



Adelaide city area noise information pack

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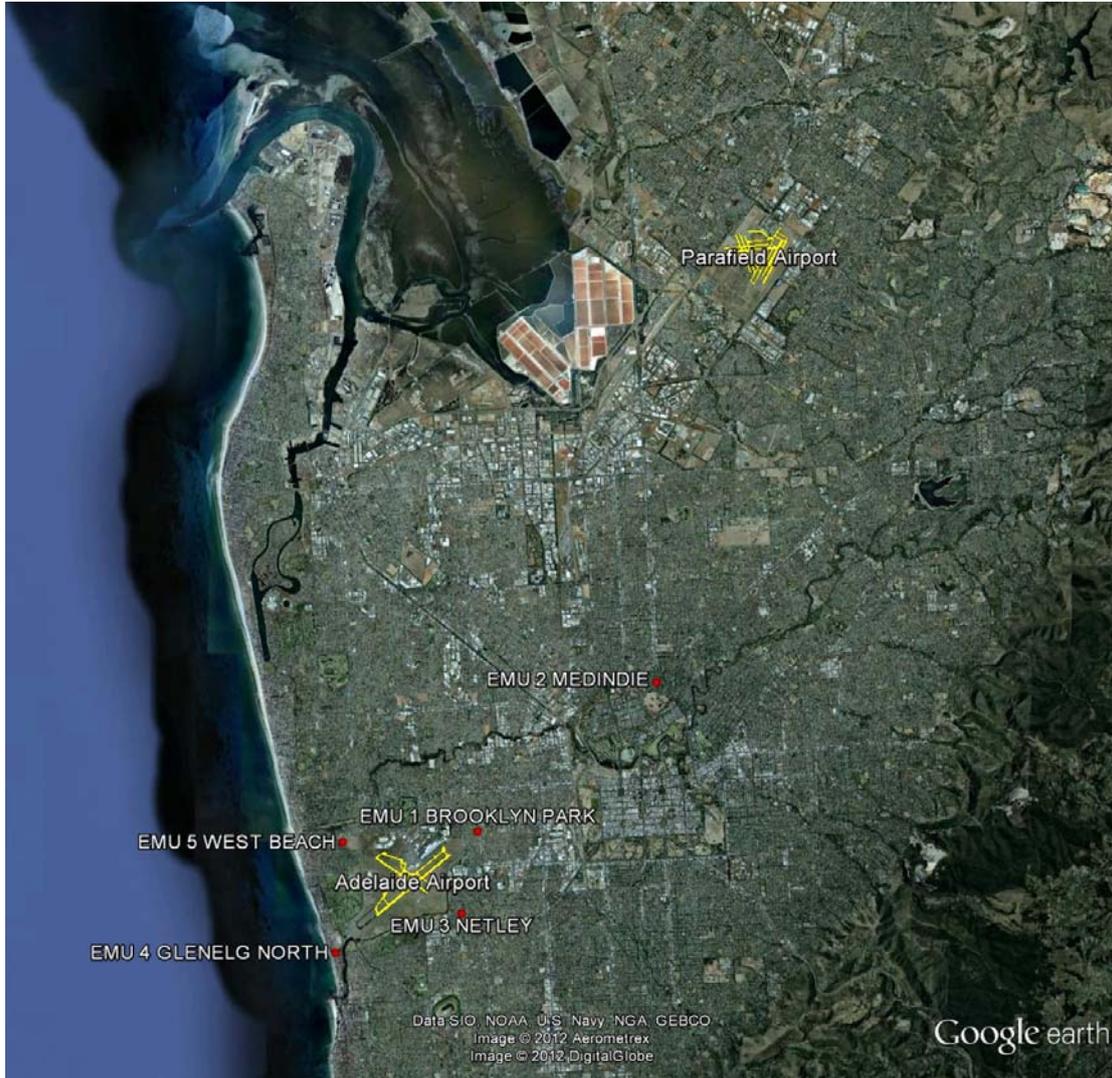
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1. Purpose and scope

The purpose of this document is to provide information on aircraft operations throughout the Adelaide area to the community. The Adelaide area is mainly affected by aircraft noise from two airfields: Adelaide Airport and Parafield Airport. The location of these airfields is shown in Figure 1.

Figure 1: Locations of airfields in Adelaide area.



1.1 Noise and Flight Path Monitoring

Airservices operates a Noise and Flight Path Monitoring System (NFPMS) based at Adelaide Airport. Flight tracks from any suitably equipped aircraft operating within 50km of the airport are captured by the NFPMS. This includes all commercial and scheduled air traffic but may exclude some small fixed wing aircraft (if they are not equipped with a transponder or are outside radar coverage). This system also tracks some operations at Parafield Airport, Aldinga Aerodrome and RAAF Edinburgh.

Airservices operates five noise monitors, also known as environmental monitoring units (EMUs), in the Adelaide area. These are shown in Figure 1. Noise events are captured individually by the noise monitor. 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. Airservices provides an internet-based tool where details about individual flights can be obtained and an aircraft noise complaint can be lodged. A link to WebTrak is provided in the “Other Resources” section.

1.2 Runway naming convention

Runway names consist of the first two digits of the compass bearing for the runway direction. For instance if the runway bearing is 210° its name will be 21. At airports where there are parallel runways an additional character is added; L, C or R to distinguish between the left, centre or right runway.

1.3 Runway selection

Runway selection is based on weather conditions, traffic volume and noise abatement procedures. As the wind changes the active runway may change as aircraft primarily take-off and land into the wind for safety and performance reasons. This often results in different areas around the airport being overflowed 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 amount of traffic are taken into consideration when deciding which runway to use.

1.4 Noise Abatement Procedures

Noise Abatement Procedures (NAPs) are designed to help reduce the impact of aircraft noise on the community. They are made up of preferred runways, preferred flight paths and noise abatement areas. The latter have restrictions on what aircraft can operate within these areas. NAPs are included in the Aeronautical Information Publication (AIP), which consists of a package of documents which provides all of the operational information necessary for the safe and efficient conduct of national (civil) and international air navigation throughout Australia and its Territories. NAPs are implemented by Air Traffic Control (ATC) but all aircraft are expected to observe the NAPs outside of ATC hours of operation. The use of NAPs at any time are subject to the weather conditions and aircraft requirements. Their use is not mandatory.

Airports also implement measures to reduce the impact of operations under their control, such as ground running restrictions or time restrictions for circuit training.

1.5 Community engagement

Adelaide Airport and Parafield Airport have independently chaired Airport Community Aviation Consultation Groups (CACGs). The purpose of the CACGs is to ensure community views are heard by the airport and to provide members of the community with an opportunity to obtain information about airport operations. CACGs discuss a range of airport matters including aviation and non-aviation developments and planning or regulatory changes.

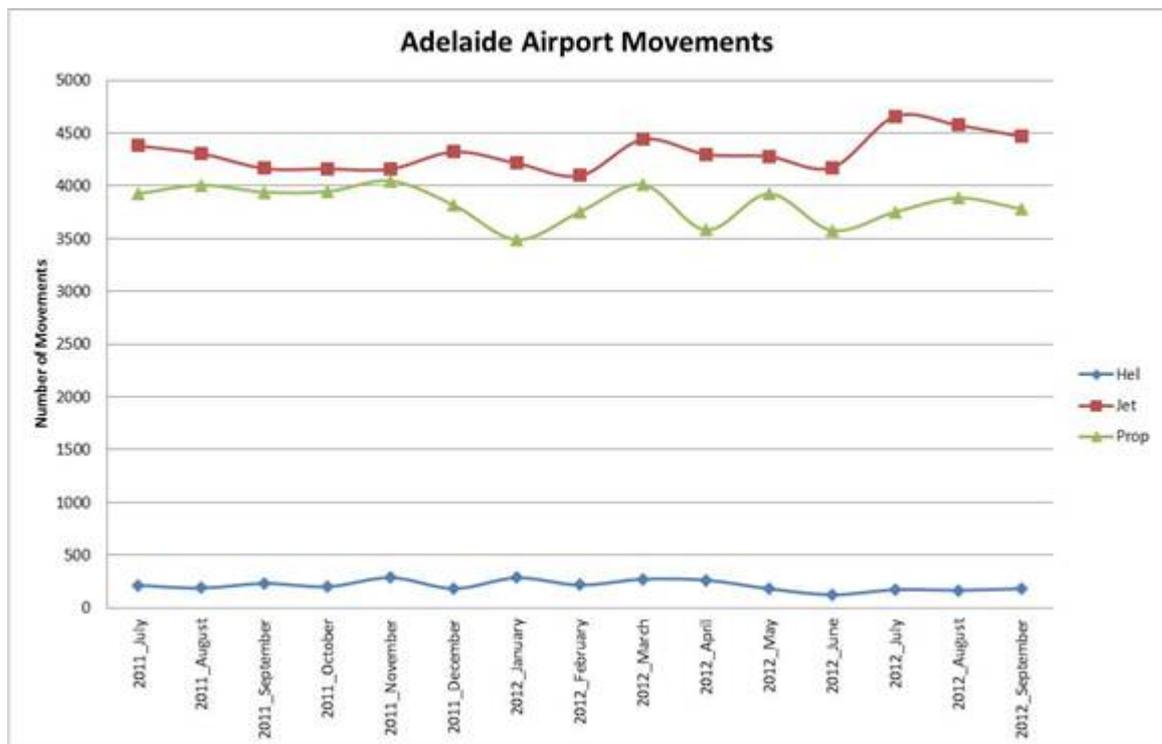
2. Adelaide Airport

Adelaide Airport is situated on the Adelaide Plains and is bounded on the west by the Gulf St Vincent and to the east by the Mount Lofty Ranges.

2.1 Aircraft movements

On average, there are a little under 300 movements per day at Adelaide Airport. Figure 2 shows aircraft movements at Adelaide Airport for the 15 month period to the end of Quarter 1 of 2012.

Figure 2: Aircraft movements at Adelaide Airport, July 2011 to September 2012

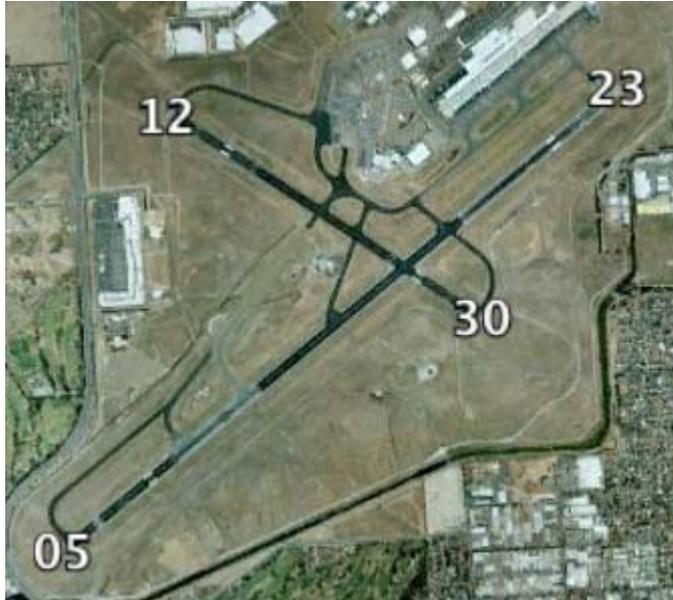


Around half the movements at Adelaide Airport are jets and around half are non-jets.

2.2 Runway configuration

Figure 3 shows the main runways at Adelaide Airport.

Figure 3: Runways at Adelaide Airport



The main runway at Adelaide Airport is 05/23, which is 3km long orientated south-west to north-east and has a single instrument landing system. There is a smaller 1.6km long cross runway, 12/30, orientated north-west to south-east, which is primarily used by propeller aircraft. This runway is served by non-precision approaches which do not utilise electronic flight path guidance.

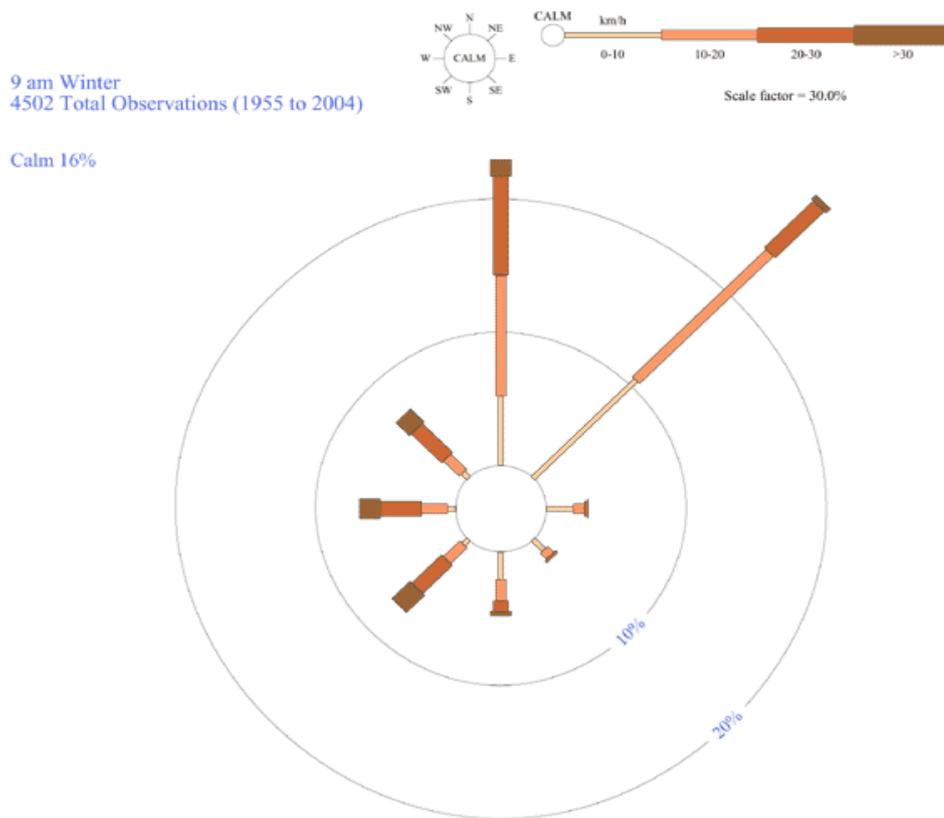
2.3 Runway use at Adelaide Airport

Fixed wing aircraft perform take-offs and landings into the wind to reduce the take-off roll and provides better lift; along with reducing the ground speed on take-off and landing. In Australia the Civil Aviation Safety Authority (CASA) sets limits upon when an aircraft may operate opposite to the wind direction. Further information on runway selection is available on Airservices website at www.airservicesaustralia.com.

It is clear that runway use is seasonal, with Runway 23 (aligned roughly north to south) used more in summer, and Runway 05 (aligned roughly south to north) used more in winter. This is due to differences in prevailing winds at Adelaide Airport that vary by season.

The Bureau of Meteorology publishes 'wind roses' for Melbourne for winter and summer (Figures 5 and 7). These summarise the occurrence of winds at a location, showing the direction, strength and frequency of the winds. Each 'branch' (the orange/ brown lines) represents winds coming from that direction, with north to the top of the diagram. The branches are divided into sections of different thickness and colour, which represent wind speed from that direction. Thinner, paler segments represent lighter winds and thicker, darker segments represent stronger winds. The frequency of winds blowing at that speed from that direction is represented by the length of each section within the branch. The longer the branch, the more prevalent is the wind from that direction. Wind roses are published on the Bureau of Meteorology's website (www.bom.gov.au).

Figure 5: Wind rose for Adelaide, winter



In winter the wind at Adelaide Airport tends to be from the north or north east. Therefore, in winter aircraft tend to use Runway 05, departing to the north over suburbs including Mile End and North Adelaide and arriving over the coast to the south, as shown in Figure 6.

Figure 6: Use of Runway 05 2009 to 2012

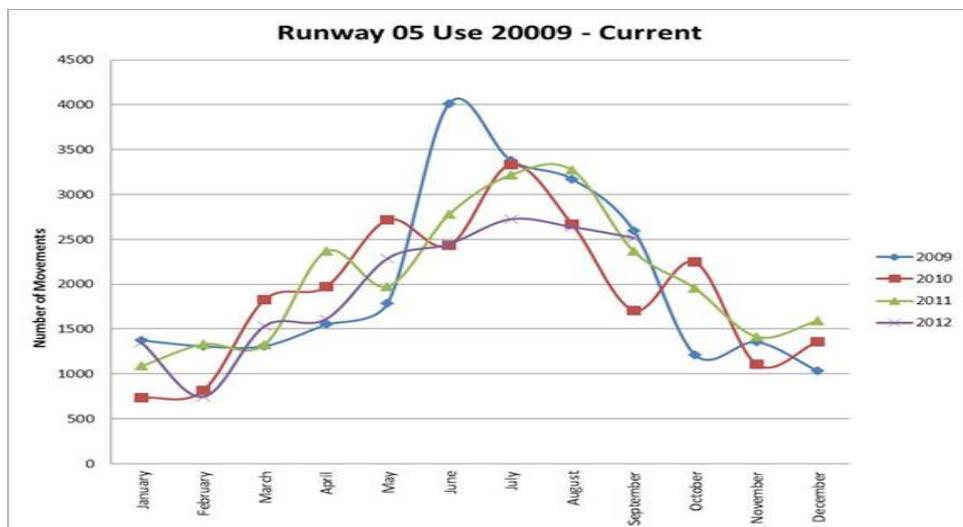
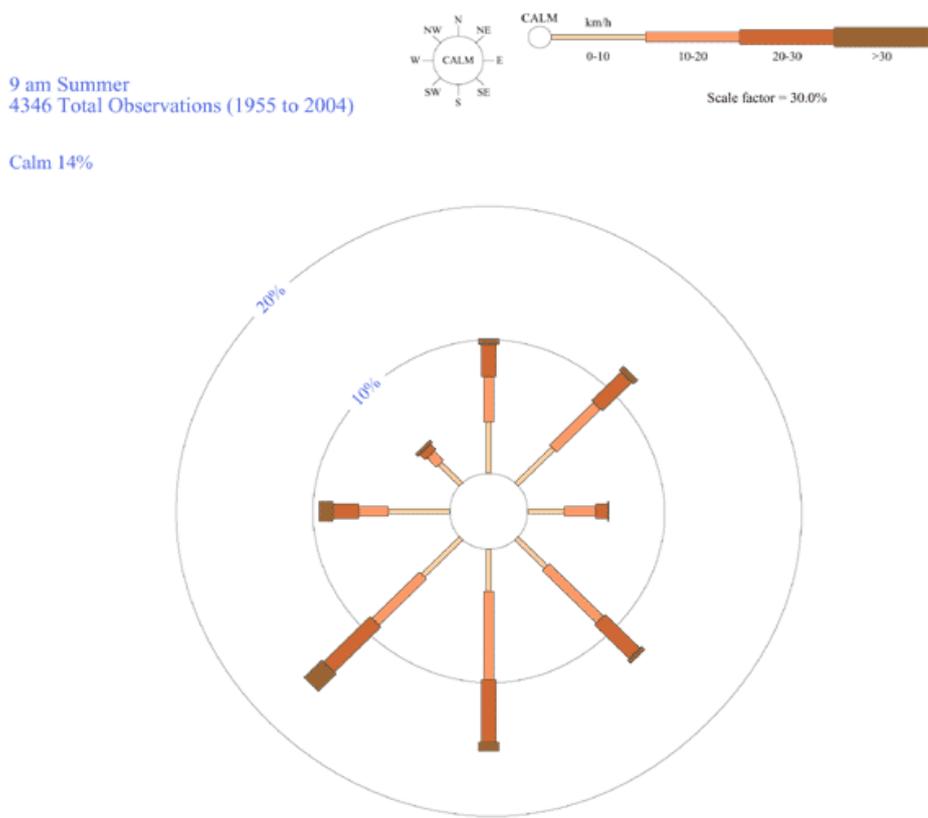
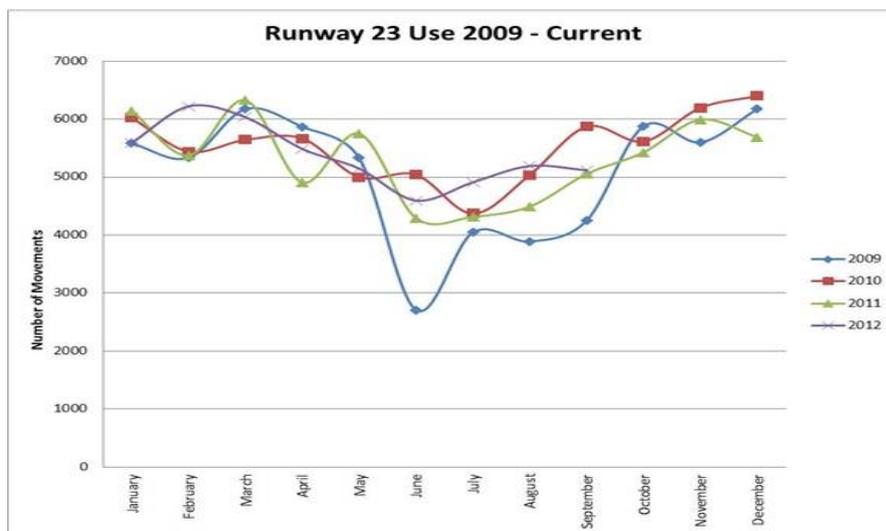


Figure 7: Wind rose for Adelaide, summer



In summer, the prevailing wind at Adelaide Airport is from the south. Therefore, in summer aircraft tend to use Runway 23, taking off to the south over the coast and arriving over the north, as can be seen in Figure 8.

Figure 8: Use of Runway 23 2009 to 2012



2.4 Curfew

Adelaide Airport has a curfew which restricts operations between 11.00pm and 6.00am to provide noise relief to residents near the airport. This does not mean that no operations at all are allowed during these hours. In line with the Adelaide Airport Curfew Act 2000, the Federal Minister for Infrastructure and Transport determines which types of movements are permitted. Figure 6 (below) shows curfew movements by category at Adelaide Airport for the 15 month period from January 2011 to March 2012.

As a general rule, most commercial aircraft carrying passengers are restricted from operating during the curfew. The main exception is a small number of 'shoulder' movements between 5.00am and 6.00am, and 11.00pm and midnight ('approved aircraft'). These are permitted on a quota basis to take account of time differences during the northern hemisphere summer which affect the schedules of airlines flying from these destinations to Australian airports. Other exceptions to curfew restrictions include:

- some small (under 34,000kg) aircraft that comply with the strictest International Civil Aviation Organization noise standards (included in 'approved aircraft' in Figure 14 below)
- a limited number of low noise freighter aircraft
- aircraft involved in emergencies
- departing aircraft that have commenced taxiing prior to the start of the curfew.

More detail on curfew restrictions is available on the website of the Department for Infrastructure and Transport at <http://www.infrastructure.gov.au/aviation/environmental/curfews/AdelaideAirport/DispensationGuidelines.aspx>.

On average, there are around 12 aircraft movements during curfew hours per night. Of these, the majority take place during the 'shoulder' hours, and are small aircraft. There are also, on average, around two low-noise freight aircraft movements per night.

The Department of Infrastructure and Transport encourages operators to land on Runway 05 and take off from Runway 23 to minimise noise disturbance over residential areas at night. However, runway usage is determined by a range of factors, with safety as the primary consideration, and there is no penalty for aircraft that use other runways during the curfew period.

2.5 Noise abatement procedures

Airport-initiated noise abatement procedures at Adelaide Airport include:

- ensuring all engine test runs are conducted over 1km from the nearest residences;
- encouraging the use of electric ground power units (GPUs) at Terminal One to minimise the running time of aircraft auxiliary power units (APU's)
- maintenance and construction activities are approved subject to compliance with the EPA's Industrial Noise Policy.
- earth mound and/or timber noise attenuation barriers have been installed near the perimeters in the east corner and along the southern boundaries of the Airport.

Airservices NAPs comprise preferred runways and preferred flight paths:

- In light wind conditions, the preferred runway is Runway 23, which results in aircraft departing over the coast and landing over the city.
- Preferred flight paths are designed to maximise overflight of the sea. Jets departing Runway 23 with destinations to the east are required to reach 5,000 feet before recrossing the coastline east bound.

2.5 Noise insulation program

In 2001, the Federal Government initiated a noise insulation program for properties around Adelaide Airport. This program, which is now closed, saw 648 homes and seven public buildings insulated.

3. Parafield Airport

Parafield Airport is located 15km north of the central business district and is surrounded by residential developments.

There are two sets of parallel runways at Parafield Airport, 08L/26R - 08R/26L and 03L/21R – 03R/21L.

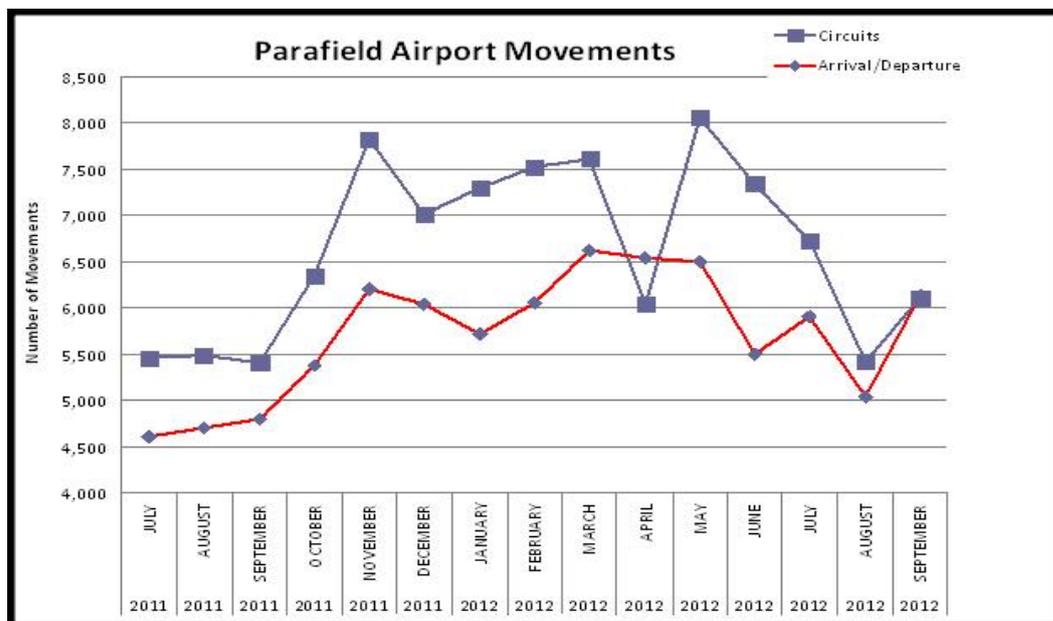
Figure 9: Runway configuration at Parafield Airport



3.1 Aircraft movements

Figure 10 shows aircraft movements at Parafield Airport.

Figure 10: Aircraft movements at Parafield Airport



There are around 400 movements per day at Parafield Airport. The majority of operations involve smaller general aviation aircraft arriving and departing, as well as circuit training for pilots. Circuit training can take place at the airport between 7.00am and 11.00pm on weekdays and 7.00am and 9.00pm at weekends.

4. Other airfields in the Adelaide Basin

4.1 Aldinga Aerodrome

Aldinga Aerodrome is located around 25km south of the CBD. It has one asphalt runway, Runway 3/21, which is 667m long. There are other dirt/ grass runways. The aerodrome is mainly used by aviation clubs operating light aircraft for training.

There are no air traffic control facilities at Aldinga Aerodrome, so Airservices does not implement NAPs there. However, Aldinga Aerodrome has a curfew that does not allow landings and take offs between 10pm and sunrise. In addition, on some runways, only right hand circuits for training are allowed, to minimise noise over residential areas.

4.2 RAAF Edinburgh

RAAF Edinburgh is approximately 25km north of Adelaide. It is primarily home to maritime patrol aircraft that conduct surveillance operations throughout Australia's airspace, and Aerospace Operational Support Group Headquarters. It has two runways. Runway 18/36 is 2560m long and Runway 04/22 is 1962m long.

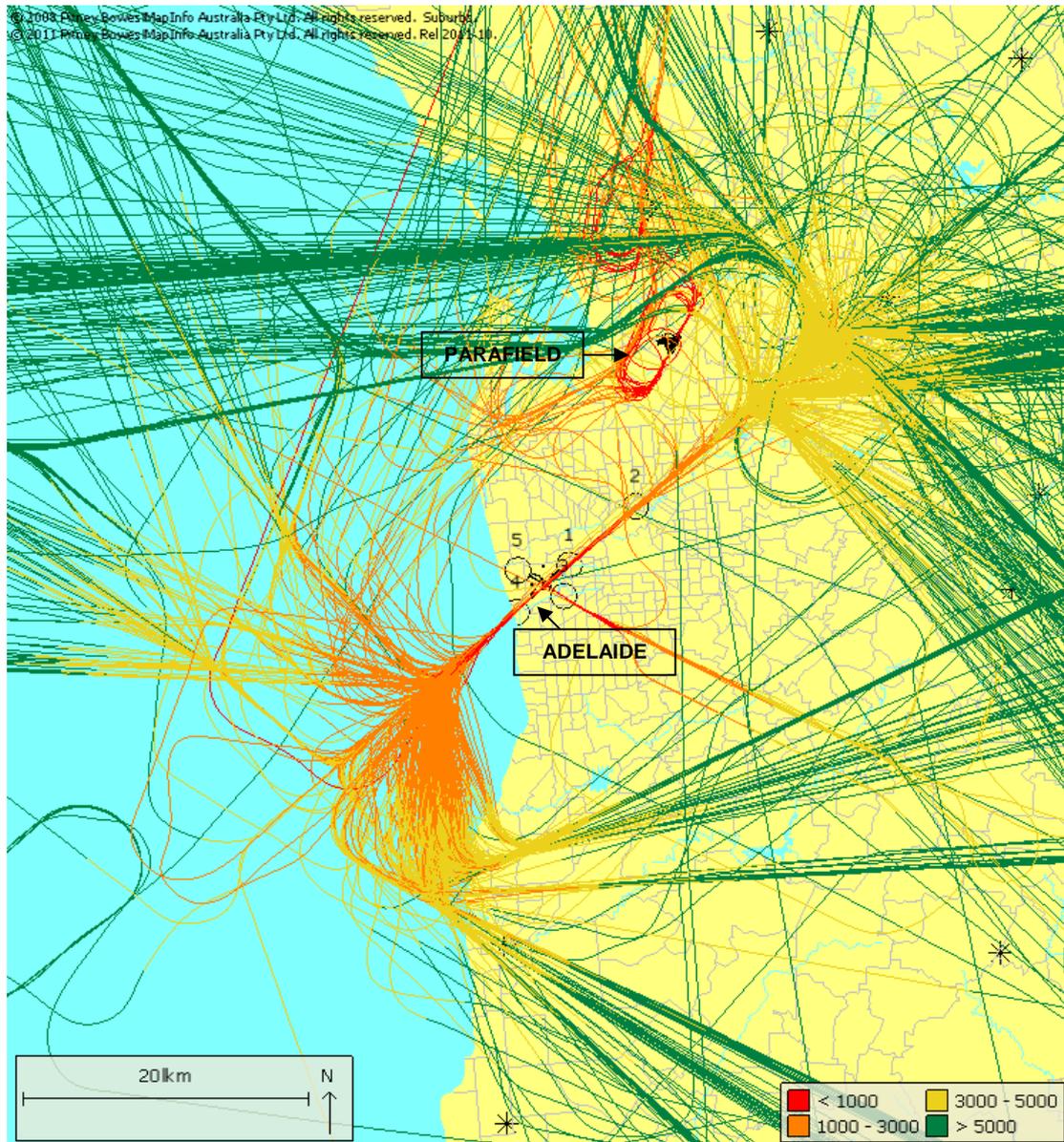
Not all aircraft operating at these two airfields have the equipment that allows movements to be tracked by NFPMS.

5. Typical flight track patterns for Adelaide city area

5.1 Jet aircraft

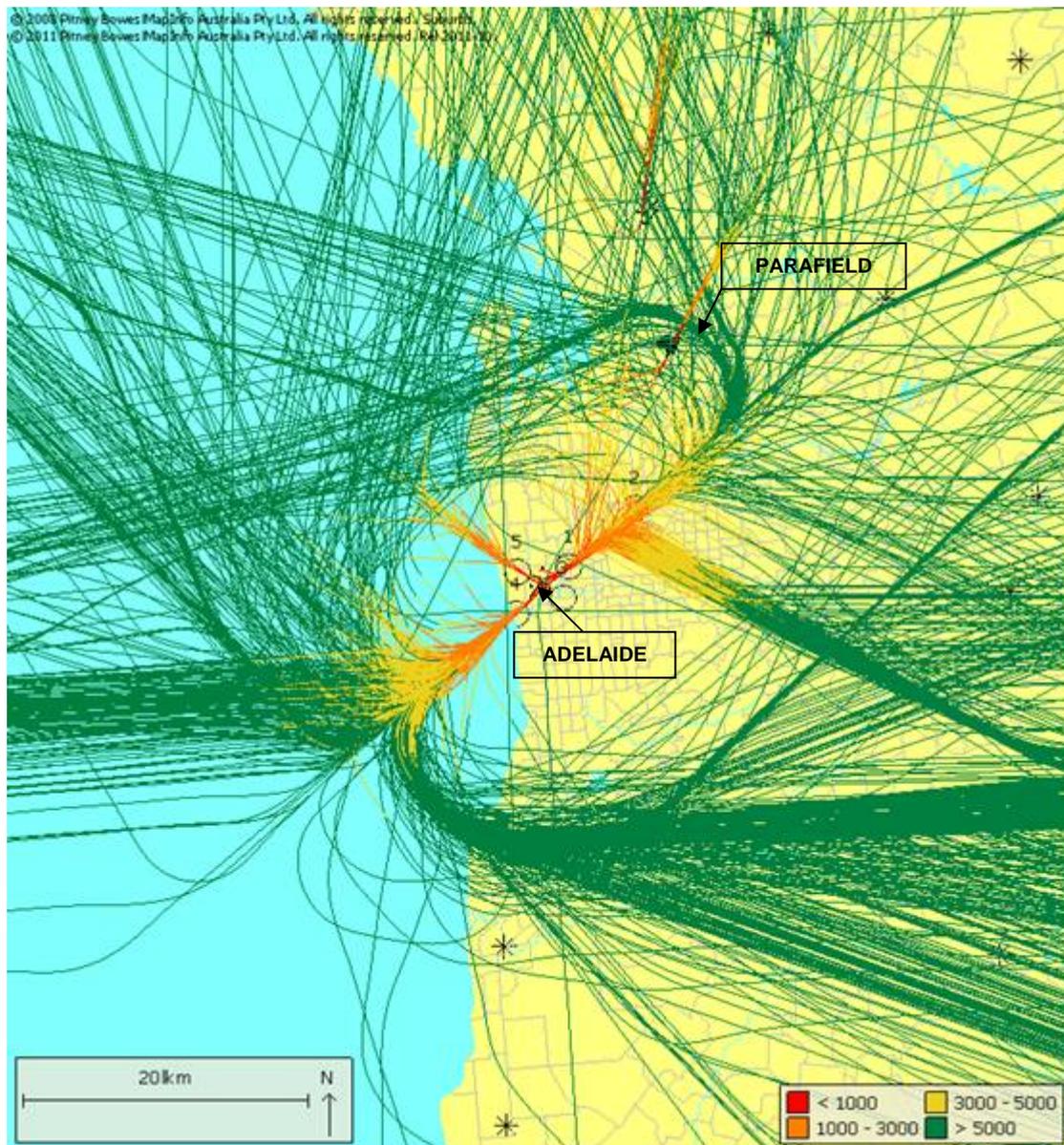
Figures 11 and 12 show jet aircraft track plots for arrivals and departures for the Melbourne basin for a typical month (August 2012), coloured according to height (in feet). The period shown has been limited to one month so that the patterns of aircraft movements can be distinguished.

Figure 11: Jet arrivals in the Adelaide area for August 2012



Jet arrivals at Adelaide Airport are aligned with the runways up to around 10km from the airport. Suburbs in line with the runways up to about 15km are overflowed by jet arrivals. Jets arriving at Parafield Airport are required to enter into the circuit configuration before landing.

Figure 12: Jet departures in the Adelaide area for August 2012



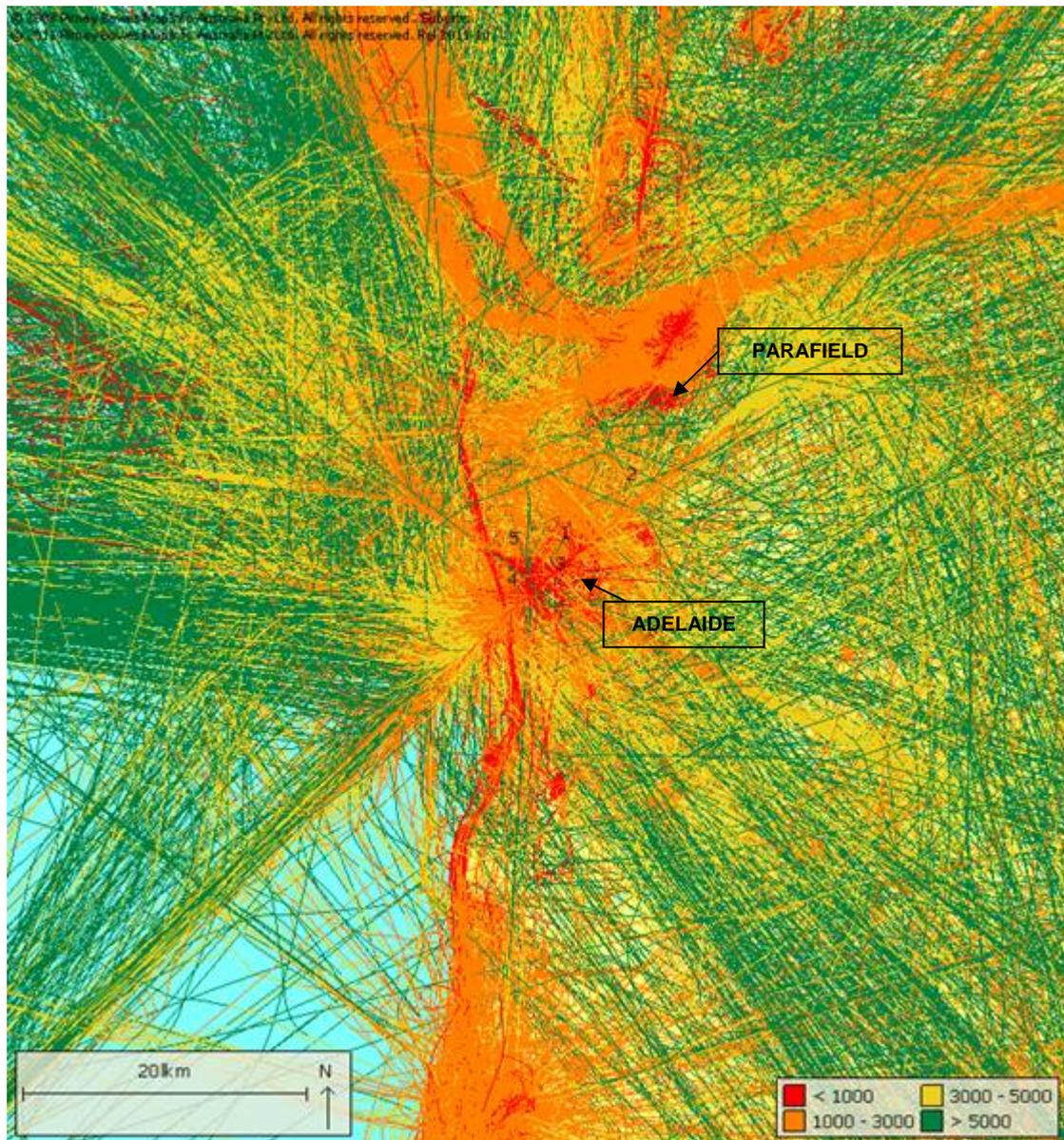
Jet departures at Adelaide Airport reach a higher altitude closer to the airport than arrivals and also deviate from runway alignment closer to the airport, around 10km from runway end. Jets taking off need to maintain high levels of power (thrust) to maintain their climb, which is why noise from departing jets is often louder than noise from arriving jets, even though they overfly nearby suburbs at a greater height. Jets that depart over the ocean and then turn to the east cross back over land at a height greater than 5000ft.

Jet departures at Parafield Airport maintain runway heading and unlike arriving aircraft at that airport, they do not spend any time in the circuit configuration.

5.2 Non jet aircraft

Figure 13 shows non-jet aircraft arrivals and departures in the Adelaide basin for a typical month (August 2012).

Figure 13: Non jet arrivals and departures for the Adelaide region, August 2012 (one month)



There are very few areas of Adelaide that are not over-flown by propeller aircraft. The red track running north to south to the west of Adelaide Airport is largely due to general aviation flying along the coast.

The circuit pattern at Parafield (training aircraft) is visible as a red/ orange ring towards the top of Figure 4, indicating that aircraft are generally maintaining a height of around 1000ft (in line with Civil Aviation Safety Authority height requirements for circuit operations).

5.3 Track density plots

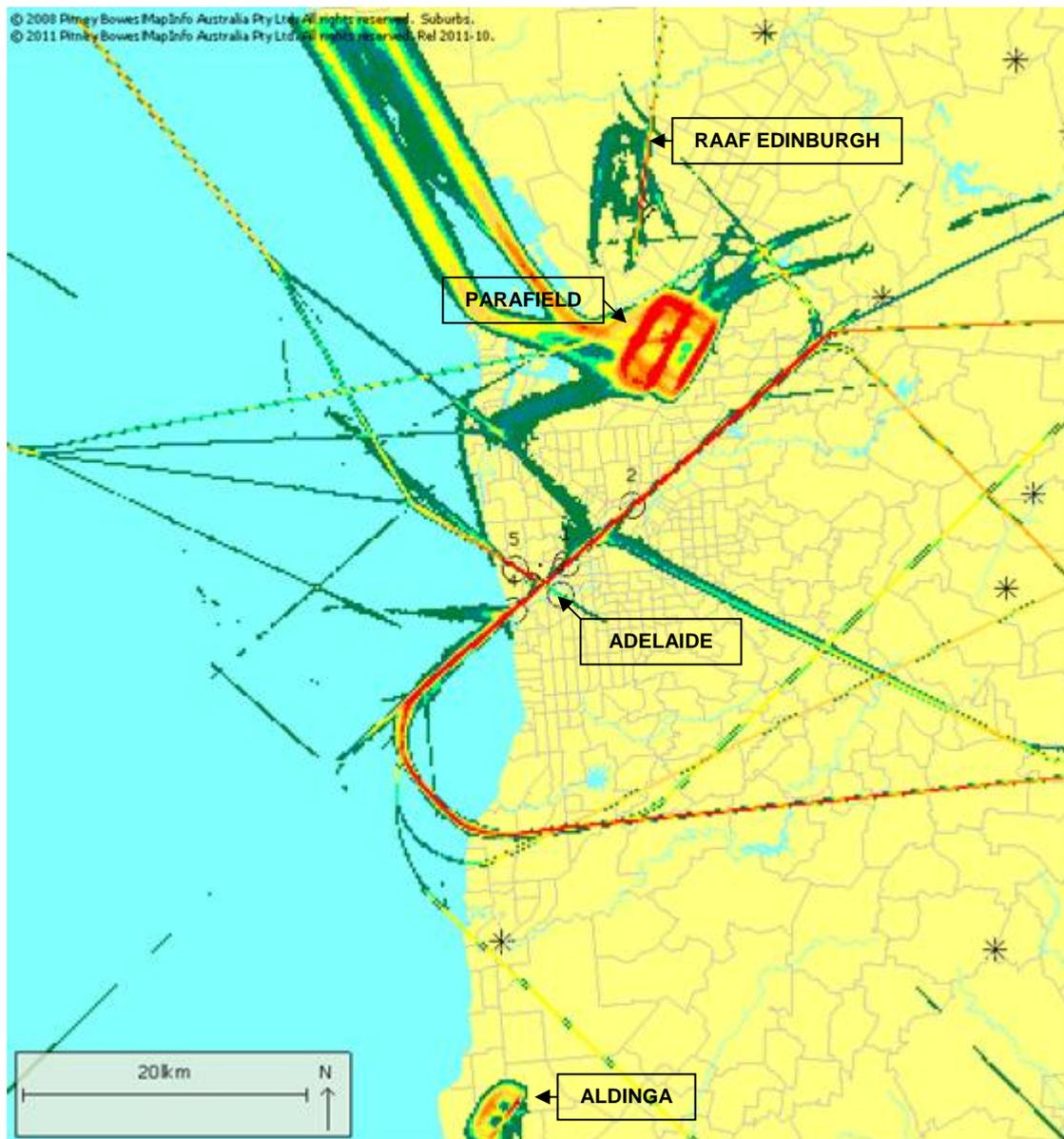
The track plots above show that residents living up to 15km from the airports and in line with Adelaide Airport's runways are regularly over-flown by jet aircraft below 5000ft. However, beyond this the regularity of flight path use is not discernible from

the track plot display. A track density plot can be useful in showing the underlying track patterns.

To create a track density plot, the land surface is divided into squares, creating a grid. The average number of flights passing over each square per day is then calculated. By colour coding according to frequency of flights, a track density plot can be illustrated.

Figure 14 shows a track density plot for all movements over the Adelaide region in Quarter 3 of 2012.

Figure 14: Track density plot for Adelaide, Quarter 3 of 2012



Flights in and out of Adelaide Airport are generally aligned with the runways.

Most operations at Parafield Airport are circuits for pilot training undertaken by smaller, general aviation aircraft.

6. 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 Adelaide 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, 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 airport curfews. Factsheets can be found at www.airservicesaustralia.com/aircraftnoise/airport-information/

Reports – Airservices produces reports summarising noise data and complaints about noise from operations at Adelaide Airport. This report, and reports for other airports, can be found on the Airservices website at www.airservicesaustralia.com/publications/reports-and-statistics/noise-reports/

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/

Information on the Adelaide Curfew Act 2000 can also be found on this website at www.infrastructure.gov.au/aviation/environmental/curfews/AdelaideAirport/index.aspx

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/

Adelaide Airport's website - www.adelaideairport.com.au/

Parafield Airport's website - <http://parafieldairport.com.au/>