

Policies and Procedures for Arriving & Departing Aircraft

Introduction

This document outlines the procedures that apply to aircraft both on arrival to and departure from Birmingham Airport.

Birmingham Airport has one runway which operates in two directions known as Runway 15 and Runway 33; the direction of operation is primarily dependent upon meteorological conditions.

Illustration of runway directions



Presently, no statutory controls exist for aircraft noise or to prevent an aircraft overflying a particular area. The airspace within the proximity of Birmingham Airport is reserved for use by Air Traffic Control (ATC). Consequently, aircraft may operate virtually anywhere within this area as ATC maintain an orderly flow of air traffic, whilst ensuring safe aircraft separation. Birmingham Airport does however operate a number of procedures in order to minimise the impact of aircraft operations which are explained in greater detail throughout this document.

Arriving Aircraft

The rules for aircraft on approach are different to those on departure. The primary difference is that whilst aircraft on departure have set routes to follow, arriving aircraft have no such routes until they are established on the Instrument Landing System (ILS) for the final stages of landing. It is the role of ATC to integrate arriving aircraft into the traffic system of departing aircraft. Safety is paramount and thus a degree of flexibility is necessary to achieve this. ATC will vector aircraft to the east and the west of the airfield prior to establishment on the ILS.

It is our aim to outline the complex procedures in place for aircraft operating into and out of Birmingham Airport in a comprehensible manner. A Glossary of Terms is provided at the back of this document.

Approach to the Runway

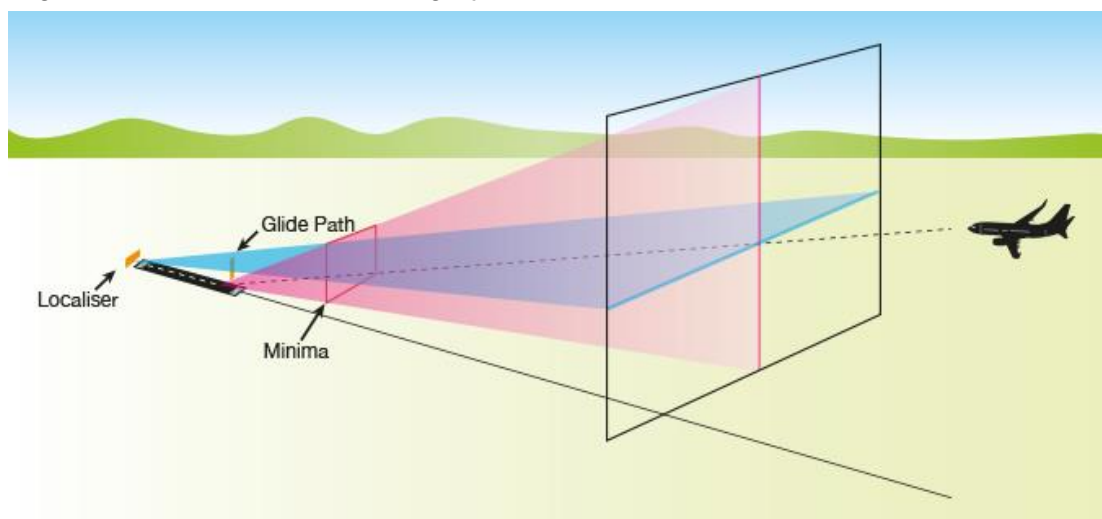
Aircraft on arrival can approach the runway by using a number of procedures, but the most common approach uses the Instrument Landing System. Other procedures include flying visually, by using the Non-Directional Beacon (NDB) or using RNAV procedures. These procedures are explained in more detail below.

The Instrument Landing System (ILS)

The ILS is a radio system that transmits two beams, the localiser and the glide path. The localiser beam defines the centreline of the runway and extends along the approach path for approximately twenty nautical miles. The glide path beam defines the angle, or glide slope, that the aircraft should fly while following the localiser course to approach the runway, safely clearing all obstacles.

Aircraft arriving at Birmingham descend at 3° (a descent rate of approximately 300 feet per nautical mile). The ILS is designed to provide a safe and manageable descent to the runway and the straight-line beam directed out from the airport runway ensures that an aircraft's final descent is controlled in an assured manner.

Diagram of the Instrument Landing System



Unlike departing aircraft, arriving aircraft do not have a specified route to follow before joining the ILS. They will be vectored by ATC and therefore there is a greater variation in the position of arriving aircraft. Aircraft join the final approach path at heights consistent with use of the ILS at that distance from the Airport. However, pilots are given instructions to maintain an altitude of at least 2500 feet until they are turned towards the ILS by ATC.

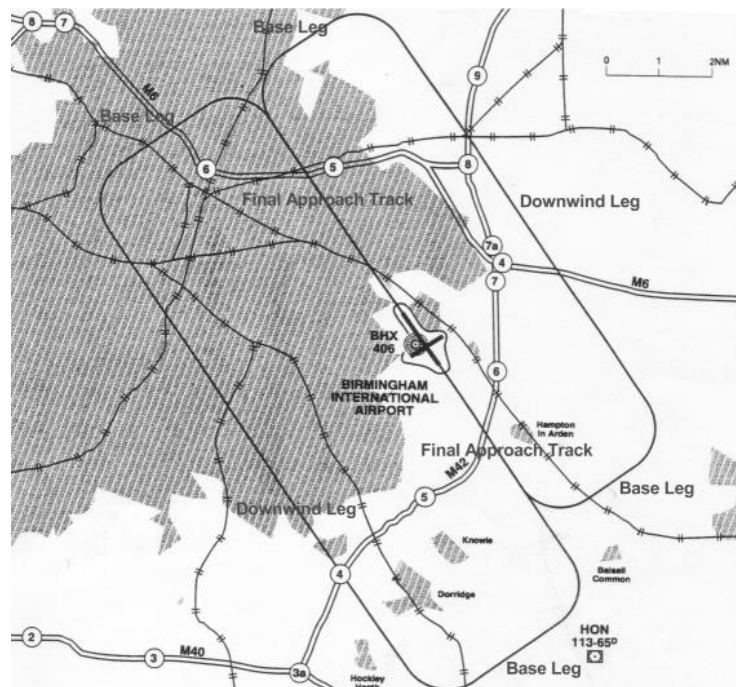
The general patterns of arriving aircraft onto runway 33 and 15 are illustrated in the two maps included on pages 7 and 8.

RNAV Approach

The RNAV approach procedure unlike the ILS is based upon satellite technology as opposed to ground-based infrastructure. It has however been designed in such a way that it will replicate the approach path of an aircraft established on the ILS (as described above). This procedure offers airlines an alternative when the ILS is out of service and will mean that residents living underneath the final approach path are unlikely to notice any difference between an RNAV approach when compared to an ILS approach.

Visual Approach

Whilst the majority of aircraft will use the ILS for their final approach to the runway, on occasions aircraft will be required to approach visually. This type of approach is also an essential part of a pilot's training schedule and they will therefore request a visual approach from time to time. Recommended training circuits for these approaches are published in the UK Air Pilot. These are shown on the map below and should be flown whenever possible.

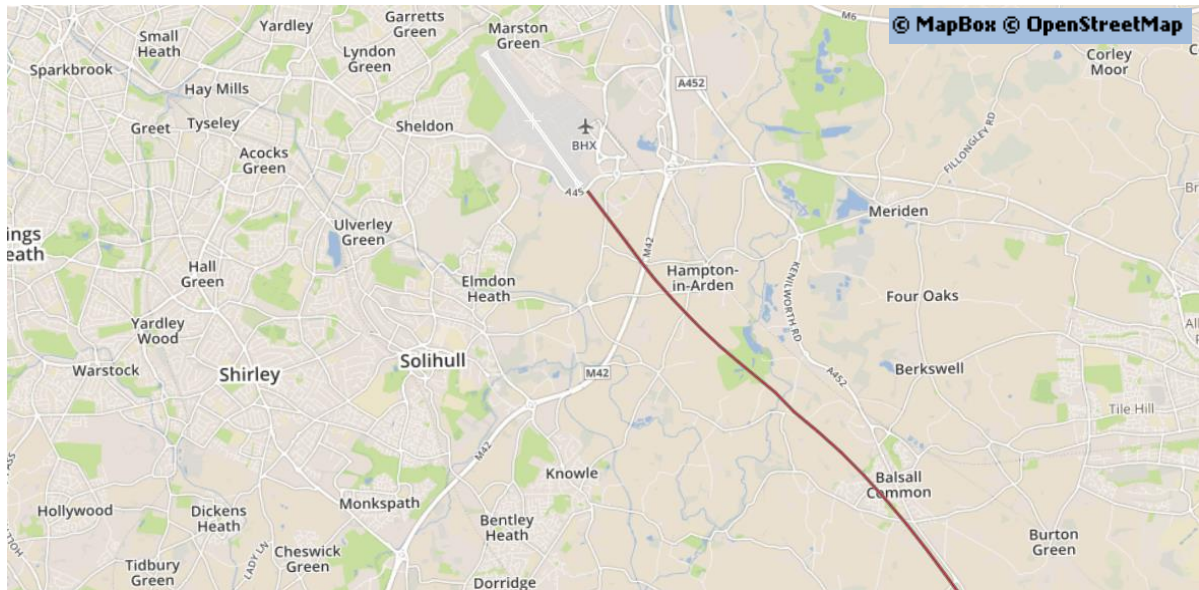


Map showing Visual Circuits Runways 15/33 Recommended Turns to Base Leg

Non-Directional Beacon Approach (NDB)

The NDB approach is required if the ILS is non-operational and the aircraft is one of a small number not equipped to carry out an RNAV approach. This type of approach is also an essential part of a pilot's training schedule so again they may request an NDB approach from time to time, even when the ILS is operational.

With the NDB approach, aircraft are positioned approximately five degrees East of the ILS localiser. This is because the beacon used for this type of approach is offset from the centreline of the main runway. The image below demonstrates a typical NDB approach onto Runway 33, the position on this approach will vary greatly when compared to the ILS.



Continuous Descent Approaches (CDAs)

CDAs were launched at Birmingham Airport in 2009, following a very successful trial with the Airlines and ATC. Airlines are routinely exceeding the Airport's previous target of 90% CDA compliance. In 2019 Birmingham Airport has launched its Noise Action Plan, which now sets an ambitious target of 96% CDA.

The basic principle of a CDA is that aircraft stay higher for longer, by descending at a continuous rate. Air Traffic Controllers issue pilots with their distance to touchdown and the pilots will calculate and perform a continuous rate of descent. CDAs require significantly less thrust, which leads to reduced air emissions and noise.

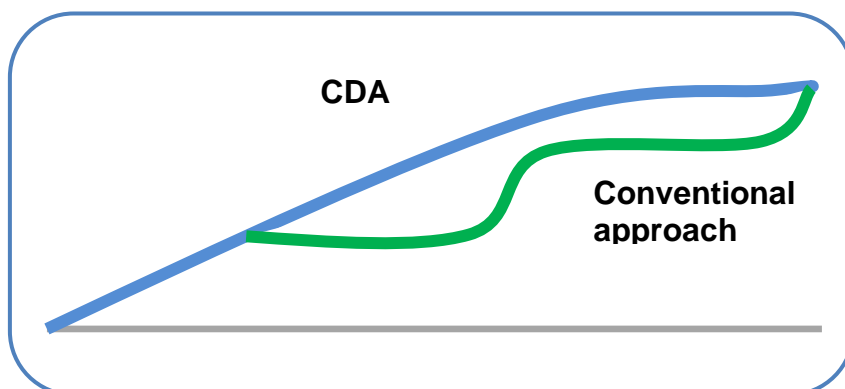
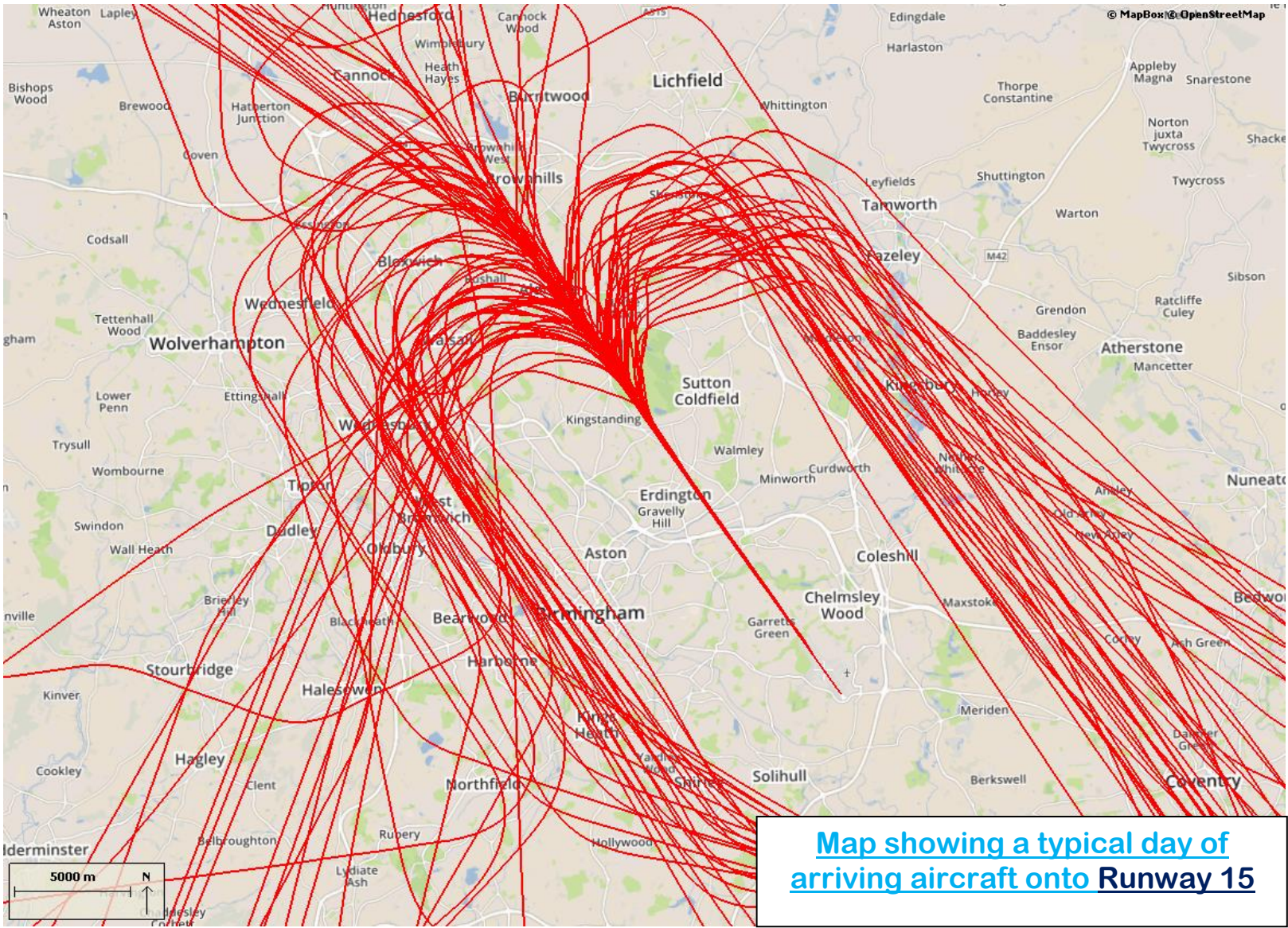


Diagram showing comparison between a CDA approach and a Conventional approach

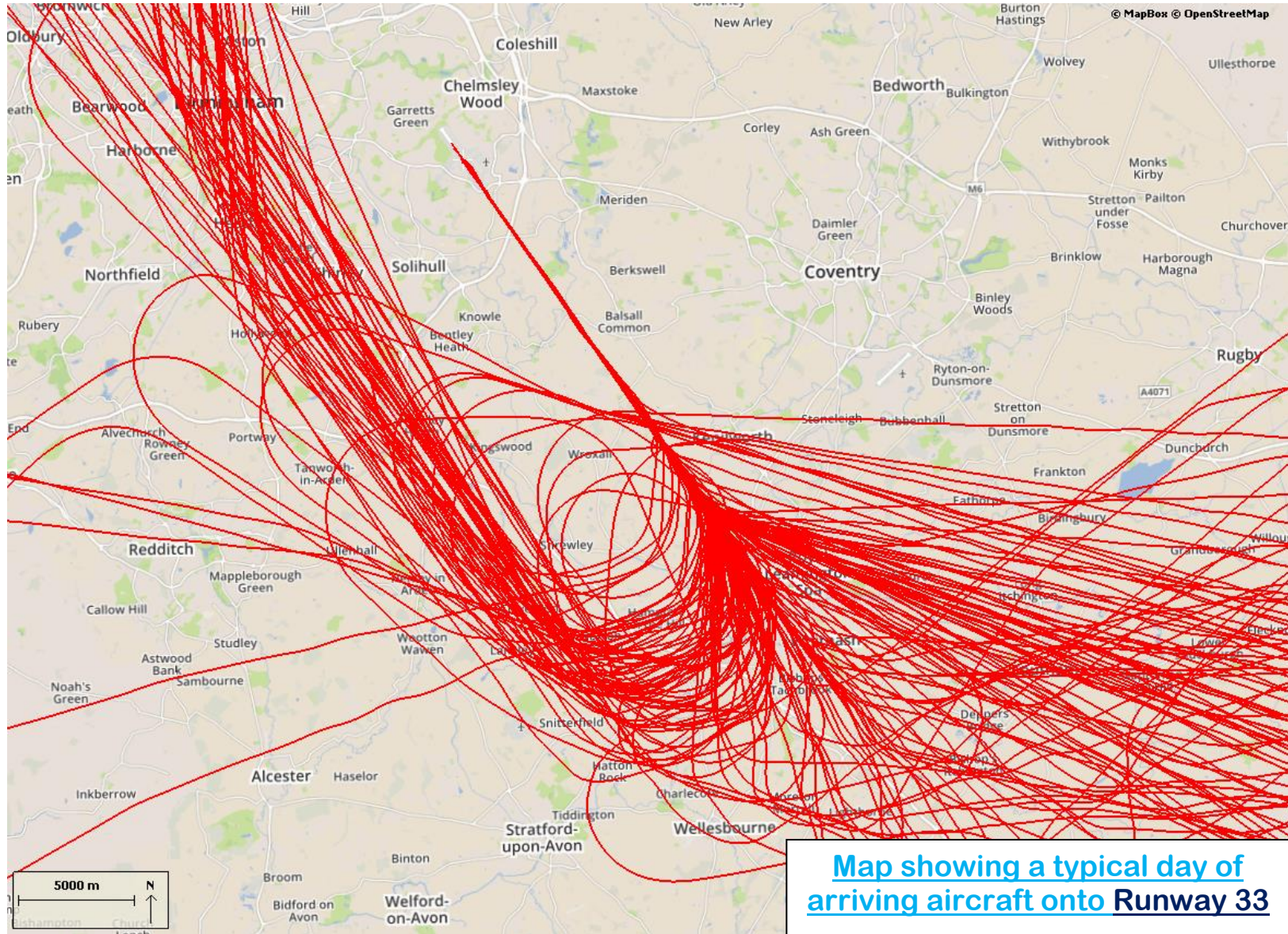
The Holding System

In order to safely integrate traffic ATC will sometimes direct aircraft to a holding area although at Birmingham Airport the use of the holds is relatively infrequent. The area, known as a 'stack' is organised over a radio beacon where each waiting aircraft flies a special circuit separated vertically from other aircraft by a minimum of 1000 feet. There are four holds for Birmingham; two located to the north of the airport (Walsall and Junction 6 of the M6) and two to the south (Bromsgrove and Chadwick End).





Map showing a typical day of arriving aircraft onto Runway 15



Departing Aircraft

Standard Instrument Departure Routes (SID)

Standard Instrument Departure (SID) routes are a set of instructions which a pilot will refer to when departing from a particular airport. SIDs apply to all departing aircraft of more than 5700 kg MTWA, unless otherwise instructed by ATC, or unless deviations are required for safety reasons.

SIDs are shown as lines on maps but, recognising that aircraft are unable to follow a line drawn in the sky, aircraft actually fly within a corridor known as the Noise Preferential Route (NPR) which can be seen later in this document. A number of factors will affect the ability of aircraft to fly within these routes such as aircraft type, load factors and weather conditions.

Noise Preferential Routes (NPRs)

Aircraft are required to follow the NPR until their requisite altitude has been achieved, unless they have been re-directed by ATC for safety reasons. Upon reaching the requisite altitude aircraft can then fly onwards to their destination. The requisite altitude varies dependent upon the runway in use and the route used and is addressed later in this document.

The NPRs at Birmingham Airport are 3km wide for the departure routes from runway 33 and 2km wide departures from runway 15. These procedures are discussed in greater detail overleaf.



Airspace Modernisation and Area Navigation (RNAV)

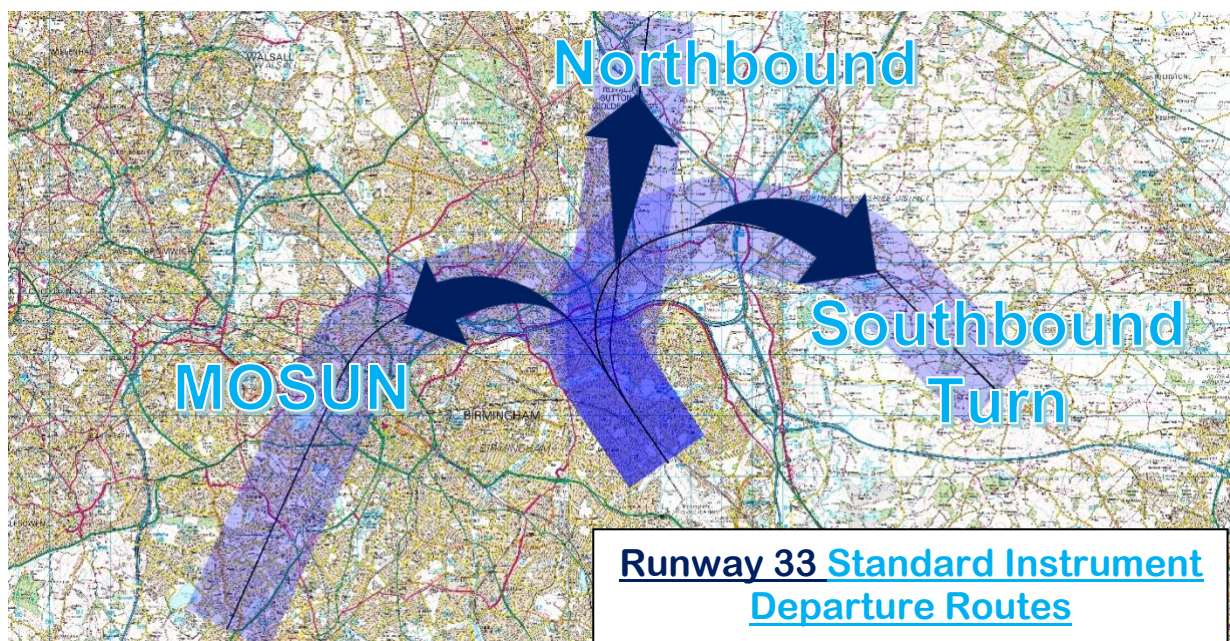
The UK's airspace is some of the most complex in the world, yet has not undergone any significant change since the 1950's. Since this time the airspace has become occupied with many kinds of aircraft including commercial passenger flights, air freight, general aviation, military and drones. As a result of this the Airspace has to be managed so that those using it can do so safely and efficiently therefore the UK is currently undergoing Airspace Modernisation by introducing RNAV routes.

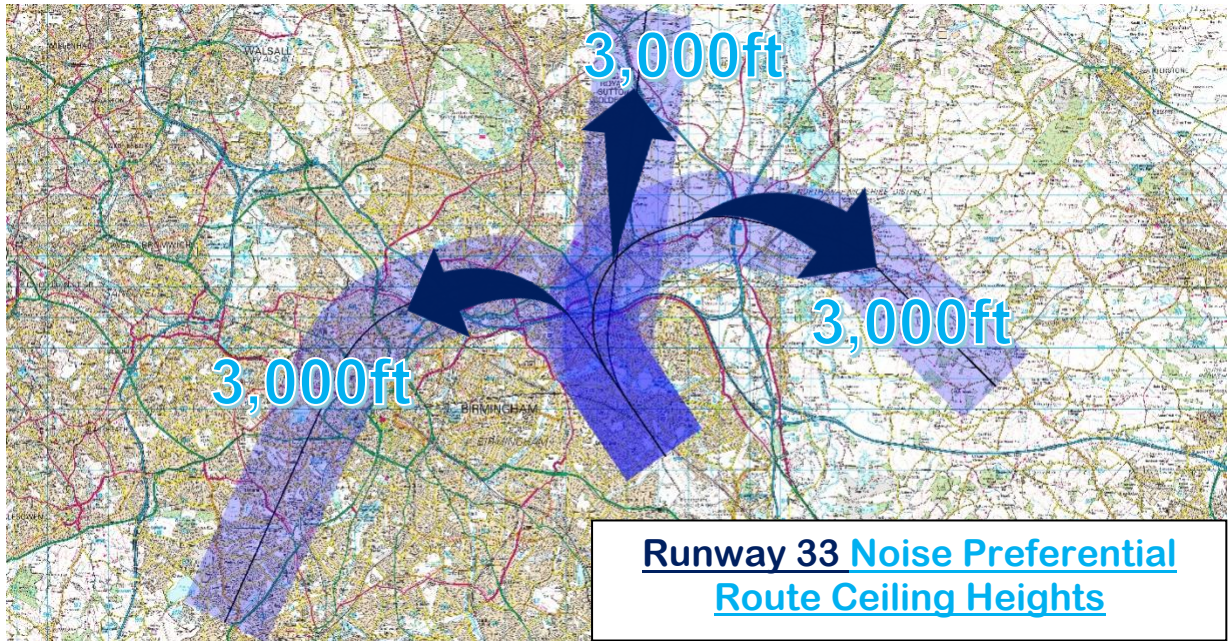
Over the last six years Birmingham Airport has introduced RNAV SIDs to the North and South for aircraft departing from both runways 33 and 15. RNAV is a method of navigation which can permit aircraft to take shorter and more direct routings to their destinations, helping to reduce aviation's carbon emissions. RNAV also allows aircraft to fly a more accurate track than the previous ground-based beacon procedures that they replace which leads to greater concentration within the NPR. RNAV procedures are used by over 99% of aircraft on departure at Birmingham Airport. For the small number of aircraft that are not RNAV equipped there is an alternative set of procedures that aim to replicate the track flown by RNAV departures.

Runway 33 Departures

The NPRs for aircraft departing from runway 33 are 3km in width and are valid until an altitude of 3000ft has been achieved. The NPRs from runway 33 can be seen below.

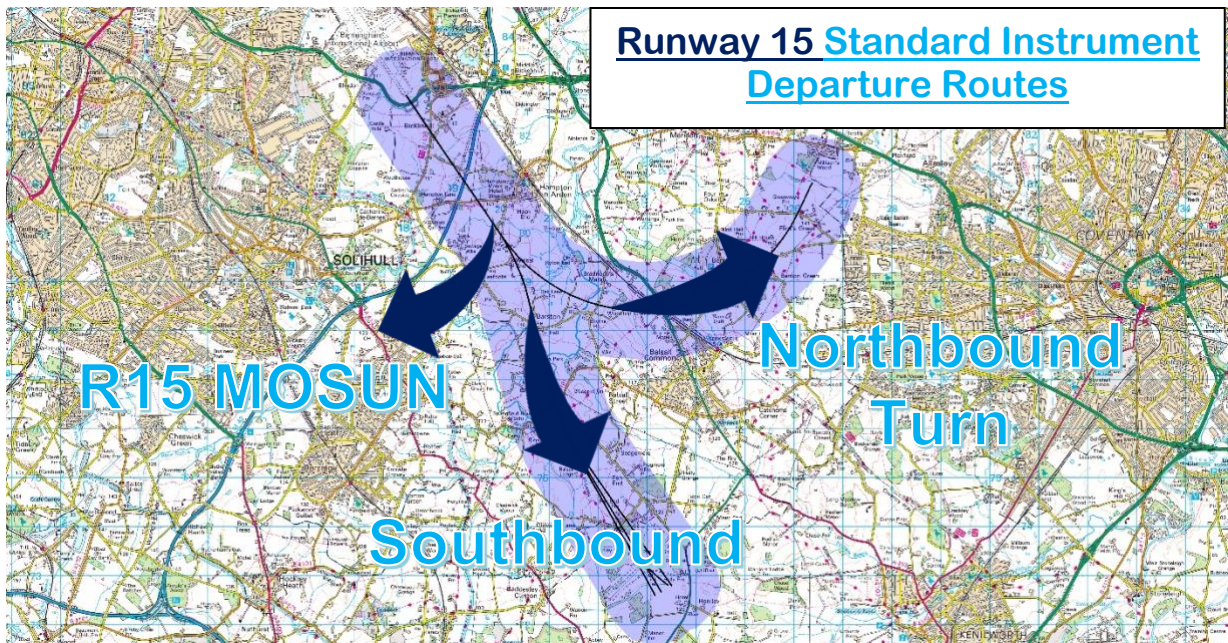
In May 2019 Birmingham Airport implemented changes to the departure routes that were approved by our regulator The Civil Aviation Authority (CAA). All of the information relating to the changes can be found via our website at this link www.birminghamairport.co.uk/flightpaths.

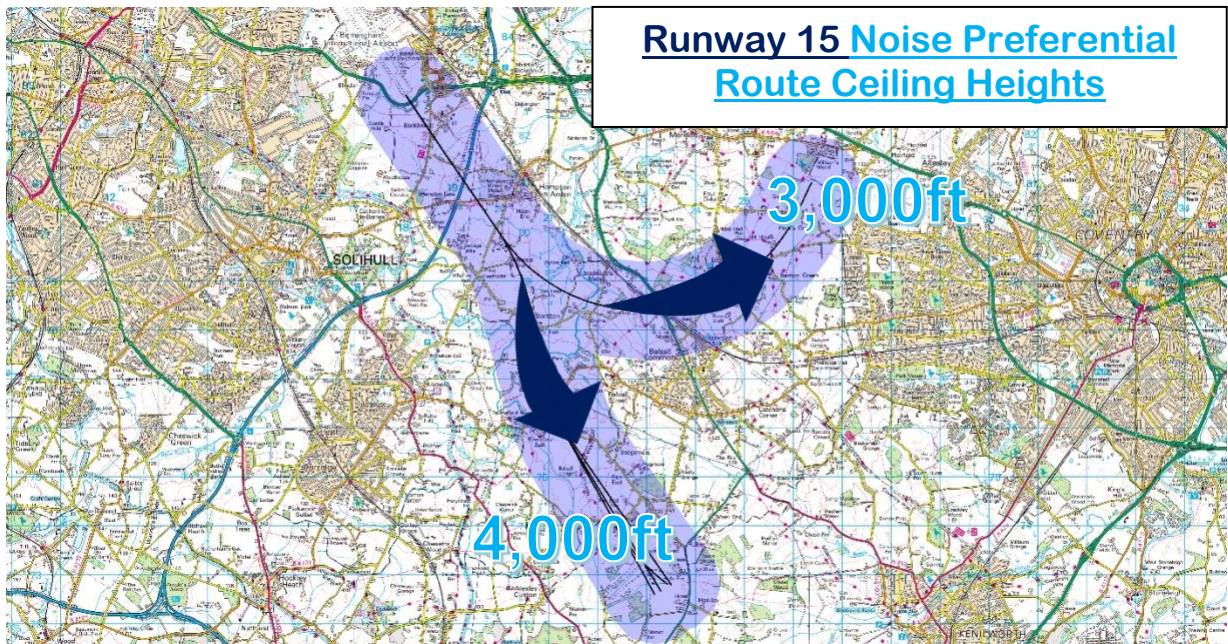




Runway 15 Departures

The NPRs for aircraft departing from runway 15 using RNAV departure procedures are 2km in width. These NPRs are valid until an altitude of 3000ft has been achieved for aircraft that depart using the Northbound Turn and MOSUN routes. The NPRs for RNAV departures using the Southbound route are 4000ft. The NPRs from runway 15 can be seen below.

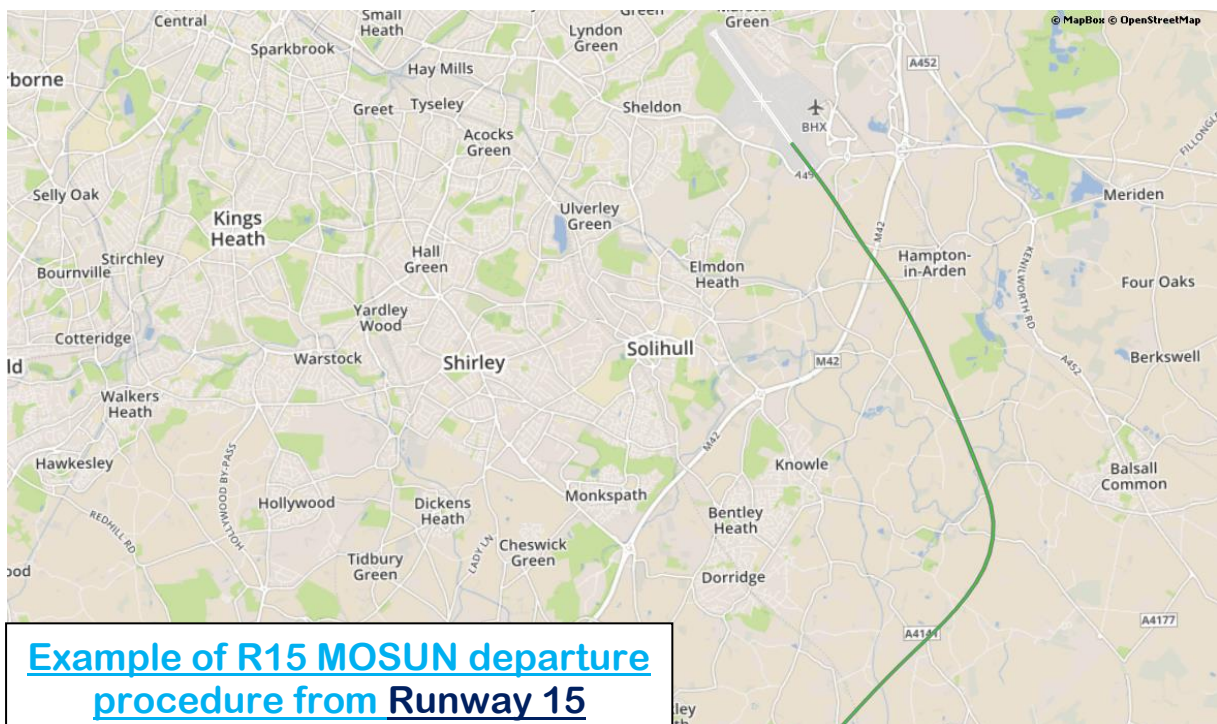




Runway 15 MOSUN Departures

The MOSUN departure procedure from runway 15 is a non-standard departure procedure used by aircraft flying to destinations such as the Canary Islands, Portugal and Southern Ireland. When departing from runway 15 the procedure for MOSUN departures aims to replicate the track flown by RNAV departures until the aircraft is 4 nautical miles from the runway when it will then make a right turn.

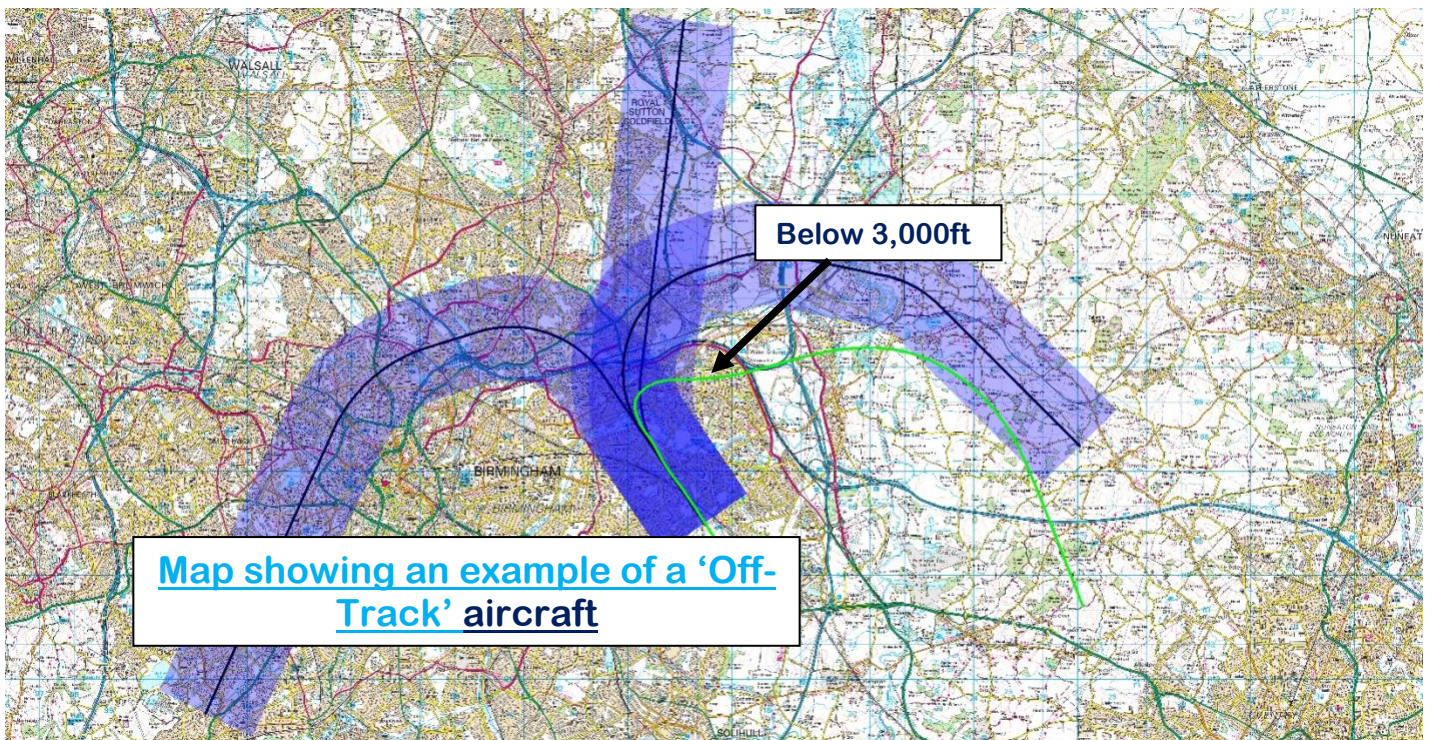
Aircraft use the procedure as it provides a more direct routing and to also avoid London airspace which is often very congested. Aircraft may use the MOSUN departure procedure between the hours of 1700 – 1000 Monday to Friday and at all times during the weekend. The MOSUN departure procedure is typically utilised by approximately 5% of departures from the Airport.



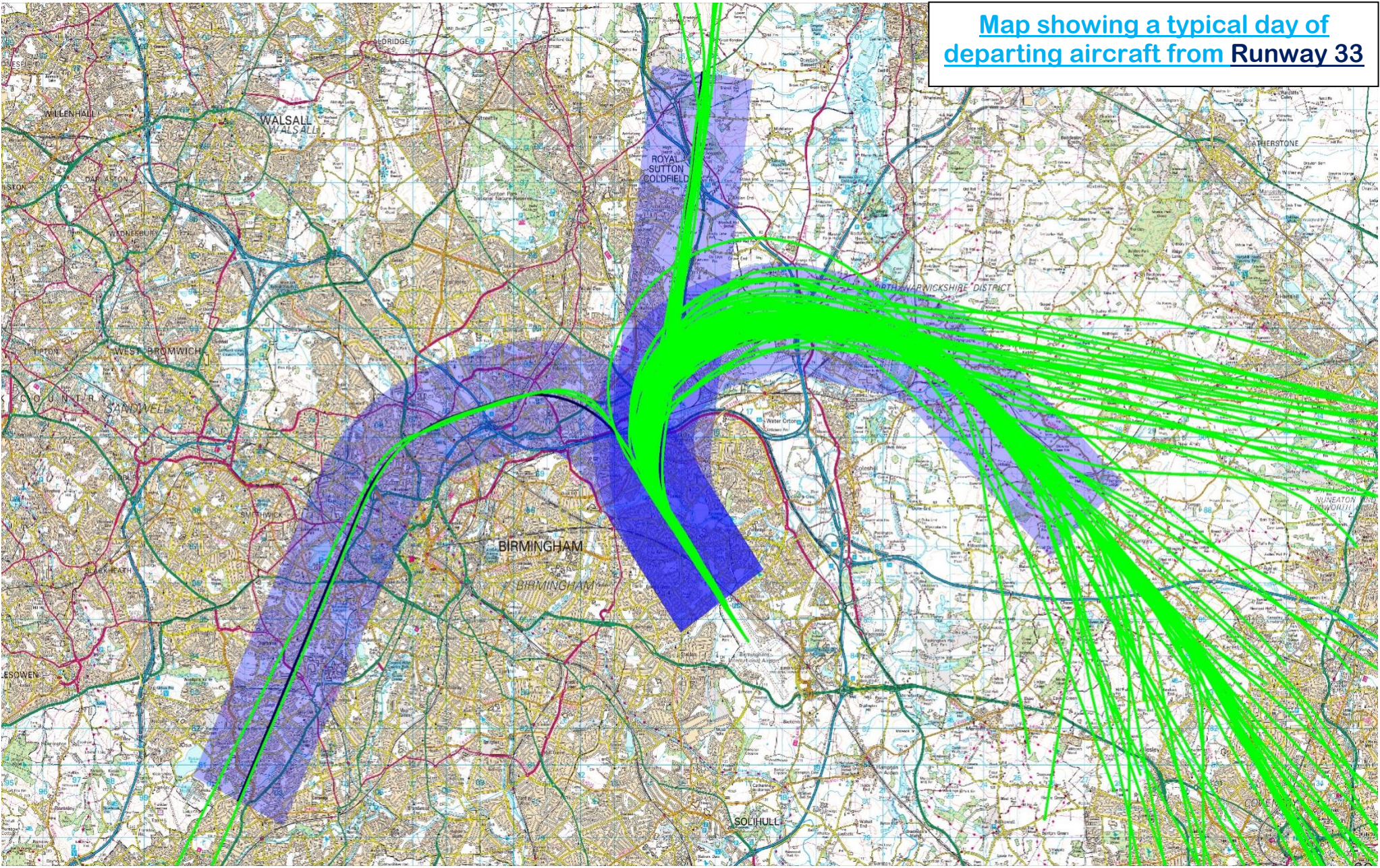
Track-Keeping Performance

Track-keeping performance refers to the ability of aircraft to fly within the NPRs until they have reached an altitude of either 3000 or 4000 feet. Each departure corridor is analysed and any aircraft (above 5700 kg) leaving the NPR below the requisite altitude is recorded as 'off track'.

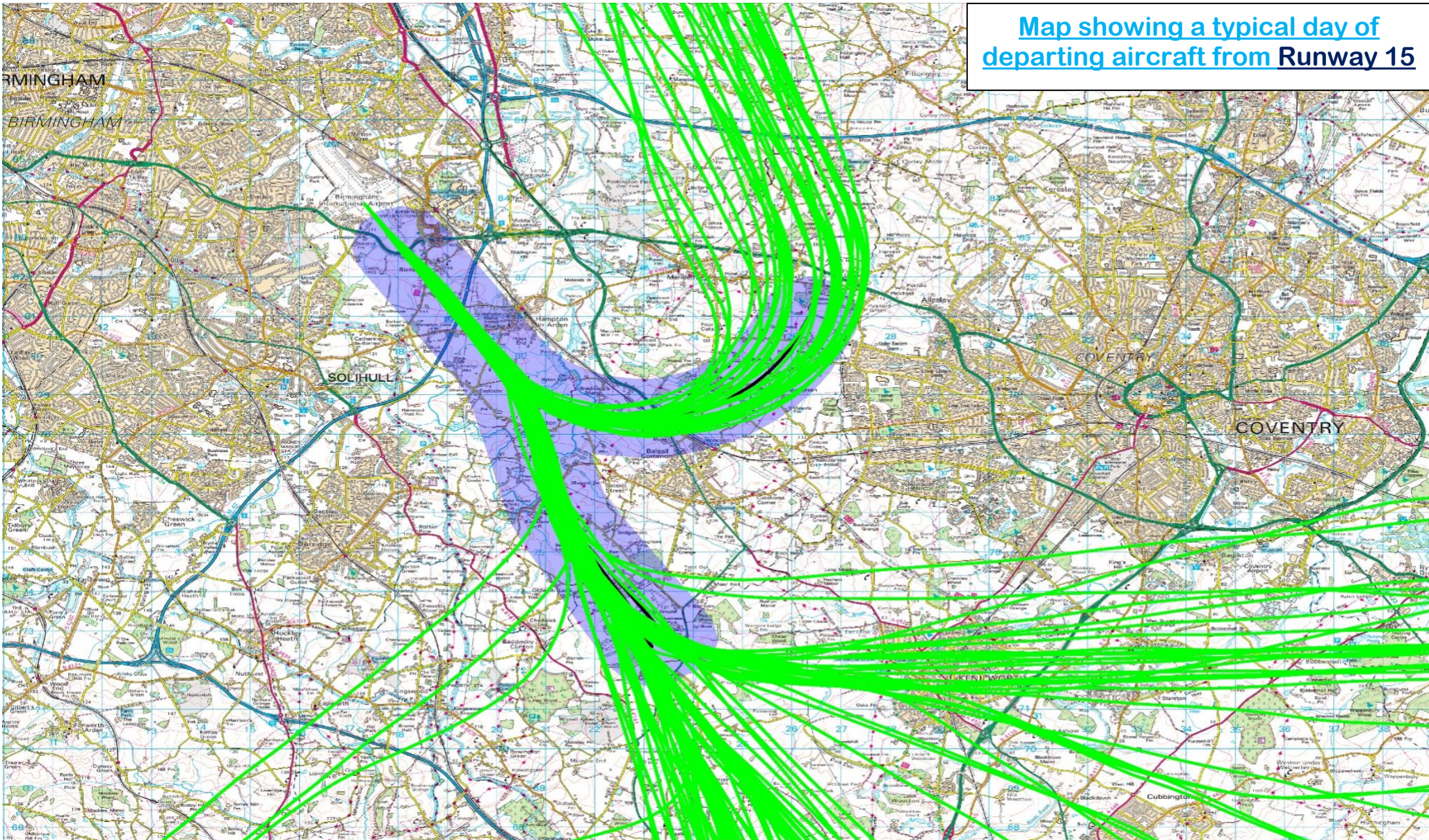
Birmingham Airport operates a sophisticated Noise and Track-Keeping Monitoring System known as ANOMS. ANOMS uses radar data comprising radar track co-ordinates and flight numbers, which are matched with noise data obtained from six community noise monitors. ANOMS is the tool used to monitor track-keeping.



Map showing a typical day of departing aircraft from Runway 33



Map showing a typical day of departing aircraft from Runway 15



Glossary of Terms

Altitude -	The vertical distance above mean sea level.
ANOMS -	Airport Noise and Operations Monitoring System, used to monitor flight tracks and noise from 6 permanent noise monitors located in the community.
ATC -	Air Traffic Control
Base Leg -	Following on from downward leg, when an aircraft turns to join the ILS.
CAA -	Civil Aviation Authority (main regulatory agency for the aviation industry in the UK).
Controlled Airspace -	The area of airspace under the management of Air Traffic Control.
DfT -	Department for Transport
Downwind Leg -	Following a path parallel to the runway at above 2500 feet altitude until approval given to pilot by ATC to turn base leg.
FMS -	Flight Management System used on modern aircraft.
Instrument Landing System (ILS) -	A radar beam directed out from the airport site to assist the landing of an aircraft, even in low visibility conditions.
NPR -	Noise Preferential Routes are the corridors which extend 1 or 1.5km either side of the SID and were designed to take aircraft over the least populated areas.
Radar vectors -	The provision of navigational guidance to aircraft in the form of specific headings based on the use of radar.
Section 106 Agreement -	Legally binding Planning Obligation which Birmingham Airport entered into with Solihull Metropolitan Borough Council in July 1996.
SID -	Standard Instrument Departure Route, pre-promulgated instructions published in the UK Air Pilot which form the centreline of the NPR
Reverse Thrust -	The application of power on landing, reversing the engine direction to assist the stopping of the aircraft on the runway.
RNAV-	Area Navigation - RNAV is a method of navigation which permits aircraft to take shorter and more direct routings to their destinations, helping to reduce aviation's carbon emissions.
Runway 15 -	The main runway at Birmingham Airport when aircraft are taking off to the south and arriving from the north.
Runway 33 -	The main runway at Birmingham Airport when aircraft are taking off to the north and arriving from the south.
UHF -	Ultra-High Frequency
UK AIP -	UK Air Pilot, a manual containing information relating to all UK airports including flight procedures, noise abatement procedures and SID charts.
VHF -	Very High Frequency
Visual Flight Rules -	A set of rules and procedures that apply to aircraft flying by visual reference only.

Contacting the Sustainability Team

We hope that this document has helped to explain how aircraft operate at Birmingham Airport and addressed any concerns or queries that you may have. However, should you require further information please contact the Sustainability Team via the form available at the link below:

<https://www.birminghamairport.co.uk/community-complaint>

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