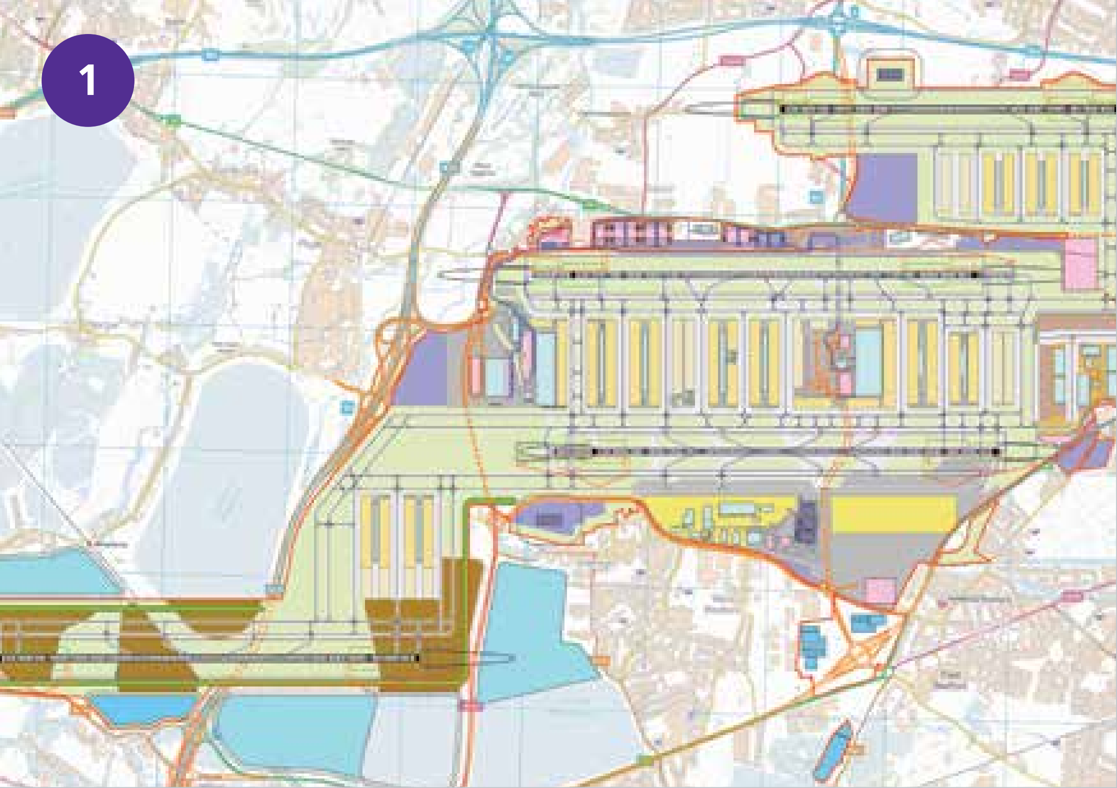
We estimate the cost of developing a fourth runway at Heathrow at an additional £8-14bn depending on the option.

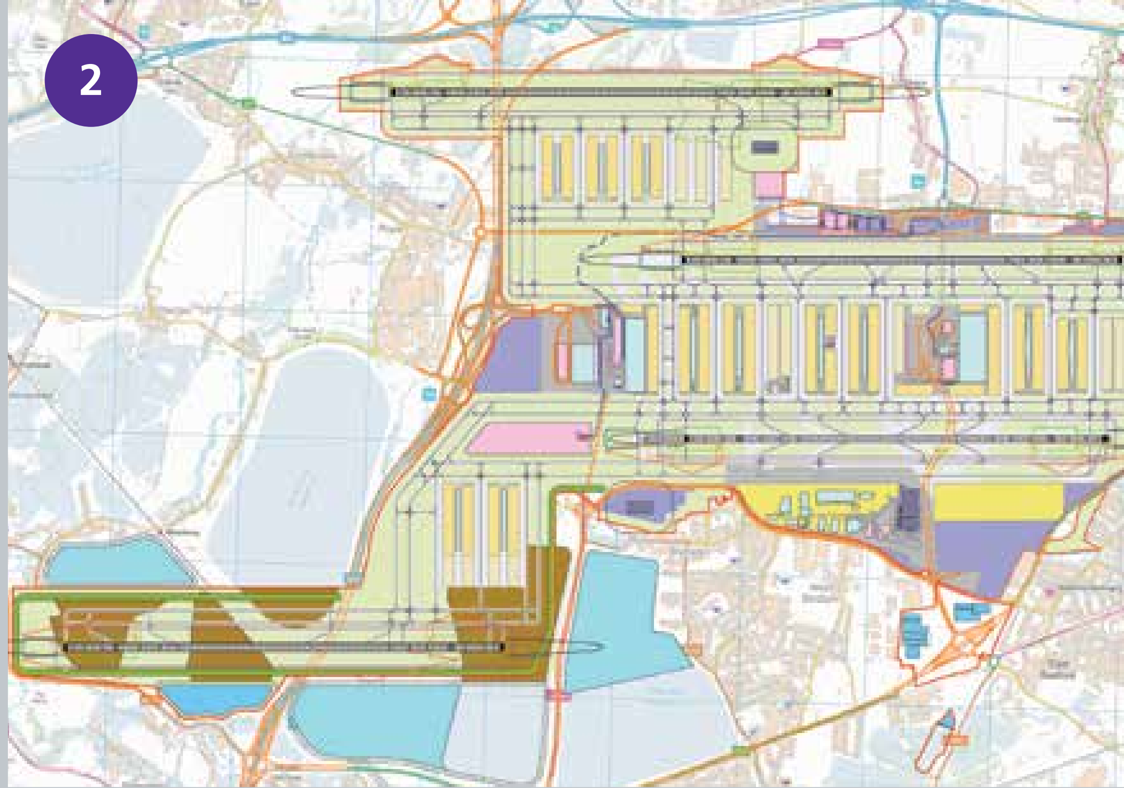
Developing from a three runway to a four runway Heathrow would require the compulsory purchase of 850-950 additional properties under the North West/South West option, 850-2,700 additional properties under the North East/South West option or 200 additional properties under the Dual North West option.

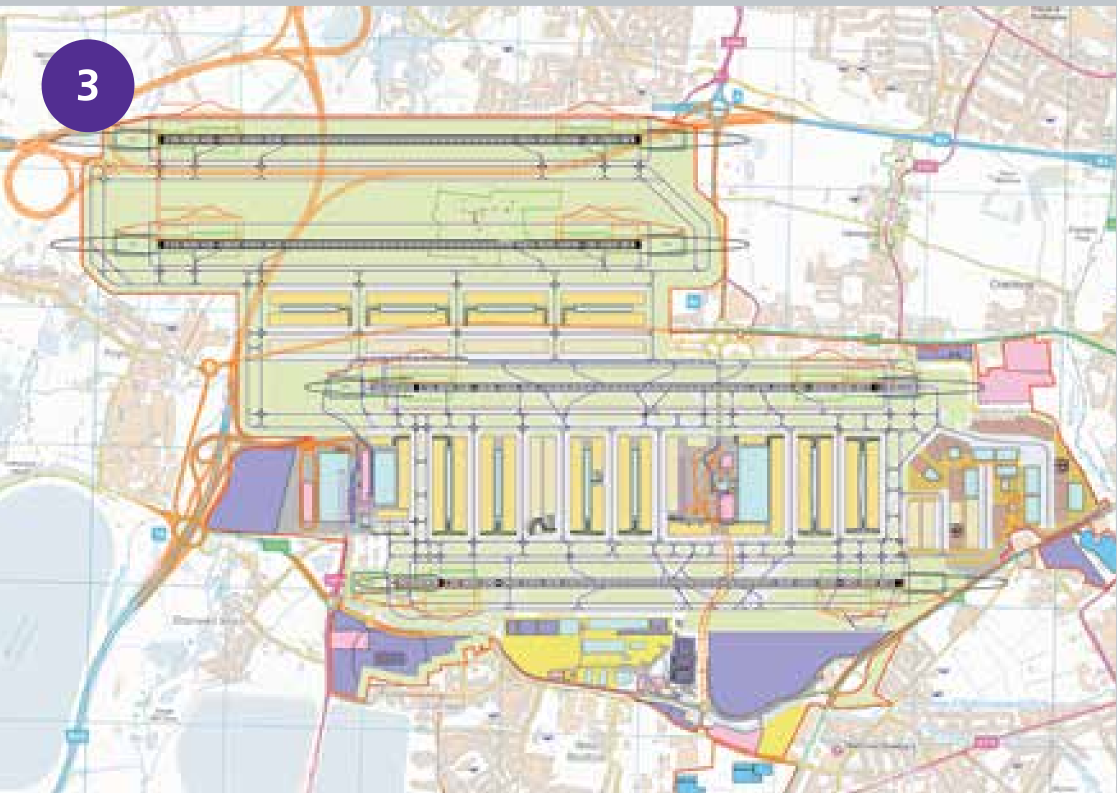
A third runway at Heathrow is not just a short-term fix. A fourth runway at Heathrow is feasible if it is ever required.

Our westerly options for new runways have been influenced by the thinking of Tim Leunig and his Policy Exchange report *Bigger and Quieter*. However we do not believe the proposal to move all four runways at Heathrow to the west is the best answer to a four runway Heathrow.

Our analysis shows the Leunig proposal would see the destruction of 1,700 more homes than some of our four runway options, while the development of any additional runway capacity at Heathrow would cost around £10 billion more and take five years longer to deliver. We believe our proposals for only new runways to be sited to the west are better than the Leunig proposal. They deliver many of the noise benefits of the Leunig proposal while performing better on local community impact, cost, timing, flood zone impact, construction risk and operational feasibility.







Four runway options

1. North/South West

2. North West/South West

3. Dual North West

7 Conclusion

The focus of the global economy is shifting around us with the rise of fast growing emerging markets like Brazil, Russia, India and China. The UK is in a global race with our major competitors, including other European hubs, for trade with these markets and the jobs and economic growth that will result.

While European competitor countries have added new runways at their hub airports, the UK has not built a new full-length runway in the south east since the Second World War.

To maintain its global aviation hub status the UK needs a single hub airport with the size and scale to provide the long-haul connectivity on which jobs and growth depend.

Britain faces a choice.

We have one of the world's most successful hub airports in Heathrow.

We can decide to build on this strength.
Or we can start again from scratch.

Building from our existing strength can connect the UK to growth more quickly and at lower cost. Starting again from scratch will cost the taxpayer more, take longer and will not deliver an airport that's in the right location to help the UK win the global race.

Growth won't wait. With every passing year, Britain is cutting itself off from trade and jobs.

We believe there is a compelling case for growth at Heathrow. All our options deliver more flights while reducing the total number of people exposed to high levels of noise. All could operate within climate and air quality limits. Heathrow offers the fastest, most cost effective and most practical route to growth.

It's time to have the vision and courage to connect Britain to the growth it needs. It's time to rediscover the ingenuity and confidence that made Britain the hub of the aviation world.
It's time for a third runway at Heathrow.


Four Runway North West/South West option

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16 CAA Passenger Survey Data, 2012

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18 Analysis of 2011 Census Population Data lying within 60 minute isochrones of Heathrow, Stansted and Estuary sites. Further details in 'Best Placed for Britain', Heathrow 2013

19 Analysis of Companies House data by a leading management consultancy for Heathrow

20 Frontier Economics, Missing trade opportunities: the impact of Heathrow's capacity constraint on the UK economy, November 2012

21 ACI, Airport Service Quality Survey data: proportion of passengers rating their journey as 'very good' or 'excellent' Q1 2007 compared to Q1 2013

22 ACI 9th annual Airport Awards and Skytrax 2013 World Airport Awards

23 Board of Airline Representatives in the UK, 2012

24 Includes Great Western Main Line upgrade programme, Western Rail Link, Heathrow Express, Piccadilly Line extension Hatton Cross to T1, 2, 3 and 4, plus later extension to T5 and Crossrail funding envelope. Costs uprated to 2012 prices. Typical 1 miles motorway cost estimate provided by EC Harris for Heathrow

25 Sustainable Aviation 2050 CO_2 Roadmap, Sustainable Aviation, 2012

26 Mayor of London, Evidence to House of Commons Transport Committee, 11 February 2013

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