Birmingham Airport

# Feasibility Study into increasing the altitude of the Noise Preferential Routes (NPRs) from 3000 to 4000 feet

**Presented by:**

[redacted]

**20th January 2016**

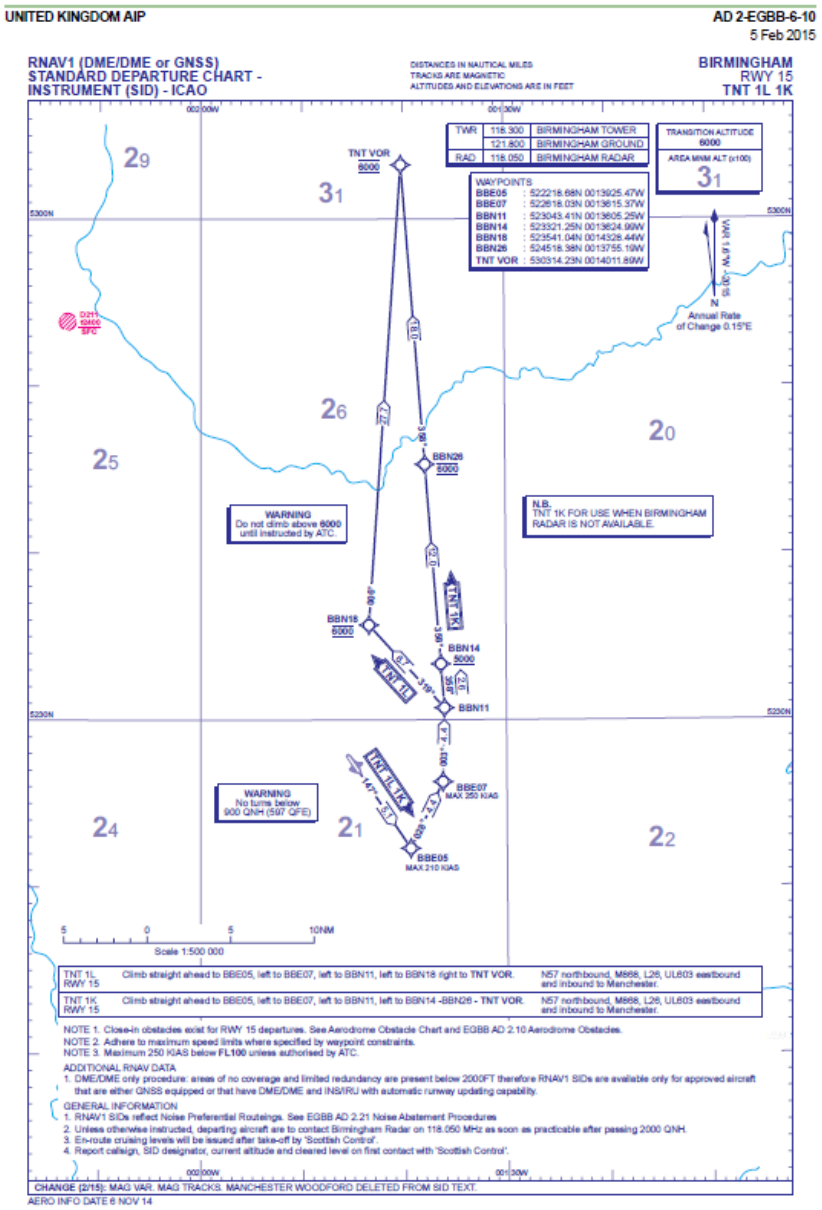
# Agenda

- What is a Noise Preferential Route?
- Background in to the feasibility study
- Findings of the study / BAL proposals

# What is a Noise Preferential Route (NPR)?

- A Noise Preferential Route is a corridor that is constructed around the Standard Instrument Departure (SID) route
- A SID is a set of instructions used to get an aircraft from the runway and in to en-route network
- SIDs are depicted as a line overlaid onto a map

# What is a Noise Preferential Route (NPR)?



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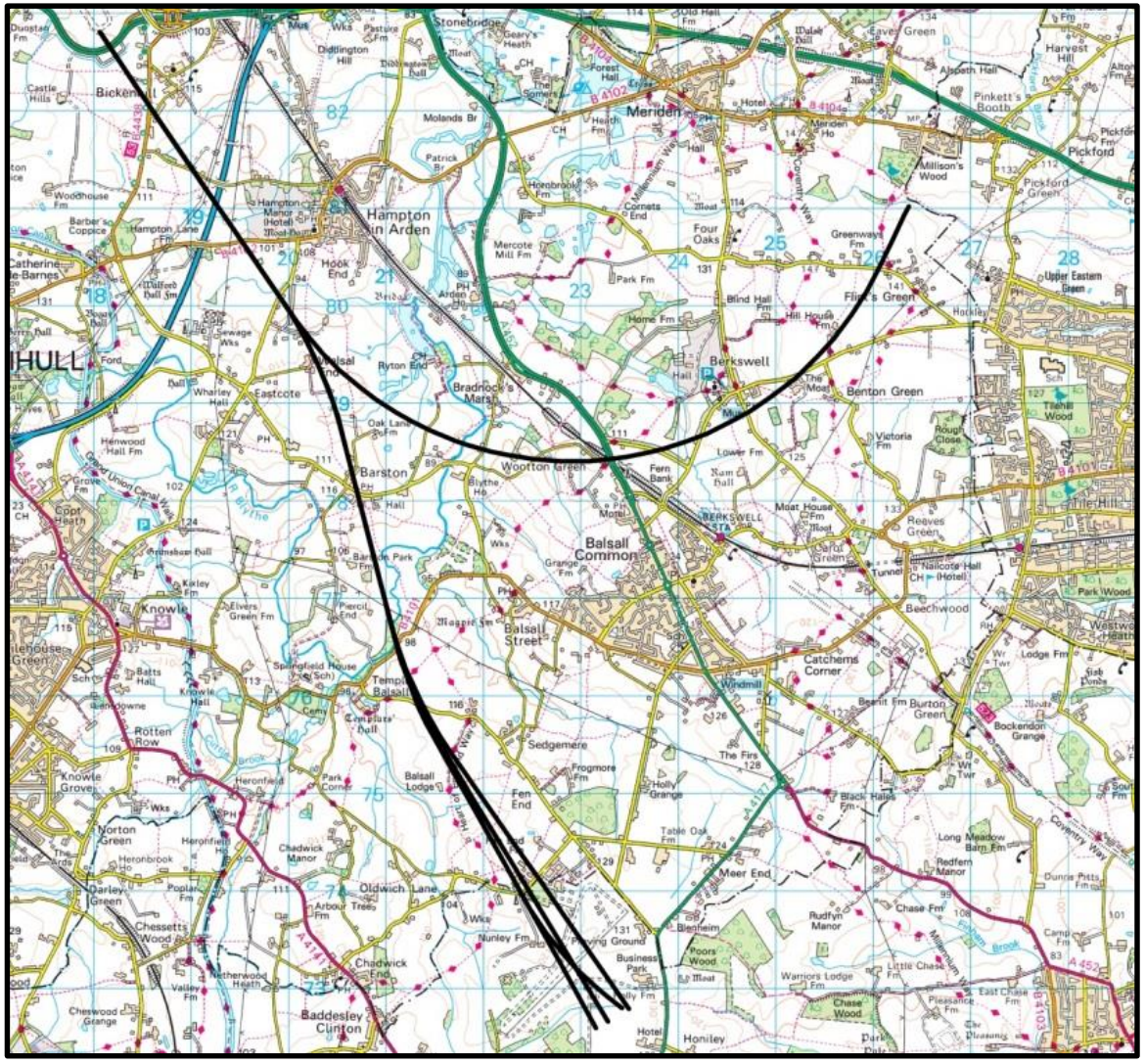

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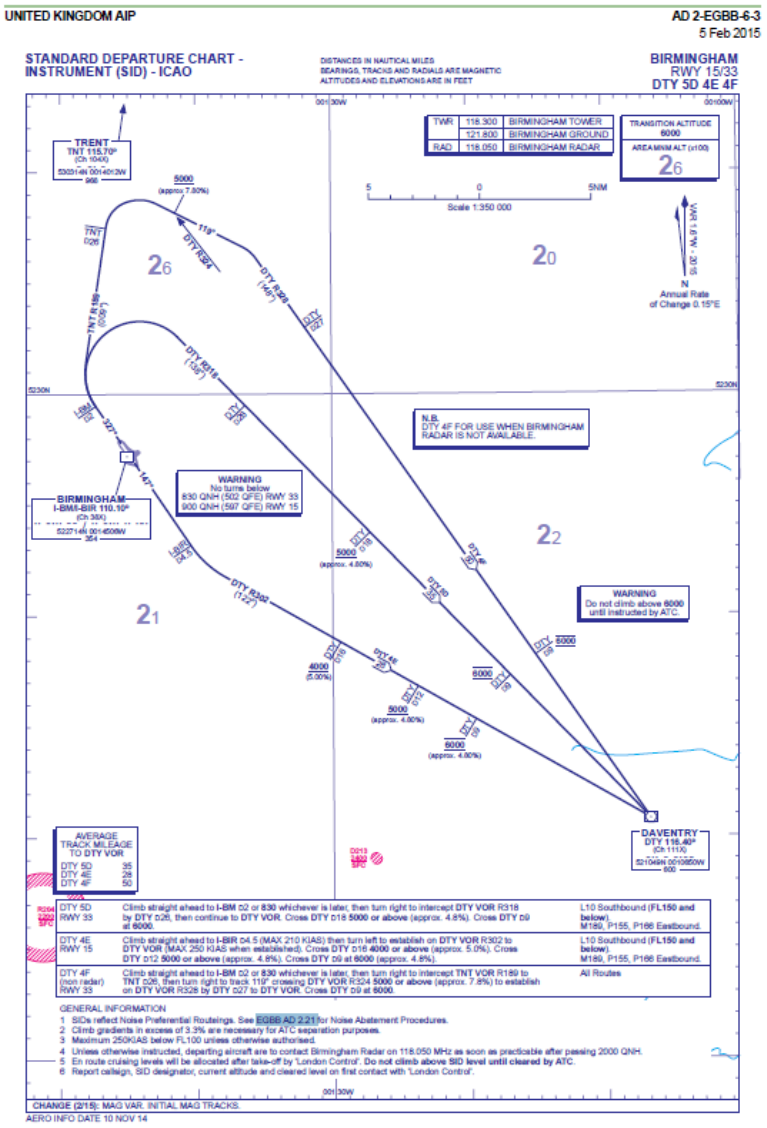


UNITED KINGDOM AIP

AD 2-EGBB-6-3
5 Feb 2015

STANDARD DEPARTURE CHART - INSTRUMENT (SID) - ICAO

DISTANCES IN NAUTICAL MILES
BEARINGS, TRACKS AND RADIALS ARE MAGNETIC
ALTITUDES AND ELEVATIONS ARE IN FEET

BIRMINGHAM
RWY 15/33
DTY 5D 4E 4F

TRENT
TNT 115.70*
(Ch 104X)

BIRMINGHAM
I-BMI-BIR 110.10*
(Ch 38X)

DAVENTRY
DTY 116.40*
(Ch 111X)

| | | |
|---|---|---|
| TWR | 118.300 | BIRMINGHAM TOWER |
| | 121.800 | BIRMINGHAM GROUND |
| RAD | 118.050 | BIRMINGHAM RADAR |

TRANSITION ALTITUDE 6000

AREA MINIM ALT (x100) 26

Scale 1:350 000

N
Annual Rate of Change 0.15°E

N.B. DTY 4F FOR USE WHEN BIRMINGHAM RADAR IS NOT AVAILABLE.

WARNING
No turns below
830 QNH (502 QFE) RWY 33
900 QNH (597 QFE) RWY 15

WARNING
Do not climb above 6000 until instructed by ATC.

AVERAGE TRACK MILEAGE TO DTY VOR

| | |
|---|---|
| DTY 5D | 35 |
| DTY 4E | 28 |
| DTY 4F | 50 |

| | | |
|---|---|---|
| DTY 5D RWY 33 | Climb straight ahead to I-BM 02 or 830 whichever is later, then turn right to intercept DTY VOR R318 by DTY 026, then continue to DTY VOR. Cross DTY D18 5000 or above (approx. 4.8%). Cross DTY D9 at 6000. | L10 Southbound (FL150 and below). M189, P155, P166 Eastbound. |
| DTY 4E RWY 15 | Climb straight ahead to I-BIR 04.5 (MAX 210 KIAS) then turn left to establish on DTY VOR R302 to DTY VOR (MAX 250 KIAS when established). Cross DTY D16 4000 or above (approx. 5.0%). Cross DTY D12 5000 or above (approx. 4.8%). Cross DTY D9 at 6000 (approx. 4.8%). | L10 Southbound (FL150 and below). M189, P155, P166 Eastbound. |
| DTY 4F (non radar) RWY 33 | Climb straight ahead to I-BM 02 or 830 whichever is later, then turn right to intercept TNT VOR R189 to TNT 026, then turn right to track 119° crossing DTY VOR R324 5000 or above (approx. 7.8%) to establish on DTY VOR R328 by DTY 027 to DTY VOR. Cross DTY D9 at 6000. | All Routes |

GENERAL INFORMATION

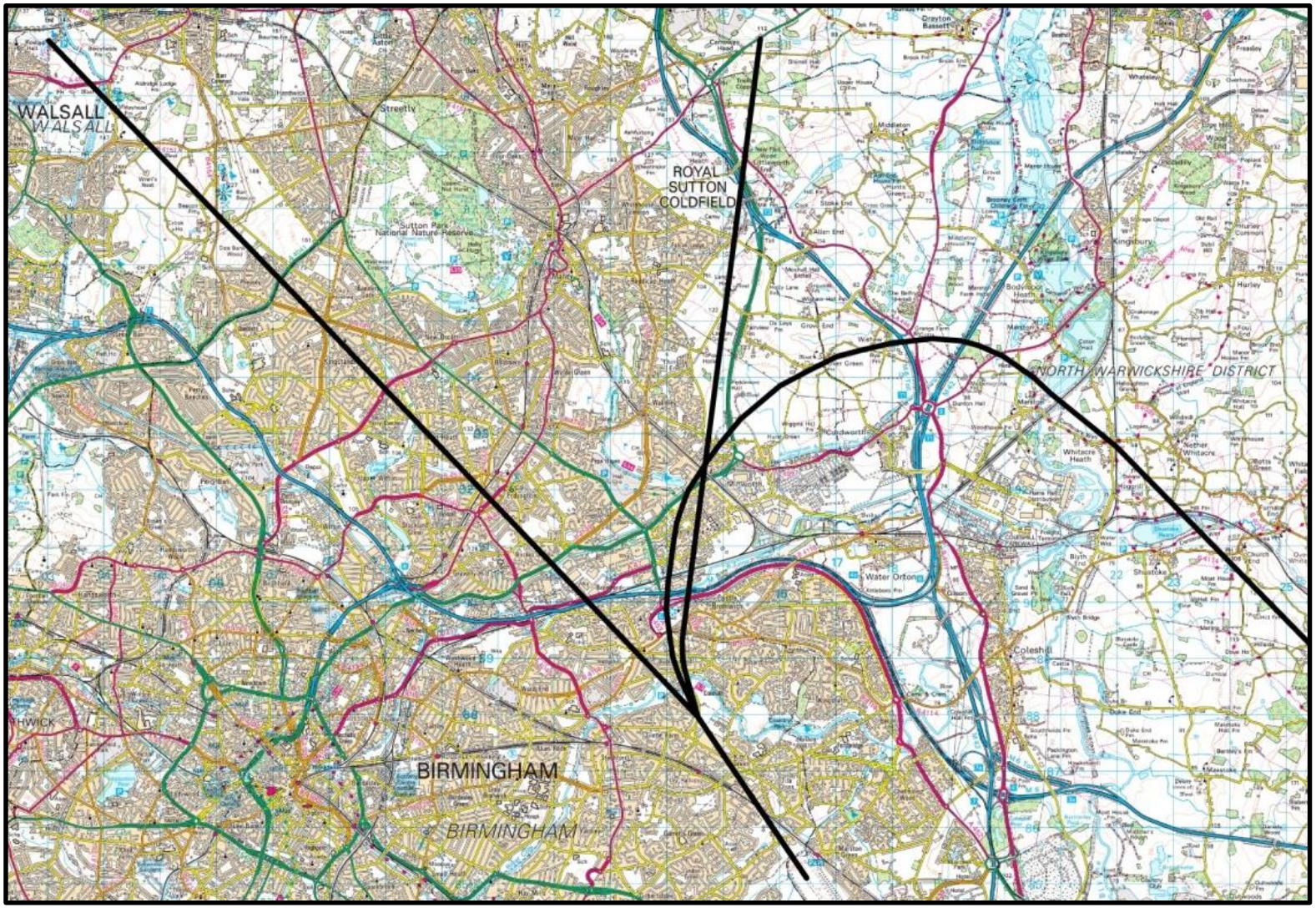
1 SIDs reflect Noise Preferential Routeings. See EGBB AD 2.21 for Noise Abatement Procedures.
2 Climb gradients in excess of 3.3% are necessary for ATC separation purposes.
3 Maximum 250KIAS below FL100 unless otherwise authorised.
4 Unless otherwise instructed, departing aircraft are to contact Birmingham Radar on 118.050 MHz as soon as practicable after passing 2000 QNH.
5 En route cruising levels will be allocated after take-off by 'London Control'. Do not climb above SID level until cleared by ATC.
6 Report callsign, SID designator, current altitude and cleared level on first contact with 'London Control'.

CHANGE (2/15): MAG VAR. INITIAL MAG TRACKS.
AERO INFO DATE 10 NOV 14

CIVIL AVIATION AUTHORITY

AMDT 2/2015

# What is a Noise Preferential Route (NPR)?



# How do Aircraft Fly the SID

- SIDs are flown by the Aircraft Flight Management System (not the Pilot)
- The SID track is coded by FMS Coding Houses employed by the Airlines



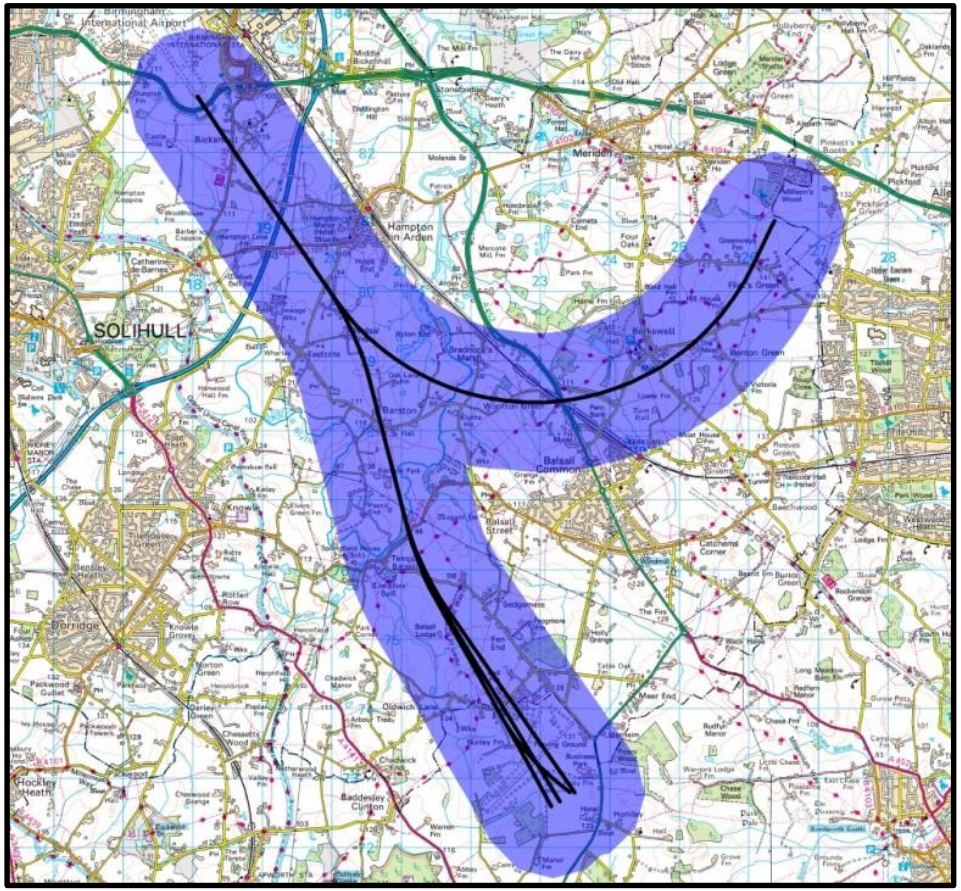
## Standard Instrument Departure Coding Tables

**Birmingham Runway 15 DTY 1L**

| Designator | Sequence Number | Path Term-inator | Waypoint Name | Waypoint Co-ordinates | Fly-over | Course/ Track °M (°T) | Magnetic Variation | Distance (NM) | Turn Direction | Level Constraint | Speed Constraint | Navigation Performance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DTY 1L | 001 | CF | BBS05 | 522233.81N 0013942.22W | N | 147° (145.8°) | -1.8 | 4.8 | LEFT | - | -210 | RNAV1 |
| DTY 1L | 002 | TF | BBE12 | 521852.78N 0012919.09W | N | 122° (120.0°) | -1.8 | 7.4 | - | +4000 | -250 | RNAV1 |
| DTY 1L | 003 | TF | BBE16 | 521652.24N 0012341.05W | N | 122° (120.1°) | -1.8 | 4.0 | - | +5000 | -250 | RNAV1 |
| DTY 1L | 004 | TF | BBE19 | 521521.65N 0011927.86W | N | 122° (120.2°) | -1.8 | 3.0 | - | 6000 | -250 | RNAV1 |
| DTY 1L | 005 | TF | DTY | 521048.51N 0010649.64W | N | 122° (120.3°) | -1.8 | 9.0 | - | 6000 | -250 | RNAV1 |

# What is a Noise Preferential Route (NPR)?

- As well as aircraft performance a number of factors influence the aircrafts ability to fly therefore a corridor is constructed around SID and valid up to 3,000 feet



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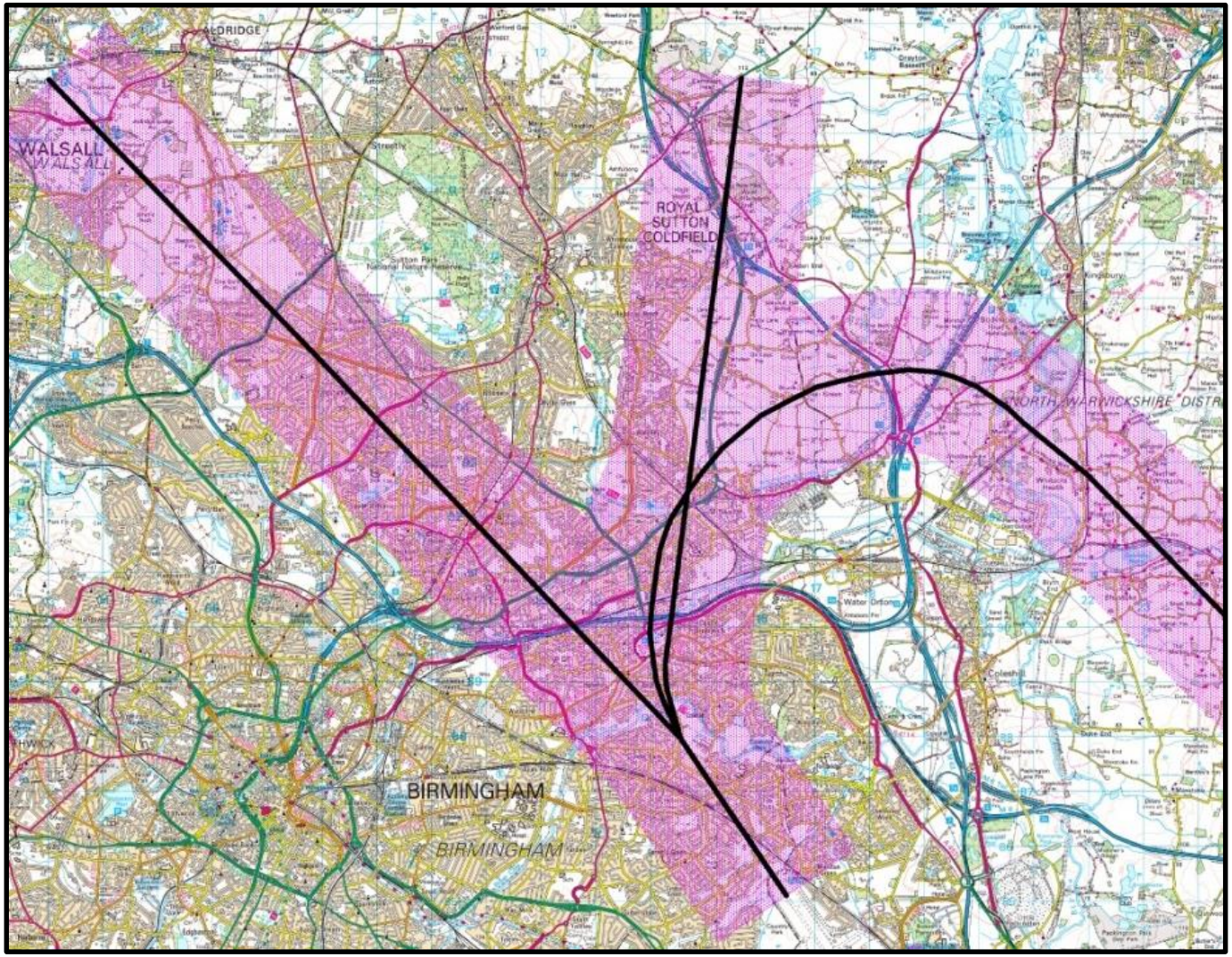

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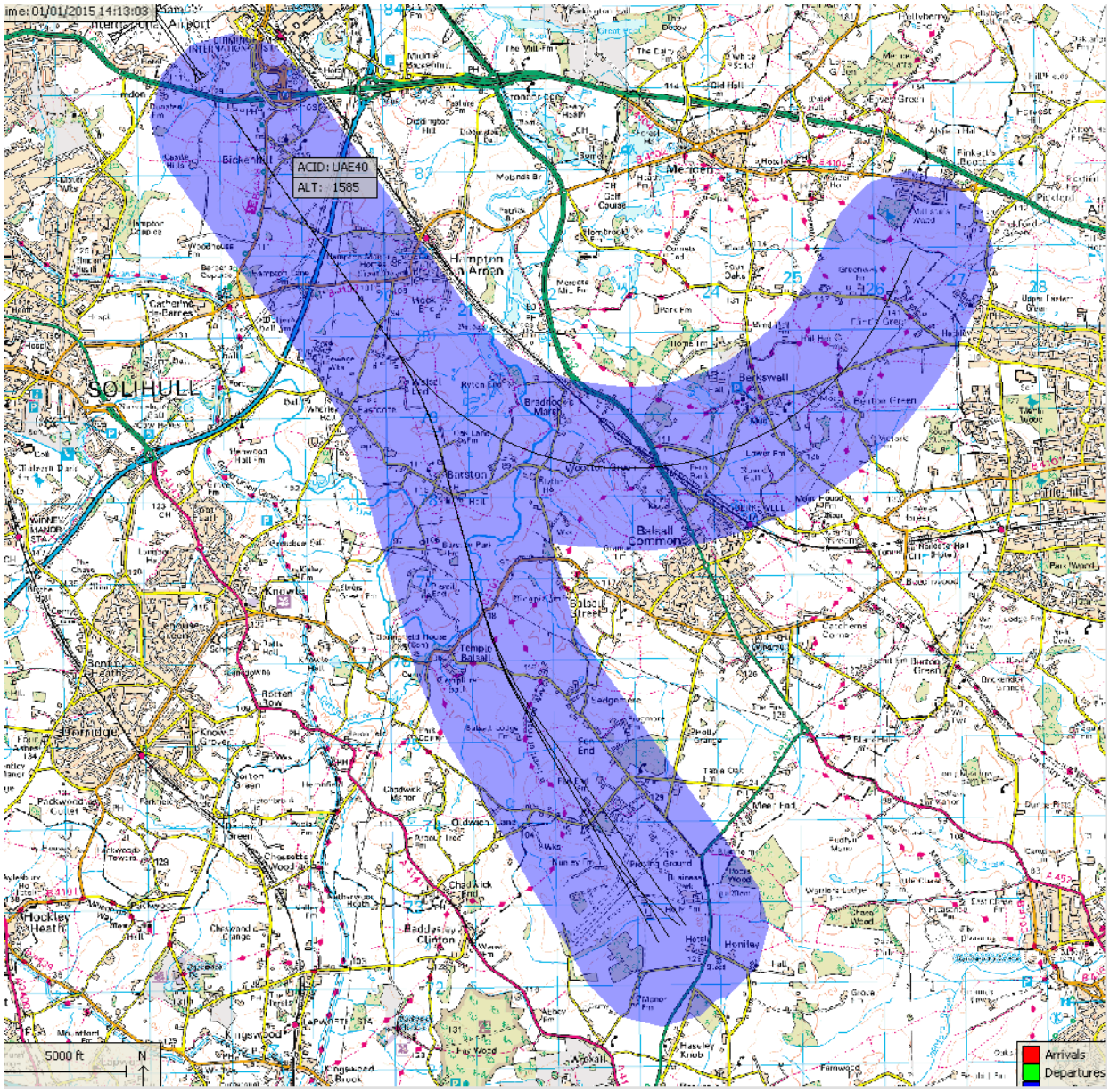


# What is a Noise Preferential Route (NPR)?

***Ownership of NPRs***

*The ownership of NPRs in the UK in operation today falls into three categories:*

*a. NPRs at the designated airports*

*b. NPRs imposed by local authorities made under Section 106 of the Town and country Planning Act 1990.*

***c. NPRs imposed voluntarily by non-designated airports as good practice**.*

# What is a Noise Preferential Route (NPR)?

Questions?

# Background in to the feasibility study

- A feasibility study was requested by the Airspace Change Stakeholder Forum and Castle Bromwich Parish Council

- Birmingham Airports Section 106 Agreement with SMBC also requires the Airport Company to carry out a feasibility study in to increasing the altitude of the NPRs from 3,000 to 4,000 feet

- A live trial was carried out over a 3 month period starting on 1st August and ending 31st October 2015

# Background in to the feasibility study

- Trial data was gathered using the Airport Noise and Operations Monitoring System (ANOMS)

- The aim of the trial was to determine whether raising the NPR to 4,000 feet would bring a benefit to local communities and to assess any operational impact

# Background in to the feasibility study

Raising the NPR means **that aircraft will not be permitted to be taken off their Standard Instrument Departure (SID) route by Air Traffic Control (ATC) until an altitude of 4,000 feet has been achieved**

# Background in to the feasibility study

- Raising the ceiling of the NPR will in no way affect an aircrafts performance in respect to its climb rate

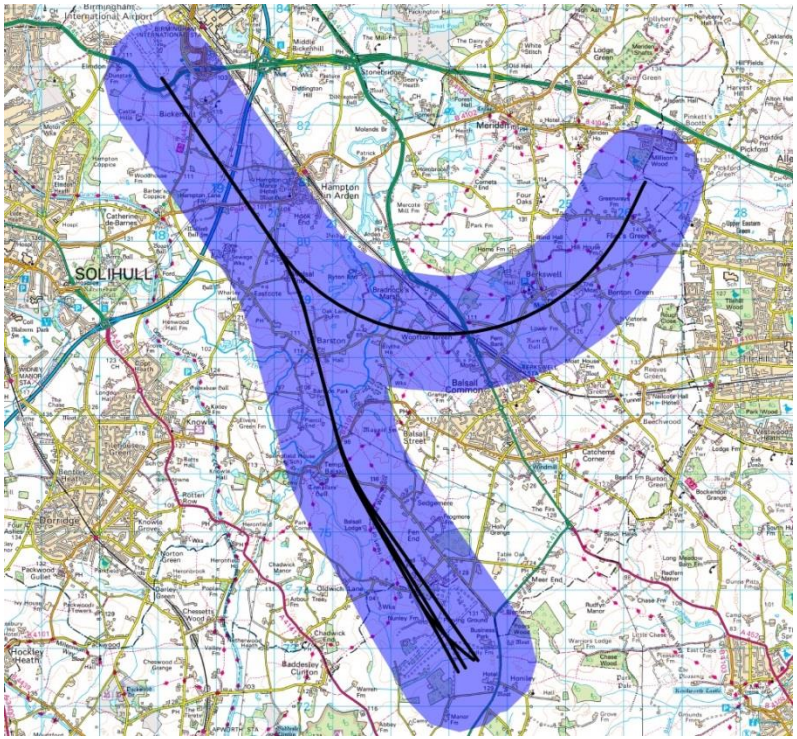
# Background to Study

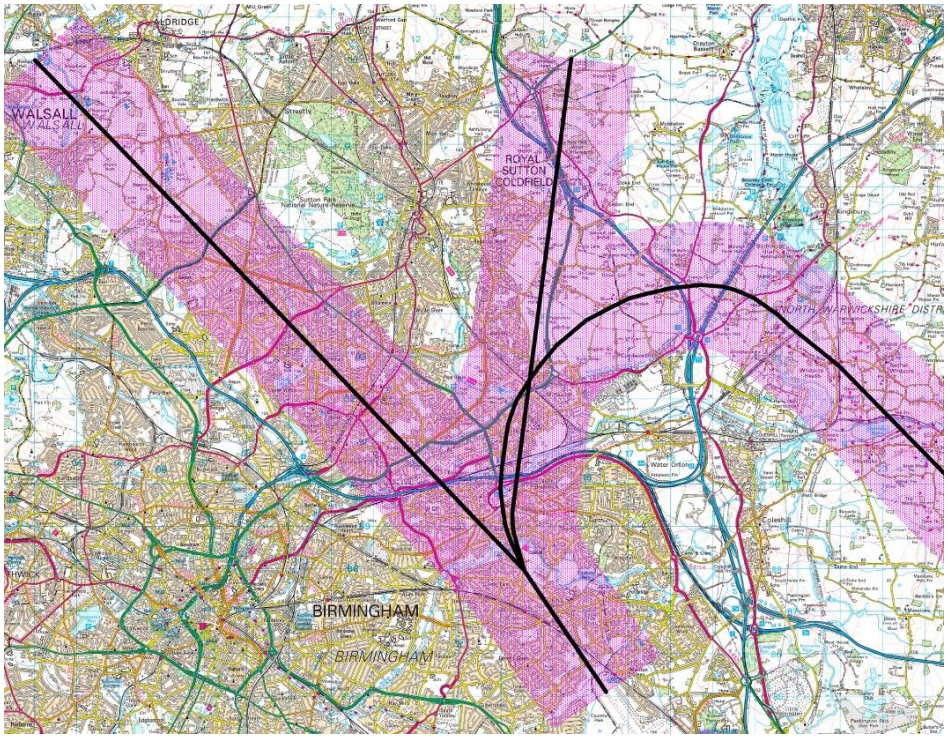
Questions?

# Findings of the study

The findings of the study have been split in to two sections:

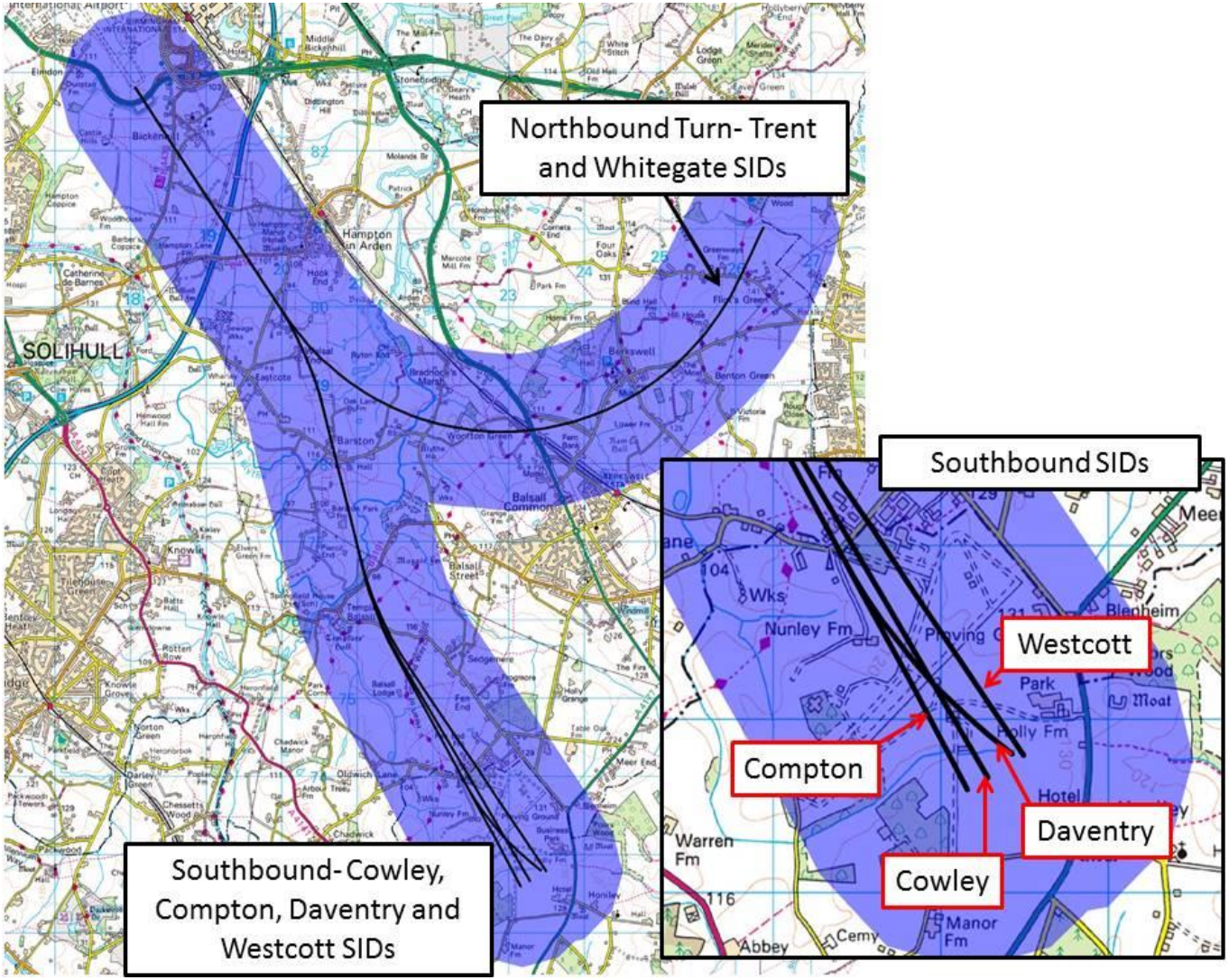
- Departures from runway 15
- Departures from runway 33



# Findings of the study- Runway 15

## Northbound and Southbound routes

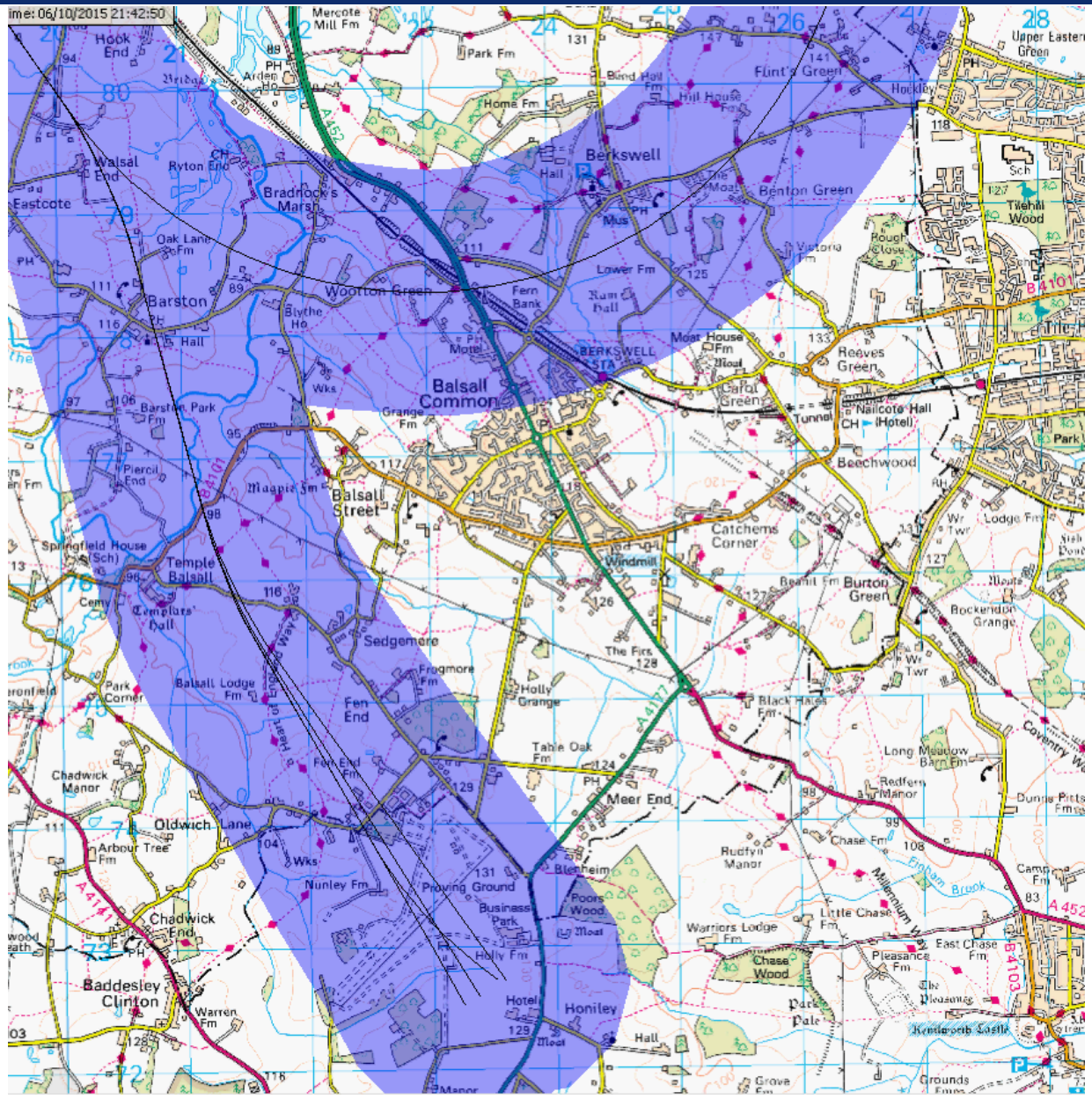


# Findings of the study- Runway 15

## Southbound Departures

- Aircraft using these routes are at no point taken off by Birmingham Airport ATC
- BAL was made aware that some aircraft on the Option 6 route are given headings by NATS en-route (London ATC)
- This has resulted in some aircraft flying closer to Balsall Common.

# Findings of the study- Runway 15



# Findings of the study- Runway 15

## Southbound Departures (Option 6)

- During the trial it was observed that aircraft departed the NPR later, therefore flying further to the south of Balsall Common

Overall track-keeping performance for Option 6:

| On-track at 4,000 feet | On-track at 3,000 feet |
|---|---|
| 99% | 100% |

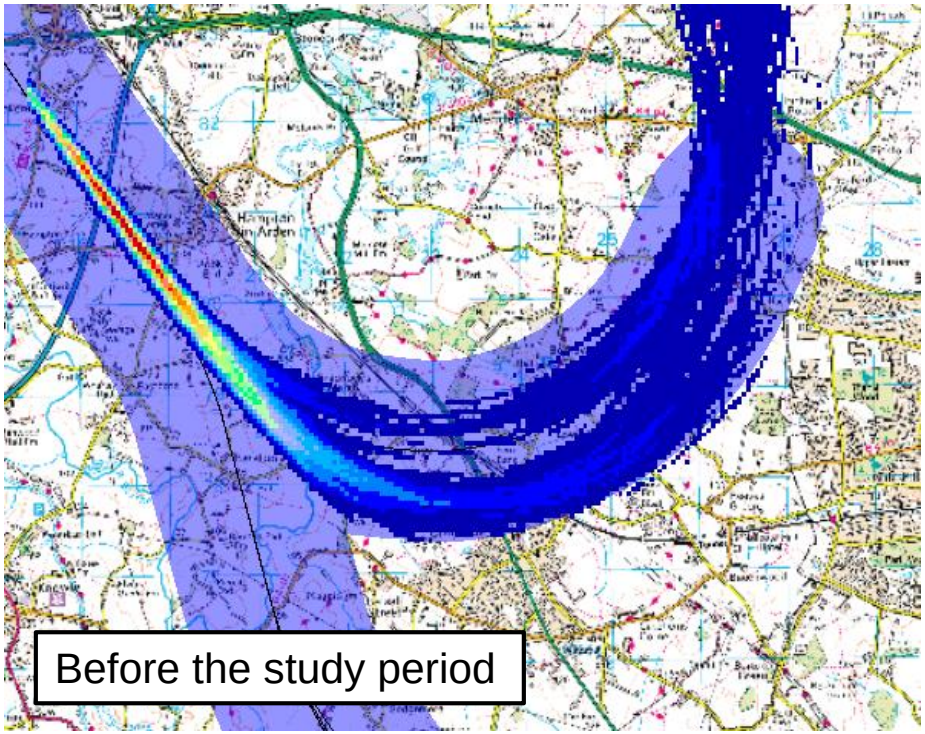
# Findings of the study- Runway 15

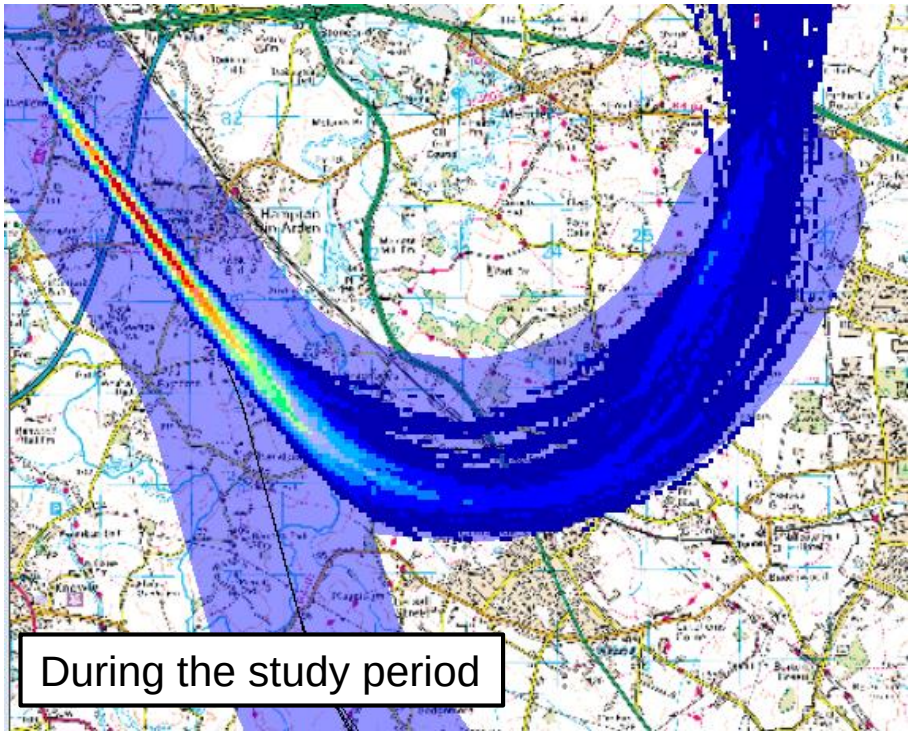
## BAL proposals for runway 15- Option 6

- BAL proposes to raise the ceiling of the NPR to 4,000 feet for all departing aircraft from runway 15 using option 6 (subject to CAA approval)

# Findings of the study- Runway 15

- No change in the track over the ground was observed



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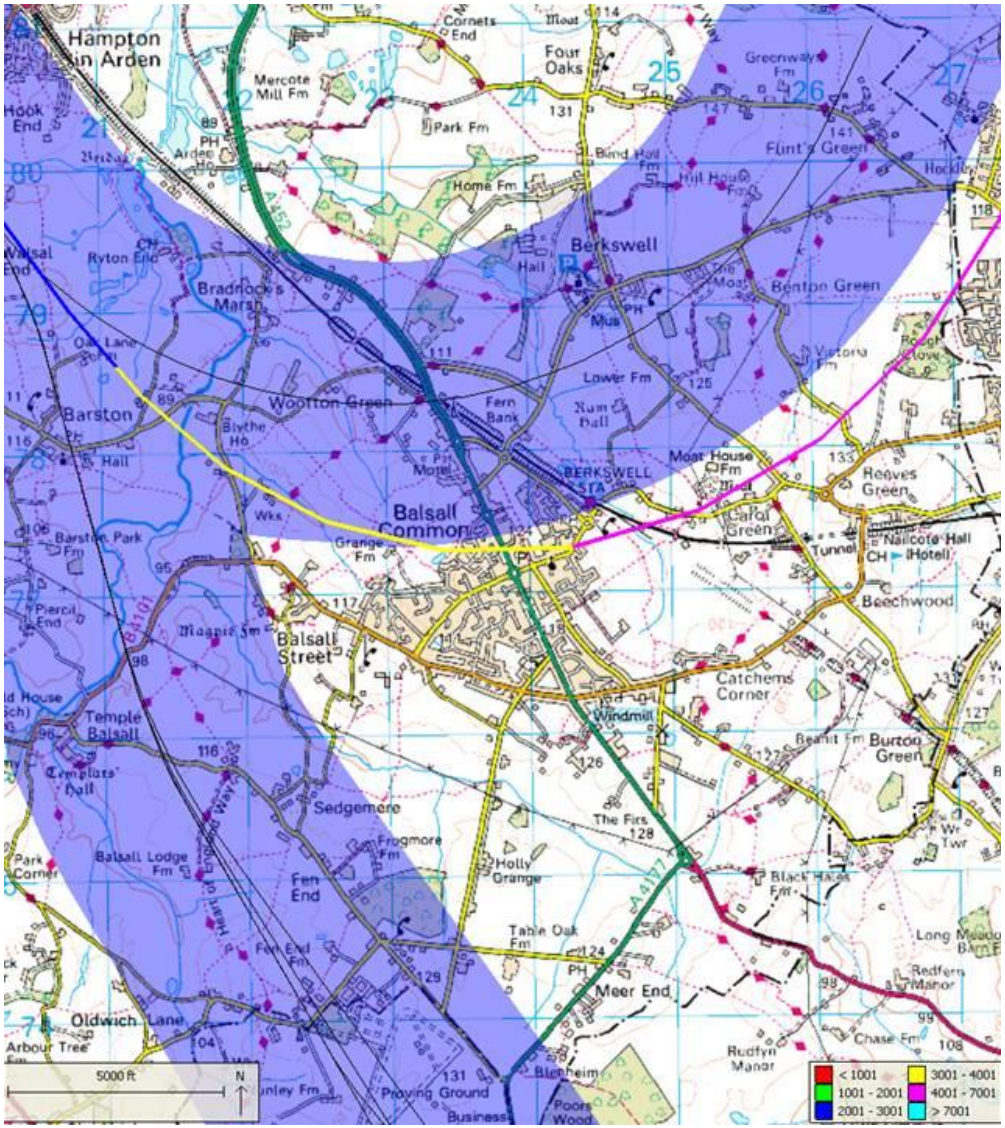


# Findings of the study- Runway 15

## Northbound Turn- Track-keeping statistics

Overall track-keeping performance for Option 6:

| On-track at 4,000 feet | On-track at 3,000 feet |
|---|---|
| 87% | 98% |

- 69% off all ‘off-track’ aircraft were the B752 and DH8D aircraft

# Findings of the study- Runway 15

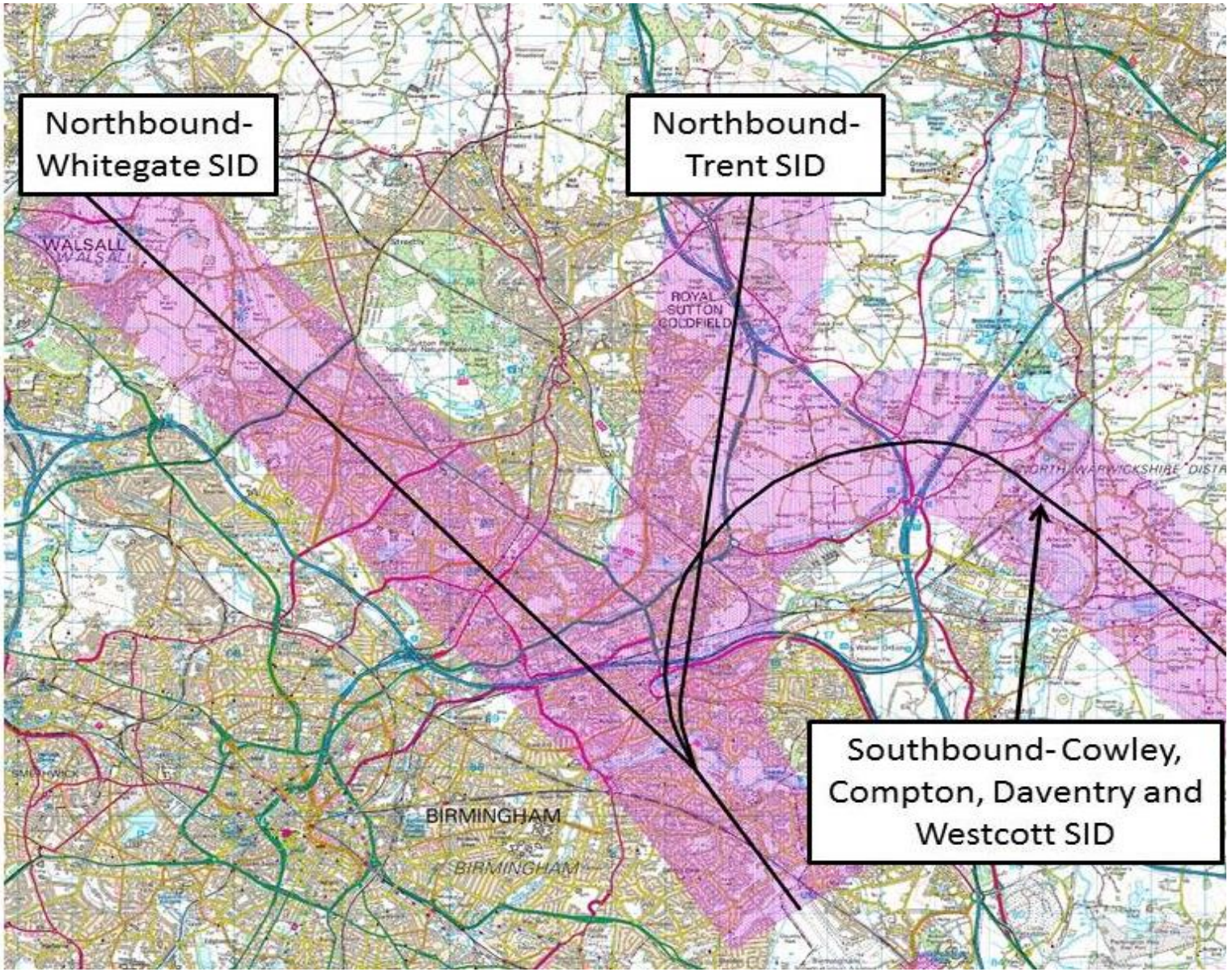
## BAL proposals for runway 15- Northbound Turn

- BAL intends to carry out redesign work to the northbound SIDs and conventional SIDs from runway 15 and any changes to the NPR will be in line with that process.

# Background to Study

Questions?

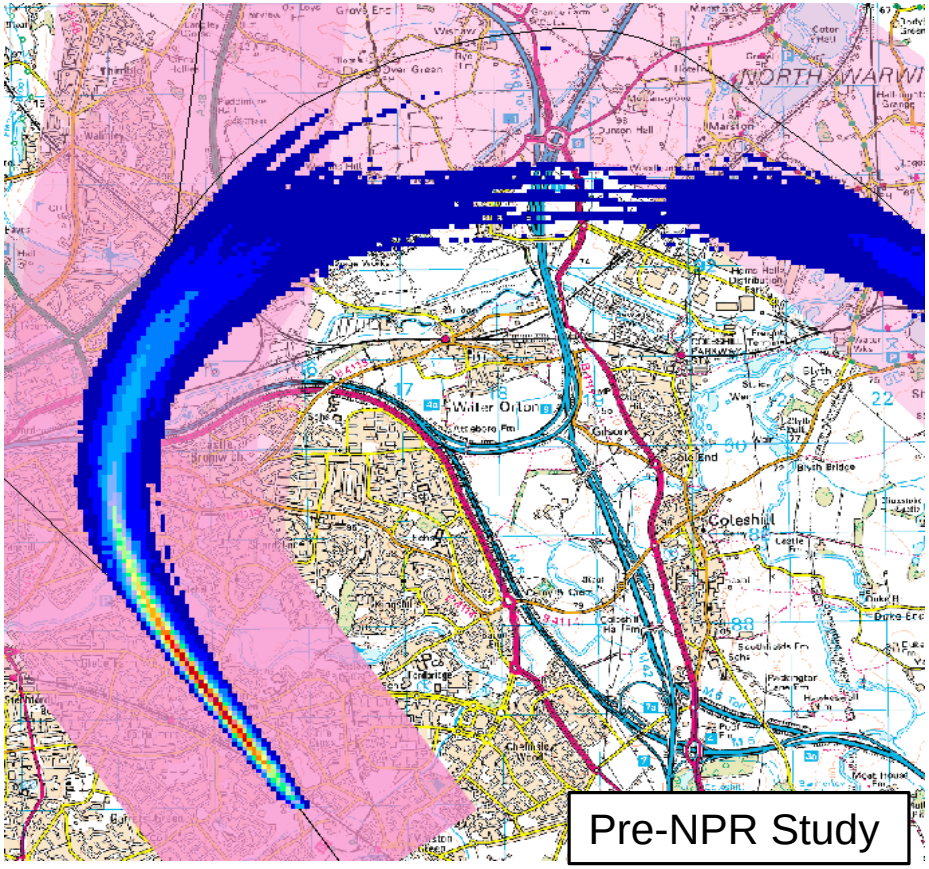
# Findings of the study- Runway 33

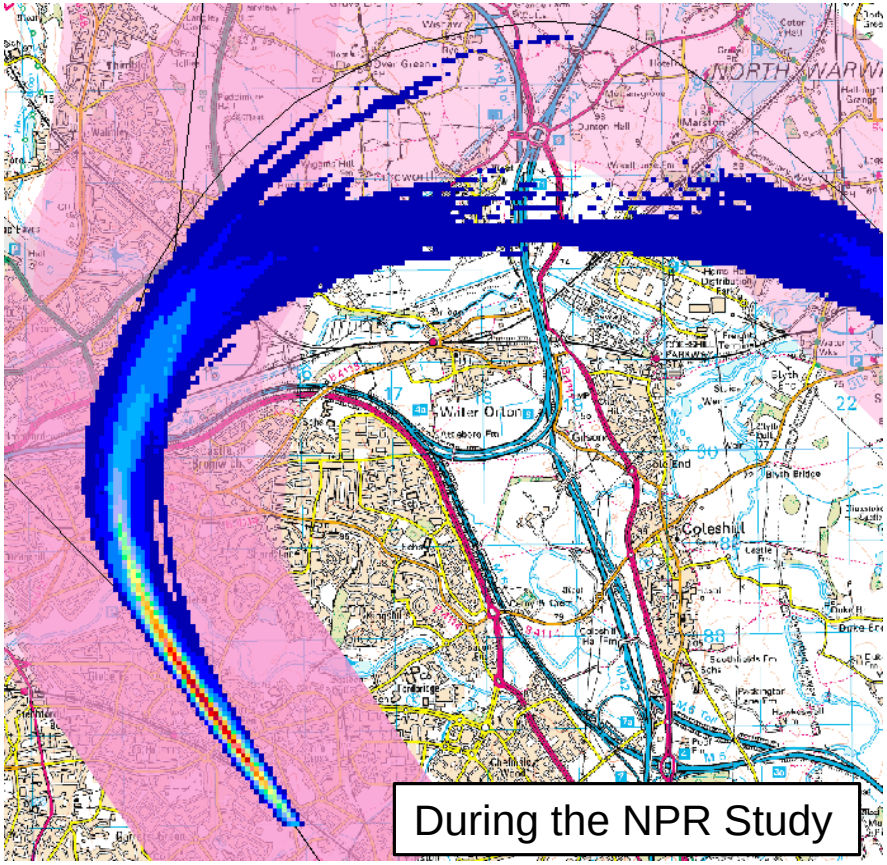


# Findings of the study- Runway 33

## Southbound Turn

- No change in the track over the ground was observed



# Findings of the study- Runway 33

## Southbound Turn

Overall track-keeping performance for Southbound turn:

| On-track at 4,000 feet | On-track at 3,000 feet |
|---|---|
| 69% | 97% |

- There is a difference between the SID and the published NPR map for aircraft departing runway 33 on a southerly heading

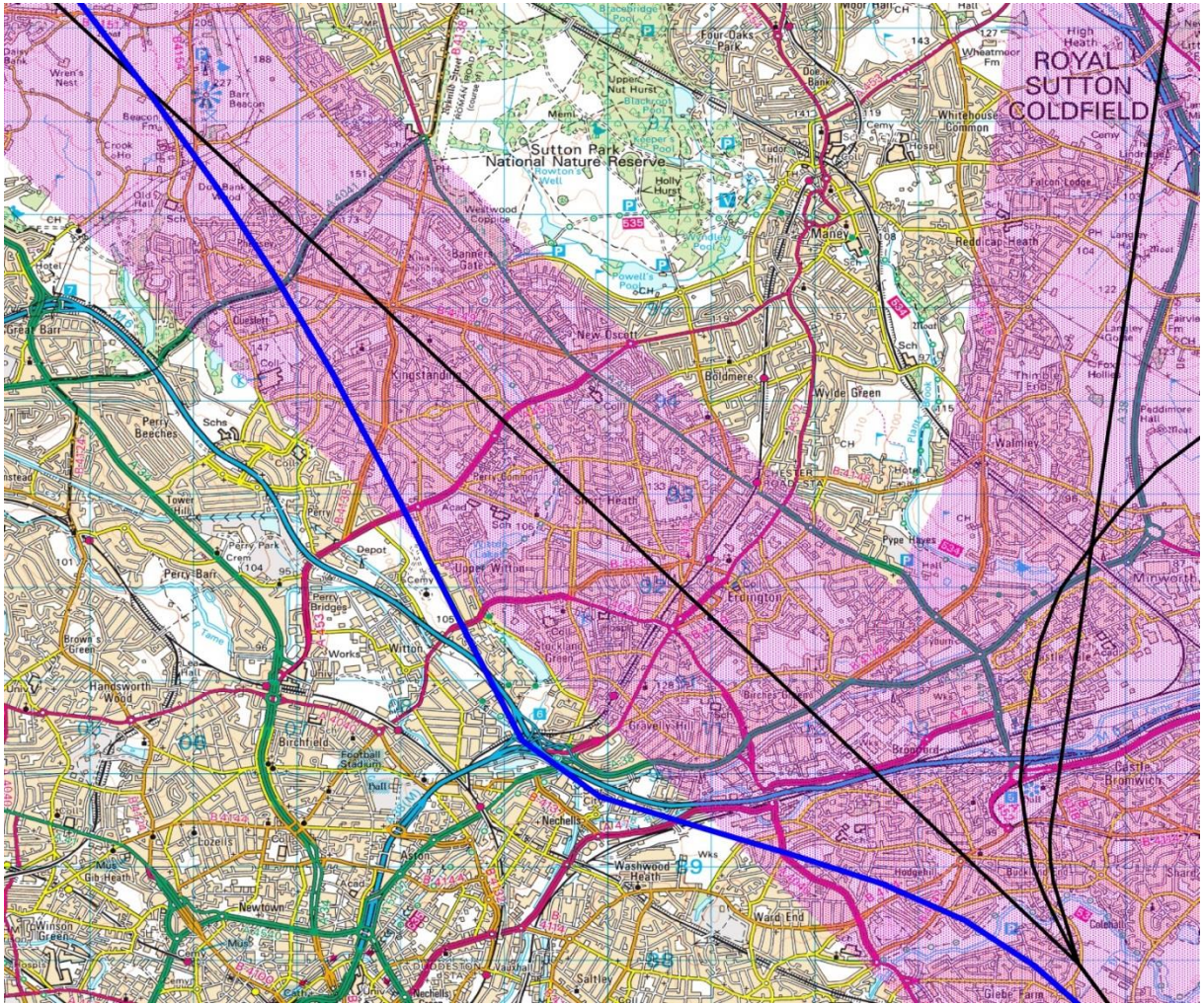
# Findings of the study- Runway 33

## Northbound Departures

- No change in the track flown over the ground
- This is unsurprising given that aircraft are not given headings by Birmingham Airport ATC
- Identified that track-keeping performance on the Whitegate SID was 97% during the trial compared to 100% prior to the trial

# Findings of the study- Runway 33

## Northbound Departures



# Findings of the study- Runway 33

## Northbound Departures

Overall track-keeping performance:

| On-track at 4,000 feet | On-track at 3,000 feet |
|---|---|
| 99% | 100% |

- This is unsurprising given that aircraft are not given headings by Birmingham Airport ATC
- Acknowledged that there is a slight reduction in Track-keeping performance- required investigation

# Findings of the study- Runway 33

## BAL proposals

- BAL is required to implement RNAV SIDs for runway 33 due to the NATs VOR removal programme- due to commence in summer 2016.

- BAL will consider any amendments to the NPR in line with this process.

# Thank you!

Sustainability Team, Birmingham Airport