# Table of Contents

1. Purpose and scope .................................................................................................................. 3
2. Moorabbin Airport .................................................................................................................. 3
3. Runway naming convention and selection ............................................................................. 4
4. Air Traffic Control at Moorabbin Airport ............................................................................. 5
5. Circuit training ....................................................................................................................... 6
6. Aircraft movements ............................................................................................................... 7
7. Track density plots ............................................................................................................... 8
8. The impacts of aircraft noise ............................................................................................... 9
9. Noise Abatement Procedures .............................................................................................. 9
10. Noise and Flight Path Monitoring ...................................................................................... 10
    10.1 Aspendale .................................................................................................................... 10
    10.2 Dingley Village ........................................................................................................... 10
11. Community engagement ..................................................................................................... 10
12. Making a complaint ............................................................................................................. 11
13. Further information ............................................................................................................. 12
Attachment 1 - Moorabbin Airport Fly Friendly Programme 2011 ......................................... 13
1. Purpose and scope
The purpose of this document is to provide information on aircraft operations throughout the Moorabbin area to the community. It also outlines Airservices role in the aircraft noise management through providing information about the impacts of aircraft noise through noise monitoring, community engagement and the noise information service.

2. Moorabbin Airport
Moorabbin Airport is located approximately 21 km south east of the Melbourne Central Business District and opened in December 1949. For most of the first 40 years of the airport’s operation, it was the primary base in Melbourne for recreational flying, and flying training for amateur pilots. Today, the airport is home to over 50 aviation organisations, including 11 flying schools, with about 400 aircraft and helicopters located on site. Moorabbin Airport is one of the busiest airports in Australia with about 250,000 aircraft movements per year.

The airport is open 24 hours a day, with the Air Traffic Control tower being active seven days a week (not during night time). When the tower is closed, pilots must make radio calls to broadcast their position in the airport area.

The location of Moorabbin airport, relative to surrounding airports is depicted in Figure 1 below.

Figure 1: Locations of airfields in Moorabbin area
3. Runway naming convention and selection

The first two digits of a runway name come from a numbering system which reflects the runways’ orientation on a compass. The runway bearing the number 09, for example, would mean that it points east at 90 degrees. A runway can normally be used in both directions, and has a different name to refer to each end. For example, Runway 09 (west to east) would turn into Runway 27 (east to west) when used in the other direction. 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.

The selection of which runway to use is based on weather conditions, degree of traffic and noise abatement procedures. Aircraft generally take-off and land into the wind, or with minimal tail wind for safety and performance reasons. As a result, Air Traffic Control will decide which runway is to be used at any given time depending on wind direction. This often results in different areas around the airport being overflown by aircraft at different times of the day. This includes helicopter operations where pilots generally make their approach to or depart from the helipad into the prevailing wind. If the wind is calm or light, other factors such as the degree of traffic are taken into account when deciding which runway to use.

Moorabbin Airport has two parallel runways aligned north-south (35L - 17R and 35R - 17L) and another set of two parallel runways orientated north-east to south-west (31L - 13R and 31R - 13L). These are of a similar length from 0.8 to 0.9 km. There is a fifth runway which is shorter (0.5km), aligned south-east to north-west (04 - 22). The runway configuration at Moorabbin Airport is shown in Figure 2.

Figure 2: Runway configuration at Moorabbin Airport
4. Air Traffic Control at Moorabbin Airport

The Air Traffic Control Tower at Moorabbin Airport was constructed from 1975 – 1977 and provides Moorabbin Airport with air traffic services. Moorabbin Airport is one of the busiest helicopter training airports in Australia. Air Traffic Control services are provided over a control zone distance of three nautical miles (about six kilometres) around the Tower and up to 2500ft in the air.

Moorabbin terminal airspace operates at a Class D where air traffic controllers provide services to all flights. The majority of aircraft operating at Moorabbin airport are Visual Flight Rules (VFR) aircraft, however Instrument Flight Rules (IFR) aircraft are also permitted. Air Traffic Control separates all IFR aircraft from each other and provides information on VFR aircraft in the area. VFR aircraft receive traffic information from Air Traffic Control in respect to all other flights and pilots employ their own ‘see and avoid’ separation system during circuit training procedures.

Figure 3: Moorabbin Airport, Air Traffic Control Tower
5. Circuit training

Pilot training is a major activity at Moorabbin airport, provided by 11 flying schools with approximately 800 students per year. This accounts for about 80 per cent of aircraft movements and commercial activity on the airport. The airport is a major employment centre with over 250 flying instructors, 1,500 personnel engaged in aviation activities and 5,000 regular users such as recreational pilots.

Circuit training, the act of repetitive take-offs, approaches and landings, is essential as it is the first stage of practical pilot training. It involves the pilot making approaches to the runway, touching down and then applying power to take-off again. Pilots must follow the instructions of Air Traffic Control regarding the height at which they fly and how they may join or depart the circuit. At airports without a control tower, Civil Aviation Safety Authority (CASA) regulations specify how an aircraft should join a circuit when it approaches the airport from outside its local area.

At Moorabbin Airport, aircraft operations are allocated between the Eastern and Western circuits for safety and noise sharing reasons. Most ‘touch and go’ training is performed on the Eastern circuit to counterbalance arrivals and departures which take place on the Western circuit. Weather conditions can also affect circuit training, for example if cloud cover is below 1,000ft no VFR aircraft can operate as IFR aircraft have priority.

Figure 3 below shows non jet arrivals and departures over the Moorabbin area for the month of February 2013. The circuit pattern is visible as red and orange rings, which indicate that aircraft are at about 1000ft for circuit operations (height requirements specified by CASA).

Figure 4: Non jet arrivals and departures for the Moorabbin region, February 2013 (one month)
6. Aircraft movements
The aircraft currently operating at Moorabbin Airport are generally single or twin engine aircraft or helicopters with a very limited number of jet aircraft movements.

Aircraft movements follow a regular seasonal pattern with peak periods in summer and spring and low periods at Christmas and winter. As shown in Figure 5 below, there was a slight spike in movements for March 2012 as tertiary students generally start their courses in February, and officially start flying in March. This may explain the slight increase in movements in March 2013 as well. There was a slight decrease in movements in December 2012 and January 2013; this was due to courses being over for the year.

Figure 5 shows aircraft movements at Moorabbin Airport for the 15 month period from January 2012 to March 2013.

Figure 5: Moorabbin Airport movements from January 2012 to March 2013.
7. Track density plots
A track density plot is a map which displays the pattern of aircraft flight tracks that pass over the region around the airport. The region is divided into a set of small grid elements where the number of flights passing over each grid element is summed. This is used to colour each grid element according to the number of over-flights in that region each day. Track density plots are useful in showing underlying track patterns and the concentration of over-flights in a particular area.

The track density plot for all movements over the Moorabbin Airport area for Quarter 1 of 2013 is shown in Figure 5 below. The figure shows the operations out of Moorabbin Airport are either training or en route to the northern and eastern edges of the bay. The remote training area for Moorabbin Airport based aircraft is also visible approximately 10km south of the airport.

The colour coding from green to red represents the range of flight tracks per day from two to 20, this would be about 184 to 1,840 flight tracks for the quarter. If a grid element is not colour coded, this means that the number of aircraft flight tracks that passed over that element during the quarter was on average less than two per day. Therefore, absence of a colour for a grid element does not mean the grid element is free from aircraft over-flights.

Figure 6: Track density plot for the Moorabbin region, 2013
8. The impacts of aircraft noise

Although the terms ‘noise’ and ‘sound’ are used interchangeably, the term noise is often used to refer to an unwanted sound which can impact on the quality of life. The term sound refers to pressure variations travelling through the air and is measured on a logarithmic scale with the decibel (dB(A)) as the unit of measure. The sound level of typical daytime urban-based activities can vary between 40dB(A) and 80dB(A).

Residents living near the airport can be exposed to the impacts of aircraft noise and this can affect people in different ways. Aircraft noise is influenced by a number of different factors such as how far away an aircraft is, power of the engine and placement of exhaust (muffler) where fitted, humidity, air density and cloud cover. These factors can impact on how sound behaves, for example noise waves from an aircraft can travel up to 10km.

Generally noise from departing aircraft is greater than that of an arriving aircraft. On departure, the noise level experienced on the ground is influenced by a range of aircraft factors such as the type and size, rate at which it climbs and the way it is flown by the pilot.

Improvements in aircraft engine and airframe technologies have resulted in modern aircraft being more efficient and quieter. From an aircraft noise perspective, Australia has one of the most modern fleets of any country.

9. Noise Abatement Procedures

Noise Abatement Procedures (NAPs) are designed to help reduce the impact of aircraft noise on the community. These procedures are comprised of preferred runways, preferred flight paths and noise abatement areas. NAPs are included in the Aeronautical Information Publication (AIP), a package of documents which provides all of the operational information necessary for the safe and efficient conduct of air navigation throughout Australia. NAPs are implemented by Air Traffic Control, however their use is not mandatory and subject to factors such as extreme weather conditions, safety and pilot requirements. All aircraft are expected to observe the NAPs outside of tower hours of operation.

Moorabbin Airport currently operates a Fly Friendly Programme (see attachment 1). The program encourages pilots to operate in a manner which is considerate of local residents and outlines a number of noise abatement procedures such as:

- Delayed turns for departing aircraft to minimise noise intrusion over residential areas over Parkdale
- Preferred runways outside of tower hours which are the least noise sensitive
- Runway operation restrictions e.g. use of jet aircraft may be restricted to only certain runways
- Restrictions on certain training procedures to avoid noise over residential areas
- Procedures to minimise noise emissions from ground running
10. Noise and Flight Path Monitoring

Airservices uses a Noise and Flight Path Monitoring Systems (NFPMS) to determine the contribution aircraft make to overall noise exposure and assess noise levels from aircraft. The NFPMS is also used to assist in the planning of airspace use and enable aircraft noise information to be provided to community groups, individuals and government and industry organisations.

Noise monitors, referred to as environmental monitoring units (EMUs), capture noise events. The data is then matched with Airservices radar data, for aircraft flying in the vicinity of the noise monitor at the time of the event.


10.1 Aspendale

Aspendale was chosen as one of the locations for short-term noise monitoring as it is an area within close proximity to the inbound point, Carrum. The monitoring results from Aspendale showed that about 80% of noise events were below 60dB(A) and about 12% were between 60dB(A) and 70dB(A), equivalent to conversational speech or a busy office. Noise events due to aircraft movements above 60dB(A) were found to be most common in the weekday hours of 10:00am to 4:00pm and on weekends from 10:00am to 1:00pm.

The most frequent and loudest aircraft types to pass over Aspendale are general aviation aircraft operating to and from Moorabbin Airport.

10.2 Dingley Village

Dingley Village is within the eastern circuit area of Moorabbin airport. The results of the short-term noise monitoring showed that the most frequent and loudest aircraft types to pass over Dingley Village are general aviation aircraft that operate to and from Moorabbin Airport. About 43% of noise events recorded were below 60 dB9A) and 50% were between 60dB(A) and 70dB(A).

Noise events recorded at 60dB(A) or above were most common in the weekday hours of 9:00am to 5:00pm and on weekends in the periods of 9:00am to 4:00pm.

11. Community engagement

Moorabbin Airport operates a Community Aviation Consultation Group (CACG) which meets quarterly. The CACG meetings were established under the Aviation White Paper in 2009 and are independently chaired. The purpose of the CACG is to ensure that key representatives of Moorabbin Airport and the surrounding communities understand each others activities and concerns.

They allow community views to be heard and provide members with an opportunity to obtain information about airport operations. Individual members of the group can raise issues that affect them which may be actioned within their area of authority. CACGs discuss a range of airport matters including aviation and non-aviation
developments and planning or regulatory changes. Moorabbin Airport may also provide information regarding forthcoming plans for the future of the airport.

Community bodies and government agencies can also provide information to the group on issues and policies that may affect future operations of Moorabbin Airport. The CACGs allow for the discussion of various issues such as aircraft noise management and flight paths, where suggestions can be made to the responsible authorities such as Airservices or CASA.

12. Making a complaint

Airservices manages complaints and enquiries about aircraft noise and operations through its Noise Complaints and Information Service (NCIS). Complaints, enquiries and requests for information about aircraft operations received by the NCIS are collected and stored in a database for the purpose of complaint management, analysis of issues and identification of causal factors.

Complaints and enquiries can be made to Airservices through:

- **NCIS**
  T: 1800 802 584 (freecall)
  F: (02) 9556 6641

- **WebTrak**

- **Write to:**
  Noise Complaints and Information Service
  PO Box 211
  Mascot NSW 1460
13. Further information

Airservices Resources

WebTrak – Airservices provides an internet based system called WebTrak which enables aircraft movements to be observed in near real-time at eight airports around Australia including Melbourne Airport and Essendon Airport. Information on the site has a delay time of 40 minutes and provides data on a map about individual aircraft such as aircraft type, altitude, and destination and noise levels. WebTrak is available on the Airservices website at www.airservicesaustralia.com/aircraftnoise/webtrak/.

Factsheets – Factsheets available on Airservices’ website contain information on commonly raised topics including management of complaint about aircraft noise, fundamentals of sound, circuit training and seasonal weather patterns. Factsheets can be found at www.airservicesaustralia.com/aircraftnoise/airport-information/

Reports – Airservices produces reports summarising noise data from Melbourne Airport and Essendon Airport and complaints from Melbourne Airport. These reports can be found on the Airservices website at www.airservicesaustralia.com/publications/reports-and-statistics/noise-reports/

Movements at Australian airports – Airservices produces reports summarising the aircraft movements at each airport each month. These reports can be found on the Airservices website at http://www.airservicesaustralia.com/publications/reports-and-statistics/movements-at-australian-airports

Other Resources

Department of Infrastructure and Transport Website – Information on aircraft noise regulations, airport curfews, factsheets and aviation’s role in reducing carbon emissions is available from this website. This site also has a link to the Federal Government’s Aviation White Paper which details the Government’s aviation policy. www.infrastructure.gov.au/aviation/

Civil Aviation Safety Authority Website – This site provides information on aircraft airworthiness and certification, airspace regulation and issues of aviation safety (for example the rules concerning low flying aircraft). www.casa.gov.au/


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Attachment 1 - Moorabbin Airport Fly Friendly Programme 2011

Fly friendly - be a good neighbour

Moorabbin Airport is committed to undertaking operations in a Fly Friendly manner. We expect aircraft pilots operating into and from Moorabbin Airport to undertake operations in a manner which is considerate of local residents. The safe operation of an aircraft must be maintained at all times. Air traffic procedures, weather and safe separation requirements may preclude at times your compliance with this programme but you are expected to make your best efforts to ensure your compliance with the spirit of this programme.

1. Circuit Training

Circuit training - repetitive touch and go operations, is a vital part of flight training and is required for day and night operations. However such operations are limited to the times published in ERSA which are:

- **Winter:** Monday-Friday 0800-2100
  - Weekends 0800-2000 or last light, whichever is sooner.
- **Daylight savings:** Monday- Friday 0800-2200
  - Weekends 0800-2000 or last light (whichever is sooner)

Moorabbin Airport is open 24 hours per day, 365 days per year. Aircraft departing or returning to Moorabbin are not subject to these limits and it is understood that an aircraft returning after the above agreed hours may be required to perform a circuit of the airport to enter into the landing pattern.

2. Altitude

It is good airmanship, and also the law, to maintain a safe altitude at all times and to ensure that when flying over residential areas this is maintained.

Except when in the act of landing or taking off the minimum height fixed wing aircraft will fly is 1,000ft over inhabited areas of 500ft over uninhabited areas or the sea. They must be a minimum of 600 metres radius from any building.

Whilst operations in the Moorabbin circuit are defined as being in the act of taking off or landing, as soon as practical aircraft should reach and maintain the 1,000ft circuit altitude.

Helicopters operate at a different altitude (700ft) to maintain safety separation from fixed wing aircraft.

CASA may issue an exemption for training purposes.
3. Delayed Turns for Noise Abatement

Moorabbin airport has intensive residential housing surrounding most boundaries of the airport. The following is thus in place for noise abatement purposes:

a. Aircraft departing from runway 17Right should delay any turn until they have flown past Woodlands Golf Club, to minimize noise intrusion over residential areas of Parkdale.

b. Aircraft departing from runway 35L should delay any turn until over Kingston Centre to minimize noise intrusion to residential property immediately to the North West of the airport.

c. Air traffic control procedures, weather or safe separation requirements may preclude pilots from adhering to these procedures. However they should at all times attempt to comply with the spirit of these procedures.

4. Runway in Use

Aircraft always land and take off into the prevailing wind. The main North/South runways (17 and 35) are used for 80% of the time. Current wind and weather information is available from an automatic advice services on (03) 9580 9637. The Runway in Use is determined by Airservices Australia when the tower is in operation.

a. Outside of tower hours Pilots should use runways which are the least noise-sensitive. Where there is a choice based upon wind the runway in use is chosen in the following order:
   - Runways 35 (at night 35R)
   - Runways 17
   - Runways 13 (at night 13L) and 31

b. After 2200 local all departures must maintain runway heading until at 1,000ft.

c. Runway 04/22 is available ONLY when operationally required. Runway 04/22 IS NOT available for circuit training at any time.

5. Operations from Runways

Aircraft noise can be mitigated by operating some aircraft from designated runways only. In particular runway 17R (facing South) and 31L (Facing North West) have the biggest impact on residential areas. We thus agree:

a. Jet aircraft: Jet aircraft will not use Runway 17R for departures.

b. Certain types of aircraft will not use runway 17R or 31L for departure unless no other runway is available. Aircraft include:
   - Cessna 180
   - Cessna 185
   - Cessna 206
   - Cessna 210
   - Beech BE35/36 with two bladed prop.
   - Cessna C336/C337 Skymaster
   - “Warbird” aircraft fitted with constant speed props.
c. Practice landings with feathered propellers will not be permitted.

d. Simulated engine failure in single engine aircraft after take off will not be permitted.

e. Simulated asymmetric operations after take off will not be permitted from runway 17R.

6. Moorabbin Airport Training Area

Much airwork training takes place to the South East of Moorabbin Airport. The requirements of the Airservices Australia Fly Neighbourly Advice (FN5) contained in ERSA GEN-SP apply as follows:

a. Designated areas AM/D314 and AM/D 315 are commonly referred to as the “Moorabbin Training Area” This is approximately bounded by a line from Moorabbin Airport to Pearcedale, then coastal to Koo-wee-rup, then Pakenham to Moorabbin Airport.

b. Pilots are requested to avoid the following urban areas: Hampton Park, Lyndhurst, Cranbourne and within circles of 1 Nautical Mile of Cardinia and Fiveways joined tangentially. If not possible to avoid these areas pilots should traverse at an altitude not below 2,000ft.

c. An aerobatic area is established east of the Berwick-Cranbourne Rd and north of Ballarto Rd. In this area pilots are requested to minimize aerobatic manoeuvres below 3,000ft.

d. Farm and other buildings should not be used as reference points for training manoeuvres.

7. Ground Running of Engines

Ground running of engines can cause noise concerns from well beyond the boundary of the airport.

a. A purpose built engine test cell allows extended running of aircraft engines for maintenance and test purposes; with noise being channelled across non-residential areas. All vehicle-mounted engines on test will use this cell.

b. Ground running of aircraft engines on airframes will be limited to run-ups on the Northern or Southern run up bay between the hours of 0800-1800 daily. Jet aircraft may additionally use the southern end of taxiway Echo which is furthest from residential housing.

c. Run-up of aircraft engines prior to flight will be accomplished in accordance with the operational procedures prescribed for the aircraft type. Extended run-ups will not be undertaken except if required to ensure the safety of flight.

d. Please be mindful of the fact that when there is low cloud the sound from engine run-ups may carry some considerable distance from the airport.
8. Helicopter Operations

This Fly Friendly programme applies to both fixed and rotary wing aircraft. Helicopters can potentially cause considerable noise irritation and thus must conform to the same standard of behaviour as fixed wing operations.

However for safety separation reasons that helicopters will operate at different altitudes to fixed wing aircraft.

9. Good Manners for Pilots

a. Good manners for pilots includes:

b. Be aware of noise sensitive areas. Moorabbin Airport is in an urban area.

c. Avoid prolonged run-ups. Not only do they produce noise but they cost money.

d. Avoid flying low at any time and especially over populated areas.

e. Keep circuits as compact as possible

f. Climb to height as soon as possible (based upon aircraft performance) and then reduce power to cruise settings.

g. Ensure that throttle settings are applied commensurate with minimum emissions of noise, subject at all times to the maintenance of aircraft safety.

h. When navigating across country look ahead and select the least noise sensitive route. If you can avoid flying over a residential area then do so.

i. For helicopter pilots avoid rotor “slap” where possible.

These guidelines form part of the Moorabbin Airport Conditions of Use 2011 and a specific Fly Friendly Agreement is negotiated with individual flying schools based on Moorabbin Airport.

Issued by: Moorabbin Airport Corporation Pty Ltd