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NOTICE

OF

### MEETING

### **AVIATION FORUM**

will meet on

#### MONDAY, 9TH NOVEMBER, 2015

At 7.00 pm

in the

#### **COUNCIL CHAMBER - GUILDHALL,**

#### TO: MEMBERS OF THE AVIATION FORUM

COUNCILLORS MALCOLM BEER, JOHN BOWDEN (CHAIRMAN), SIMON DUDLEY, DAVID HILTON AND JOHN LENTON

<u>SUBSTITUTE MEMBERS</u> COUNCILLORS JESSE GREY, LYNNE JONES, GEORGE BATHURST, CARWYN COX, DR LILLY EVANS AND SIMON WERNER

Karen Shepherd - Democratic Services Manager - Issued: Date Not Specified

Members of the Press and Public are welcome to attend Part I of this meeting. The agenda is available on the Council's web site at <u>www.rbwm.gov.uk</u> or contact the Panel Administrator

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### <u>AGENDA</u>

### <u>PART I</u>

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1.	WELCOME	
2.	APOLOGIES FOR ABSENCE	
	To receive any apologies for absence.	
3.	DECLARATIONS OF INTEREST	
	To receive any declarations of interest.	
4.	MINUTES	5 - 8
	To confirm the minutes of the meeting held on 8 June 2015.	
5.	MATTERS ARISING	
	To consider any matters arising.	
6.	ENVIRONMENTAL AUDIT COMMITTEE	9 - 32
	To receive a verbal update from Chris Nash on representation made to the Environmental Audit Committee.	
7.	CONSIDERATION OF THE TEDDINGTON & TWICKENHAM FLIGHT ANALYSIS	33 - 106
	To receive a verbal summary from Chris Nash on report conclusions. <u>http://www.heathrow.com/noise/making-heathrow-quieter/our-noise-strategy/working-with-local-communities/community-noise-forum/teddington-and-twickenham-flight-analysis</u>	
8.	COMPTON GATE PROCEDURE / FLIGHT PATHS - UPDATE	
	To receive a verbal update from Cllr Hilton on Compton Gate Procedure and the effect on residents.	
9.	HEATHROW LOBBYING / COMMUNITY ROADSHOWS	
	To receive a verbal update from Craig Miller on resident engagement.	
10.	PARTNERSHIP BODIES	
	To receive an update regarding key developments from Strategic Aviation Special Interest Group (SASIG), Heathrow Airport Consultative Committee (HAAC) and Local Authority Aircraft Noise Council (LAANC).	
11.	DATES OF FUTURE MEETINGS	

16 February 2016 10 May 2016 

### Agenda Item 4

### **AVIATION FORUM**

### 20 AUGUST 2015

PRESENT: Councillors John Bowden (Chairman), Malcolm Beer and David Hilton.

Officers: Louisa Dean (Communications and Marketing Manager), Craig Miller (Community Protection & Enforcement Service Lead), Chris Nash (Team Leader - Environmental Protection) and Shilpa Manek (Clerk).

### <u>PART I</u>

#### 1. WELCOME

The Chairman welcomed everyone to the Forum.

The Chairman informed the Forum that the meeting would be audio recorded and of fire drill procedures.

#### 2. <u>APOLOGIES FOR ABSENCE</u>

Apologies for absence were received from Councillors Dudley and Lenton and Jamie Jamieson.

3. <u>DECLARATIONS OF INTEREST</u>

There were no declarations of interest.

#### 4. <u>MINUTES</u>

### **RESOLVED UNANIMOUSLY:** That the minutes of the meeting of the Forum held on 8 June 2015 be approved.

#### 5. <u>MATTERS ARISING</u>

Chris Nash, Team Leader, Environmental Protection, informed the Forum that the nearest measuring station to Oakley Green was on Galley Road, Longmead and it had one of the lowest readings of 21. The Forum found this reassuring.

#### 6. <u>RESPONSE TO GOVERNMENT RE: AIRPORTS COMMISSION</u> <u>RECOMMENDATION</u>

Chris Nash, Team Leader, Environmental Protection, informed the Forum that a recommendation had been put forward on 1 July 2015 and a decision would be made by the end of the year.

The headline objections that were highlighted included:

- Ban of scheduled night flights.
- Legal binding on noise envelope.

- Guaranteed times of respite.
- Provision of the £1 billion noise reduction fund and the access needs.
- Establish 50% mode of shift of public transport.
- Seeking approval from lead member and Leader.

Chris Nash continued to explain that once approved, it would be sent to all 2M authorities to add their signatures to add further weight before sending to the Secretary of State.

Councillor Beer gave a brief background on the authorities that are members of 2M. He explained how many council's had joined and how many constituents.

Councillor Hilton asked if the council dialogue was going to be accepted by other local authorities. Officers explained that there was very positive dialogue with other local authorities except Slough, who was supporting the airport commission decision. The borough has very good relationships with all local authorities that are part of 2M.

The next step was to draft the response with input from the Aviation Forum and send to the Lead member and the Leader for approval and then approach the other local authorities for signatures and then send on to the Secretary of State.

Councillor Beer highlighted that that LAANC comments would definitely be considered when writing our response.

Other points discussed:

- Would the response state our objection? Yes, this would be clearly stated.
- Getting public on board to raise the profile further and organising meeting to inform constituents, Craig Miller advised that this was already in hand and discussion were taking place with communications team. He advised that an action plan was being developed and would be presented to the next Aviation Forum.

Councillor Hilton advised the Forum that a leaflet had already been developed and was to be distributed through letterboxes across the borough; 1.6 million leaflets had been prepared. Councillor Hilton had contributed £100 to the campaign and was going to write to the Leader to see if the council could also contribute to the campaign. Councillor Hilton advised that a rally had been organised for 10 October. He encouraged everyone to spread the word. Craig Miller advised the Forum that the council was supporting the leaflet and are referencing it.

The Chair advised that the council was setting aside funds to contribute to any campaign that was taking place.

#### 7. CRANFORD AGREEMENT - UPDATE

Chris Nash, Team Leader, Environmental Protection, informed the Forum that further to the boroughs representation, the Secretary of State was taking his time to respond. Everyone was working to a 9 November 2015 deadline. An update will be given at the next meeting.

### 8. <u>AIRSPACE CHANGE PROCESS</u>

Councillor Hilton gave a verbal update on the following three points:

### Heathrow Noise Forum

- Track not in line with what Webtrack have advertised.
- NRL work has started, the results will be available in two months.
- Members of the Forum have requested feedback at the same time as the Heathrow outcome.
- Putting gates across the flight paths looking at this afterwards as it will take longer.

### > Departure trials – ended November 2014

- Complaints.
- Impacts of the trials.
- Conclusions of the trials.

### > Airspace Change Process

- Achieved by 2017.
- Two meetings planned, 7 and 14 September.
- We support the views of the consultation of 2014 that noise should be prioritised.

The Chairman opened the floor for questions from the public. Some of the points raised included:

• NRL work was funded by Heathrow.

• Paul Jennings, Oakley Green and Fifield residents association, went through some technical points on altitudes above and under 7000 feet and glide scopes of 3.2 and how they don't make much of a difference.

• The "wide noise app" and that it could be used to give an idea of noise levels.

• Councillor Dr Lilly Evans raised points on the health implications at peak events and wanted to know what was in place. Levels at peak events do not fall into the dangerous category.

• Anything in the sky, CAA (Civil Aviation Authority) would be responsible and anything on the ground, in the borough, the borough would be responsible.

• BAA had many mobile monitors but finding a secure location for them was proving to be difficult. Councillor Beer suggested it was worth asking what happened to the programme for these.

• NATS owned 49% by the airline industry, so could be biased.

• Craig Miller explained that there were two live noise monitoring units in the borough to gather evidential base to any comments that we would make. They were placed in Central Windsor and Old Windsor. Both units had gone live on the week commencing 17 August 2015. These would be advertised once they were more established.

### 9. PARTNERSHIP BODIES

HAAC - Last meeting very joyous about the Davies Commission report.

LAANC – Should there be a challenge to the Davies Commission – it would be less expensive to challenge now. When in Parliament, it would be very expensive to mount a

legal review. There was discussion on the 3.2 glide slope and that only British Airways was participating.

#### 10. DATES OF FUTURE MEETINGS

The Forum noted the following dates for the future meetings of the Aviation Forum:

9 November 2015 16 February 2016 10 May 2016

#### <u>MEETING</u>

The Chairman thanked everyone for attending the Aviation Forum and closed the meeting. The meeting, which began at 7pm ended at 8.45pm.

Agenda Item 6

ITTER PRESERVE

# Assessing the work of the Airports Commission

6 5358533



October 2015



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### FOREWORD

This document sets out why we, as members of the 2M Group of councils opposed to Heathrow expansion, believe that the Airports Commission's findings are not convincing. We wish to make it absolutely clear from the start that we strongly oppose the proposed building of a third runway on environmental, health, and community impact grounds.

We believe the UK Airports Commission has presented MPs with an inflated and distorted case for expanding Heathrow. Throughout this report we point to a series of omissions, errors and perverse lines of argument in the Commission's work, all of which serve to promote the third runway scheme over and above rival options for expanding the UK's aviation capacity.

As we will explain, the Commission's methodology for comparing new runway options was engineered to favour Heathrow. Critical factors which present the greatest challenge to the third runway – such as air quality and flightpaths – have been misinterpreted or simply avoided.

We examine the Final Report's economic claims, in particular the colossal economic windfall the Commission expects to generate from a handful of new trade routes. We question why the Commission centred its arguments on growth forecasts which its own expert advisors dismissed as "extreme" and "misleading". We also ask MPs to consider carefully whether a scheme that is forecast to deliver a net reduction in direct routes between Heathrow and domestic airports is truly in the interest of regional economies.

This document also brings to light the web of legal, environmental, transport, political and social factors that make a third Heathrow runway undeliverable. These barriers are unique to Heathrow, stemming from the airport's location at the heart of the most densely populated area in Europe, and they continue to grow as legislative regimes tighten.

We also look at the mitigation and compensation measures which the Commission insists must be firm conditions attached to the third runway's approval. Now that Heathrow's owners have confirmed that they cannot viably operate the airport under these constraints it is clear that the Commission's solution is flawed.

As the evidence in this report spells out, there is no way to satisfactorily mitigate the impacts of Heathrow expansion and this third runway proposal is no different from those which went before it. As with previous schemes, it is wide open to legal challenge and the environmental costs do not justify the economic benefits.

The Airports Commission's recommendation, if followed, will lead to more wasted years and another failed runway scheme. We believe that Heathrow expansion is the wrong answer for London and the UK. We urge the Government not to continue to shoehorn yet more airport capacity into a location where the social and environmental harm cannot be justified.

May Pudepoor Nicholas True Ran Esvirdin' Dand J Ruly -

Signed by the Leaders of the London Boroughs of Hillingdon, Richmond, Wandsworth, and the Royal Borough of Windsor and Maidenhead.

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### **1. STRATEGIC FIT**

### A. Additional aviation capacity

- 1.1 The Commission concludes that a new north west runway (NWR) is expected to deliver the best solution for UK plc in terms of providing increased levels of long-haul connectivity. This conclusion is flawed because:
  - a) its own evidence shows that only a very small number of extra long haul destinations are forecast to be provided to serve the UK as whole if a third runway were to be added at Heathrow

The Commission's own studies show that, in the most likely future scenario where there is a carbon cap on total emissions from aviation, even without any extra runways, the numbers of daily long haul services available from all UK airports are predicted to rise from 61 (2011 base) to 82 by 2050. The effect of adding a third runway at Heathrow would be that this number would rise to 87; which is just 5 more across the whole UK. The increase in long haul routes at Heathrow with a third runway is shown to be to the detriment of other regional airports which would lose the long haul services that they already have or might be expected to gain by 2050 without a third runway at Heathrow. (Tables 5.10 and 6.28, Airports Commission, Strategic Fit, July 2015)

b) there is no means of preventing Heathrow airlines from using any new slots from additional capacity to fly at greater frequencies on the most lucrative routes, be those long haul or short haul, as opposed to serving the emerging economy destinations

This means that the promise of UK economic prosperity with the emerging economies arising from increased trade, tourism and investment with a third runway at Heathrow has been significantly overestimated.

c) its own evidence shows that it fails to deliver, or even maintain the seven UK regional destinations served today and this will drop to four regional airports with an expanded Heathrow

The Commission's own evidence (comparing Table 6.1 on page 117 with Figure 13.2 on page 252 in the Commission's Final Report) shows that there would be fewer domestic airports served by 2030 and 2050 than today. The fall in the numbers of domestic destinations being served means that cities such as Leeds/ Bradford, Newcastle and Aberdeen could lose their connections to Heathrow. In comparison a two runway Gatwick will serve at least seven domestic destinations for the government's objective of creating a Northern Powerhouse, to address the north/south divide and to rebalance the UK's economy.

Regional airports may also suffer if the Commission's conclusion is correct in that Heathrow will offer better access for passengers across the Midlands and North West, particularly due to HS2, while the Western Rail Access link would also provide a superior connection to the West of England and South Wales.

d) the Commission's only solution for maintaining a widespread network of domestic routes at Heathrow is by the use of public service obligations (PSOs) which comes at a considerable cost

Existing PSOs have proven to be costly to the government and the likely costs to the public have not been factored into the Commission's assessment. Nor has any account been taken of the wider detrimental economic impacts for other regions.

e) it recommends Heathrow as the UK's hub airport whilst recognising that it can never compete in the future with larger European mega hub airports because it cannot exceed 800,000 air traffic movements per annum due to London's congested airspace

The Commission has recommended that the NWR scheme should be taken forward subject to measures which include a fourth runway being firmly ruled out because there is no sound operational or environmental case for it. Sir Howard Davies emphasised to the London Assembly on 8 September 2015 that he had ruled out a fourth runway at Heathrow because there is a maximum limit of 800,000 air traffic movements per annum (ATMs) at any single London airport, due to London's congested airspace. Given that the third runway would provide up to 740,000 ATMs, there would not be any justification for another runway at Heathrow to provide 60,000 ATMs.

Given that Heathrow's future growth is highly constrained, it will never be able to compete with other larger mega hubs such as Istanbul and therefore 'maintain the UK's position as Europe's most important aviation hub' (Commission's Final Report page 37). It is inevitable that London's airports will need to continue to act together as the UK's hub.

f) it has ruled out a fourth runway, which would constrain Heathrow's future growth, but may not be enforceable, as history shows

There are concerns that it is unlikely to be legally possible to impose a restriction on future government decisions to rule out a fourth runway. The Terminal 5 planning inspector ruled out a third runway in 1999; BAA agreed to rule out an additional runway in 2001; and yet the proposal was discussed again before David Cameron ruled it out in 2010. John Holland Kaye, the CEO of Heathrow Airport has already indicated that he is reluctant to rule out a fourth runway because in his view there is physical room for it. In December 2014 he publicly stated that *"I have read the community leaflets distributed by the airport almost* 20 years ago, which committed to permanently rule out a third runway at Heathrow. I am shocked by that commitment. It should never have been made and it could never be kept. That is not an excuse; it is an apology. I am sorry that Heathrow made that commitment."

g) it pays insufficient regard to the fact that point to point trips are increasing and transfer traffic is declining across Europe

The Commission accepts that point to point trips (direct flights) are increasing and transfer traffic across Europe has been declining because of technological improvements and the rise in low cost carriers. The indication is that the new runway at Heathrow could be used largely for short haul journeys and very few long haul trips.

### **B.** Maximising the benefits of competition

- 1.2 The Commission concluded that the benefits of competition are greatest for the NWR scheme because the excess demand in the London airport system is greatest at Heathrow, leading to significant scarcity rents and higher average fare levels. This conclusion is flawed because:
  - h) long term competition is unlikely because the third runway is predicted to be full within a few years of its opening

The Commission fails to give due consideration to the likelihood that in the long term, the creation of a monopoly at Heathrow is unlikely to be in the interests of passengers, particularly as the Commission's technical assessment indicated,

Heathrow will be at 80 per cent capacity by 2030 and full by 2050. This means that by 2030 Heathrow will once again suffer from poor resilience, suffer delays and find that slots are constrained, just as it does today with its two runways. The claims recently made by Sir Howard Davies that a third runway would avoid the current problems by being able offer greater flexibility to switch flights between runways in time of pressure, are in our view at best speculative. His claims appear to have forgotten the fact that the airport's existing two runways have no capacity to absorb additional flights for most of the day.

### 2. ECONOMY

### **Maximising economic benefits**

- 2.1 The Commission concludes that a NWR scheme performs most strongly, generating £69.1 billion of benefits for the UK by 2050, compared to £60.1 billion from the Gatwick second runway. This conclusion is potentially flawed because:
  - a) the wider economic benefits of Heathrow expansion have been over stated by the Commission

The Commission's peer review panel (A note from Expert Advisors, Prof Peter Mackie and Mr Brian Pearce on key issues considering the Airports Commission Economic Case May 2015) cautioned against giving significant weight to the Commission's quoted £147bn quoted for additional UK GDP. They raised concerns about double counting; the fact that higher aeronautical charges have not been factored into the modelling; the reliance on significant further infrastructure investment; and the focus of the model on seat capacity rather than destinations served. The lack of increased long haul connectivity and the reduction in domestic connectivity does not appear to have been factored into the assessment.

### b) significant costs have been omitted from the evaluation of the Heathrow scheme

The Final Report, page 147, Table 7.1 shows that the net social benefits of a third runway at Heathrow are higher than those for Gatwick. However this excludes the actual costs of the schemes which are far higher for the NWR Heathrow scheme, i.e. an extra £16bn compared with £6bn for the Gatwick scheme. The Commission has only included £5bn for surface access costs for Heathrow whereas TfL believe that this will require a further £10–15bn to be invested; this brings the Commission's analysis into question. Furthermore, it is still unclear whether the Government or scheme promoter will pay for surface access (para 16.33 Final Report). This raises concerns about the huge burden on the taxpayer which may arise from the scale of the improvements needed to cope with expansion at Heathrow.

c) there is a potential 40 per cent reduction in benefits for Heathrow in a carbon capped future scenario

The letter dated 1 July 2015 from Sir Howard Davies to Lord Debden at the Committee on Climate Change (CCC) raises concerns over the economics of the expansion at Heathrow. It stated that in a carbon capped scenario, i.e. within the CCC's planning assumption of requiring aviation emissions limited to 37.5MtCO2 in 2050, the monetised transport economic efficiency and wider economic benefits of expansion are reduced by 40 per cent. Given the high costs associated with

delivering the Heathrow option this would question the robustness of the conclusion that benefits outweigh costs

### Economic growth in the local area and surrounding region.

- 2.2 The Commission concluded that Heathrow expansion would promote greater local economic benefits than Gatwick. This conclusion is flawed because:
  - d) it underplays the increased local pressures that will arise for new housing and related community infrastructure

The 77,000 new jobs that are expected to be generated locally as a result of expansion far exceed the local available labour supply; for example in 2011, wards closest to the airport in Hillingdon had an unemployed population of just 1,888 residents. The specialist nature of many employment opportunities will be unsuitable for local residents and the vast majority of new employees will therefore be from other parts of London and the UK.

The Commission recognises that expansion at Heathrow will result in a growth in jobs which 'could increase demand for local housing and related community infrastructure.' It terms of dealing with this increased pressure, it is not able to offer any positive proposals but merely suggests that 'Heathrow Airport Ltd. should build on existing commitments to support sustainable development of communities over several years. Local planning authorities should support sustainable development through more integrated joint planning across boundaries' (Final Report para 14.64).

In reality the burden has been totally shifted to local councils who will be required to provide accommodation and new community facilities, including schools and health facilities, for the 1,072 households whose homes are being demolished (783 due to a NWR and 289 due to the additional land take required) and others who have moved into the area for employment at the airport or in airport associated businesses. The capacity to accommodate the necessary improvements to physical and social infrastructure that are required to support new growth have not been properly assessed.

It should be stressed that neither the London Plan, nor Hillingdon's Local Plan Part 1 (the borough in which Heathrow falls) nor other Plans in the local authorities along the Thames Valley, take account of the development of a third runway at Heathrow. The additional growth arising from airport expansion would be additional to that within existing development plans.

For example, the recently published Substantive Version of Hounslow's Local Plan includes two new polices for mixed use development in areas referred to as the Great West Corridor and the West of the Borough, taking in the centres of Feltham, Cranford, Bedfont, Heston and Hanworth. These policies set out how development will be achieved in these areas but do not assign specific levels of growth.

The implementation of these policies will, however, require firstly the adoption of Hounslow's Local Plan and then the completion of evidence base studies to justify the release of Green Belt land, the proposed level of growth and requirements for supporting infrastructure improvements. The impact of the proposals on surrounding boroughs and the wider sub-region will also need to be fully assessed. It is understood that the proposals will come forward as a partial review of Hounslow's Local Plan. Until this work has been completed and the proposals have been fully tested through the Local Plan process, they cannot be relied upon.

### **3. SURFACE ACCESS**

By surface access, we mean access to the airport by all means other than air.

- 3.1 The Commission's assessment that the NWR scheme will be able to deliver its targets to shift people from car to public transport is flawed because:
  - a) public transport to Heathrow is already very congested and the planned improvements were designed for the existing two runway airport and the demand in background growth

The Commission reports that many key road and rail links in the Heathrow region are expected to be close to capacity by 2030 even with its 'extended' baseline. Whilst it acknowledges the long term capacity issues arising from background growth in surface access at Heathrow, it appears to dismiss appropriate responsibility for the impacts of the new runway by stating that 'The additional challenges presented by airport expansion are not a transformative factor that would significantly change the scale of these challenges' (para 8.25 of the Final Report.

b) it has totally underestimated the impacts on roads and public transport when a third runway is fully operational

Transport for London state on page 24 of the 'Mayor of London's response to the Airports Commission's recommendations for a three runway Heathrow' that the Commission has assumed that the runway can serve 148 million passengers per annum at full utilisation but for the purposes of surface access it only looks at the 2030 scenario with partial utilisation at 125.2 million passengers per annum.

The Commission has also underestimated the demand for surface transport infrastructure by not taking proper account of the growth in traffic and freight movements on the strategic and local roads which will arise from new businesses and jobs in the area and the further catalytic jobs and housing growth due to airport expansion.

c) it underplays the road and public transport infrastructure required and the associated costs

The Commission has grossly underestimated the surface access infrastructure required for Heathrow. It acknowledges that by 2030: "For Heathrow, the Southern Rail Access link and the central sections of Crossrail are forecast to be highly congested during the morning peak (on a par with the busiest sections of the London Underground network today and busier than the current surface rail routes) while the Piccadilly Line will also be reaching the limits of its capacity as it approaches central London" (para 8.22 of the Final Report).

The Commission also admit that, 'On the strategic road network, a number of links near to the airport, particularly those sections of the M4 in the closest proximity, are expected to require widening to cope with increased demand resulting from expansion....' (para 8.23 of the Final Report).

Transport for London has made clear on page 26 of the 'Mayor of London's response to the Airports Commission's recommendations for a three runway Heathrow' that the proposed £5bn cost underestimates the actual cost of coping with an expanded Heathrow by £10-15bn, which could fall to the public purse.

### d) its mitigation measures are not sufficient

The Commission has suggested that a set access charge of £20 on all passenger vehicles including taxis, and other interventions such as removal of employee

parking spaces could result in expansion at Heathrow without leading to more cars on the road. There is no evidence that such interventions will significantly affect a shift from car to public transport for airport passengers because public transport is not generally convenient for airport passengers and shift workers.

e) the predictions about modal shift targets for passengers and staff at Heathrow from around 40 per cent today to about 53 per cent by 2030 are not realistic. Even if the 53 per cent target for public transport to access the airport were achieved, Transport for London believe that this would result in 202,000 public transport trips per day by 2030 (31 per cent increase, i.e. 48,000 more trips compared to the 2030 no expansion scenario) and 183,000 trips by car (28 per cent increase, i.e. 40,000 more trips compared to the 2030 no expansion scenario). It is highly uncertain whether the level of new rail infrastructure proposed will be able to cope with the demands put upon it; and the highway schemes to provide upgrades at key junctions on the M25 and M4 are assumed to have occurred by 2030 but the funding for these schemes is not attributable to airport expansion.

### Accommodating the needs of other users of transport networks

- 3.2 The Commission's conclusions about the implications of the NWR scheme on other transport users are flawed because:
  - f) local and strategic roads will not be able to cope with the additional demands arising from increased passenger and freight traffic

Local roads are already heavily congested and they will not be able to cope with the additional demands arising from increased numbers of passengers and freight traffic, due to capacity issues, even with the proposed mitigation measures. The Commission's work shows that by 2030, in the morning peak hours, the M25 will already be at capacity and this situation will be exacerbated with Heathrow expansion. This will have significant implications as it is likely to lead to motorway traffic reassigning onto local roads to avoid delays, thus resulting in traffic queues at local junctions and also cause unacceptable levels of emissions in residential areas such as Wraysbury. Delays on the local road network will lead to longer and less reliable journey times and have cost implications for the local economy, and to the environment and public health from the harmful emissions emitted from vehicles queuing in traffic. The efficiency of local businesses will be affected as they incur higher fuel costs and greater time delays.

The principal road corridor that would be most adversely affected by increased road traffic growth arising from an expanded Heathrow, is the A4180 West End Road/Ruislip Road A312 Parkway corridor linking the A40 Polish War Memorial with the M4 junction 3. This is an important link providing north south connectivity on the eastern side of Hillingdon borough and access to Greenford, Uxbridge, Southall, the Southall Gas Works development site and Hayes town centre.

By 2030, even without Heathrow expansion, in the afternoon peak hours, the M25 will again be over capacity, as will be the A40 between the A406 Hanger Lane and A4180 Polish War Memorial junctions. Near Uxbridge town centre there will also be congestion from the A40 westbound off slip onto the B467 Harefield Road. These areas will all be greatly exacerbated with Heathrow expansion.

In terms of public transport, the Commission assumes that people will travel to work at Heathrow from as far afield as at Old Oak Common and in east London. This will inevitably cause more strain on public transport including Crossrail, which was not designed to accommodate the passenger impacts of a third runway.

g) surrounding areas will become a car park for airport passengers, staff and taxis There are already significant local concerns about car parking and associated traffic on local residential streets by airport users. These relate both to the car parking needs of airport passengers and airport staff as well as taxi parking and passenger drop offs. This can impact on the daily lives of local people, causing considerable inconvenience, road safety issues, noise and nuisance. There are also instances where businesses set up illegal car parks on a temporary basis, knowing that enforcement proceedings can take several months, during which time they can earn substantial sums in parking fees.

### **4. ENVIRONMENT**

The Commission is proposing to add a new runway at Heathrow with the total capacity of Gatwick (numbers of flights and passengers) into an already crowded, congested, noisy, polluted urban environment, which will take away any benefits the communities may eventually achieve from improving vehicle or aircraft technologies. This approach is flawed because improvements should now accrue to those who have been impacted for the last 20 years.

### A. Noise Minimising noise impacts

- 4.1 The Commission concludes that overall, the Gatwick Airport second runway scheme performs best in minimising and reducing noise impacts. Despite this, the Commission has recommended that conditions could be attached to mitigate against the harm caused by a third runway at Heathrow. This conclusion is flawed because:
  - a) a three runway Heathrow will still remain worse for aircraft noise than the top five European airports combined

The Heathrow NWR scheme will expose more people at 55dBLden than its five European competitors combined (Paris CDG; Frankfurt; Amsterdam; Madrid and Munich).

b) it is not acceptable to simply contain the problem to 'no worse than current' There are currently about 725,000 people exposed to aircraft noise at 55dBLden, which is unacceptable. The 2 runway Heathrow could however become a better neighbour over time with technological improvements and subject to the continuation of the cap of 480,000 air traffic movements per annum.

The Commission's report 'Noise Local Assessment' dated November 2014 shows in Table 4.49 that with the 3rd runway, there could be 726,600 people exposed to 55dBLden by 2050. This would bring us back to about the same numbers of people being affected by aircraft noise as today, which is totally unacceptable. But the additional point is that, with new flight paths, it would be different people being overflown and as yet those people are unaware that they will be subjected to such noise. Although the Commission claims that it might be possible to devise new flightpaths with a third runway which would have the effect of reducing noise for some communities, these proposals are speculative and untried. Even if they are possible in the future these new flights paths would result in over 160,000 people being newly affected (to a material degree) for the first time by aircraft noise from Heathrow.

The Government's policy in the Aviation Policy Framework (para 3.12) includes a vision that there should be a sharing of the benefits of future aviation technology to minimise noise impacts especially where they can impact on people's health. Instead the Commission unconvincingly concludes that Heathrow would be a better neighbour with a 3rd runway than it is today, because its proposal is to maintain current unacceptable levels of noise, which cannot be regarded as a fair interpretation of this policy.

c) The Commission has in effect hidden the real impact of a third runway at Heathrow by selective manipulation of data and not revealing flight paths information

The Commission's Final Report appears to include selective information on noise impacts. It does not include a comparison table summarising the noise effects of each of the schemes against the range of noise metrics and nor does it clearly highlight the numbers of people newly affected by aircraft noise and where those will be.

d) the NWR scheme proposes 260,000 more flights a year which will mean more aircraft noise across a wider geographical area

The Commission has refused to accept that despite improvements in technology for quieter planes, more flights will mean more aircraft noise and its answer to this is to spread the noise across a wider area.

The Commission fails to give sufficient weight to the noise impacts of the NWR scheme which despite very optimistic assumptions for new technology and rerouting flight paths, will affect more than 726,000 people and an additional 108 schools (in comparison to 36,000 people and an extra 14 schools with the Gatwick scheme).

### The Commission's solutions to mitigating noise impacts

### i) The night ban

4.2 The Commission has proposed a night ban as part of a package of mitigation measures intended to make the airport's expansion more acceptable to its local community and to Londoners generally. Whilst in principle a night ban is supported, the solution is flawed because:

### e) the night ban as proposed is not effective or sustainable

The ban on all scheduled night flights from 11.30pm to 6am is not sufficiently long because it only provides six and a half hours of scheduled relief from noise rather than the eight hour period recommended by the World Health Organisation. The Commission's own evidence (Final Report, Table 14.1, p 280) shows that there are vastly improved health benefits by extending the curfew hours to cover the full eight hour night time period.

Whilst the proposed ban means that 16 flights are shifted from the 4.30am to 6am period to after 6am, this will mean that without any restrictions after 6am and due to the greater throughput from three runways, these flights will need to be accommodated in the following hour, thus causing further sleep disturbance to thousands of people.

In addition, John Holland Kaye, the CEO of Heathrow Airport has already indicated that he is reluctant to accept this proposed night ban and that he is to press for loosening of this condition. The Commission says a curfew is possible for the night quota period and the health benefits show it should be implemented for the whole night period. The Government should therefore take this forward now, regardless of a third runway, to improve the health of Londoners as soon as possible.

#### ii) The noise envelope

- 4.3 The noise envelope is another mitigation measure intended to make the airport's expansion more acceptable to its local community and to Londoners generally. This assessment is flawed because:
  - f) the noise envelope is a vague concept rather than a specific mitigation measure and given the lack of detail, it is unclear what impact, if any, this will have

The Airports Commission has been unable to put forward specific proposals for a noise envelope because there is no policy framework within which limit values must be met around the airport either in terms of noise levels or numbers of flights. Given that there are no details about the noise envelope, it is unclear how this would operate in practice and what levels of noise and at what times these would impact on local communities.

The Commission suggests that a noise envelope could be set to ensure the total number of people affected by noise would be no higher than today. This is not an acceptable objective for communities who require an improvement on the current unacceptable levels of noise.

Whilst there may be some merit in a noise envelope that reduces noise impacts over time, provided that this is alongside a robust cap on flight numbers as well as a cap on noise levels, it is essential that this is underpinned by a new social survey of attitudes to aircraft noise.

### iii) Respite from noise

- 4.4 The proposed periods of respite is yet another mitigation measure proposed by the Commission to make the airport's expansion more acceptable. The conclusion that the respite proposals contribute to the 'no worse than today package' is flawed because:
  - g) the proposal will provide most people with only 25% respite, or just a quarter of their day without flights overhead, which is half of what is offered today

The proposal cannot be seen as a benefit because for many people, the daily noise impact will be much worse than experienced today. Furthermore, the proposal cannot by definition provide respite for those who will be newly overflown.

On the basis of current experience it can be predicted, with some confidence, that even the respite periods will be eroded by the introduction of 'tactical' measures as the spare capacity at Heathrow fills up again to levels approaching 99 per cent capacity.

### iv) Community compensation fund

4.5 The community compensation fund is also intended to make the airport's expansion more acceptable to its local community. This conclusion is flawed because:

### h) there has been no analysis of whether the compensation fund will cover the costs needed to address the harm caused

When asked how the compensation fund was evaluated, John Holland Kaye (on 3 December 2014 at a public meeting with the Airports Commission) simply said it was three times more than last time. It is a fundamental failure of the Commission's process not to have independently evaluated and assessed the harm caused and the mitigation required to address it.

Of the £1billion community compensation fund, the Commission's Final Report states in para 14.50 that £700 million will be used to insulate 160,000 homes and the remainder will be used for community infrastructure, including schools. There are however no details as to who pays for the rest of the impacted homes and schools and also other community buildings and open spaces, including playgrounds, playing fields and allotments which are blighted for outdoor recreational use.

The Commission has (Final Report, para 14.58) also suggested a noise levy with no idea on whether it will work, who will pay it or how much will be raised. The noise levy is unlikely to raise more than £50m per year because the Commission acknowledges that it will be unaffordable at more than 50p per passenger. Even at £50m, this would only provide support for around 11,500 households for noise insulation.

### v) Community engagement board and noise authority

- 4.6 The community engagement board and the independent aviation noise authority are also intended to make the airport's expansion more acceptable to its local community and to Londoners generally. This conclusion is flawed because:
  - i) it is unclear how it is intended to ensure that the community engagement board and the independent aviation noise authority will have any real decision making or enforcement powers to bring about actual improvements

The Commission has been impressed by community engagement at Schiphol Airport in Amsterdam, called the Alders Platform. It is effective because the majority of the airport is publicly owned. This model is not transferable to Heathrow because it is privately owned and therefore the airport will resist any interference with its operations.

The community engagement board is unlikely to be any different from any of the bodies that already exist at Heathrow. Whilst it may be able to influence the way that the community compensation fund is spent, it is unlikely to be able to influence the funding in terms of when and how much is received.

The Commission has recommended that the noise authority (IANA) has real decision making and enforcement powers, for example to set noise limits and impose fines. However national aviation policy currently lacks any commitment to achieve meaningful reductions in noise around Heathrow. In the light of this it is difficult to see what difference the IANA could make.

No costs for its establishment and continuation have been given and it is not clear whether it will be able to influence aircraft operations. Without any details the noise authority could simply become a talking shop with no outcome in terms of actual improvements in noise or the quality of life for communities.

Para 14.103 of the Final Report suggests that the noise authority will be funded from the noise levy and/or by the government. The noise levy is unlikely to be sufficient to cover these costs and therefore this may be a public burden.

### **B.** Air quality

- 4.7 The Commission's assessment of the NWR scheme on air quality is flawed because:
  - j) it is placing a significant new source of pollution emissions in an area already stressed, without due regard to health impacts

Despite its own evidence about the negative impacts of air pollution on health, the Commission has not carried out a proper Health Impact Assessment before making its recommendation. It has thereby failed to evaluate the existing and proposed levels of health burden in the surrounding areas and has knowingly recommended an option which increases air pollution for over 121,000 people.

k) the Commission's test for compliance is based on an incorrect understanding of the law

The Commission's assessment considers that it would be acceptable for Heathrow to continue to breach the health based legal limit values of nitrogen dioxide provided that the air quality there never gets worse than the most polluted location in the Greater London Authority (GLA) Urban Zone. This interpretation is wrong. Limit values must be met throughout any identified Zone and not made worse where it is currently already in breach.

I) the Commission has not demonstrated with any confidence that compliance with EU limit values can be achieved with a third runway at Heathrow

The Commission recognises that without mitigation, the current non compliant situation will be made worse. It therefore suggests various measures to reduce the air quality impacts. Most of these measures hinge on Heathrow's overoptimistic assumptions about there being no increase in the number of cars to and from the airport and an under-estimate of the surface access provision needed to achieve it.

It has not provided a clear mitigation plan with measures that have been identified as fully funded and which will be implemented and will achieve the reduction required to ensure that the health based limits will be met and then maintained with the operation of a third runway.

m) there is no UK Air Quality Plan which includes the full expansion of Heathrow with an accompanying robust evidence base to demonstrate that compliance with EU legislation will be achieved

The publication of the draft Air Quality Plan, as ordered by the Supreme Court, has been recently released for consultation ('Consultation on draft plans to improve air quality', Defra September 2015). The specific draft Plan for the GLA Urban Zone does not include measures to address any impacts arising from expansion at Heathrow.

 n) no assessment has been made on the negative economic impacts of building a new runway and not being able to use it to its capacity, due to environmental constraints

The Commission's condition states 'Add*itional operations at an expanded Heathrow must be contingent on an acceptable performance on air quality. New capacity should only be released when it is clear that air quality at sites around the airport will not delay compliance with EU limits'.* There is no evidence presented to demonstrate any confidence that the expansion of Heathrow can be achieved and EU limits met and maintained. As this is a legal requirement of EU law the release of capacity may not be realised. This could lead to a runway built and never fully utilised.

### C. Carbon emissions

- 4.8 The Commission's assessment that Heathrow will be able to mitigate against the harm caused by the NWR scheme with regard to carbon emissions is flawed because:
  - o) it is an inappropriate use of the UK's carbon allowance

The Commission's own assessment shows that Heathrow is by far the worst option in terms of carbon emissions because it would produce over 25 per cent more than the Gatwick scheme due to an overall higher number of passengers and air traffic movements and a larger construction programme. It would appear irresponsible not to give proper weight to carbon impacts in determining the future of the UK's aviation industry.

p) there has been no analysis of carbon trade-offs in future technologies In a carbon constrained world, there may be strict targets imposed to ensure reductions in aviation CO<sub>2</sub> emissions. If international policies change to give greater priority to reducing CO<sub>2</sub> in the future, it is inevitable that the development of new aircraft technologies will adapt to meet these requirements and those technologies, which currently are relied upon to deliver future noise benefits and cleaner aircraft in terms of NOX may be compromised. For example the A380 aircraft design parameters were influenced to meet the noise criteria at Heathrow to the detriment of fuel burn and CO<sub>2</sub> emissions.

### D. Natural habitats and biodiversity

- 4.9 The Commission concluded that the NWR scheme would raise potential bird strike control issues potentially affecting an internationally designated site and require a challenging programme of watercourse diversions. It would also have an impact on a nationally rare plant species, Pennyroyal. Nevertheless it considers that the NWR scheme can address these concerns. This conclusion is flawed because:
  - p) it involves a loss of 905.9 hectares of open land and habitats which is far greater than any of the other airport options and almost double the previous rejected proposal for expansion at Heathrow

The Jacobs Place Assessment prepared for the Airports Commission in November 2014 identifies a total loss of 905.9 hectares of land as a result of the NWR scheme, of which approximately 431 hectares is designated Green Belt land, a commodity highly valued in the urban environment around Heathrow to control urban sprawl and maintain largely undeveloped land between urban areas. Whilst the largest areas of land take relate to agricultural land, Jacobs identify a loss of 61.1 hectares of recreational land.

### E. Surface and ground water

- 4.10 The Commission has concluded that the NWR scheme is acceptable in terms of water quantity and flooding. This conclusion is flawed because:
  - q) there has been little assessment of the impacts or the mitigation measures required to protect the quality of surface and ground water and minimise flood risk

Despite recognising the substantial challenges at Heathrow in completing the detailed design of a programme of watercourse diversions in the Colne Valley, there has been little assessment of the impacts or the mitigation measures that may be required to ensure that increased demand for water at an expanded

Heathrow could be met, whilst also protecting the quality of surface water and ground water and minimising flood risk. These mitigation measures have not yet been identified, nor costed or proven to work.

### F. Landscape character and heritage assets

- 4.12 The Commission concludes that the NWR scheme has the greatest adverse impacts of all the options even with mitigation but nevertheless:
  - r) it understates the impacts on landscape character and heritage assets at Heathrow

The Commission assumes that the mitigation measures will work but many of these impacts cannot be mitigated against and the suggested proposals are not detailed enough to be capable of being assessed in terms of their effectiveness, enforceability or sustainability. The Jacobs Place Assessment prepared for the Airports Commission in November 2014 states that the NWR scheme would result in:

- more land being used (up to 905.9 hectares) than for the Gatwick scheme (702.2 hectares)
- the loss of 431 hectares of Green Belt land compared to just 9.2 hectares for the Gatwick scheme (the Jacobs Place Assessment prepared for the Airports Commission in November 2014)
- the loss of about 430 hectares of agricultural land, which is better quality than that around Gatwick
- the loss of more built up areas than around Gatwick
- a significant adverse effect on the Colne Valley Regional Park during construction as some of the Park would be lost to accommodate the new runway and there would be views from the Park towards the construction works
- a significant adverse effect on the Hillingdon Lower Colne Floodplain character area in terms of landscape and townscape character as the majority of construction works would take place here. The Commission accepts that even with mitigation, the Hillingdon Lower Colne flood plain would continue to be severely impacted after construction has been completed at Heathrow
- a detrimental effect upon heritage and tourism sites in the wider Thames Valley including Windsor Castle and Eton;
- a far greater overall impact on loss of listed buildings compared to the Gatwick scheme

The Commission has recognised that many of the impacts on listed buildings at Heathrow are concentrated in the Conservation Areas in the village of Longford, which would be removed in its entirety, and Harmondsworth, part of which would also be lost. There would also be impacts on the setting of other remaining assets such as Grade I listed Harmondsworth Great Barn, which would sit immediately outside the boundary of the expanded airport, though its demolition would not be required.

### 5. PEOPLE

### A. Community destruction

- 5.1 The Commission recommends the NWR scheme despite the devastating scale of community loss it would cause. This conclusion is flawed because:
  - a) it would result in the unacceptable loss of 1,072 homes, including the demolition of all of Longford village as well as parts of Harmondsworth and other nearby villages. This is far more than the previous rejected proposal for expansion at Heathrow

The Commission accepts that the NWR scheme would result in the loss of 1,072 homes compared to 205 homes for the Gatwick scheme (the Jacobs Place Assessment prepared for the Airports Commission in November 2014) but the mitigation measures proposed are insufficient and no other feasible measures are available to further address the impacts.

The Commission is aware that the land take required for the NWR scheme would result in the demolition of all of Longford village as well as parts of Harmondsworth and other nearby villages.

Whilst it recognises that the NWR scheme results in the greatest loss of housing and the largest scale of land take, it has not given adequate weight and consideration to the associated devastating impacts.

b) the offer of full market value plus 25 per cent to homeowners who lose their homes is not likely to enable people to purchase a comparable home in the area

The offer by Heathrow Airport Limited has been deemed suitable by the Commission without any evaluation as to whether people can relocate to similar properties or remain in the area.

### **B.** Construction impacts

- 5.2 The Commission recommends the NWR scheme despite the unacceptable construction impacts that would have to be borne by local communities. This conclusion is flawed because:
  - c) there has been no proper consideration of the full wider impacts of construction

The construction impacts are likely to be devastating for large numbers of people and they will continue over a period of 10 years or more. For young people, this will cover a substantial part of their childhood and it will blight the retirement years of those who are at the start of that phase of their lives.

The full demolition and construction impacts on local communities should have been given proper consideration and yet these have been underestimated, for example, the displacement of traffic from the strategic roads to local roads during the long construction period will bring local areas to gridlock.

The Jacobs Place: Assessment prepared for the Airports Commission in November 2014 identifies a total loss of 905.9 hectares of land as a result of the NWR scheme, of which approximately 431 hectares is designated Green Belt land, a commodity highly valued in the urban environment around Heathrow to control urban sprawl and maintain largely undeveloped land between urban areas.

The Jacobs Place Assessment report prepared for the Airports Commission in November 2014 noted that properties in Stanwell, Stanwell Moor, Harmondsworth and Sipson would all experience a significant adverse effect on views during construction due to the proximity of works and the open nature of views. The significant adverse effect would continue into the operation of the airport for properties in Harmondsworth and Sipson. This is because the operational airport would be in very close proximity and although partially screened by bunding, the bunding (usually high earth mounds, fencing or walling) itself would have a visual impact.

### C. Health

- 5.3 The Commission's assessment on health is flawed because:
  - d) it fails to adequately assess the health impacts of the schemes and the effectiveness of the proposed mitigation measures

The 'Equity Focused Review Report of the Airports Commission's Final Report and Community Health Relevant Assessments', by Public Health by Design in September 2015 concludes that:

- the weaknesses and flaws in the Commission's community health assessments, which were highlighted by Public Health by Design in its earlier reports to the Commission have not been addressed. The only realistic alternative would have been the provision of full health impact assessments for each chosen location during the Appraisal Framework process. The Commission has failed to do this
- the Airports Commission's approach that a full detailed understanding of the health impacts will be developed once the preferred scheme is chosen has completely missed the important fact that the impacts on health of different locations should have informed the appraisal process in relation to suitability of location for expansion, prior to any final recommendation.
- the Commission has failed to properly assess and identify the current health burden of the area surrounding the airport let alone carry out a proper assessment of the impacts of expansion
- potential mitigation measures that may be required to address health impacts, such as increased funding for hospitals and other health care facilities; or health monitoring throughout the area to identify cardiovascular risk factors in the exposed populations so that preventative measures can be taken to avoid more serious cardiovascular disease progression, have not been satisfactorily considered and put forward because there has been no proper health assessment carried out by the Airports Commission
- the Commission has assumed that any negative health and well being impacts can be minimised or avoided through its proposed mitigation measures. These measures to address noise and air quality impacts are, in most cases, unworkable and also not quantifiable in terms of what improvements they will actually achieve
- the Commission emphasises the positive benefits to health that employment afforded by a new runway can bring and it wrongly assumes that this can balance out the negative impacts arising from noise disturbance and poor air quality
- the Commission's leisure travel analysis is largely irrelevant in terms of health as its assumption that all the people who suffer the detrimental health impacts will be sufficiently wealthy to fly and gain the higher levels of life satisfaction is wrong.

• Heathrow's mitigation proposals for health impacts are also totally inadequate, for example it proposes large green spaces where people can exercise and be active, without recognising that large open spaces already exist, and some of these would be lost

### **D. Equality**

5.3 The Commission concludes that the population around Heathrow is younger and more ethnically diverse and the population around Gatwick is older and less diverse than at Heathrow. With the information currently available, it decided that it would not be appropriate to compare the differing scale of these impacts between schemes. This conclusion is flawed because:

#### e) an adequate equalities impact assessment has not been carried out

The Commission states that it would not be appropriate to compare the differing impacts between the schemes at this stage and that the equalities impact assessment would need to be revisited as the scheme progresses through the detailed stages. This appears to be a poor justification for the omission of a proper equalities impact assessment at a time when good quality information is crucially needed to enable a critical decision to be made on the location of a new runway.

It is unclear why the Commission is unable to make any initial assessment of the likely impacts at this stage. The Commission has merely assumed that mitigation measures could be developed to address the disproportionate impacts on any social group and there is no evidence to show if and how that could be achieved.

### 6. COSTS, DELIVERABILITY AND OPERATIONAL VIABILITY

### A. Social, environmental and economic costs and benefit

- 6.1 The Commission's recommendation is flawed because:
  - a) it has over stated the economic benefits and under estimated the social and environmental impacts of Heathrow expansion

The Commission has assessed the options in terms of their ability to deliver the greatest economic benefits for the UK as an aviation hub. In doing so, the Commission has not given adequate weight to the social and environmental impacts of the schemes. The result is that the economic benefits of Heathrow expansion have been over stated, whereas the social and environmental impacts have been under estimated or in some cases, such as health, not properly addressed. The mitigation measures have not been properly costed or adequately considered in terms of whether they are capable of addressing the harm caused.

### B. Deliverability Commercial viability

6.2 The Commission concludes that the NWR scheme is commercially viable without a requirement for direct government support. This conclusion is flawed because:

b) the scale of the financial investment points to very significant financing issues and this may result in the scheme being unrealistic to deliver

We note the concerns in the 'Mayor of London's response to the Airports Commission recommendation for a three runway Heathrow' dated September 2015 and those of Gatwick Airport in its report dated 14 July 2015 on its initial response to the Commission's recommendations about the very significant financing issues with the NWR and doubts about whether the scheme is deliverable. There are also concerns about so much public spending in just one location to the detriment of other national projects and whether this is justifiable and assists in creating the Northern Powerhouse. We note that Willie Walsh has stated that, "This issue of financing was glossed over and was put in there as if it was a done deal ... The debate hasn't really started yet."

Willie Walsh, the CEO of the International Airlines Group (IAG) has voiced concerns about the financial aspects of the third runway as he cannot see how the whole project could be financed, saying, "There is a major issue to address in terms of the cost of this infrastructure and I fail to see how the airport will be able to finance it, given the impact that it would have on the operating costs of Heathrow. You are talking about extremely expensive infrastructure that will not be fit for purpose, and I don't think it's right that we lock future generations into inefficient, expensive infrastructure."

Willie Walsh has warned that the IAG would refuse to pay the charges that would be needed to make the runway commercially viable, with aeronautical charges forecast to rise to £28-£30 per passenger on average.

### New runway operational by 2030

- 6.3 The Commission's assessment that the NWR scheme meets the objective of being operational by 2030 is flawed because:
  - c) it has grossly underestimated the enormous scale of the delivery risks, which could delay the completion of the runway beyond 2030

The NWR scheme faces huge infrastructure challenges, aside from the construction of the new runway, which will all be extremely challenging to resolve and given that they will cause significant disruption and carry huge risks, they are likely to be controversial and Heathrow will undoubtedly face fierce public opposition.

These include the demolition of 783 homes, the placing of the M25 in a tunnel and significant operational and commercial impacts on RAF Northolt, with civilian flights potentially being stopped. There are also risks with the demolition of the Lakeside Energy from Waste Plant, which plays a significant role in regional and local waste management and has a valuable capability to process clinical waste and other contaminated material. The Commission acknowledges that its replacement is necessary and that the planning and construction of an Energy from Waste Plant would be a substantial exercise in its own right, whose timescales are not substantially shorter than the delivery of new runway infrastructure.

### **Community engagement**

- 6.4 The Commission concludes that all three of its shortlisted schemes have demonstrated an understanding of the engagement a new runway will require and the competence to manage the complex consultative and engagement programmes this will entail. The Commission's assessment is flawed because:
  - d) it has underestimated the considerable distrust that there is locally

There is considerable local distrust due to the fact that past engagement with Heathrow Airport Limited has been extremely poor and that the NWR scheme will face immense opposition at every opportunity.

### C. Operational viability

- 6.5 The Commission concludes that overall the NWR scheme performed most strongly under this objective, taking into account its capacity increase and flexible mix of aircraft. This conclusion is flawed because:
  - e) it has ignored the potential for operational resilience to be sacrificed within a few years of opening

The Commission's own technical assessment indicated that Heathrow is predicted to be almost at capacity in five years (to open in 2026 and be at 80 per cent capacity by 2030). It is likely that soon after that, operational resilience will once again be sacrificed for more flights, and that in turn will result in further operational measures that will be at the expense of residents and once again, put pressure for another new runway. A third runway will not solve Heathrow's issues; it is not a sustainable solution and this cycle cannot be allowed to repeat itself.

f) it has totally underestimated the problems it faces in terms of airspace and flightpaths

The Commission has proposed airport expansion within the most congested airspace network, where there is already considerable community disquiet over future flightpaths; the policies to be applied in terms of concentration or dispersal; and the delivery of respite and what it should be. The environmental benefits and disbenefits of new operational measures such as glide slopes and curved approaches (for example, planes landing at steeper angles) have not yet been evaluated and it is not yet known if these airspace measures are feasible.

g) it has not assessed the safety of Londoners being over-flown by significantly increased numbers of flights within the most densely populated area in Europe

The Commission has not properly considered the risks to residents of air crashes arising from flight paths over highly densely populated urban areas and the likely risks associated with that. The flightpaths have not yet been agreed and there is no proper assessment of the numbers and density of development that is overflown. The threat of terrorist attacks over London cannot be dismissed lightly.

Published by Hillingdon, Richmond, Wandsworth, and Windsor and Maidenhead councils, members of the 2M Group of local authorities opposed to Heathrow expansion.

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### TEDDINGTON FLIGHT PATH ANALYSIS FINAL REPORT

October 2015

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- 2. Analysis approach
- 3. Dover gate results
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- 5. Southampton gate results
  6. Conclusions





### INTRODUCTION

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# Teddington and surrounding areas are overflown by three of Heathrow's departure routes on easterly operations



Note: During the analysis period covered in this report the designation on the DVR SID has changed to Detling (DET) so that the route is now referred to as DET SID. The report retains the previous DVR designation
# A series of operational trials have been performed to investigate and inform potential re-design of airspace and more flexible departure operations

Operational freedoms	Easterly departure trial 1	Easterly departure trial 2
Period of trial: • 1 July 2012 to 31 January 2013	<ul><li>Period of trial:</li><li>16 December 2013 to 15 June 2014</li></ul>	Period of trial: • 28 July 2014 to 12 November 2014 Departure routes affected:
<ul> <li>Departure routes affected:</li> <li>DVR</li> <li>MID</li> <li>Purpose of trial:</li> <li>to test the effectiveness of early vectoring of departing traffic to increase the departure runway throughput rate</li> </ul>	<ul> <li>Departure routes affected:</li> <li>MID</li> <li>Purpose of trial:</li> <li>to test the feasibility of alternating traffic on a weekly basis between two temporary SIDs on either side of the existing MID routes but still within the boundaries of the NPR</li> </ul>	<ul> <li>CPT</li> <li>SAM</li> <li>MID</li> <li>Purpose of trial:</li> <li>CPT: to test a new RNAV1 SID classified as PIBUG.</li> <li>MID: to test an RNAV1 SID as close as possible to the existing MID SID.</li> <li>SAM: to test a RNAV1 SID with the initial turn changed to match the MID initial turn</li> </ul>

The Teddington Action Group (TAG) has highlighted concerns relating to changes in flight paths and noise impact after the end of the trial period. This study has investigated traffic distributions over a period of time, pre-, during and post-trial to identify and understand the changes that have occurred



#### ANALYSIS APPROACH

2



# Traffic distributions have been investigated at three of the locations specified by the Teddington Action Group



#### Location of the penetration gates used for flight path analysis

# Penetration gate analysis investigates the spatial distribution of flight paths passing through the window in space defined by the gate



Each point on the right-hand chart represents an individual flight (here they are colour coded according to whether they are assigned to the stream 1 or stream 2 swaths)

The gate distribution or flight path swath is the pattern of points where flights pierce the gate over a period of time. The swath is characterised by:

- **centre of gravity**: the mean average of the distribution of the flights within the swath as an indicator of the position of the core of the swath (this is not necessarily the point of highest intensity)
- dispersion: the standard deviation of the distribution of all the flights within the swath as an indicator of the spread of the swath
- minimum height: the position of the lowest flight in the swath over the time period



### Analysis over the period from November 2011 to May 2015 has been undertaken to understand residents' observations of significant changes to pre-trial flight paths

The analysis period has been broken down into twelve periods to isolate the effects of schedule changes from summer-to-winter-to-summer, as well as the impacts of the two sets of departure trials

	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2011										1 W11-12			
<u>₽</u> 012	1	W11-12		2 S12 3 W12-13						2-13			
2013	3	W12-13		Summer 2012					5 W13-14 6 W13 tria		3-14 al 1		
2014	6	W13-14 trial 1		7	S14 trial 1	8	S14	9	S14 trial 2		10 (1) v	V14-15	
2015	(1)	W14-15		12 S15						V	V14-15 trial 2		I.

#### The twelve time periods for analysis



Because different types of aircraft operate differently and have varying degrees of noise and visual impact, the analysis classifies aircraft into five broad categories

	Examples of	f types of aircraft in ea	ch category	
A380	Heavy	Medium	Small	Light
Aircraft weighing over 560 tonnes, e.g.: • A380 4	Aircraft weighing over 136 tonnes, e.g.: • B747 • B767 • B777 • B787 • A330 • A340	Aircraft weighing between 40 and 136 tonnes, e.g.: • B737 • B757 • A320 • A319 • A318 • A321	Aircraft weighing between 17 and 40 tonnes, e.g.: • Gulfstream	Aircraft weighing less than 17 tonnes, e.g.: • Cessna Citation • Learjet

These classifications are based on aircraft size and do not necessarily give an indication of the noise produced, although broadly speaking larger aircraft are likely to have a greater perceived impact than smaller aircraft. Generally, aircraft within each category might also be expected to exhibit similar flight performance, e.g. climb rate. However, aircraft performance is also strongly influenced by

- on-board electronics, particularly the software used in navigation systems, which can vary within aircraft type
- airline standard operating procedures, which can vary markedly from airline-to-airline
- the destination which influences the weight of the aircraft and hence its climb performance



### The analysis is based on gate data extracted on a flight-by-flight basis from Heathrow's ANOMS system over the period 1 November 2011 to 1 May 2015

# Southampton (SAM) 43

#### The three gates

#### The data fields

Data fields for flights crossing each gate
Scheduled departure time
Flight number
Aircraft type
Departure runway
Lateral position relative to centre line at gate
Height above ground at gate
Date and time of crossing gate
Ground speed
Direction of crossing gate
Designated departure route (SID)

#### ANOMS – Airport Noise and Operational Management System



# The objective of the analysis is to understand traffic patterns before, during and after the trials and to identify any changes that have occurred

#### The main indicators calculated during the analysis

#### Volume of traffic

- Number of flights crossing the gate per day classified by assigned departure route and aircraft category
- Number of flights occurring before 08:00 hours local time and after 20:00 hours local time classified by aircraft category
- Number of flights crossing the gate each day at heights below 2000 feet and 3000 feet

#### Distribution of traffic

- The swath defined by the lateral and vertical position of each flight track as it crosses the penetration gate during each analysis period, classified by:
  - designated departure route; and
  - aircraft category
- The lateral and vertical centre of gravity of the swath on a daily basis, showing the centre of the flight paths (note: this Is not necessarily the point of highest concentration of flights)
- The lateral and vertical extent of the swath on a daily basis, showing the spread of flights crossing the gate
- The lower extreme of the swath on a daily basis, showing the height of the lowest aircraft to cross the gate on that day
- The concentration of the traffic across the swath for each of the time periods analysed



# The first dimension of the analysis is to understand the evolution of the volume of traffic over time

The total number of flights crossing the gate each day is counted and classified into the main aircraft categories:

- A380, shown as black bars on the charts
- heavy, shown as red bars on the charts
- medium, shown as yellow bars on the charts

As an indicator of night flights, the number of flights crossing the gate before 08:00 hours and after 20:00 hours local time are counted and classified into the three main aircraft categories

Small and light aircraft types are not shown because of the very small volume of aircraft in this class

On days when the airport is operating in the westerly direction, there are no flights crossing the gate and there are gaps in the chart

The periods covered by the trials are indicated as bars at the top of the chart for reference



#### Daily total flights crossing the gate

#### Daily flights crossing the gate during the night period



### The spatial distribution of flights (the swath) is indicated on scatter plots with the flights classified either by departure route or aircraft type



Scatter plots for departure route

Each point represents the coordinates of a single flight crossing the gate during the analysis period: the horizontal axis is distance from the centre line (negative to the left, positive to the right) and the vertical axis is height above the ground

Flights are colour coded according to their designated departure route (SID):

- red for DVR
- blue for SAM
- gold for MID
- black for other SIDs

#### Scatter plots for aircraft type



Each point represents the coordinates of a single flight crossing the gate during the analysis period: the horizontal axis is distance from the centre line (negative to the left, positive to the right) and the vertical axis is height above the ground

Flights are colour coded according to the type of aircraft

- red for heavy aircraft
- gold for medium aircraft
- black for A380s
- blue for light aircraft (very low numbers)
- light blue for small aircraft (very low numbers)



# The variation of lateral centre of gravity (mean average), lateral extent and lateral dispersion (standard deviation) of the swath is analysed on a daily basis



Each point represents the lateral centre of gravity of the swath on a daily basis. Each bar represents the lateral extent of the swath. The solid red line is the best straight line fit to the centre of gravity



Each point represents the standard deviation of the lateral swath distribution as a measure of the lateral spread or dispersion of the swath. The solid red line is the best straight line fit to the dispersion



### Similarly, the vertical centre of gravity and the bottom limit of the swath are used to describe the swath's vertical characteristics on a daily basis



### The daily number of flights below thresholds of 3000 feet and 2000 feet are used as additional measures to quantify height performance



Each point represents the number of flights assigned to a SID below the threshold. The red line represents the best straight line fit

# The concentration or intensity of flights across the gate is calculated and displayed as a heat map

The simple scatter plots show the position of each flight passing through the gate during the analysis period

Because there are large numbers of flights crossing the gate during each analysis period, the points on the plot are superimposed and give little indication on the concentration or intensity of flights across the gate

Heat maps have been produced, using statistical distributions derived from the scatter plots, to give a measure of this concentration, derived from the statistical distributions of the flights

The heat maps are normalised to the number of days affected during each measurement period so that different measurement periods and different gates are directly comparable

Heat maps are divided into pixels, approximately 50m horizontally by 30m vertically

The unit of intensity is flights per day per pixel



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# Finally the analysis must be understood in the context of the easterly:westerly split that influences the number of flights operating during the measurement period



#### Proportion of departures towards the East

57





#### DOVER NPR RESULTS

3



### The DVR gate is located at the intersection of the DVR noise preferential route (NPR) centreline and Strawberry Vale/Cross



#### Location of the DVR NPR gate



# The DVR gate captures traffic using the DVR SID, near to its centre, and traffic using the SAM SID at its right hand extreme





### The traffic volume crossing the DVR gate per day was fairly flat until the start of the winter season 2014-15 when it increased

#### Daily departure traffic through the DVR NPR gate classified by SID



Reduction in volume due to SAM traffic being shifted out of the gate during the second departure trial



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55

### The number of A380s using the DVR SID has increased steadily from 2012 and, since autumn 2014, there has been an increase in the overall traffic volume

### Daily DVR SID traffic through the DVR gate by aircraft type

### Daily SAM SID traffic through the DVR gate by aircraft type



Except for a decrease during the operational freedoms trial period, the total volume of daily traffic using the DVR SID was fairly consistent: approximately 150 flights per day from late 2011 until the beginning of the 2014-15 winter season. At this point the volume of traffic increased to around 180 per day.

The mix of aircraft using the route has also changed slightly over the analysis period. The number of A380s using the route has increased from four per day in late 2011 to, typically, 11 to 14 per day in 2015. The number of heavy aircraft using the route has also increased from 50 per day in 2011 to approximately 70 per day at present. Except during the operational freedoms and second departure trials periods, where there was a decrease, the volume of traffic crossing the DVR gate using the SAM SID has remained consistent at approximately 30 flights per day. The traffic is made up of heavy and medium aircraft with few A380s observed in the data.



# The volume of traffic using the DVR SID before eight in the morning and after eight in the evening is cyclical with season and also appears to be increasing

### DVR SID traffic traversing the DVR gate before 08:00 hours and after 20:00 hours

### SAM SID traffic traversing the DVR gate before 08:00 hours and after 20:00 hours



The number of DVR SID flights traversing the DVR gate before 08:00 hours and after 20:00 hours has increased from approximately 20 flights per day in early 2012 to approximately 30 flights per day in 2013 and further to approximately 35 flights per day in early 2015. The volume of traffic is higher in summer than in winter.

At least 50% of these flights are by large aircraft and this often increases to higher proportions. Until the start of the 2013, there were only one or two A380s in the traffic mix: this has increased since then and is now typically three to five.

Apart from the period at the end of the first departure trial and during the second departure trial, the number SAM SID flights traversing the DVR gate before 08:00 hours and after 20:00 hours has remained consistent at between five and ten per day. During the end of the second trial period there appears to have been a slight increase in the number of flights whereas the flights disappear during the second departure trial.

Slightly over 50% of the flights during this time window appear to be made by heavy aircraft although there are no A380s in the mix.



# The DVR gate captures the DVR SID traffic, most of the SAM SID traffic and occasional flights assigned to other SIDs



#### Annual spatial distribution of traffic crossing the DVR gate classified by SID



# The DVR swaths clearly identify the effect of operational freedoms vectoring in 2012 and early 2013





### The effect of the second departure trial period is to move the SAM SID traffic out of the DVR gate with no perceivable effect on the DVR SID traffic

Distribution of traffic crossing the DVR gate classified by SID for the final six analysis periods





#### In 2012, the traffic vectored during the operational freedoms trial was mainly made up of medium aircraft: in 2013 it included more heavy aircraft and some A380s

Distribution of traffic crossing the DVR gate classified by aircraft type for the first six analysis periods





### Over the period from late 2011 to spring 2015, the number of A380s can be seen to be increasing at the lower levels of the DVR SID swath

#### Distribution of traffic crossing the DVR gate classified by aircraft type for the final six analysis periods





# The lateral position of the DVR swath appears to be static but the traffic is becoming more concentrated

#### Lateral centre of gravity and extent of the DVR SID swath



The lateral centre of gravity of the DVR SID swath is fairly consistent at approximately 300m to the left of the centre line. Where there are fluctuations of the lateral centre of gravity from this position, the shift tends mostly to be further to the left of the centre-line and is most marked during the operational freedoms trial during the second half of 2012. It seems likely, therefore, that shifts of the centre of gravity from its normal position are due to controllers vectoring aircraft on the SID, as in the operational freedoms trial.

The lateral extent of the swath is very variable. This variation does not appear to be systematic. The lateral extent ranges from approximately 1200m to over 2.5km.



Lateral dispersion

The lateral dispersion, defined as the standard deviation, gives a quantitative measure of the width of the swath. The chart above shows that the lateral dispersion of the swath was largest during the operational freedoms trial, caused by the vectoring of aircraft away from the usual centre of gravity. The overall trend in the dispersion is downwards, from approximately 250m in late 2011 to approximately 175m in April 2015. This implies that the traffic is becoming more concentrated around the centre of gravity.

Note the points with zero dispersion in the chart are associated with days with very low traffic, i.e. when operations are predominantly westerly



# Over the analysis period, there appears to be a downward trend in the height of the DVR SID swath

#### Vertical centre of gravity and extent of the DVR SID swath at the DVR gate



Lower limit of the DVR SID swath at the DVR gate



The vertical centre of gravity of the DVR SID swath fluctuates around an average value of approximately 3200 feet. At the 95% level the vertical centre of gravity of the swath ranges between 2800 feet and 3800 feet.

The vertical extent of the swath extends from approximately 1400 feet to approximately 6200 feet. The top of the swath appears to be getting lower.

The trend of the height of the centre of gravity appears to be downwards. The trend-line suggests a decrease from approximately 3400 feet in late 2011 to approximately 3100 feet at the end of April 2015. The lower limit of the swath is defined by the lowest aircraft flying on the DVR SID traversing the gate each day. On average, this height is approximately 2000 feet. There is a perceptible trend in this over the analysis period from slightly above 2000 feet in late 2011 to slightly below 2000 feet in spring 2015.

There are daily fluctuations above and below the trend line. The bounds of these fluctuations are that on 95% of days the lower limit of the swath is between 1600 feet and 2600 feet. During the measurement period, the lowest aircraft traversed the gate at a height of 1423 feet.



# There is also a increasing trend in the number of aircraft crossing the gate at heights below 3000 feet and below 2000 feet

#### Daily number of flights along the DVR SID below 3000 feet at the DVR gate

### Daily number of flights along the DVR SID below 2000 feet at the DVR gate



The number of flights on the DVR SID crossing the gate at a height of less than 3000 feet varies very widely and randomly from fewer than 10 on some days to, occasionally, over 90 per day.

The best straight line fit to the data, shown as the red line in the chart above, indicates that trend on the number of DVR SID flights crossing the gate below 3000 feet is upwards.

The number of DVR SID flights crossing the gate at below 2000 feet varies from a minimum of one per day up to 15 on one single occasion.

The trend on the number of flights crossing the gate at below 2000 feet appears to be slightly upwards but only increasing from two flights per day in late 2011 to three flights per day by April 2015.



### During 2012 and 2013, heat maps show the core of the DVR SID traffic at approximately 300m to the left of the centre line and between 3000 and 4000 feet





### The heat maps show the traffic at the core of the DVR swath is becoming more concentrated and extending to lower heights



### Over the analysis period there have been some measurable changes in the traffic pattern using the DVR SID at the DVR gate

#### Conclusions concerning the DVR SID at the DVR gate

#### Traffic volume & mix

The post trial traffic volumes at the **DVR gate** (comprising DVR and SAM traffic) are higher than pre-trial levels. There is a decrease during the second trial period due to SAM traffic being shifted out of the DVR gate

After remaining approximately constant (~150) from late 2011 to summer 2014, the dag volume of traffic using the **DVR SID** increased to ~180 per day at the start of the 2014 winter season (November 2014), continuing through to 2015. Similarly the number of flights crossing the gate before 08:00 hours and after 20:00 hours has also increased latterly. The pattern of these night flights is cyclical with higher volume in the summer season than the winter season.

The proportion of large aircraft using the DVR SID has also increased: A380s have increased from 4 per day in late 2011 to up to 14 per day in early 2015. The volume of other large aircraft has also increased, up to 70 per day from 40 to 50 per day. A380 aircraft typically fly at the bottom of the traffic swath and other heavy aircraft tend to fly lower than medium aircraft

#### Lateral position

Other than during the operational freedoms trials, the lateral position of the centre of gravity of the DVR SID has not moved appreciably. The DVR route was unaffected by the 2013-14 departure trials

The traffic using the DVR SID has become much more concentrated in the core of the swath at point approximately 300m to the left of the centre-line of the NPR. As well as increasing in intensity, the core of the swath has increased in size, extending both laterally and to lower heights

#### Height

The analysis suggests that the trend for aircraft using the DVR SID is to fly lower than previously:

- heat maps show that the core of the traffic has become more concentrated and is extending to lower heights
- the vertical centre of gravity of the swath (not necessarily the centre of concentration) has decreased in height from approximately 3400 feet in 2011 to approximately 3100 feet in 2015
- the trend on the number of aircraft flying below 2000 feet and 3000 feet is increasing
- the minimum aircraft height at the gate appears to be decreasing and now is typically just below 2000 feet. On 95% of days the lower limit of the swath is between 1600 and 2000 feet
- the absolute minimum height at the gate over the period was 1423 feet

Note: Detailed conclusions concerning the SAM SID are drawn in section 5



#### MIDHURST NPR RESULTS

4



#### The MID gate is located at the intersection of the MID NPR centreline and Park Road



#### Location of the MID NPR gate



### The MID gate captures traffic using the MID SID, slightly to the right hand side, and traffic using the SAM SID at the left hand extreme



### The traffic crossing the MID gate increases during the second trial period due to a shift in the SAM SID and then appears to fall slightly below the pre-trial level

#### Daily departure traffic through the MID NPR gate classified by SID



the gate during the second departure trial


On average, the volume and mix of the traffic using the MID SID appears to reduce very slightly over the analysis period but with fluctuations from day-to-day

### Daily MID SID traffic through the MID gate by aircraft type

Daily SAM SID traffic through the MID gate by aircraft type



Until the second departure trial period the traffic using the MID SID is at a reasonably constant level at just over 100 per day on easterly days, albeit with fluctuations above and below. This is approximately half of the traffic volume using the DVR SID. After the second trial, the traffic volume appears to decrease slightly to just below 100 per day.

The mix of aircraft using the route has remained roughly constant over the analysis period other than a few A380s in the mix during the latter part of the analysis period. The split heavy:medium is approximately 1:4 but with daily fluctuations across the analysis period. The traffic using the SAM SID that traverses the MID gate has an average volume of approximately 20 flights per day on easterly operations, again with fluctuations from day-to-day. The volume increases during the first part of the second departure trial and then reverts to the background level during the second half of the trial and subsequently.

The ratio of heavy to medium aircraft is approximately 1:3. There are sometimes a few A380s in the mix.



The volume of traffic using the MID SID before eight in the morning and after eight in the evening fluctuates widely but with no apparent systematic trend

### MID SID traffic traversing the MID gate before 08:00 hours and after 20:00 hours

### SAM SID traffic traversing the MID gate before 08:00 hours and after 20:00 hours



The number of MID SID flights traversing the MID gate before 08:00 hours and after 20:00 hours fluctuates from approximately five to approximately 15 per day with the occasional peak at 20 flights per day. There does not appear to be any overall trend nor the seasonal cycle observed for the DVR SID.

The proportion of heavy aircraft in the mix has increased compared to the overall daily proportion, typically comprising 50% or more of the traffic. There are no A380s in the mix.

The number SAM SID flights traversing the DVR gate before 08:00 hours and after 20:00 hours is typically less than five per day, again with daily fluctuations. There is no apparent upwards or downwards trend although there is a slight increase during the second departure trial period, reverting to the background level after the trial

The majority of flights during this time period are by heavy aircraft. There are no A380s in the mix.



## The gate captures the MID SID traffic, some SAM SID traffic and a number of CPT flights from the left hand side of the CPT SID



#### Spatial distribution of traffic crossing the MID gate classified by SID





## The traffic scatter plots clearly show the effect of the first departure trial in winter 2013-2014





## The effect of the second departure trial period is to overlap the MID and SAM SID traffic at the left hand side of the gate



#### Distribution of traffic crossing the MID gate classified by SID for the final six analysis periods

## Heavy aircraft tend to cluster near to the NPR centre line; at the left hand edge and bottom of the MID swath

Distribution of traffic crossing the MID gate classified by aircraft type for the first six analysis periods



### Post trials, the heavy and medium aircraft appear to be separated into two clusters in the MID swath whereas previously there was more overlap

Distribution of traffic crossing the MID gate classified by aircraft type for the final six analysis periods





28/07/2014

#### The splitting of the MID SID during the trial period is apparent in both the lateral centre of gravity and dispersion

ateral

Standard deviation of

01/11/2011 09/02/2012 19/05/2012 27/08/2012 05/12/2012 15/03/2013

#### Lateral centre of gravity and extent of the MID SID swath



Prior to the departure trials the lateral centre of gravity of the MID SID swath is fairly consistent at approximately 600m to the right of the centre line. During the first departure trial the centre of gravity is split with the second swath being centred approximately 300m to the left of the centre line. During the second trial period, the centre of gravity of the swath is moved to approximately 450m to the left of the NPR centre line.

The lateral extent of the swath fluctuates but typically appears on average to be 1500m wide, typically covering half of the gate.

#### of the MID SID swath Lateral dispersion of MID SID swath Standard deviation of swath distribution Operational freedoms trials Departure trials 2000 Ê 1800 **distribution** 1000 1700 High dispersion Low dispersion 1200 during first trial during second trial 1000 800 600

Date

23/06/2013 01/10/2013 09/01/2014 19/04/2014

Lateral dispersion

The lateral dispersion, defined as the standard deviation, gives a quantitative measure of the width of the swath. The chart above shows that the lateral dispersion of the swath was highest (above the red line) on some days during the first departure trial, when the SID was effectively split into two. The dispersion is also low (below the red line) on other days during this period. As each point represents a day this implies that track-keeping on one of the MID trials SIDs is good and is poor on the other MID trial SID. The dispersion is also low during the second trial period when the traffic is concentrated on the RNAV SID.

The dispersion trend line is flat implying that overall the spread of the traffic across the MID SID has remained constant.

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There is a scatter on the vertical centre of gravity of the MID swath but with no clear trend; there is, however, a slight downwards trend on the lower limit of the swath

### Vertical centre of gravity and extent of the MID SID swath at the MID gate



### Lower limit of the MID SID swath at the MID gate



The vertical centre of gravity of the MID SID swath fluctuates around an average value of approximately 3100 feet. At the 95% level the vertical centre of gravity of the swath ranges between 2500 feet and 3700 feet.

The vertical extent of the swath extends from approximately 1500 feet to between 5000 and 6000 feet. The top of the swath appears to be getting lower.

Qualitatively the trend line of the height of the centre of gravity suggests that there has been little change over the measurement period.

The bottom limit of the swath is defined by the lowest aircraft flying on the MID SID traversing the gate each day. On average, this height is approximately 2000 feet with a downward trend from late 2011 (slightly over 2000 feet) to present (slightly below 2000 feet).

There are daily fluctuations above and below the trend line. On 95% of days the lower limit of the swath is between 1500 feet and 2500 feet. During the measurement period, the lowest aircraft traversed the gate at a height of 1420 feet. The frequency of days with low flying aircraft is increasing.



# Paradoxically there appears to be a slight trend to a decrease of flights below 3000 feet but an increase in flights below 2000 feet on the MID SID at the MID gate

### Daily number of flights along the MID SID below 3000 feet at the MID gate

#### Daily number of flights along the MID SID below 2000 feet at the MID gate



The number of flights on the MID SID crossing the gate at a height of less than 3000 feet varies very widely and randomly from fewer than 10 on some days and occasionally approaching 80 per day.

The trend on the number of MID SID flights crossing the gate below 3000 feet appears to be downwards.

The number of MID SID flights crossing the gate at below 2000 feet varies from a minimum of one per day up to seven on a single occasion.

The trend on the number of flights crossing the gate at below 2000 feet appears to be slightly upwards, increasing from an average of one flight per day in late 2011 to three flights per day by April 2015.



### Pre-trials MID SID traffic progressively concentrates at about 1000m right of the centre line: the first trial splits the SID with another concentration at 500m to the left



### The traffic hot spots change structure and position during the trials, returning to the original pattern but with higher intensity after the trials



Note: the behaviour of the SAM SID is discussed in section 5

PY

There have been significant variations in the volume and distribution of traffic on the MID SID: these appear mainly associated with the trials rather than systematic

#### Conclusions concerning the MID SID at the MID gate

#### Traffic volume & mix

Underlying the day-to-day fluctuations in the traffic volume using the **MID SID** alone, there appears to have been a slight reduction in volume from just over 100 per day before the second trial to just under 100 per day after the second trial.

Although the pre- and post trial traffic volumes at the **MID gate** (comprising MID and SAM traffic) are similar, there is an increase during the second trial period. This is caused by SAM traffic being shifted into the MID gate.

The proportion of different sizes of aircraft in the MID SID mix has also remained roughly constant with 20% heavy aircraft and 80% medium. There are a few A380s in the mix

#### Lateral position

Before the trials the lateral position of the MID SID was approximately 600m to the right of the NPR centre line. There appear to be two areas of traffic concentration within the swath.

During the trials there were shifts in the swath's lateral position with areas not previously affected being overflown. During the first trial the swath's centre of gravity is split (at 300m to the left and 600m to the right of the centre line). During the second trial a single centre of gravity is shifted to approximately 450m left of the NPR centre line.

After the trials, the position and structure of the MID swath reverts to those observed pretrial.

The first trial appears to have resulted in a spreading (increased dispersion) of the swath whereas the second trial resulted in increased concentration, albeit at a different location.

After the trials, the traffic appears slightly more intense at the cores of the swath than before the trials

#### Height

There appears to have been little or no systematic change in the vertical centre of gravity of the MID SID swath. However:

- there are large daily fluctuations in the height of the centre of gravity, typically in the range 2500 feet to 3700 feet
- there are large fluctuations in the lower limit of the swath, from typically 1500 feet to 2500 feet with the lowest flying aircraft being measured at 1420 feet
- there is a perceptible downward trend on the lower limit of the swath over the analysis period and the frequency of days with low flying aircraft appears to be increasing
- paradoxically there appears to be a downward trend (reduction) in the number of flights below 3000 feet but an upward trend on the flights below 2000 feet.

Note: Detailed conclusions concerning the SAM SID are drawn in section 5





### SOUTHAMPTON NPR RESULTS

5



# The SAM gate is located at the intersection of the SAM NPR centreline and Teddington High Street/ Broad Street



#### Location of the SAM NPR gate



87

#### The SAM gate captures traffic using the SAM SID around the NPR centre line, MID SID traffic at the right hand extreme and small amount of DVR traffic on the left

### Position of the SAM NPR gate and Typical horizontal and vertical traffic distribution at the SAM NPR gate associated departure flows DVR SI CPT • DVR • MID • SAM 80 -1500 -1000 -500 Distance from centre of gate (m)

Traffic departing along the DVR SID but falling within the SAM NPR

Traffic departing along the SAM SID

Traffic departing along the MID SID but falling within the SAM NPR

1000

500



B 1500

## The traffic volume crossing the SAM gate increases during the trials due to MID traffic shifting into the SAM gate: the volume then reverts to pre-trial levels

#### Daily departure traffic through the SAM NPR gate classified by SID



Increase in volume during the departure trial periods due to MID traffic being shifted into the SAM gate



## SAM traffic using the SAM gate has remained fairly constant over the analysis period but MID traffic increased during the departure trial periods

### Daily SAM SID traffic through the SAM gate by aircraft type

Daily MID SID traffic through the SAM gate by aircraft type



The volume of traffic using the SAM SID is fairly consistent over the analysis period from late 2011 to Spring 2015 at between 35 and 40 flights per day (compared to 150 for DVR and 100 for MID). The traffic mix is typically 20% heavy aircraft and 80% medium aircraft. There were few A380s using the route during the analysis period Except during the two departure trial periods, the volume of MID traffic crossing the SAM gate is small at approximately three to five flights per day. These flights are predominantly made by heavy aircraft.

During the first trial period, the volume of MID traffic using the SAM gate increases to a peak of approximately 60 flights per day. During the second trial period, the volume of MID traffic traversing the SAM gate increases further to approximately 100 flights per day. During the trail periods, the proportion of heavy aircraft using the MID route through the SAM gate is in the range 10% to 20%, the remainder being medium aircraft



## There is no overall trend on the traffic SAM SID traffic volume before 08:00 hours in the morning and after 20:00 hours but MID traffic increased during the trials

### SAM SID traffic traversing the SAM gate before 08:00 hours and after 20:00 hours

### MID SID traffic traversing the SAM gate before 08:00 hours and after 20:00 hours



The number of SAM SID flights traversing the SAM gate before 08:00 hours and after 20:00 hours ranges from five to seven or eight flights per day.

At least 50% of these flights are by large aircraft, with the proportion being higher at some times, including the first departure trial period.

Other than during the departure trial periods, the number of MID SID flights traversing the SAM gate before 08:00 hours and after 20:00 hours is lower than five per day.

During the first trial period, this number increased to around ten per day, increasing further to approximately 15 per day during the second trial period. The proportion of heavy aircraft in the mix over both trial periods is typically 15% to 20% but with some variation



## The gate captures SAM SID traffic near to the NPR centre line, as well as MID traffic at the right extreme and DVR traffic on the left extreme

Spatial distribution of traffic crossing the SAM gate classified by SID









## The traffic scatter plots clearly show the MID swath moving into the SAM gate during the first departure trial in winter 2013-2014

Distribution of traffic crossing the SAM gate classified by SID for the first six analysis periods



## The effect of the second departure trial period is to move the SAM traffic to the right of the gate and overlap with MID SID traffic



Distribution of traffic crossing the SAM gate classified by SID for the final six analysis periods



## Heavy aircraft tend to cluster at the centre line at the bottom of the SAM swath: the first trial moves low flying heavy aircraft to a previously unaffected location

Distribution of traffic crossing the SAM gate classified by aircraft type for the first six analysis periods





The second trial results in traffic moving to the right side of the gate and leaving the centre free: the pattern reverts to the normal pattern after the trials have finished

Distribution of traffic crossing the SAM gate classified by aircraft type for the final six analysis periods





# The shift of the centre line of the SAM SID during the second trial period is apparent in the lateral centre of gravity

#### Lateral centre of gravity and extent of the SAM SID swath



### Lateral dispersion of the SAM SID swath



Until the onset of the second trial period, the lateral centre of gravity of the SAM SID swath is fairly consistent, near but slightly to the left of the NPR centre line. During the second trial period, the swath centre of gravity shifts to approximately 1100m to the right of the centre line. After the completion of the trials, the centre of gravity reverts to its original position near to the centre line.

The position of the lateral centre of gravity fluctuates from dayto-day with these fluctuations generally appearing to be largest during the trial periods. The lateral dispersion, defined as the standard deviation, gives a quantitative measure of the width of the swath. The chart above shows that the lateral dispersion of the swath was largest during all of the trial periods although operational freedoms and the first departure trials did not include the SAM SID. The overall trend in the dispersion is upwards, from approximately 250m in late 2011 to slightly below 300m in April 2015. This implies that the traffic is becoming less concentrated around the centre of gravity.

Note the points with zero dispersion in the chart are associated with days with very low traffic, i.e. predominantly westerly operations



### There is to be a definite downward trend on the height of the SAM SID

### Vertical centre of gravity and extent of the SAM SID swath at the SAM gate



The vertical centre of gravity of the SAM SID swath fluctuates around an average value of approximately 3300 feet. At the 95% level the vertical centre of gravity of the swath ranges between 2600 feet and 3900 feet over the analysis period.

The vertical extent of the swath extends from approximately 1500 feet to between 5000 and 6000 feet. The top of the swath appears to be getting lower.

The trend line of the height of the centre of gravity suggests that there has been a gradual decrease in the height of the centre of gravity from approximately 3400 feet in late 2011 to approximately 3200 feet in April 2015

#### Lower limit of the SAM SID swath at the SAM gate



The bottom limit of the swath is defined by the lowest aircraft flying on the SAM SID traversing the gate each day. On average, this height is approximately 2200 feet with a definite downward trend from late 2011 (slightly over 2300 feet) to the present (approximately 2000 feet).

There are daily fluctuations around the average with aircraft. On 95% of days the lower limit of the swath is between 1600 feet and 2800 feet. During the measurement period, the lowest aircraft traversed the gate at a height of 1456 feet.

The frequency of days with low flying aircraft is increasing.



## There was a large increase in the number of SAM SID flights crossing the gate below 300 feet during the second trial period

### Daily number of flights along the SAM SID below 3000 feet at the SAM gate

#### Daily number of flights along the SAM SID below 2000 feet at the SAM gate



The number of SAM SID flights per day crossing the gate at a height below 3000 feet fluctuates but is generally between five and ten. There was a noticeable increase in the number of flights crossing the gate below 3000 feet.

The trend on the number of SAM SID flights crossing the gate below 3000 feet appears to be upwards, from around five per day in late 2011 to approximately eight per day in spring 2015 The number of SAM SID flights crossing the gate at below 2000 is either one or two per day across the analysis period.

Although, there is no upward or downward trend on this statistic, the few days with two flights per day below 2000 feet at the gate occur towards the end of the analysis period



## Although only of moderate intensity, the hot spots within the SAM swath change across analysis periods. The first trial creates hot spot at the right of the gate





## The second trial moves and increases the traffic intensity to the right of the SAM gate



# The second trial had a major impact on the SAM SID but, in addition, there appear to be ongoing underlying changes in the traffic pattern

#### Conclusions concerning the SAM SID at the SAM gate

#### Traffic volume & mix

Although the pre- and post trial traffic volumes at the **SAM gate** (comprising SAM and MID traffic) are similar, there is a large increase during the first trial period followed by a further increase during the second trial period. This is caused by MID traffic being shifted into the SAM gate.

After the trials, volumes revert to pre trial levels.

The volume of **SAM SID** traffic does not change appreciably and is fairly consistent at 35 to 40 flights per day on easterly days.

The proportion of different sizes of aircraft in the SAM SID mix has also remained roughly constant with 20% heavy aircraft and 80% medium. There are a few A380s in the mix.

#### Lateral position

Before the trials the lateral position of the SAM SID was just to the left of the NPR centre line. The second trial resulted in a large shift in lateral position with the swath's centre of gravity shifting to approximately 1100m to the right of the centre line.

The concentration pattern of the traffic within the SAM SID swath varies across analysis periods . Shifting of the MID SID also introduces additional hot spots within the gate. During the second trial, there is a significant traffic hot spot at the right edge of the gate due to the combining of the SAM and MID SIDs.

After the trials, the position and structure of the MID swath are similar to those observed pre-trial but with a slightly different and higher traffic intensity at the core of the swath. Conversely, the overall dispersion of the swath appears to be increasing, implying concentration at the core but increased spread of outliers.

#### Height

There are large daily fluctuations in the height of the swath's vertical centre of gravity, typically in the range 2600 feet to 3900 feet. However, there is a slight downward trend in the height of the SAM SID:

- the vertical centre of gravity moves downwards from approximately 3400 feet in late 2011 to approximately 3200 feet in spring 2015
- there is a definite downward trend on the lower limit of the swath from 2300 feet in late 2011 to approximately 2000 feet in April 2015 (the lowest observed aircraft over the analysis period was at 1456 feet)
- the frequency of days with low flying aircraft has increased
- paradoxically (other than during the trial periods) there is no perceptible trend in the number of aircraft flying below 3000 feet and 2000 feet at the gate.

Note: Detailed conclusions concerning the MID SID are drawn in section 4





### CONCLUSIONS

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### At the request of the Teddington Action Group flight path analysis has been undertaken on Heathrow easterly departures at three locations of interest

A general observation that for all three SIDs is that there are, sometimes large, fluctuations from day-to-day in the characteristics of and traffic volume using the SIDs. The analysis has attempted to identify any systematic trends underlying these fluctuations.

A second general observation is that the trials resulted in major changes to the distribution of the traffic crossing the gates while the trials were being performed. After the trials the traffic distributions reverted, qualitatively, to very similar structures those observed pre-trial. However, there are underlying trends in the characteristics of the traffic which were observed before the trials and continued after the trials had ended. It is reasonable to conclude, therefore, that these trends are not due to the trials but are more general in nature

Of the three, the **DVR SID** has the highest overall traffic volume, at around 180 per day when the airport is operating to the tast. DVR carries the vast majority of the Airport's A380 easterly departures. Both overall traffic volume and the number of heavy aircraft and A380s using the DVR route have increased. Departures before 08:00 and after 20:00 have increased in line with the underlying increase in traffic volume. However, the volume of these night departures appears to be cyclical: higher in summer than in winter.

The DVR route itself was unaffected by the departure trials, but was affected by the earlier operational freedoms trials from mid-2012 and to early 2013. The SAM traffic crossing the DVR gate was shifted out of the gate during the second trial period. It subsequently returned at the same position and volume after then end of the trial.

The concentration of flights at the core of the DVR traffic swath has increased. The data also indicates that the height of the DVR swath is decreasing both in terms of average height from approximately 3400 feet to 3100 feet, and the lowest flying aircraft. The number of low flying aircraft has increases. On 95% of easterly days the lowest DVR flight crossed the gate at heights between 1600 feet and 2600 feet, with the lowest flight at 1423 feet.



### MID and SAM SIDs were affected significantly by the trials

In terms of volume, the **MID SID** ranks next after DVR. On easterly operations, prior to the second trial period there were just over 100 flights per day using the MID SID. After the second trial this appears to have reduced slightly, to just under 100 flights per day. The route is dominated by medium aircraft at 80% of the total. The remainder of the traffic comprises mainly heavy aircraft with a few A380s.

The position and intensity of the MID SID was affected considerably by the trials with large shifts in the lateral centre of gravity, resulting in flights over locations not previously overflown. After the end of the trials, the MID swath returned to its pre-trial location but the concentration of flights within the swath has increased. Although the vertical position of the centre of gravity of the swath has remained consistent, there is a trend indicating that the lowest flying aircraft have got lower. The frequency of days with low flying aircraft has also increased.

**SAM SID** traffic is typically at a level of around 35 to 40 flights per day, comprised of approximately 20% heavy aircraft and 80% medium aircraft with a few A380s. During the trials, the MID SID traffic was shifted to within the SM gate resulting in an increase in traffic crossing the gate. The changes to both the SAM and MID SID locations during the trial resulted in a redistribution of traffic across the SAM gate. After the trials, the SAM traffic patterns reverted to their pre-trial structures but exhibit slightly higher concentration than before the trials. There is a downward underlying trend in the height of the SAM SID swath, both in terms of the centre of gravity, reducing from 3400 feet to 3200 feet, and the lowest flights, reducing from 2300 feet to 2000 feet. The frequency of the number of days with low flying aircraft has also increased.



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