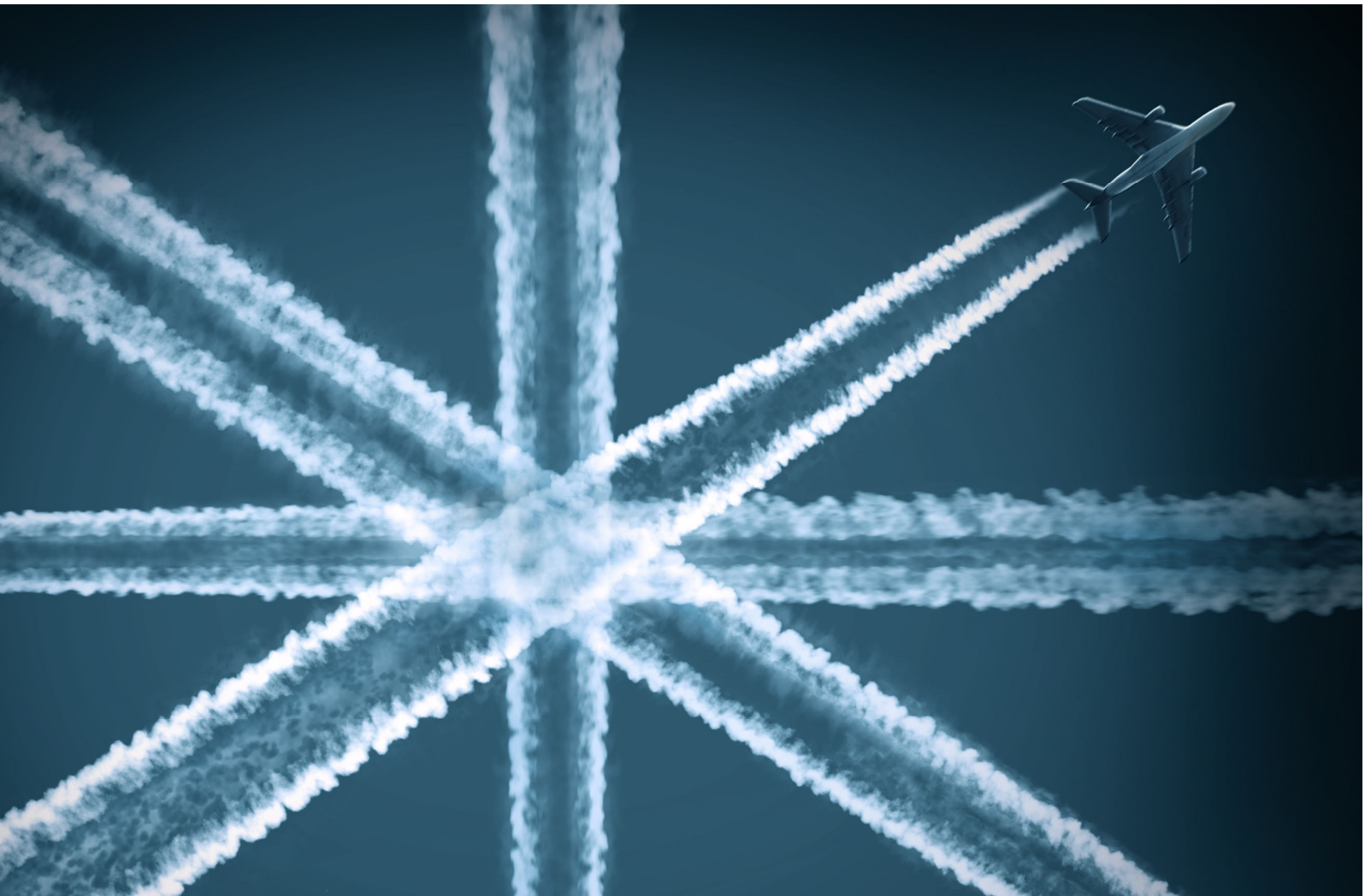
Runway 04 ILS Joining Point Trial (Night-Time)

Results and Analysis



Introduction

On the 1st March 2013 , London Stansted, in cooperation with community representation at the Airports Noise and Track Keeping Working Group (NTKWG), Air Traffic Control and the Airport's Consultative Committee sub-group the Environmental Interest Group (EIG), commenced a trial to improve noise, particularly at night, around the Ware, Hertford and Hoddesdon areas. The trial was conducted over a two month period ending on the 30th April 2013 when all previous published procedures were re-instated.

The aim of the trial was to reduce noise disturbance from aircraft arriving at night into London Stansted from the west, onto our northeasterly runway 04, by reducing the likelihood that they fly over the urban areas of Ware, Hertford and Hoddesdon.

After the trial dates were formalised, London Stansted sent a letter to East Herts Council informing them of the trial and also published details on London Stansted's website[1].

Joining Point Criteria

Aircraft on approach to London Stansted have to align directly with the runway and intercept the Instrument Landing System (ILS) at a minimum distance from touchdown. The point at which aircraft intercept the ILS is known as the Joining Point Criteria.
The existing Joining Point Criteria, as published in the UKAIP[2], varies between daytime and night-time arrivals under rules set by the UK Government. Daytime arrival rules, those between 06:00 and 23:30 local time, state aircraft are required to join the ILS at not less than 2,000ft amsl (above mean sea level) with no specific distance stated, although this is usually 6.5 nautical miles (nm) from the runway threshold ,a point north of Harlow, as shown in **figure 1**. Night-time arrivals, those between 23:30 to 06:00 local time, are

[1] http://www.stanstedairport.com/about-us/local-environmental-impacts/noise/noise-in-your-area
[2] http://www.ead.eurocontrol.int/eadbasic/pamslight-E0BCD0FF3072DFE15609D6BE1529B0B8/7FE5QZZF3FXUS/EN/AIP/AD/EG_AD_2_EGSS_en_2013-06-27.pdf

required to join the ILS at a distance not less than 10nm from the runway threshold ,a point north of Nazeing, and at a minimum height of 3,000ft amsl, as shown in **figure 2**.

Figure 1, Daytime Joining Point Criteria

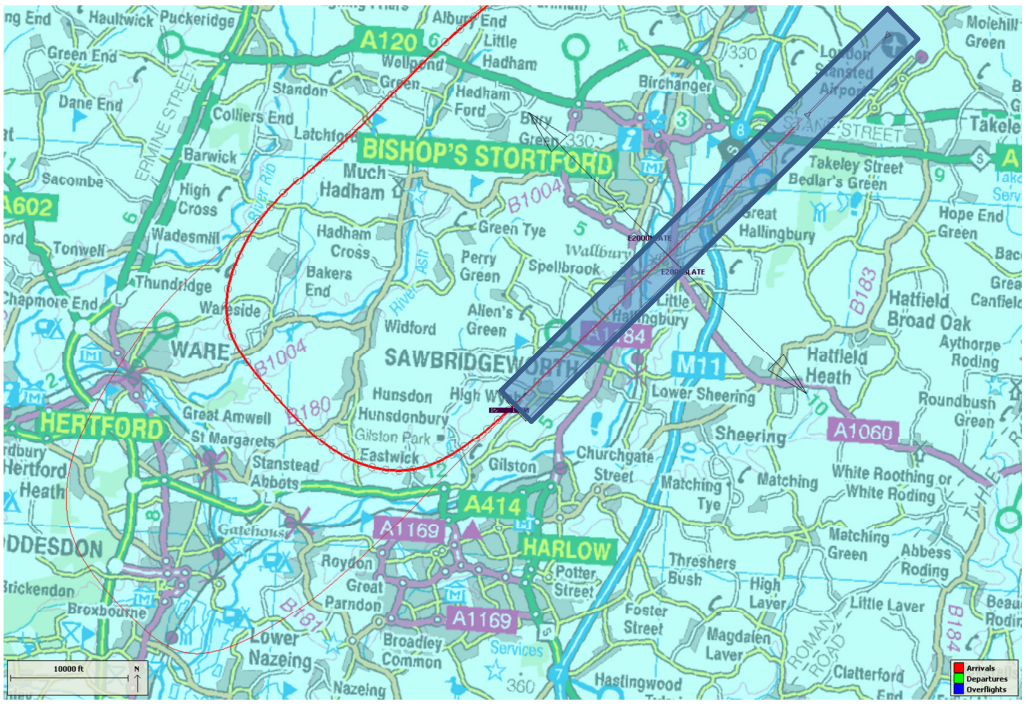


Figure 2 Night-time Joining Point Criteria

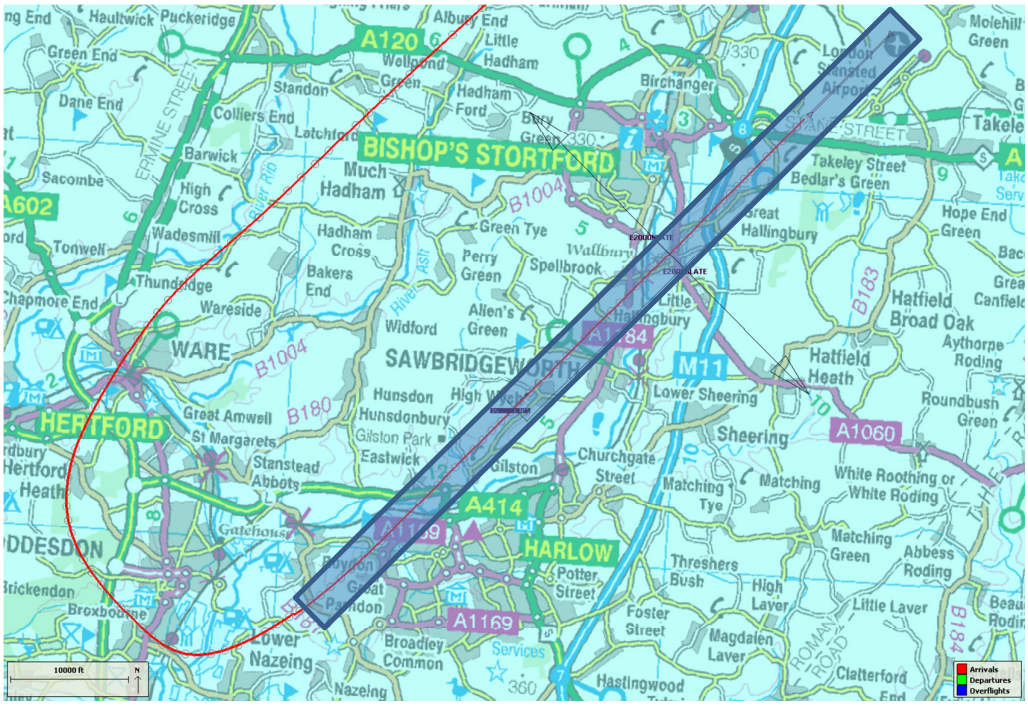


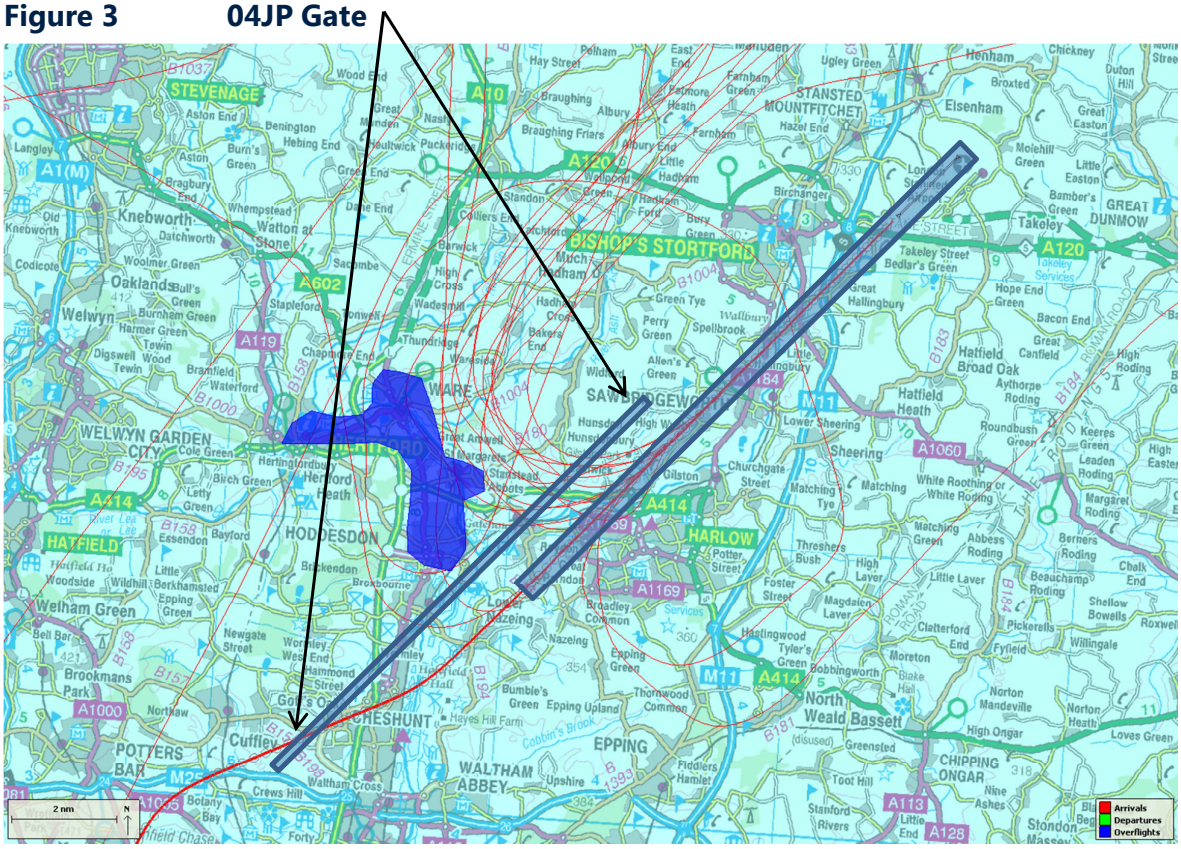
Figure 1 and Figure 2 clearly outline the purpose of the trial, i.e. to avoid extended vectoring of arrivals from the north , flying further south just to meet the night time Joining Point criteria resulting in unnecessary over flight of Ware, Hertford and Hoddesdon.
There are also other environmental factors to be considered, as there is also an additional fuel saving benefit to be realised for aircraft operators through less track miles flown at low altitude.

Data Capture

London Stansted uses a dedicated Noise and Track Keeping system called ANOMS. The system uses a series of "gates" to capture flight track data.
When new gates are drawn within the ANOMS system for the purposes of data analysis, historical flight track information can also be re-processed though these new gates to enable accurate monitoring and so enabling direct comparisons of previous data to current trial data. For the purposes of this trial, data has been processed since 1st January 2012, enabling the same two months of March and April to be compared year on year.

Figure 3 below shows the ANOMS system setup including the Joining Point gates for night-time arrivals, the '04JP' gate to capture arrivals only from the north, northwest and west and the area of perceived benefit/monitoring zone shown in blue

Figure 3 **04JP Gate**



Results

It was immediately obvious that there was a great disparity between the number of operations in 2013 and 2012 in the same 2 month period, 674 and 361 respectively. To enable better comparison of track data, 2012 analysis was extended to 3 months, 1st March - 31st May, now resulting in a comparable 688 tracks.

Track data was analysed firstly by filtering all arrivals that penetrated the 04JP gate to exclude track data from the south, east and north east in each dataset. Then further filtering was undertaken to exclude all track that had not overflown the Ware, Hertford and Hoddesdon monitoring area.

Table of results

	2012 (1st March – 31st May)	2013 (1st March – 30th April)
Total Night Time Arrivals to Runway 04	688	674
Arrivals penetrating 04JP gate	275	300
Arrivals penetrating 04JP and monitoring zone	62	81
Arrivals from the West	184	209
Arrivals penetrating 04JP and monitoring zone from the West	2	28
Arrivals from the North	91	91
Arrivals penetrating 04JP and monitoring zone from the North	60	53

There are two areas worthy of comment from the table of results, the large increase in arrivals overflying the monitoring zone from the west and the reduction of arrivals penetrating this same zone from the north.

As the data table suggests, the 2013 trial shows a distinct shift in arrival tracks compared with 2012, as per **figures 4** and **5** showing many more aircraft being vectored in from the west and overflying the monitoring area to meet the daytime joining point criteria. This is certainly an adverse effect on the monitoring zone, however, this will have benefited communities further south, such as Cheshunt.

Figure 4 Arrivals from the West 2012

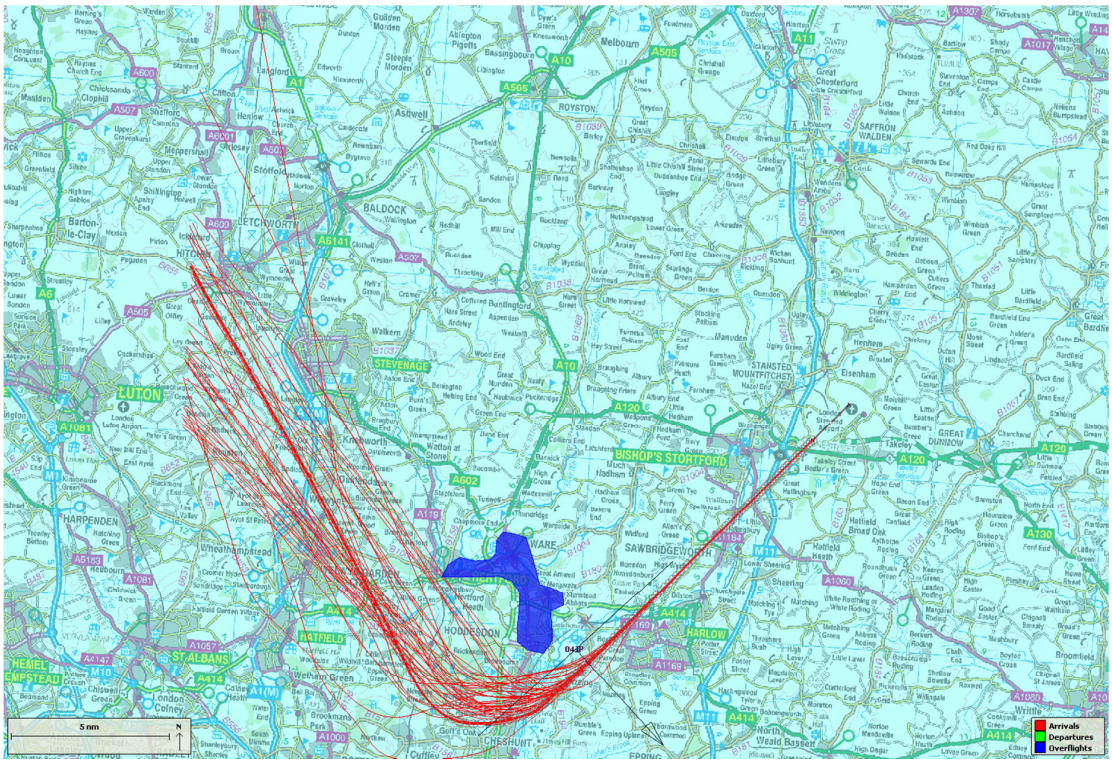
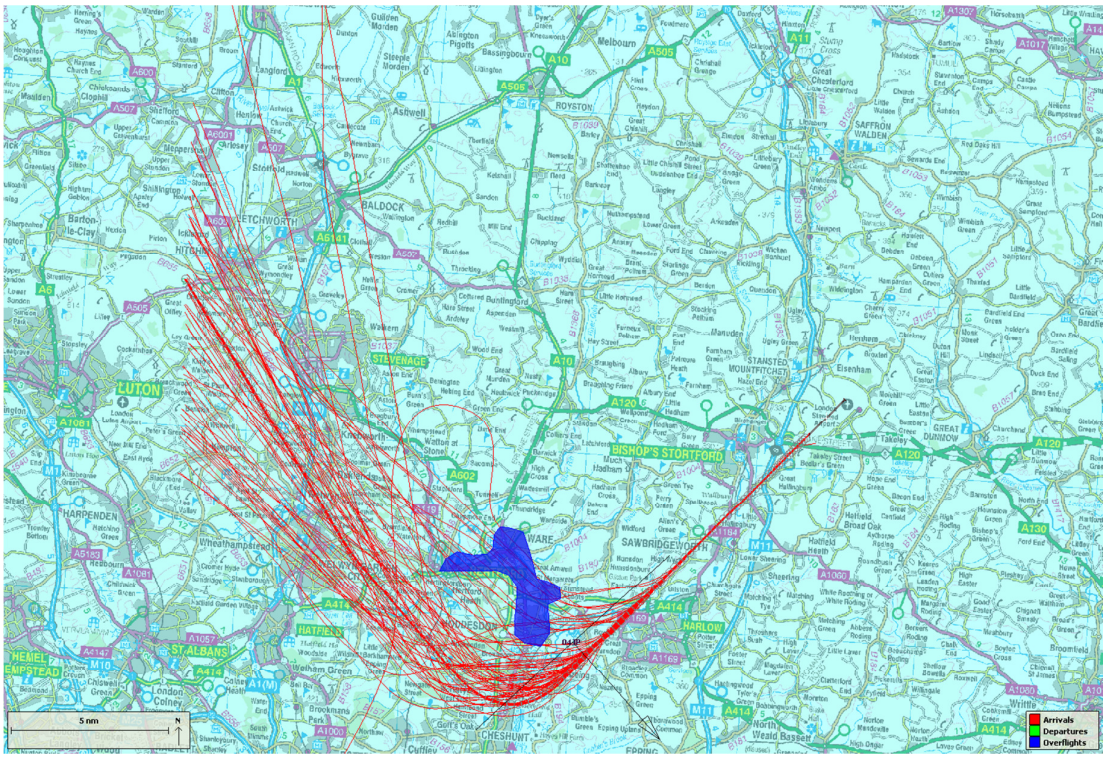


Figure 5 Arrivals from the West 2013



In contrast to arrivals from the west, the arriving traffic from the north has shown a slight improvement in respect of less aircraft overflying the monitoring zone. As per the previous images, there is also a noticeable shift in tracks to the north, now comfortably meeting the daytime joining point criteria with less now overflying the monitoring zone, as shown in **figures 6** and **7** and comfortably making the day time joining point.

During the period of the trial there were no complaints from the Ware, Hertford and Hoddesdon areas during the night period.

Figure 6 Arrivals from the North 2012

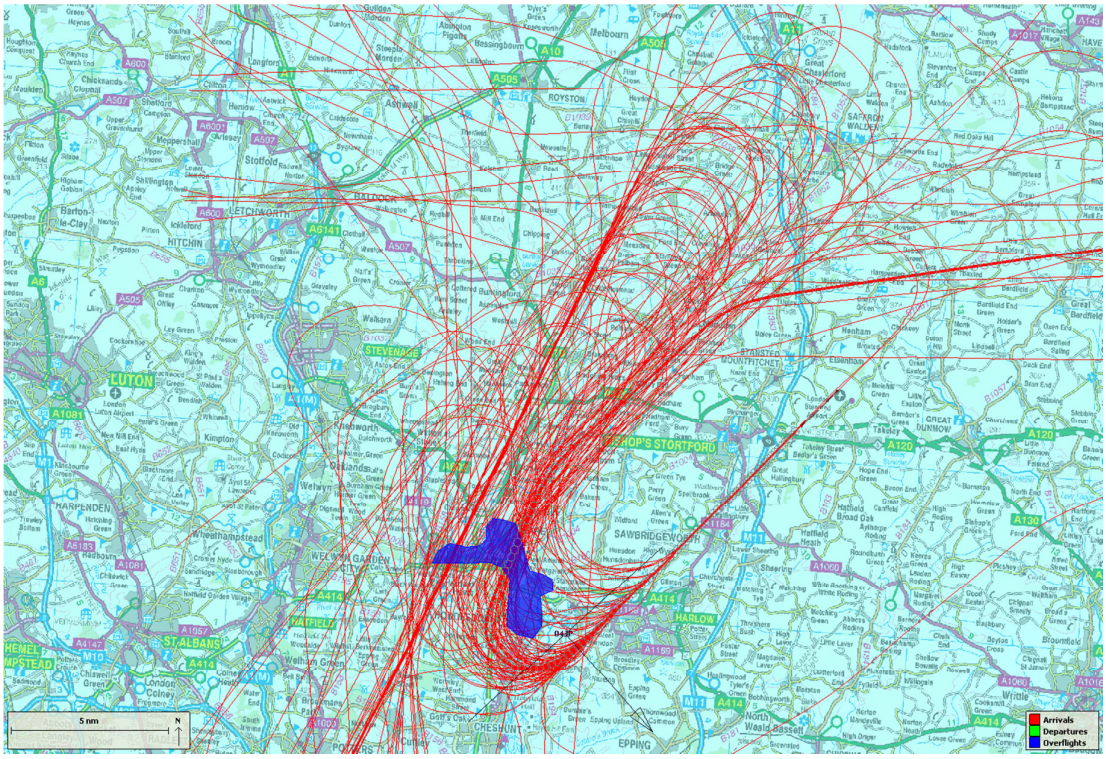
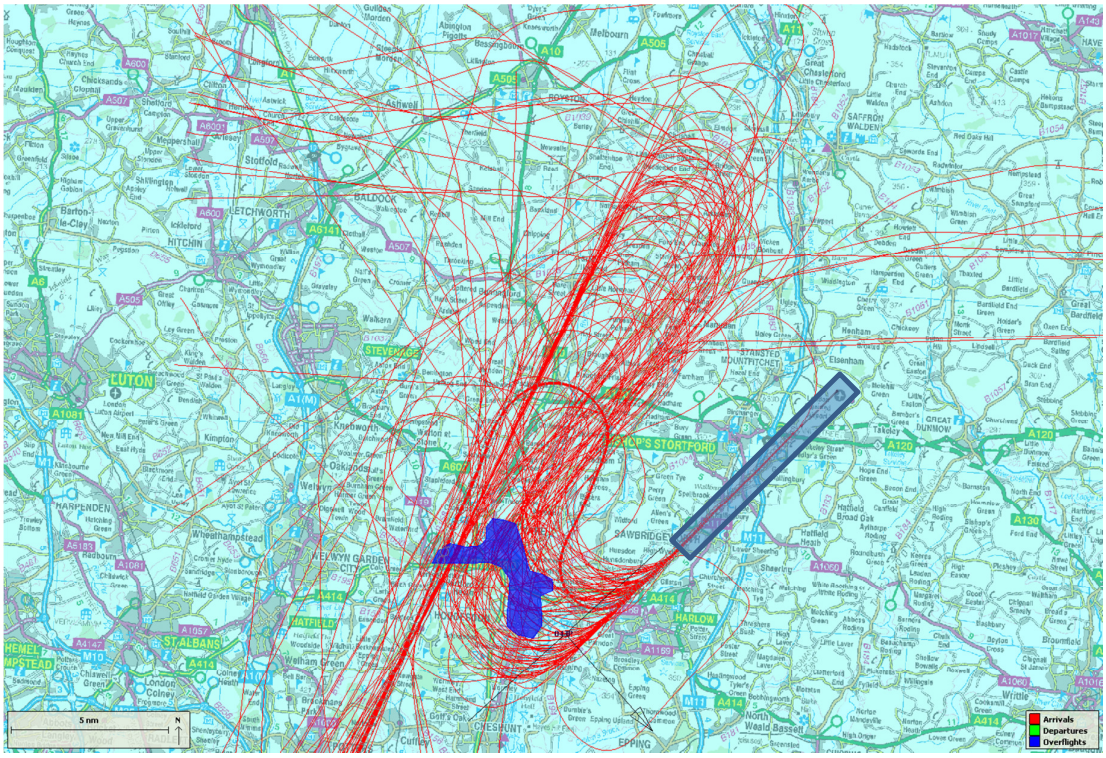


Figure 7 Arrivals from the North 2013 with daytime joining point



NATS have indicated that there is a fuel saving to make in terms of track miles flown for arrivals from the north that met the daytime joining point criteria. Those flying further south to make the night-time joining point criteria would have flown on average an extra six track miles per arrival.

For the duration of the trial there were no complaints from the Ware, Hertford and Hoddesdon areas during the night period.

Summary

Although this was an extremely short trial, it has highlighted some areas where significant benefit can be achieved both for both local the community and aircraft operators alike. This trial was conducted without the benefits of a PRNAV approach and was reliant on Air Traffic Controllers vectoring aircraft. Ideally, aircraft arriving from the west would continue to join the ILS at 10nm as per the current night-time criteria, whilst those from the north could be turned earlier and not over fly large communities making the daytime criteria.

The procedures trialled would no doubt be improved by a PRNAV approach and it is possible that in time a tailored arrivals procedure(s) could be agreed as a best fit for local communities. For example, perhaps several arrival routes into London Stansted could be developed by flying either side of those communities as per this trial and the Harlow area from the east, where the current day time joining point criteria would appear unsuitable as shown below in **figure 8**

Figure 8 Daytime arrivals over Harlow