

[REDACTED]
[REDACTED]

15 February 2018
EIR Reference: E0003569

Dear [REDACTED]

I am writing in respect of your recent request of 21 January 2018, for the release of information held by the Civil Aviation Authority (CAA).

Your request:

'Under the Environmental Information Regulations, please can you provide a copy of the slide presentation "Implementing PBN and the Environmental Challenge" given by Geoff Burtenshaw, PBN Project Lead - Airspace, CAA as part of "Panel 2A: Delivering the Safety Benefits of RNP" at 2014 FAA-EASA International Safety Conference ,17 June 2014.

Unfortunately the original file included in <http://www.2014faaeasaconference.com/wp-content/uploads/2014/06/Panel-2A.zip>

no longer appears to be accessible.'

Our response:

Having considered your request in line with the provisions of the Environmental Information Regulations 2004, please find attached the information you have requested.

If you are not satisfied with how we have dealt with your request in the first instance you should approach the CAA in writing at:-

Caroline Chalk
Head of External Information Services
Civil Aviation Authority
Aviation House
Gatwick Airport South
Gatwick
RH6 0YR

caroline.chalk@caa.co.uk

Civil Aviation Authority

Aviation House Gatwick Airport South Gatwick RH6 0YR www.caa.co.uk
Telephone 01293 768512 foi.requests@caa.co.uk

The CAA has a formal internal review process for dealing with appeals or complaints in connection with requests under the Environmental Information Regulations. The key steps in this process are set in the attachment.

Should you remain dissatisfied with the outcome you have a right to appeal against the decision by contacting the Information Commissioner at:-

Information Commissioner's Office
FOI/EIR Complaints Resolution
Wycliffe House
Water Lane
Wilmslow
SK9 5AF
<https://ico.org.uk/concerns/>

If you wish to request further information from the CAA, please use the form on the CAA website at <http://publicapps.caa.co.uk/modalapplication.aspx?appid=24>.

Yours sincerely

A handwritten signature in black ink that reads "Rihanne Stephen". The signature is written in a cursive, flowing style.

Rihanne Stephen
Information Rights Officer

CAA INTERNAL REVIEW & COMPLAINTS PROCEDURE

- The original case to which the appeal or complaint relates is identified and the case file is made available;
- The appeal or complaint is allocated to an Appeal Manager, the appeal is acknowledged and the details of the Appeal Manager are provided to the applicant;
- The Appeal Manager reviews the case to understand the nature of the appeal or complaint, reviews the actions and decisions taken in connection with the original case and takes account of any new information that may have been received. This will typically require contact with those persons involved in the original case and consultation with the CAA Legal Department;
- The Appeal Manager concludes the review and, after consultation with those involved with the case, and with the CAA Legal Department, agrees on the course of action to be taken;
- The Appeal Manager prepares the necessary response and collates any information to be provided to the applicant;
- The response and any necessary information is sent to the applicant, together with information about further rights of appeal to the Information Commissioners Office, including full contact details.

Implementing PBN and the Environmental Challenge

Panel 2A: Delivering the Safety Benefits of RNP

2014 FAA-EASA International Safety Conference

17 June 2014



Introduction



- **In the UK the CAA, industry and government is working collaboratively towards delivering a Future Airspace Strategy (FAS)**
- **Key to this is the implementation of PBN and modernisation of our airspace structures, especially around London**
- **Major investment programmes from ANSPs, airports and airlines**
- **Objectives of improvements in capacity, flight efficiency, safety and minimising environmental impact**
- **Environmental opposition to new airspace developments, especially those in busy terminal airspace around densely populated areas, has the potential to delay progress towards implementation of PBN**

Environmental Opposition

- **Programme risks in the form of:**
 - **Cost of public consultation**
 - **Risk of Judicial Review of how airspace change process was conducted**
 - **Hostility from local residents**
 - **Local and Government politics**
- **All can have an impact on timescales for deployment**
- **One cannot overlook the potential downsides for the communities close to an airport from implementing PBN**
- **The challenge therefore, is in taking mitigation measures through airspace design to minimise the environmental impact on those communities**

Night flight noise is twice the legal limit

By Ben Webster

Transport Correspondent

THE Government concealed research showing that disturbance caused by night flights had been grossly underestimated.

The noise generated by jumbo jets arriving at Heathrow airport in the early hours is almost double the legal limit, according to research. The Department for Transport has had to admit that its estimate of the noise generated by the 16 flights between 11.30pm and 6am failed to reflect the true impact on 600,000 people living under the airport's flight paths.

The Government does not measure the actual noise levels of night flights but relies on estimates based on the noise ratings, or certifications, for different aircraft types. However, flight tests carried out by the Department for Transport since 1999 have found that the ratings are seriously flawed.

A Boeing 747-400 with Rolls-Royce engines was found to have twice the effect assumed in its noise rating. Most night flights involve 747-400s arriving from the Far East and other long-haul destinations.

The Government quietly published the results of the monitoring last month, more than three years after the department had realised that the ratings could be wrong. The new ratings were buried in a 60-page consultation document on reforming the rules governing night flights.

Wandsworth council, which has tens of thousands of residents under flight paths, used the new ratings to show that the actual noise was almost twice the legal limit, known as the noise quota count.

A Department for Transport spokesman said: "The perceived noise levels on some aircraft were found to be higher than the certificated levels. It is quite possible, operationally, that aircraft exceeded the quota count score over a season."

But he denied that the findings meant that the number of night flights would have to cut. "They sound noisier, but they are not breaking any regulations because the EU directive requires that the noise limit is based on certificated noise levels, not operational ones."

He said that the department had not released the information before because "the flow of data came to a head in

SOUND AND FURY

Night flights are restricted by the number and the noise level. The restrictions apply to the period from 11.30pm to 6am and also apply to Gatwick and Stansted airports



NIGHT FLIGHT LIMITS

Annual average per night

16 FLIGHTS
HEATHROW

33 FLIGHTS
STANSTED

45 FLIGHTS
GATWICK

HEATHROW NOISE LEVELS

(QC="quota count" or noise rating of engines)



Source: Wandsworth Council

Damages may hit £2bn if residents win their case

By Ben Webster

COMPLAINTS about night flights soar at this time of year as people sleep with their windows open and are woken by the sound of aircraft.

The disturbance is heightened by the greater frequency of flights in summer, when the night flight limits at Heathrow, Gatwick, and Stansted increase with foreign holidays.

While the frequency remains a fraction of the daytime rate, when aircraft land at Heathrow every 90 seconds, the lack of road traffic

noise at night accentuates the sound from the skies.

The 16 flights each night at Heathrow have been the subject of a ten-year legal battle between the residents and the Government.

In October 2001 the European Court of Human Rights ruled that the Government had "failed to strike a fair balance" between the economic benefits of landing at night and the right of individuals to a good night's sleep.

The court accepted claims by eight residents living under the Heathrow flight paths that the

flights breached two articles of the European Convention on Human Rights: Article 8, which guarantees "respect for private and family life"; and Article 13, which provides for "an effective remedy before a national authority".

The residents were each awarded £4,000 in compensation. But they have yet to receive the money because the Government appealed. Ministers claimed that the taxpayer might have to fund more than £2 billion in similar claims.

In a sign of ministers' determination to overturn the

ruling, the Government was represented at last November's appeal hearing in Strasbourg by Lord Goldsmith, the Attorney-General.

The wheels of European justice move slowly and, after six months waiting, residents have now been told to expect the judgment in the second week of next month.

In defending its approach to the limits placed on night flights, the Government said that it sought "to strike a balance between the need to protect local communities from excessive aircraft noise levels at

night and to provide for air services to operate at night where they are of benefit to the local, regional and national economy".

The Department for Transport calculates that 603,000 people around Heathrow suffer daytime aircraft noise above 54 decibels, the level deemed by the World Health Organisation to cause "community annoyance". This would fall to 499,000 by 2015 because of the introduction of quieter aircraft. But construction of a third runway at Heathrow would push the number up to 748,000.

April". Edward Lister, leader of Wandsworth council, said: "The Government has known that their noise figures were wrong for almost four years, yet they continue to tell those of us under the flight path that things are getting better."

"It is as if ministers just wanted to bury this piece of unwelcome news."

"The fact that night noise has now been proved to have deteriorated could open the floodgate to a wave of compensation claims from people woken up by early-morning arrivals."

The council called on ministers to establish new noise limits based on actual readings rather than estimates.

John Stewart, chairman of ClearSkies, which campaigns against aircraft noise, said: "The actual noise level may not be illegal, but it is pretty dishonest of the Government to hide behind estimates that have been shown to be false."

British Airways, which operates most of the night flights, says that they are essential to Heathrow's position as the leading European airport. International time differences mean that passengers would have to depart at unsociable hours if forced to arrive in London after 6am.

Most of the 16 night flights arrive between 4.30am and 6am. People tend to be sleeping deeply at this time and may find it hard to fall asleep

again if woken. But last month's consultation document concluded there was little evidence to link sleep disturbance with flights.

It said that people "become used to noise and sleep through it undisturbed, especially when it is steady or familiar".

The Government has commissioned a study of the effect of aircraft noise, but it will not be published until the end of 2004, well after ministers have

announced plans for massive airport expansion in a White Paper due before Christmas.

Heathrow is governed by some of the strictest noise limits in Europe because its location requires aircraft to approach directly over the capital. Charles de Gaulle airport in Paris, which has open fields on three sides, is allowed 94 flights a night.

Three British airlines are to hand out more than 100,000 leaflets to passengers urging

them to write to the Government to request more runways in the South East.

Freedom to Fly, the aviation industry's campaign group, has produced the leaflets to counter the huge volume of objections sent by people living around airports. They will be handed out over the next month by British Airways, Virgin Atlantic and bmi british midland.

Leading article, page 17



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The Times
Tuesday 27 May
2003

New Gatwick flight path trials are 'destroying' Sussex village life



UK Government Guidance to CAA on Environmental Objectives



- **“Altitude based priorities”**
- **From ground to 4,000 feet (amsl) the priority is to minimise noise impact, with consideration for local air quality**
- **4,000 feet (amsl) is the usual maximum altitude for a Noise Preferential Routes (NPR)**
- **From 4,000 to 7,000 feet (amsl) the focus should continue to minimise the impact of aviation noise on densely populated areas, but the CAA may balance this requirement with the need for an efficient and expeditious flow of traffic that minimises emissions**
- **Above 7,000 feet (amsl) the CAA should promote the most efficient use of airspace with a view to minimising aircraft emissions**
- **Below 7,000 feet (amsl) avoid Areas of Outstanding National Beauty (AONB) and National Parks**
- **All changes below 7,000 feet (amsl) should take into account local circumstances in the development of airspace structures**

Specific Navigational Guidance

- **Departure procedures**
- **Continuous Climb Operations (CCO)**
- **Arrival procedures**
- **Continuous Descent Operations (CDO)**
- **Navigational accuracy and PBN**
 - **Overall level of aircraft track-keeping improved leading to concentration around a published route**
 - **Minimises the number of people impacted – but those people who are over flown will be impacted with a greater frequency**
 - **“Alternation” and “Respite” measures**
 - **“Replication” of redesigned routes around the airport and thereby minimise the need for re-alignment of NPRs**

Mitigation Measures - Replication

- **Replication of conventional procedures close to the airport**
 - **Positives**
 - **Communities are used to where the aircraft are**
 - **Reduced cost of public consultation**
 - **Negatives**
 - **May not provide the most efficient route**
 - **Difficulty in getting design to mimic conventional route**
 - **Aircraft have migrated over time – where they fly today is an approximate overlay of the conventional procedure**
 - **NPRs no longer aligned**
- **In UK we have had some success with use of RNP and Radius to Fix (RF) turns**
- **The first turns and configuration / speed management are critical**

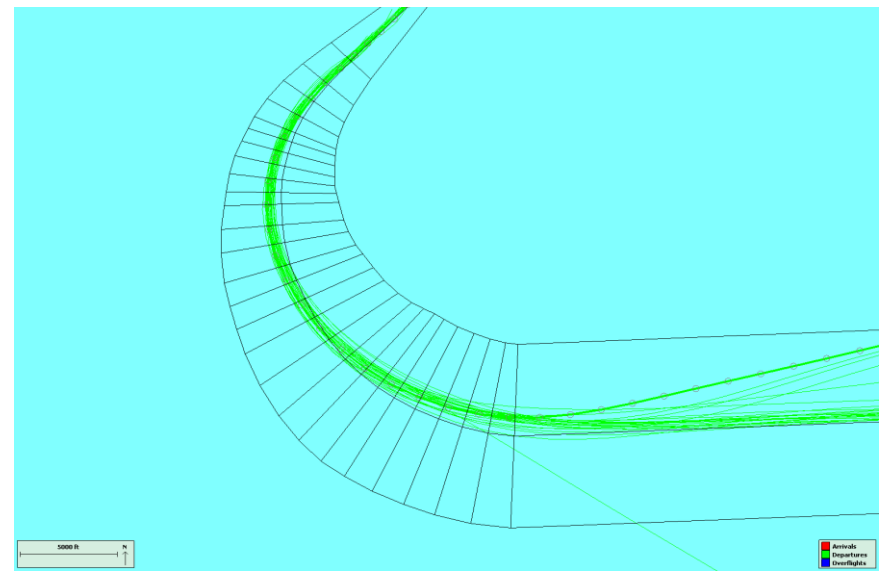
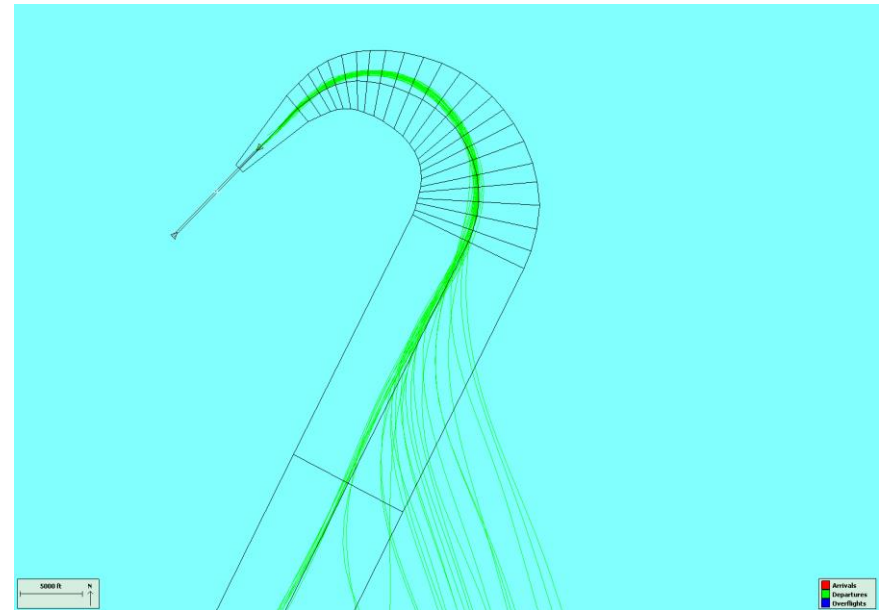
Example - Replication



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London Stansted CLN1E and DET1D RNP 1 departures



Mitigation Measures – Displaced Landing Threshold

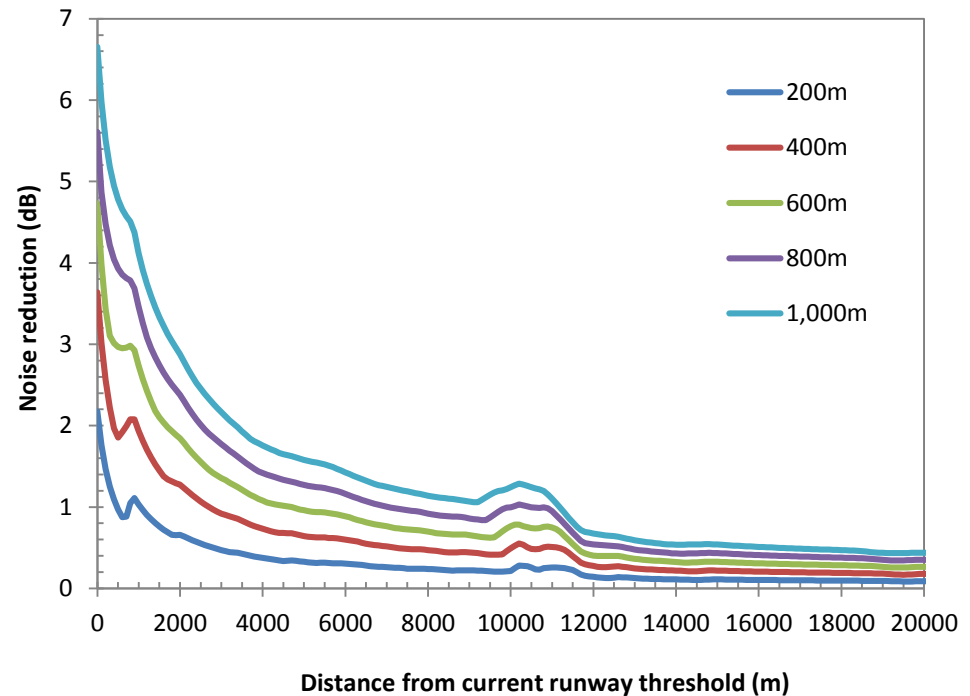


Noting:

Airbus A380 is 5dB quieter than a B747-400
B787-8 is 3dB quieter than a B767-300.

Benefit of 1,000m displacement in region
0-3km is comparable to step change in
technology.

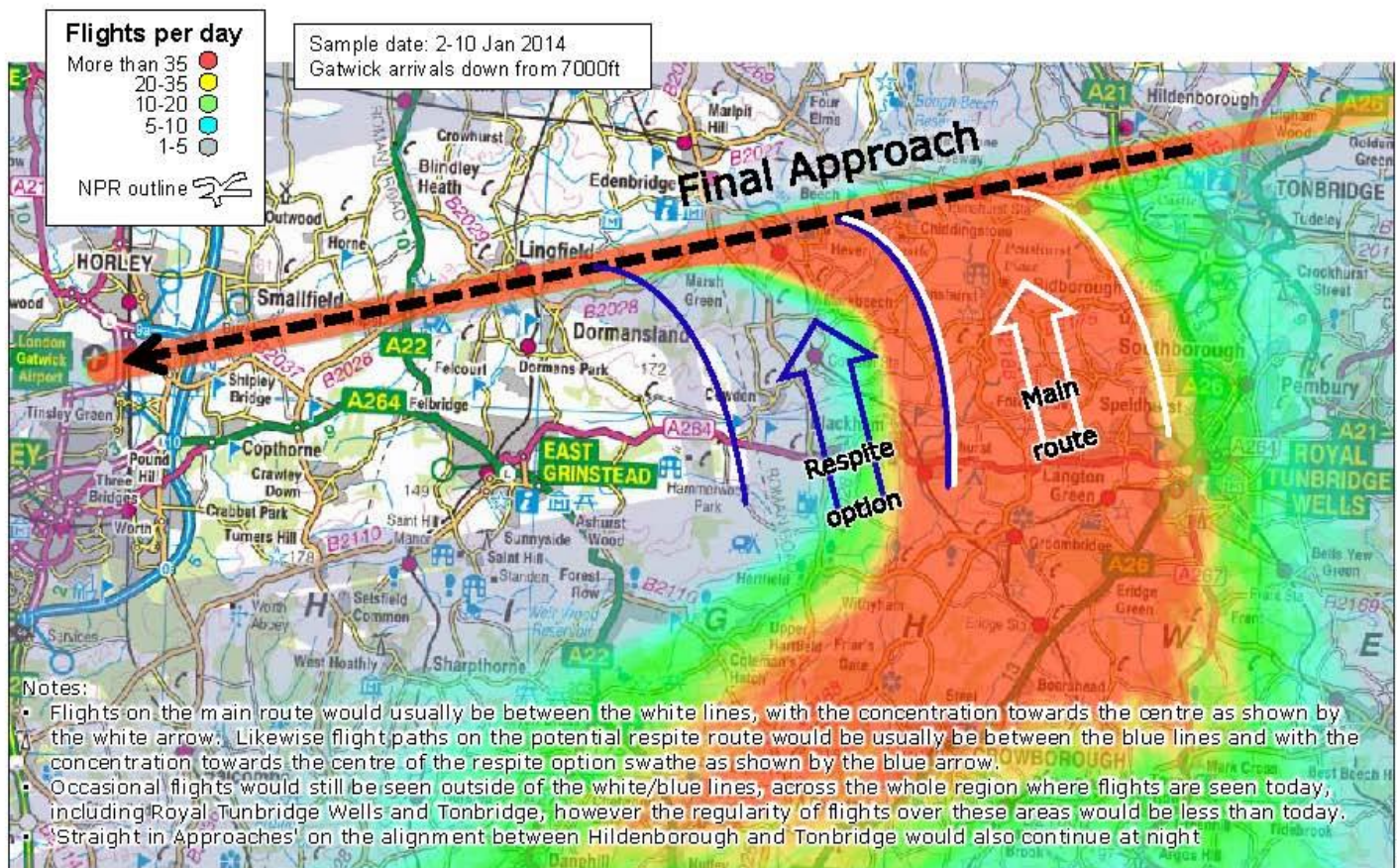
Current landing distance LGW 08R 2,766m
Landing distance LHR 27L with 1,000m
displacement is 2,660m.



Mitigation Measures – Night-Time Respite Option for LGW RWY26 Arrivals



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Map 34: RWY26 arrivals and respite option overlaid existing RWY26 arrivals flight density plots (below 7,000ft, 1:250K background)

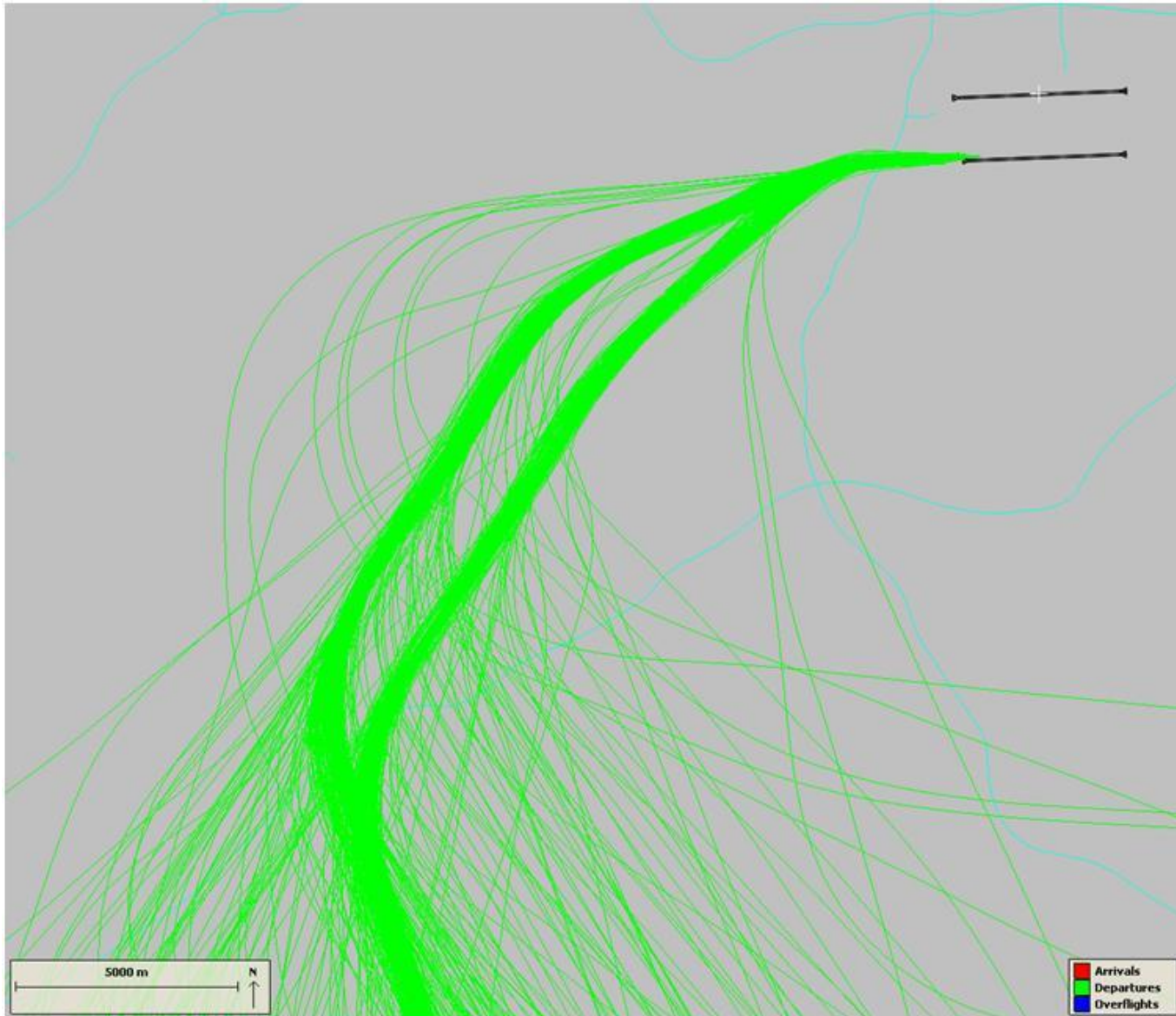
Mitigation Measures – SID Alternation

- **Apply the same principles of alternation that applied today to runway use at Heathrow to departure procedures**
- **London Heathrow 6 months DOKEN Trial**
 - **4 SIDs**
 - **RWY27R DOKEN1A and 1B**
 - **RWY27L DOKEN1C and 1D**
 - **Inner and Outer offset tracks**
 - **Weekly rotational use, 1A and 1C and then 1B and 1D**
 - **Trial subject to noise monitoring and social surveys**

Example - SID Alternation on DOKEN1C and 1D



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Mitigation Measures – Reduced NPR Swathe

- In UK the current NPR swathe is +/- 1.5 Km
- LHR, LGW and STN are designated airfields requiring Government approval to change the NPRs
- Aircraft track keeping performance, even on RNAV 1 departures is such that a reduction in width is realisable (probably to +/- 750 m)
- Increased climb profile can also shorten the length of the NPR
- Navigation performance linked to procedure design, FMS coding and flyability
- Will provide predictability to local planning authorities

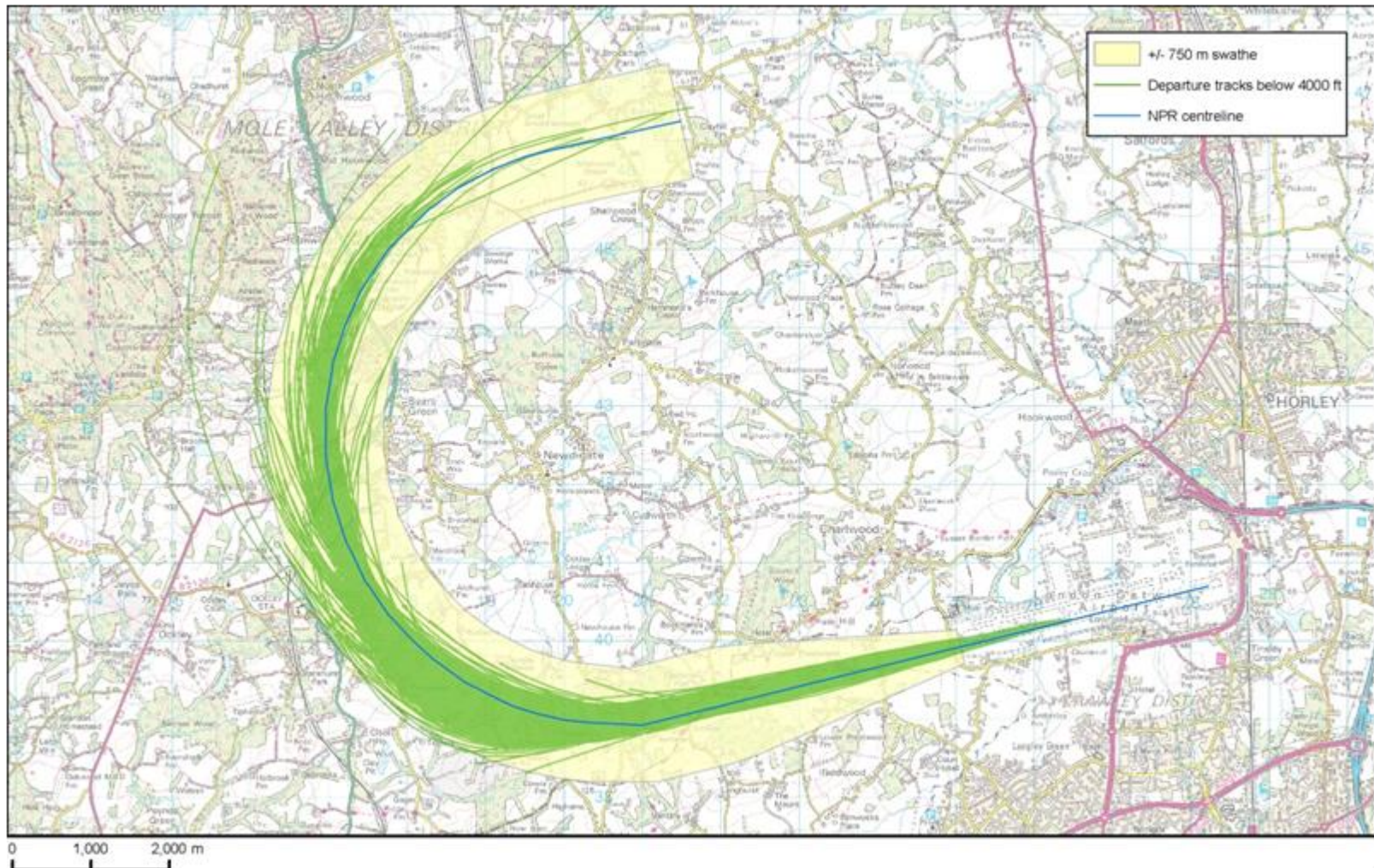
Example - Illustrative NPR swathe for Gatwick CLN3X/LAM1X/BIG1X SID



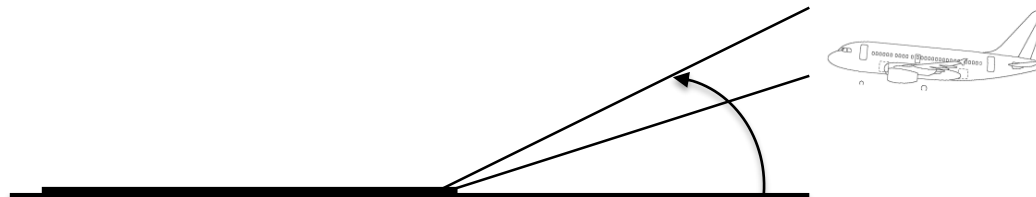
FUTURE | AIRSPACE | STRATEGY



Civil Aviation
Authority

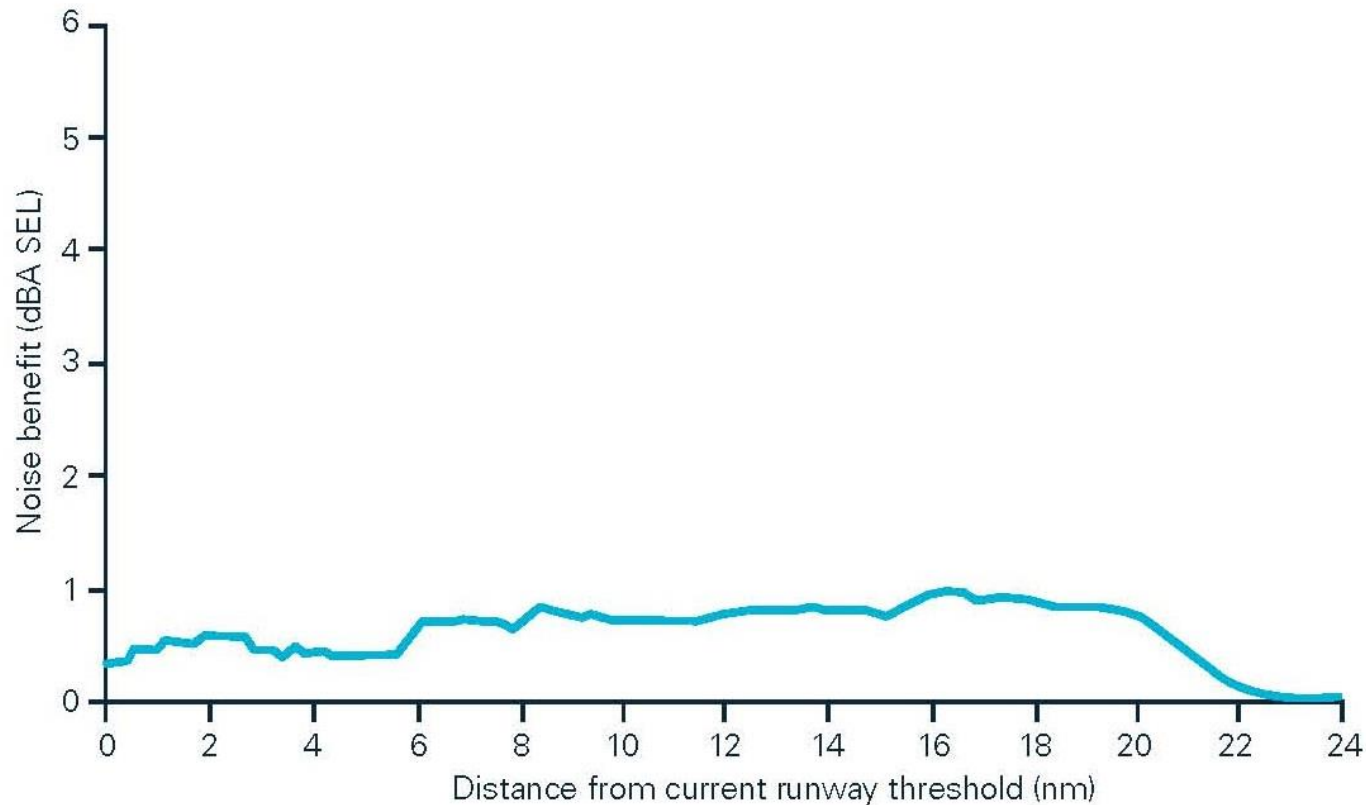


Mitigation Measures – Steeper Approaches



- Enabled through RNP APCH or new ILS installation or through GLS
- Glide path angles above 3° are permitted for obstacle reasons
 - Where angles exceed 4.5°, classified a 'steep approach', triggers special rules and regulations
- ICAO urges States not to adopt glide path angles greater than 3° for environmental reasons
- Major issues:
 - Applicable to all types in order to avoid integration difficulties
 - CAT III auto-land currently limited to 3.25°
 - Modern aircraft optimised for ~3° degree descent angle, steeper angle may result in early deployment of landing gear, negating the benefits

Noise Benefits from an Increase in Glide Path Angle to 3.2 degrees



Mitigation Measures – Research into Two-Segment Approaches

- **Proposal is for a steeper intermediate descent gradient in-line with runway returning to a conventional final approach gradient by approximately 5 miles**
- **The Intermediate segment starts at approximately 7,500 feet at a 5 degree slope down to 1500 feet where the approach transitions to 3 degree**
- **Numerous issues**
 - **Flyability (stable speed and descent path)**
 - **Energy management**
 - **Aircraft re-clearance by OEMs**
 - **Flight crew training**
 - **ILS capture from above**
 - **Could only do this with RNAV or maybe GBAS**
 - **ATC issues including wake vortex, approach sequencing**
- **UK trials flown on B777 simulator**
- **Potential for further studies e.g., DLR in Germany**

Summary

- **If we are to realise the safety benefits from RNP (and PBN in general) at the major airports and TMAs we will have to address the opposition (on environmental grounds), from those communities living close to the airports**
- **Important that there is clear and strong guidance from Government and that Government is kept informed**
- **Trials and studies are important so as to understand the art of the possible**
- **In the UK the airport has responsibility for procedures below 4000 feet (amsl)**
- **Airports know the local opposition hot spots and are therefore key in deciding where to locate new routes and in running the local environmental consultation**

Summary cont.

- **The airspace designer when using PBN must consider environmental mitigation measures**
- **A case of doing what you can to minimise the number of people subject to noise nuisance on the ground**
- **Some measures fairly simple to deploy e.g., replication, respite procedures, alternation, reduction in NPR swathe**
- **Others require further thought e.g., steeper approaches**
- **Others are still only concepts in the research phase e.g., two-segment approaches**
- **Whilst implementing PBN offers great potential, the communities close to an airport must be a consideration**
- **As a group, they are informed and they will not go away**