

PROPOSAL TITLE:	Capacity Max	Group:	Other
SUBMITTED BY:	Airports Commission Secretariat	Reference No.:	70

PROPOSAL

A proposal to maximise the use the existing capacity at South Eastern airports by removing any planning and operational constraints e.g. operational restrictions on night flights or increasing upper operational 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.¹

ASSESSMENT SUMMARY

This package provides significant benefits in terms of additional capacity at Heathrow (potentially up to 15%, but more likely in the region of 8-12%). However, this package has potential resilience impacts. It also has very significant public acceptability impacts, to the point where the planning application involved in raising the cap at Heathrow must be considered a lengthy and risky process.

The Maximum capacity packages would substantially increase the ability of Heathrow Airport to meet current and future demand over the short to medium term, by allowing existing and new airlines to increase frequencies and introduce new routes, reducing travel times and fares for passengers (including increased competition). The number of flights that are allowed to be added (between three and nine per hour) will influence the extent to which capacity will be able to respond to demand. The introduction of mixed mode will also allow for a significant improvement in resilience and reliability, although the benefits in reduced delays lessen as the capacity cap is increased (i.e. 540,000 ATM sees significantly lower resilience benefits compared with 500,000 ATM). However, this additional capacity could be expected to be filled up quickly and constraints would return to Heathrow in the mid to longer term, drawing into question its value compared to other expansion options.

¹ This template is based on the analysis carried out for the short and medium term work and as such has not been compiled on an entirely consistent basis, partly as a result of the very different nature of the proposal. The broad scales of impact are, however, comparable with templates looking at other expansion options and given the differing orders of magnitude are comparable on this basis.

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OVERVIEW

Capacity	Limited additional system capacity, main impact at Heathrow; reference case is an increase of 60,000 ATMs to a total of 540,000 ATMs
Economy	Net NPV of between £4.2bn and £4.6bn NPV (2014-2030) compared to the status quo, an increase in NPV of between £1.6bn and £1.9bn compared to the core package. The Maximum capacity package would increase the number of flights at Heathrow by between three and nine per hour on average, enabling airlines to provide additional routes, additional frequencies and allowing more airlines to provide services at Heathrow, including highly valuable night services. It would also deliver initially higher standards of reliability and reduced delays, and would provide lower operating costs for airlines, lower travel times and delays for passengers, and increased connectivity and choice for passengers, both for international and domestic destinations (including connectivity from regional airports to international destinations). However, in the longer term these benefits would disappear as constraints returned to the system. This will contribute towards wider economic benefits by supporting growth in trade, tourism and investment.
Surface Transport	Significant increases in passengers using Heathrow are likely to put some pressure on surface access, which will be partially ameliorated by Crossrail and the Piccadilly line upgrade.
Environment	The overall noise impact is significantly worse than the current situation though expected to be less than any expansion of capacity at the airport. Although (based on anticipated fleet mix changes) ERCD Report 0705 suggested that 540,000 ATMs in mixed mode would by 2030, in comparison to 2002, see the 57dBA L_{eq} contour reduce by approx. 35.5km ² (28%) and the number of people in that contour reduce by 76,700, the overall benefit is considered to be highly negative. This is because the increase in movements will lead to an increase in noise in the short term, and the proposal to remove the night flights cap will be very negatively received by the public.
People	There is a series of trade-offs in impacts on people, from enhanced employment opportunities, through to reduced quality of life where noise impacts are key. At Heathrow, additional night flights and loss of respite are the major impacts, but growth in aviation will provide additional opportunities. Maximising capacity elsewhere is likely to affect other communities currently less conditioned to noise impacts.
Cost	<p>Costs are expected to be low, especially when compared to expansion options. Increased capacity caps are likely to require some additional infrastructure works at Heathrow to accommodate greater numbers of queuing and parked aircraft. Any package that increases ATM caps at the major airports, or requires extension to the night flights regime, will incur additional planning costs, and this should be considered in addition to capital expenditure on infrastructure.</p> <p>The 2007 Impact Assessment carried out to assess the impacts of three different options for increasing Heathrow's capacity estimated that the cost of implementing mixed mode within the 480,000 ATM planning cap would be circa £600 million in 2006 values, adjusted for inflation bias. The Q5 capital investment package (2008-2013, now Q5+1 to 2014) has delivered £4.79bn capital expenditure to date, and in the course of the development of Eastern Campus (T2a and T2B, T3 integrated Baggage, and related apron and runway projects) a large volume of the infrastructure works indicated for mixed mode in the 2006/7 Impact Assessment will have been completed, so additional capital costs are not considered to be significant, although further works on taxiways, aprons and stands will be required.</p>
Operational Viability	Implementing mixed mode at 540,000 ATMs may present some risks that may mean it cannot deliver substantial benefits in terms of resilience. A safety case will be needed to implement full mixed mode at Heathrow.
Delivery	There are substantial delivery risks around obtaining planning permission for increased capacity caps at Heathrow and mixed mode operations, and airspace redesign needed to allow for mixed mode and reduced separation between SIDs. It is not clear to what extent these would be less than those for an expansion proposal; however, the proposal would be subject to an order of magnitude less construction and finance risk than expanding an airport.

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ECONOMIC IMPACTS

Impact on Industry (summary commentary) The primary impact of the maximum capacity package on the aviation industry will be at Heathrow. Heathrow would see additional flights, increasing airline services, including frequencies, routes and airline operators at the airport, and also additional night flights. In addition, airlines and passengers will experience higher savings of time (and operating costs), because the introduction of mixed mode would add to resilience beyond that of operational freedoms. Compared to “do nothing” this package will reduce costs for airlines and passengers, and increase utility for airlines and passengers by delivering net economic benefits by 2030 for the aviation sector and its users, including the value of the remaining core package. Economic benefits from maximum capacity from 500,000 to 540,000 ATMS are going to be less than other expansion options.	
Airports	Compared to the core package, Heathrow will have potentially increased passengers, and associated revenue, of approximately 3M, 5M, 6M or 9M additional passengers in each of the 500k, 515k, 520k and 540k ATM cap scenarios respectively, assuming current passenger to movement ratios. It is likely that this increase in capacity will reduce demand at Gatwick Airport in the short term, as a few services are shifted to Heathrow, but over the longer term capacity constraints at both airports will see Gatwick’s capacity reutilised for other services. The degree of impact on Gatwick is related to the extent to which capacity cap is increased.
Airlines	Airlines will have access to 20k, 35k, 40k or 60k additional slots per year at Heathrow respectively in the 500k, 515k, 520k and 540k ATM cap scenarios. Operational and resilience improvement measures will deliver quantifiable airline cost savings (2014 to 2030) at Heathrow of: <ul style="list-style-type: none"> between £1,527m and £1,364m NPV due to reduced delays (higher efficiency) £201m NPV due to reduced cancellations (higher resilience). They will also deliver potential savings of order £80m NPV in reduced block-time buffers at Heathrow as flight delays reduce and flight times become more predictable. Efficiency measures will deliver delay reduction benefits at other airports during busy times, especially at Gatwick. Compared to the core package, the maximum capacity package will deliver better airline benefits by between £1.36bn and £1.55bn NPV (2014 to 2030) for a total of between £2.88bn and £3.07bn NPV.
Passengers	Passengers will have additional capacity, destinations and frequencies available from Heathrow due to the 20k, 35k, 40k or 60k additional slots at Heathrow respectively in the 500k, 515k, 520k and 540k ATM cap scenarios. Operational and resilience improvement measures will deliver quantifiable passenger cost savings (2014 to 2030) at Heathrow of between £680m and £594m NPV due to reduced delays (with lower benefits for higher capacity cap packages. The core package measures will also deliver benefits at other busy airports, principally Gatwick. The net difference between the maximum capacity scenarios and the core scenario for passenger benefits ranges from £578m and £721m NPV, for the range of 500k-540k (a total net benefit to passengers of between £1.16bn and £1.3bn NPV)
DfT WebTAG Impacts (summary commentary) <ul style="list-style-type: none"> Economic Surplus Producers: Compared to the core package, between £1.4bn and £1.5bn NPV in benefits due to increased ability to respond to demand, greater resilience and reduced operating costs. Economic Surplus Passengers: Compared to the core package, between £0.6bn and £0.7bn NPV in benefits due to reduced travel times and fares, and increased utility from passengers who would not otherwise have travelled. Time Savings From Delay Reduction: £680m, £620m or £594m NPV in the scenarios as passenger benefits above. Public Accounts: Highly likely to be positive, as increased capacity and demand should result in higher APD revenue. Wider Impacts And Regeneration: (See National Economic Impacts, Local & Regional Economic Impacts). Surface Access Impacts: (See below Domestic connectivity). 	
User benefits	Increased choice of direct flights, routes, frequencies and airlines, with reduced delays and cancellations because of the introduction of mixed mode and reduction/elimination of caps on night flights.
Externalities (e.g. noise & CO₂)	Savings are less than available from the core package alone. Based on CO ₂ savings from the 500,000 to 540,000 ATM caps over the period 2014 to 2030, there are central scenario traded carbon cost savings of approximately £126.9m NPV to £49.0m NPV (compared £147.9m NPV for the core). Noise cost benefits have not been quantified. Respite will be lost in the mixed mode scenario at Heathrow, although total noise exposure reduces by around 30% by 2030.

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Connectivity to domestic markets (summary commentary)			
Allowing an additional three to nine flights an hour overall should result in a proportion of those flights being used to increase frequencies to existing domestic airports or introduction of services to such airports, increasing connectivity between Heathrow and domestic markets.			
International connectivity (interline vs. point-to-point; market access)	An increase in the capacity declaration at Heathrow should result in additional flights to existing destinations and the introduction of some new destinations, enhancing connectivity and also allowing for more airlines to provide greater competition at Heathrow (particularly from airlines that do not consider services to other UK airports as being commercially viable)		
Domestic connectivity (surface transport & domestic aviation)	Impacts are expected to be negligible.		
National Economic Impacts (summary)			
The Maximum capacity package will result in benefits in terms of airlines being able to offer a wider range of services, including new direct routes, additional frequencies and additional airline market entry, enhancing competition and reducing air fares. In addition, the reduced delays expected from implementation of mixed mode will enhance the overall quality of service at Heathrow Airport, increasing the attractiveness of the UK for inbound investment and tourism. Though the scale of these benefits will be much less than those offered at other expansion options.			
Local & Regional Economic Impacts (summary)			
<ul style="list-style-type: none">▪ Support to trade: An increase in flights at Heathrow, including reduction or removal of the cap on night flights would significantly support increased trade, investment and inbound tourism, by enabling the airport and airlines to meet currently constrained demand. Additional destinations, frequencies and airlines are likely to service Heathrow, enhancing London and UK wide connectivity.▪ Creation of new industries: At higher levels of increased flight caps, the resulting reduction in price and time costs of air travel will help to support the creation of new industries with high dependency on air travel costs as an input or to supply or access customers.▪ Land Impact: Negligible impact, although a high increase in the capacity cap is likely to increase demand for construction of hotels, logistics facilities and other support related functions or industries in the vicinity of Heathrow Airport.▪ Direct Employment: Highly positive impact on employment at Heathrow and with airlines and companies supporting airline operations at Heathrow.▪ Indirect Employment: Highly positive impact on employment in logistics, trade, tourism and related service industries due to lower air fare and cargo prices and increased ability to meet demand.▪ Induced Employment: Likely to be positive multiplier impacts on employment due to increased trade, tourism and investment.▪ Catalytic Employment: Likely to be positive multiplier impacts on employment due to increased trade, tourism and investment.▪ Agglomeration Impacts: Likely to be positive impacts on agglomeration in the Thames Valley/M4/Heathrow corridor as increased airline services support businesses that are located to gain the benefits of air connectivity. Modest positive impacts for agglomeration for London, as increased services support connectivity for London, with reduced travel times, fares and improved service quality (due to reduced delays).▪ Residual Value: Not relevant			

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ENVIRONMENT

Noise

The overall impact is a negative noise impact. This package includes measures which will generate additional noise associated with 20000, 35000, 40000 and 60,000 additional movements at Heathrow each year. Based on anticipated fleet mix changes, ERCD Report 0705 suggested that 540,000 ATMs in mixed mode would by 2030, compared to 2002, see the 57dBA L_{eq} contour reduce by approx. 35.5km² (28%) and the number of people in that contour reduce by 76,700 (compared to 115,600 in segregated mode). The overall benefit is considered to be highly negative, because although the increase in movements will lead to a relatively small increase in noise in the short term, assuming limited immediate improvement in fleet mix, and ongoing improvements in the use of quieter aircraft, the proposal to remove the night flights cap will be very negatively received by the public. The recent first phase of the consultation on night flights received significant response from the public seeking a reduction or ending of night activity. The introduction of mixed mode is also seen as strongly negative as people will be affected differently with some experiencing significant increases. Modernisation of the fleet is not expected to change this outcome.

Local air quality

The overall impact is dependent on scale of ATM capacity increase. Quantitative analysis indicates savings of approximately 5,860 tonnes in the 500,000 ATM scenario through to an increase of 3,800 tonnes of NO_x at Heathrow over the period 2014 to 2030, compared to a do nothing situation based on 2008 operations and performance, extrapolated to 2030 taking into account fleet changes. Delivered through:

- SIDs separation reduction (saving 165 tonnes per year), available from 2016 until 2019 when it is subsumed into mixed mode;
- reduced departure delays due to mixed mode: saving 630, 340 or 228 tonnes per year for the 500,000, 515,000 and 520,000 ATM cap scenarios - there are no NO_x savings on baseline indicated for 540,000 ATM;
- increases in NO_x emissions due to increased ATMs at LHR of between 320 and 800 tonnes per year;
- No savings have been ascribed to reduced engine taxi, despite the potential NO_x and noise benefits, as the increase in ATMs within existing taxiway and apron space will restrict the opportunity for ground movement flexibility due to constrained taxiway availability.

Climate change

Carbon savings to 2030 are significantly reduced compared to the Core Package, which delivers 7.12m tonnes. Quantitative analysis indicates savings of approximately 5.69m tonnes, 4.47m tonnes, 4.07m tonnes or 2.44m tonnes of CO₂ over the period 2014 to 2030, respectively in the 500,000, 515,000, 520,000 and 540,000 ATM cap scenarios compared to a do nothing situation based on 2008 operations and performance, extrapolated to 2030 taking into account fleet changes.

PEOPLE

Employment

Likely to create a positive impact for employment overall, as the ability to meet currently constrained demand, is likely to boost employment at Heathrow, airlines that are able to increase services and the businesses that support them. This is likely to have indirect positive effects on employment, due to increased tourism, trade (resulting in increased air cargo) and investment. The higher the capacity cap, the greater the positive impact on employment.

Housing and demolitions

No housing demolitions will be required. The overall impact of 500,000 to 540,000 ATMs under segregated mode operation could see an initial increase in the number of people within the 57dBA L_{eq} contour dependent upon the rapidity of fleet modernisation.

Mixed mode operations will impact more locations and more people, with limited respite.

Vulnerable groups

Some impacts on vulnerable groups might anticipated from deployment of the maximum capacity package, as although noise impacts are anticipated to reduce over time, the widening of the noise footprint unless mitigated by fleet improvements may result in specific local impacts. Even so, an increase in ATMs even with noise event sound level reductions is likely to be perceived negatively in noise terms, if historic precedent is accepted.

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Quality of life This package will have a more significant negative effect on noise related quality of life than the core package. Prior to the introduction of mixed mode at Heathrow will be in summary: <ul style="list-style-type: none"> ▪ application of operational freedoms will result in an increase in the number of de-alternated flights, compared to a baseline where this would be managed using conventional TEAM. The increase in de-alternated flights would range from approximately 15 per day in 2014 up to 26 per day in 2019 meaning that there will be a general reduction in respite after 07:00 hours. ▪ use of a single runway for arrivals between 05:00 and 07:00 will result in an increase in arrivals between 05:00 and 06:00. However, alternation and respite would be guaranteed, from 05:00 to 07:00. At Heathrow, application of mixed mode will remove respite. In addition, extra noise will be generated in each of the scenarios by the increased number of movements. Allowing the smoothing of the early morning schedule will result in more early morning arrivals before 06:00 and there will be no guaranteed respite.			
Social impacts No additional social impacts compared to those indicated under the above sections are anticipated.			

COST

Capital Minimal in comparison to other expansion options, costs are unlikely to exceed £1bn. The 2007 Impact Assessment carried out to assess the impacts of three different options for increasing Heathrow's capacity estimated that the cost of implementing mixed mode within the 480,000 ATM planning cap would be circa £600m in 2006 values, adjusted for inflation bias. The Q5 capital investment package (2008-2013, now Q5+1 to 2014) has delivered £4.79bn capital expenditure to date, and in the course of the development of Eastern Campus (T2a and T2B, T3 integrated Baggage, and related apron and runway projects) a large volume of the infrastructure works indicated for mixed mode in the 2006/7 Impact Assessment will have been completed, so additional capital costs are not considered to be significant, although further works on taxiways, aprons and stands will be required.

OPERATIONAL IMPACT

Resilience At Heathrow, resilience measures (forming part of the Airport's Airfield Efficiency Programme) are likely to deliver savings in cancellations of £201m NPV from 2014 to 2030. The 2008 runway resilience study showed that Heathrow is far more prone to large-scale cancellations than other airports, due to its operating very near to capacity. Resilience measures will likely have much more impact at Heathrow than at other airports. Qualitatively, the more robust operations enabled by the capacity headroom generated by mixed mode will also contribute to an increase in resilience, although this increase in resilience will diminish beyond 500,000 ATMs.
Efficiency At Heathrow, mixed mode coupled with the other measures is likely to deliver savings in delays to airlines of £1,527m, £1,413m or £1,364m NPV in the 500,000, 515,000 and 520,000 ATM cap scenarios respectively due to reduced delays from 2014 to 2030 and savings in delays to passengers of £680m, £620m or £594m NPV in the 500,000, 515,000 and 520,000 ATM cap scenarios from 2014 to 2030 compared to a do nothing situation based on 2008 operations and performance, extrapolated to 2030 taking into account fleet changes. In addition to the measures identified within the core package, this package also delivers benefits from: <ul style="list-style-type: none"> ▪ mixed mode: £52m, £38m or £32m savings to airlines and £28m, £21m or £18m savings to passengers in reduced delays in each of the three scenarios, starting from 2019; ▪ mixed mode: £53m savings per year in avoided delay costs to airlines and £26m per year in avoided delay costs to passengers per year associated with the avoidance of arrival delays driven by the increase in A380s in the fleet mix. This benefit is realised from 2019 but is delivered prior to that by Operational Freedoms at the rate of £44m avoided costs to airlines per year and £20m avoided costs to passenger per year between 2014 and 2019.
Reliability Based on reduced delay and enhanced resilience at Heathrow and associated airspace, operation to an optimised daily service plan and incentivisation of arrival punctuality, airlines will be able to reduce the buffers in Heathrow schedules, currently necessary to ensure reasonable punctuality against uncertain levels of delay. It is estimated that these savings in block-time buffers could amount to a reduced cost to airlines of £80m NPV from 2014 to 2030, although this is likely to reduce at higher ATM scenarios. Similar levels of buffer are not likely to be applied at other airports so this benefit is likely to be restricted to Heathrow.
Passenger Experience

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<p>In addition to the measures identified within the core package, this package also delivers benefits for the passenger experience through reduced airborne and ground holding at Heathrow due to mixed mode and local A-CDM.</p> <p>Passengers are also likely to benefit from reduced travel times (due to the increase in frequencies and direct services) and reduced fares (due to increased choice of services and airlines) at Heathrow, with higher capacity declarations to have a positive impact upon this. Conversely, the higher the capacity declaration, the lower the expected benefits from reduced delays.</p>			
<p>Safety The implementation of mixed mode will likely require a safety case.</p>			
<p>Scalability The package is scalable at Heathrow, as is shown by the range of benefits from 500,000 to 540,000 ATMs. Economic benefits are maintained, but resilience and environmental benefits drop off as the scale increases.</p>			
<p>Airspace There is potentially a need for significant airspace redesign to enable mixed mode.</p>			

DELIVERY

<p>Timescale The measures would be delivered in phases starting in 2014 with the core package. Mixed mode would be delivered by 2019.</p>
<p>Technical and operational risks The principal technical and operational risks of this additional package are safety cases for mixed mode at Heathrow.</p>
<p>Planning risk There is planning risk associated with:</p> <ul style="list-style-type: none"> ▪ permission for increased capacity caps at Heathrow; ▪ permission for mixed mode operations; ▪ permission to apply operational freedoms, prior to the introduction of mixed mode; ▪ permission for additional night flight operations; and ▪ airspace redesign for mixed mode.