

## SHORT (& MEDIUM) TERM MEASURES - EXECUTIVE SUMMARY

MEASURE SET	Airport operations	
MEASURE TITLE	Mixed mode operations at Heathrow	
MEASURE SUMMARY	This measure would introduce mixed mode operations for Heathrow runways. This would allow both runways to be used for both arrivals and departures as opposed to current operations in segregated mode where a single runway is currently used for arrivals and the other for departures.	
MEASURE INVOLVES	<div><div><input type="checkbox"/> Behavioural Change</div><div><input checked="" type="checkbox"/> Infrastructure Change</div><div><input checked="" type="checkbox"/> Operational Change</div><div><input checked="" type="checkbox"/> Regulatory Change</div><div><input type="checkbox"/> Technical Change</div><div><input checked="" type="checkbox"/> Policy Change</div></div>	
WHAT DOES THIS ADDRESS?		
<p>Under current operating procedures, Heathrow runways are used mainly in segregated mode; that is one runway is used for arrivals and the other is used for departures. There are exceptions to this when, under certain circumstances, both runways can be used to a limited extent for arrivals – so-called Tactically Enhanced Arrivals Measures (TEAM). The segregated mode of operations results in a lower achievable runway throughput and less resilience against disruption than mixed mode operations, where both runways are used for arrivals and departures contemporaneously. The reason for this limitation is, principally, the need to ensure adequate spacing between adjacent aircraft in the arrival stream and similarly between adjacent aircraft in the departures stream. This spacing constrains segregated mode operations more than mixed mode operations because the former does not enable the natural spacing resulting from interspersing arrivals and departures on the same runway. However, mixed mode operations would reduce or remove the noise respite currently provided by alternating runways between arrivals and departures when Heathrow flights are operating to the west.</p>		
WHAT WOULD BE DONE?		
<p>Mixed mode operations would enable both runways to be used for arrivals and departures within the same time period during the day. In addition to operational changes, mixed mode would require additional taxiway infrastructure and airspace redesign, both of which would need to be enabled by the appropriate consultation and planning approvals as well as safety cases. As Heathrow is currently operating very near its capacity cap, to use mixed mode to enable additional slots would also require the capacity cap to be relaxed.</p>		
WHAT IS THE IMPACT?		
<p>From a technical perspective, NATS' estimates identify potential for maximum gains in capacity of approximately 5%, 10% and 15% over periods of two, four and more than five years respectively. These capacity gains could be utilised to:</p> <ul style="list-style-type: none"><li>improve resilience, by reserving capacity headroom above and beyond the demand level, to mitigate the impact of disruption and facilitate recovery after disruption</li><li>create additional slots to allow extra movements by reducing the current constraints on demand: this would require a relaxation of the current 480k movement cap</li><li>a mixture of the two, with the appropriate balance yet to be determined.</li></ul> <p>However, even though operational and infrastructure issues can be addressed in the short-term, planning, regulatory and consultation processes are likely to take considerably longer. Therefore this measure has been categorised as medium-term.</p>		

MEASURE SET:	Airport operations	Short Term	<input type="checkbox"/>
MEASURE TITLE:	Mixed mode at Heathrow	Medium Term	<input checked="" type="checkbox"/>

## MEASURE SUMMARY

Proposed by:	ABTA (005), BA (007), BAR UK(008), CBI (012), IAAG (027), GAPAN (067), LACC/AOC(043), LCCI (042), London First (047), NATS (053), Scottish RTP (063), Scottish CDI (062), SE LEP (064), Kent CC (075)		
Proposal:	This measure would introduce mixed mode operations for Heathrow runways. There are three sets of proposal for the measure: <ul style="list-style-type: none"><li>• support additional slots</li><li>• retained as headroom for resilience or</li><li>• a mixture of additional slots and resilience.</li></ul> Each of these proposals is likely to be realisable in the medium-term.		
Approach	In addition to the balance of capacity use for additional slots and increased resilience, application of mixed mode could be envisaged as: <ul style="list-style-type: none"><li>• a permanent solution;</li><li>• a temporary, time-limited solution until longer-term measures are implemented.</li></ul> Application could also be envisaged as: <ul style="list-style-type: none"><li>• available at all times during the operational day;</li><li>• limited to certain time-windows.</li></ul>	Stated Capital Cost: Not stated	
		Capacity (mppa): Up to 80M based on current aircraft size (Source: NATS)	
		Capacity (atm): Up to 15% (550k atms)(Source: NATS)	
Benefits	Benefits would vary depending on the specific application of mixed mode. These would include: <ul style="list-style-type: none"><li>• increased resilience due to retained headroom as well as inherently more resilient way of operating runways</li><li>• increased connectivity due to additional slots</li><li>• improved delay/punctuality performance due to retained headroom/reduced stress in the system</li><li>• reduced emissions (GHG and LAQ) due to reduced delays</li><li>• more efficient airline operations due to reduced contingency in schedules enabled by more reliable performance.</li></ul> Extensive work has been done to quantify the benefits of mixed mode operations, for example in support of the then BAA's third runway optioneering and in the CAA's runway resilience study ( <a href="http://www.caa.co.uk/docs/589/ICF_runway_resilience_final_report_16Feb09.pdf">http://www.caa.co.uk/docs/589/ICF_runway_resilience_final_report_16Feb09.pdf</a> )		
Issues & Risks	As a short-/medium-term option this is not supported by: (i) current policy; (ii) the airport operator; nor (iii) the principal airline, other than for resilience purposes alone. In addition, there would need to be a revision of operating processes: to allow twin arrival streams and airspace structures to support twin departure streams - to enable delivery of benefits which would range from +5% capacity in the short-term up to +15% in the long-term. The higher the capacity gain, the higher the complexity, risk and timescale is likely to be. Routing bias in the departure schedule (e.g. preference for flights at specific times to all be in the same direction) may be problematic. Benefits and costs would also depend on the balance that was struck between using the additional capacity created to enable allocation of more slots and that reserved for resilience purposes. It would be extremely imprudent to allocate all additional capacity to the creation of new slots as there would then be no headroom for resilience and safety valves, such as Tactically Enhanced Arrivals Management (TEAM) – where both runways are used for arrivals to manage the build up of delays on arrival - would no longer be available.		
Mitigations	For mixed mode to be acceptable to local communities, there would need to be mitigation and compensation for the loss of noise respite that is currently achieved through the runway alternation programme, at least when the airport is operating towards the west.		

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Dependencies	<p>Optimal application of mixed mode would require redesign of airspace to enable simultaneous parallel departure streams from both runways and would also require</p> <p>Realisation of any capacity increase at Heathrow through use of mixed mode to enable additional slots would require an increase in the 480k cap on air transport movements as the current schedule delivers annual movements very near to the cap.</p> <p>Regulatory approval would be required for simultaneous departure and parallel approaches in Instrumented Meteorological Conditions (IMC).</p>
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## ASSESSMENT SUMMARY

<b>Strategic Fit</b>	Not stated – depends on long-term options
<b>Economy</b>	<p>Mixed mode could have a number of positive economic impacts:</p> <ul style="list-style-type: none"> <li>• consumer and supplier surplus (e.g. approx. £16M per year on a transatlantic route: CAA runway resilience study) and additional connectivity enabled by new slots</li> <li>• reduced airline operating costs: <ul style="list-style-type: none"> <li>○ tactically resulting from reduced holding delays</li> <li>○ strategically resulting from more reliable performance enabling schedule buffers to be reduced</li> </ul> </li> <li>• passenger value of time savings and improved passenger experience</li> <li>• reputational benefits from improved resilience against significant disruption</li> </ul>
<b>Surface Transport</b>	There would likely be additional pressure on existing infrastructure and services due to potential for increase of passengers of up to 85MPPA or beyond, based on the potential for a 15% increase in ATMs.
<b>Environment</b>	<p>Mixed mode would have both positive and negative environmental impacts:</p> <ul style="list-style-type: none"> <li>• aircraft holding would be reduced on the ground (improving LAQ and reducing GHG emissions) and in the air (reducing GHGs) although if the additional slots were used entirely for capacity, these benefits would drop off</li> <li>• currently, when the airport is operating to the west, residents under the flight paths are given respite from noise by alternating the runways between arrivals and departures at 15:00 each day. Using runways for both arrivals and departures would reduce or remove this respite</li> <li>• when the airport is operating toward the east, there is no alternation – the northern runway is used predominantly for arrivals and the southern runway is used predominantly for departures, so mixed mode would have a mixed impact: <ul style="list-style-type: none"> <li>○ residents under the flightpaths departing from the southern runway and landing on the northern runways will likely have their noise exposure decreased</li> <li>○ residents under arrival flightpaths onto the southern runway and departure flightpaths from the northern runway will have their noise exposure markedly increased.</li> </ul> </li> <li>• total noise energy would only be increased if the number of flights is increased otherwise it would only be redistributed.</li> </ul>
<b>People</b>	As described above, residents' exposure to noise will be changed and, on the whole, increased. Passenger experience likely to improve due to reduced delays, improved reliability and enhanced ability to recover from major disruption.
<b>Cost</b>	<p>Costs are currently not known but will include:</p> <ul style="list-style-type: none"> <li>• airspace restructuring and consultation</li> <li>• air traffic control training</li> <li>• airfield infrastructure development</li> <li>• additional mitigation to overcome loss of noise respite i.e. through a more rigorous noise compensation scheme.</li> <li>• development &amp; approval of supporting safety cases.</li> </ul>
<b>Operational Viability</b>	The proposal is operationally viable but is challenging and complex. It will require airspace restructuring, additional airfield infrastructure (taxiways), operational process redesign and control of directional bias in the schedule.
<b>Delivery</b>	<p>The main risks to delivery are:</p> <ul style="list-style-type: none"> <li>• technical complexity</li> <li>• lack of support from the airport</li> <li>• strong resistance from local communities and other stakeholder groups</li> <li>• likely strong political opposition from west London MPs.</li> </ul>

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- opposition to the planning process required to secure additional ATMs leading to long delays on delivery.