

A Guide to Understanding Aviation Noise and Noise Forecasts Camden Airport Preliminary Draft Master Plan

Sound is a normal part of every day life. It provides a vast array of functions in our life and is often not given a second thought, until the sound becomes annoying, unpleasant or unwanted, at which it is referred to as “noise”.

Noise in general is a complex and subjective issue, and aircraft noise is no different. Many of the ways used to describe sound itself rely on complex terms such as non-linear metrics and is often not easily understood.

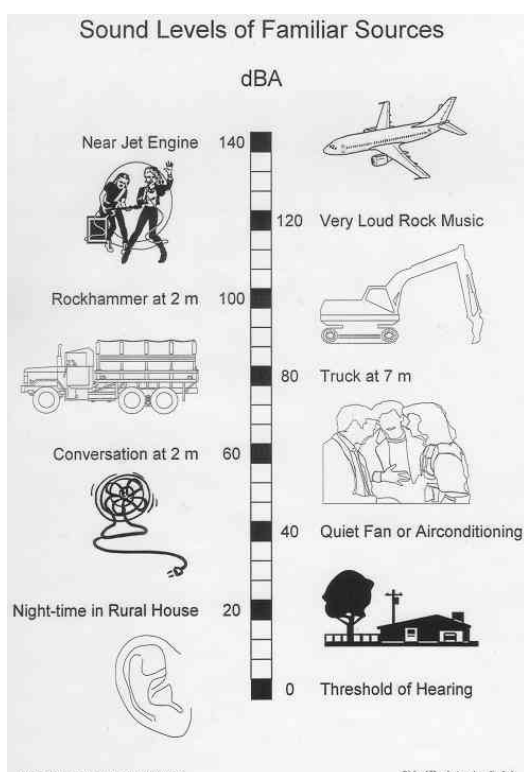
The decibel (dB) is used to measure sound level. The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an “A-weighting” filter that has a frequency response approximately equivalent to a typical human ear.

Different sources having the same dBA level generally sound about equally loud. A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.

How noisy and annoying a sound is depends not only on the physical properties of the sound, but also on human auditory characteristics and individual sensitivity. As a result, human reaction to noise varies widely from individual to individual.

The table below shows the sound levels typically associated with some common activities:

Activity	Typical Noise Level dBA
Quiet Room	28 – 33
Background Music/Radio	50
Rainfall	50
Microwave Oven	55 – 60
Washing Machine	65 – 70
Inside Car, Windows Closed, 50km/h	68 – 73
Main Road	70
Vacuum Cleaner	85 – 90
Circular Saw	100 – 104



Building Type	Acceptable	Conditional	Unacceptable
House, home unit, flat, caravan park	Less than 20 ANEF1	20 to 25 ANEF2	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF1	20 to 25 ANEF2	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF1	20 to 25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF1	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Note 1: The actual location of the ANEF contour is difficult to define accurately, mainly because of variation in aircraft flight paths. Because of this, the procedure of Clause 2.3.2 may be followed for building sites outside but near to the 20 ANEF contour.

Note 2: Within 20 to 25 ANEF some people may find that the land is not compatible with residential or educational uses. Land use authorities may consider that the incorporation of noise control features in the construction of residences or schools is appropriate (see also Figure A1 of Appendix A of AS2021-2000).

Note 3: There will be cases where a building of a particular type will contain spaces used for activities which would generally be found in a different type of building (eg an office in an industrial building). In these cases, Table 2.1 (above) should be used to determine site acceptability but internal design noise levels within the specific spaces should be determined by using Table 3.3 of AS2021-2000.

Australian Noise Exposure Forecast

The traditional tool for noise forecasting in Australian Airport Master Plans is the Australian Noise Exposure Forecast (ANEF). ANEF is a **forecast** based on the anticipated mix of aircraft that will be operating at the Airport 20 years in the future.

The ANEFs are forecast noise levels in 20 years time, taking into account many components of noise such as intensity, duration, number of noise events with a penalty for events at night, as well as aircraft type and flight paths, amongst other factors.

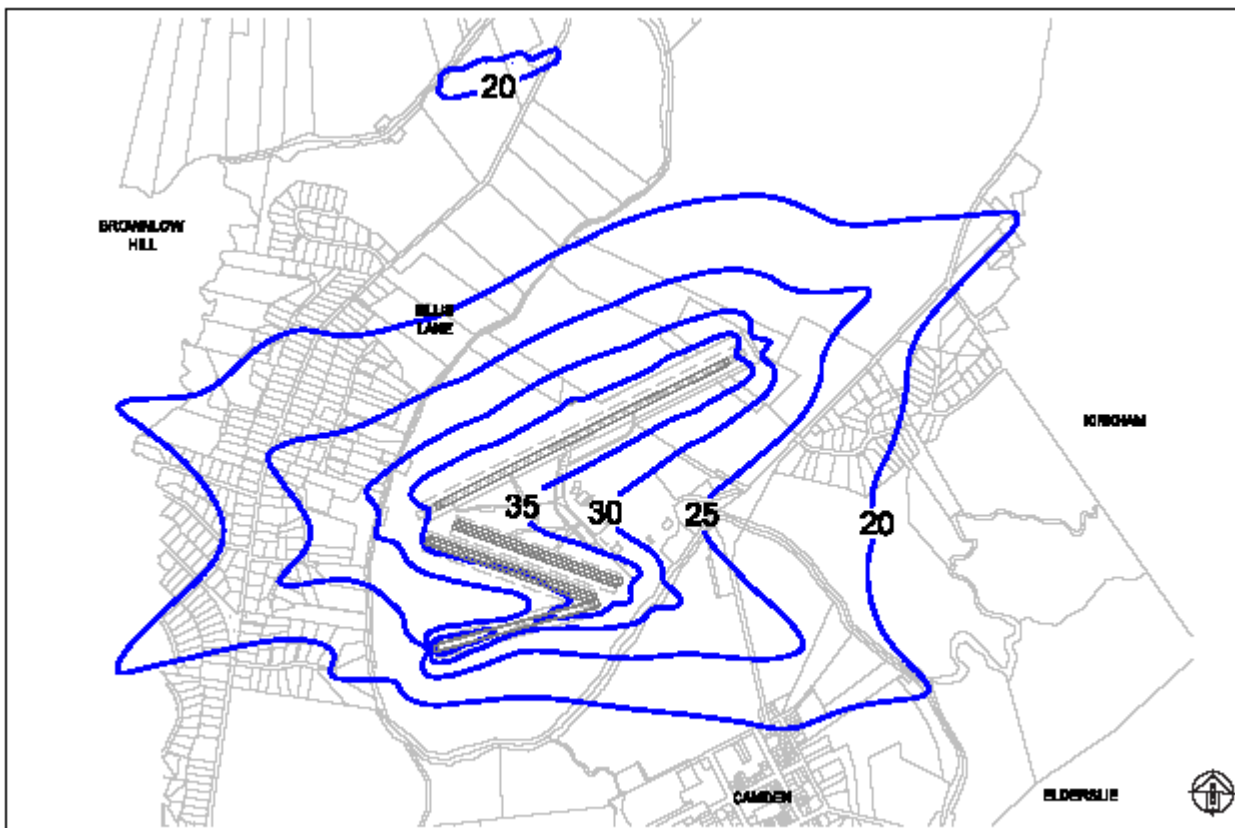
The ANEF is the Government endorsed measure used for land use planning, indicating the type of new development activity allowed in an area close to an airport using Australian Standards AS 2021-2000.

This Australian Standard places restrictions on the type of **new** development which can be built in the ANEF contours. It is **not retrospective** and existing developments are not affected by changes to the ANEF contours when there are revisions to Airport Master Plans.

The ANEF system is a “one size fits all” approach to planning, with criteria for acceptable” land usage being the same whether the land is in the vicinity of a major international jet airport (RPT) or a small regional non-jet aerodrome. The system makes no allowance for local conditions, with an airport on a “greenfield” site treated the same as one already “built out”.

The Camden Preliminary Draft Master Plans include comparative ANEFs diagrams in both the current approved Master Plan (2005) and the forecasts in the Draft Plans (2010). The Draft Plans (2010) also show aircraft flight paths, which is a recent legislative requirement.

Camden Airport is the State’s premier sport and recreation Airport with a wide variety of aviation operations from flight training, recreational aircraft such as gliders and hot-air balloons, charter operations, rotary wing operators, maintenance, and emergency services operations. The type of aviation activity on the Airport is not forecast to change over the next 20 years, remaining a Code 2B Airport.



CAMDEN AIRPORT MASTER PLAN 2010 Figure 22: ANEF 2029/30

N60

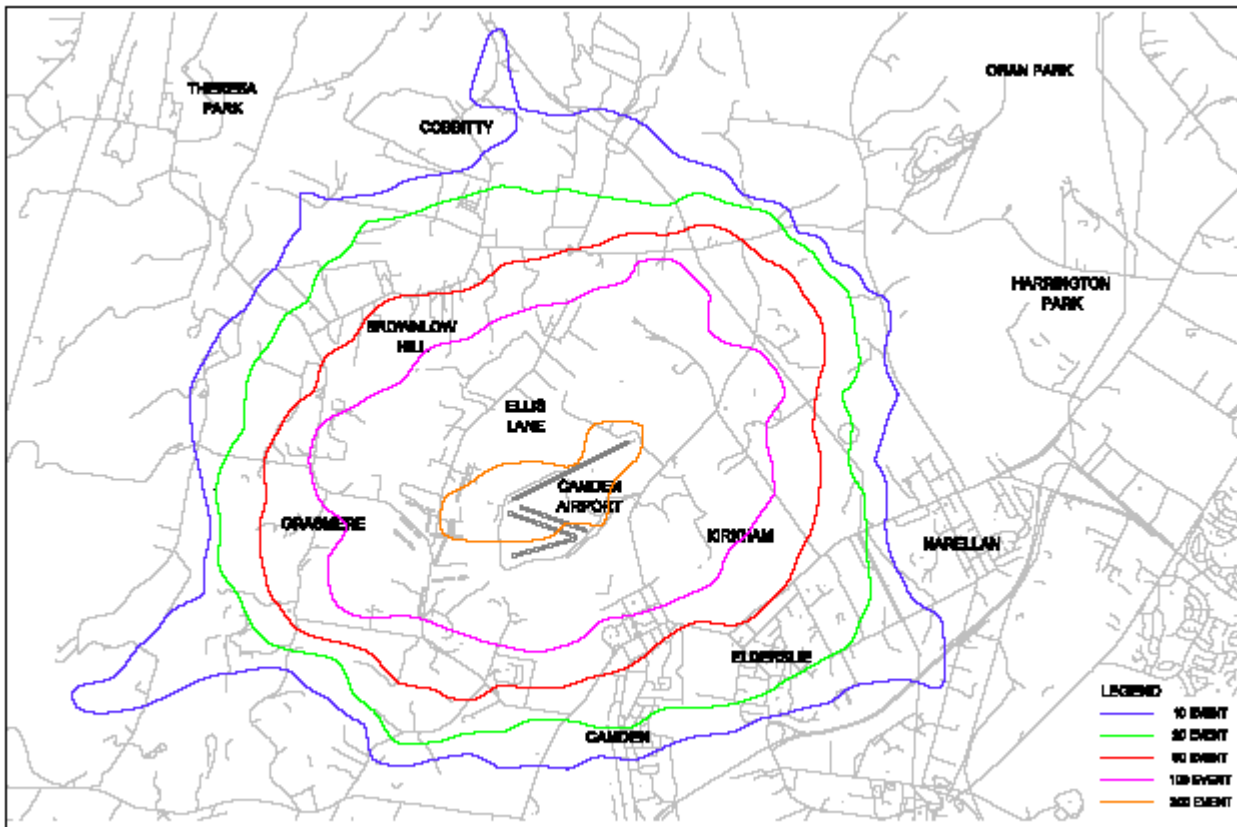
The Preliminary Draft Master Plans also include a more effective noise modelling tool, the N60. It is not required by the legislation to include this noise measure in the Preliminary Draft Master Plan and is considered to be best practice.

This tool, the N60 map is often more easily understood, as it shows the number of events per day that are 60 decibels or higher for example, the way a person perceives the noise event, rather than complex combined effects of the ANEF. This is a noise level which is equivalent to normal conversation. This noise modelling tool was used effectively in the current approved Master Plan (2005) and the Preliminary Draft Master Plans include comparative diagrams of the N60 contours.

The contours on an N60 chart indicate the number of aircraft noise events (for example 50 or 100 events) louder than 60 dBA respectively which are expected to occur on the average day.

It is easier for most people to conceptualise noise impact using “number above” contours like the N60 because they represent aircraft noise in the way a person perceives it - as a series of events, some of which are perceptibly intrusive.

The Preliminary Draft Master Plan includes N60 contours based on the 2029/30 ANEF.



CAMDEN AIRPORT MASTER PLAN 2010 Figure 23: N60 Map 2029/30

Changes in Noise Contours from the 2004/05 Master Plan

There have been changes to the shape and extent of the 2029/30 ANEF contours when compared with the ANEF contours for 2024/25 contained within the current 2004/05 Master Plan. There have also been changes, but to a lesser extent, in the N60 contours.

The number of flights on Camden Airport is forecast to grow an average of 3.3% (compound annual growth rate) per year over the next 20 years.

The Preliminary Draft Master Plan shows a change in the Australian Noise Exposure Forecast (ANEF) diagram contours around the Airport. The ANEF diagrams are forecasts of the expected level of aviation activity in the year 2030.

- The growth in aviation traffic at Camden Airport arising from growth in the General Aviation industry. The ANEF current approved Master Plan was based on a traffic forecast of 136,000 aircraft movements in 2025, rather than the 145,647 aircraft movements used for the 2029/30 ANEF. Current annual movements at Camden Airport in 2008 were approximately 62,000 movements
- The modelling used include the use of more realistic forecasts for traffic and aircraft type
- More accurate modelling of traffic patterns, particularly with respect to the use of the powered aircraft cross-wind runway (Runway 10/28)
- The inclusion of the glider strips (and associated activity) and helicopter movements in the ANEF analysis for the first time
- Software advances in the Integrated Noise Model including improved noise profile information for aircraft and helicopters
- Improved modelling techniques including the dispersion of circuit tracks to account for deviations from nominal flight paths

Aircraft Noise Reduction Technologies

The ANEF included in the Preliminary Draft Master Plan has been calculated based on the assumption that the same types of aircraft will be operating in 20 years time operating at Camden Airport today. The majority of current aircraft types operating at Camden Airport are reaching the end of their product life and by 2030, these older aircraft will be replaced by newer, more advanced, aircraft types that are significantly quieter.

The 2029/30 ANEF contours shown in this Preliminary Draft Master Plan therefore represent a “worst case” expectation for aircraft noise in 20 years time.

Camden Airport has developed Noise Abatement Procedures to encourage pilots to consider the local community when taking off and approaching the Airport. The Airport has also regulated ground running to minimise the noise impact from ground based aircraft operations such as maintenance checks.

The Airport works with local governments such as Camden Council and Campbelltown City Council to advise them of the land affected by aircraft noise to ensure any new developments in these areas comply with Australian Standards AS 2021-2000.

References

1) *Discussion Paper – Expanding Ways to Describe and Assess Aircraft Noise, March 2000, Department of Transport & Regional Services.*