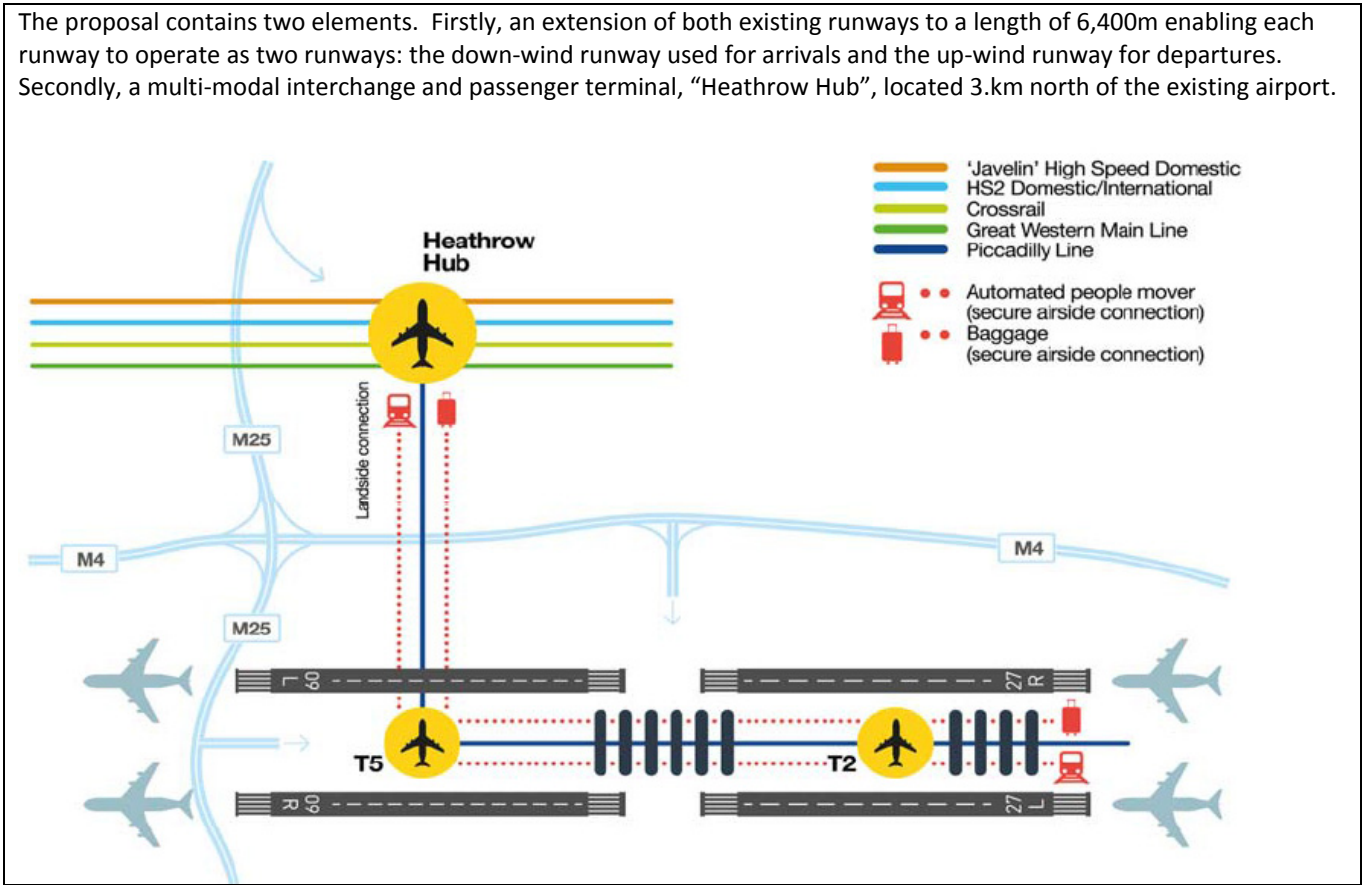


PROPOSAL TITLE:	Heathrow Hub	Group:	LHR
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PROPOSAL



ASSESSMENT SUMMARY

Phased expansion building upon existing airport and surface access infrastructure, with potential to expand to in the longer term if required. Although the scheme offers the potential for greater resilience over current operations, this is perhaps the most uncertain of the Heathrow options. Based upon uncertain, novel operational procedures, which would appear to carry the greatest risk.

Although the proposal would reduce the number of people affected by aircraft noise, the impact is marginal and is the smallest reduction of all of the Heathrow options. The scheme significantly impacts the existing reservoirs west of Heathrow and the SPA, and has a high capital cost compared to some of the other Heathrow options.

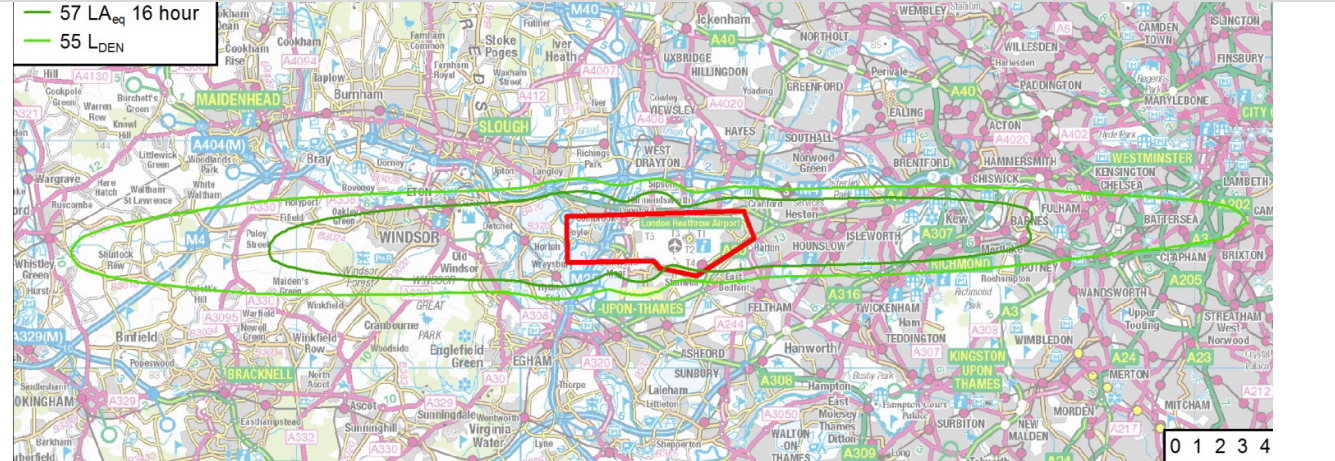
Some services may transfer from Gatwick, Stansted and Luton, because of enhanced opportunities to increase their viability and take advantage of hub connectivity. This may free capacity at those airports but may be seen to limit competition in the London system.

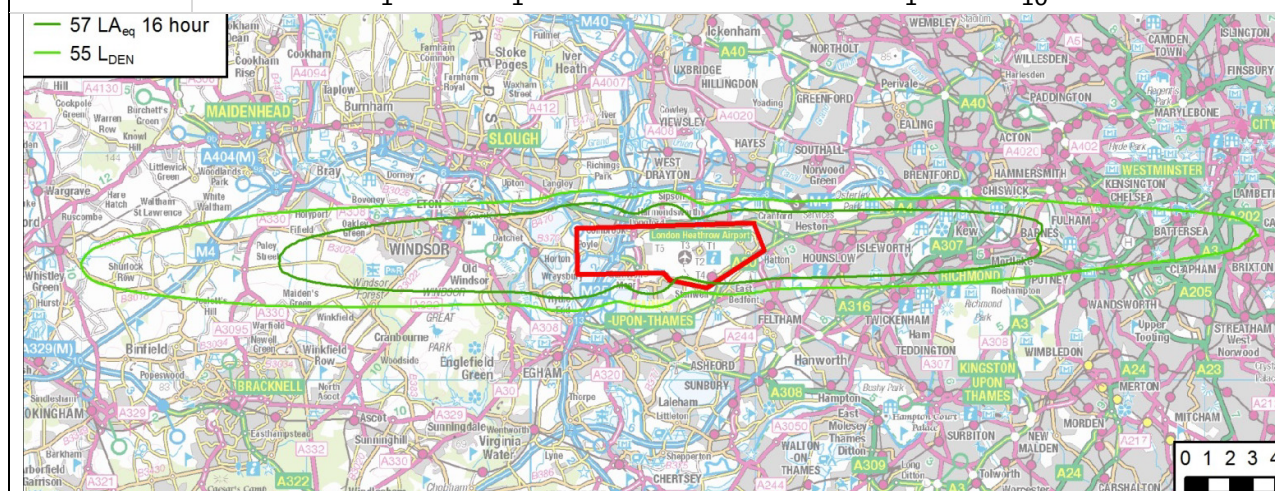
The surface access options would be expected to improve connectivity to regions beyond the southeast. However, the proposed rail links would go beyond what is currently planned, with additional services utilising a HS2/HS1 link (for which funding has yet to be committed) and a high speed service to Bristol and South Wales (not currently part of HS2).

The proposed scheme would add capacity and seeks to offset some of its environmental impacts. The amount of capacity that would be added is significant, but is based upon untried operational procedures.

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OVERVIEW

Approach	Enabling legislation to be provided 2015-2018 with design and procurement commencing, at risk, in 2017, enabling construction to start in 2018 and Phase 1 to open in 2023. Implicit that this would be delivered by HAL through established regulatory capital investment programmes.							Opening Year 2023
Capacity	The mode of operation is untested and therefore, whilst the claimed ATM capacities may be achievable in time, they appear high. The long term, Phase 2, passenger capacity may not be achieved given potential noise constraints.		Runways	Phase 1		Phase 2		
				Airport	Net	Airport	Net	
				3 670,000 120	1 190-220k 30	4 850-900k 170 150	2 370-420k 80 60	
Cost	Allowance for surface access may underestimate the total cost for surface access works to connect to the Heathrow Hub.			Airport	Access	Other	Sub Total	Including Risk/OB
				7.5	3.6	1.5	12.6	26.5
Surface Transport	<ul style="list-style-type: none">Proposals include provision for new remote Air/Rail terminal to link with HS2 and GWML.Would require significant extension of planned HS2 route and HS1-HS2 link.Would require diversion into tunnel and widening of M25.					1 hr isochrone	18	
						2 hr isochrone	38	
						London centre	15miles	
Economic	Borough Unempnt (%)	Hillingdon 7.9	Hounslow 7.5	Ealing 10.7	Slough 8.2	Spelthorne 4.4	Windsor 4.2	Runnymede 4.3
	Ave. Salary (£/yr)	31,086	29,323	29,427	26,837	31,569	37,705	30,930
	County	Bucks	Greater London	Berkshire	Surrey			
	GVA (£/cap)	22,125	34,779	31,057	25,432			
Environment	Significant impacts to a European/International designated reservoir likely to require compensatory habitat provision that could be difficult to deliver. Loss to river corridor and flood plain area requiring diversion and flood compensation storage.						Airport 57 LAeq 55 LDEN	Net 234,000 573,000 (6,000)
	SAC ¹	SPA ¹	Ramsar	CA ¹	AONB ¹	SSSI ¹	Listed Buildings	SAM ¹
	-	1	1	-	1	10	-	Houses Lost 720
<div><div><div>57 LAeq 16 hour</div><div>55 LDEN</div></div></div>								



¹ 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	Bucks	Greater London	Berkshire	Surrey			
GVA (£/capita)	22,125	34,779	31,057	25,432			
Impact on Industry Effectively adding two more runways at Heathrow could provide sufficient long term capacity for the airport to meet forecast demand until at least 2050, 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.							
Airports	Although the operational model is untested, the proposal may add 190,000 ATMs p.a in its first phase rising to 370,000 in its second, on top of the existing 480,000 fully segregated operation at Heathrow. 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.						
Airlines	Airlines currently using Heathrow others seeking to use it 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 increase available capacity there.						
Passengers	Passengers would benefit from increased capacity due to delay reductions and a greater choice of destinations/enhanced frequencies. There may be reduced travel times for a minority of passengers if the Heathrow hub terminal/railway station concept was also implemented.						
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. Almost all will 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 2050.							

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SURFACE ACCESS

Time/Distance to Central London	1 hr isochrone population	Key required upgrade schemes
15 mins 15 miles	18	<ul style="list-style-type: none"> New Heathrow Hub station on Great Western Main Line (GWML) connected to HS2. Automated People Mover system from hub station to airport terminals. Extension of Piccadilly Line. Road Spur from M25 to hub station parking. Capacity improvements to M25 J12-J16, M4 J2-4 and local improvements to A4, A30 and A312.
Journey times to other population centre	2 hr isochrone population	
Birmingham 50 mins Manchester 70 mins	38	

Rail Infrastructure Capacity Analysis

The number of rail links proposed goes beyond what is planned for the UK rail network with additional services utilising an HS2/HS1 link which has yet to have funding committed and a high speed service to Bristol and South Wales which is not currently part of HS2. Many of these links are not committed and if they are vital to the success of the new airport they would need to be examined carefully. The Javelin high speed rail line from Kent to Heathrow and westwards relies on the HS1-HS2 link being built; analysis has been undertaken on London terminal capacity; analysis has been undertaken to verify that the rail services proposed could dissipate a 60% public transport modal share of a 120mppa airport. It is also unclear whether there are available train paths for these services; this requires further analysis. The proposal describes scope for a District Line extension, but this is at a very early stage of planning. More analysis is required to verify if there is sufficient track capacity between the Hub station on the GWML and Paddington to cater for a 4 runway airport with a predicted 60% public transport mode share, and how much rail demand is assumed from the HS1-HS2 link and further westward extensions of HS2.

Highways Capacity Analysis

The baseline assessment of the highway network **identifies M25 J13 – J14 NB and SB, M25 J12-J13 NB and M4 J3-J4 westbound as being at 85% - 99% of capacity** with other routes operating at less than 85% capacity (airport traffic is small proportion of overall traffic in area). Future 2060 forecasts with no airport development identified stress at: **M25 J12-J16; M4 J2-J4 west of M25; and The Parkway (A312) southbound north of M4. Future 2060** with airport development forecasts (assuming a 53.8% car modal split) identified additional impacts at: **M25 J12 –J16 (both directions); M4 J2 –J4 (both directions); A30 London Road over capacity northbound; A4 Bath Road east of Tunnel Road over capacity westbound; Tunnel Road southbound over capacity; A312 The parkway (M4 –A4); The Parkway (A312) north of M4 over capacity southbound and under stress northbound; and A308 High Street exceeds capacity.** The submission states that the highway network will require strengthening with and without the Heathrow expansion but does not recommend specific schemes other than managed motorways and local improvements. The proposed highway improvements may not be sufficient even for the proposed target of 60% usage of public transport. If this aggressive mode share target is not achieved, much more substantial highway improvement schemes will be required.

Accessibility to Population & Business centres

The existing connections to London would remain with the new Crossrail service serving the airport directly (25 minutes to Central London and 40 minutes to Canary Wharf) and Heathrow Express (taking 15 minutes) offering a premium service in addition to the Piccadilly line which would be extended to the new intermodal transport hub. The new integrated hub would connect directly to HS2 and the Great Western Mainline as well as being directly accessed from the M25. **The hub would be served by 50 trains per hour and used by 70 mppa by 2030.** It would bring nearby cities such as Reading and Oxford closer to the airport by rail as currently passengers from these areas use coach, or interchange at Paddington.

Accessibility to Transport Interchanges

The new hub and Crossrail expansion greatly increase the number of transport interchanges served with the potential for direct services to Paddington; Farringdon; Tottenham Court Road; Bond Street; Canary Wharf, Old Oak Common and Reading. The new hub itself would be a major interchange with the potential to serve Kent and Hampshire via a HS2/HS1 link, the North via HS2 and the South West by further extensions to the HS2 network. It is envisaged that regional services from the new hub could also be improved to other areas such as Kent and Hampshire.

Accessibility to Workforce

The proposal leaves in place much of the current transport provision with some reduced journey times to nearby cities such as Oxford and Reading, creating potential for mode shift from car and coach to rail. The submission identifies no modal split targets for employees but does suggest that the public transport modal split could be increased in the future.

Modal Split Assumptions

A 60% public transport modal split could be achieved by public transport improvements and a direct HS2 connection.

Potential Wider Use

The area surrounding the remote terminal would become one of the best connected parts of London with direct connections to most of the country. Many cities to the west would benefit from reduced journey times to Heathrow.

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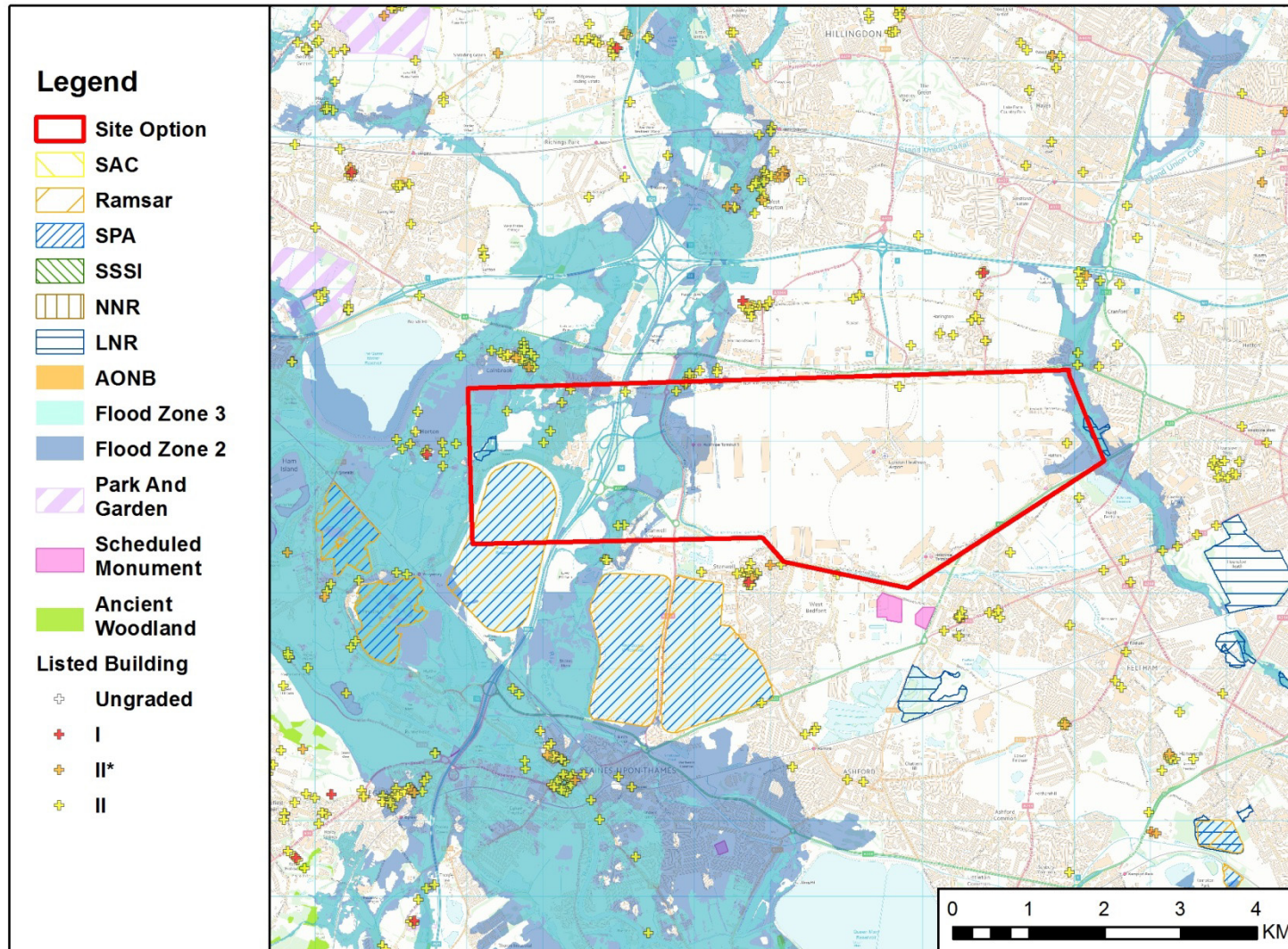
ENVIRONMENT

Overall noise impact	234,000 people within airport 57 LAeq contour; 6,000 fewer than currently affected.						57 LA_{eq}	Airport	Nett
							55 L_{DEN}	573,000	(6,000)
	SAC	SPA	Ramsar	CA	AONB	SSSI	Listed Buildings	SAM	Houses Lost
	-	1	1	-	-	1	10	-	720
Air Quality <u>Overall emissions are expected to remain within EU limits - due to technological improvements.</u> No significant difference between Heathrow runway options for meeting air quality standards							Mitigation Plan		
Noise <u>Flight paths would remain unchanged so no new areas of impact.</u> <u>Longer runways will allow deeper early morning landings to decrease night noise affecting sleep disturbance. A reduction in noise of 68 % is predicted for night time noise in phase 2.</u> The reduction is due to the change in aircraft emissions as the fleet complies with higher standards outweighing the increased ATMs. Moves noise west, therefore although flight paths may be kept the same the option does bring new areas to the west into the 55 L _{den} and 57LA _{eq} noise contours. Independent noise analysis shows 234,000 people within 57LA _{eq} and 573,000 at 55 L _{DEN} . The option provides a reduction of 6,000 to the population currently affected by Heathrow (2012) within the 57 LA _{eq} contour. Overall this option provides the least noise reduction at the 57 LA _{eq} contour of all of the Heathrow options being considered at this stage, leaving the greatest number affected by noise, of all the Heathrow options.							Mitigation Plan <u>Continue existing measures for mitigation. Also increased capacity to be used to accommodate runway alternation schemes</u>		
Designations <u>Wraysbury reservoir would be effectively lost as part of an SPA while bird numbers on surrounding water bodies may be reduced.</u> <ul style="list-style-type: none"> Direct impact on Wraysbury reservoir- part of the South West London Water Bodies SPA/Ramsar SPA/Ramsar site (also an SSSI) and therefore of European/International and national importance. The site is designated largely for its importance for birds. Total loss of the reservoir designation is expected. The extent of impact related to bird strike control or noise changes on other adjacent reservoirs/wetlands is not clear. Impacts on the SPA/Ramsar sites will require Appropriate Assessment under the Habitats Regulations to determine significant adverse effects on integrity of the site, if determined as having no alternatives and being of overriding public interest, compensatory measures will be required. Although as a habitat type open water is not technically difficult to replace, finding new locations to replace habitat lost/affected by bird strike control measures will 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. However, not clear, without Appropriate Assessment what the potential for mitigation would be and the scope of compensatory measures required. Proposal indicates <u>minimum compensation habitat required as 1,995,280m².</u> The Hub option involves significant negative impact on a reservoir forming part of a European/international site which will not be easy to mitigate/compensate for and compensation habitat would be costly to provide. Other designations affected include Grade II listed buildings in Stanwell Moor and Poyle. The Colnbrook Conservation Area is in close proximity to the northern runway and may additionally be affected by surface access changes. Lowest direct loss of cultural heritage sites of the different Heathrow options.							Mitigation Plan New locations to replace large area habitat lost/affected by bird strike control measures, will be difficult. Submitter states that <u>options to provide compensatory habitat have been provisionally identified to maintain integrity on South West London Water bodies SPA.</u> However these are not identified.		

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Climate Change <u>Operation: Emissions for a given number of flights likely to be equivalent to those from other airport solutions.</u> <u>Construction and demolition: M25 tunnelling CO₂ emissions estimated between 1.5- 2.3 Million tonnes.</u> Construction related carbon emissions for this option are likely to be higher than for the north and north west options with the reservoir reconstruction, provision for habitat, flood storage and water supply storage compensation and additional M25 tunnelling.		Mitigation Plan <u>Construction and operational and emission reduction measures</u>	
Other Issues <ul style="list-style-type: none"> Runway crosses River Colne corridor with loss of flood zone 3 storage - this would require compensatory storage in addition to run off attenuation. Water supply storage impact through reduction/loss of Wraysbury Reservoir - likely to require alternative storage capacity to be found. Land lost includes Greenbelt land and open space. Landfill sites within runway footprint - may require relocation. 		Mitigation Plan <u>Mitigation to prevent water pollution</u>	

PEOPLE

Housing <ul style="list-style-type: none"> Residential property in Stanwell Moor and Poyle will be demolished. Along with the increase in employment opportunities, all Heathrow Hub options are likely to add to housing pressure in the region. 	Demolished 720
Vulnerable Groups <ul style="list-style-type: none"> High proportion of 'most deprived' wards around Heathrow. Little basis for distinguishing between runway options. 	
Quality of Life <ul style="list-style-type: none"> Negative impacts on communities close to new runway e.g. Colnbrook and Old Windsor through new noise exposure, over flight, and access changes. Impacts on open space loss including the river corridor and changes to the setting for local open space. 	
Wider Social Impacts No major differences between runway options in terms of wider social impacts	



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COST

Capital Cost	£ bn
<u>Submitter estimates a cost of £12.1 bn (at 2013 rates), adjusted for optimism bias of 50% for airfield works and 60% for Heathrow Hub. Cost includes risk allowance at an unknown percentage. Surface transport costs are specifically excluded, and the cost of replacement reservoirs does not appear to be included.</u>	Airport 7.5
	Access 3.6
	Other 1.5
	Sub-Total 12.6
	Risk 5.0
	Optimism Bias 8.8
	Total 26.5
Independent cost analysis based on common set of assumptions for all similar schemes estimates total cost in the order of £26.5bn.	
Key Risks <ul style="list-style-type: none"> Construction in area currently occupied by reservoirs. Identification of a suitable, alternative location for the relocated reservoirs and obtaining planning permission. Risks associated with the construction of the relocated reservoirs. Diversion and tunnelling of the M25. Construction adjacent to and in line with the existing runways. Tunnelling for rail and road links. Extensive surface transport works local to Hub. 	
Risk and Contingency Allowances Independent assessment based upon 40% contingency and 50% optimism bias applied to risk adjusted cost.	
Surface Access Costs £3.6bn estimate for onsite road and rail links and identified costs for offsite highway works or rail works for additional capacity within the main line network. This, however, may underestimate the broader works required to develop the transport networks to operate the Heathrow Hub.	
Other Off-Airport Costs Significant levels of mitigation and/or compensation required to ensure Water Framework Directive and flood risk storage requirements are met. An allowance of £0.5bn has been provided within the cost estimate. A further allowance of £1bn has been included to cover mitigations measures for compensatory habitat creation and relocation of the negatively impacted reservoirs.	
Summary Comments Whilst the approach adopted for the cost estimation appears reasonable, the cost may underestimate the total cost including reconfiguration of the M25 and relocation of the impacted water reservoirs.	

OPERATIONAL VIABILITY

Capacity	Phase 1		Phase 2	
The mode of operation is untested and therefore, whilst the claimed ATM capacities may be achievable, they appear high. The long term, Phase 2, passenger capacity may not be achieved given potential noise constraints.	Airport		Airport	
	Runways	Net		
	ATM	190-220k	850-900k	370-420k
	pax	30	170	80
			150	60
Resilience, Reliability and Efficiency The mode of runway use is novel, however, the broader infrastructure is based upon traditional approaches. Whilst the scheme may permit some increase in resilience and efficiency of Heathrow's operations, the scheme does not fundamentally change the operation given the constraints imposed by the separation between runways.				
Safety The scheme includes a novel and largely untried operational proposal, which whilst not unreasonable, may require an extended introduction period to fully deliver capacity benefits. Although unusual, it appears likely that the scheme could be designed to comply with safety requirements.				
Scalability Although the proposal is defined within an identified boundary, it appears that additional capacity could be developed if required, broadly in line with the options set out by Heathrow Airport.				
Airspace The proposal would require significant airspace redesign given its novel operating procedures. The London terminal manoeuvring area (LTMA) would be amended and Heathrow's SIDs, STARS and interfaces with en route airspace would be substantially amended to include the additional runways and procedure. 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

Enabling legislation to be provided 2015-2018 with design and procurement commencing, at risk, in 2017, enabling construction to start in 2018 and Phase 1 to open in 2023. Implicit that this would be delivered by HAL through established regulatory capital investment programmes.

Commercial Deliverability

- **Private financing based on established RAB approach.** Scale of investment is in line with capital programmes proposed or undertaken by HAL.
- Assumes transport interchange sold to others rather than included with Heathrow RAB.
- Government support may be needed to support wider investment in surface transport.