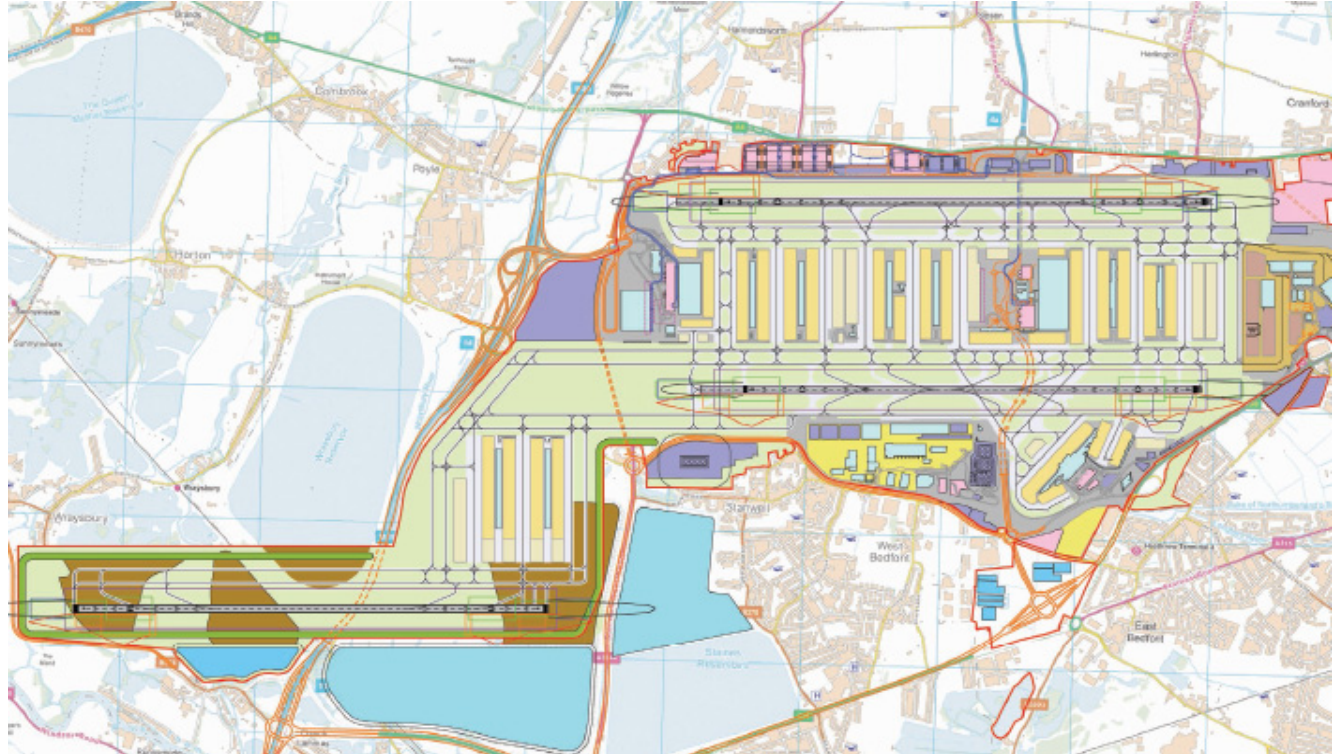


<b>PROPOSAL TITLE:</b>	<b>Southwest Runway</b>	<b>Group:</b>	<b>LHR</b>
<b>SUBMITTED BY:</b>	<b>Heathrow Airport limited</b>	<b>Reference No.:</b>	<b>36</b>

## PROPOSAL

New 3,500m runway constructed to the southwest of the existing airport with linking taxiways to the west of the current south runway. The new runway could operate independently from the existing runways. Includes expansion of existing terminals plus new Terminal 6 immediately west of Terminal 5 serving new satellites and aprons located between the new and current southern runways. Requires diversion of M25 into a new tunnel under the new development, plus entails construction over the existing reservoirs.

The new runway is located as far west as possible to reduce noise impact over London.



## ASSESSMENT SUMMARY

Phased expansion, building upon existing airport and surface access infrastructure, with potential to expand to fourth runway if required. The scheme offers the potential for greater resilience over current operations. This option however has the greatest capital cost of Heathrow Airport Limited's (HAL) three options.

A smaller population could be affected by noise nuisance than currently. Of HAL's three options, this option delivers the greatest reduction in total people currently affected by noise. Across the three options, this option marginally causes the least number of houses to be demolished. However this has the greatest negative impact on the existing reservoirs west of Heathrow and the SPA. .

Some services could transfer from Gatwick because of enhanced opportunities to increase their viability and take advantage of hub connectivity.

The scheme adds to capacity whilst seeking to minimise the environmental impact of flying and whilst making maximum use of existing infrastructure. It is therefore aligned with the Commission's terms of reference.

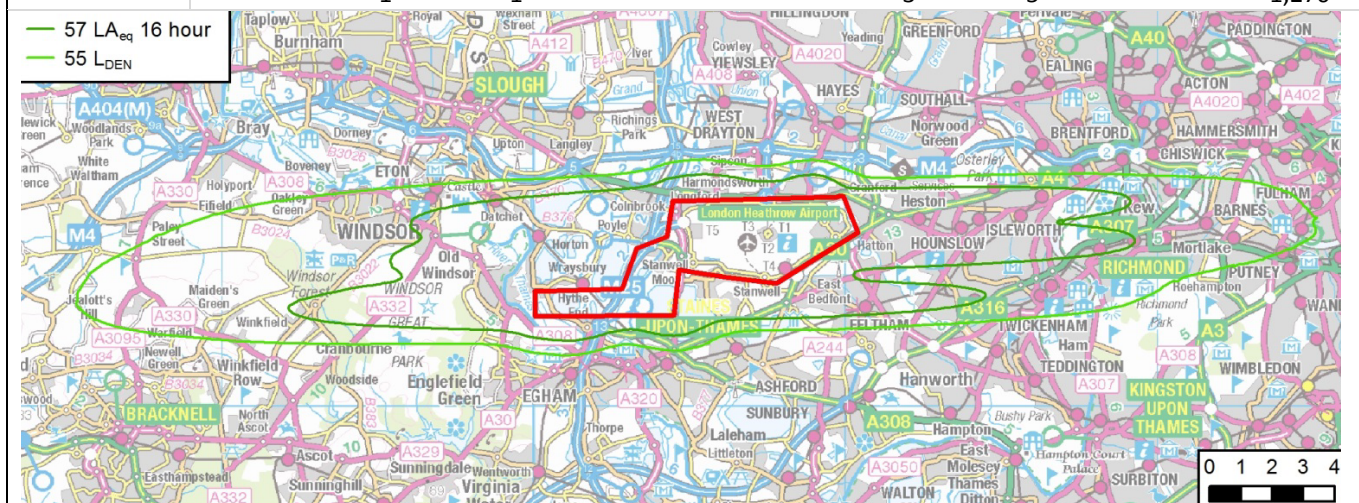
<b>PROPOSAL TITLE:</b>	<b>Southwest Runway</b>	<b>Group:</b>	<b>LHR</b>
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## OVERVIEW

Approach	Enabling legislation 2015-2029 with construction commencing in 2019 with opening in 2029 following established regulated mechanism.							Opening Year 2029	
Capacity	Runways ATM pax							Airport 1 740,000 130 Net 1 260,000 40	
Cost	The cost estimate includes the relocation of the negatively impacted reservoirs.				Airport 6.3	Access 3.5	Other 2.5	Sub Total 12.3	Including Risk/OB 24.9
Surface Transport	<div><div>Rail provision includes HEX; Crossrail; improved Piccadilly line; south rail connection, west rail connection and potentially a HS2 spur.</div><div>Assumption that extra runways can be provided without any increases of airport-related demand on the surrounding road network.</div><div>No major highway upgrades.</div></div>						1 hr isochrone 2 hr isochrone London centre	16 36 15 miles	
Economic	Borough	Hillingdon	Hounslow	Ealing	Slough	Spelthorne	Windsor	Runnymede	
Unempt (%)	7.9	7.5	10.7	8.2	4.4	4.2	4.3		
Ave. Salary (£/yr)	31,086	29,323	29,427	26,837	31,569	37,705	30,930		
County	Greater London	Surrey	Berkshire	Bucks					
GVA (£/cap)	34,779	25,432	31,057	22,125					
Environment	Significant impacts to international level designations, likely to require large area of compensatory habitat provision that could be difficult to deliver. Large loss of river corridor and flood plain area requiring diversion and flood compensation storage.						57 LAeq 55 LDEN	Airport 183,000 191,000 359,000 409,000	Net (48,000) (49,000)
	SAC <sup>1</sup>	SPA <sup>1</sup>	Ramsar	CA <sup>1</sup>	AONB <sup>1</sup>	SSSI <sup>1</sup>	Listed Buildings	SAM <sup>1</sup>	Houses Lost
	-	1	1	-	-	3	5	-	1,270

57 LAeq 16 hour

55 LDEN



<sup>1</sup> SAC: Special Areas of Conservation; SPA: Special Protection Areas; CA: Conservation Area; SSSI: Site of Special Scientific Interest; SAM: Scheduled Ancient Monument.

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## ECONOMY

Borough	Hillingdon	Hounslow	Ealing	Slough	Spelthorne	Windsor	Runnymede
Unemployment (%)	7.9	7.5	10.7	8.2	4.4	4.2	4.3
Ave. Salary (£/yr)	31,086	29,323	29,427	26,837	31,569	37,705	30,930
County	Greater London	Surrey	Berkshire	Bucks			
GVA (£/capita)	34,779	25,432	31,057	22,125			

### Impact on Industry

Adding a third runway at Heathrow to the southwest of the current airport would provide sufficient capacity for the airport to meet expected demand through to 2040, allowing more services with reduced delays due to improved resilience. This would support growth of aviation, tourism, logistics and related support businesses, and contribute to the agglomeration impacts of industry clustered in the Thames Valley/M4 corridor. A fourth runway option could be preserved for another northern or north-western runway as well.

<b>Airports</b>	Adding a third runway at Heathrow to the southwest of the existing runways would provide a capacity increase of <b>260,000</b> to the existing 480,000 ATM fully segregated operation at Heathrow from <b>2029</b> . Competition among London and South East airports will remain, although Heathrow's position will be strengthened by its additional capacity. It is expected that Heathrow would attract a small proportion of traffic from Gatwick. A fourth runway option would need to be preserved to match the expected capacity of the Heathrow Hub and Centre Forum proposals (at either the northern or north-western sites).
<b>Airlines</b>	Airlines currently using Heathrow and others seeking to use Heathrow would benefit from the increase in capacity to offer more services, with fewer delays due to greater resilience. Airlines would continue to have the same choices of airports as at present. Some short-term relocation from Gatwick would enhance opportunities for airlines interested in new services at Gatwick.
<b>Passengers</b>	Passengers would benefit from increased capacity due to delay reductions and a greater choice of destinations/enhanced frequencies.

### Local & Regional Economic Impacts

The expanded airport would facilitate growth of new and existing industries in airport and aviation support services and travel, tourism, logistics and other related sectors, to service growth in passenger and freight demand. Almost all would be able to continue serving customers of the airport from their existing position on the M4 corridor. This proposal would support agglomeration in the Thames Valley/M4 corridor, given its proximity to existing commercial developments supported by Heathrow. Direct, indirect and induced employment effects would be in the immediate vicinity and along key corridors to Heathrow.

### National Economic Impacts

The main national economic impacts come from the provision of new capacity sufficient to meet demand till at least 2040 (whilst preserving options for a fourth runway), with no negative impacts on airport competition.



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## SURFACE ACCESS

<b>Time/Distance to Central London</b> Paddington 15 mins Docklands 40 mins 15 miles <b>Journey times to other population centre</b> Birmingham 50 mins Manchester 70 mins	<b>1 hr isochrone population</b> 16  <b>2 hr isochrone population</b> 36	<b>Key required upgrade schemes</b> <ul style="list-style-type: none"> <li>▪ HS2 Heathrow spur</li> <li>▪ Western rail access line</li> <li>▪ Southern rail access line</li> </ul>
<b>Rail Infrastructure Capacity Analysis</b> The sponsors state that the proposed rail connections would provide sufficient capacity to support airport passengers and staff, in addition to new demand for non-airport users. Average September weekday 2030 assessments have identified busiest evening peak demand to the airport on Crossrail and Heathrow Express of 4,000 passengers/hr (combined), compared to a proposed seating capacity of 4,500 passengers/hr and 8,500 passengers/hr respectively. The annual demand from Heathrow using the Piccadilly Line is expected to fall by 2030 relative to 2011 levels due to Crossrail. Furthermore, the upgrade would increase trains per hour and capacity. Network Rail is developing proposals for a Western Rail Access Link to Heathrow, with anticipated operation by 2021. However, no specific proposals are currently in development by Network Rail for a Southern Rail access to Heathrow. At this stage it is unclear that the proposed rail services can cater for the increase in rail demand, but a combination of HEX, Crossrail, Piccadilly Line, Western Rail Access and Eastern Rail Access provides a significant increase in current capacity.		
<b>Highways Capacity Analysis</b> LHR is currently well located in relation to the strategic highway network, with direct access from the M25 and M4, as well as being within 10 miles of the M3 and M40. The sponsors state that they expect no major improvements to highway capacity to be necessary as part of the proposals to expand LHR. The road-based mode share is predicted to reduce from 60% currently to 50% in 2030, with total passengers increasing from 70 mppa to 100 mppa. A larger reduction in mode share is predicted for taxi and 'kiss and fly' compared to 'park and fly', resulting in a lower average number of traffic movements per passenger in 2030 than 2011, and representing more efficient car use. It is not clear that the increase in airport capacity would be catered for by increases in public transport mode choice and 'background changes' and that airport-related traffic would not rise.		
<b>Accessibility to Population &amp; Business centres</b> Over 16 million people currently live within a 60 minute journey time of LHR, with 6 million having a public transport option. LHR is currently connected to Central London by the Heathrow Express (taking 15 minutes), Heathrow Connect (25 minutes) and the Piccadilly Line (45-60 minutes). The surface access strategy builds on existing projects to provide 17 miles of new railway on the following new rail access lines: Crossrail (25 minutes to Central London and 40 minutes to Canary Wharf); Piccadilly Line upgrade (frequency and journey time improvements); Western Rail Access (direct connections to Slough, Reading and the wider Thames Valley; not committed) , HS2 Heathrow spur (providing an interchange at Old Oak Common, for services to the North; not committed) and Southern Rail access (providing rail access to South and South West London, Surrey and the South Coast; not committed). No new road links are proposed as the sponsors state that <b>it is possible to deliver a third runway without increasing airport-related traffic on the roads.</b>		
<b>Accessibility to Transport Interchanges</b> Key transport interchanges directly served by the proposed rail services include: Paddington; Farringdon; Tottenham Court Road; Bond Street; Canary Wharf; Old Oak Common and Reading. The HS2 Heathrow Spur would enable direct services to Birmingham, Leeds, Manchester, Nottingham, Edinburgh and Glasgow, with journey time savings of between 80 and 120 minutes, compared to today's journey times.		
<b>Accessibility to Workforce</b> Currently, 35% of employees use sustainable modes to access the airport. The target is to increase this to 40%. This would be achieved by public transport service improvements and staff incentives, and reduced staff car parking supply with priority for car sharers. Daily staff vehicle movements are predicted to reduce by approximately 30% with the reduction in staff related car movements off-setting a marginal increase in passenger related traffic. The catchment area for airport employees is expected to be increased, with the improvements to rail services.		
<b>Modal Split Assumptions</b> Currently 40% of passengers and 35% of employees use sustainable travel modes to access LHR. This represents 19 mppa using public transport, with 8.2 mppa using the underground, 6.8 mppa using bus/coach services and 3.8 mppa using Heathrow Express. The surface access strategy is based on increasing the public transport mode share in 2030 to 50% for passengers and 40% for employees. This would represent 34 mppa using public transport, split as follows: bus/coach (10.2 mppa); underground (6.9 mppa); Crossrail (6.6 mppa); Heathrow Express (5.6 mppa) and Western/Southern Rail (4.7 mppa). However, the biggest component of the increase in public transport mode share from 40% to 50% in 2030 is 'background changes' (3.7%) due to traffic growth, travel cost increases and wider committed rail service improvements.		

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New coach services account for 2.3% of the increase (doubling of frequencies and new routes). Beyond 2030, it has been assumed that improvements in public transport technology and policy/attitude changes would deliver greater modal shift.

## ENVIRONMENT

Overall noise impact	<b><u>183,000 people within airport 57 LAeq contour 21% less than currently affected (2011)</u></b>						57 LA <sub>eq</sub>	<b><u>183,000</u></b>	<b><u>(48,000)</u></b>
								191,000	(49,000)
							55 L <sub>DEN</sub>	<b><u>359,000</u></b>	409,000
SAC		SPA	Ramsar	CA	AONB	SSSI	Listed Buildings	SAM	Houses Lost
-		1	1	-	3	-	5	-	1,270
<b>Air Quality</b> <b><u>Heathrow located in southern part of Hillingdon AQMA with exceedences for NO<sub>2</sub> predominately at residential properties close to heavily trafficked roads. Additional capacity can be delivered at Heathrow whilst meeting air quality standards.</u></b> HAL's analysis is based on modelled results and assumptions for: <ul style="list-style-type: none"><li>2030 with 570,00 ATMs and for 2040 with 740,000 ATMs and expected improved standards and aircraft fleet for 2030</li><li>improvements in road vehicle emissions and assuming an increase use of passenger public transport use to 50%. - Airside emission assumptions include increased use of low emission vehicles.</li></ul> No significant difference between Heathrow runway options for meeting air quality standards.							<b>Mitigation Plan</b> <b><u>Maximise public transport use and restrict access to Low emission vehicles only - 3 objectives and steps set out. No increase in road transport and modal shift to 50% public transport. Work with partners in surrounding areas to ensure air quality limits are not breached.</u></b>		
<b>Noise</b> <b><u>Population within 57 dB Leq will be reduced by 21% compared to 231,000 people affected currently.</u></b> The reduction is due to the change in aircraft emissions as the fleet complies with higher standards outweighing the increased ATMs. Although there is an overall reduction, the population affected includes communities not currently experiencing noise nuisance, an increase in noise nuisance to others and reductions to some. Could provide additional respite for currently affected population but new nuisance for significant population. South West option affects the lowest population compared to other runway options.  Independent noise modelling for comparison provided the following results: <ul style="list-style-type: none"><li>57LAeq: 191,000 people affected (providing a reduction of 49,000 compared to the current population affected.</li><li>55Lden: 409,000 people affected.</li></ul> The difference between the HAL's figures and the independent analysis due to a combination of different assumptions for aircraft mix and flight paths and population data.  <b><u>Current restrictions on night flights assumed and proposal to use of just one runway for small number of night flights - can operate to provide respite to residents through runway alternation. Respite achievable with three runways generally averages to 33% of the time, compared with 50% of the time now and under a 4-runway scenario.</u></b>  Overall South West option affects fewer people than the other runway options and provides similar level of night time noise respite to the North East option based on HAL's analysis.							<b>Mitigation Plan</b> <b><u>Current restrictions on night flights to continue. Potential for further operational mitigation in use of runways. Full packages for compensation/mitigation for new and increased noise exposure</u></b>		
<b>Designations</b> <ul style="list-style-type: none"><li>Impacts on and Wraysbury reservoir, King George VI reservoir and Staines Moor, and the Wraysbury and Hythe End Gravel Pits. All are part of South West London Water Bodies SPA/Ramsar designation (all are individual SSSIs) and are therefore of European/international and national importance.</li><li>These sites are partly designated for their importance for birds. Given the need to control bird strike risk, the overall impact is likely to be greater than</li></ul>							<b>Mitigation Plan</b> Delivery of replacements for very large areas of effective habitat loss would be difficult to achieve.		

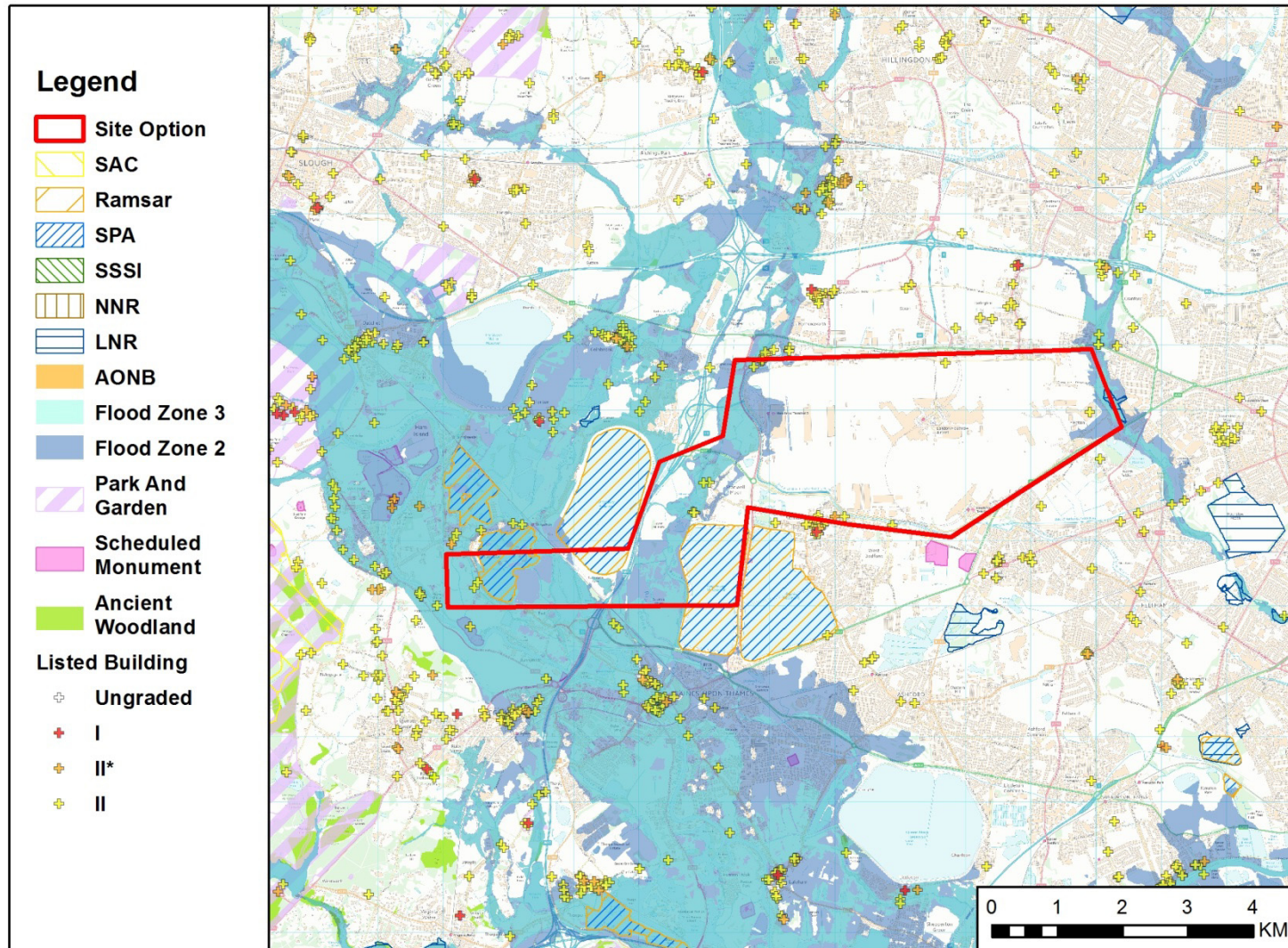
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<p>the physical loss of habitat (assuming the reservoirs would be reconfigured around the runway).</p> <ul style="list-style-type: none"> <li>▪ The extent of impact related to bird strike control on the surrounding sites such as the adjacent Staines reservoir is not clear.</li> <li>▪ Impacts on the SPA/Ramsar sites would require Appropriate Assessment under the Habitats Regulations to determine significant adverse effects on integrity of the site. If there are no alternatives, they would require compensatory measures.</li> <li>▪ Although as a habitat type open water is not difficult technically to replace, finding new locations to replace habitat lost/affected by bird strike control measures would be very difficult. Note for example that Water Companies have struggled to find suitable and acceptable sites for new reservoirs in the region. There may be less resistance to provision of new wetlands.</li> <li>▪ It is not clear without an Appropriate Assessment, required by the Habitat regulations, what the potential for mitigation might be or the scope for what compensation habitat should be provided.</li> <li>▪ 5 Grade 2 listed buildings. Additional impacts on the setting of designated Cultural Heritage sites likely.</li> </ul> <p>All the runway options are within an area of influence for the SPA/RAMSAR site but this South west option potentially has the greatest direct impact. Given the large areas of designated habitat affected it may be difficult to deliver the compensatory measures likely to be required.</p>			
<p><b>Climate Change</b>  <b>Operation: A third runway is consistent with meeting UK's legally binding climate change targets. Providing a UK hub is more carbon efficient than UK customers using a European Hub.</b> This is the same for all runway options and all hub options.  <b>Construction and demolition:</b> As for all Heathrow expansion options - avoids carbon emission related to major demolition and reconstruction for a new hub location.</p> <ul style="list-style-type: none"> <li>▪ Construction related carbon emissions for this South West runway option likely to be higher than for others with the reservoir reconstruction, habitat and flood storage and water supply storage compensation and additional M25 tunnelling.</li> </ul>		<p><b>Mitigation Plan</b>  <b><u>Efficiency potential in technology, modal shift design and operation</u></b>  <b><u>Proposal to increase passenger use of public transport to 50% to contribute to reduce CO<sub>2</sub> emissions.</u></b></p>	
<p><b>Other Issues</b></p> <ul style="list-style-type: none"> <li>▪ Runway crosses River Colne corridor with loss river/riverside habitat and <b><u>1,416,000 m<sup>3</sup> of flood zone 3 storage</u></b> – this would require compensatory storage in addition to run off attenuation.</li> <li>▪ Water supply storage impact through reduction of King George VI and Wraysbury Reservoirs and likely to require alternative storage capacity to be found.</li> <li>▪ Land lost includes Greenbelt land, open space and recreational amenity.</li> </ul>		<p><b>Mitigation Plan</b>  Some compensatory provision indicated as included in costs but no detail given.</p>	

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## PEOPLE

<b>Housing</b> <b><u>Fewest residential properties lost with this option - Stanwell Moor would need to be compulsory purchased.</u></b> Along with the increase in employment opportunities, all Heathrow airport options, are likely to add to housing pressure in the region.	<b>Demolished</b> 1,270
<b>Vulnerable Groups</b> <ul style="list-style-type: none"> <li>For vulnerable groups, the South West option may have the least impact in terms of the fewest number of properties demolished and the level of upheaval and change associated with relocation. However no information was provided for the population profile of the affected areas.</li> <li>High proportion of 'most deprived' wards around Heathrow.</li> <li>Little basis for distinguishing between runway options.</li> </ul>	
<b>Quality of Life</b> <ul style="list-style-type: none"> <li>Negative impacts on communities close to new runway e.g. Wraysbury, Old Windsor, Hythe End and north Staines, through new noise exposure, over flight, and access changes.</li> <li>Impacts on open space loss including the river corridor and setting for local open space e.g. Colne Valley Regional Park.</li> <li>Lowest population noise impact compared to other Heathrow runway options – although additional impacts from aircraft noise increase affecting both new populations and currently affected populations.</li> </ul>	
<b>Wider Social Impacts</b> No major differences between runway options in terms of wider social impacts.	







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## COST

<b>Capital Cost</b>	<b>£ bn</b>
<b>HAL estimates a single point cost estimate of £17.6 bn (at 2013 rates).</b> Independent Cost	<b>Airport</b> 6.3
Analysis assesses the scheme to cost £24.9bn.	<b>Access</b> 3.5
	<b>Other:</b> 2.5
	<b>Sub-Total</b> 12.3
	<b>Risk</b> 4.3
	<b>Optimism Bias</b> 8.3
	<b>Total</b> 24.9
<b>Key Risks</b>	
<ul style="list-style-type: none"> <li>Construction in area currently occupied by reservoirs.</li> <li>Identification of a suitable, alternative location for the relocated reservoirs and obtaining planning permission.</li> <li>Risks associated with the construction of the relocated reservoirs.</li> <li>Construction including an M25 tunnel.</li> <li>Construction adjacent to and in line with the existing southern runway.</li> <li>Tunnelling for rail and road links.</li> </ul>	
<b>Risk and Contingency Allowances</b>	
HAL include a 15% contingency. Independent assessment based upon 35% contingency, reflecting the greater degree of definition of the scheme compared to other submissions, but making a greater risk allocation than for the other Heathrow Airport Limited options to reflect the uncertainty of works in the area of the current reservoirs, and 50% optimism bias applied to risk adjusted cost.	
<b>Surface Access Costs</b>	
£3.5bn estimate for onsite road and rail links and identified costs for offsite highway works (including cut and cover tunnelling for M25) and rail works for additional capacity within the main line network. The surface access sum includes connection to HS2 line at £1.7bn.	
<b>Other Off-Airport Costs</b>	
A general allowance of £0.5bn has been included to cover typical environmental mitigation measures. Significant levels of mitigation and/or compensation required to ensure Water Framework Directive and flood risk storage requirements. Cost is uncertain, but allowing for land acquisition, c £2 bn may not be an unreasonable allowance.	
<b>Summary Comments</b>	
Whilst the approach to cost estimating for the airport works is generally reasonable, the cost underestimates the consequential costs, and specifically excludes the relocation of the negatively impacted reservoirs, leading to an underestimate in total.	

## OPERATIONAL VIABILITY

<b>Capacity</b>	<b>Net</b>	<b>Airport</b>	<b>Net</b>
Increase to existing airport capacity and enabling operations to be conducted in a more resilient manner.	<b>Runways</b>	<b>1</b>	<b>1</b>
	<b>ATM</b>	<b>740,000</b>	<b>260,000</b>
	<b>pax</b>	<b>130</b>	<b>40</b>
<b>Resilience, Reliability and Efficiency</b>			
The proposal supports independent parallel approaches, however, capacity has been constrained to limit noise impacts. The proposal could be defined to improve resilience over current operations.			
Transfer between terminal zones may exceed times acceptable to airlines.			
<b>Safety</b>			
The proposal would be designed to comply with safety requirements, but would cause an increase in flights over central London.			
<b>Scalability</b>			
This proposal only allows for development of a fourth runway by adopting either the northwest or north runway options.			
<b>Airspace</b>			
The proposal would not require significant airspace redesign. The boundaries of the London terminal manoeuvring area (LTMA) would be amended and Heathrow's SIDs, STARS and interfaces with en route airspace would be amended to include the additional runway. However, given the long-term nature of the options and the likely airspace and air traffic management developments under SESAR, restructuring could be achieved as part of the on-going development process. There would not need to be any change of international boundaries.			

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#### DELIVERY

##### Timescale

**Open in 2026, with public policy in place 2015 to 2019.**

##### Commercial Deliverability

- Private financing based on established RAB approach (roughly doubling current RAB value).
- Effects on aero charges etc not stated but asserted to be lower than other hub options, though increased RAB could result in charges rising by 25-40%
- Viability may be dependent upon suggested increase in regulatory period or WACC adjustment.
- Government support of £4-6bn funding plus potential debt underwriting needed to support financeability/viability, raising issues of affordability, value for money and potential legal issues (e.g. State Aid).