

# Airspace Modernisation and Sustainability - A View From the UK

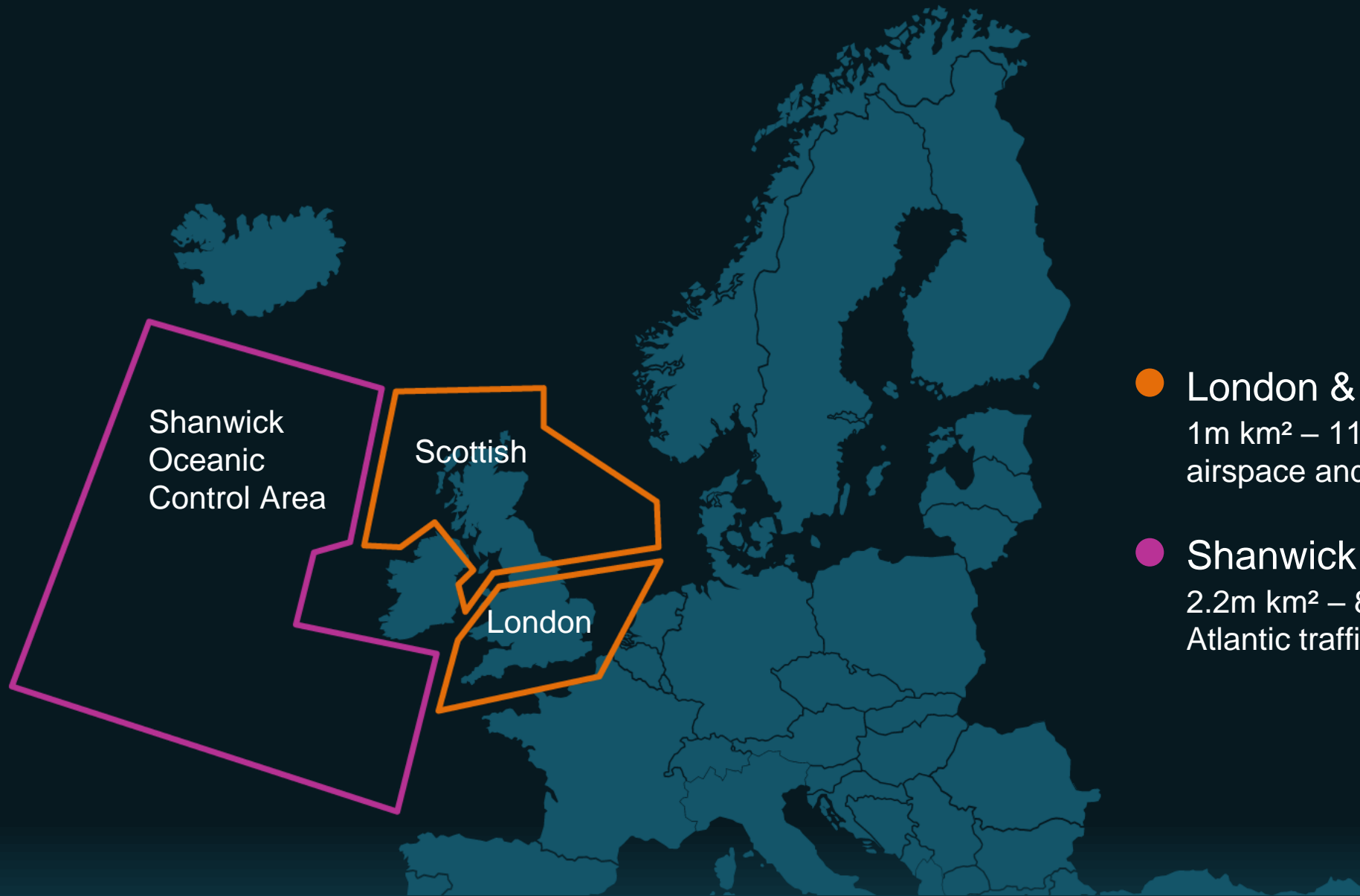
Ian Jopson

Head of Environmental and Community Affairs

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- London & Scottish:  
1m km<sup>2</sup> – 11% of Europe's  
airspace and 25% of traffic
- Shanwick  
2.2m km<sup>2</sup> – 80% of North  
Atlantic traffic

# Management of UK Airspace



2.5 million flights.



Over 250 million  
passengers



13 of the busiest  
UK airports



World's first:  
environmental  
targets





*“Without a complete modernisation of the airspace structures above us delays are set to soar to fifty times their current levels, costing over £1bn a year, some of which is passed on to customers. Basically, we have the equivalent of a road network in the sky that’s fast losing the ability to keep pace with demand. Think of what would happen if you tried to put a million more vehicles on our existing roads!”*

Martin Rolfe, CEO

# Some short term sustainability improvements



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World's first virtual control facility

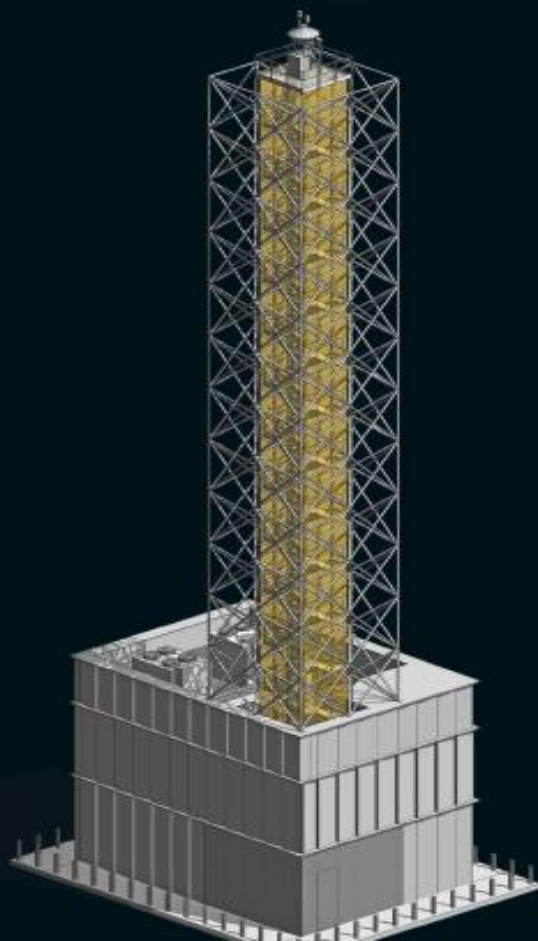
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## The Technology



14 high definition cameras provide a full 360 degree view of the airport



Pan, tilt and zoom cameras to view any part of the airfield in unprecedented detail

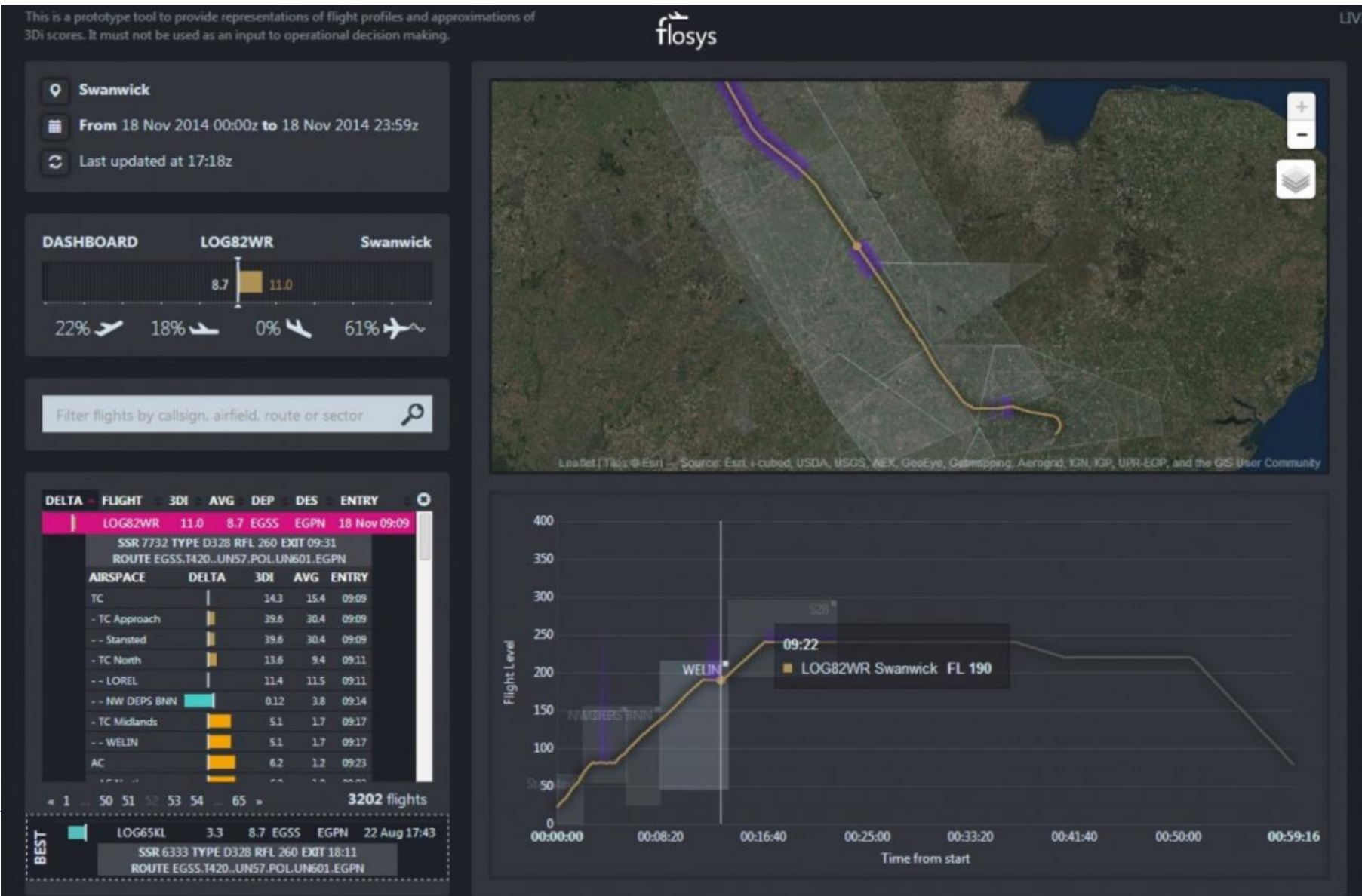


Displays enhanced with augmented reality style maps and aircraft data for increased controller awareness



# Digital Towers







## Electronic Flight Strips





## Airspace and Procedure Changes

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# UK's Aviation Strategy

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# Aviation Strategy - quicker, quieter and cleaner...



- Strategy sets out UK Government's airspace modernisation objective ***to deliver quicker, quieter and cleaner journeys and more capacity***
  - Create sufficient airspace capacity to deliver safe and efficient growth of commercial aviation
  - Progressively reduce the noise of individual flights, through quieter operating procedures
  - Require that noise impacts are considered through the airspace design process and clearly communicated
  - Decisions over concentration vs respite should be based on local circumstances and informed by consultation with local communities.
  - An Independent Commission on Civil Aircraft Noise (ICCAN) to consider how they can best support communities in engaging with the airspace change process
  - Legislation giving Secretary of State the power to direct airports or air navigation service providers to take forward airspace changes for reasons other than safety or capacity (...noise)
-

# Aviation Strategy – Noise

- Proposing a new objective to ***‘limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise’***
  - A new national indicator to track the long term performance of the sector in reducing noise.
    - a noise quota?
    - total contour area?
  - Setting noise caps as part of planning approvals to balance noise and growth and to provide future certainty to communities
  - Requires all major airports to set out a plan which commits to future noise reduction, with periodic review
  - Improved flight path information for prospective home buyers so that they can make better informed decisions
  - New statutory enforcement powers for ICCAN or CAA
  - For airspace changes which lead to significantly increased overflight, a new minimum threshold of an increase of 3dB LAeq, which leaves a household in the 54dB LAeq 16hr contour or above as eligible for assistance with noise insulation
-



# Aviation Strategy – Sustainable growth



- A 'partnership for sustainable growth' to deliver growth whilst reducing impact on the environment.
  - All major airports should invest in community funds
  - Support ICAO long term goal for aviation to help meet Paris agreement (1.5 degrees)
  - Accept Committee on Climate Change's recommendation that emissions from UK departing flights should be at 2005 levels by 2050
  - Support Carbon Offsetting and Reduction Scheme for International Aviation
  - Require planning applications for capacity to include full emissions impact assessment
  - Support airspace modernisation to reduce noise impact
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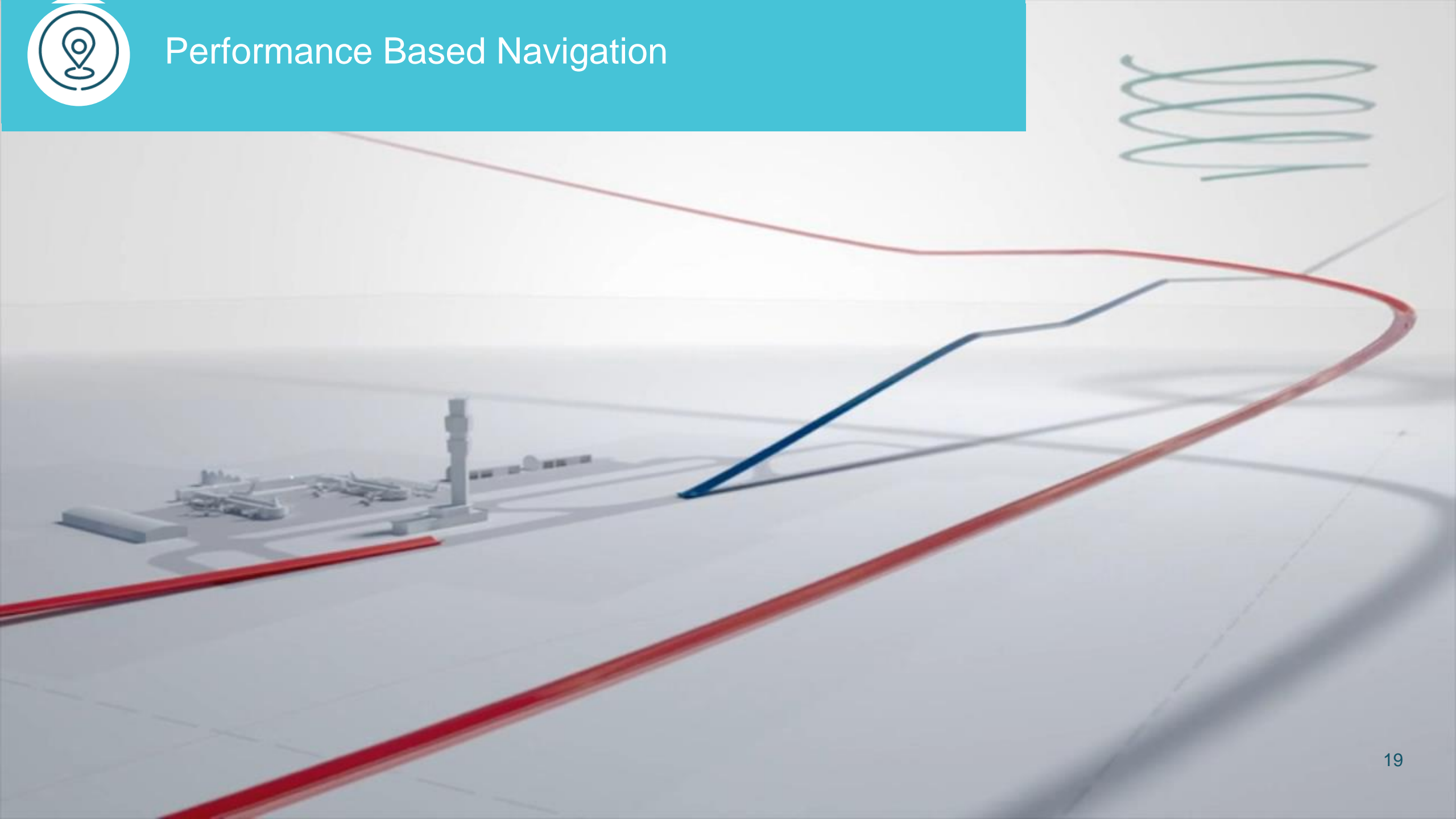
# UK Airspace Modernisation

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# Performance Based Navigation



## PBN - Opportunities

- Sharing routes over a wider area with multiple PBN routes (although might increase the total number of people overflown)
  - Routing aircraft accurately over urban areas where there is higher general noise levels
  - Routing aircraft over rural areas where fewer people live
  - Protect parks and other quiet spaces by routing aircraft over built up areas or vice versa
  - Prioritise noise over CO<sub>2</sub> emissions in low level airspace; or the reverse in areas where noise has less impact
  - Use multiple PBN routes to alternate flights over different areas, possibly on a planned basis to give community predictable periods of respite or temporary relief from aircraft noise
  - Changing PBN routes at particular times of day to manage noise impacts
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# PBN - Benefits



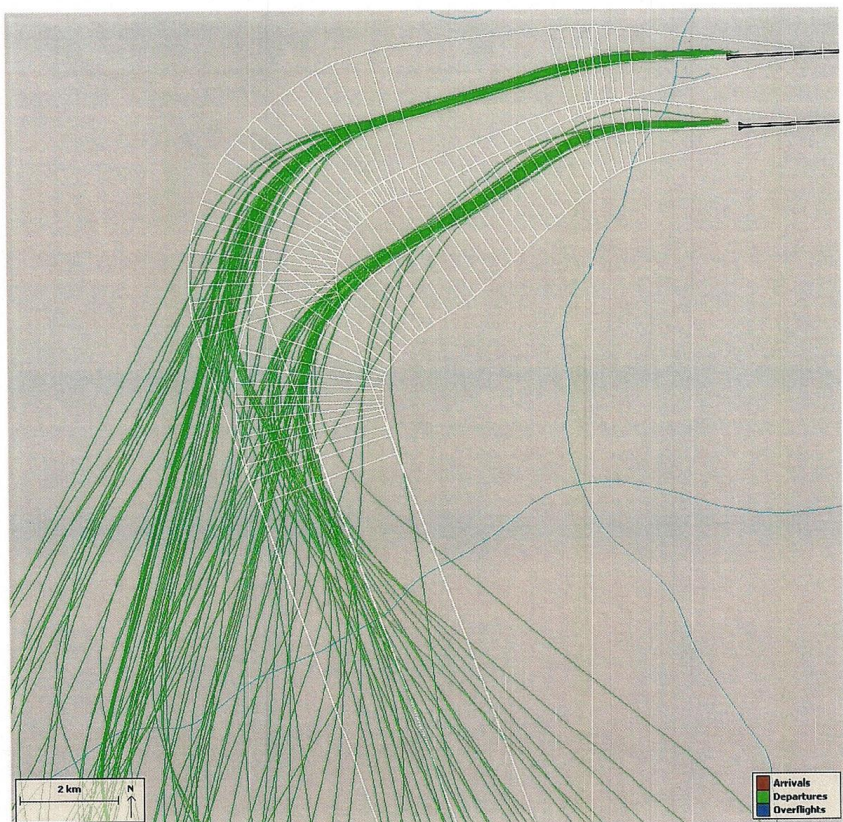
- Possible 10-20% emissions reduction in UK airspace
- Gothenburg RNP-AR implementation saved 11nm in flight distance per flight compared to the conventional design
- Portland, Oregon, Alaska Airlines and Boeing RNP implementation showed fuel savings of 136 to 240 kg for a Boeing 737 aircraft and reduced noise exposure of 55 dBA or greater for 59,000 to 73,000 people
- Riga an approach with a short 1nm final route shortening of several miles while still keeping the route over water
- London City PBN SID replications led to 1.2 million fewer people being overflown below 7,000ft
- Stansted PBN departure routes on two SIDs led to a 83% and 87% reduction in overflown population
- Edinburgh offered the potential to reduce the number of people overflown by up to 46%

	Potential % Reduction in Size of Noise Footprint per Flight at 55dB
Birmingham	10.3%
Cardiff	3.1%
Bristol	0.6%
Luton	27.8%
Gatwick	20.8%
London City	70.2%
Heathrow	34.2%
East Midlands	5.2%
Stansted	19.3%

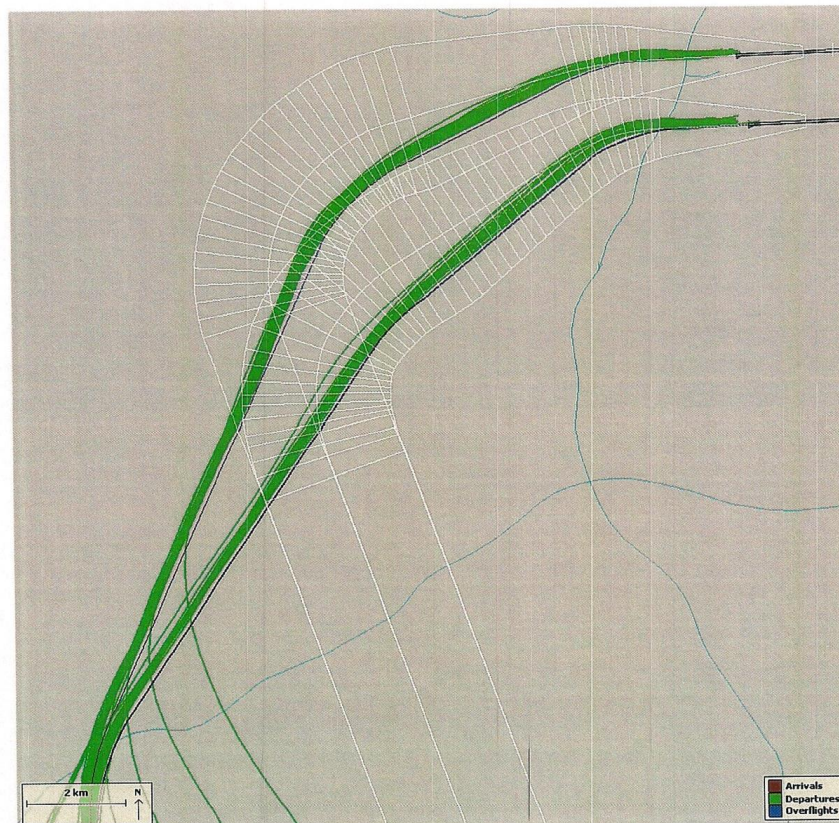


# All good...?

MID departures, 15 December 2013 (with NPRs shown)

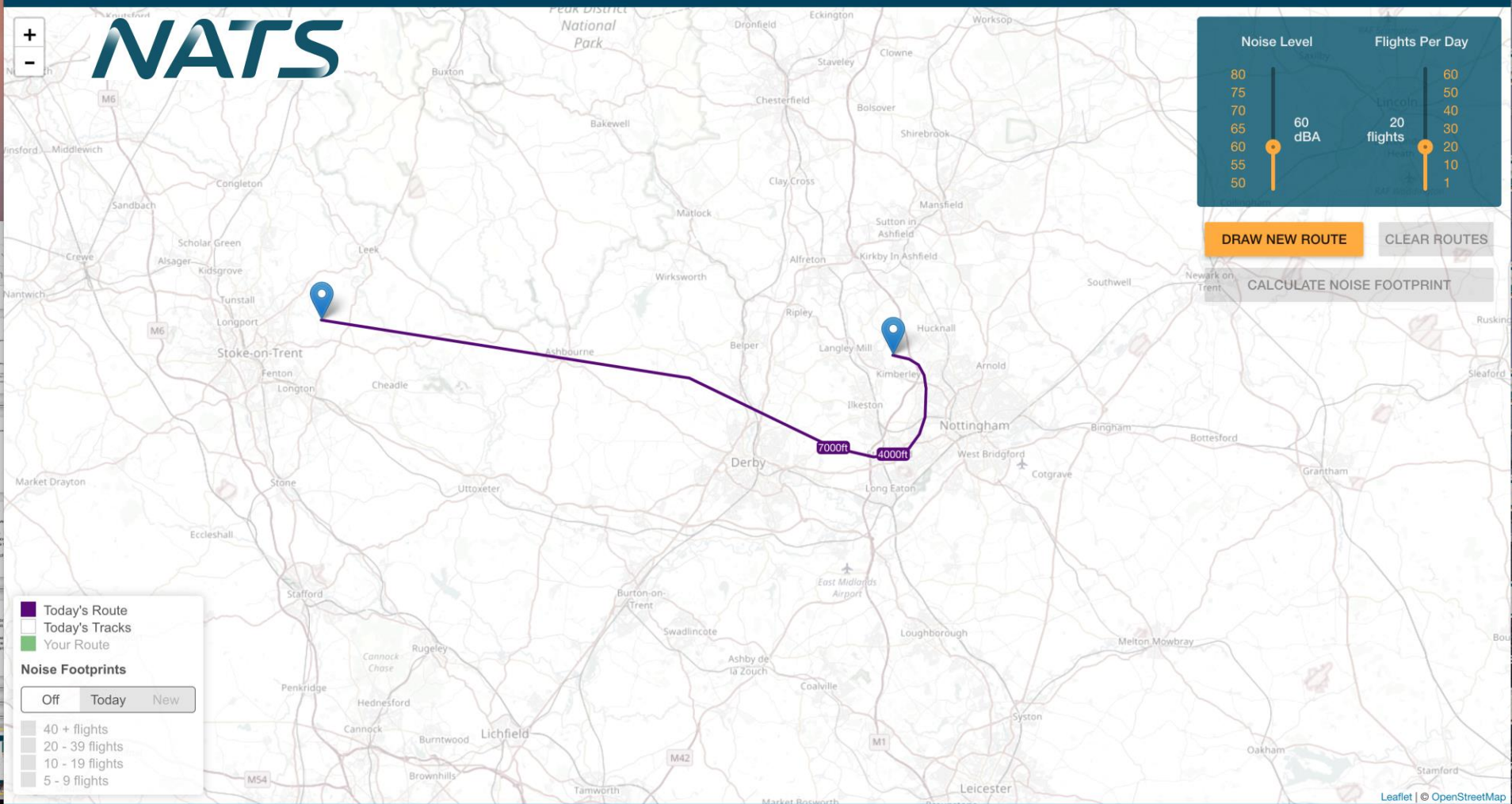


MID departures, 16 December 2013 (with NPRs and DOKEN routes shown)



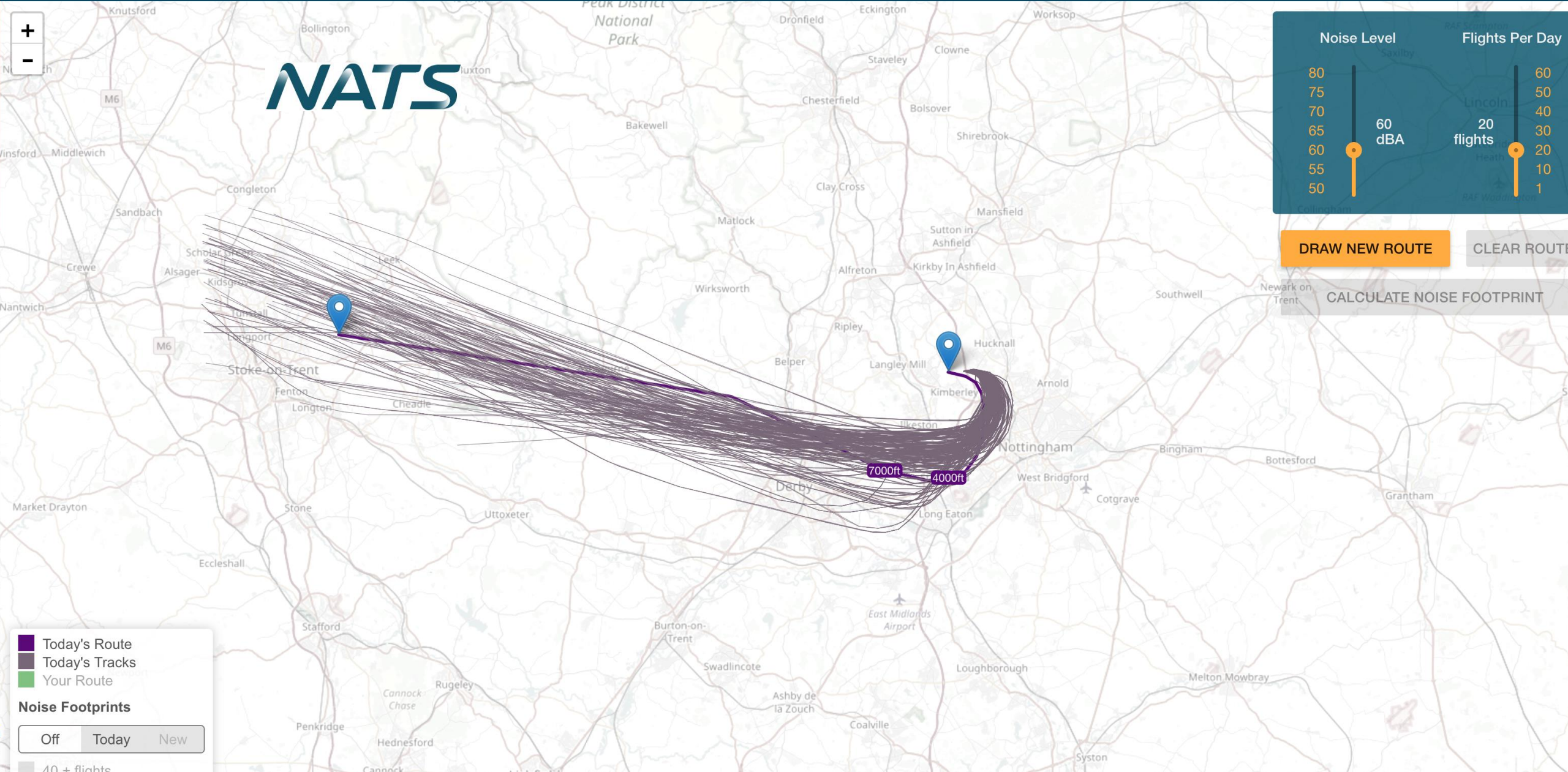


# Comp-Air



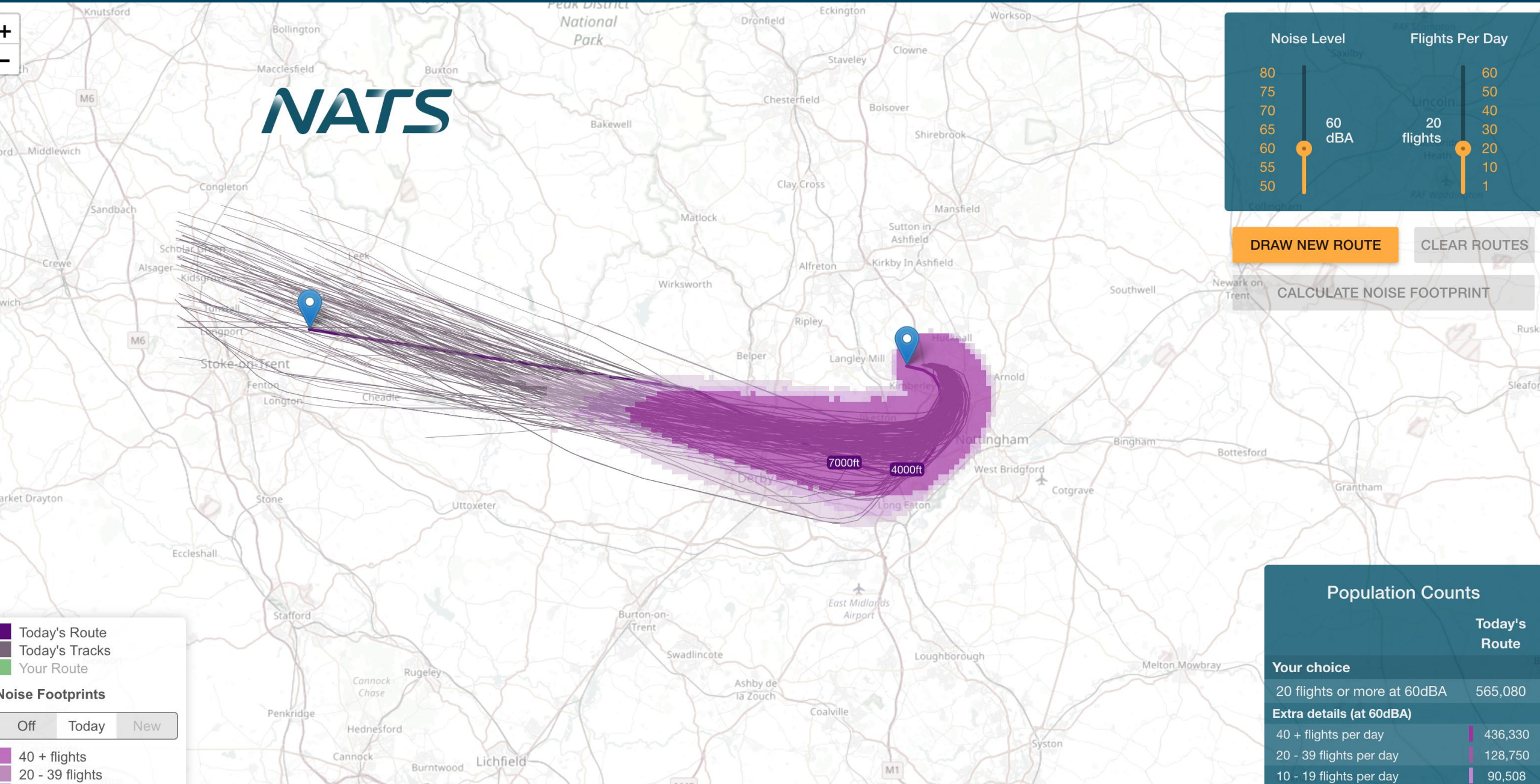


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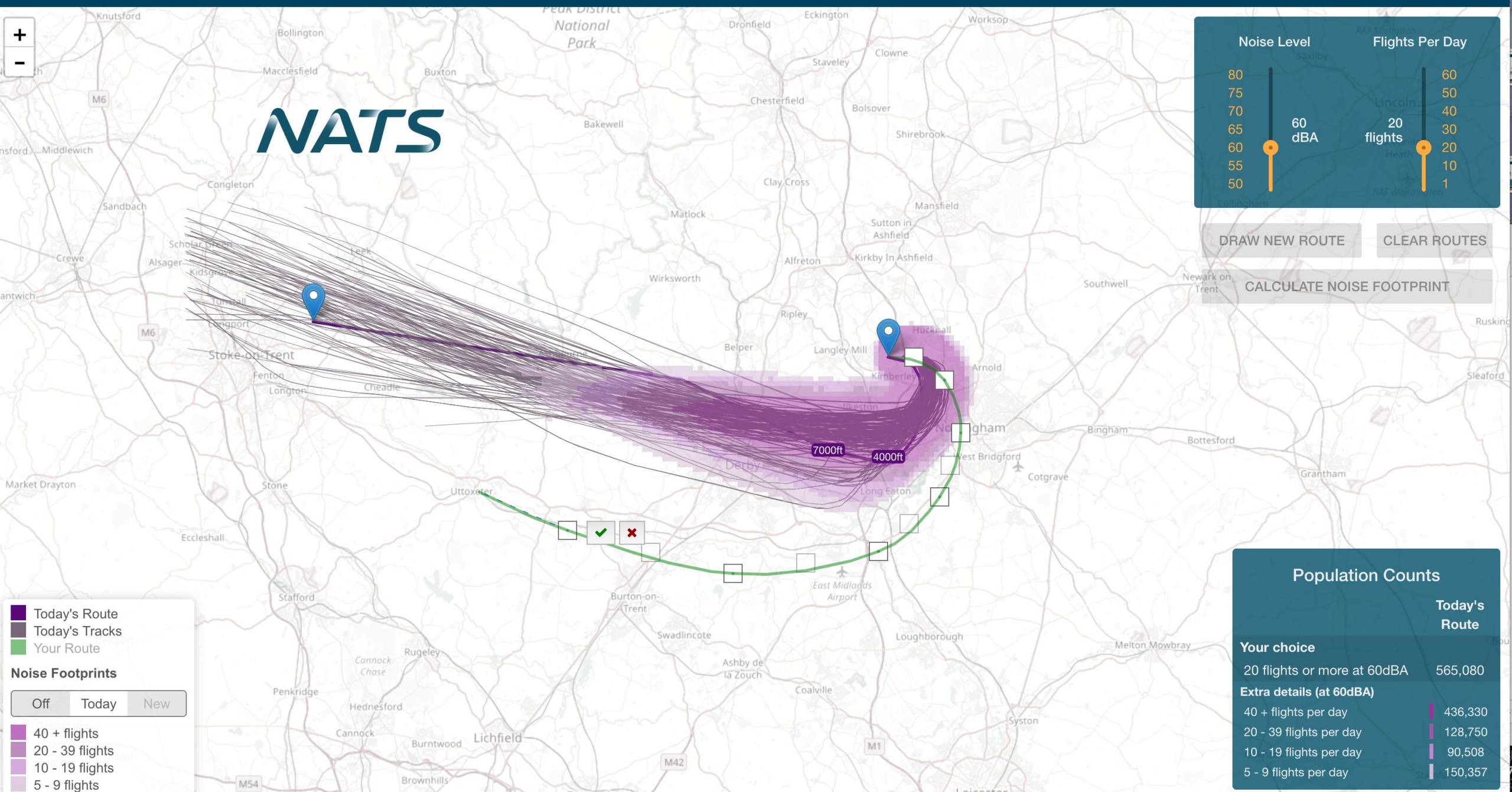




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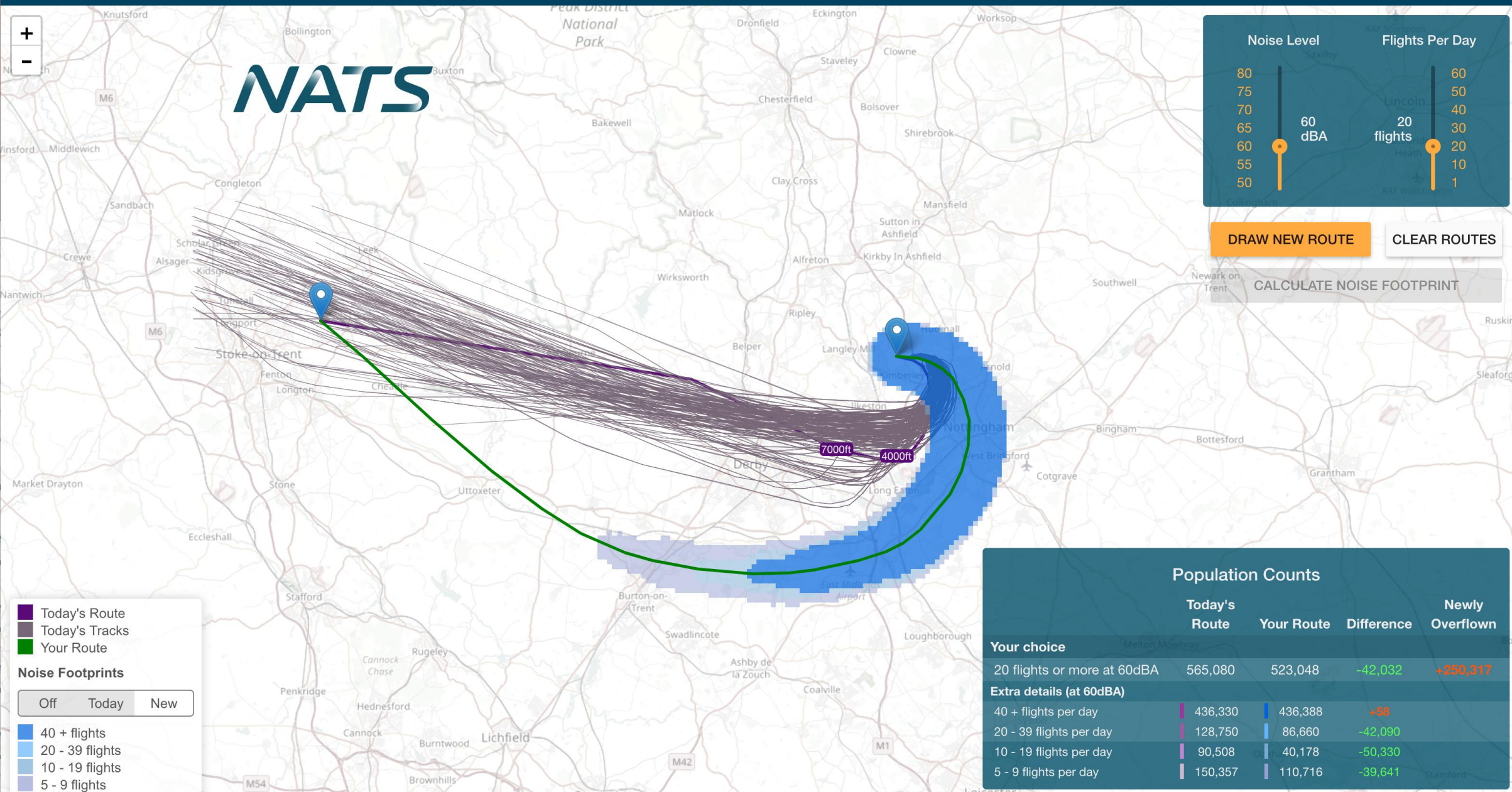






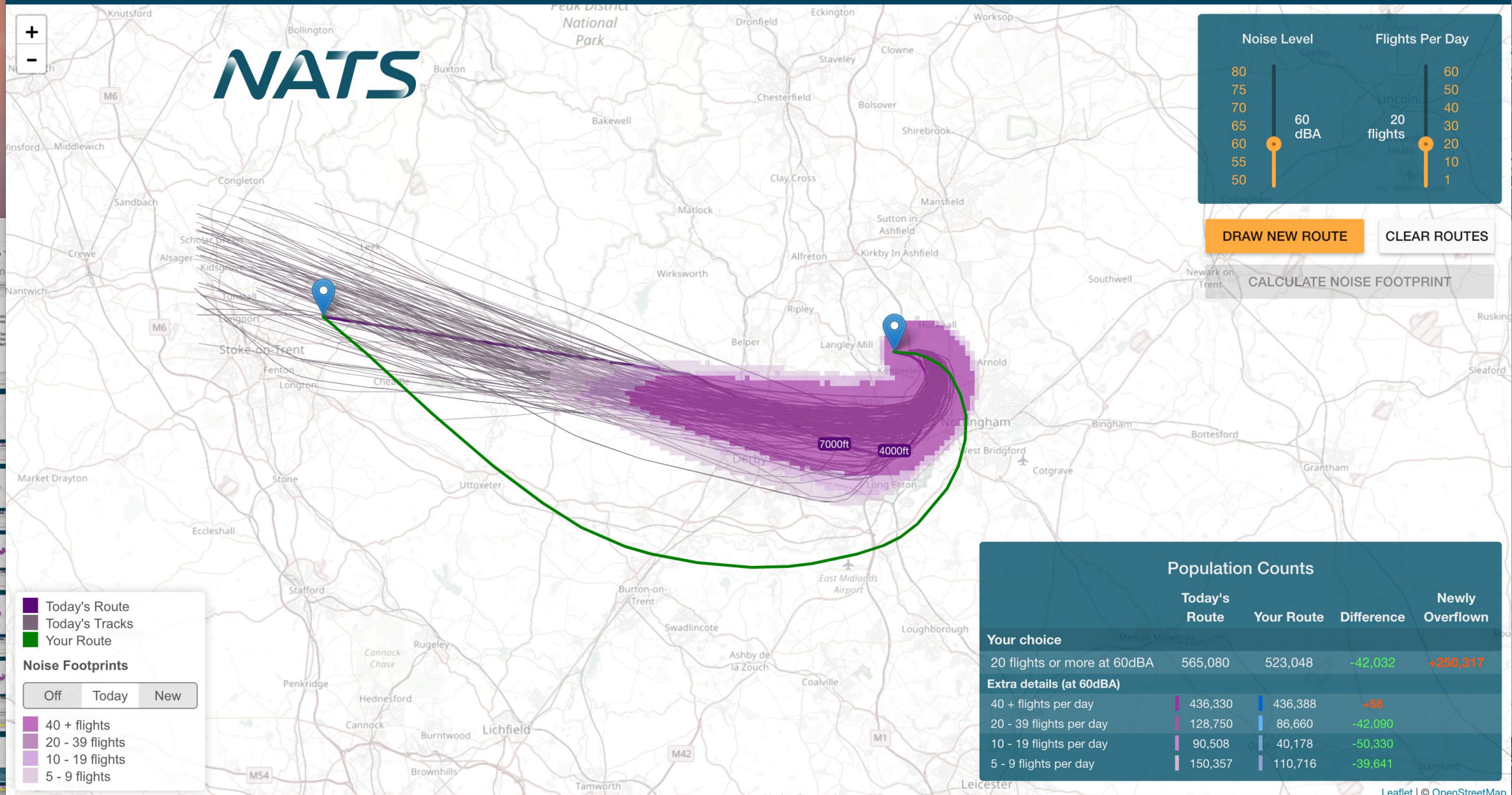


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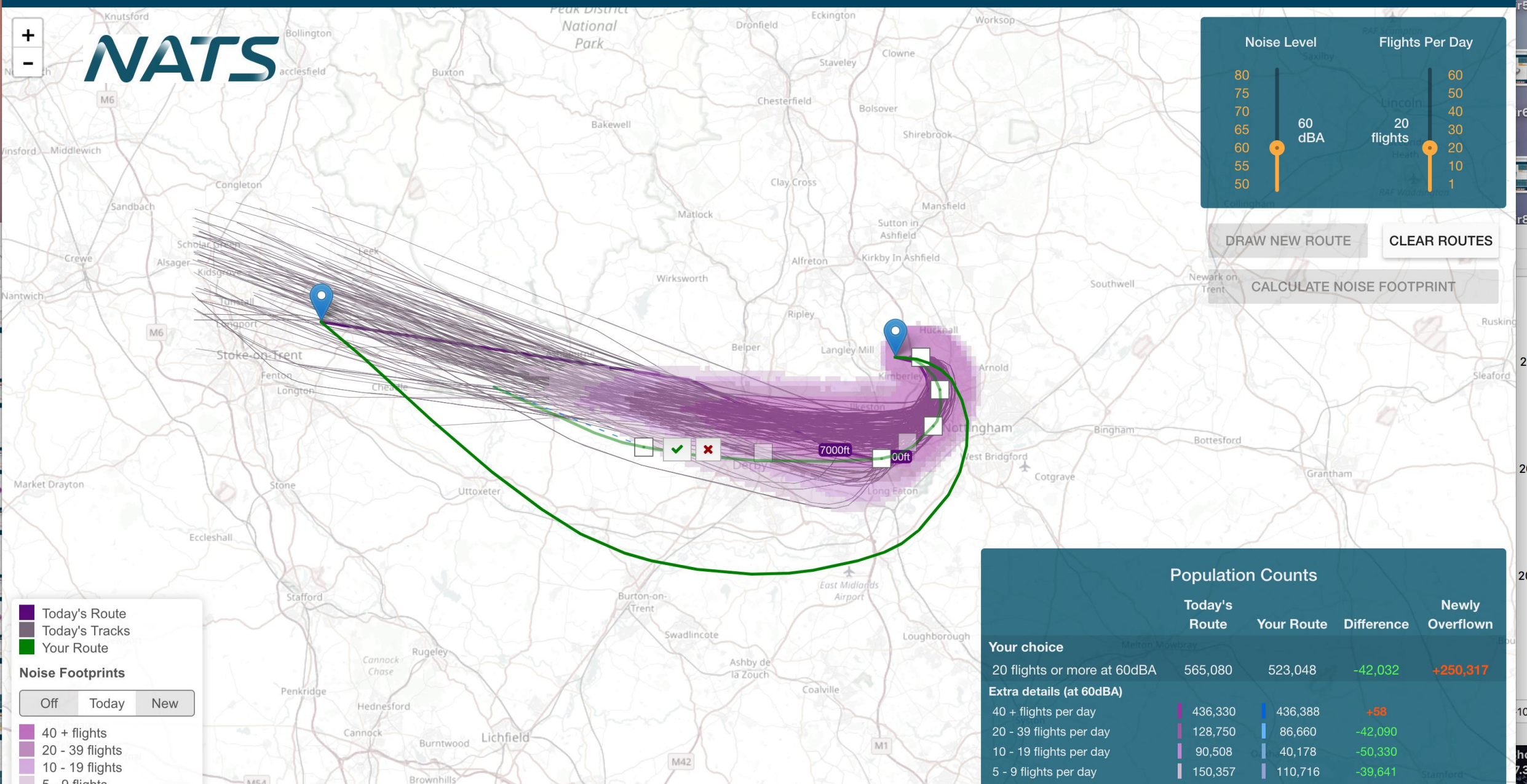


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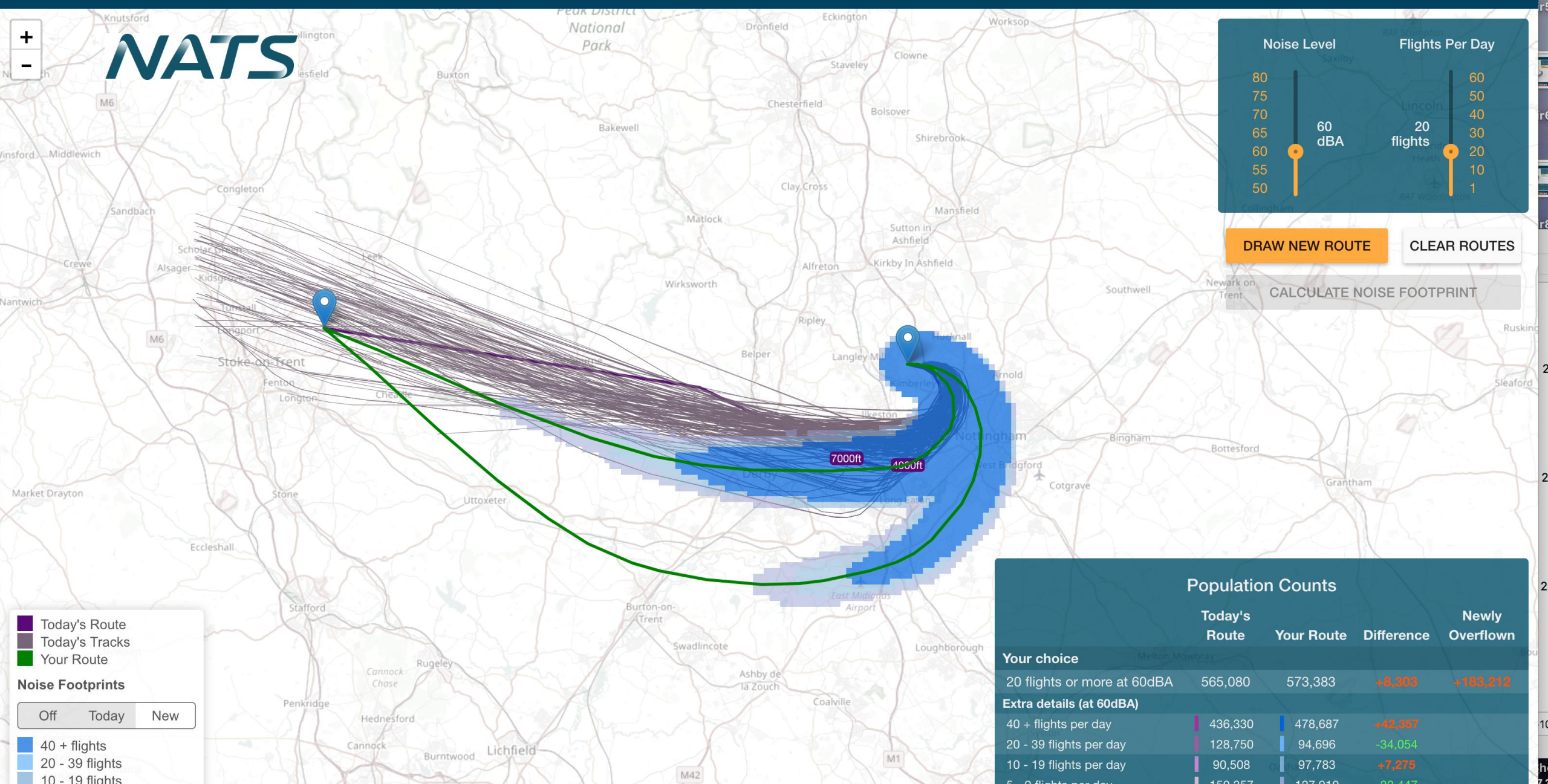


# Comp-Air





# Comp-Air



# Summary



- Sustainability activities in UK air traffic control have reduced fuel burn and emissions significantly
  - Further improvements will need airspace modernisation
  - PBN is coming - and offers significant operational benefits
  - Community reaction to PBN is likely to be significant a blocker to improvements
  - We need to work out how to bring communities closer to the airspace modernisation debate to deliver future growth and capacity in a sustainable way
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