

# LAMP PIR

## Requirements B10, B14

Commentary on Track Plots for London City RNAV procedures  
Post-implementation of LAMP Phase 1A

Prepared by NATS Airspace Change Assurance (CPW)

For publication

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The slide features several decorative orange lines. Two thick lines run diagonally from the top right towards the bottom left. A thinner line forms a loop on the left side, crossing the diagonal lines. Another thin line runs parallel to the lower diagonal line.

# London City RNAV procedures - Introduction



This document provides a brief commentary on the track plots provided for items B10 & B14 of the LAMP PIR. Sub-folders contain the relevant track plots in PDF format. The resolution in these plots is high enough to identify roads and buildings. The track plots were created in a newer tool than that used for the original consultation. The same pre-implementation radar data has been used to create equivalent plots in the new tool, enabling comparison with both the consultation material and with post-implementation radar data.

The file name and page numbering denotes the year, month and altitude band shown in the picture. For example, filename *Density-E-Arr-40-00* has pages *2013-06-E-Arr-00-40*, *2016-02-E-Arr-00-40*, *2016-05-E-Arr-00-40*, *2016-08-E-Arr-00-40* & *2016-11-E-Arr-00-40*.

An equivalent system has been applied to each PDF, which should be self-evident and simple to follow. Filename *BPK* includes traffic using CPT SIDs, both pre- and post-implementation. Filename *DVR* compares pre-implementation DVR SID traffic with post-implementation EKNIV traffic.

This document is divided into three sections:

- B10 Arrivals commentary

- B14 Departures commentary

- Data and information on numbers of flights and a key to the density colour bands

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# B10 London City RNAV arrivals commentary



Tracks from 4,000ft to the runway using the RNAV1 arrival transition are illustrated via density plot.

## **Pre-implementation**

Arrivals show general convergence over Kent, Essex and London to several wide flows.

They start to become more highly concentrated (mostly purple) late downwind (E) or mid-final (W).

## **Post-implementation**

Arrivals show a well-contained purple band starting much further out from the runways. This illustrates that track-keeping accuracy is high such that the main colours shown are purple or blue-grey, i.e. concentrated or off-transition. The width of the flows is far narrower and follows the track of the arrival transition (which starts over the sea to the east), reducing the spread of flights over Kent, Essex and London. The concentration is comparable with the black dots shown in the consultation.

## **Off-transition flights**

Controllers state that flights using the transition follow it well, unless tactically instructed. Off-transition flights are generally manually vectored. They are either RNAV1 flights vectored to achieve a particular approach spacing, or are non-RNAV1.

## **Strong winds and flyability**

Storm Imogen affected the London area on 7/8 Feb 2016, bringing 30kt winds with 45kt gusts from the southwest. There were 26 go-arounds over the two-day period, likely attributable to these gusting conditions, illustrated in a separate whisker plot (filename B10-Whisker-Strongwindgoarounds). This was a W day at LC, so the straight-in arrival transition was not significantly affected. Had this been an E day then we would expect some ballooning around the TODBI/ODLEG turns.

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(For point-merge density plots and whisker plots, see item C11.)

# B14 London City RNAV departures commentary



Tracks from the runway to 4,000ft using the RNAV1 arrival transition are illustrated via density plot and whisker plot.

**Easterly:** BPK, CLN, DVR SID concentration is comparable with the black dots shown in the consultation.

**Westerly:** BPK, DVR SID concentration is comparable with the black dots shown in the consultation.

CLN SID concentration in the right turn between Dagenham and Hornchurch occurs c.450m NW from the black-dot path predicted in the consultation. CAP1498 was published in Feb 2017, proposing definitions for “overflight” of an area. Using CAP1498’s widest elevation-angle threshold of overflight ( $48.5^\circ$  from horizontal), at 4,000ft the radius of the overflight cone would be 1,079m.

The predicted black-dot path in the consultation document is within the  $48.5^\circ / 1,079\text{m}$  “overflight zone” of the concentrated area. See next slide for illustration.

## **Off-SID flights, including tactical shortcuts over Romford**

Controllers state that flights using the SIDs follow them well, unless tactically instructed. Off-SID flights are generally manually vectored due to conflicts with Southend or Biggin Hill traffic, or are non-RNAV1 and either following the pre-implementation SIDs or being manually vectored.

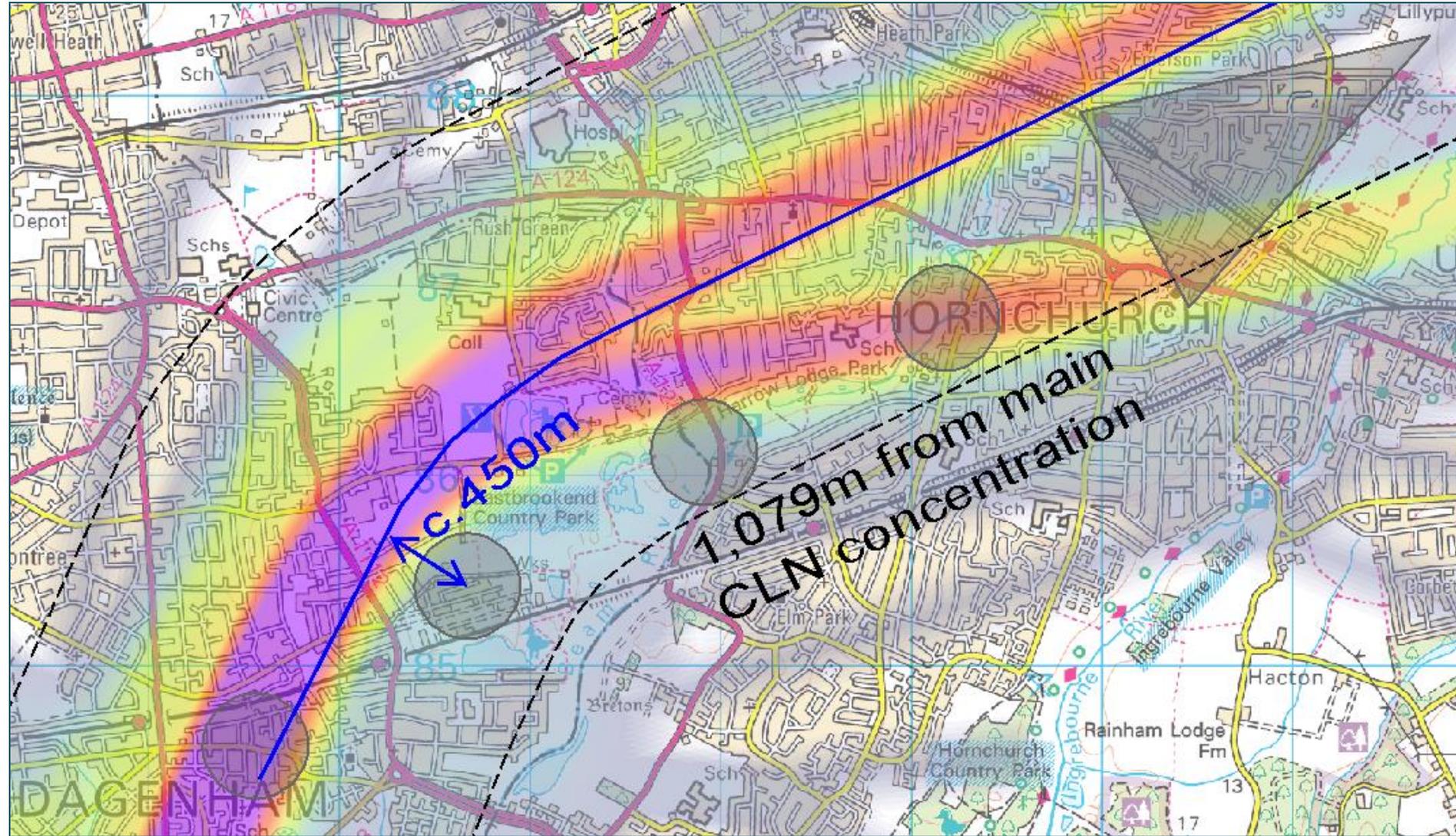
See file B14-Whisker-Multi-Romford: Pre-implementation, a band of flights was tactically routed across central Romford. Post-implementation, there was a c.80% reduction in the number of flights tactically routed across the same area.

## **Strong winds and flyability – BPK/CPT westerly SID**

See file B14-Whisker-Multi-Strongwind: Storm Imogen affected the London area on 7/8 Feb 2016, bringing 30kt winds with 45kt gusts from the southwest. There was clear tailwind ballooning east of Woodford during the left turn NW, followed by turn recovery. After the storm passed and winds became lighter, the majority of tracks more closely followed the SID.

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# B14 London City RNAV departures – CLN SID



Example CLN SID vs predicted black-dot path vs CAP1498's definition of "overflight" using an elevation angle of  $48.5^\circ$ .

May 2016 sample.  
Post-implementation density plots show the same behaviour for all CLN flights compared with the predicted black-dot path.

## B10, B14 Conclusion

The post-implementation arrangements are consistent with the predictions made in the consultation material.

The impact of strong wind on flyability has been demonstrated, via track plots on the dates of Storm Imogen.

Off-transition and off-SID flights are either tactically vectored for specific reasons, or are non-RNAV1 traffic.

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Sample data information; and  
Key to density colour bands

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<b>Month, Year, Runway dir</b>	<b>Num Dep</b>	<b>Num Arr</b>	<b>Specific Dates</b>
Jun 2013 E	681	687	03-07 Jun
Jun 2013 W	672	669	24-28 Jun
Feb 2016 E	442	439	12-13+26-28 Feb
Feb 2016 W	633	650	07-11 Feb
May 2016 E	619	604	10-14 May
May 2016 W	634	637	17-21 May
Aug 2016 E	595	584	15-18+27 Aug
Aug 2016 W	590	593	09-13 Aug
Nov 2016 E	664	663	23-25+27-28 Nov
Nov 2016 W	633	633	15-19 Nov

5 days per sample as per original consultation, count based on spatial filtering of relevant traffic flows

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# London City Density Plots for LAMP PIR

## Updated density tool - Colour assignments – Flights Per Day



Each flight in this sample is set to be a 500m wide track (250m either side of the radar trajectory)

Settings for number of *divisions* between densities, and what quantities define the min/max colour bands

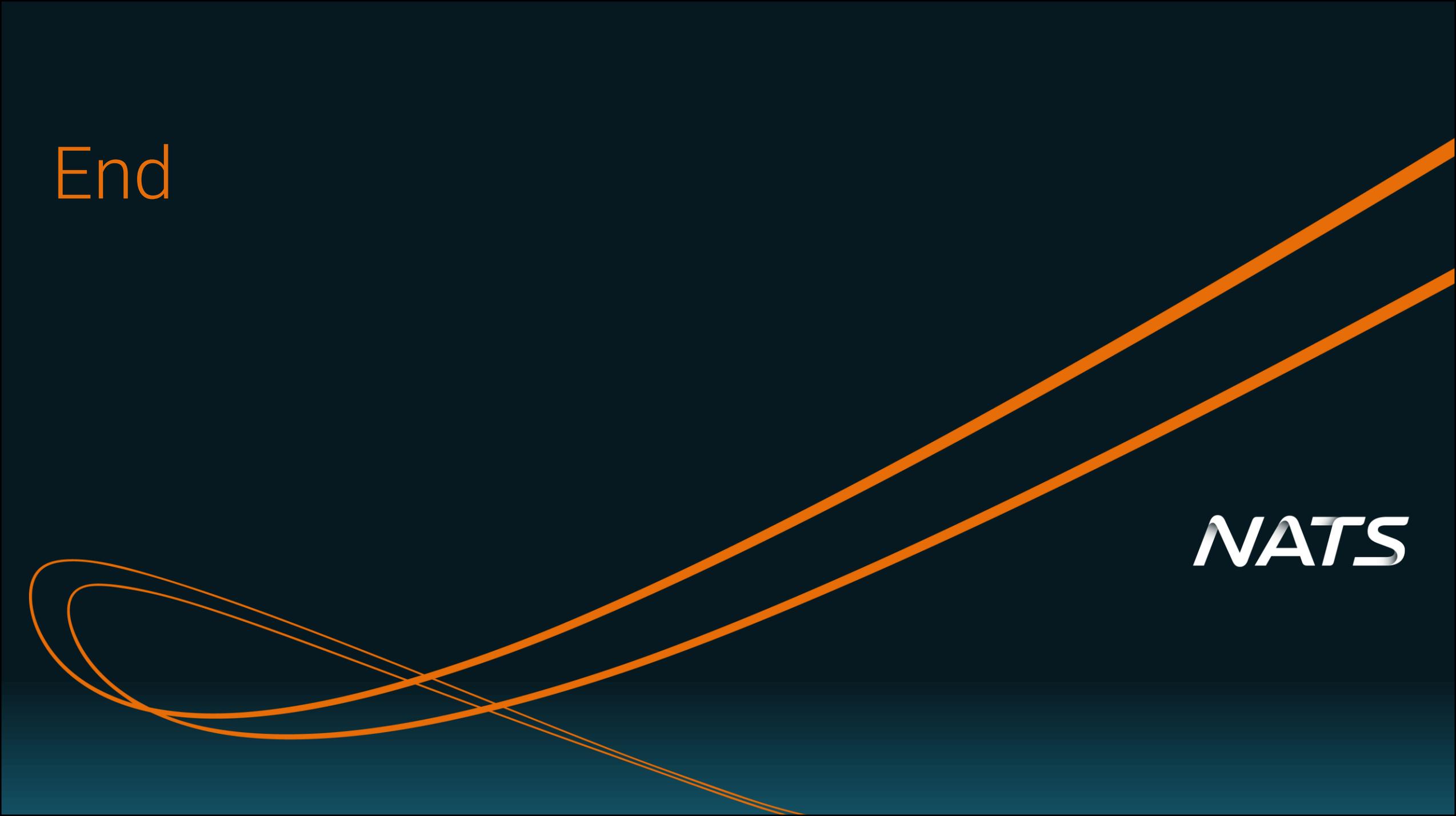
Where a number of tracks overlap the same place within the 5 day sample period, it shows the appropriate colour. The density colours are set to 50% transparent so the underlying OS map can be seen.

E.g. for a yellow colour to be seen, 25-49 flights overflow within 250m of a location over the 5 day period

Dividing 25-49 flights by 5 days is "5 to (less than 10)", hence 5-9.9

End

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The image features a dark blue gradient background. In the top left corner, the word "End" is written in a light orange, sans-serif font. In the bottom right corner, the word "NATS" is written in a white, italicized, sans-serif font. Two thick orange lines originate from the bottom left, forming a loop that crosses itself, and then extend diagonally upwards towards the top right corner. A thinner orange line also originates from the bottom left and extends diagonally upwards, parallel to the thicker lines.