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## **SUMMARY NOTE ON PROPOSED AIRSPACE CHANGES: NATS Consultation - Terminal Control North Airspace Change Proposal**

### **1 PURPOSE OF THIS NOTE**

National Air Traffic Services ('NATS')<sup>1</sup> launched a consultation on 21 February 2008 proposing changes to the airspace known as Terminal Control North which covers much of East Anglia. The contents are summarised in this note, drafted by Stop Stansted Expansion ('SSE'), primarily in relation to the impacts associated with the operations of Stansted Airport. A separate guidance note is available from SSE on points to make when responding to the consultation before the extended closing date of 19 June 2008 – see [www.stopstanstedexpansion.com/nats\\_guidance\\_2008.html](http://www.stopstanstedexpansion.com/nats_guidance_2008.html).

### **2 INTRODUCTION**

Terminal Control North (TCN) serves the airspace north of the Thames for Heathrow, Stansted, Luton and London City Airports as well as for 57 smaller airports and military airfields. The NATS consultation document proposes route changes to certain parts of the system for which there are varying degrees of interdependency.

The consultation does not address those existing routes for which changes are not being proposed. Impacts are only given where changes are being proposed. This means that the consultation does not provide a total picture of all aircraft flying in the region or the cumulative impacts that will occur as a result of the changes.

Additionally and fundamentally, the document only considers airspace up to 7,000ft and likely traffic patterns to 2014. Indeed, the consultation specifically excludes feedback on air traffic growth and airport developments as well as the airspace implications for air traffic increases of a second runway at Stansted and a third runway at Heathrow.

NATS proposes only one solution, without describing discarded options, and seeks feedback before the extended closing date of 19 June 2008.

### **3 REASON FOR THE NATS PROPOSAL**

NATS say that due to the rapid increase of air traffic, the current TCN airspace route structure is now inefficient in controlling aircraft. It has therefore proposed changes to provide efficiency gains for its customer, the airlines.

It should be clearly recognised that NATS has proposed these changes to accommodate the Government's continued pursuit of increased air traffic in the south east of England.

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<sup>1</sup> NATS is a Public Private Partnership whose shareholders comprise the Government, major UK airlines, BAA, banks and NATS employees. NATS provides air traffic services exclusively for TCN under licence from, and regulated by, the Civil Aviation Authority.

## 4 OVERALL RESULT OF THE PROPOSAL

Across a region with a population of 12.6 million, some efficiency gains are achieved and some environmental gains are claimed. However these environmental gains are only achieved by moving air traffic to less densely populated areas. The result is that previously tranquil areas will in future suffer from environmental harms. Some routes below 4,000ft have been moved to avoid sizeable population centres. Between 4,000 and 7,000ft, the new routes trade off noise against reducing fuel burn/emissions. Above 7,000ft, the priority has been to reduce fuel burn/emissions rather than reduce overflying of population centres.

## 5 ENVIRONMENTAL IMPACTS

### 5.1 Emissions

Overall NATS say there will be no change to emissions per flight for the changed routes although they do not provide details of the modelling methodology. The departure emissions will increase, but arrivals and holding stack emissions will reduce giving an overall neutral outcome according to NATS modelling. These results are based on average emissions per flight and take no account of any growth of air traffic beyond 2014, nor any account of those routes which will not change.

### 5.2 Noise

NATS defines noise impact by the number of people affected rather than the amount of noise they are exposed to. Noise impacts are shown by  $Leq^2$  and  $SEL^3$  contours and by  $Lmax^4$  values for individual aircraft flying overhead. The  $Leq$  contours – which rely on averaging and therefore present a distorted picture – suffer from the disadvantage that in no way do they adequately represent the annoyance caused by the number of aircraft movements together with the known deficiencies of the metrics used.

For airport departures up to 4,000ft, by changing some of the Noise Preferential Routes ('NPRs') NATS makes some gains made by reducing the population count under these routes. For Stansted this involves two out of six NPRs; the four other routes remain unchanged. However this gain is offset by aircraft climbing more steeply and more noisily on take off for those people living under and close to the new NPRs as well as those under the unchanged NPRs. This means that the population count within the 16 hour 57 decibel  $Leq$  contour around Stansted and Luton airports will increase.<sup>5</sup>

A further gain is claimed by reducing the population count under holding stacks. Three new stacks are proposed to replace the current two shared by Stansted and Luton where arriving aircraft queue in these stacks with 1,000ft separation at heights from 7,000ft up to 14,000ft. However, this gain is offset by the fact that the new stacks will be over less populated areas that previously were relatively free from aircraft noise and which will suffer more in future.

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<sup>2</sup>  $Leq$ : equivalent sound level of aircraft noise in decibels, often called equivalent continuous sound level – used to depict the total impact of aircraft noise over a period of time.

<sup>3</sup>  $SEL$ : sound exposure level – the sound level of a one second burst of steady noise that contains the same total sound energy of an aircraft noise event.

<sup>4</sup>  $Lmax$ : the highest noise level of an aircraft noise event

<sup>5</sup> The 16 hour 57 decibel  $Leq$  value is used by the Department for Transport as the level for the onset of significant community noise. This value is the notionally equivalent continuous sound level that has the same energy as all the fluctuating aircraft sounds measured in a 16 hour period (0700-2300) during the 92 day period 16 June to 15 September inclusive. However, the World Health Organisation Guidelines for Community Noise recommends a lower level of 50 decibels for moderate annoyance and this lower figure is also reported by the results of the Department for Transport's Attitudes to Noise from Aviation Sources in England (ANASE) study dated November 2007.

It is also important to note that the proposed changes rely on widespread use of modern technology that enables aircraft to fly more accurately. This will have the effect of concentrating more noise on the 'centrelines' of the flight paths described in the consultation document.

### **5.3 Tranquillity and Visual Intrusion**

Tranquillity measurements have not been undertaken by NATS and no assessment of visual intrusion is offered. The two are interrelated and the frequency of use of the new routes will have an impact, particularly where there is overflying of areas that were previously tranquil.

### **5.4 Local Air Quality**

No local air quality analysis has been undertaken for Stansted or Luton Airports. NATS believe that the proposed changes will have a negligible impact on local air quality based on their analysis carried out for Heathrow and London City.

## **6 THE NEW ROUTES**

It is important to note that not all TCN routes are proposed for change. Those that are unchanged in the East Herts and West Essex region are

- Gatwick departures
- Stansted departures to the south and east (four of the six Noise Preferential Routes)
- Heathrow and Northolt arrivals
- Arrivals and departures to smaller airfields in the London area (not Heathrow, Luton, Stansted, London City, Northolt or Cambridge)
- Overflights from other UK airports going to, or heading from, Europe and the east
- Overflights between Europe and the Americas

The NATS proposals do not provide information or impacts for these unchanged routes.

For the new routes, NATS has provided air traffic forecasts based on historical trend data which is unrelated to any airport plans. For Stansted Airport, NATS has used an average annual growth rate of 3.5% to 2014.

The route lengths for the two new Stansted departure routes are longer than previously, typically between 6 and 8 miles. For all of the Stansted arrival routes, there will be some shorter routes by up to 4 miles and some longer routes by up to 12 miles. Overall the arrival routes will increase typically on average by about 2 miles. NATS claim that these longer routes will fly over fewer people but it is not clear whether the NATS calculations include the new housing plans for the East of England and particularly the location of new large settlements which are currently under discussion.

The new routes are colour coded in the NATS document to show typical heights and route boundaries with centrelines. A guide to noise levels for aircraft passing overhead at heights up to 7,000ft is also given.

## **7 NEW HOLDS**

NATS is proposing that the current two holding stacks near Sudbury (Abbot) and Barkway (Lorel) that jointly serve Stansted and Luton will be taken out of use and replaced by three dedicated holds which are positioned further north:

- Stansted Airport will be provided with two holds: a westerly hold between Saffron Walden and Newmarket and an easterly hold between Stowmarket and Ipswich.
- The new Luton Airport hold will be to the west of Cambridge between Huntingdon and Royston. These holds are used when the airport is busy and aircraft have to queue to land.

The holds consist of oval circuits separated by 1,000ft from 7,000ft up to 14,000ft. Aircraft descend to lower circuits when clear to do so and are finally sequenced to land from the bottom of the stack. A circuit normally takes about 4 minutes to complete and since the lower circuits are flown at slightly lower speeds, the circuits get smaller as aircraft descend in the hold. The maps given in the NATS document show the largest area that aircraft could be flying over when queuing in these holds and the maps also show the new arrival routes from these holds to the airport.

NATS has positioned these new holds and the new arrival routes away from densely populated areas and particularly for the arrival routes from the holds to the airport since aircraft will be at low level. The consequence is that people currently living in currently tranquil areas under these proposed holds and under the new arrival routes will experience more noise. Furthermore, the base of the current Sudbury hold is at 8,000ft and the lowering of the base of the new holds to 7,000ft will have an adverse noise impact in the area. Air traffic levels are such that these holds are normally used from 6am until midnight.

When traffic levels are low enough to avoid using the holds, aircraft will instead use direct routes into the airport and will then not avoid flying over densely populated areas. Whilst this is of direct benefit to the airlines, it will increase the number of people overflown and this will be particularly noticeable during the sensitive night period.

## **8 CONTINUOUS DESCENT APPROACH**

Stansted currently operates a procedure known as Continuous Descent Approach (CDA) for arrivals on the 'runway 23' approach (ie arrivals towards the south west). NATS proposes to introduce CDA for arrivals on the 'runway 05' approach (ie arrivals to the north east).<sup>6</sup>

The advantage of CDA is that aircraft can stay higher for longer in the final approach to the airport, using less engine thrust. The net result is a reduction of noise, fuel burn and emissions under the flight path from about 25 miles out until about 10 miles out from the airport. However, noise reduction is not constant over this 15 mile distance. It typically starts from zero at 25 miles out, can be some 5 decibels for a Boeing 747 at about 15 miles out and then reduce to zero again at 10 miles out. It should be noted that a change of 3 decibels – a halving of the sound pressure levels - is the minimum perceptible under normal conditions. CDA provides no benefit for the last 10 miles of the final approach and is normally operated from about 6,000ft down to about 3,000ft.

## **9 STANSTED AIRPORT AIR NOISE CONTOURS**

The route changes around Stansted airport will increase the air noise footprint. To describe this footprint, NATS has used the 16 hour 57 decibel Leq metric, which takes little account of the number of aircraft and is higher than 50 decibel World Health Organisation guidelines, but nonetheless the population count within this 57 contour will increase by 220 (8.6%) in 2009.

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<sup>6</sup> Stansted operates two runway directions, namely runway 05 and runway 23. The NATS document refers to these runways as easterly and westerly respectively. This defines the approximate orientation of the runway. It does not indicate the direction of origin or destination of aircraft. So for instance, when NATS says Stansted easterly arrivals, it means aircraft landing on runway 05.

In the case of Luton airport, the population count within the 57 decibel contour will increase by a massive 5,310 (111.6%) in 2009. It is interesting to note that the population counts for Stansted, Luton, London City and Northolt Airports will all increase within the 57 decibel contour, but that Heathrow will slightly decrease.

## **10 STANSTED DEPARTURES**

Two of the existing six Noise Preferential Routes (NPRs) for departures have been changed. These are those routes for which the ultimate destination is to the north and south west of Stansted and operate from both the westerly and easterly runway directions.

These new routes will fly over areas previously not overflown close to the airport. The principle of an NPR is that aircraft should stay on a fixed departure route until they have reached 4,000ft, after which they may alter course towards their ultimate destination.

- Stansted westerly departures will execute a tighter right turn around Thorley and then head towards Saffron Walden, passing Little Hadham and reaching 4,000ft after Manuden about level with Quendon.
- Easterly departures will continue on a more northerly route over Broxton, Wimbish and towards Ashdon, finally reaching 4,000ft as they turn west around the north of Saffron Walden.

For these two new routes as well as the existing unchanged NPRs, the noise and emissions levels will increase since aircraft will be climbing more steeply. As stated earlier, improved technology means less deviation from the route centrelines, concentrating the impacts.

Details of the unchanged NPR departure routes can be found in the Addendum to the NATS consultation document and it enables an assessment to be made of how many new people would be under the NPRs.

## **11 STANSTED ARRIVALS**

The routes to both runway directions have changed as a result of the new holding stack positions. Generally speaking the route centerlines avoid densely populated areas.

Furthermore the introduction of CDA for runway 05 will improve the noise climate around Ware as aircraft will be routed around the south of Hertford and Hoddesdon before lining up with the runway over the west of Harlow. This route does not strictly meet the UK criteria for CDA but it is better than the current approach in that fewer people are overflown. However, one of the arrival routes that previously approached the easterly runway from the south east of Bishop's Stortford over North Weald will now fly across the north of the town before joining the CDA route to runway 05.

## **12 ROUTES TO AND FROM OTHER AIRPORTS**

Certain changes to arrivals and departures for Luton, Heathrow, London City and Northolt Airports are proposed which will affect the areas around East Hertfordshire, Essex, Suffolk and Cambridgeshire. Luton and Northolt departure routes for destinations towards the east and south east will be moved north from near Harlow to almost over Bishop's Stortford. Heathrow departure routes towards the north east will alter slightly over Harlow towards Colchester.

## **13 AREAS OF OUTSTANDING NATURAL BEAUTY**

NATS proposals mean that Luton and Stansted arrivals will avoid the Dedham Vale and the Stour and Orwell estuaries Areas of Outstanding Natural Beauty ('AONB'). As a consequence, more aircraft will fly over adjacent areas, in particular above Ipswich. The Suffolk Coasts and Heaths AONBs will see no change to overflights with the exception of the southern portion around the Stour and Orwell estuaries mentioned above.

## **14 ENLARGEMENT OF CONTROLLED AIRSPACE**

NATS proposes to enlarge the volume of the TCN airspace by lowering the lower height boundary in certain places. This affects airspace near Luton and over Cambridgeshire, Suffolk and north east Essex which could result in lower flying and more noise.

## **15 UNDERSTANDING THE NATS CONSULTATION**

The NATS document provides details of all proposed changes to routes, heights, stacking holds and extended controlled airspace. It does not provide details for any existing routes that are unchanged.

For any specific location or area within TCN airspace, it is possible to evaluate the effect of the changes in terms of flight paths, frequency and height of air traffic, environmental impacts and population likely to be affected. However, to compile a complete picture several maps need to be studied in the appropriate regional section as well as the guidance material in the common sections.

Aircraft heights can be measured in three ways; namely height above ground, height above average mean sea level and flight level depending on the phase of flight. This has been normalized in the NATS document to simplify the explanation and only give one height measurement. Other than knowing that Stansted and Luton airports are 350ft and 500ft respectively above average mean sea level, it does not really have any significant influence on the assessment.

Aircraft noise is likely to be the main concern. This is because aircraft are intrinsically noisy and there are no measures proposed, nor indeed are there any available, to mitigate this noise in open spaces, compared with land based noise sources which can be shielded. Aircraft noise has three main components, namely the level of the noise, the duration of the noise and the number of flights. Additionally aircraft noise has a large low frequency component which travels further and a tonal characteristic which can be disturbing.

The NATS consultation document includes tables which provide a ready reckoner to assess the noise from typical aircraft flying overhead for each of the airports. The noise figures are given as peak noise L<sub>max</sub> decibels in height increments of 1,000ft up to 7,000ft and for arrivals and departures.

NATS also provide a table of equivalent L<sub>max</sub> levels for typical sounds and this is reproduced below including some additional illustrations. The L<sub>max</sub> levels are given in decibels (dB) which is a logarithmic scale. A 3 dB increase is a doubling of sound level and a 10 dB increase is a ten fold increase in sound level:

Typical Sound	Noise level (dB)
Threshold of pain	140
Aircraft take off at 50 metres	140
Aircraft take off at 300 metres	120
Pneumatic drill at 7 metres	95
Car at 40mph at 7 metres	70
Busy general office	60
Quiet office	50
Average suburban area	40
Quiet bedroom/library	35
Empty theatre	20
Threshold of audibility	0

While the NATS document only describes the proposed changes, people currently living under the TCN airspace can make a reasonable judgment of how these changes will affect them in their present location.

It should be remembered that these proposals only consider traffic patterns to 2014. They do not allow for a second runway at Stansted or a third runway at Heathrow. What is more difficult to assess is the situation where people are considering moving to a new location or an area under the TCN airspace since the total picture is not provided.

## 16 ACCESSING AND RESPONDING TO THE NATS CONSULTATION

The consultation document can be found online at [www.nats.co.uk/TCNconsultation](http://www.nats.co.uk/TCNconsultation), where you can also register and respond online. The consultation document is a very large document (17MB) which means it can be slow to download from the Internet. The document is only available to the general public in hard copy form at public libraries.

It is also possible to respond by post by writing to:

TCN Consultation  
NATS  
Freepost NAT22750  
Reading RG1 4BR

The extended closing date for responses is 19 June 2008.

Each regional section is complete in describing the changes for that region and the likely impacts. Where there is interdependency with other regions, this is also included. The internet site for the consultation also allows consultees to enter a postcode to search for route changes affecting specific locations.

Respondents are asked to state whether they support or object to the proposal and give reasons. A post consultation report will be made available by 22 June 2008 and, subject to CAA approval, NATS intends to implement the changes from March 2009 onwards.

Specific guidance on responding is also available in a separate note from SSE available online at: [www.stopstanstedexpansion.com/nats\\_guidance\\_2008.html](http://www.stopstanstedexpansion.com/nats_guidance_2008.html) or SSE can send copies on request.