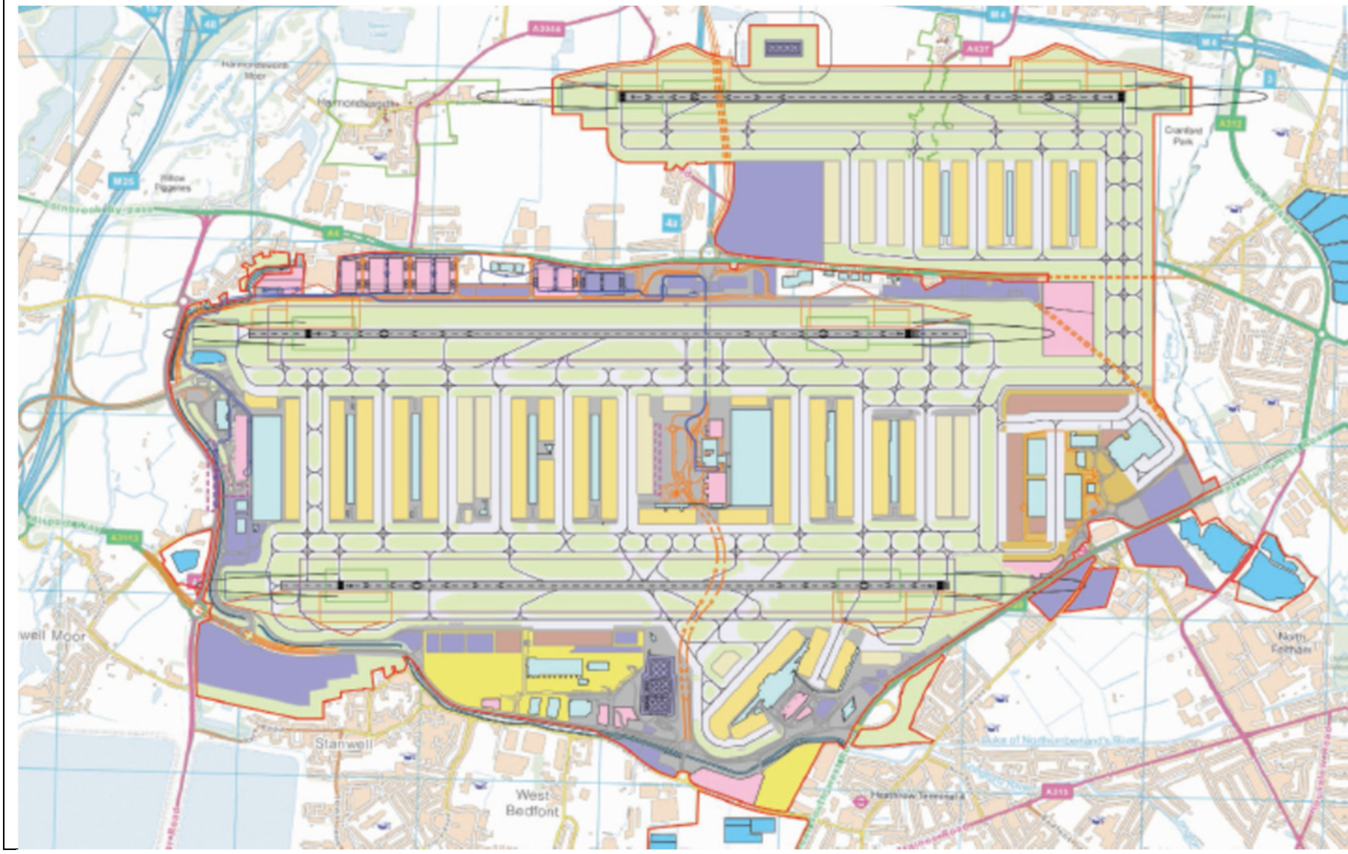
PROPOSAL TITLE:	North Runway	Group:	LHR
SUBMITTED BY:	Heathrow Airport limited	Reference No.:	34

PROPOSAL

New 2,800m runway constructed to the north of the existing airport with linking taxiways to the east of the current north runway. The new runway could operate independently from the existing runways. Includes expansion of existing terminals plus new satellites and aprons located between the new and current northern runways. Requires tunnelling of the M4 Spur under the new runway.



ASSESSMENT SUMMARY

Phased expansion building upon existing airport and surface access infrastructure, with potential to expand to fourth runway if required, however, with the shortest runway, this option has the lowest capacity of the three schemes proposed by Heathrow Airport Limited (HAL). The scheme offers the potential for greater resilience over current operations, although this option may be the least flexible of the three proposed by HAL. This option however has the least capital cost.

A lower population could be affected by noise nuisance than currently although this option has least reduction of HAL's three options. Across the three options, this causes the greatest number of houses to be demolished. This option does not affect the existing reservoirs west of Heathrow.

Some services may 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 whilst making maximum use of existing infrastructure. It is therefore aligned with the Commission's terms of reference.

OVERVIEW

Approach	**Enabling legislation 2015-2029 with construction commencing in 2019 with opening in 2025** (the earliest of HAL's three options) following established regulated mechanism. **Public support for surface access and other costs: property and noise compensation, and mitigation and flood and ecology impact mitigation.**					Opening Year 2025
Capacity					Airport	Net
				Runways	**1**	**1**
				ATM	**702,000**	**222,000**
				pax	**123**	**33**
Cost	Lowest capital cost of HAL's three options.	Airport	Access	Other	Sub Total	Including Risk/OB
		5.1	3.3	0.5	8.9	17.4

Surface Transport	▪ Rail provision includes HEX; Crossrail; improved Piccadilly line; south rail connection, west rail connection and potentially a HS2 spur. ▪ Assumption that extra runways can be provided without any increases of airport-related demand on the surrounding road network. ▪ No major highway upgrades.	1 hr isochrone	16
		2 hr isochrone	36
		London centre	15 miles

Economic							
Borough	Hillingdon	Hounslow	Ealing	Slough	Spelthorne	Windsor	Runnymede
Unempnt (%)	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 (£/cap)	22,125	34,779	31,057	25,432			

Environment	Highest number of residential properties demolished with the loss of 3 communities. In addition to direct losses to listed buildings, the setting of an adjacent Conservation Area and listed buildings would be severely affected. Noise affects the largest number of people for this option compared to the North West and South West runway locations although fewer than the 'Heathrow Hub' option.		Airport	Net
		57 LA_{eq}	**208,000**	**(23,000)**
			205,000	(35,000)
		55 L_{DEN}	**413,000**	
			486,000	

SAC[1]	SPA[1]	Ramsar	CA[1]	AONB[1]	SSSI[1]	Listed Buildings	SAM[1]	Houses Lost
-	-	-	-	-	0	10	0	3,190

[1] SAC: Special Areas of Conservation; SPA: Special Protection Areas; CA: Conservation Area; SSSI: Site of Special Scientific Interest; SAM: Scheduled Ancient Monument.

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

Adding a third runway at Heathrow to the north of the current airport would provide sufficient capacity for the airport to meet expected medium term 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 a south-western runway only.

Airports	Adding a third runway at Heathrow to the north of the existing runways, would provide a capacity increase of 222,000 to the existing 480,000 ATM fully segregated operation at Heathrow from 2025. There would be no changes to competition in the London airport system; although it is possible Heathrow could attract a 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 the south-western site). This option provides the least capacity of any of the Heathrow options, because it provides for a shorter additional runway compared to the alternative proposals.
Airlines	Airlines currently using Heathrow and others seeking to use them 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 is possible from Gatwick which would enhance opportunities for airlines interested in new services at Gatwick.
Passengers	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.

SURFACE ACCESS

Time/Distance to Central London	1 hr isochrone population	Key required upgrade schemes
Paddington 15 mins Docklands 40 mins 15 miles	16	▪ HS2 Heathrow spur ▪ Western rail access line ▪ Southern rail access line
Journey times to other population centre	**2 hr isochrone population**	
Birmingham 50 mins Manchester 70 mins	36	

Rail Infrastructure Capacity Analysis

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 (HEX) 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.

Highways Capacity Analysis

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.

Accessibility to Population & Business centres

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 states that **it is possible to deliver a third runway without increasing airport-related traffic on the roads**.

Accessibility to Transport Interchanges

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.

Accessibility to Workforce

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.

Modal Split Assumptions

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. 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

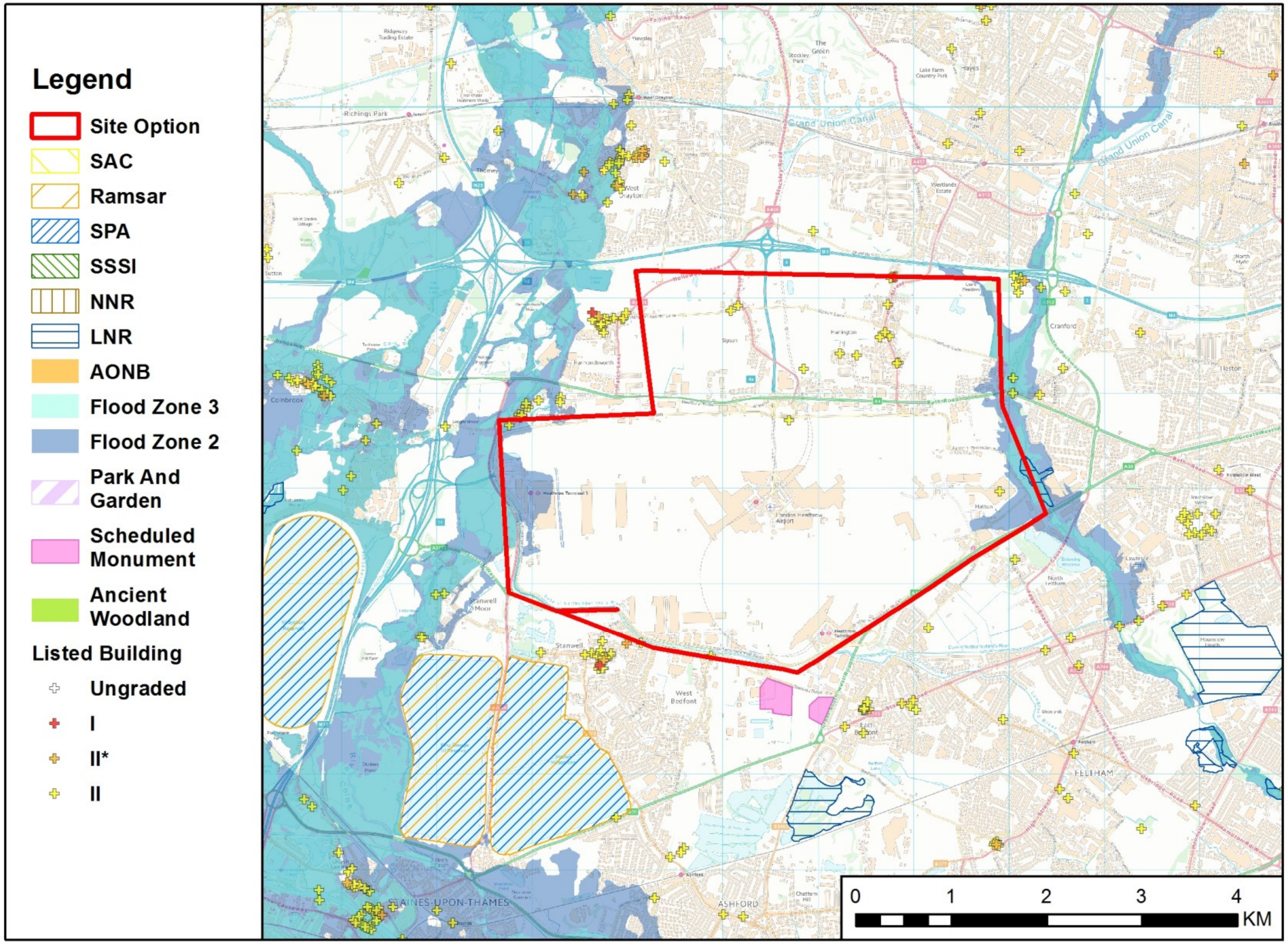
Overall noise impact	**208,000 people within airport 57 LAeq contour. 10% less than currently affected (2011).**							Airport	Nett
							$57\ LA_{eq}$	**208,000**	**(23,000)**
								205,000	(35,000)
							$55\ L_{DEN}$	**413,000**	
								486,000	
	SAC	SPA	Ramsar	CA	AONB	SSSI	Listed Buildings	SAM	Houses Lost
	-	-	-	-	-	0	10	0	3,190

Air Quality	Mitigation Plan
Additional capacity can be delivered at Heathrow whilst meeting air quality standards. HAL's analysis is based on modelled results and assumptions for: ▪ 2030 with 570,000 ATMs and for 2040 with 740,000 ATMs and expected improved standards and aircraft fleet for 2030; and ▪ 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. **Heathrow located in southern part of Hillingdon AQMA with exceedences for $N0_2$ predominately at residential properties close to heavily trafficked roads.** No significant difference between Heathrow runway options for meeting air quality standards.	**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.**
Noise	**Mitigation Plan**
Population within 57 dB Leq will be reduced by 10% compared to 231,000 people affected currently. Reduction due to 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. Independent noise modelling for comparison provided the following results: ▪ 57LAeq: 205,000 people affected (providing a reduction of 35,000 compared to the current population affected, estimated as 240,000 based on 2012 data). ▪ 55Lden: 486,000 people affected. 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. **With same restrictions on night flights and 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.** Overall North option affects the largest population and provides least night time noise respite compared to other options.	**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**

Designations	Mitigation Plan
Expansion avoids loss of listed buildings. Harmondsworth Conservation Area including the Tithe barn and St Mary's church would be retained. Harmondsworth Conservation Area is located close to the western end of the new runway and includes 13 listed buildings. The Great Tithe Barn is a Scheduled Monument and Grade 1 listed building. St Mary's Church is a Grade II* listed building. The area is also an Archaeological Priority Area Significant negative impact on setting of this Conservation Area /listed buildings even if the buildings can be physically retained.	
Climate Change 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.** This is the same for all runway options and hub options. Construction and demolition: No estimates of carbon emission changes given: ▪ Construction related carbon emissions for this North runway option likely to be lower than for North West and South West and much less than a new hub. ▪ As for all Heathrow expansion options - avoids carbon emission related to major demolition and reconstruction.	**Mitigation Plan** **Efficiency potential in technology, modal shift design and operation Proposal to increase passenger use of public transport to 50% to contribute to reduce $C0_2$ emissions**.
Other Issues ▪ **Loss of 6,000m^3 flood zone 3 storage** –much less than the North West and South West runway options. ▪ **Impact on Greenbelt but needs to be weighed against development of national importance of proposals.** ▪ Loss of Greenbelt land and open space including Cranford Park.	**Mitigation Plan**

PEOPLE

Housing	Demolished
Villages Sipson, Harlington and Cranford Cross would be within the new runway footprint with a total of 2700 residential properties demolished ▪ Highest no of residential properties lost compared to North west and Southwest options. ▪ All Heathrow options are likely to add to housing pressure in the region along with the increase in employment opportunities.	3,190
Vulnerable Groups ▪ High proportion of 'most deprived' wards around Heathrow. Little basis for distinguishing between runway options. ▪ The North option may have the greatest impact on vulnerable groups of all the Heathrow options, given it has the largest number of properties demolished and therefore a greater level of upheaval and change associated with relocation. (However no information was provided for the population profile of the affected areas.)	
Quality of Life and Health ▪ The new runway area lies between the M4 and current airport within an area heavily affected by the airport and major transport infrastructure. ▪ Highest population affected by noise impact compared to North West and South West options, only better than the Heathrow Hub option. Significant additional impacts from aircraft noise and access changes on certain residential areas e.g. Harmondsworth which is located west of the North runway.	
Wider Social Impacts No difference between runway options in terms of wider social impacts.	



Legend
Site Option
SAC
Ramsar
SPA
SSSI
NNR
LNR
AONB
Flood Zone 3
Flood Zone 2
Park And Garden
Scheduled Monument
Ancient Woodland
Listed Building
Ungraded
I
II*
II
Grand Union Canal
FELTHAM
STAINES-UPON-THAMES
ASHFORD
0 1 2 3 4
KM

COST

Capital Cost		£ bn
HAL estimates a single point cost estimate of £14.3 bn (at 2013 rates). Independent Cost Analysis assesses the scheme to cost £17.4bn. When compared to other Heathrow schemes which share the same set of common assumptions, this option appears to be the lowest priced option.	Airport	5.1
	Access	3.3
	Other	0.5
	Sub-Total	8.9
	Risk	2.7
	Optimism Bias	5.8
	Total	17.4

Key Risks

- Potential for protracted land acquisition within the area previously allocated for Runway 3.
- Tunnelling for road and rail links.
- Link to HS2.
- Third party provision of wider road and rail upgrades.

Risk and Contingency Allowances

HAL include a 15% contingency. Independent assessment based upon 30% contingency, reflecting the greater degree of definition of the scheme compared to other submissions, and 50% optimism bias applied to risk adjusted cost.

Surface Access Costs

£3.3bn estimate for onsite road and rail link and identified costs for offsite highway works (including tunnelling for the M4 spur) and rail works for additional capacity within the main line networks. The surface access sum includes connection to HS2 estimated at £1.7bn.

Other Off-Airport Costs

Significant levels of mitigation and/or compensation required to ensure Water Framework Directive and flood risk storage requirements are met and an allowance of £0.5bn has been included to cover typical mitigations measures.

Summary Comments

Whilst the approach to cost estimating is generally reasonable, the cost may underestimate the consequential costs, leading to an underestimate in total.

OPERATIONAL VIABILITY

Capacity	Net	Airport	Net
Although the additional capacity would enable operations to be conducted in a more resilient manner than currently, this option, of Heathrow Airport's three, provides the shortest runway and adds the lowest capacity increase.	Runways	1	1
	ATM	702,000	222,000
	pax	123	33

Resilience, Reliability and Efficiency

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, although it may be the least flexible of Heathrow Airport's three submissions.

Transfer between terminal zones may exceed times acceptable to airlines.

Safety

The proposal could be designed to comply with safety requirements, but would cause an increase in flights over central London. As this option has the most easterly landing threshold of Heathrow's three options, this layout would cause aircraft on Runway 27R to be the lowest over London.

Scalability

This proposal only allows for development of a fourth runway by adopting the southwest runway option.

Airspace

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.

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).