

## ASSESSMENT SUMMARY

		Impact relative to current situation				
Criterion	Constituency	++ve	+ve	Neutral	-ve	--ve
Strategic fit						
Economy	Airport					
	Airlines					
	Passengers					
	Connectivity					
	Employment					
	Public accounts					
Surface access	Road access capacity					
	Rail capacity					
	Journey time					
Environment	Noise					
	Air quality					
	Climate change					
People	Employment					
	Housing & demolition					
	Vulnerable groups					
	Quality of life					
	Social impacts					
Costs	Capital					
	Operating					
	Surface access					
Operational	Resilience					
	Efficiency (delay)					
	Reliability					
	Passenger experience					
	Safety					
	Scalability					
	Airspace					
Delivery	Timescales					
	Technical & operational risk					
	Planning risk					

## ASSESSMENT RESULTS

<b>Summary</b>	This scenario offers some potential connectivity benefits. Any increase in night movements would be extremely contentious, but there may be merits in combining elements of this package with the maximum resilience and mitigation packages.
<b>Strategic fit</b>	Eliminating the night flight cap would provide a positive contribution to enhanced connectivity and flexibility for air services, it would add to noise at the period that causes the greatest concern for those affected by noise at Heathrow. The net overall effect of this package will be to marginally reduce capacity at Heathrow, enhance the flexibility in using the remaining capacity, but also increase the exposure of noise at the most sensitive periods, whilst reducing noise at other times.
<b>Economy</b>	There is a Net NPV of <b>£2.9B</b> (2014-2030) compared with the status quo <sup>1</sup> , an increase in NPV of nearly £0.3B compared with the core package, largely due to the benefits of increasing the proportion of night flights. In addition, there is likely to be marginally greater connectivity with long haul destinations and consequential reductions in connectivity to shorter haul destinations. The introduction of a reduced capacity declaration at Heathrow would have a negligible negative impact on airlines, consumers and connectivity.
<b>Surface Transport</b>	Negligible impacts compared to the core package. Incremental additional demand before 0620 at Heathrow.
<b>Environment</b>	Slight improvements in air quality and carbon emissions compared to the core package. Beneficial in terms of CO <sub>2</sub> reductions, with 7.43M tonnes being saved compared to the status quo (480,000 ATMs at LHR and current operations as they exist today at other airports). Overall noise impacts are limited, as there is no increase in flights, but night flights are sensitive as an issue of particular community concern. Negative impacts due to the increase in night noise, offset by reductions in noise during daylight hours.
<b>People</b>	Negligible technical impacts compared to the core package, although the extension of night flights is likely to have specific impacts on particular communities in terms of quality of life. Night noise is a key area of sensitivity, so the noise contour impacts should not be considered in isolation. No significant employment impacts are likely.
<b>Cost</b>	Negligible cost impacts beyond those identified in the core package. Any scenario that requires extension to the night flights regime, will incur additional planning costs, and this should be considered in addition to capital expenditure on infrastructure.
<b>Operational Viability</b>	Reduced capacity declaration at Heathrow likely to result in only one less flight per day over a 10 year period, as demand is unlikely to see capacity surrendered.
<b>Delivery</b>	Significant planning and regulatory barriers to increasing night flights and need for regulatory measures to prohibit business and general aviation from Heathrow and Gatwick

<sup>1</sup> The 'status quo' means current operations using a baseline of 2008 data.

## ECONOMIC IMPACTS

## Impact on Industry (summary commentary)

Compared to “the status quo” this scenario will reduce costs for airlines and passengers, delivering net economic benefits of around **£2.9 billion** (NPV) by 2030 for the aviation sector and its users, including the value of the remaining core package. This is around **£0.3 billion** (NPV) **higher** than the core package. Compared to the core package, the primary impact of the “more night flights and no overall increase in flights” package will be at Heathrow, but it would also have minor impacts on other airports due to the introduction of a QC system into full day operations at all major airports. The primary impact will be to allow flights to be rescheduled during night flight hours, allowing airlines to choose to shift capacity from lower value routes to higher value routes (the latter being more likely to be long haul services). A minor impact over the longer term will be to reduce the total number of flights at Heathrow. Compared to the core package, the net impact will be higher yields for airlines, but with slightly higher numbers of passengers and likely neutral impacts on connectivity, as introduction of new services during night periods will be due to withdrawal of other services.

## Airports

Compared to the core package, Heathrow Airport will have about the same level of overall activity, but with increased activity during night periods, and reduced activity at other times. The reduced capacity declaration will incrementally reduce flights and passenger numbers. Compared to the core package, Heathrow will have similar levels of resilience and reliability. Heathrow would also lose incremental traffic (average 4.9 flights per day) from a prohibition on business/general aviation traffic (Gatwick will lose on average 5.7 flights per day from such a prohibition). A small proportion of short-haul traffic that may be displaced by increases in night flights (using existing daytime slots for more lucrative night time services) may relocate to Stansted and other airports.

## Airlines

Compared to the core package, the “more night flights and no overall increase in flights” package will deliver **higher** quantifiable airline benefits (2014 to 2030) by around **£127M NPV** primarily due to the higher value to some airlines of providing services at night (such a shift enables them to operate services that may command higher yields).

## Passengers

Compared to the core package, the “more night flights and no overall increase in flights” package will deliver **higher** passenger cost savings (2014 to 2030) of **£56M NPV** (a total of **£635M NPV in savings**) primarily due to the higher value to some passengers of travel at night. Furthermore, compared to the core package the reduced capacity declaration is likely to create a further loss to passengers and airlines together of around **£9M NPV**.

## DfT WebTAG Impacts (summary commentary)

- Economic Surplus Producers: Compared to the core package, at least **£127M NPV more** in surplus due to more efficient utilisation of capacity and slightly improved resilience at other times.
- Economic Surplus Passengers: **£56M NPV more** benefits to passengers compared to the core package due to the higher value of increased night flights.
- Time Savings From Delay Reduction: Likely to be similar to the core package.
- Public Accounts: Likely to be neutral, as higher patronage/yielding night services may result in higher APD revenue, although this may be offset by the lower capacity declaration.
- Wider Impacts And Regeneration: (See National Economic Impacts, Local & Regional Economic Impacts);
- Surface Access Impacts: Nil

## User benefits

Reduced delays; improved resilience, but no different benefits compared to core package.

Externalities  
(e.g. noise & CO<sub>2</sub>)

The benefits of this package are similar, although slightly better than the core package. Based on CO<sub>2</sub> savings, and the price of in the central scenario of traded carbon cost<sup>2</sup> savings are indicated over the period 2014 to 2030 of approximately **£160.4M NPV**. Noise cost benefits have not been quantified. Increased night flights will bring additional wider cost benefits.

## Connectivity to domestic markets (summary commentary)

Allowing airlines to shift towards more night flights may incentivise some airlines to reduce domestic services in favour of long haul services that depart/arrive at nights, if such services would be more profitable, reducing overall connectivity.

International  
connectivity (interline  
vs. point-to-point;  
market access)

Allowing a higher proportion of Heathrow services to operate at night may increase connectivity to destinations that benefit or require such scheduling to operate optimally (e.g. Africa, Asia, Australia), but may reduce connectivity to those destinations that may be seen as lower yielding (e.g. Europe).

Domestic connectivity  
(surface transport &

Impacts are expected to be negligible.

<sup>2</sup> <https://www.gov.uk/carbon-valuation>

**National Economic Impacts (summary)**

Compared to the core package, the “more night flights and no overall increase in flights” scenario will result in largely similar benefits in terms of reduced delays and operating costs for passengers and airlines. By eliminating the night flight cap, a small number of relatively high value flights may substitute for lower value flights at Heathrow, as determined by the likely patronage and yield of such services, but this is likely to have a relatively modest impact nationally. The introduction of other measures to mitigate and provide respite from noise will have a negligible economic impact. A reduced capacity declaration for Heathrow and prohibitions on general and business aviation at Heathrow and Gatwick will also have negligible impacts.

**Local & Regional Economic Impacts (summary)**

- Support to trade: Allowing more night flights in exchange for fewer flights at other times is likely to have a negligible impact on trade and tourism, as the positive effects of new flights at night may be largely offset by the cancellation of other flights. Given that the services likely to be cancelled in favour of new night services will be short haul services more able to be provided from airports other than Heathrow (and the new services will be those that are unlikely to be viable at airports other than Heathrow), this is likely to be slightly positive for trade, tourism and investment compared to the status quo.
- Creation of new industries: Negligible impact.
- Land Impact: Negligible impact
- Direct Employment: Negligible impact, reduced capacity declaration marginally negative in longer term.
- Indirect Employment: Negligible impact
- Induced Employment: Negligible impact
- Catalytic Employment: Negligible impact
- Agglomeration Impacts: Reduced available capacity at Heathrow is likely to have a negative impact on agglomeration, only partially offset by more efficient use of Heathrow capacity
- Residual Value: Not relevant

## ENVIRONMENT

**Noise**

This scenario will result in greater noise impacts than the core package. The resilience measures will not create any additional noise energy but this will be redistributed in time and space as described under *quality of life*. The overall impact of this scenario is seen as negative. Whilst a number of the measures in this scenario are seen as positive, the reduced capacity declaration at Heathrow, the introduction of displaced thresholds and the possible banning of noisier aircraft, the increase in night activity is more than sufficient to result in a negative assessment. The expected fleet modernisation is not seen as sufficient to counter this. A negative public reaction would be expected to more night flights even if they were almost silent.

**Local air quality**

This option delivers no additional air quality improvements over the core package (6,850t).

**Climate change**

This scenario offers slightly improved carbon savings compared to the core package (7.12Mt), with a net additional 300,000 tonnes being saved. Quantitative analysis indicates savings of approximately **7.43M tonnes** of CO<sub>2</sub> over the period 2014 to 2030<sup>3</sup>, compared to 'the status quo' based on 2008 operations and performance, extrapolated to 2030 taking into account fleet changes. The additional benefit is delivered by transferring early morning arrivals to the night period, reduced capacity declaration and banning business and general aviation: 118,000 tonnes per year, starting in 2019, (this effectively subsumes the benefit of distributing early morning arrivals earlier in the day).

## PEOPLE

**Employment**

No significant impacts on employment are anticipated from deployment of the night flights package, although some redistribution might be expected in working patterns, and there may be long term negative impact (albeit marginal) from the reduced capacity declaration at Heathrow.

**Housing and demolitions**

No housing demolitions will be required. The impact on housing from additional night flights is likely to require additional compensatory and mitigation funding.

**Number of Houses***New**Demolished*

Nil

Nil

**Vulnerable groups**

Some impacts on vulnerable groups are anticipated from deployment of this package, as although noise impacts are anticipated to reduce over time, re-distribution of noise to night may result in specific local impacts.

**Quality of life**

There will be a steady decrease in noise levels, reflecting the fleet mix. Some redistribution of noise will be inevitable particularly in the early morning period.

**Social impacts**

No additional social impacts compared to those indicated under the above sections are anticipated.

## COST

**Capital**

- Negligible

**Operating**

- Negligible

**Mitigation and compensation**

Unknown at this stage.

**Surface access**

To be considered separately.

<sup>3</sup> Carbon impact calculated from estimated fuel savings, using emission factor for Jet A1: <http://www.ukconversionfactorscarbonsmart.co.uk/>

## OPERATIONAL IMPACT

### Resilience

At Heathrow, resilience measures<sup>4</sup> (forming part of the Airport's Operational Airfield Efficiency Programme) are forecast 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.

### Efficiency

At Heathrow, compared to the core package, this scenario will deliver **increased** benefits of around **£619M NPV** from 2014 to 2030 in delays to airlines and **increased** benefits of **£56M NPV** from 2014 to 2030 to passengers. In detail, efficiency initiatives are likely to deliver savings in delays to airlines of **£1.6B NPV** from 2014 to 2030 and savings to passengers of **£635M NPV** from 2014 to 2030 compared to *the status quo* based on 2008 operations and performance, extrapolated to 2030 taking into account forecast fleet changes. As well as benefits identified within the core package, this is delivered<sup>5</sup> by transferring early morning arrivals to the night period; reduced capacity declaration and banning business and general aviation resulting in an estimated £20M savings/year (airlines) and £10M savings/year (passengers), starting in 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<sup>6</sup>, currently necessary to ensure reasonable punctuality against uncertain levels of delay. It is estimate that these savings in block-time buffers could amount to a reduced cost to airlines of **£78M NPV** from 2014 to 2030.

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

There are likely to be similar impacts on the passenger experience as with the core package, but improvements on the current situation. Business and general aviation users who currently prefer to use Gatwick and Heathrow will see a reduction in user experience from a ban on such users at those airports.

### Safety

Displaced thresholds will require a safety case.

### Scalability

The scenario is not easily scalable.

### Airspace

Some airspace redesign will be needed but is being addressed through the LAMP and FAS programmes.

## DELIVERY

### Timescale

The measures would be delivered in phases starting in 2014 and the complete package would be delivered by 2019.

### Technical and operational risks

The principal technical and operational risks are:

- safety cases for displaced thresholds.
- technical feasibility of improved weather forecasts needed for enhanced low visibility operations, specifically the triggers for the application of LVP.

### Planning risk

There is planning risk associated with:

- removal of the cap of night flights
- incorporate or dilute QC system into full day operations at all major airports.

<sup>4</sup> Derived from fuel savings information provided by Heathrow Airport.

<sup>5</sup> Derived from models produced to support the study: Feasibility and options for reducing airborne holding for Heathrow arrivals, Helios report, P1480D005 v1.0 dated 30 June 2011, produced under contract 1387 jointly sponsored by CAA and NATS

<sup>6</sup> Based on the observations on the extension of short-haul block-times reported in the CAA runway resilience study ([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))

#### MEASURES INCLUDED IN THE PACKAGE INCREMENTAL TO THE CORE PACKAGE

Measure	Description	Template ref.
Raise or eliminate night flights cap	This measure will see to the removal of the night flights cap at Heathrow so that there are no restrictions to the number of night movements during Heathrow's current operating hours (0500 – 2300).	NFlt-ERE-2
Reduced capacity declaration at major airports	This measure would provide a lower capacity declaration at airports, to manage down congestion over time (or prevent airports reaching full capacity) so as to minimise the impacts of congestion on resilience. The proposal would be for a greater focus to be provided on the efficient utilisation of slots through the slot allocation process.	SSR-DMA-1
Displaced thresholds	The 'threshold' is the physical point on a runway where an aircraft aims to touch down. Operating a displaced threshold results in that point being further along the runway. Operating a displaced threshold would result in aircraft being higher above the ground at a specific distance from touchdown, with a resultant reduction in noise contours.	ApOP-GOI-4
Ban general aviation and business aviation from Heathrow and Gatwick	This would prevent general and business aviation flights from using Heathrow (and potentially Gatwick), with the intention of improving capacity usage at those airports.	REG-ACR-1
Incorporate or dilute QC system into full day operations at all major airports.	This measure proposes an expansion in the current use of QC categories as a method for incorporating noise management into airport capacity management. The QC system allows each night flight to be individually counted against an overall noise quota (or noise budget) for an airport according to the QC rating (i.e. the noisiness) of the aircraft used. This measure would extend this QC system to day time operations.	EMit-NMT-1

## ASSUMPTIONS

Measure	Approach and assumptions
En route arrival management	Starts 2019. Assumes linear holding can absorb 2 to 3 minutes of stack holding. Modified stack holding is calculated from operational data by subtracting the linear hold from each flight's stack hold and averaging over summer and winter seasons to give an average reduction in stackholding. Assumes that there is no time saving because the queue is shifted upstream. Assumes that there is a saving in CO <sub>2</sub> emissions driven by the reduction in average stack holding time with the multiplier derived from the analysis underpinning the Helios airborne holding report ( <b>reference:</b> Feasibility and options for reducing airborne holding for Heathrow arrival, Helios, 30 June 2012 produced under contract 1387 (Helios) service order number 20, commissioned jointly by CAA and NATS). Gives a lower bound of the CO <sub>2</sub> saving because it omits the saving from the en route phase of flight arising because of a slower cruise speed, even though the flight is 2 to 3 minutes longer. Calculation is limited to Heathrow flights even though benefits likely to accrue at other airports during busy arrival periods. Simple scaling is possible for Gatwick based on the 2008 runway resilience report that shows airborne holding delays at LGW are 16% of those at LHR in summer and 7% in winter. Averaged this gives a yearly average of 14% - assumes that en route arrival management delivers 14% of the benefits at Gatwick that it delivers at Heathrow. Calculation limited to Heathrow and Gatwick even though benefits likely to accrue at other airports during busy arrival periods.
Time based separations	Starts 2019. Assumes that TBS delivers increased arrival flows during high (20 knots at 3000ft) headwind conditions (reference operational freedoms trigger condition). Assumes that this condition is met 20% of the time in summer and 36% of the time in winter. TBS adds 2 to 4 arrivals per hour during very high headwind conditions (source: NATS). Half this increase is assumed as a baseline. Benefits calculated in terms of reduced stackholding using the models developed for the CAA runway resilience study that includes the impact of strong winds for the day from 08:00 onwards (assumes that pre-08:00 is dealt with through TEAM which is applied virtually every day from 06:00 to 08:00. This impact is neutralised by adding back TBS capacity scaled in proportion to the likely occurrence of strong winds (2 to 4x0.20 for summer and 2-4x0.35 in winter).
Single runway for early morning arrivals	Starts 2015. Assumes that the demand profile from 05:00 to 07:59 is smoothed over those three hours. With the statistical models as currently established the modelling resolution is one hour – so it is not possible to look at the schedule in more detail. Single runway arrivals are assumed for 05:00 to 07:00.
Independent parallel approaches at Heathrow	Enables more efficient use of TEAM. Assumes that this only has an impact on the 06:00 hour when TEAM is applied such that both runways are used equally as opposed to other times of the day when fewer than 6 arrivals can be landed on the departure runway. Currently around 22 aircraft are landed on each runway between 06:00 and 07:00 – assumes that independent use of runways can accommodate up to 30 aircraft on each runway, i.e. a 36% capacity increase. <b>Note:</b> the benefits of this measure are exclusive with the benefits of use of a single runway for early morning arrivals, which negates the need for improved TEAM efficiency.
Reduction in separation between SIDs	Starts 2016. Assume 10 to 15% increase in departure capacity due to reduced separation between SIDs achieved either by PBN/RNAV capabilities or through controller vectoring. The impacts of this are calculated using the Heathrow delay curve models for time and CO <sub>2</sub> savings. CO <sub>2</sub> saving is translated into a fuel saving (1 tonne of fuel = 3.149 tonnes of CO <sub>2</sub> ) and then translated into NO <sub>x</sub> (1 tonne of fuel = 12.8kg of NO <sub>x</sub> ) The 2008 runway resilience report shows a very similar average ground holding delay at Gatwick compared to Heathrow. The total delays therefore scale according to traffic (assumed to be 2:1) resulting in departure benefits at Gatwick that are 50% of those at Heathrow
Local A-CDM	Starts 2014. Assumes A-CDM and other process improvements deliver (source: Information provided by Heathrow Airport) the following at LHR: <ul style="list-style-type: none"> <li>- reduction in departure holding of 1.5 minutes per flight (assumed also to apply at Gatwick and scales from Heathrow results on a 2:1 basis, as explained above)</li> <li>- avoidance of 200 cancellations per year.</li> </ul>
Operational freedoms	Starts 2014. Assume that the availability of operational freedoms is used to overcome the negative capacity impact of increasing numbers of A380s (21 arrivals in 2014 (3%), 30 arrivals per day in 2016 (4.5%), 62 arrivals in 2030 (5.5%)) (Source: NATS). The Helios airborne holding report ( <b>reference:</b> Feasibility and options for reducing airborne holding for Heathrow arrival, Helios, 30 June 2012 produced under contract 1387 (Helios) service order number 20, commissioned jointly by CAA and NATS) is used to compare the difference in delay using a 20 minute trigger for TEAM with the assumption that all A380s are landed on the departure runway (i.e. no negative impact on capacity).

Scenario: 4	More night flights but no overall increase in flights		
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	<p>This difference is assumed to be the sole quantifiable benefit of operational freedoms based on the results of the recent trial.</p> <p>The negative impact on departures is calculated by adding the A380 arrivals to the departure runway loading taking account of the additional capacity gained through reduction in separation of SIDs</p>
LVP	Starts 2014. Information provided by Heathrow Airport suggests that improved LVP procedures will result in 600 fewer cancellations per year split at a ratio of 70:730 long haul:short haul.
Block time reduction	Starts 2019. The 2008 runway resilience study shows an increase in block time of short haul flights to LHR of up to 18 minutes over 20 years. It is assumed that increases in reliability/resilience will reverse this increase by 50% over a period of 10 years, starting in 2019. Eurocontrol standard figures for strategic delays are used to calculate the benefit of this.

#### More night flights but no overall increase in flights increments

Measure	Approach and assumptions
Reduction of Raise or eliminate night flight cap	Starts 2019. Same assumptions as early morning flights on a single runway except that single runway operations are not assumed.
Lower capacity declaration at Heathrow	Starts 2014. Assumes that the capacity declaration is reduced to provide a cap at 90% of capacity (similar to the Gatwick cap in this package). However, because of grandfather rights it is unlikely that slots will be handed back so the underlying (constrained) demand level will remain the same. The impact of the lower capacity declaration will be to remove the capacity to award ad hoc slots to back-fill the schedule when flights are cancelled – it is assumed that this will prevent general and business aviation from operating at the airport and reduce on the day demand by approximately 8 arrivals and departures per day (1%).
Ban general and business aviation from Heathrow and Gatwick	Starts 2014. This is covered by the reduced capacity declaration, above, at Heathrow. At Gatwick it will likely mean that the actual demand will be approximately 89% of capacity instead of at the 90% cap as it will not be possible to backfill cancellations with ad hoc slots for general and business aviation.
General	All four components of the package increment have to be considered together as they are not separable nor additive. Assumes that there will be no impact on departures

# Quantitative assessment for resilience and efficiency

Item	Costs	Annual benefits/savings		
		Low	Med.	High
En-route arrival management	£6M (ref: NATS)	70ktonnes CO2 saving. Fuel cost saving: £15M	105ktonnes CO2 saving Fuel cost saving: £22M	135ktonnes CO2 Fuel cost saving: £29M
Time based separations	£13M (ref: NATS)	41ktonnes CO2 saving Total aircraft operating cost saving:£8.6M Pax opportunity cost saving: £4.1M	58ktonnes CO2 saving Total aircraft operating cost saving:£12.1M Pax opportunity cost saving: £4.9M	72ktonnes CO2 saving Total aircraft operating cost saving:£14.9M Pax opportunity cost saving: £7.2M
Early morning arrivals on single runway	Small	55ktonnes CO2 saving Total aircraft operating cost saving:£8.5M Pax opportunity cost saving: £4.1M		83ktonnes CO2 saving Total aircraft operating cost saving:£13.6M Pax opportunity cost saving: £6.6M
Independent parallel approaches at LHR	TBD		51ktonnes CO2 saving Total aircraft operating cost saving:£9.0M Pax opportunity cost saving: £4.3M	
Reduction in separation between SIDs	£500k (source: NATS)	34ktonnes CO2 saving 138 tonnes NOx savings Total aircraft operating cost saving:£14.7M Pax opportunity cost saving: £10.0M		47ktonnes CO2 saving 191 tonnes NOx savings Total aircraft operating cost saving:£20.1M Pax opportunity cost saving: £13.8M
Local A-CDM	Sunk		26ktonnes CO2 saving 106 tonnes NOx savings Total aircraft operating cost saving:£10.9M Pax opportunity cost saving: £7.4M. Avoided cancellations: £6.3M	
Operational freedoms to reduce impact of A380s (2014)	Small cost 15 additional de-alternated flights per day		68ktonnes CO2 saving Total aircraft operating cost saving:£44M Pax opportunity cost saving: £19M.	

Operational freedoms to reduce impact of A380s (2016)	Small cost 20 additional de-alternated flights per day		93ktonnes CO2 saving Total aircraft operating cost saving:£49M Pax opportunity cost saving: £21M.	
Operational freedoms to reduce impact of A380s (2030)	Small cost 48 additional de-alternated flights per day		104ktonnes CO2 saving Total aircraft operating cost saving:£49M Pax opportunity cost saving: £21M.	
Improved LVP processes: triggers for application; and increased flow rates with MLS			Avoided cancellations: £11M	