

## APPENDIX A GLOSSARY OF TERMINOLOGY

Ambient	The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source
ANE metric	Australian Noise Exposure. An exposure-based noise metric which represents an average of the noise of all aircraft movements occurring during a year. The average is based on a complex rating of each aircraft event, with noise adjustments applied to movements that occur during the evening/night period to account for increased sensitivity to noise during this period.
ANEC	Australian Noise Exposure Concept. A contour map showing forecast of aircraft noise exposure around an aerodrome for a future year. It is based on a forecast of aircraft movement numbers, operating times, types, destinations and flight paths
ANEF	Australian Noise Exposure Forecast. A reviewed and endorsed ANEC by Airservices Australia or Department of Defence. It is the only contour map with status in land use planning decisions for aircraft noise exposure
ANEI	Australian Noise Exposure Index. A contour map based on historical data from a previous year, where the numbers and types of aircraft which used the aerodrome are known. The map provides the average daily aircraft noise exposure around the aerodrome for that year. ANEI are typically used as benchmarks or an indicator of change in aircraft noise exposure
(Annual) Average Day	Number of daily movements based on the total flight operations/movements during a defined operating period divided by number of operating days during period. In Australia, the concept of annual average day is commonly used, i.e. the total number of annual flight movements divided by 365 days
AGL	Above ground level
ASL	Above sea level
A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear. All A-weighted sound pressure levels in this report are designated by the subscript 'A' e.g. $L_{Aeq}$ or $L_{Amax}$
day	As defined by Australian Noise Exposure Forecast system (7 am – 7 pm)
dB	Decibels – the unit of sound pressure and sound power levels Sound pressure levels are expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
ft	Feet. Unit length 0.3048 metres
INM	Integrated Noise Model. A computer program used to model the impact of aircraft noise developed by the US Federal Aviation Administration
knots	Unit of speed, equivalent to 1 nmi/hr (1.852 km/hr)
$L_{Aeq}$	The equivalent continuous sound level. This is commonly referred to as the average noise level and is measured using an A-weighting
$L_{Amax}$ or $L_{ASmax}$	The A-weighted, slow response maximum noise level. The highest noise level which occurs during the measurement period

movement	Refers to departure or approach by an aircraft
nmi	Nautical mile. Unit length 1,852 metres
night	As defined by Australian Noise Exposure Forecast system (7 pm – 7 am)
Touch and go	Procedure regularly used by aircraft for training purposes and involves the aircraft landing on a runway and taking off again without stopping
TNIP	Transparent Noise Information Package Expert. A computer program developed by the Australian Government for the purpose of enabling output files from the INM to be processed to generate a range of alternative aircraft noise metrics such as N-contour maps.

## APPENDIX B REFERENCES

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## APPENDIX C INPUT FLIGHT OPERATIONS

In order to model aircraft noise levels, it is necessary to describe (or represent) the aircraft types that use the airport as well as which flight track they typically use.

Details of the type of operation are input into the model (i.e. arrival, departure, or circuit), and the annual number of operations per time period (day, evening, and night) are defined in the following sections.

### C1 Aircraft movements

The total annual aircraft movements for the current 2018 ANEI and future 2038 ANEC modelled scenarios are provided in Table 12 and Table 13 respectively.

**Table 12: Annual aircraft movements – 2018 ANEI**

Noise Model Designation	Arrivals	Departures	Local Circuits (Touch and Go) <sup>(1)</sup>	Total
<i>Fixed wing</i>				
GASEFP	2,561	2561	5,856	10,977
GASEFV	1,561	1561	3,595	6,717
Light twin engine	263	263	127	654
<i>Rotor wing</i>				
R44	200	200	-	400
SA365N	414	414	-	828
<b>Total</b>	<b>4,999</b>	<b>4,999</b>	<b>9,578</b>	<b>19,576</b>

**Notes:** (1) One touch and go manoeuvre equates to one departure and one arrival movement, totalling two movements

**Table 13: Annual Aircraft Movements – 2038 ANEC**

Noise Model Designation	Arrivals	Departures	Local Circuits (Touch and Go) <sup>(1)</sup>	Total
<i>Fixed wing</i>				
GASEFP	3,125	3,125	7,145	13,395
GASEFV	1,904	1,904	4,387	8,195
Light twin engine	321	321	155	798
<i>Rotor wing</i>				
R44	200	200	-	400
SA365N	505	505	-	1,010
<b>Total</b>	<b>6,056</b>	<b>6,056</b>	<b>11,687</b>	<b>23,798</b>

**Notes:** (1) One touch and go manoeuvre equates to one departure and one arrival movement, totalling two movements

## C2 Runway use

To derive the percentage runway use, a review of the Bureau of Meteorology (BoM) Cerberus weather station data was conducted. Specifically, the 9 am and 3 pm wind direction data for years between 1987 and 2019 was available for review. It was assumed that arrival and departure movements for all aircraft were such that the aircraft were flying into a headwind, best practise and as generally required by law.

Based on the main runway orientation and the grouping of wind directions, the analysis of the wind direction data resulted in the general Tyabb Airfield percentage runway use for fixed wing aircraft types as detailed in Table 14. These percentages were reviewed by PAC and considered acceptable for the purpose of the noise modelling.

**Table 14: Tyabb Airfield annual runway percentage – fixed wing aircraft**

Runway	17	35
Percentage use	60 %	40 %

## C3 Flight track use

Training areas for fixed wing aircraft to and from Tyabb Airfield are located in the North-East, North-West, South-East and South-West directions. Flight distribution to and from each direction for fixed wing aircraft operations was provided by PAC.

All rotor wing aircraft (helicopter) operations have been modelled as arriving and departing from the nominated 'helipad,' designated "H", located adjacent the main runway. As per the FNA, helicopter pilots are requested to vary their approach and departure tracks so that movements are not concentrated over any one particular area. Accordingly, the track distribution for these operations has been assumed to be equal between the North-East, North-West, South-East and South-West directions

The percentage direction distribution applied to all aircraft operations for both the current and future scenarios is provided in Table 15.

**Table 15: Tyabb Airfield percentage flight direction distribution**

Direction To/From	Fixed wing aircraft	Rotor wing aircraft
North-West	10 %	25 %
North-East	35 %	25 %
South-East	35 %	25 %
South-West	20 %	25 %

## C4 Night-time operations

PAC advised that the majority of flights at Tyabb Airfield occur between 9 am and 5 pm, with occasional night training for pilots to obtain night rating.

The night distribution (i.e. between 7 pm and 7 am, as defined in AS 2021) is based on a nominal value of 2 % for all aircraft operations, both the current and future modelling scenarios.

The Fly Neighbourly Advice for Tyabb Airfield discourages night circuits after 8 pm, or one hour after last light, whichever is the later. Consistent with advice from PAC, the majority of circuit operations are conducted during daylight hours only, with a nominal (albeit conservative) 1% of circuit movements are assumed to occur during the night hours (7 pm to 7 am).

The percentage of operations occurring during the night-time period (7 pm to 7 am) are provided in Table 16 for individual aircraft and operation types. These values have been applied to both the 2018 current and 2038 future noise model scenarios.

**Table 16: Tyabb Airfield percentage of night-time operations – 7 pm to 7 am**

Noise Model Designation	Arrivals	Departures	Local Circuits (Touch and Go)
<i>Fixed wing</i>			
GASEFP	2 %	2 %	1 %
GASEFV	2 %	2 %	1 %
Light twin engine	2 %	2 %	1 %
<i>Rotor wing</i>			
R44	2 %	2 %	n/a
SA365N	2 %	2 %	n/a