

Arrivals



Unlike departing aircraft, there are no set routes leading to the final approach for arriving aircraft; neither are there any noise limits or fixed heights. This is because arriving aircraft approach UK airspace in a random pattern and then have to be sequenced to ensure safe separation. When the airport is busy, arriving aircraft may be held by Air Traffic Control (ATC) in a 'stack' before being instructed to make their final approach. Please see our leaflet on Aircraft stacks for more information.

ATC ensure that the planes are sequenced for safe separation by controlling the speed and lengths of routings prior to the aircraft being turned on to final approach. Aircraft are finally directed onto the Instrument Landing System (ILS).

The ILS

The ILS is a beam which is aligned with the runway centreline in order to guide aircraft in a straight line approach to the runway threshold for landing. It consists of two signals, one giving vertical guidance (the glideslope) and the other indicating whether to fly left or right in order to line up with the runway (the localiser). The beam has a protected range which extends out a horizontal distance of 25 nautical miles (nm). The glideslope at Heathrow is set at 3°, which is the angle recommended by the International Civil Aviation Organisation (ICAO) for commercial aviation for safety reasons. Steeper angles are generally only accepted if required to avoid obstacles. They are not recommended for any other reason.

As a result of the set 3° approach angle, aircraft using the ILS will be at a set height for distance from the runway. At the same distance, each aircraft will be at about the same height.

Landing is of course a very busy stage of flight and it is essential for safety reasons that aircraft are stabilised in their approach some distance from touchdown. This means that amongst other things the aircraft must be set up for landing, not turning and have their approach speed stabilised.

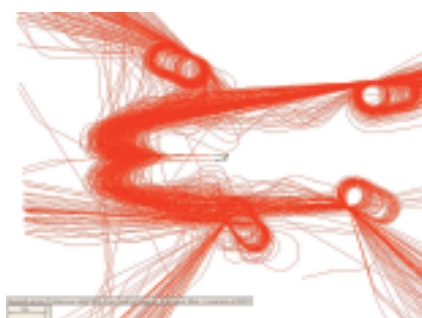
Therefore, ATC have discretion over where they direct aircraft to join the ILS in the interests of separation and safety to allow aircraft to be stabilised at an appropriate distance from touchdown. It is for these reasons that the aircraft must arrive in a straight line down to the runway. It is not possible for this procedure to be avoided.

Therefore any area beneath the ILS will necessarily be overflowed by arriving aircraft. Additionally any areas to the sides of the ILS can be overflowed by aircraft being directed to the ILS. Aircraft arriving at Heathrow airport will join the ILS from both the north and south.

The wind

For safety reasons, aircraft must take off and land into the wind. Most of the time at Heathrow, the wind comes from the west. This is known as a westerly wind. Therefore, because aircraft must land into the wind, they will usually arrive from the east (that is over London). However, when the wind is coming from the east (an easterly wind), aircraft will arrive from the west (that is over Windsor).

The direction of the wind is assessed at the airport at ground level and at 1,000ft and 2,000ft by ATC and also with reference to reports from aircrew. It is important to note that the wind on the ground at the airfield can vary from that even locally. Additionally, the wind experienced at 1,000ft and 2,000ft can be very different from that experienced at ground level. It is therefore not possible to rely on local wind direction you may experience at your property or on weather reports.



A typical day of easterly arrivals.

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A typical day of westerly arrivals.

Although the direction of the wind is the predominant factor which affects which direction the planes must land (and take off in), at Heathrow, government policy is that unless the wind is too strong, planes should always take off to the west (towards Windsor). This means that unless the wind is too strong, they should therefore arrive from the east (over London). This is known as the 'westerly preference'. However, if the wind is from the east and is over 5kts (little more than a breeze), aircraft will take off to the east and so arrive from the west (over Windsor).

Please note that the westerly preference does not operate at night. In 2001 the Department for Transport (DfT) introduced a weekly rotation of easterly and westerly operations, where weather conditions permit, at night. Therefore, at night, when there is little or no wind, the preference will be easterly one week and westerly the next. The aim is to provide a more even split of easterly and westerly operations during the night.

What does this mean locally?

On average, annually approximately 70% of arrivals come from the east (over London) and about 30% from the west (over Windsor). The exact percentages vary from month to month and year to year. As it is due to wind direction, the direction of operation cannot be controlled or predicted.

Noise abatement procedures for arriving aircraft

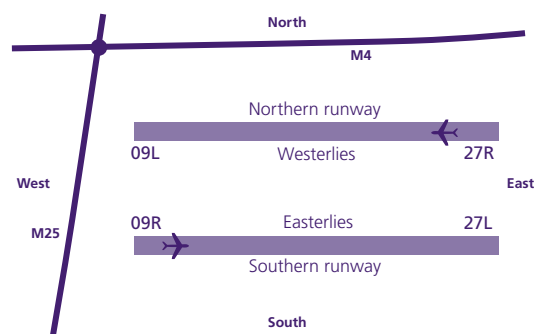
The government does not set any noise limits for arriving aircraft. However, there are various noise abatement procedures in force to minimise the impact of arriving aircraft on both the local and wider community. These are:

- **Runway alternation**

A system of runway alternation was introduced in the 1970s for landing aircraft during westerly operations (i.e. when aircraft arrive over London). This is possible because Heathrow has two runways which are parallel to each other and so planes can arrive from the east but land on either the northern or southern runway. The reason for landing runway alternation is to provide predictable periods of relief from the noise of landing aircraft for communities under the final approach tracks to the east of the airport.

The pattern of alternation has been modified several times since the 1970s and in 1999 was extended to the night period.

Runway alternation applies to landing aircraft. Therefore, aircraft taking off during westerly operations can use either runway, but most use the runway that is not in use for arrivals.



Heathrow's runways

The current alternation pattern

The present pattern provides for one runway to be used by landing aircraft from 06:00 until 15:00 hours local. The other runway is then used from 15:00 hours local until after the last departure.

On Sunday each week the runway used before midnight continues to be used for landings until 06:00 hours local. This means early morning arrivals before 06:00 hours local use a different runway on successive weeks and that the runways used by landing aircraft before and after 15:00 hours local also alternate on a weekly basis.

De-alternation & TEAM

Whilst every effort is made to adhere to the alternation programme, there are occasions when, for short periods, unforeseen circumstances mean that changes in the procedure need to be made at short notice. For example, occasionally for safety reasons it is necessary for aircraft to land on the runway not scheduled for landings.

Additionally, if there is a build-up of traffic in the stacks, or within UK and neighbouring airspace, ATC may need to change from the published schedule. This in order to maintain minimum separation distances between inbound aircraft, maintain usual high safety standards and keep air traffic flowing. In these circumstances, ATC may use both runways for arrivals for a short period. This is referred to as Tactically Enhanced Arrivals Mode (TEAM).

06.00 - 07.00 hours local

The government have confirmed that runway alternation between 06.00 – 07.00 hours local is now a permanent arrangement, "subject to operational requirements". Therefore, whilst there is a designated landing runway during that period, we are able to use both runways to land arriving aircraft to ease congestion and a build up of delays.

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A typical day's alternation pattern may look like this:

| Times (hours local) | Runway |
|------------------------------|-----------------|
| 06:00 - 15:00 | Southern runway |
| 15:00 - until last departure | Northern runway |
| Last departure - 06:00 | Southern runway |

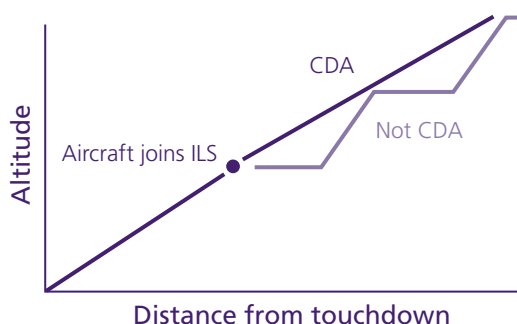
Please see the current runway alternation programme on our website.

Runway alternation and easterly operations

Runway alternation does not operate in the daytime during easterly operations due to the Cranford Agreement. For more details of this see our publication on departures.

• Continuous Descent Approach

Subject to safety requirements, one of the main noise abatement measures is Continuous Descent Approach (CDA). A CDA is a noise abatement technique of flight during which a pilot descends at a rate with the intention of achieving a continuous descent to join the glide-path at the correct height for the distance. This procedure thereby avoids the need for extended periods of level flight. The intention of a CDA is to keep aircraft higher for longer, using reduced thrust and thereby reducing arrival noise. In terms of noise, CDA will benefit areas further from the airport before aircraft join the ILS.



Model CDA and Non CDA arrivals

Note – The angle of approach is exaggerated for illustrative purposes. The angle of approach once established on the Instrument Landing System (ILS) is 3°. There is no set angle for a CDA.

A CDA is not a precise art and relies on the accuracy of track miles provided by Air Traffic Control to the flight crew, pilot skill, weather and operational circumstances. Additionally, different aircraft types perform differently requiring varying operating practices to be able to slow the aircraft down and meet speed restrictions. The requirement to fly a CDA is therefore not compulsory, rather it is to fly a CDA whenever practicable.

Additionally, there is often a requirement for a period of level flight prior to joining the ILS to meet the ICAO approach of joining the ILS from below and for NATS speed and sequencing requirements. There are no set height requirements for CDAs.

In addition to aiding noise reduction, CDAs reduce fuel-burn thereby cutting emissions and producing an overall environmental benefit.

Percentage CDA achievement:

| Times (hours local) | 2002 (%) | 2010 (%) |
|-----------------------|----------|----------|
| Night (23:30 – 06:00) | 90 | 94 |
| Day (07:00 – 23:00) | 77 | 83 |

The CDA compliance levels are regularly reported back to our Noise and Track Keeping Working Group and the Heathrow Airport Consultative Committee as well as the Flight Operations Performance Committee (FLOPC), which includes airline and ATC representatives.

A voluntary code of practice is in place which was compiled by a group representing BAA, airlines, NATS, Civil Aviation Authority, airports and the Department for Transport, Local Government and the Regions (DTLR) (now DfT). The code encourages air traffic controllers and pilots to seek to facilitate a continuous descent approach in the descent from 6000 ft. The code was originally produced in 2002 and later revised in November 2006.

• 'Joining Point Rules'

There are rules which dictate at which point aircraft must be established on the ILS before being able to descend further. At night the requirement is 500ft higher than during the daytime. During the day and at night aircraft are not permitted to fly below the glideslope i.e. they must be established on the ILS by a certain height and distance from touchdown. The aim of these rules is to keep aircraft higher for longer and avoid prolonged periods of level flight at low levels. These rules will benefit areas closer to the airport.

Arrivals

- **Limiting the use of reverse thrust**

Reverse thrust is a way of slowing down planes once they have landed. It is not used in the air. Sometimes, for example, on a wet runway, reverse thrust must be used for safety reasons. However, to reduce disturbance in areas close to Heathrow, pilots are asked not to use reverse thrust after landing between 23:00 and 06:00 hours local, unless they need to for safety reasons.

- **Financial Incentives**

All airports charge airlines to use its facilities. At Heathrow we charge noisier aircraft more to land than we do for quieter aircraft. This acts as an incentive to airlines to introduce quieter fleets. For full details see our section 'What we do about it' on our website.

Our other factsheets

Please see our other fact sheets which provide information on:

- Departures
- Go arounds
- Aircraft stacks
- Night flights
- Aircraft noise on the ground
- Heathrow and helicopters
- The legal overview.

Further information

If you would like further information, please contact the Flight Evaluation Unit:

By telephone: 0800 344 844

By e-mail: noise_complaints@baa.com

By post: Flight Evaluation Unit
Second Floor Meridian
The Compass Centre
Nelson Road
London Heathrow Airport
Hounslow
TW6 2GW

Website: Make an enquiry on our website:
www.heathrow.com/noise

Please note that the freephone telephone number is an answerphone between 4.30pm and 8.30am. Please leave your name, contact details and brief details of your enquiry. A member of the FEU will contact you as soon as possible. Between 8.30am and 4.30pm, your call will be answered whenever possible.