



Western Sydney International (Nancy-Bird Walton) Airport

Aircraft noise

Understanding aircraft noise

The level of noise heard from an aircraft during take-off, landing and during flight can vary. Aircraft noise is affected by a number of different factors, including:

- **Weather** – the noise experienced varies significantly depending on the wind speed and direction, the season and cloud cover. For example:
 - temperature and humidity affect an aircraft's ability to gain height
 - wind direction affects the direction a plane will fly because aircraft land and take off into the wind
 - cloud cover and temperature inversions will refract sound waves, making aircraft noise seem louder.
- **Height of an aircraft** – the higher an aircraft is the less noise is generally heard on the ground.
- **Changes in engine thrust** – the thrust used affects the amount of wind resistance and noise experienced.
- **Type of aircraft** – different planes have different noise profiles dependent on size and engine types.
- **Topography** – the elevation and shape of landforms affect the noise experienced. Higher elevations are closer to the aircraft overhead than at sea level. Noise from aircraft also bounces off valleys and mountains affecting the noise experienced.

People react differently to noise and this can be influenced by many different factors, including surroundings and other activities happening in the background.



Aircraft noise and Western Sydney International (Nancy-Bird Walton) Airport

The operation of the Western Sydney International (Nancy-Bird Walton) Airport (WSI) will result in changes to the pattern and exposure of aircraft movements in Greater Sydney through the introduction of new aircraft operations.

The most effective way of protecting communities from aircraft noise is appropriate land use planning to prevent new residential development in areas where aircraft noise will be highest. Planning controls that limit the amount of noise-sensitive development in the areas closest to WSI have been in place for nearly 3 decades.

Communities in Greater Sydney will be affected by noise from aircraft during take-off, landing and when in flight. The greatest impacts are predicted to be experienced in locations closer to the airport, under or near the aircraft departure and arrival routes.

The geographic extent and level of aircraft noise exposure from operation of the airport is complex and dependent on final flight paths, operating procedures, time of day, season, weather conditions and other factors.

Measuring aircraft noise

In Australia, exposure to aircraft noise at major airports is measured using a number of tools that include the Australian Noise Exposure Concept (ANEC), Australian Noise Exposure Forecast (ANEF), the Number Above 'N' and the Single Event Maximum Noise Level (LAMax).

These tools are used to inform land use planning around an airport site and for assessing the impacts of aircraft noise.

Australian Noise Exposure Concept

An ANEC for the airport was generated for the 2016 WSI Stage 1 Development Environmental Impact Statement (EIS), based on the runway direction and indicative 'proof-of-concept' flight paths for take-offs and landings.

An ANEC is a cumulative noise measure which:

- illustrates aircraft noise exposure based on operation scenarios
- shows expected exposure levels from an average day's anticipated aircraft movements, calculated over a 12-month period.

The coloured areas shown on the map below are noise exposure zones, displayed in representative units of 20, 25, 30 and 35+. The higher the numbers, the higher the levels of noise exposure. These units are not decibel measurements, they are representative units generated from a noise model which factors in aircraft types and performance, points of origin and destination, noise level and pitch, and the number and time of movements.

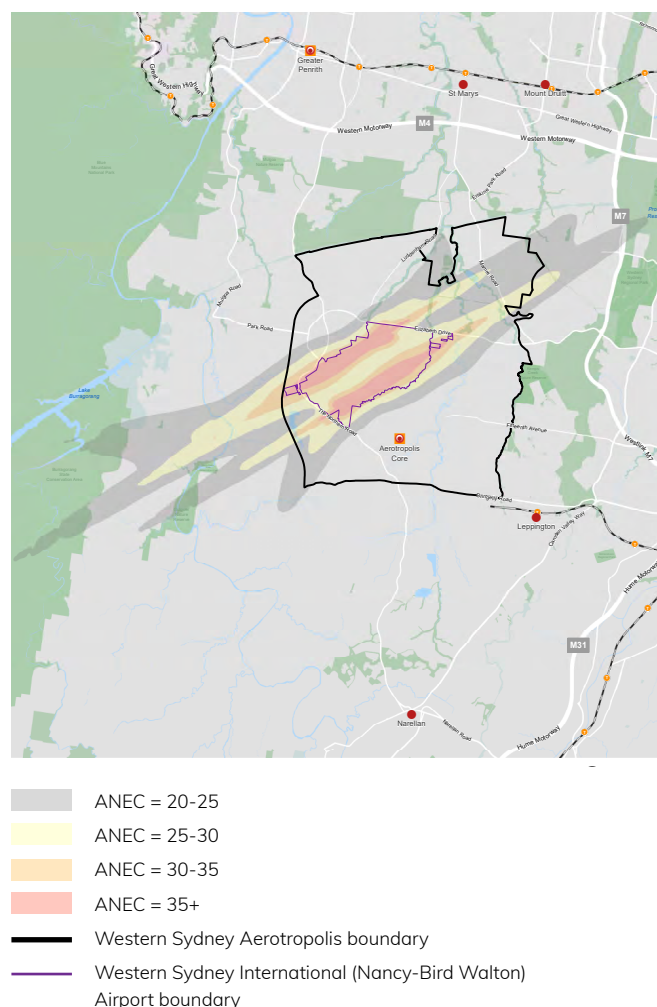


Figure 1 Combined ANEC for the 05 and 23 operating modes for long-term airport operations.

Source: Western Sydney Aerotropolis Plan 2020

Australian Noise Exposure Forecast

An ANEF chart is a more refined ANEC, generated based on the final approved flight path design. ANEF noise zones are formally endorsed for technical accuracy and practical operational application by Airservices Australia – the Government air navigation service provider. ANEFs are published for all federally leased airports.

An ANEF chart shows a forecast of aircraft noise levels based on approved flight paths. Landowners with properties outside of the ANEF zones may still experience aircraft noise. To recognise and communicate this, other noise exposure measures, such as those outlined in this fact sheet, have been developed so residents can better understand forecast noise levels.

Number Above ('N') and Single Event Maximum Noise Level (LAmax)

In order to assist in understanding the impacts of aircraft noise, additional measures are generated to illustrate aircraft noise exposure at certain locations. Two of the most commonly used in Australia are the Number Above ('N') and Single Event LAmax.

The 'N' measure is based on the intensity and frequency of individual aircraft noise events experienced on an average day, and is intended to convey information in a way that communities may understand better than ANEF charts. This measure is presented in decibels and indicates how many aircraft noise events are predicted to exceed a particular decibel level each day. For example, the N60 or N70 measures show the number of aircraft noise events above 60 or 70 decibels that would be experienced on an average day.

In addition, the LAmax measure shows the maximum noise levels predicted at a location, during a series of flyovers by specific aircraft.

Flight path design and further noise assessment

The 2016 EIS for WSI used a combination of the ANEC, Number Above and LAmax measures to describe the level of noise exposure predicted for proof-of-concept flight paths for the Airport.

Final flight paths are subject to further environmental assessment and community consultation. The process to finalise the flight paths will seek to further reduce aircraft overflights of residential areas and minimise noise impacts on communities and noise-sensitive areas.

An ANEF for WSI will be available once the flight paths have been finalised and the environmental assessment has been approved.

Noise insulation and property acquisitions

The Australian Government is currently developing a noise insulation and property acquisition policy in relation to aircraft overflight noise for buildings outside the Airport site. A draft policy will be released for public comment in mid-2023, as well as the draft EIS for WSI flight paths.

For more information

- www.westernsydneyairport.gov.au
- 1800 038 160
- WSIflightpaths@infrastructure.gov.au