

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

MEASURE SET	Airport operations	
MEASURE TITLE	Heathrow process changes	
MEASURE SUMMARY	The measure addresses the processes used to operate Heathrow's runways, in terms of selecting the direction of operations, alternating usage between runways, the point at which aircraft land and trading-off between starting daytime operations earlier and providing respite from early morning noise.	
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 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>Heathrow's runways are oriented east-west and as the prevailing wind is predominantly westerly the airport operates mainly with arrivals and departures to the west, i.e. flying into the wind. This is supplemented by a so-called westerly preference during daytime operations, which means that the airport continues to operate in a westerly direction until the easterly component of the wind (effectively the tailwind) exceeds 5 knots. This means that for approximately 75% of the time, flights operate to the west, that is landing aircraft approach over London and departures take-off over Windsor.</p> <p>During westerly operations, the two runways are operated in segregated mode where one runway is used for arrivals and the other for departures. The arrival and departure runways are swapped (alternated) at 15:00 hours each day to give those living under the flightpaths respite from noise. For historical reasons, based on the Cranford Agreement that has now been rescinded, the easterly runways, also used in segregated mode, are fixed with the northern runway being used predominantly for arrivals and the southern runway for departures. There is no alternation of the runways on easterly operations.</p> <p>Immediately after the end of the night period, at 06:00 hours when the daytime alternation process begins, it is routine that both runways are used in equal measure for arrivals up until 07:00 hours, irrespective of the direction of operation. This is called Tactically Enhanced Arrivals Management (TEAM). The reason for using both runways for arrivals, enabled by the few departures that take place in that hour, is to cope with the high level of demand from large, long-haul aircraft at that time without incurring excessive airborne holding in the stacks. However, this means that there is no noise respite from arrivals traffic between 06:00 and 07:00 hours.</p>		
WHAT WOULD BE DONE?		
<p>This group of proposals would modify Heathrow's processes to: <b>either</b> (i) remove the westerly preference so that aircraft would always operate into the wind, reducing the proportion (75%) of westerly operations slightly; <b>or</b> (ii) increase the westerly preference such that a 10 knot easterly (tailwind) would be needed before the switch were made from westerly to easterly operations, thereby increasing slightly the proportion of operations towards the west.</p> <p>The proposals would also apply alternation when the in the easterly direction, such that the respite would be provided to residents living under the easterly flightpaths in the same way as is currently done for those living under the westerly flightpaths. This would require some new taxiway infrastructure as an enabler.</p> <p>Use would also be made of displaced thresholds, meaning that aircraft would touchdown more towards the middle of the runway than at the near-end as at present, meaning that they would be slightly higher than at present when entering the airport perimeter.</p> <p>The final proposal would be to open the airport to daytime operations at 05:00 – an hour earlier than at present – spreading the demand over two hours instead of one on the condition that only one runway would be used for arrivals between 05:00 and 07:00.</p>		
WHAT IS THE IMPACT?		
<p>The main impacts of the proposals would be associated with noise, as follows:</p> <ul style="list-style-type: none"><li>• redistribution, temporal and spatial: in all cases, there would be winners and losers, some being less affected and some more affected than under current processes</li><li>• respite: where both easterly alternation and early arrivals would give some guaranteed respite from noise</li><li>• reduction: where displaced thresholds might result in a slight reduction of noise intensity near to the airport.</li></ul>		

MEASURE SET:	Airport operations	Short Term	<input checked="" type="checkbox"/>
MEASURE TITLE:	Heathrow process changes	Medium Term	<input type="checkbox"/>

## MEASURE SUMMARY

Proposed by:	BAR UK (, HAL, IoD, LACC/AOC, London Councils, NATS		
Proposal:	<p>There are five proposals to modify Heathrow processes associated with the operation of its runways. The proposals are:</p> <ul style="list-style-type: none"> <li>• application of the alternation regime on easterly operations</li> <li>• removal of the westerly preference</li> <li>• in contradiction to this, change of the preference criteria to increase westerly preference</li> <li>• use of displaced thresholds</li> <li>• a single runway would be for arrivals between 05:00 and 07:00 hours local time enabled by effectively opening the airport at 05:00 instead of at 06:00 hours at present</li> </ul> <p>All of these proposals have the potential to be enacted in the short-term.</p>		
Approach	<p>The approach for each of the proposals is as follows:</p> <ul style="list-style-type: none"> <li>• for easterly alternation, a pattern similar to that currently applied on westerly operations would be utilised. This would mean that the runways used for arrivals and departures would be swapped at 15:00 hours following a similar pattern to that applied on westerly operations</li> <li>• for removal of westerly preference, the tailwind threshold of &gt;5knots would be replaced by a decision based simply on wind direction, thereby reducing slightly the proportion of time that the airport operates towards the west</li> <li>• in contradiction, an increase in westerly preference tailwind threshold to 10knots would increase westerly preference and the airport would operate in a westerly direction for a higher proportion of the time</li> <li>• displaced thresholds would allow aircraft to land further towards the centre of the runway, meaning that their approach paths would be higher and therefore less noisy outside the perimeter of the airport</li> <li>• to enable use of a single runway for arrivals between 05:00 hours and 07:00 instead of the two runways that are routinely used between 06:00 and 07:00, the proposal is to open the airport earlier to spread the early arrivals over two hours instead of one to guarantee use the single runway for arrivals. This would provide respite under the approach path of one runway but would mean that noise under the other flight path would be increased and be more intense earlier in the morning. It is assumed (not stated in the proposal) that the alternation pattern would apply from 05:00 hours.</li> </ul>	<p>Stated Capital Cost: Small</p> <p>Capacity (mppa): None</p> <p>Capacity (atm): None</p>	
Benefits	<p>The principal benefits of the proposals are respite from noise, although there are associated dis-benefits from the temporal and spatial redistribution of noise, affecting those that are not currently affected. There may also be some operational and financial benefits associated with a potential reduction in airborne holding (stacks) that is currently experienced at 06:00 and is associated with queuing for the opening of the airport.</p>		
Issues & Risks	<p>The balance of winners and losers from noise redistribution is not currently clear and needs additional analysis to be properly understood. There are also questions concerning the feasibility, safety, operational and environmental impact of displaced thresholds and the extent to which the theoretical reduction in noise is actually audible at various distances from touchdown. In addition, the feasibility of use of the single arrival runway between 05:00 and 07:00 compared to airline schedules is not known and the risk that TEAM would need to be applied, negating the respite benefits needs to be assessed.</p>		
Mitigations	<p>Noise mitigation, e.g. sound insulation, schemes might need to be expanded to include those currently unaffected residents that would be subject to increased noise due to easterly alternation.</p>		
Dependencies	<p>Policy changes to: (i) enable change of direction preference; (ii) allow the airport to open for daytime operations at 05:00 instead of 06:00. Planning approvals for taxiway modifications to enable easterly alternation are currently being progressed by Heathrow Airport.</p>		

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## ASSESSMENT SUMMARY

<b>Strategic Fit</b>	Not stated – depends on long-term options.
<b>Economy</b>	There would be little or no economic impact from: application of alternation on easterly operations; change of westerly preference or displaced thresholds. There is potentially an improvement in connectivity through earlier arrivals although this most benefits connecting passengers.
<b>Surface Transport</b>	There would be little or no impact on surface transport from any of: application of alternation on easterly operations; change of westerly preference or displaced thresholds. There would need to be an earlier start to surface access from the airport arising from an effective opening time of 05:00.
<b>Environment</b>	<p>The environmental impacts of each of the measures are likely to be as follows:</p> <ul style="list-style-type: none"> <li>easterly alternation: introduction of respite to those under the approach path for the northern runway and the departure path of the southern runway but with the penalty of increased noise under the approach path for the southern runway and the departure path for the northern runway.</li> <li>decrease of westerly preference: an increase in arrivals noise to the west and departure noise to the east (over west London). The relative benefits/dis-benefits are not currently known.</li> <li>increase of westerly preference: reverse of decrease in westerly preference described above</li> <li>displaced thresholds: a reduction in noise footprint under the approach paths of the airport enabled by higher approaches. Redistribution of noise associated with taxiing. Impact on LAQ and GHG is not known and depends on taxi-paths with and without displaced thresholds</li> <li>single runway for arrivals between 05:00 and 07:00: the positive environmental impacts of this proposal are: (i) it would provide respite under the approach path for one runway between 06:00 and 07:00 compared to the approximately 20 arrivals that would be using that runway currently; (ii) it would likely reduce stackholding around 06:00 and thereby reduce GHG emissions. The dis-benefit would be that it would mean that noise under the approach path to the runway in use would commence at 05:00 and be associated with approximately 25 arrivals per hour<sup>1</sup> in two hours (05:00 – 07:00) rather than 20 arrivals in the hour after 06:00. Noise under the flight path to the runway designated in the night alternation pattern would be reduced in exposure from between 04:30 to 06:00 (currently) to 04:30 to 05:00 (proposed).</li> </ul>
<b>People</b>	<p>The impact on people is complex and is principally associated with the spatial and temporal redistribution of noise as described above. Some of the proposals have support from HACAN (easterly alternation; ending westerly preference where HACAN have suggested that there is no doubt that more people would benefit than disbenefit from ending westerly preference; and running a trial of using a single runway for arrivals between 05:00 and 07:00)</p> <p>The impact on airlines' schedules/networks of the single arrivals runway between 05:00 and 07:00 is not known but shift changes may be needed to address earlier arrivals of inbound traffic.</p>
<b>Cost</b>	<p>The costs associated with the proposals are expected to include:</p> <ul style="list-style-type: none"> <li>modifications to the taxi system to support easterly alternation, understood as already planned and that the planning application for the modifications has been submitted. Relocation and recommissioning of navigational aids would also be required.</li> <li>simulation of the application of displaced thresholds and subsequent revisions to operational procedures if implemented, including the development of a safety case to confirm that operations would continue to be safe. Costs would also be associated with changes in the taxiway system needed to enable displaced thresholds</li> <li>additional noise mitigation/compensation measures associated with easterly alternation, changes to westerly preference and single runway arrivals between 05:00 and 07:00</li> <li>potential shift changes to air traffic controllers, ground handlers and immigration staff to cope with the earlier demand associated with the 05:00 to 07:00 single arrival runway proposal.</li> </ul>

<sup>1</sup> estimate based on approx 40 arrivals scheduled between 06:00 and 07:00 and approx 10 arrivals scheduled between 05:00 and 06:00 at present

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<b>Operational Viability</b>	<p>Proposals appear to be viable. Risks and questions remain on:</p> <ul style="list-style-type: none"> <li>operational feasibility, safety, operational and environmental impacts of displaced thresholds (used at a number of airports, including Gatwick, Madrid &amp; Frankfurt, so not insurmountable)</li> <li>feasibility and safety assurance for aircraft landing and taking-off with 10knot tailwinds</li> <li>the viability to airlines of rescheduling for use of single runway arrivals between 05:00 - 07:00</li> <li>the continued requirement to use TEAM between 05:00 to 07:00 to cope with arrivals bunching thereby negating the noise benefits of single runway use</li> </ul>
<b>Delivery</b>	<p>Resistance from residents currently not affected by noise but who would be affected under the proposals. Resistance from west London residents and politicians in the case of a change of westerly preference which would mean slightly increased impact of departure noise.</p>