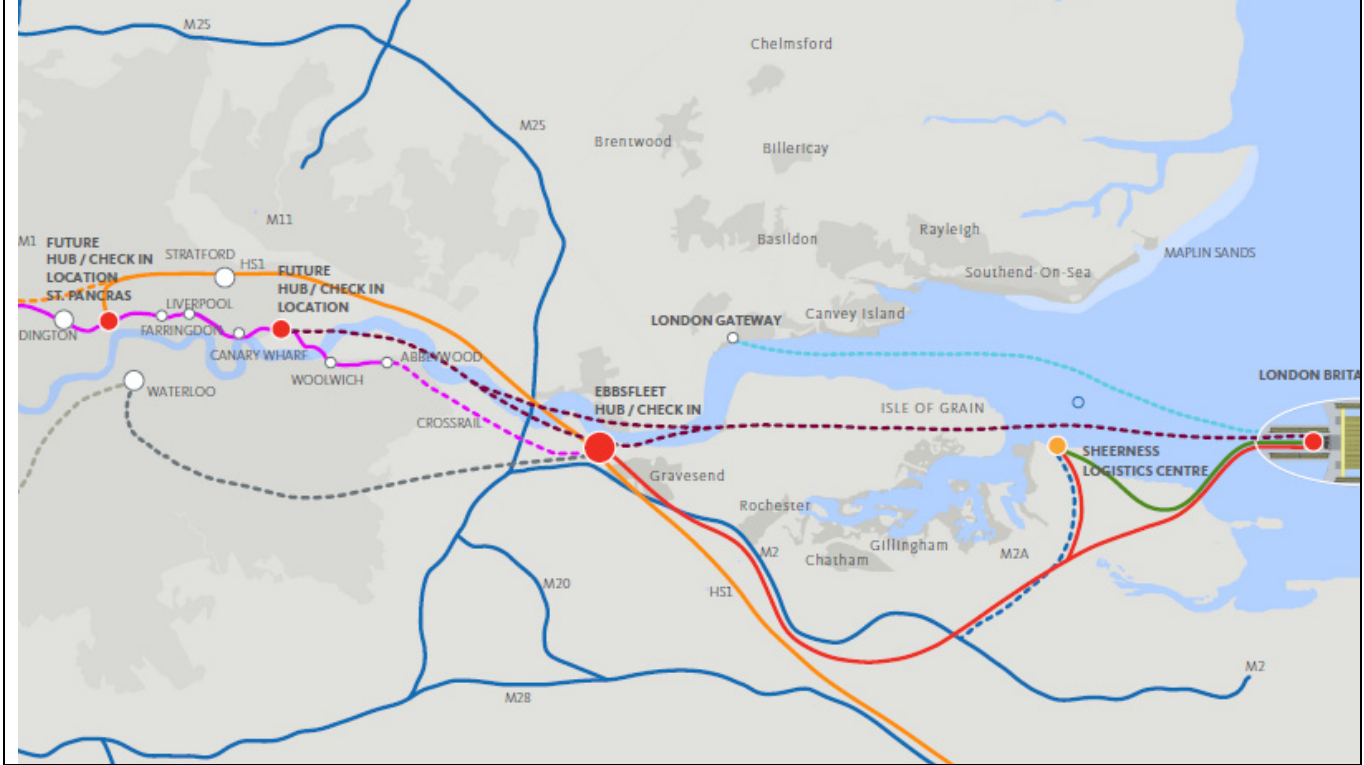


PROPOSAL TITLE:	London Britannia Airport	Group:	New
SUBMITTED BY:	TESTRAD	Reference No.:	50

PROPOSAL

New five (expandable to six) runway airport on a purpose-built island off the north Kent coast. On opening of the new airport Heathrow would be closed and its site redeveloped, with the realised value offsetting the cost of construction of the new airport. Constructed on 15 km by 6 km reclaimed land platform with option to expand to 6 runways. Runways of unspecified length, aligned E/W. Triple independent approaches with dual independent departures or vice-versa.

High speed rail link to an Origin and Destination (O&D) Terminal located at Ebbsfleet. O&D Terminal connected to the M2, HS1, HS2 and Cross Rail. Requires all supporting infrastructure (road and rail links, utilities, etc), plus settlements (with their supporting infrastructure) to accommodate direct and indirect employees to be constructed.



ASSESSMENT SUMMARY

Broadly similar scheme to others in the Thames Estuary or on the Hoo Peninsula, proposing an east of London replacement for Heathrow. As with other off-shore proposals, this scheme offer a substantial reduction to noise affected populations due to the closure of Heathrow. However this proposal removes protected habitats which would require replacement and the demonstration that there is no alternative plus an overriding public need, with provision of compensatory habitats.

Located off-shore and further from existing transport networks, this off-shore proposal has high capital costs (as do the other off-shoe proposals). Complex configuration and infrastructure requirements result sin this option having the highest capital costs, substantially higher than development at existing airports or new sites with better existing surface access.

The early phases of proposed development only replace the lost capacity at Heathrow, with the fuller build-out required to add capacity to the system. The novel runway configuration potentially provides an efficient operation but does not make maximum use of the infrastructure, although it would enable future growth by changing operational procedures without substantial major investment.

Although the scheme adds capacity, and does so without significantly weakening competition in the London system, its cost, location and environmental impact are challenging.

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OVERVIEW

Approach	Enabling legislation to be provided 2015-2020 with construction commencing in 2022; new airport opened and Heathrow closed by 2029. Aside from enabling legislation, the transition between Heathrow closing and the new airport opening is not clear.						Opening Year 2029		
Capacity	The claimed opening phase would replace Heathrow, but not add to system capacity. The longer term claimed capacity (1,134,000 ATM pa, 172 mppa), will add to system capacity and may underestimate the potential runway capacity. Conversely, the claimed 172 mppa could be achieved with fewer movements.			Runways	Airport	Net			
ATM				6	4				
pax				1,134,000	470,000				
				920,000	82				
Cost (£bn)	The off-shore location and the extent of surface access requirements significantly increase the cost.		Airport	Access	Other	Sub Total	Including Risk/OB		
42.4			7.4	1.3	51.1	115.0			
Surface Transport	New lines needed to connect Ebbsfleet to Waterloo, to connect the Ebbsfleet terminal to the airport gates and a Crossrail extension to Ebbsfleet. Additional capacity would be needed at London termini to accommodate additional services and it is questionable whether HS1 has sufficient capacity to accommodate the density of rail usage proposed. It is likely that significant capacity increases will be needed for the M2/A2 and M25 to meet expected traffic demand. Operation of remote terminal means passengers require interchange to access airport. Relies on achieving high rail share of access mode to address highway constraint (65% rail mode share target).				1 hr isochrone	11			
					2 hr isochrone	22			
					London centre	55 miles			
Economic	Borough	Medway UA	Maidstone	Swale	Canterbury	Thanet			
	Unemployment (%)	9.5%	6.7%	7.5%	8.5%	12.1%			
	Ave. Salary (£/yr)	27,378	28,236	28,085	28,371	21,585			
	County	Medway UA	Kent exc UAs						
	GVA (£/capita)	13,631	15,883						
Environment	As with other off-shore proposals in the East of London, there is low risk of air noise impact. Airport to be located on a 90km ² platform, compared to a 55km ² footprint for the TfL outer estuary scheme, all located within a marine SPA & SAC. Additional noise impacts on bird populations in 5 SPAs. Significant compensatory habitats will be required and may be difficult to provide. Major coastal flooding, erosion and estuary process risk, also substantial materials need to be imported to construct Island.				Airport	Net			
					57 LA _{eq}	0	(240,000)		
				55 L _{DEN}	5,000				
	SAC ¹	SPA ¹	Ramsar	CA ¹	AONB ¹	SSSI ¹	Listed Buildings	SAM ¹	Houses Lost
	1	1	-	-	-	-	-	-	-

¹ SAC: Special Areas of Conservation (or Site of Community Interest); SPA: Special Protection Areas; CA: Conservation Area; SSSI: Site of Special Scientific Interest; SAM: Scheduled Ancient Monument.

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ECONOMY

Borough	Medway UA	Maidstone	Swale	Canterbury	Thanet
Unemployment (%)	9.5%	6.7%	7.5%	8.5%	12.1%
Ave. Salary (£/yr)	27,378	28,236	28,085	28,371	21,585
County	Medway UA	Kent exc UAs			
GVA (£/capita)	13,631	15,883			
Impact on Industry					
A new airport with 5 or 6 runways on an artificial island off Whitstable would provide a net increase of 3 or 4 runways assuming Heathrow is closed, though the runways may not be entirely independent. This would provide sufficient capacity to meet expected hub airport demand to at least 2050. This creates benefits by allowing new services and reducing operational costs due to operation of a more efficient airport, and by allowing significant improvements in connectivity over time. However this may be offset in part by increased landing charges to recover capital costs of construction, and being less well located for the airlines' prime passenger market. It would free up land at Heathrow helping address demand for other uses.					
Airports	The 5 or 6 runways may not be entirely independent due to airspace restrictions, but this should provide sufficient capacity to meet anticipated hub airport demand. The large capacity of the airport would attract network traffic away from Gatwick. It may also restrict growth at Southend Airport, and inhibit development of Manston, but otherwise there is relatively little impact on other regional airports. By enhancing connectivity with the regions, it may see an increase in services to airports in the north of England, Scotland and Northern Ireland.				
Airlines	As with any other major airport on an estuarial site, airlines using Heathrow and others seeking to use it would benefit from the increase in capacity allowing new direct routes, higher frequencies and for reduced delays, because of sufficient capacity for resilience. Greater competition and significantly reduced airline 'slot' values will affect some airlines. Interline traffic would have more potential to increase, enhancing the viability of more direct routes, particularly by airlines based at the new hub. LCC and charter airlines would be likely to face a greater choice of airports, as some network traffic may transfer out of Gatwick because of the greater interlining opportunities.				
Passengers	As with any other large hub airport on an estuarial site, passengers will benefit from increased capacity at the new site via delay reductions, a greater choice of destinations and/or enhanced frequencies, more competition (reducing fares) and faster terminal throughput times. But travel times and costs would increase on average for typical customers, but longer than typical estuarial sites further west, though with reduced travel times in Kent and South East London.				
Local & Regional Economic Impacts					
The airport is located off Swale district (an area of slightly elevated unemployment for the South East). However, it is probably close enough to Medway, Canterbury and Thanet districts, all high unemployment areas, especially Thanet, to attract employment from those. The new site providing an expanded airport with sufficient capacity to meet expected medium term demand would facilitate growth of new and existing industries in aviation, airport and aviation support services and travel, tourism, logistics and other related sectors, to service the growth in passenger and freight demand met by the new airport. It is likely that most of these businesses will have relocated from the vicinity of Heathrow. The immediate effect would be to increase commercial property development in the vicinity of the new site, but there would also be significant potential to redevelop the Heathrow site for both commercial purposes and residential development. The agglomeration effects of the existing Heathrow/Thames Valley/M4 corridor would be diluted significantly, as such businesses may prefer to locate closer to the new airport around the A2 corridor. Reduced noise impacts are likely to have a modestly positive effect on land prices to the east of the Heathrow site, offset by some smaller negative impacts closer to the new airport. There would be significant dislocation of employment, with many employees needing to relocate, although there are lower relative housing prices around nearby towns. Existing commuters in North Kent may experience increased congestion and travel costs, despite the improved transport connections.					
National Economic Impacts					
The main impacts come from the provision of new capacity, enabling more flights and connectivity, and the increase in business and leisure trips, and trade in goods and services (and the indirect effects on inward investment. Increased choices of flights and airlines, reducing travel time and fares should generate significant consumer/welfare benefits. The benefits would be offset by higher access costs from London (although lower costs for Kent and South East London).					

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SURFACE ACCESS

Time/Distance to Central London 22 Minutes 35 mins 55 miles Journey times to other population centre	1 hr isochrone population 11 2 hr isochrone population 22	Key required upgrade schemes <ul style="list-style-type: none"> ▪ New rail line from the airport terminal to HS1 at Ebbsfleet ▪ Crossrail extension to Ebbsfleet ▪ Connection from Ebbsfleet to the old CTRL line to Waterloo ▪ London termini platform capacity improvements ▪ New road tunnel to the airport ▪ New link from airport to M2 ▪ Widening M2/A2 and M25 between the M23 and M11 junctions
Rail Infrastructure Capacity Analysis Indicated that the potential demand is for 10,000 rail passengers per hour assuming an airport of 172 mppa although if the 65% public transport mode share is achieved this could be significantly higher. With increases in Javelin (domestic high speed rail service from Kent) services from central London, a Crossrail extension and improvements to local services that this is achievable. It is possible that there is insufficient line and station capacity in central London termini to provide an O&D hub at Ebbsfleet. Based on existing information, it is unclear whether the proposed rail schemes would be sufficient to cater for airport-related demand (even after taking in to account proposed upgrade schemes), particularly given constraints of capacity on HS1 and London rail termini.		
Highways Capacity Analysis Suggests that highway access is sufficient with the nearby M25, A2/M2 and M20 passing close to the airport . A new M2A road would need to be constructed to serve the Logistics Centre (at Sheerness) in addition to a tunnel to the airport. Assumes that the Lower Thames Crossing is completed prior to the airport opening. Whilst strategic roads pass near to the airport, substantial capacity improvements are likely to be required. This is not addressed in the submission.		
Accessibility to Population & Business centres The airport is located in the outer Thames estuary approximately 55 miles from London. However much of the surface access would operate via a remote terminal at Ebbsfleet. Initially trains to the airport from Ebbsfleet would take 15 minutes although the submission provides for a more direct route to London to allow direct services at 22 minutes (although this speed is much faster than average speeds on HS1 currently). From Ebbsfleet there are direct connections to London using existing infrastructure. Were the HS1/HS2 link to be constructed the airport could be connected to Birmingham and other northern cities. A secondary line could operate to Waterloo from Ebbsfleet utilising the now redundant Eurostar platforms. A Crossrail extension to Ebbsfleet would serve east and central London. Journey times for car journeys would be noticeably longer.		
Accessibility to Transport Interchanges The main transport hub would be Ebbsfleet, from where passengers would travel by train to the departure gates located off-shore on a service which could run up to 15 trains per hour via a tunnel to the airport . Services would run to St Pancras via Stratford. A Crossrail extension would serve important interchanges such as Canary Wharf, Liverpool Street, Tottenham Court Road and local services could serve London Bridge and Charing Cross from Ebbsfleet.		
Accessibility to Workforce With the main airport access via Ebbsfleet, the Thames Estuary, Medway Towns and East London would be located within a reasonable distance of the airport for employees. There are no specific mode shares outlined, but as there is no parking at the airport site itself, those choosing to drive would have to interchange at the O&D terminal. Commuters from north of the Thames by road would pay a toll to use the Lower Thames Crossing.		
Modal Split Assumptions The surface access assumption is initially based upon that of Heathrow with 60% car trips, 30% rail and 10% by bus and coach for both passengers and staff. It is hoped to achieve a public transport mode share of 65% in the future . Their research indicates that with demand of 172 mppa they would need to supply rail services for 10,000 passengers per hour in both directions and 15,000 vehicles per hour for road access . The proposed rail schemes are unlikely to be sufficient to provide the capacity to enable the airport to achieve this target.		
Potential Wider Use The accessibility of Ebbsfleet by road and rail would increase. Other proposed road and rail connections are airport-specific and are unlikely to have significant wider economic benefits.		

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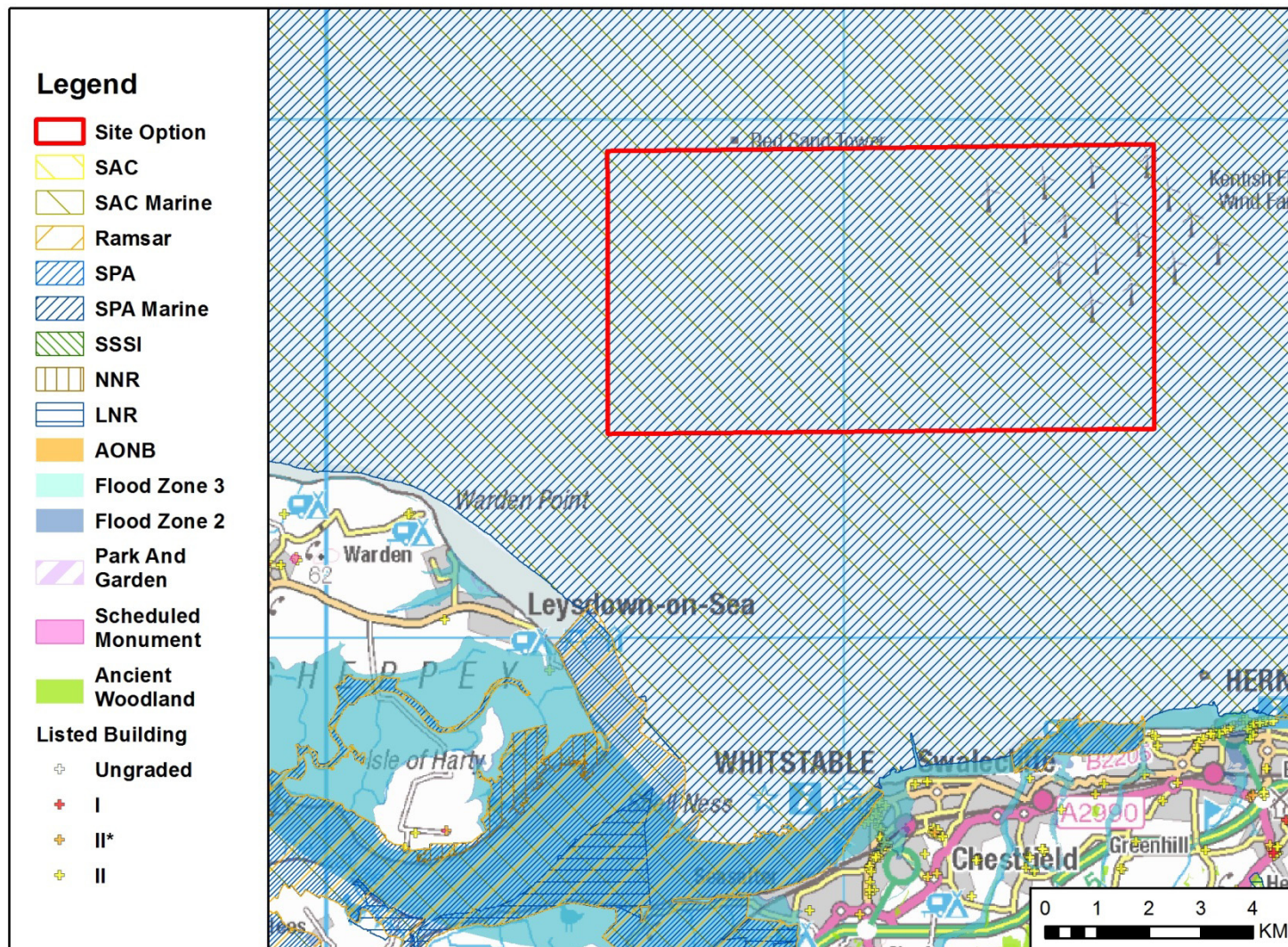
ENVIRONMENT

Overall noise impact	<u>Lack of noise constraints for offshore location will enable 24 hour operation.</u>						Airport	Net
							57 LA _{eq}	0
							55 L _{DEN}	5,000
	SAC	SPA	Ramsar	AONB	SSSI	CA	Listed Buildings	Houses Lost
	1	1	-	-	-		-	-
Air Quality Offshore location unlikely to generate air quality impacts but surface access issues as with other schemes. <u>Other Airports:</u> As for all new hub options, potential for some local air quality benefits through removal or reduction of Heathrow airport's contribution to local NO ₂ . Luton airport would close for this option, with removal of airport and related traffic contribution to air emissions locally.							Mitigation Plan	
Noise <u>Lack of noise constraints for offshore location will enable 24 hour operation.</u> Independent noise modelling for comparison provided the following results: <ul style="list-style-type: none"> 57LAeq: 0 people affected; 55Lden: 5,000 people affected. The population affect by 57LAeq represents a net reduction of 240,000 given the closure of Heathrow.							Mitigation Plan	
Designations <u>Proposal acknowledges the many designated sites in and around the estuary and notes that the majority are SPAs/SSSIs designated for the feeding grounds they provide for over-wintering birds. Proposal acknowledges the site is to be located within the sensitive Outer Thames Estuary SPA. These waters provide important fish spawning and nursery grounds. The offshore areas provide important feeding grounds for red throated divers.</u> The proposed scheme is on a 90km ² reclaimed land platform, representing a significantly higher footprint than the TfL outer estuary scheme (55km ²). The site is located within the Margate and Long Sands SAC and Outer Thames Estuary SPA. Impacts from surface access and associated development not covered. Possible further impacts associated with coastal geomorphology changes. Bird strike risk measures would cause further additional impacts. Significant effects on the Natura 2000 sites are unlikely to be avoidable and therefore compensation i.e. replacement habitat needed. Will need to follow process under Habitats Regulations (implementing EU Habitats and Birds directives) and undertake Appropriate Assessment, demonstrate no alternatives and overriding public interest and provide compensatory measures.							Mitigation Plan <u>Identify least environmentally sensitive location in outer estuary.</u> <u>Habitat compensation.</u>	
Climate Change Level of greenhouse gas emissions will be related to aircraft movements and independent of the airport location. All new hub airports could offer more efficient ground and airspace use e.g. reduced stacking and departure queues. Opportunity to encourage modal shift to rail through new infrastructure arrangements. As a significant new build, construction will involve high carbon emissions likely to be higher than adaptation of an existing resource. Demolition and reconstruction at Heathrow will also result in additional carbon emissions.							Mitigation Plan Proposals to include significant solar tidal and wave power.	

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Other Issues <u>Airport would impact on coastal process (sediment transport, wave climate, tidal currents). Preliminary modelling undertaken for site selection purposes indicated no significant influence on tidal or surge propagation upstream into the Thames Estuary.</u> Substantial materials import required to construct Island. <u>Major sediment impacts during associated dredging work to build platform.</u> <u>Proposal includes overwintering bird distribution map of the inner and outer Thames Estuary, indicating bird strike risk at proposed location should be significantly lower than for the estuary on-shore schemes.</u> Significant impacts from surface transport and additional development which may be considerable.		Mitigation Plan <u>Platform orientation and design has been selected to minimise impacts on tidal flows.</u>	

PEOPLE

Housing <u>Offshore location so loss of housing only for surface access infrastructure.</u> Additional housing requirement in <u>(31,000)</u> in Thames Gateway area	Demolished 0
Vulnerable Groups <u>The plan for a new hub airport can be integrated with the plan for the communities of The Thames Gateway to begin to transform them in social, economic and cultural terms. A coherent, linked-up plan would pave the way for the uplift of the region's social economic culture, and its health and well-being indices, borne of holistically planned regeneration across the Thames Gateway National Priority Area.</u>	
Quality of Life Noise and air quality benefits: considerable net gains for large population around Heathrow. Some noise and air quality disbenefits around new hub, but improved employment and housing access significant contribution to health and quality of life.	
Wider Social Impacts <u>The new hub airport would bring positive transformative economic and social affects to the Heathrow area in the west, and to economically and socially under-performing communities in the east around The Thames Gateway.</u> There are likely to be additional impacts from in-migration of working population in terms of increased pressure on services such as health, housing and education and changes to population mix and health issues. Additional pressure on housing and housing/rental could reduce affordability for the existing population. Social impacts at Heathrow would depend on redevelopment of the airport site and the extent they can provide for housing and employment needs	



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COST

Capital Cost	£bn
Total capital cost, not adjusted for optimism bias, is estimated at £47.3 billion. The submission does not state whether this figure includes a contingency. The cost estimate excludes land acquisition. The cost of this scheme may need to be increased in order to improve flooding protection and greater Runway End Safety Area provision.	Airport 42.4
	Access 7.4
	Other 1.3
	Sub-Total 51.1
	Risk 25.6
	Optimism Bias 38.3
	Total 115.0
Independent Cost Analysis assesses the scheme to cost £115bn.	
Key Risks <ul style="list-style-type: none"> ▪ Nature of reclaimed land platform poses increased risk of differential settlement ▪ Relocation or removal of Kentish Flats wind farm required ▪ Surface Access Links ▪ Marine habitat compensation and coastal flood/erosion protection measures ▪ Sea Bed Licences 	
Risk and Contingency Allowances Given the greater risk of off-shore construction a 50% contingency has been adopted for all costs. A 50% optimism bias has been applied to the risk-adjusted cost.	
Surface Access Costs £7.4bn estimate for road and rail links based on requirement for infrastructure identified by independent analysis.	
Other Off-Airport Costs An allowance of £0.3bn has been included within the independent cost analysis for marine habitat compensation and coastal flooding/erosion protection measures. An allowance of £0.5bn has been made for the relocation of the Kentish Flats wind farm. A further £0.5bn has been included to cover other typical environmental mitigations measures.	
Summary Comments The general approach is reasonable with respect to the airport infrastructure, but underestimates the broader costs. Costs associated with the closure of Heathrow have been excluded.	

OPERATIONAL VIABILITY

Capacity	Runways	Airport	Net
The claimed opening phase would replace Heathrow, but not add to system capacity.		6	4
The longer term claimed capacity (1,134,000 ATM pa, 172 mppa), will add to system capacity and may underestimate the potential runway capacity. Conversely, the claimed 172 mppa could be achieved with fewer movements.	ATM	1,134,000	
		920,000	470,000
	pax	172	82
Resilience, Reliability and Efficiency The proposal supports an interesting configuration of runways designed to avoid the need to cross an operational runway. The proposal could be defined to meet resilience targets.			
Safety There does not appear to be any need to fly over significant population centres on final approach or immediately after departure. The removal of approaches to and departures from Heathrow over central London would increase system safety. Bird strike would represent an unusually high threat compared to inland airport locations. Fog may also present a significant hazard, although its greatest negative impact maybe on capacity.			
Scalability Although the proposal is defined within an identified boundary, it appears that additional capacity could be developed if required, although this would require expansion of the artificial island.			
Airspace The proposal would require significant considerable airspace design in terms of relocating the boundaries of the London Terminal Manoeuvring Area (LTMA), SIDs, STARS and interfaces with en route airspace. The LTMA would extend from the new airport in the east to Gatwick in the South, Luton and Stansted in the north. This would be a major reconfiguration and would also require international consultation and agreement. Given the long-term nature of the option and the likely airspace and air traffic management developments under SESAR, restructuring may be achieved as part of the on-going development process, however this is not certain. International boundaries may require amendment.			

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DELIVERY

Timescale

Enabling legislation to be provided 2015-2020 with construction commencing in 2022; new airport opened and Heathrow closed by 2029.

Sources of funding

Unclear funding strategy. Partly based on estimated £33bn surplus between Heathrow buy-out at RAB value & £45bn redevelopment value. Range of commercial/financing approaches mentioned including RAB model, government guaranteed construction finance, financing by airport operator with some government start-up finance and 3rd party investment. Post construction, indicates that franchises could be sold but unclear what these are. Mentions potential tax hypothecation but recognises may not be achievable. Anticipates end to price capping but international competition has is not factored and uncertain whether CAA would permit in any case. Also seems to suggest departure from well-established Single Till principle.

Commercial Deliverability

Even with government grant the scale of private financing challenge is very significant, but may be achievable subject to regulatory structure and comprehensiveness of government support package. The offshore location may increase the risk profile potentially reducing private sector interest, or increasing the risk premium. The capital cost raises major taxpayer Value for Money questions. Without grant funding landing charges would need to rise to levels that are likely to be unsustainable if the airport were to remain competitive