



Airports Commission: Interim Report

Appendix 2: Assessment of Long-term Options

December 2013

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Section 1:

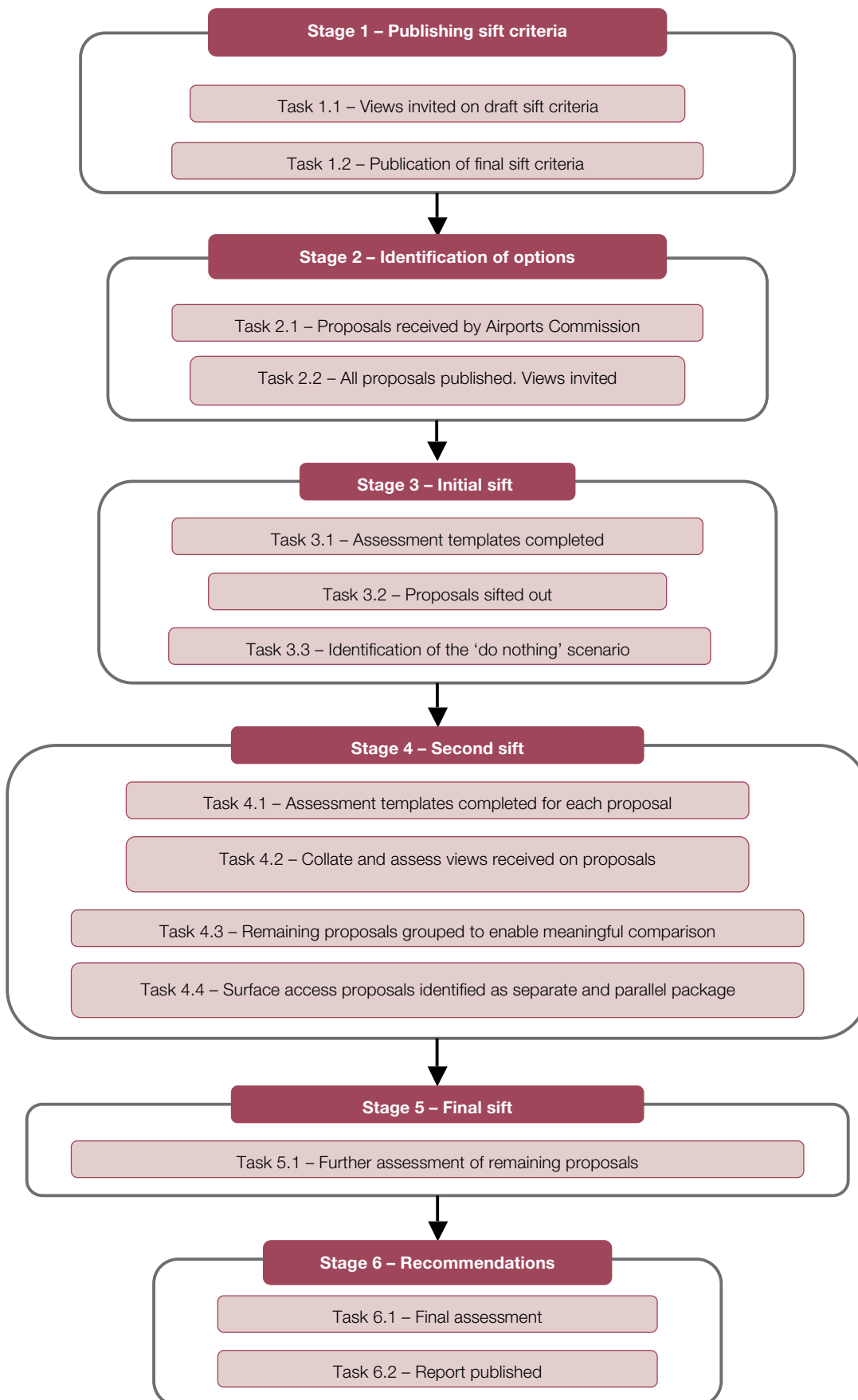
Introduction

- 1.1** The Commission's remit includes examining the evidence on the nature, scale and timing of the UK's future aviation capacity and connectivity needs, in order to maintain the UK's position as Europe's most important aviation hub. This includes publishing a short-list of the most credible long-term options to address the UK's connectivity and capacity needs, to be further developed before the Commission's final report in 2015.
- 1.2** Long-term options are those options which involve the substantial development of a new or existing airport site. This includes the delivery of any major surface access links or other infrastructure required to ensure that the new airport capacity can be utilised.
- 1.3** This appendix describes the process the Commission engaged in to assess the long-term proposals received.

The methodology

- 1.4** The overall methodology that the Commission has followed in coming to its views for the second phase is set out in **Figure 1.1** below. Further detail of each stage is described in its own section in turn below. Supporting documents and evidence to this process such as the assessment templates completed by the Commission's consultants for each proposal submitted are included on the Commission's website.¹

¹ Where referenced in this document the Commission's supporting analysis is available in the "Publications" section of <https://www.gov.uk/government/organisations/airports-commission>

Figure 1.1 The methodology

Section 2

Publishing sift criteria

- 2.1** In the ‘Guidance Document 01: Submitting evidence and proposals to the Airports Commission,’ the Commission set out its intended approach to publishing sift criteria, and advising on the UK’s aviation capacity and connectivity needs.²
- 2.2** It set out the process for submitting proposals to the Commission for providing long-term capacity, and set out some early categories of factors which scheme proposers were encouraged to consider in developing their proposals.
- 2.3** The Commission invited parties interested in developing proposals to send a notification of intention to the Commission by 28 February 2013, in order to facilitate the Commission’s work, and enable the Commission to identify any gaps in the options under consideration.
- 2.4** The Commission also asked for suggestions for sift criteria that might be used to help identify the long-term options, and to send them to the Commission by 15 March 2013. It requested that individuals and proposers with an interest in developing long-term proposals submitted their proposals by 19 July 2013.
- 2.5** In May, the Commission published ‘Guidance Document 02: Long Term Capacity Options: Sift Criteria,’ setting out the sift criteria that the Commission would use to assess submissions on the long-term options.³
- 2.6** The sift criteria were informed by the Commission’s consideration of the key factors underpinning the process alongside around 40 submissions from airports, statutory bodies, airlines, private individuals, lobby groups and businesses.

² Available at <https://www.gov.uk/government/publications/submitting-evidence-and-proposals-to-the-airports-commission>

³ Available at <https://www.gov.uk/government/publications/sift-criteria-for-long-term-capacity-options-at-uk-airports>

Section 3

Identification of options

- 3.1** The Commission received 52 proposals in total, of which 39 were from organisations and 13 from private individuals. Alongside this the Commission also received many comments on possible sites for development or on the question of maintaining the UK's position as Europe's most important aviation hub.
- 3.2** All proposals were published on the Commission's website, occasionally redacted in line with confidentiality and data protection requirements. Further comments on these proposals were then invited from interested parties by 27 September.
- 3.3** Overall the scope and level of detail of these submissions varied substantially and in a number of cases more than one submission was made in relation to the same site. For example, seven different proposals saw expansion at, or in the immediate vicinity of, the current Heathrow site.
- 3.4** The Commission also received a number of proposals relating to the Stansted site, and several for schemes in the Thames Estuary, including two at Cliffe, three on the Isle of Grain and others offshore in the outer Estuary or on the Essex coast.
- 3.5** In addition, a number of proposals were submitted which did not suggest new airport infrastructure, but rather enhanced surface transport links between existing airports. There were also proposals not to have any new airport infrastructure, and to redistribute demand through other methods such as changes to taxation.
- 3.6** The Commission also received a number of items of correspondence in response to both the July and September deadlines offering commentary and analysis. These argued in favour of or against particular types of scheme or locations for expansion, rather than put forward a specific proposal. This commentary and analysis was also taken into account alongside the detailed proposals.
- 3.7** The Commission was supported in the sifting process by a consortium of experienced technical advisers led by LeighFisher and Jacobs UK Ltd ("the Commission's consultants") as well as the Civil Aviation Authority and NATS. Pricewaterhouse Coopers were also appointed to provide analytical and modelling support.

3.8 In addition an Expert Advisory Panel was established to ensure the Commission had access to scientific and technical expertise on issues relating to its work. The terms of reference for the Expert Advisory Panel can be found on the Commission's website.

3.9 Before 19 July, the Commission:

- held discussions with a wide range of stakeholders, including but not limited to, airlines, airports, the Commission on Climate Change, lobby groups, aviation industry stakeholders, the Civil Aviation Authority, Network Rail, the Highways Agency, NATS and the Department for Transport;
- engaged with possible scheme proposers who had questions about the criteria or the wider process; and
- undertook an extensive programme of site visits to UK airports, and potential sites, to understand local and specific issues faced by individual locations.

3.10 After 19 July, in addition to seeking further views and comments on published proposals, the Commission's engagement activities consisted of:

- visits to international airports such as Schiphol and Frankfurt to understand how they operate and how they compare to UK airports;
- visit to Stansted as this had not taken place with other earlier airport visits, and to meet with Fedex and the Association of International Courier and Express Services to understand the impacts on the freight industry; and
- meetings and correspondence with some interest groups and proposers to deal with clarifications in order to ensure the underlying evidence base was as clear as possible, for example to request clarification from proposers on their proposals where appropriate.

3.11 Following early consideration of the 52 proposals, the Commission worked up three additional proposals to address gaps which it was felt should be given consideration:

- new airport, located west of Milton Keynes and east of Bedford to replace Heathrow and Luton airports. Both existing airport sites would be redeveloped for alternate mixed use purposes;
- new airport, constructed as a replacement for Heathrow, located between Maidenhead and Reading, 30 miles west of central London, straddling the M4 and Great Western mainline corridor; and

- significant expansion at Gatwick, in line with the options considered prior to the 2003 Air Transport White Paper consultation documents, as a replacement for Heathrow. A second runway to the south of the existing runway at a width that enables independent operations. A third, independent runway to the north, with an enlarged terminal zone between the current and the additional northern runways. The potential for further expansion to include a fourth runway to the north if required.

3.12 Heathrow Airport Ltd submitted one proposal, which included three runway options with details behind all. For ease of assessment, these were split into three templates:

- new 3,500m runway constructed to the northwest of the existing airport with linking taxiways to the west of the current north runway;
- new 3,500m runway constructed to the southwest of the existing airport with linking taxiways to the west of the current south runway;
- new 2,800m runway constructed to the north of the existing airport with linking taxiways to the existing airport using 'around the end taxiways' to the east of the existing northern runway.

3.13 CentreForum submitted one proposal with ideas for a four runway airport at Heathrow or a four runway option at Luton. These were split into two templates to allow for assessment of each:

- an alternative hub at Luton. This would involve the closure of Heathrow and Stansted, with a second runway developed at Gatwick to accommodate displaced leisure and low-cost flights; and
- a Heathrow development comprising two pairs of closed spaced runways marginally wider apart than the current runways and displaced westwards.

3.14 This brought the total to 58 proposals for the Commission to consider.

Section 4

Assessment of options, initial sift

The assessment of need: a 'do nothing' scenario

- 4.1** The assessment of need is the Commission's analysis setting out the scale and timing of any requirement for additional capacity to maintain the UK's position as Europe's most important aviation hub. In effect the forecasts underpinning the assessment of need provide a picture of what would happen if no additional capacity was added to the system. For this reason the Commission used the analysis of the assessment of need as its 'Do Nothing' option. From consideration of this option it is clear that further capacity is required in London and the South East, and the Commission's aviation demand forecasts provide a baseline for the comparison of different expansion options.
- 4.2** With capacity constraints, total demand across the London airport system is projected to reach around 90 per cent of available runway capacity by 2030, in both 'carbon capped' and 'carbon traded' scenarios. This rate of runway utilisation is above the point at which high levels of reliability would normally be able to be maintained – particularly when they apply to the system as a whole.
- 4.3** With capacity unconstrained (i.e. when passenger choices are not restricted by the limitations of existing runways or other infrastructure), demand in the London airports system would continue to grow such that it would exceed the theoretical maximum capacity by around 14 per cent by 2050. In contrast, there is projected to be significant spare capacity available at airports elsewhere in the country.
- 4.4** Therefore even with a carbon cap and a projected increase in aircraft sizes and loadings, by 2030, demand across the five major London airports would be reaching the limits of what could feasibly be accommodated. By 2050, meeting unconstrained demand for air travel in London and the South East would require just under 1.5 million ATMs per annum, against the currently forecast runway capacity of 1.3 million ATMs. This equates to a gap of some 170-200,000 ATMs.
- 4.5** On the basis that a single runway might accommodate some 200,000 ATMs or more, this suggests that one net additional runway would be able to accommodate demand growth in London and the South East between 2030 and 2050 (or slightly earlier in some scenarios). By the end of that period the system would once again

be above or approaching the limits of its capacity, suggesting that there may be a case for a second additional runway to be operational by around 2050.

The initial sift

- 4.6** The Commission engaged in three sifts in order to come to a short-list of the long-term options. The purpose of each sift was to identify schemes which did not merit more detailed assessment, and could be removed from consideration before coming to a view on what the final short-list of credible options would be.
- 4.7** Before finalising its short-list, however, the Commission reviewed all its sifting decisions in the light of relevant evidence and commentary received.
- 4.8** In sift one, summary templates (two pages long) were generated for all submissions identified as proposals. These were based on the published sift criteria to capture the key high-level information in relation to each proposal.
- 4.9** Each template presents an overview of the proposal and summarises its stated costs and benefits. They set out an overview of the key issues and risks associated with the proposal.
- 4.10** In summary, the Commission sifted proposals out on the basis of three criteria:
- a) the proposals had fundamental issues which could not conceivably be addressed, for example around cost, safety, affordability or deliverability;
 - b) the proposals were similar in scope to other better developed and more detailed proposals; and
 - c) the proposals did not fit with the Commission's remit or offer a solution to the key question of providing additional long-term capacity and connectivity for the UK.

(a) The Commission decided that the following proposals had fundamental issues which could not conceivably be addressed.

Name	Description	Commission's view for sift out
Exhaustless	A scale proof of concept for an innovative assisted take off system. An electromagnetic propulsion system launches modified aircraft at high speeds.	This proposal offers a high risk and unproven concept, with initial requirement for £200m to fund further research into viability. It would be slow to deliver any additional capacity, which would be highly uncertain and dependent on the technology proving viable in a commercial context. The extent to which the proposal fits within international aviation legislative framework and guidelines is unclear.
Imperial College London	Dispersed hub system comprising a number of two-runway airports at Heathrow, Gatwick and Stansted.	This proposal for dispersing airlines according to routes would create market distortions, and generate operational inefficiencies such as split airline operations. EU legislation and bilateral air service agreements would likely have to be significantly amended to facilitate, leading to potentially long lead times with no certainty of delivery.
Private – Foulness	A new airport at Foulness, Essex, on government owned land currently used as an experimental munitions testing facility for the Ministry of Defence.	This proposal on MoD land is not feasible due to ongoing defence requirements at the site and potentially high risks to costs and deliverability associated with converting the site to civilian use. In addition, the location presents no significant benefits over other better-developed proposals to the east of London.
Private – Heathrow 7	Call for action to ensure that Heathrow retains capacity to ensure London has sufficient hub capacity for the long-term. A high level scheme setting out the potential for seven runways and a spaceport is illustrated.	This proposal does not give additional benefit over other proposals with fewer runways for the site. The configuration of the suggested runways does not allow for more capacity than other Heathrow options with fewer runways but requires much more land take.
Private – London East	New two runway airport in the motorway triangle (M25, M26, M20). Some element of traffic distribution.	One element of this proposal involves the redistribution of flights around London airports including this proposed airport. This would likely create market distortions, and generate operational inefficiencies including airlines splitting their operations. EU legislation and bilateral air service agreements may have to be significantly amended as well. The site also has challenging topography being in the North Downs and lies wholly within the Kent Downs AONB.

Name	Description	Commission's view for sift out
Private – Lydd & Gatwick	Proposal for Gatwick to put its existing second runway into service, and for expansion of Lydd Airport near Romney Marshes, potentially adding two runways.	One element of this proposal for an expansion of Lydd airport would likely have operational and capacity constraints due to its proximity to the Dungeness nuclear power station and its associated restricted area of airspace. The second element of this proposal is to make use of the existing second runway at Gatwick; however, there are runway licensing requirements that prohibit the concurrent use of both the runways. In addition the significant distance of Lydd from London and key centres of demand make this an unattractive prospect.
Private – Maplin	New London airport to be constructed on reclaimed land on Maplin Sands as part of a broader programme of infrastructure developments.	This innovative airport concept is not deliverable within current international and national legal and regulatory frameworks and guidelines, which would add significant uncertainty to its deliverability. Location is in the Range Sea Danger Area of a MoD munitions testing area and would likely require surface access through the MoD site and therefore is not feasible due to ongoing defence requirements at the site and potentially high risks to costs and deliverability associated with converting the site to civilian use. In addition, the location presents no significant benefits over other better-developed proposals to the east of London.
Private – Mega Hub	High level design concept for group of “mega hubs” in the South East.	This proposal considers creating multiple hubs within the UK, which would require large land take and face airspace challenges given the configurations of the proposed runways. Also there is no evidence that the UK needs so many hubs and even if feasible would deliver more capacity than necessary.
Private – London Thames Global (Thurrock)	A single runway airport proposed at the London Gateway Logistics Park, a brownfield site and deep water port being developed by DP World on the Thames estuary near Thurrock, south of Basildon.	This proposal would require closure and relocation of DP World's investment in the Thames Gateway for limited additional benefit over other options.

Name	Description	Commission's view for sift out
Private – Walland Marsh	To develop a modular four runway airport on Walland Marsh on the southern Kent coast as a replacement for either Heathrow, Gatwick or Stansted airport.	This proposal is essentially the same site as Lydd airport which would likely have operational and capacity constraints due to its proximity to the Dungeness power station and its associated restricted area of airspace. In addition distance from London and environmental impacts are significant (designated sites affected including a National Nature Reserve, a Special Protection Area and a Special Area of Conservation) make this an unattractive prospect compared to other options.

(b) The Commission believed that the following proposals were similar in scope to other better developed and more credible proposals.

Name	Description	Commission's View for Sift Out
Aras Global	Heathrow to be developed as the UK's hub airport. The scheme comprises various elements including the introduction of mixed mode on existing runways, construction of a third runway and a fourth runway in the longer term.	There are other submissions regarding the Heathrow site that present a more detailed case for similar concepts. Any novel concepts from this proposal were looked at with other Heathrow proposals.
Beckett Rankine	A new airport with up to five runways located on reclaimed land, built upon Goodwin Sands, 71 miles from London and two miles to the east of Deal.	This proposal is not within the bounds of the Thames Estuary so is a significant distance from London and has fewer benefits than those proposals based on a similar strategic case for an offshore site in the Outer Estuary.
London Medway Airport	New four runway airport on the Hoo Peninsular on the north Kent coast, predicated upon the closure of Heathrow.	There are two proposals submitted (London Medway and IAAG) at Cliffe at the western end of the Hoo Peninsula which were very similar in scope. The Commission believed that the more detailed IAAG proposal would be used as the basis for further work on this site, with scope to incorporate elements from the London Medway proposal where appropriate.
MAKE Architects	The scheme proposes a four-runway international hub airport at Stansted, building on existing air, road and rail facilities.	The airport elements of this proposal are less detailed than other proposals for a Stansted hub airport which will be taken forward to the next sift stage to ensure this concept was assessed. Some elements of surface access were considered alongside those from other Stansted hub proposals.

Name	Description	Commission's View for Sift Out
Private – LHR and STN	A range of potential developments at a number of locations around London (existing airports as well as new on and off shore locations). Should a threshold of one million noise impacted residents be considered acceptable, the submission proposes that Heathrow should be developed, otherwise it recommends the development of Stansted into a replacement hub with Heathrow closed and redeveloped.	This proposal is less developed than other proposals for those sites. The ideas behind this proposal, i.e. Heathrow development and Stansted expansion will be tested through analysis of other proposals suggesting expansion of these two airports.
Private – LHR four runways (two southern)	Two additional runways located southwest of the existing airport. Two options appear to be proposed, one with equal length additional runways, one with a shorter northerly of the two new runways	There are other submissions regarding the Heathrow site that present a more detailed case for similar concepts.
Private – Twyford	A new airport development at Twyford in North Buckinghamshire at the intersection of two prospective railway lines: HS2 (London-Birmingham) and the East West line which will eventually connect Southampton and Reading with Bedford, Cambridge and the various northbound Main Lines.	The site of this proposal is a significant distance (c. 50 miles) from London with limited access to current rail links. It is dependent on an additional HS2 station, which does not form part of the HS2 proposed scheme. Limited detail provided by this proposals but similar location to, and no significant additional benefits over, Pleiade Oxfordshire and gap option near Bedford. The focus on this area should therefore be on the Oxfordshire and Bedford options instead.
Progressive Aviation Group	Proposed two sites: RAF Croughton near Brackley, Northamptonshire and a greenfield location near Steventon southwest of Abingdon, Oxfordshire. At either location a new London Gateway Airport comprising four parallel runways, each pair separated by two terminal buildings, which could be provided as a replacement for Heathrow which would be closed and redeveloped.	The Steventon option in this proposal duplicates the London Oxford by Pleiade which is more detailed and therefore the Pleiade option should assessed for this location. The RAF Croughton option contained in this proposal is a significant distance from London (c. 54 miles) with limited access to rail links. Dependent on additional HS2 station, which does not form part of proposed scheme. The area is also essentially covered by Pleiade and Bedford gap option with no apparent significant additional benefits over them.

(c) The Commission also assessed the following proposals did not fit with the Commission's remit or offer a solution to the key question of providing additional long-term capacity and connectivity for the UK.

Name	Description	Commission's view for sift out
Drive Through Airport	The proposal is a concept for a revolutionary view of an airport terminal as opposed to a particular solution to UK airport capacity.	This proposal concentrates on a new concept for the operation of any terminal, changing how planes are processed through the terminal but does not relate to the core issue of runway capacity that the Commission is addressing.
Fairoaks	Fairoaks Airport lies two miles north of Woking. It currently serves General Aviation and some business aviation but has spare capacity within its existing permissions to accommodate more business traffic from Heathrow or another large airport in the south east. Thus it could act as a reliever airport and free up slots to increase hub airport capacity elsewhere.	Proposal presents some potential as a reliever airport, but does not address the larger question of London & South East capacity. The concept of reliever airports, including this one is considered in short and medium term work. Please see Appendix 1 for further information.
Manston	Policy initiatives and surface transport improvements to develop Manston as a 'reliever' airport for London and the South East, freeing up capacity at more congested airports, and reducing the need for new runway capacity to be built.	This proposal presents some potential as a reliever airport, but does not address the larger question of London & South East capacity. The concept of reliever airports is considered in short and medium term work. Please see Appendix 1 for further information.
MSP Solutions	Submitter suggests the construction of an airport in the Severn estuary to replace Bristol and Cardiff airports.	The scale of the contribution of a new airport in the Severn Estuary as presented in this proposal to UK airport capacity is not clear and would not appear to offer additional capacity where the assessment of need identified the demand (the South East). Given that Cardiff and Bristol airports would close, any additional capacity benefit may be small compared to the proposed cost.
Richmond Heathrow Campaign	Range of no-build options that seek to increase passenger throughput, across all London's airports within existing aircraft movement capacities in order to make best use of existing infrastructure.	The Commission has considered a 'do nothing' option (see assessment of need), however the key elements of this proposal (changes in tax regime, use of bigger planes etc) are being considered through other elements of the work programme. Included in this proposal is the concept of dispersing flights around the South East enabling flights with certain destinations to go from certain airports. Such elements would create market distortions, and generate operational inefficiencies such as split airline operations. EU legislation and bilateral air service agreements would likely have to be significantly amended to facilitate.

Name	Description	Commission's view for sift out
Severn24	New two runway airport on a reclaimed island in Severn Estuary with road and rail links to M4 and Great Western Mainline near Newport.	Whilst providing capacity to serve the South West of England and the south of Wales, it is not clear that this proposal would add significantly to overall national capacity, given the almost certain operational and commercial need for Cardiff and Bristol airports to close, therefore the additional benefit may be small against the proposed cost.

4.11 Of the 52 proposals received, ten suggested surface transport or other alternatives to make better use of the UK's current infrastructure. These encompassed a broad range of options, including radial railways around London and "hub-and-spoke" models based from a single central London terminal. The Commission decided to combine elements of these proposals to create three templates testing key themes, which would assess the overall potential to use surface access improvements to address aviation capacity constraints. Table 4.1 below describes these proposals in more detail.

4.12 Alongside these alternatives the Commission also analysed the scope for operational measures at airports to maximise capacity. This work was based on that undertaken as part of the short and medium-term analysis and included:

- revising the planning cap at Heathrow to allow for the theoretical maximum of around 540,000 annual ATMs;
- introduction of mixed mode operations for Heathrow runways to allow both runways to be used for both arrivals and departures as opposed to current operations where a single runway is currently used for arrivals and the other for departures; and
- removing the night flights cap at Heathrow, Gatwick and Stansted so that there are no restrictions on the number of night flights during Heathrow's current operating hours.

Table 4.1 Proposals received offering surface transport and other alternatives

Name	Description
Avery Waterhouse Schabas	Proposal to connect Stansted via Crossrail into central London providing non-stop services from Stansted to Stratford or Canary Wharf.
First Class Partnerships	This submission presents a number of surface access improvements to Stansted as part of a wider transport strategy. It also proposes to construct a four-runway airport at Stansted, with no requirement to close or downgrade Heathrow which is being tested in other proposals.
Greengauge21	This proposal suggests a high speed railway network connecting Heathrow with the south and west over existing railway lines, and new connections to Euston and northbound main lines. It suggests creating a surface transport hub at Heathrow with direct rail connectivity to all of the major cities and regions in England by the late 2020's as well as to south and north Wales and to Scotland.
Grimshaw	This proposal seeks to redefine the concept of a hub airport and proposes that London should become a 'Hub city', with excellent connections to its major airports, encouraging transfer passengers into central London to break up their journey and contribute to the economy.
Interlinking Transport Solutions	Construction of a light rapid transit system alongside the M25, M23 and M1 connecting the existing airports and railway lines is promoted by this proposal. The light rail 'RapidRail' system will mix express services with stopping services and with a maximum speed of 125kph. RapidRail stations will be located close to airport terminals and will integrate with existing stations using elevated platforms and guide ways.
Private – London Orbital Maglev	A London orbital MAGLEV system to connect London's five main airports is suggested in this proposal. It is proposed to run beside/over the M25 with spurs to each airport. This is considered a way to encourage passengers to transfer between airports generating a dispersed hub.
Private –London Orbital HS Railway	Proposal for a high speed underground orbital railway to connect existing capacity and increasing glide slopes to 5.5 degrees.
Private – MERLIN	This proposal suggests the development of Luton Airport as either a single hub with a high speed rail link connecting Luton to HS2 and the East Midlands, the Midland Express Rail Link (MERLIN), or to develop Luton and Heathrow as a dual hub with a new high speed rail link between the two airports.
Private – Universal Hub	The construction of a single universal hub at Farringdon with a station beneath Smithfield Market used by all air travellers irrespective of airport or airline is suggested by this proposal. The Universal Hub would serve London's main airports via direct, non-stop underground rail links.
Quaestus	This proposal suggests the development of high speed rail infrastructure such that all major cities north of Milton Keynes will have a direct connection to Heathrow, reducing the demand for domestic flights. Low frequency domestic flights from regional airports would be expected to be replaced by frequent train services bringing most cities to within three hours of Heathrow.

Section 5

Assessment of options, the second sift

Categorising the remaining proposals

5.1 The remaining proposals were grouped into the following categories to enable more meaningful comparison:

Alternatives to new runways

London Orbital	Linking the London airports by a rapid transit system to enable passengers to interline between airports. The surface transport systems would also be connected to the national rail system to facilitate improved surface access for travellers and workers.
National Network	Substituting domestic flights from UK regional airports into the main London airports by high speed rail with two options: (i) substituting all air traffic, i.e. point-to-point and feeder, connecting traffic; or (ii) only point-to-point traffic. This would require the construction and operation of additional high speed rail links connecting the catchment areas of the regional airports to the main London airports.
London Central	Enable central London to operate as a 'virtual' or actual hub, with a downtown mega-terminal connecting existing London airports.
Maximum Capacity from Airport Operations	Package of proposals to maximise the use of existing capacity at South Eastern airports by removing any planning and operational constraints e.g. operational restrictions on night flights or increasing upper movement caps at Heathrow. This would allow both runways at Heathrow to be used for both arrivals and departures (mixed mode) as opposed to current operations where a single runway is currently used for arrivals and the other for departures (segregated mode). It is based on the option considered for the short and medium term.

Dispersed capacity proposals

Birmingham Airport	One additional wide spaced runway at Birmingham
Gatwick Airport	Three options for one additional runway at Gatwick
Kent County Council and Medway Local Authority	Dispersed model of extra runways at Gatwick and Stansted
Manchester Airports Group	One additional runway at Stansted
Western Gateway Group	Expanded Cardiff to be part of a dispersed model

Heathrow expansion proposals

Heathrow Airport	North Option: one new short wide spaced runway
Heathrow Airport	Northwest Option: one new long wide spaced runway
Heathrow Airport	Southwest option: one new long wide-spaced runway over King George IV and Wraysbury reservoirs
Heathrow Hub	Extend current runway westwards into two very long runways and use as four separate runways
Centre Forum, Policy Exchange joint submission	Relocate the current Heathrow runways to the west and add two more runways

New hub airport proposals

AC Sec – Milton Keynes/Bedford	New four runway hub between Milton Keynes and Bedford
AC Sec – New west London Heathrow	Replacement airport for Heathrow located to the west of current site between Maidenhead and Reading
Fosters and partners	New four runway hub at the eastern end of the Hoo Peninsula
International Aviation Advisory Group	A new airport at the western end of the Hoo peninsula
Metrotidal Limited & Thames Reach Airport Ltd	Several alternate options for an offshore airport/tunnel/bridge/power production concept in the eastern end of the Hoo Peninsula
Pleiade Associates	London Oxford – New four runway hub in Oxfordshire
Thames Estuary Research and Development Company	London Jubilee International Airport (off-shore Thames Estuary airport)
Mayor of London	Isle of Grain – new four runway hub airport at the eastern end of the Hoo Peninsula
Mayor of London	Outer Estuary – new four runway hub airport on an artificial island in the Thames Estuary

Hubs at existing airports proposals

AC Sec – Gatwick Four Runways	Expand Gatwick to a three or four runway hub airport
Manchester Airports Group and Mayor of London	Combined template incorporating both proposals for a four/five runway hub at Stansted
MSP Solutions	Proposal to expand Stansted to four runways, operate Heathrow in mixed mode and build a Severn estuary airport
Policy Exchange and Centre Forum	Expand Luton airport to become a four runway hub
Weston Williamson and partners	Expand Luton airport to become a four runway hub

5.2 These remaining proposals were considered further by the Commission in a second sift. This sift developed the information considered by independently analysing the proposals according to a consistent methodology in relation to the sift criteria e.g. costs, noise impacts etc. Further details are available in the “Long Term Options: Approach and Assumptions” paper.

The second sift

5.3 The following schemes were sifted out at this stage for the following reasons:

Group	Name	Reasons for rejection
Alternatives to new runways	London Orbital	This option does not deliver the additional capacity that will be required in the future as set out in the assessment of need. Obtaining an acceptable transfer time between airports with some of the concepts presented here would be difficult. The option would entail significant cost. Local environmental costs of the infrastructure not quantified but likely to be significant additional impact.
	National Network	This option would entail significant cost. However, with the potential to substitute domestic air journeys there is more possibility that slots at the South East airports might be freed. Analysis of the current slots shows that the potential scope for international flight substitution is limited e.g. under 7% of Heathrow's ATMs. This absolute maximum potential falls short of the identified need, even before consideration is given to the plausibility of turning these slots into additional international movements that increase international capacity. As with London Orbital, local environmental costs would likely be significant.
	London Central	This option does not increase the capacity of the system, rather it improves surface connectivity. Given that demand growth is forecast to exceed overall capacity within the London system, it is unlikely that this approach will mitigate the need for new infrastructure. The validity of the concept that passengers would be drawn to using the central or orbital hubs has yet to be tested, and there are several risks that are deemed not able to be satisfactorily addressed. It also involves considerable cost.
	Maximum capacity from airport operations	The assessment of need concludes that by 2050, with a carbon constraint in place, there is expected to be demand in excess of existing capacity around 170,000 – 200,000 ATMs a year in the South East. It is clear from the work done for the short and medium term that of all the airport operations options looked at, mixed mode and night flights are the only ones that offer any significant additional capacity. Together these offer a maximum of an additional 60,000 ATMs coupled with very significant noise impacts and concerns over resilience. This is deemed not to be sufficient to meet the identified demand.

Group	Name	Reasons for rejection
Dispersed	Birmingham Airport	Significant distance from the key catchment area of London makes it unlikely that this airport would cater as well as more proximate options. It would offer the largest catchment of people within two hours of the airport of all options. This is largely dependent on the journey time assumptions of HS2, which also makes the London airport system easier to access for passengers from Birmingham's core aviation market. Largest noise impacts of the group and current demand profile favours other airports in the group.
	Kent County Council and Medway local authority (various)	This proposal delivers an over provision of capacity compared to the assessment of need and overlaps other options for expansion at Gatwick and Stansted.
	Western Gateway Group (Cardiff)	This proposal has a high cost due to its high speed requirements and does not deliver any significant additional capacity. Furthermore the very limited additional capacity it does deliver is in a region of the country where it is not clear that unfulfilled demand exists. Therefore does not meet the requirements identified in the assessment of need.
Heathrow	Heathrow Airport (one north runway)	The capacity gained by the shorter runway in this option is lower than the other two longer runway options offered by the airport. This option also has the highest number of people within the 57 LAeq contour and the most houses that will need to be demolished of all the Heathrow Ltd options. Other options in the group offer more potential.
	Centre Forum, Policy Exchange joint submission (Heathrow – four west runways)	This proposal entails extending the airport westwards, a concept which has also informed Heathrow Airport Ltd's proposals. There are time, cost and environmental issues associated with building over the reservoir which are not applicable to other options in the group. This option also potentially gives more capacity than is needed at a higher cost than other Heathrow options and is therefore considered less credible.

Group	Name	Reasons for rejection
New	AC Secretariat (New West London Heathrow – Maidenhead)	The assessment of the noise impact of this option appears much greater than the others in the group. It also suffers from environmental issues such as a significant flood plain not associated with other options in the group. Potential need to demolish more houses than others in the group.
	Thames Estuary Research and Development Company (outer estuary)	Compared against the inner estuary options, this is a more expensive proposal due to its surface access requirements and location, and it also delivers an over provision of capacity set against the assessment of need, and will place a large amount of pressure on Ebbsfleet. Its benefit over the inner Estuary proposals is the complete lack of people affected by noise but the inner Estuary offers very few people affected. The inner Estuary was therefore considered a more plausible option for further analysis.
	Mayor of London (outer Estuary)	Compared against the inner Estuary options, this is also a more expensive proposal due to its surface access requirements and location. This option also delivers an over provision of capacity set against the assessment of need. The inner Estuary was therefore considered a more plausible option for further analysis.
	Pleiade Associates (London Oxford)	Although less housing would be demolished and this was cheaper with a better relative noise performance to some others in the group, this option is at a greater distance from London. This proposal would also cause the loss of over 300 hectares of high value agricultural land and would sit on a major floodplain needing significant compensatory storage provision. This area has also been earmarked as a site for a future reservoir by Thames Water.
	AC Secretariat (Milton Keynes/ Bedford)	Amongst the cheapest in the group and located very close to good transport links to the rest of the country, this option is, however, located further from London and the core centre of demand identified in the assessment of need than many other options in the group. This option potentially necessitates the closure of Heathrow and Luton lessening the additional capacity it supplies to the London airport system. It may also impact on the competitiveness of Birmingham and could constrain the maximum utilisation of Stansted, all of which could reduce the competitiveness and capacity of the overall airport system.

Group	Name	Reasons for rejection
Existing	Policy Exchange and Centre Forum (Luton Hub)	Due to the closure of Heathrow and the reduction in capacity at Stansted for commercial and airspace issues respectively that is necessitated by this proposal, the overall effect was considered to be a likely overall reduction in capacity. Therefore despite being amongst the cheapest in the group this option was sifted out.
	Weston Williamson and partners – (Luton Hub)	Due to the closure of Heathrow and the reduction in capacity at Stansted for commercial and airspace issues respectively that is necessitated by this proposal, the overall effect was considered to be a reduction in capacity. Therefore despite being amongst the cheapest in the group this option was sifted out.
	Manchester Airports Group/ Mayor of London (Stansted Hub)	Although only one template was produced at this point for the two similar proposals from the Mayor of London and Manchester Airports Group only the four runway option was sifted out at this stage. The proposal for the four runways gave very little extra capacity in the system due to its likely effect on Luton and the need to close Heathrow. The five runway proposal was taken forward for further assessment.
	MSP Solutions (Stansted Hub)	As per the above proposal, very little extra capacity in the system is created due to its likely effect on Luton and the need to close Heathrow for airspace and commercial issues respectively.
	AC Secretariat (Gatwick four runways)	Maximum capacity is likely to be significantly less than the requirement identified in the assessment of need. Largest number of houses likely to be demolished in the group and only middling noise performance and costs.

5.4 The Commission reviewed the new hub airport proposals and decided to combine elements of the inner Estuary proposals from Foster and Partners, the International Aviation Advisory Group, Metrotidal Limited and Transport for London into one package. In addition, the Commission decided to combine elements of the various Heathrow proposals to offer an option with four runways at Heathrow, which avoided some of the issues associated with those options rejected.

5.5 This left eight proposals to go forward to the final sift with full additional analysis plus the additional limited assessment of Birmingham:

- 1. Heathrow Airport: One new runway northwest option** – Proposed by Heathrow Airport Ltd. New 3,500m runway constructed to the northwest of the existing airport with linking taxiways to the west of the current north runway.
- 2. Heathrow Airport: One new runway southwest option** – Proposed by Heathrow Airport Ltd. New 3,500m runway constructed to the southwest of the existing airport with linking taxiways to the west of the current south runway.

3. **Heathrow Airport: Westerly extension of northern runway** – Proposed by Heathrow Hub Ltd. Firstly, an extension of the most northerly existing runway to a length of 6,400m enabling it to operate as two runways. This option was reduced from the proposer’s four runway option to three runways to allow for comparison with other Heathrow Airport three runway options. Secondly, a multi-modal interchange and passenger terminal, “Heathrow Hub”, located 3km north of the existing airport.
4. **Gatwick Airport one new runway** – Proposed by Gatwick Airport Ltd. Assessment based on the widest spaced runway of the three options provided by the proposer for a second runway to the south of the existing runway, permitting fully independent mixed mode to both runways.
5. **Isle of Grain new hub airport** – A four runway option considered for the Thames Estuary area developed by the Commission incorporating elements from several proposals submitted to the Commission that would give the maximum noise reduction available and the best chance of avoiding an impact on the LNG facility at the south east corner of the Isle of Grain.
6. **Heathrow Airport two new runways** – Developed by the Commission. An option for the provision of a third and fourth runway starting with a northwest runway slightly altered from the single extra northwest runway option with a second additional runway north of that.
7. **Stansted Airport – one new runway** – Proposed by Manchester Airports Group. The most easterly and wide spaced of the two options submitted for a second runway at Stansted, which would allow for fully independent operation on both runways
8. **Stansted Airport Hub** at existing site – Proposed by the Mayor of London. Four new additional runways to allow for retention of the current runway and terminal adjacent to the new four runway hub.

Section 6

Assessment of options, the final sift

6.1 In the final stage, assessments against a number of the sift criteria were undertaken in more detail. To support this, additional work was carried out, including:

- the capacity analysis was developed in the light of analysis from NATS and CAA;
- noise modelling was further refined with additional metrics and better estimations of population;
- surface access analysis was refined with input from Network Rail and the Highways Agency, alongside greater details on expected volumes and flows;
- costs were refined, including any additional surface transport capacity required;
- a 45 minute isochrone was developed alongside the 60 and 120 minute variants to reflect a wider range of journey times to an airport;
- likely financing opportunities of each option were assessed using both the consultant's cost estimate and the proposer's estimates;
- analysis of local and regional GVA as a proxy for economic opportunity as well as 'Index of Multiple Deprivation' for an indication of deprivation around the various proposed sites; and,
- a further specific study into the economic, financial, and social impacts of closing Heathrow was completed.

6.2 All sift assessments were undertaken in a manner to maintain a balance between the sift criteria. Where independent analysis was undertaken, it was done so to ensure consistent assessment across proposals.

Table 6.1: Summary of various key data from stage 5 analysis								
	LHR NW	LHR SW	HH	LGW 2	STN 2	Estuary	LHR 4	STN 5
Total cost £bn	6-9	8-10	6-9	5-6	4-6	39-53	8-10	28-38
Adjusted total cost £bn – 2030	13-18	16-22	13-18	10-13	9-13	82-112	16-22	59-80
57 LAeq – 2030 local – with scheme	142,600	144,600	180,900	6,300	2,500	1,400	144,000	13,500
57 LAeq 2030 net system impact	-8,100	-6,100	30,200	4,400	-1,360	-229,100	-51,350	-188,040
55 LDEN 2030 local	380,900	385,500	357,100	22,200	5,600	5,600	382,000	50,700
Net runways	1	1	1	1	1	1	2	2
ATM (000's)	260	260	190	222.5	268	250	370	317
Pax(mppa)	40	40	30	34	46	53	60	62
House lost	1500	1300	720	200	260	1600	1600	800
Listed blds	30	7	8	15	39	7	32	157
Grade I	1	0	0	0	0	2	1	2
Grade II*	1	0	0	5	1	1	1	7
Number of directly affected designated sites	2xCA	1x SPA, 1x Ramsar, 3x SSSI	0	0	2x SSSI, 2x SAM	2x SPA, 2x Ramsar, 2x SSSI, 5xSAM	1x CA	1x SSSI, 4x SAM
Population (m) within 45 mins travel time	14	14	17	10	6	9	14	9
1 hr	16	16	18	14	12	13	16	16
2 hr	36	36	38	20	25	25	36	27
Increase in aero revenues*	1.5	1.6	1.5	1.3	1.6	3.4	1.6	2.4

*Aero revenues are those charged to the airlines for using the airport

Source: Jacobs

6.3 Chapter 6 of the *Interim Report* describes the most credible options that the Commission has decided should be taken forward to the next phase of its work. The Chapter also describes the further analysis that the Commission intends to carry out on an Isle of Grain option in the next phase of its work.

The final sift

6.4 On the basis of the additional analysis carried out on the remaining eight options at the final sift, those options sifted out were for the reasons stated below. Further details are available alongside the evidence and sources used on the Commission's website.

Stansted – one additional east runway

6.5 This option had the benefit of increasing runway capacity while affecting few new people with noise at a lower cost than many other options. It also required fewer demolitions than other options at this sift apart from Gatwick.

6.6 A combination of issues across a number of sift criteria led to this option being sifted out:

- Strategic Fit:
 - the airport is currently operating at roughly half its permitted capacity and is not forecast to reach capacity until approximately 2040, even with other London airports remaining constrained. It is therefore uncertain that it would provide an effective solution to wider emerging capacity constraints; and,
 - there is lesser immediate catchment around the Stansted area than at Gatwick or Heathrow.
- Surface Access:
 - rail journey times to Stansted are longer (over 40 minutes) from central London than for other options. While the proposal includes some rail improvements, any significant reduction in journey times would require the construction of a new line, which is not currently included in costings.
- Cultural/Heritage Impacts:
 - there are potential impacts on 39 listed buildings and two Scheduled Monuments, more than any other option at this stage for one additional runway.
- Commercial:
 - to fund the debt requirement without government funds, the aeronautical charges would have to increase to around 1.6 times Heathrow's Q6 charges.
 - given the forecast demand, heritage impacts and commercial issues mentioned above, this has not been short-listed as a credible option.

Heathrow – one additional south west runway

- 6.7** Heathrow Ltd supplied three possibilities in its proposal for a third runway option. One of these, a shorter runway to the north of the current site was sifted out after the second sift. This left two options, a third runway to the north west and a third to the south west.
- 6.8** The benefit of the south west option is the increase in connectivity supplied by a larger airport and the reduction in overall noise impacts to the local population while not requiring the large expense of a new hub airport, nor the consequent movement of surrounding businesses. This option also had fewer cultural heritage impacts than most options, with no Grade I or Grade II* listed buildings within the proposed site.
- 6.9** A combination of issues across a number of sift criteria led to this option being sifted out:
- Environment:
 - the proposed location would cause the loss of the King George IV reservoir and a reduction of the Wraysbury reservoir. This impact would require an alternative storage capacity of around 22 million m³ meaning a new reservoir would be required in a location unknown at this stage;
 - to understand the implications of building over reservoirs, Heathrow Ltd commissioned Thames Water to undertake a feasibility study on reservoir replacement. Thames Water explained the importance of maintaining the water supply to London residents and not allowing any development that would potentially reduce that supply. An initial conclusion was that to replace the reservoir could take up to 14 years, and that replacement should take place before construction of any new airport infrastructure, in order to maintain supplies to London;
 - these reservoirs are part of the South West London Water Bodies SPA/ Ramsar designations;
 - locating on this area would potentially cause a flood plain loss of around 670 hectares requiring over 1.4million m² of compensatory storage; and,
 - the Environment Agency has plans to construct a new flood diversion channel (typically around 80 metres wide and five metres deep) in the Lower Thames which the proposed runway would cross.

- 6.10** The issues with the reservoirs, river and flood plain add an extra level of complexity to this site with consequent risk, time and cost meaning it has been sifted out.

Heathrow – four runways

- 6.11** Heathrow Airport Ltd did not put forward a fully developed proposal for four runways (although the concept was described in their submission), however, the Commission looked at this option to ensure there was a full understanding of the possible future of Heathrow. Of the several possible options a fourth runway north of the north west option was analysed. This was chosen as it minimised the cost and avoided creating two separate airport operations at the site, as would have been necessary if the fourth runway was built to the south west of the airport.
- 6.12** The benefits of this option are that the preparation of the fourth runway can be done while building the third runway and would potentially give a large amount of extra capacity without the need for any direct or indirect airport businesses to relocate. However, ultimate capacity may be limited due to interactions with other airports in the London system.
- 6.13** A combination of issues across a number of sift criteria led to this option being sifted out:
- Operational Viability:
 - NATS advise that it may be difficult to realise the full additional benefit of the additional runway in the current London airspace architecture, due to potential impacts on other traffic, potentially resulting in little or no additional capacity across the system; and,
 - the projected capacity if fully realised would be in excess of identified need, which a single additional runway at Heathrow satisfies.
 - Costs:
 - the additional costs of a fourth runway bring extra costs for airport and highway infrastructure as well as the runway, without it being clear that this extra capacity is desirable or possible.
 - Surface Access:
 - the fourth runway would require further disruption to the road system around Heathrow, including major changes to the M25/M4 interchange.

- People:
 - more houses lost than other options except for Estuary which has a similar impact; and,
 - this option provided capacity in excess of the level required by the Commission’s assessment of need, and presented additional costs and transport requirements compared to other Heathrow options. Therefore it was sifted out.

Stansted – five runways

6.14 The proposal submitted by the Mayor of London was for four additional runways plus the retention of the existing runway. The current runway and terminal would be used to serve low-cost carriers with the four further runways built adjacent to the current airport site. These four would be wide spaced independent runways. This would require the closure of Heathrow for commercial reasons and reduction in capacity of Luton and London City. The effects of the closure of Heathrow are discussed in the Isle of Grain explanation below and are relevant to this proposal as well.

6.15 The benefit of this option is the removal of noise impacts to those in west London with a much smaller additional population newly affected in the Stansted area. This option, though expensive is less so than the Estuary option. Also, the additional surface access requirements may be of benefit to the local population outside the airport business.

6.16 A combination of issues across a number of sift criteria led to this option being sifted out:

- Cost:
 - with the large surface access requirements as with the Estuary, on top of the new airport costs, the total cost is very large (although lower than the Estuary) and far higher than the expansion of an existing airport; and,
 - these costs do not include any finance required for buying and closing Heathrow and the resulting requirements to making it attractive to investors (see Isle of Grain section below), nor any costs relating for compensation to Luton or London City for any necessary reduction in their capacity.
- Surface Access:
 - significant additional surface transport infrastructure would be required which would add to the cost, complexity and risk associated with the proposal; and,

- a new high speed line into St Pancras as suggested would cut through a large section of countryside, presenting potentially significant environmental challenges, and would have to be built through – or beneath – north London into a station where there is currently limited platform capacity.
- Operational Viability:
 - airspace interactions with other London system airports may limit the extent of additional capacity achieved;
 - in addition to the closure of Heathrow, Luton and London City would be expected to have their capacities significantly reduced or closed to allow the Stansted site to accommodate the expected volume of traffic;
 - there may also be an upper limit to the total number of ATMs possible at one site. NATS advise that in the London context it may be difficult to achieve much more than one million movements at any one site which would almost eliminate any capacity gain; and,
 - these reductions would not only impact system wide capacity but also fundamentally alter the nature of capacity available for certain sections of the market. The assumption in the proposal that the current runway would remain as is and still attract the low-cost market is untested and may prove difficult in practice. If this could not be sustained the low-cost market would have fewer airport options in the South East.
- Economy:
 - this option would require the closure of Heathrow for commercial reasons and a reduction in capacity at Luton and London City for airspace reasons. The assessment of the economic and social impacts of the closure of Heathrow on west London is uncertain as the relocation of an airport the size and importance of Heathrow is unprecedented.
- People:
 - the closure of Heathrow has potential for immediate adverse effects on employment in the area, though this may subsequently be offset by any longer term positive impact from the redevelopment of the site and the provision of new housing opportunities. The overall balance, nature and extent of economic impacts are highly uncertain and the process would add significant risk to the project; and,

- Stansted is located in an affluent area of the country, offering fewer regeneration opportunities than an Isle of Grain airport, and although broadly aligned with the development corridor along the Lea Valley would not support London’s economic development objectives to the same extent.
- Heritage and Landscape:
 - there would be impacts on a Site of Special Scientific Interest, on 157 listed buildings including two grade 1 and seven grade II* and four Scheduled Monuments; and,
 - there would be a loss of over 2,000 hectares of grade 1 and 2 (best and most versatile) agricultural land.

6.17 A combination of high costs, surface access issues, limited regeneration opportunities, heritage and landscape impacts and potential airspace issues (which could limit the additional capacity achieved significantly) led to this option being sifted out.

Section 7

Recommendations and short-list

Isle of Grain (Thames Estuary) – further assessment

- 7.1** As mentioned above, the Isle of Grain option was created by the Commission using elements of the inner Estuary proposals considered in sift two, reducing the noise impacts to the maximum possible while reducing any impacts on the LNG facility nearby.
- 7.2** A key advantage of this option is that it would deliver the most significant noise reduction of any of the options considered at this stage, effectively solving the problem of airport noise for all but a few thousand people in the South East. It also has potentially lower air quality impacts than most of the other options considered. It would additionally create a new pole of economic development east of London and an opportunity for substantial redevelopment of the Heathrow site. In addition its operations would be subject to fewer restrictions than Heathrow for noise or night operational reasons
- 7.3** These benefits could be significant, but in contrast, the Commission has also identified a number of significant challenges:
- Cost:
 - there is potentially a very large cost; for the airport itself, the new surface access requirements and upgrades to existing networks;
 - these costs do not include any requirements for buying and closing Heathrow and the resulting infrastructure necessary to making the Heathrow site attractive to investors nor any likely costs to buy or compensate London City airport;
 - the redevelopment of the Heathrow site would take many years to complete reducing the financial benefit of buying Heathrow and developing the site; and,
 - the incremental costs of this option are much greater than extending an existing airport.

- Environment:
 - the airport would impact on two Special Areas of Protection (SPA) and two Ramsar Sites which would require appropriate assessment under the UK's Habitats Regulations, including proving no alternatives and the provision of alternative habitats as described in Chapter 6; and,
 - in addition there may also be environmental impacts associated with any required surface access infrastructure, which have not been assessed.
- Commercial:
 - it appears unlikely that a project with the level of capital investment required, without an existing RAB, could go forward without some form of significant government subsidy. There is no precedent for such a large infrastructure project in terms of scale or cost in the UK; and,
 - at the level of investment required for the airport and necessary surface access, the aeronautical charges would have to increase over three times that of the proposed Heathrow Q6 charges to break even.
- Surface Access:
 - the requirement for new roads to connect the airport to existing roadways and the need to expand those connected roadways would be substantial;
 - there would also need to be major improvements in terms of new and existing railways. A new high speed line into central London splitting to two stations of St Pancras (via HS1 line) and Waterloo/Canary Wharf/London Bridge (via a new tunnel under Central London) as well as an extension to Crossrail, would be expensive, and delivery in time to support an opening date before 2030 may be challenging, increasing the project's risk; and,
 - there are a number of risks to the assumptions underpinning the proposed surface access strategy, such as the availability of capacity on HS1 and at the currently unused platforms at Waterloo.
- Economy:
 - this option would require the closure of Heathrow for commercial reasons and London City for airspace reasons. The assessment of the economic and social impacts of the closure of Heathrow on west London is uncertain as the relocation of an airport the size and importance of Heathrow is unprecedented.

- People:
 - the closure of Heathrow has potential for immediate adverse effects on employment in the area, though this may subsequently be offset by any longer term positive impact from the redevelopment of the site and the provision of new housing opportunities. The overall balance, nature and extent of economic impacts are highly uncertain and the process would add significant risk to the project.

7.4 In light of the fact that the costs and risks attached to such a proposal are so high, the Commission believes they present serious challenges to the credibility of it. Given the complexity of some of the issues, however, the Commission does not consider that a firm conclusion can be reached that an Isle of Grain airport option would have no prospect of credibility and further work is required to evaluate these challenges fully.

7.5 In addition, the scale of benefits associated with such a proposal is potentially greater than for any of the other options that the Commission has considered and therefore the Commission intends to carry out further analysis of the feasibility and impacts of an Isle of Grain airport and reach a decision in the second half of 2014 as to whether this constitutes a credible option for detailed development and appraisal. If it concludes that it is, it will be subject to a similar process of appraisal and consultation as the existing short-listed options.

The short-list

7.6 This section offers a brief summary of the key arguments surrounding the short-listed options. These are treated in more detail in **Chapter 6** of the *Interim Report* itself.

Gatwick – one additional south runway

- The existing runway is already nearing its capacity with forecasts showing that an expanded Gatwick could operate at 70% capacity in 2030.
- This capacity could be achieved at a relatively low cost, Stansted offering the only cheaper option. The strong demand suggests that finance could be credibly found, although some form of Government support may be necessary. As with all short-listed options, any Government funding would need to be compliant with European rules on State Aid and this will be considered as part of the assessment of deliverability of options in Phase 2.

- Local noise impacts are of a similar order of magnitude to other incremental expansions of existing airports, but do not offer the massive scale of system wide reductions that a new hub at the Isle of Grain would
- No internationally designated sites are directly impacted though there may be indirect impacts on nearby Sites of Special Scientific Interest, Conservation Areas and Scheduled Monuments.
- There is limited scope for significant regeneration as the area immediately surrounding the airport is relatively affluent, however, there is still potential for local and regional economic and employment benefits.
- Surface transport connectivity is reasonably good with railway connections to two key terminus stations and a catchment area of similar if slightly less magnitude than Heathrow at the 45 and 60 minute boundaries

Heathrow – one additional north west runway

- Demand forecasts indicate that expansion at Heathrow would see the airport operating at around 80-90% capacity by 2030, with a new runway in place.
- The costs of the north west runway would be similar to that of extending the northern runway as proposed by Heathrow Hub Ltd. This would be more expensive than additional runways at Stansted and Gatwick but cheaper than the south west runway at Heathrow. It would be orders of magnitude cheaper than any of the new hub airport options.
- The connections and proximity to central London and the catchment area of the airport is amongst the best of the options considered, reflecting the current extensive infrastructure and some limited additional improvements.
- Expansion at the current site would continue to support the existing agglomeration impacts of the Thames Valley/M4 corridor.
- The site would potentially have indirect impacts on some internationally designated sites and would require the demolition of significant numbers of residences and impacts on local cultural heritage.
- Overall noise impacts at Heathrow are higher than at any of the other locations under consideration, but the noise performance of the airport would possibly be improved by shifting the new runway away from the denser areas of surrounding population. It would be of similar scale to new runways at Gatwick and Stansted but better than the extension of the northern runway. Noise impacts at night and

on the basis of a 55 Lden contour however, would be higher than those from the extended northern runway option.

Heathrow – extension of the northern runway

- Impacts for this option are broadly similar to those for the north west runway with a small number of key exceptions.
- The noise impacts are worse at 57 LAeq as the additional traffic is focussed on the same approach paths as the current runways, however noise impacts at night and using the 55 Lden contour would be lower than for the north west runway option.
- The novel nature of the proposal introduces some risks to the delivery of the capacity as a safety case will need to be made.
- Impacts on local cultural heritage are less significant than for the north west runway option. The extended northern runway option would also result in fewer demolitions of residential properties.
- In addition to the runway option, the proposal also suggests a transport hub to the north of the airport which would improve the already good connectivity of the site further. This could be adopted in relation to either Heathrow runway option and will be investigated further in phase 2 of the Commission's work.