

Community Impact: Focus on Marston Green



With flights to more than 140 destinations worldwide and a workforce of around 8,500 people, Birmingham is the UK's 7th largest airport and an economic powerhouse, contributing millions of pounds to the Midlands economy every year. However, these benefits have to be balanced against the Airport's impact on nearby communities. Focussing on Marston Green, this guide aims to explain operational procedures at Birmingham and how they affect your neighbourhood.

The Basics: where do aircraft fly and why?

This section introduces some of the basic principles behind the operation at Birmingham Airport.

Controlled Airspace

Marston Green lies within the Control Zone for Birmingham Airport, an area of Controlled Airspace extending from ground level up to a height of 4,500 feet. In turn, the Control Zone is part of a wider system of airspace controlled by Air Traffic Control (ATC) to ensure the safety of aircraft operating in and out of the Airport. All aircraft operating within Controlled Airspace are under control of ATC and while the majority of movements follow the well-established procedures we will describe here, there are occasions when ATC will route aircraft away from the usual flight paths. So, while residents will become familiar with the 'normal' routes aircraft follow, there are occasions when they may be seen in locations where they do not normally appear. This does not mean that they have 'broken the rules' or are flying 'illegally'. On occasion, aircraft may be seen *anywhere* within controlled airspace, though the Airport, the airlines and ATC all work closely together to make sure that these occasions are kept to an absolute minimum. See the section on 'other factors' later in this guide for more information.

The Runway

Birmingham Airport has one runway, which aircraft use in either of two directions, known as Runway 15 and Runway 33. The numbers refer to the runway's heading, in degrees. Runway 15 is aligned on a heading of 150°, approximately South southeast, while Runway 33 lies on a heading of 330°, or North northwest. The runway only operates in one direction at any time.



This means that at any given point in time, residents of Marston Green may be affected by either arrivals or by departures. It is meteorological conditions – primarily the direction of the wind – which determines this because, where possible, aircraft will usually take off and land heading into the wind.

However, where winds are below five knots, arriving aircraft will generally be directed onto Runway 33. This is designed to minimise the risk of wake vortex strikes. Wake vortices are rotating columns of air generated at the wingtip of an aircraft as it passes through the air. In calm conditions they can cause damage to roofs of properties to the north of the airport underneath the path of arriving aircraft. Although less than 0.005% of flights cause vortex damage at Birmingham, the Preferential Runway Policy aims to limit the risk. Taken together, weather conditions and the Preferential Runway policy mean that averaged out over the course of a year, 60% of operations typically use R33 with 40% using R15.

What happens when aircraft are coming in to land at Birmingham?

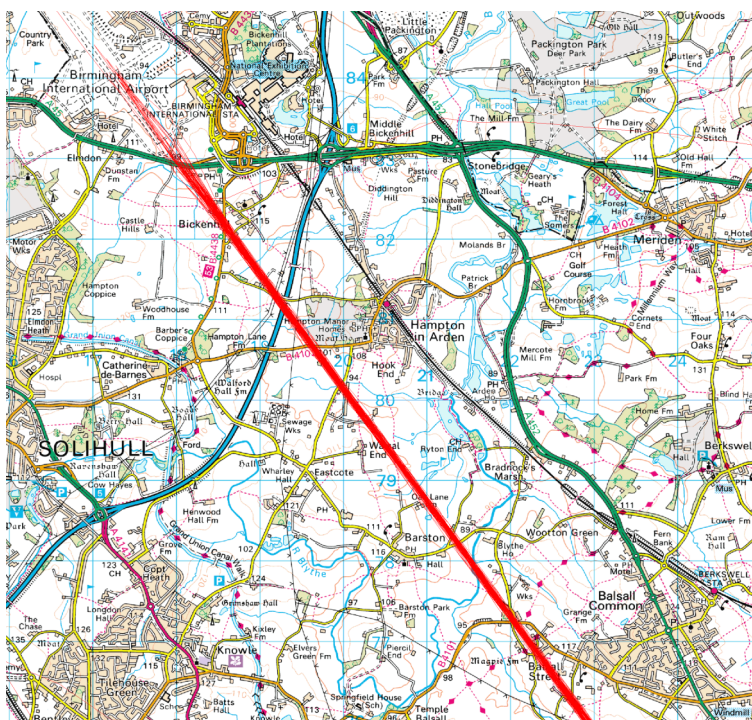
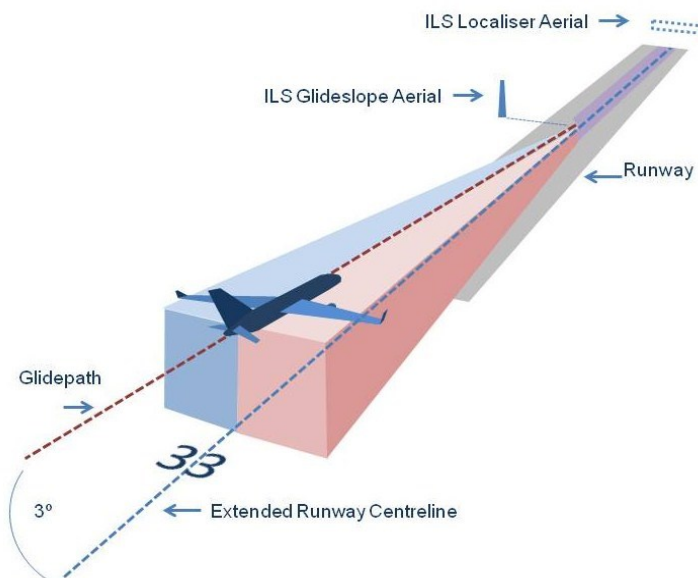
When Runway 33 is operating, you will notice aircraft arriving from the south, crossing the M42 and the A45, while when Runway 15 is operating, you will see them arriving over Sheldon Country Park.

The ILS is a highly accurate system that enables aircraft to land safely on the runway, including at night and in poor visibility. It consists of two radio signals transmitted from the airfield.

The *localiser* establishes the centre-line of the runway and defines a straight line approach path which extends out from the Airport for around twenty miles.

The *glide slope* beam defines the *glidepath*, the angle at which the aircraft descends, enabling it to fly along the localiser beam in a controlled descent, clearing all obstacles along the way, until it touches down safely on the runway.

The angle of the glide slope is 3°, which means the aircraft will descend approximately 300 feet for every mile it travels. In practical terms, arriving aircraft crossing the airfield perimeter will be at an approximate height of 150 feet and because they are so close to touch down, will always be seen flying the same path.

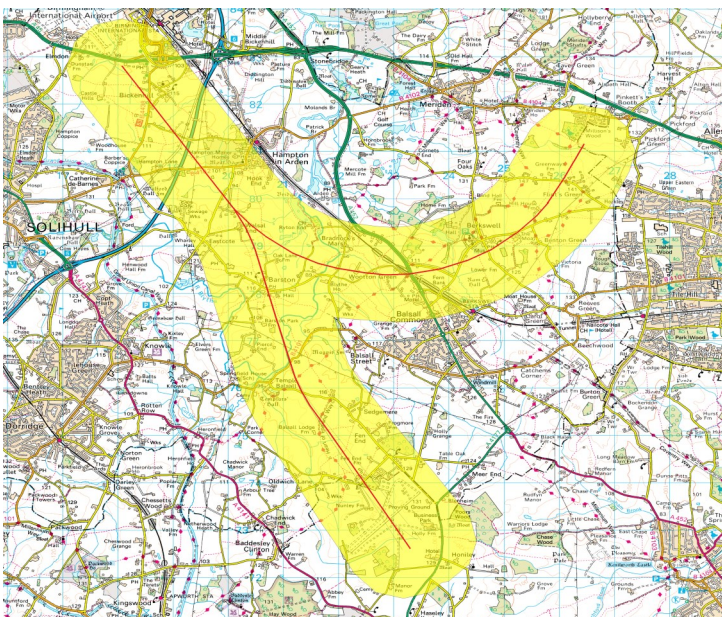


Aircraft tracks for arrivals on to Runway 33, showing aircraft established on the ILS.

Residents sometimes report large aircraft, such as the easily-recognised A380 operated by Emirates, are arriving, they appear to be flying lower than other types. However, once an aircraft is established on the ILS, at any given point along the glide slope it will be at approximately the same height as all other aircraft passing that same point.

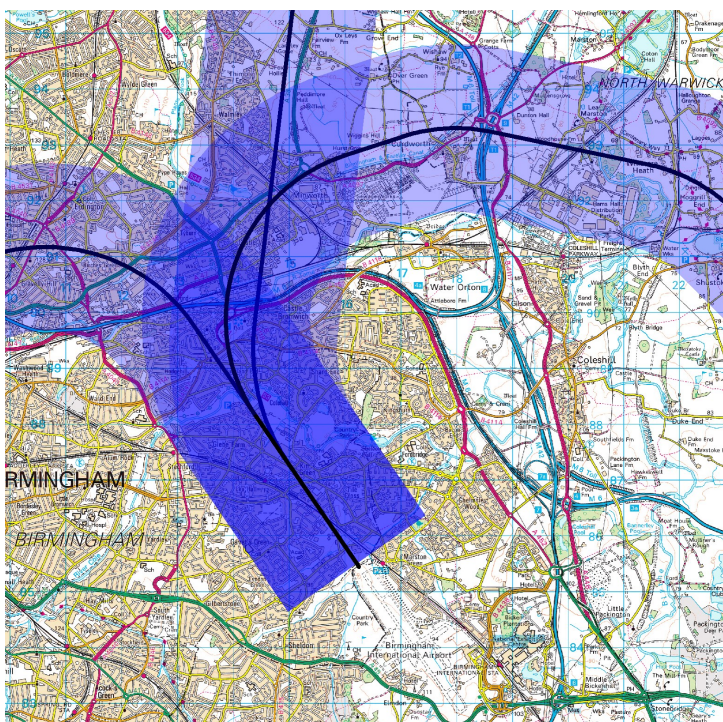
What we see is an optical illusion, caused by the size of these aircraft, which operate only a few times each day, compared to the smaller types with which people are more familiar. Because all aircraft are established on the same ILS glide slope, there is very little actual variation in height.

What happens when aircraft are taking off?



Above: Runway 15 NPRs in yellow showing the centreline of the SIDs in red.

Below: Runway 33 NPRs in blue with the centreline of the SIDs in black



When Runway 15 is in operation, you will notice aircraft taking off and climbing away to the south, over the A45.

Conversely, when Runway 33 is in operation, you will see them taking off to the north, over The Radleys.

Departing aircraft are required to follow Standard Instrument Departure (SID) routes. A SID is a set of instructions that pilots will refer to when departing from a particular airport. They are intended to strike a balance between the need to avoid terrain and obstacles, noise abatement and considerations relating to the management of the wider airspace beyond the immediate locality of the airport.

SIDs are shown as lines on maps but, recognising that aircraft fly in three dimensions, they actually operate within a corridor known as a Noise Preferential Route (NPR) of which the SID forms the centreline.

A number of factors, including the type of navigation aid in use, the aircraft type and load, as well as weather conditions, will determine an aircraft's ability to remain within the NPR, but while aircraft flying 'off-track' can be seen as an issue for communities further away, because Marston Green is so close to the Airport, aircraft will always operate within the NPR.

A number of other considerations will influence how Marston Green, in particular, is affected by the Airport's operations.

Night Flying

Some residents believe that Birmingham Airport closes at night, or that night flying is banned. Neither is true. Birmingham is a 24-hour operation and has been for many years. However, there is widespread recognition that night flying is one of the main impacts that Airports have on local communities and it is an issue that we take very seriously. In fact, we have one of the most stringent Night Flying Policies of any UK airport, with an annual limit on night movements, a ban on the noisiest aircraft operating during the night period and a night noise limit of 83dB (A). If a departing aircraft registers a noise level above this at our noise monitors, then the airline is surcharged an amount equivalent to a full runway charge. All funds from night noise violations are placed into the Community Trust Fund, which makes grants to small, community based organisations in areas affected by our operations, including Marston Green. You can find out more about the Community Trust Fund on the Airport's Website at <https://birminghamairport.co.uk/about-us/community-and-environment/community-investment/>

Engine Ground Running

Engine ground running, or engine testing, is required after essential maintenance to ensure aircraft can safely be returned to service and only takes place when absolutely necessary. To minimise disturbance from ground running, we operate an Engine Ground Running Policy which specifies locations to create the least noise disturbance to local residents while meeting operational needs, and restrictions that mean full power engine ground runs (which produce the most noise) can only take place between 06:00 and 23:00 (Monday to Saturday), 08:00 until 10:30 and then 12:30 until 23:00 on Sundays. All engine ground runs require prior approval from the Airfield Duty Manager and we compile monthly reports on a quarterly basis for the Airport Consultative Committee. We know engine ground running is a key concern in Marston Green and will continue to work hard to minimise its impact on the village.

Bird Control

The potential for collisions between aircraft and birds poses a serious risk to safety and it is the role of the Airfield Safety Unit to minimise this risk. Their vigilance means that the number of strikes has been falling in recent years. Habitat management plays an important part in reducing the risk, both on the airfield (where grass is cut to a specific height to discourage birds) and nearby. This is why, although we know that residents prefer to see it well-vegetated, we have had to reduce the amount of vegetation on the noise bund at the rear of Elmdon Lane. We have a number of other tactics to deter birds from frequenting the airfield, including the use of pyrotechnic cartridges which produce a loud bang and the broadcasting of species-specific distress calls from airport vehicles, both of which may be audible to residents. As a last resort, firearms are occasionally deployed on the airfield under strictly licensed conditions.

Go-Arounds

A Go-Around is the term used to describe a procedure to deal safely with an aircraft that aborts its landing during final approach. A go-around may take place when the aircraft landing in front is slow to vacate the runway, or if an aircraft given clearance to take off is slow to do so. Alternatively, adverse weather conditions such as crosswinds may cause the pilot to decide it is not safe to continue with the landing. Whatever the cause, pilots are well-trained for these situations and the procedure is safe; indeed it is designed to prevent dangerous situations from arising. Once a go-around is initiated, the crew will apply take-off power to climb away from the airport and this may be very noticeable in Marston Green.

The published procedure generally takes aircraft west of the airfield as the aircraft repositions for another approach, although it may be directed elsewhere to maintain safe separation. While they are not uncommon, go-arounds are relatively infrequent and may therefore be noticeable when they do occur.

More about weather

As we've seen, wind direction is the main factor that determines the direction that the runway at Birmingham is used. However, there are other weather-related factors that can have an impact. One issue of particular relevance to Marston Green is the prevailing wind. As the wind rose shows, the predominant wind direction experienced at the Airport (and indeed the UK in general) is from the west or south-west, which of course means that it carries the sounds of the airfield into the village.

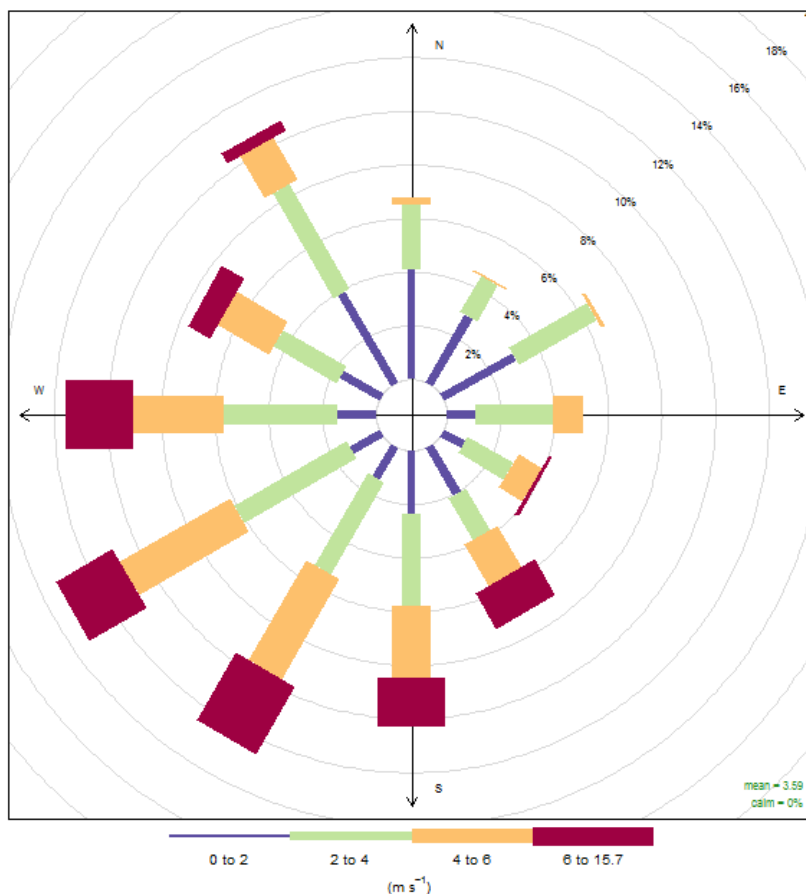
The primary noise bund which runs along the rear of houses in Elmdon Lane and the secondary noise bund, protecting properties in the Foredrift and Digby Drive, do reduce the noise impact somewhat, but clearly cannot offer complete protection.

Varying levels of cloud cover will also influence how much

noise residents hear, with low cloud tending to bend sound waves downward toward the ground, which can increase the noise level you might experience. Temperature inversions, where cold air is pooled at the surface while warmer air sits above it (often resulting in fog after cool clear nights), have the same effect on noise as does cloud cover, slowing the atmospheric absorption of the sound waves and causing aircraft to sound louder.

Extreme weather may cause aircraft to deviate from the usual flight paths. Pilots are sometimes instructed by ATC to take a non-standard route shortly after taking off to avoid thunderstorms, which can cause severe turbulence. Often the storm cell involved may be some miles away from Marston Green and its presence is not apparent to anyone on the ground in the village. Although relatively uncommon, these 'weather avoidance' procedures may mean you sometimes see aircraft where you are not used to seeing them.

Something that we often notice is that there will be a spike in complaints when changes in runway direction are implemented after a prolonged period of settled weather. Sometimes the runway is used in the same direction for a period of days, even weeks. When the weather shifts and the runway direction is reversed, some residents become very aware of aircraft and believe we have changed flight paths, whereas in reality, there has been no such change, just a reversion to operating procedures that have not been used for some time. Living in such close proximity to the Airport, Marston Green residents are less likely to experience this effect.



Airfield Wind Rose, colour coded by speed in metres per second. The grey circles indicate the % of time over a year that the wind was measured from each direction

Keeping track

As near neighbours of Birmingham Airport, residents of Marston Green will always be affected by aircraft operations. It is our job to ensure that we keep that impact to a minimum and one of the most important ways we can achieve this is by monitoring how well our policies and procedures are working.

To do so we operate a sophisticated system known as ANOMS – the Airport Noise and Operations Monitoring System. ANOMS uses radar data to record details of the height, speed and position of every aircraft operating into and out of Birmingham. ANOMS allows us to record and replay actual tracks over the ground and when matched against noise data from our six community noise monitors, we have a set of highly accurate data with which we can measure the impact of aircraft activity.

One example of how we use ANOMS is to record Track-Keeping Performance, which refers to the ability of aircraft to fly within the NPRs until they reach the required altitude of either 3,000 or 4,000 feet, depending on which route they are. Each NPR is monitored and analysed by the system and any aircraft leaving the NPR below the required altitude is recorded as 'off track'.

We can use this information to work with the airlines to improve track-keeping and we report our statistics through the Airport Consultative Committee and Solihull Metropolitan Borough Council, which monitors the Airports compliance with its Section 106 Planning Agreement with the Council. We also use ANOMS to investigate individual complaints, where it provides us with the accurate information we need to discuss residents concerns in more detail.

And finally....

We hope you find this guide to how airport operations affect Marston Green useful. We hope too that it has answered some of the questions you may have had. If not, the Sustainability Team is always happy to discuss your individual concerns. You can contact us by completing the form on our web site at: <https://www.birminghamairport.co.uk/community-complaint>

