

RUNWAY SELECTION

Weather, in particular wind speed and direction, is generally the main factor in determining which runways are in use at an airport, in which direction aircraft will take off and land and which flight paths are used.

At all times, the safe operation of aircraft will be the primary consideration.

This factsheet explains how runways are selected for use, limitations on runway selection and how runways are named.

The decision of which runway is in use at any time can have an impact on aircraft noise experienced by residents around airports.

Air traffic control tries to minimise the number of aircraft flying over residential areas when arriving or departing from an airport.

RUNWAY NAMES

Runways are named using a numbering system which reflects the runways' orientation. The number, between 01 and 36, correlates to the degrees on a compass.

This means that:

- a runway numbered 09 points east (90°)
- a runway numbered 18 points south (180°)
- a runway numbered 27 points west (270°)
- a runway numbered 36 points to the north (360° rather than 0°).

A runway can normally be used in both directions, and has a different name to refer to each end. For example, 'Runway 09' in one direction is west to east, 'Runway 27' is east to west when used in the other direction. The two numbers always differ by 18 (180°).

Some airports have parallel runways, or runways which run 'next to' each other. These are identified by adding Left (L), Centre (C) or Right (R) to the runway number.



This can be seen in the photograph of Archerfield Airport (pictured below) with Runway 10L and Runway 10R. When used in the opposite direction, Runway 10R becomes Runway 28L.

SELECTION OF RUNWAY IN USE

Aircraft take-off and land into the wind, or with minimal tail wind. Based on the wind direction, air traffic control will decide which runway is to be used at any given time.

Larger airports tend to have more than one runway, so that a runway is always available depending on the wind direction. Airports with just one runway are generally constructed so that the runway is aligned with the prevailing wind.

Runway selection is monitored at all times, as weather conditions can quickly change. Every runway has a wind indicator known as an 'anemometer', and wind observations contribute to the runway selection decision. Pilot reports of upper level winds can also impact on runway selection.

When a runway is selected, it needs to be available for an extended period of time to allow pilots to plan their descent, approach and landing. As this involves anticipation of developing trends, aircraft may continue to land on a runway for a period when weather conditions at a local level no longer appear to warrant it.

Other factors that air traffic control will take into consideration when deciding which runway to use include:

- the number and type of aircraft programmed for the airport
- length of runway(s)
- weather conditions (both present and forecast); including wind velocity and gradient, wind shear, wake turbulence effects and position of the sun
- availability of approach aids in poor visibility conditions
- location of other aircraft
- taxiing distances, including availability of taxiways
- braking conditions.

Some airports also have 'preferred runway' systems. This means that if wind conditions, workload and traffic conditions permit, a particular runway will be used to move traffic as efficiently as possible to reduce the noise impact over residential areas.

SEASONAL TRENDS

In many Australian cities, prevailing winds vary by season. This means that one runway may get used more in one season than in another. As a result, some communities may be affected predominantly by noise from arriving aircraft in one season, and by departing aircraft in another.

NOISE VARIATION WHILE CHANGING RUNWAYS

A sudden change of wind direction when the wind is strong may require aircraft established for arrival on one runway to divert to land in the opposite direction. This can require an immediate operational change. In these circumstances, air traffic control will safely divert aircraft. This can lead to aircraft using flight paths over areas that generally experience few overflying aircraft.

LIMITATIONS ON RUNWAY SELECTION

Operating in strong tailwind and crosswind conditions can have adverse effects on aircraft performance during take-off, approach and landing. Certain conditions set out in the table following generally preclude the use of a runway.

Completely dry	Crosswind exceeds 20 knots (KT) including gusts
	Downwind exceeds 5 KT including gusts
Not completely dry	Crosswind exceeds 20 KT including gusts
	There is a downwind component

Air traffic control may nominate a runway when a crosswind or downwind exceeds these conditions:

- if an alternative runway does not exist
- if a landing is not possible on an alternative runway
- if noise abatement procedures recommend the use of that runway and air traffic control considers that this would not compromise safety.

The decision to take off or land rests solely with the pilot-in-command. The pilot must ensure that the runway is suitable for the operation of the aircraft. When a pilot asks for an alternative runway for operational reasons, this will be provided without the aircraft being delayed.

FURTHER INFORMATION

Specific noise abatement Procedures (NAP) for individual airports may be found at: www.airservicesaustralia.com/aip/current/dap/AeroProcChartsTOC.htm

Information on the Sydney Airport Long Term Operating Plan (LTOP) may be found at: www.airservicesaustralia.com/publications/reports-and-statistics/sydney-airport-and-associated-airspace-ltop

Airservices has published other factsheets about aircraft operations and noise, which can be found at: www.airservicesaustralia.com/aircraftnoise/factsheets