



# **Sydney Airport**

## **N407 Australian Noise Exposure Index**

**1 January - 31 March 2000**

**REPORT No: EO 20-078**

**JUNE, 2000**



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## Environment Services Branch

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**1.0 INTRODUCTION**

**1.1 Background**

In accordance with recommendation 21 of the Proponent's Statement for the Long Term Operating Plan (LTOP) at Sydney Airport, Airservices Australia has prepared a three month Australian Noise Exposure Index (ANEI) for the period 1 January 2000 to 31 March 2000 inclusive (Reference Number N407).

**1.2 Airport Layout**

Sydney Airport has three runways. Runway 07/25 (2529m long and 45m wide), Runway 16R/34L (3962m long and 45m wide) and Runway 16L/34R (2438m long and 45m wide). The runway end coordinates and elevations, Aerodrome Reference Point coordinates and elevation data were supplied by the Sydney Airports Corporation Limited (SACL) at Sydney Airport along with displaced threshold information. The airport average temperature and humidity was obtained from Bureau of Meteorology data. The temperature and humidity are an average taken over the three month period. These data are shown in Table 1.1.

**Table 1.1 Sydney Airport Runway Data**

Location	Latitude (AGD66)	Longitude (AGD66)	Elevation AHD	Displaced Landing Threshold
Aerodrome Reference Point	33 56 51.3S	151 10 33.4E	6.4m	
Runway End 07	33 56 43.2S	151 09 44.8E	5.3m	0m
Runway End 25	33 56 20.8S	151 11 19.7E	6.0m	340m
Runway End 16R	33 55 51.4S	151 10 13.5E	2.1m	85m
Runway End 34L	33 57 57.1S	151 10 46.1E	4.1m	0m
Runway End 16L	33 57 04.3S	151 11 13.7E	4.5m	230m
Runway End 34R	33 58 21.6S	151 11 33.8E	3.1m	38m
Airport Average Temperature				22.0°C
Airport Average Humidity				66.2%



## **2.0 THE INTEGRATED NOISE MODEL (INM)**

The Integrated Noise Model (version INM 6.0a) developed by the US Federal Aviation Administration (FAA) was used to model the noise contours for the period 1 January to 31 March 2000 for Sydney Airport.

## **3.0 ASSUMPTIONS AND METHODOLOGY USED IN THE DEVELOPMENT OF THE ANEI**

### **3.1 Introduction**

The development of the ANEI consisted of the following stages:

- i) collection and verification of the required data;
- ii) preparation of the data as INM input files;
- iii) running of the model; and,
- iv) preparation and verification of model's output.

### **3.2 Collection and verification of the required data**

The runway and associated airport data was supplied by the Sydney Airports Corporation Limited (SACL) at Sydney Airport.

The aircraft movement data were obtained directly from the Airservices Noise and Flight Path Monitoring System (NFPMS). A correction factor was applied to ensure that the total number of movements for departures and arrivals were equal.

The total number of movement records from the unadjusted NFPMS data for the study period was 68,230. A total of 134 of these movement records (0.20%) lacked sufficient information to be included in the calculations. This data deficiency included aircraft type, runway and airport destination or origination. Movement data derived from published Avcharges data indicated that there were 70,754 movements at Sydney for the same period. Once the departure and arrival figures had been adjusted to be equal, the total number of movements used in the modelling for the ANEI was factored to 70,754 or an average of 778 movements per day.

The flight tracks used in the model were determined from the NFPMS. The track plots from the NFPMS were used to identify the major flight paths associated with aircraft movements to and from the airport. Representative periods were selected between 1 January and 31 March 2000.



A nominal backbone track for all the major flight paths was identified by means of geographic coordinates along the length of the track and from NFPMS track plots. The corresponding spread of the track was also determined from the NFPMS plots. These tracks were put into the INM as 'point type' tracks. Each 'nominal backbone track' was prepared with four subsidiary tracks; two either side. This provided a realistic lateral spread of traffic along the nominal tracks.

### 3.3 Preparation of INM input file

The aircraft movement data extracted from the NFPMS were organised into:

- aircraft types and the associated operation (departure or arrival);
- the runway used; and
- the time of day or night.

For the purposes of modelling and using the Australian Noise Exposure Forecast (ANEF) metric, night is considered to be between the hours of 7:00pm and 7:00am and carries a weighting of 4.

Terrain around the airport was also taken into account. Terrain data for the Sydney region was compiled into a .3CD format in accordance with the INM User's Guide. This data was aligned to the aerodrome reference point (ARP) and incorporated by the INM when calculating the ANEI contours.

The use of terrain data results in changes to the shape of the contours when the terrain surrounding the airport is either higher or lower than the ARP. The change in elevation increases or reduces the distance between the aircraft and the ground that is used to calculate aircraft noise levels, thereby reducing or increasing the calculated noise levels or ANEF value at that point.

The types of aircraft that operated at Sydney Airport were assigned to 32 representative aircraft types that are contained within the INM database and are shown in Table 3.1. Where possible, the actual aircraft type was matched to its INM counterpart. However, in cases where a particular aircraft type had a small number of movements, it was grouped with a major INM type or INM substitute. In order to model helicopters a generic single engine helicopter profile was developed. This type of helicopter accounts for 90% of all helicopter operations at Sydney airport. All helicopters were modelled as departing from, or arriving to the Helipad that is situated south of the threshold of Runway 25.

**Table 3.1 Aircraft types used to model the 1 January to 31 March 2000 Sydney ANEI**

707320	Represents B707, C135 and DC8 type aircraft
727EM2	Boeing B727 fitted with hushkitting
737300	Boeing B737-300
737400	Boeing B737-400
737500	Boeing B737-500
74720B	Represents B747-200 and B747-300
747400	Boeing B747-400
757PW	Boeing B757-200
767300	Boeing B767-300
767JT9	Represents 55% of B767-200 movements
767CF6	Represents 45% of B767-200 movements
777200	Boeing B777-200
A310	Airbus Industries A310
A320	Airbus Industries A320
A340	Airbus Industries A340
BAE300	Represents BAe146
BEC58P	Represents GA twin piston-engine aircraft
C130	Represents C130, P3 and other 4 engine turbo-prop military aircraft
CL601	Canadair CL601 Challenger
CNA441	Represents GA twin turbine-engine aircraft
CONCRD	Aerospatiale/BAC Concorde
DC1030	Represents DC10 and MD11 type aircraft
DHC6	Represents Twin Otter and similar aircraft
DHC830	Represents Dash 8, FK50 type aircraft
F10065	Fokker F100
GASEPF	Represents GA single engine fixed pitch propeller aircraft.
GASEPV	Represents GA single engine variable pitch propeller and/or turbine aircraft
HS748A	Represents BAe 748A and Hawker Siddeley 748A, FK27 aircraft
LEAR25	Represents Lear 24/25 and Falcon 20 aircraft
LEAR35	Represents other small business type jets
SF340	Saab 340
HELO	Represents helicopters

The aircraft types were assigned to representative tracks based on the type of aircraft (jet, turbo-propeller or propeller) and the general cardinal direction from Sydney Airport of the destination or originating airport. This was further refined by determining the way-points associated with the major routes. As stated previously, the tracks were prepared as point type tracks, the location of which, and lateral spread, being determined from the NFPMS data.

Each operation associated with a particular runway and direction was assigned to a specific track. Where there was more than one track associated with a particular route, the percentage of operations was proportioned, based on the



data obtained from the NFPMS. The percentage of aircraft operations allocated to the backbone tracks and their subsidiary tracks was as follows:

Backbone track (Nominal) - 39%  
First subsidiary track (x2) - 24%, and  
Second subsidiary track (x2) - 6.5%.

A small number of tracks, for example turbo-propeller and other propeller aircraft departing from Runway 25 for the east, were not spread due to the small variations in their dispersal and the correspondingly few number of movements on these routes. In those cases a single nominal track was determined from the NFPMS.

The average daily movements for each aircraft type by runway, time of day and type of operation are shown in **Attachment A**.

### 3.4 Running of the Model

The INM was run using standard noise profile data for each of the aircraft types. The Australian Noise Exposure Forecast (ANEF) metric is a modification of the US Noise Exposure Forecast (NEF) within INM 6.0a. The parameters used for the ANEF metric were:

Day multiplier	1.0
Night multiplier	4.0

The evening multiplier is included as part of the night period (7:00pm to 7:00am) and is not modelled separately as in the US NEF process.

INM 6.0a allows for the use of average temperature and humidity for the period being modelled when calculating the noise levels. An average temperature of 22.0°C and an average humidity of 66.2% was used for the 1 January - 31 March 2000 ANEI (N407).

### 3.5 Preparation and verification of the model output.

The ANEI contours produced by the INM were plotted on a proprietary software base map. The contours produced for the 1 January - 31 March 2000 ANEI (N407) were consistent with flight tracks and the aircraft operations for the period and the use of terrain data.

The 1 January - 31 March 2000 ANEI (N407) had average daily movements of 778. This was an increase of 17 aircraft movements per day over the 1 January - 31 March 1999 ANEI (N399), which was modelled with average daily movements of 761.



#### 4.0 Comparison of the 1 January - 31 March 2000 ANEI (N407) with the 1 January - 31 March 1999 ANEI (N399)

The 1 January - 31 March 2000 ANEI (N407) contours for Sydney Airport are shown in **Attachment D**. In addition, a plot of the ANEI (N407) with terrain contours is included as **Attachment C**. For comparison purposes, the 1 January - 31 March 1999 ANEI (N399) for Sydney Airport has been included as **Attachment E**.

It should be noted that the terrain contours displayed in **Attachment C** are not an accurate representation of actual ground contours as they have been prepared by the INM program by interpolating ground elevation data that is set out in a grid format. The INM requires the terrain data to be prepared in feet; therefore, the terrain contours have been produced at 50 feet, or approximately 15 metre, intervals. The terrain contours in **Attachment C** are shown in metres.

As the 1 January - 31 March 2000 ANEI (N407) was prepared using terrain and with a newer version of INM (INM 6.0a), a direct comparison between N407 contours and those for the 1 January - 31 March 1999 ANEI (N399) for Sydney airport is not possible. However, a comparison has been made between ANEI N407 and ANEI N399 in regard to runway movement numbers. Where possible, comments have been included in regard to any changes in the shape of the contours between ANEI N407 and ANEI N399, taking into account what effect the modelling of terrain has had on the resultant contour. In **Attachment C** it can be seen that areas to the north, east and west of the airport are higher than that of the airport. This has had the effect of lengthening the contours in these areas.

##### North-West of the Airport

Average daily departures from Runway 34L have increased from 63.62 in ANEI N399 to 82.31 in ANEI N407. The 20 ANEI contour bumps to the north-west of the airport, especially the contour bump associated with jet departures via Katoomba, have increased in their extent. This increase is attributable to an increase in the number of jet and turbo-prop aircraft departures from this runway. Jet aircraft departures from Runway 34L using the Katoomba SID are required to turn when they reach an altitude of 800 feet. Turbo-prop aircraft departures from Runway 34L using the Wollongong and Glenfield Four SIDs are required to turn when they reach an altitude of 600 feet. This has resulted in the majority of aircraft turning at approximately the same lateral position. This factor, together with the increase in the number of departures, has resulted in an increase in the extent of the 20 ANEI contour. The inclusion of terrain has also had an effect on the 20 ANEI contour. In **Attachment C** it can be seen that the bump associated with these departures is located close to a 30 metre terrain contour.

Long-haul B747 aircraft departing for destinations in the USA were split between the RICHMOND TWO SID and a track that maintains runway heading before turning east. The proportion of aircraft on each track was determined from the



analysis of NFPMS data. The number of B747 aircraft bound for the USA that departed from Runway 34L in ANEI N407 was on average 2.79 aircraft per day. Of these aircraft, an average of 2.21 maintained runway heading while the remainder (an average of 0.58) tracked via the Richmond SID. By comparison, the number of B747 aircraft bound for the USA that departed from Runway 34L in ANEI N399 was, on average, 2.53 aircraft per day. Of these aircraft, an average of 1.61 maintained runway heading while the remainder (an average of 0.92) tracked via the Richmond SID.

#### North of the Airport

Average daily arrivals on Runway 16R have decreased from 98.40 in ANEI N399 to 82.18 in ANEI N407. However, the contours associated with these arrivals increased slightly in their extent. This can be attributed to the inclusion of terrain in the modelling. See **Attachment C** for details of the terrain contours in relation to ANEI N407.

Average daily arrivals on Runway 16L have decreased from 57.06 in ANEI N399 to 46.00 in ANEI N407. However, the contours associated with these arrivals however, have increased slightly in their extent. This can be attributed to the inclusion of terrain in the modelling. See **Attachment C** for details of the terrain contours in relation to ANEI N407.

#### East of the Airport

Average daily arrivals on Runway 25 have increased from 7.34 in ANEI N399 to 8.88 in ANEI N407. Average daily departures from Runway 07 have increased from 0.56 in ANEI N399 to 0.81 in ANEI N407. The contours associated with these operations have shown a corresponding increase in their extent.

Average daily departures from Runway 34R have increased from 63.72 in ANEI N399 to 82.57 in ANEI N407. The contours associated with these departures have shown an increase in their extent accordingly.

The inclusion of terrain in the modelling has also influenced these increases in the extent of the ANEI contours. See **Attachment C** for details of the terrain contours in relation to ANEI N407.

#### West of the Airport

Average daily arrivals on Runway 07 have decreased from 48.47 in ANEI N399 to 40.87 in ANEI N407. Average daily departures from Runway 25 have decreased from 12.42 in ANEI N399 to 10.43 in ANEI N407. The contours associated with these aircraft arrivals and departures have shown a slight decrease in their extent. This slight reduction in the extent of the ANEI contours can be attributed to the inclusion of terrain in the modelling. See **Attachment C** for details of the terrain contours in relation to ANEI N407.



South of the Airport

Average daily departures from Runways 16L have decreased from 67.94 in ANEI N399 to 58.60 in ANEI N407. Average daily departures from Runway 16R have decreased from 158.40 in ANEI N399 to 136.64 in ANEI N407. The contours associated with these departures have shown a corresponding decrease in their extent.

Average daily arrivals on Runway 34L have increased from 101.16 in ANEI N399 to 130.62 in ANEI N407. Average daily arrivals on Runway 34R have increased from 54.22 in ANEI N399 to 62.81 in ANEI N407. Accordingly, the contours associated with these arrivals have shown an increase in their extent.

**4.1 Comparison of Runway Use**

The percentage of runway operations used in 1 January - 31 March 2000 ANEI (N407) compared with the percentage of runway operations used in the 1 January - 31 March 1999 (N399) are shown in Table 4.1 and Figure 4.1a and 4.1b.

**Table 4.1 Runway usage of ANEI N407 compared with ANEI N399.**

Runway	ANEI N407 (1 July - 31 March 2000)		ANEI N399 (1 January - 31 March 1999)	
	N407 Arrivals	N407 Departures	N399 Arrivals	N399 Departures
<b>Rwy 07</b>	5.3	0.1	6.4	0.1
<b>Rwy 25</b>	1.1	1.3	1.0	1.6
<b>Rwy 16L</b>	5.9	7.5	7.5	8.9
<b>Rwy 16R</b>	10.6	17.6	12.9	20.8
<b>Rwy 34L</b>	16.8	10.6	13.3	8.4
<b>Rwy 34R</b>	8.1	10.6	7.1	8.4
<b>Helipad</b>	2.2	2.2	1.8	1.8

Note: Numbers represent percentage of total movements for the respective period of the ANEI and have been rounded to one decimal place.

The data in Table 4.1 and Figures 4.1a and 4.1b indicate that the proportion of movements to the north, south, east and west of the airport vary when comparing ANEI N407 with ANEI N399. In calculating the proportion of aircraft movements, helicopter operations were not taken into account.

There was a reduction in the proportion of movements to the north of the airport (arrivals on R16L and R16R and departures from R34L) from 28.8% (N399) to 27.1% (N407) while there has been a slight decrease in the proportion of movements to the south of the airport (arrivals on R34L and R34R and departures from R16L and R16R) from 50.1% (N399) to 50.0% (N407). The proportion of movements to the east of the airport (arrivals on R25 and departures from R07 and R34R) has increased from 9.5% (N399) to 12.9%



(N407) while there has been a reduction in the proportion of movements to the west of the airport (arrivals on R07 and departures from R25) from 8.0% (N399) to 6.6% (N407).

Figure 4.1a Arrival Runway Use

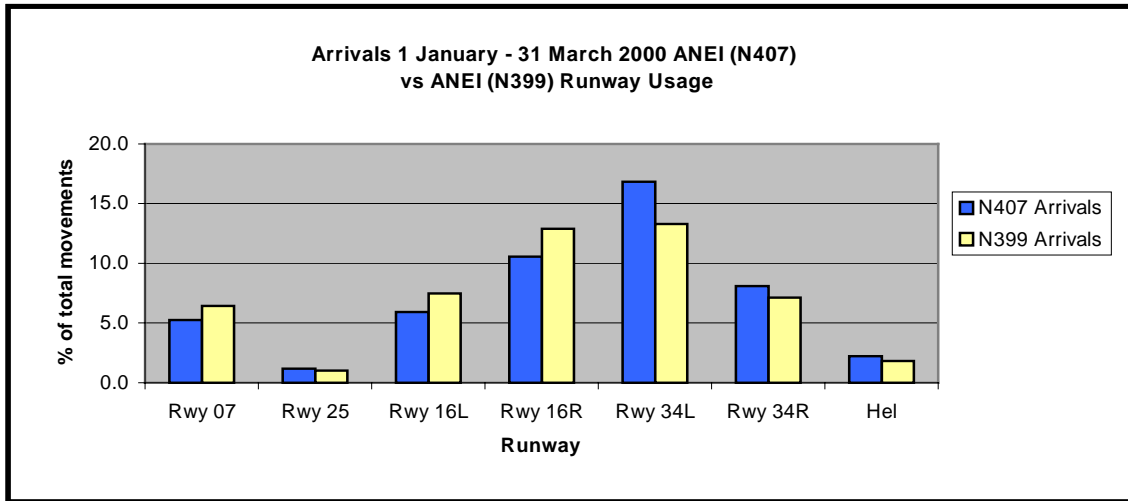
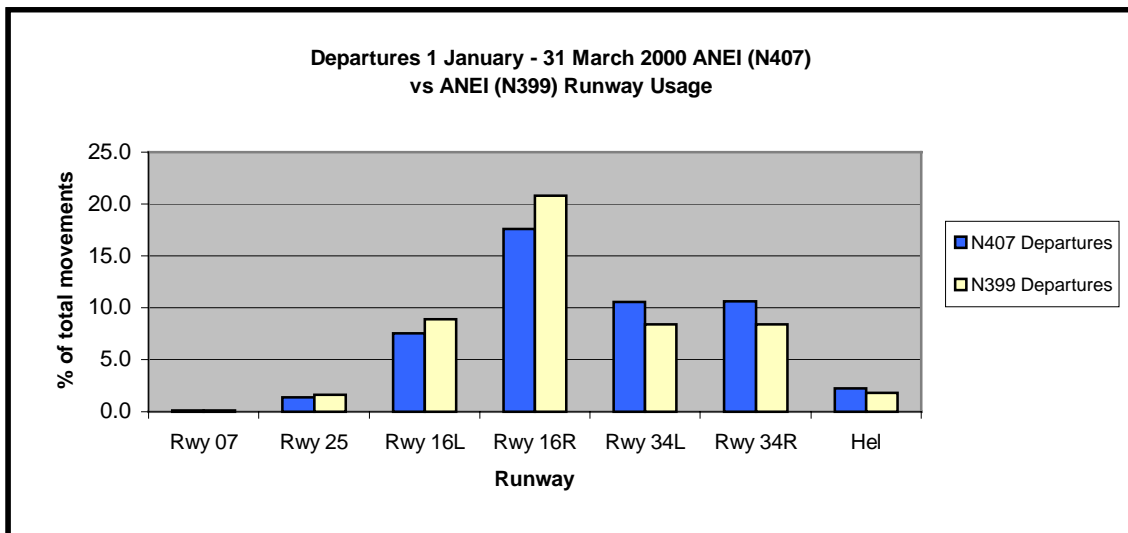


Figure 4.1b Departure Runway Use





#### 4.2 Comparison of Population Counts

The estimated number of people within each of the contours of the 1 January - 31 March 2000 ANEI (N407) are shown in Table 4.2. These population estimates are based on the Australian Bureau of Statistics 1996 Census and have been rounded to the nearest 100.

Due to the use of INM 6.0a and the inclusion of terrain data in the modelling of ANEI N407, a comparison between the estimated population within each contour for the 1 January - 31 March 2000 ANEI (N407) and the 1 January - 31 March 1999 ANEI (N399) has not been undertaken.

**Table 4.2 Estimates of the number of people within each ANEI contour.**

Contour	>=20 ANEI	>=25 ANEI	>=30 ANEI	>=35 ANEI	>=40 ANEI
1 Jan-31 Mar 2000 ANEI (N407)	84,500	24,100	5,100	500	0

The number of people within the various ANEI contours listed by suburb is shown in **Attachment B**. Notes and methodology specific to the suburb and contour population counts are included in **Attachment B**.



# **Attachment A**

## **Average Daily Aircraft Movements by Runway Used in ANEI N407**



Attachment A

Runway	Aircraft Type	Arrivals			Departures			Totals	
		Day	Night	Total	Day	Night	Total		
07	707320	0.00	0.01	0.01	0.00	0.00	0.00	0.01	
	727EM2	0.03	0.12	0.16	0.00	0.00	0.00	0.16	
	737300	4.34	1.90	6.24	0.16	0.03	0.19	6.43	
	737400	2.40	1.57	3.97	0.03	0.00	0.03	4.00	
	74720B	0.25	0.10	0.35	0.00	0.00	0.00	0.35	
	747400	0.55	0.55	1.09	0.00	0.00	0.00	1.09	
	767300	1.94	0.95	2.89	0.11	0.04	0.15	3.04	
	767CF6	1.85	0.89	2.74	0.06	0.03	0.09	2.83	
	767JT9	1.51	0.73	2.24	0.05	0.02	0.07	2.31	
	777200	0.00	0.12	0.12	0.00	0.01	0.01	0.13	
	A310	0.02	0.00	0.02	0.00	0.00	0.00	0.02	
	A320	1.85	0.96	2.81	0.15	0.03	0.18	2.99	
	A340	0.18	0.14	0.32	0.00	0.00	0.00	0.32	
	BAE300	0.50	0.12	0.63	0.01	0.00	0.01	0.64	
	BEC58P	0.66	0.47	1.13	0.00	0.00	0.00	1.13	
	CL601	0.00	0.01	0.01	0.00	0.00	0.00	0.01	
	CNA441	0.01	0.03	0.04	0.00	0.00	0.00	0.04	
	DC1030	0.12	0.10	0.22	0.00	0.00	0.00	0.22	
	DHC6	3.34	1.89	5.22	0.02	0.01	0.03	5.25	
	DHC830	3.72	0.69	4.41	0.03	0.00	0.03	4.44	
	F10065	0.19	0.00	0.19	0.00	0.00	0.00	0.19	
	GASEPF	0.01	0.00	0.01	0.00	0.00	0.00	0.01	
	GASEPV	0.04	0.00	0.04	0.00	0.00	0.00	0.04	
	HS748A	0.00	0.07	0.07	0.00	0.00	0.00	0.07	
	LEAR25	0.02	0.01	0.03	0.00	0.00	0.00	0.03	
	LEAR35	0.40	0.20	0.60	0.00	0.00	0.00	0.60	
	SF340	4.51	0.78	5.29	0.00	0.00	0.00	5.29	
			<b>28.45</b>	<b>12.42</b>	<b>40.87</b>	<b>0.62</b>	<b>0.19</b>	<b>0.81</b>	<b>41.68</b>
16L	737300	6.06	0.71	6.77	6.75	1.93	8.67	15.44	
	737400	2.81	0.47	3.28	4.38	1.41	5.79	9.07	
	737500	0.00	0.00	0.00	0.01	0.00	0.01	0.01	
	74720B	0.00	0.00	0.00	0.00	0.02	0.02	0.02	
	747400	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
	767300	1.95	0.32	2.28	2.30	0.63	2.93	5.21	
	767CF6	1.65	0.37	2.02	2.71	0.79	3.50	5.52	
	767JT9	1.35	0.30	1.65	2.21	0.65	2.86	4.51	
	777200	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
	A320	1.41	0.22	1.63	2.62	0.73	3.34	4.97	
	A340	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
	BAE300	0.45	0.21	0.66	0.44	0.36	0.81	1.47	
	BEC58P	2.03	0.36	2.39	1.16	0.15	1.31	3.70	
	CL601	0.01	0.01	0.02	0.01	0.01	0.02	0.04	
	CNA441	0.02	0.01	0.03	0.01	0.00	0.01	0.04	
	DC1030	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
	DHC6	8.36	1.47	9.83	10.70	1.63	12.33	22.16	
	DHC830	6.92	0.84	7.76	8.64	1.37	10.02	17.78	
	F10065	0.01	0.00	0.01	0.11	0.00	0.11	0.12	
	GASEPF	0.00	0.00	0.00	0.01	0.00	0.01	0.01	
	GASEPV	0.01	0.00	0.01	0.05	0.00	0.05	0.06	
	HS748A	0.00	0.02	0.02	0.00	0.00	0.00	0.02	
	LEAR25	0.00	0.01	0.01	0.03	0.00	0.03	0.04	
	LEAR35	0.39	0.06	0.45	0.46	0.09	0.55	1.00	
	SF340	6.32	0.86	7.18	4.78	1.40	6.18	13.36	
			<b>39.75</b>	<b>6.25</b>	<b>46.00</b>	<b>47.38</b>	<b>11.22</b>	<b>58.60</b>	<b>104.60</b>



Attachment A

Runway	Aircraft Type	Arrivals			Departures			Totals
		Day	Night	Total	Day	Night	Total	
16R	707320	0.00	0.01	0.01	0.02	0.02	0.04	0.05
	727EM2	0.03	0.11	0.14	0.10	0.33	0.43	0.57
	737300	8.51	1.74	10.26	12.60	3.89	16.49	26.75
	737400	5.07	1.45	6.52	7.30	2.08	9.38	15.90
	737500	0.01	0.00	0.01	0.01	0.00	0.01	0.02
	74720B	3.55	0.80	4.35	3.91	1.38	5.29	9.64
	747400	6.49	3.11	9.61	10.62	1.88	12.49	22.10
	757PW	0.00	0.00	0.00	0.01	0.00	0.01	0.01
	767300	6.25	1.68	7.93	8.80	2.38	11.17	19.10
	767CF6	4.57	1.48	6.05	6.24	2.21	8.45	14.50
	767JT9	3.74	1.21	4.95	5.10	1.81	6.91	11.86
	777200	0.41	0.57	0.98	0.02	1.33	1.35	2.33
	A310	0.51	0.00	0.51	0.54	0.02	0.56	1.07
	A320	4.32	0.88	5.20	5.41	1.95	7.36	12.56
	A340	1.03	0.32	1.35	1.26	0.73	1.98	3.33
	BAE300	0.94	0.26	1.19	1.29	2.86	4.15	5.34
	BEC58P	0.86	0.33	1.19	2.33	3.14	5.47	6.66
	C130	0.00	0.01	0.01	0.01	0.00	0.01	0.02
	CNA441	0.02	0.02	0.04	0.07	0.15	0.22	0.26
	CONCRD	0.00	0.00	0.00	0.01	0.00	0.01	0.01
	DC1030	0.52	0.20	0.73	0.48	0.49	0.97	1.70
	DHC6	4.47	1.25	5.72	5.10	10.53	15.64	21.36
	DHC830	3.83	0.51	4.34	6.59	1.07	7.66	12.00
	F10065	0.11	0.00	0.11	0.24	0.00	0.24	0.35
	GASEPF	0.01	0.00	0.01	0.02	0.00	0.02	0.03
	GASEPV	0.03	0.00	0.03	0.06	0.01	0.07	0.10
	HS748A	0.06	0.06	0.11	0.00	0.92	0.92	1.03
	LEAR25	0.02	0.02	0.04	0.09	0.03	0.12	0.16
	LEAR35	0.58	0.19	0.77	1.06	1.35	2.41	3.18
	SF340	8.90	1.07	9.98	14.35	2.47	16.82	26.80
		<b>64.87</b>	<b>17.31</b>	<b>82.18</b>	<b>93.63</b>	<b>43.01</b>	<b>136.64</b>	<b>218.82</b>
25	727EM2	0.03	0.02	0.06	0.00	0.00	0.00	0.06
	737300	0.93	0.32	1.25	0.95	0.52	1.47	2.72
	737400	0.60	0.29	0.89	0.51	0.33	0.84	1.73
	74720B	0.07	0.07	0.13	0.12	0.03	0.15	0.28
	747400	0.12	0.12	0.25	0.16	0.03	0.19	0.44
	767300	0.27	0.13	0.40	0.48	0.22	0.70	1.10
	767CF6	0.34	0.17	0.52	0.54	0.25	0.79	1.31
	767JT9	0.28	0.14	0.42	0.44	0.21	0.65	1.07
	777200	0.02	0.02	0.04	0.00	0.02	0.02	0.06
	A310	0.00	0.01	0.01	0.00	0.00	0.00	0.01
	A320	0.50	0.12	0.62	0.47	0.25	0.72	1.34
	A340	0.09	0.01	0.10	0.01	0.03	0.04	0.14
	BAE300	0.14	0.13	0.28	0.07	0.01	0.08	0.36
	BEC58P	0.12	0.13	0.26	0.12	0.08	0.20	0.46
	CNA441	0.02	0.01	0.03	0.00	0.01	0.01	0.04
	DC1030	0.00	0.01	0.01	0.00	0.00	0.00	0.01
	DHC6	0.71	0.40	1.12	0.71	0.22	0.93	2.05
	DHC830	0.95	0.12	1.07	0.75	0.37	1.12	2.19
	F10065	0.04	0.00	0.04	0.02	0.00	0.02	0.06
	GASEPF	0.00	0.00	0.00	0.01	0.00	0.01	0.01
	HS748A	0.00	0.01	0.01	0.00	0.00	0.00	0.01
	LEAR25	0.00	0.00	0.00	0.01	0.00	0.01	0.01
	LEAR35	0.09	0.04	0.13	0.05	0.10	0.15	0.28
	SF340	1.14	0.09	1.23	1.75	0.56	2.31	3.54
		<b>6.48</b>	<b>2.40</b>	<b>8.88</b>	<b>7.17</b>	<b>3.26</b>	<b>10.43</b>	<b>19.31</b>



Attachment A

Runway	Aircraft Type	Arrivals			Departures			Totals	
		Day	Night	Total	Day	Night	Total		
34L	707320	0.04	0.00	0.04	0.02	0.00	0.02	0.06	
	727EM2	0.01	0.26	0.27	0.07	0.29	0.35	0.62	
	737300	11.30	3.92	15.22	7.06	1.82	8.87	24.09	
	737400	7.09	2.90	9.99	4.09	1.30	5.39	15.38	
	74720B	4.04	1.23	5.27	3.71	0.93	4.64	9.91	
	747400	7.78	5.39	13.17	9.88	1.54	11.42	24.59	
	757PW	0.01	0.00	0.01	0.00	0.00	0.00	0.01	
	767300	7.05	2.95	10.00	3.97	0.95	4.92	14.92	
	767CF6	6.17	2.94	9.11	1.23	0.69	1.92	11.03	
	767JT9	5.05	2.41	7.45	1.01	0.56	1.57	9.02	
	777200	0.52	0.60	1.13	0.03	0.85	0.88	2.01	
	A310	0.45	0.06	0.50	0.44	0.03	0.48	0.98	
	A320	5.33	2.11	7.44	2.34	0.97	3.31	10.75	
	A340	1.18	0.48	1.66	1.00	0.40	1.40	3.06	
	BAE300	1.28	2.22	3.50	0.04	0.01	0.05	3.55	
	BEC58P	1.58	1.71	3.29	2.80	0.32	3.12	6.41	
	C130	0.00	0.01	0.01	0.01	0.00	0.01	0.02	
	CL601	0.02	0.02	0.04	0.02	0.02	0.04	0.08	
	CNA441	0.09	0.14	0.23	0.12	0.01	0.14	0.37	
	CONCRD	0.01	0.00	0.01	0.00	0.00	0.00	0.01	
	DC1030	0.77	0.21	0.98	0.41	0.55	0.97	1.95	
	DHC6	5.94	6.74	12.68	4.78	2.20	6.98	19.66	
	DHC830	6.67	1.16	7.83	6.35	1.26	7.62	15.45	
	F10065	0.17	0.00	0.17	0.03	0.00	0.03	0.20	
	GASEPV	0.10	0.02	0.12	0.08	0.03	0.12	0.24	
	HS748A	0.09	0.58	0.67	0.01	0.00	0.01	0.68	
	LEAR25	0.03	0.06	0.09	0.02	0.01	0.03	0.12	
	LEAR35	1.24	1.22	2.46	0.43	0.05	0.48	2.94	
	SF340	14.80	2.47	17.26	14.58	2.96	17.55	34.81	
			<b>88.83</b>	<b>41.79</b>	<b>130.62</b>	<b>64.54</b>	<b>17.77</b>	<b>82.31</b>	<b>212.93</b>
	34R	727EM2	0.06	0.10	0.16	0.00	0.00	0.00	0.16
		737300	7.70	1.08	8.78	10.44	2.38	12.83	21.61
		737400	3.52	0.78	4.30	5.79	1.71	7.51	11.81
		767300	3.08	0.49	3.57	5.52	1.67	7.19	10.76
767CF6		2.66	0.71	3.38	7.28	1.78	9.06	12.44	
767JT9		2.18	0.58	2.76	5.96	1.45	7.41	10.17	
A310		0.00	0.00	0.00	0.01	0.00	0.01	0.01	
A320		1.93	0.32	2.25	3.96	1.10	5.06	7.31	
BAE300		0.40	0.19	0.59	1.32	0.43	1.75	2.34	
BEC58P		2.65	0.83	3.48	1.50	0.13	1.63	5.11	
CL601		0.03	0.00	0.03	0.04	0.01	0.05	0.08	
CNA441		0.04	0.00	0.04	0.05	0.00	0.05	0.09	
DHC6		11.25	2.83	14.08	11.01	1.74	12.74	26.82	
DHC830		9.57	1.14	10.71	7.97	1.71	9.68	20.39	
F10065		0.12	0.01	0.13	0.24	0.01	0.25	0.38	
GASEPF		0.02	0.00	0.02	0.00	0.00	0.00	0.02	
GASEPV		0.07	0.02	0.09	0.05	0.02	0.07	0.16	
HS748A		0.03	0.01	0.04	0.00	0.00	0.00	0.04	
LEAR25		0.02	0.01	0.03	0.03	0.00	0.03	0.06	
LEAR35		0.46	0.12	0.58	1.27	0.13	1.40	1.98	
SF340	6.86	0.90	7.77	4.43	1.42	5.85	13.62		
		<b>52.67</b>	<b>10.14</b>	<b>62.81</b>	<b>66.87</b>	<b>15.70</b>	<b>82.57</b>	<b>145.38</b>	
H	HELO	15.48	1.93	17.41	15.94	1.46	17.41	34.82	
		<b>15.48</b>	<b>1.93</b>	<b>17.41</b>	<b>15.94</b>	<b>1.46</b>	<b>17.41</b>	<b>34.82</b>	
<b>Grand Total:</b>		<b>296.53</b>	<b>92.24</b>	<b>388.77</b>	<b>296.15</b>	<b>92.61</b>	<b>388.77</b>	<b>777.54</b>	



# **Attachment B**

## **Number of People Within each ANEI Contour Shown by Suburb**



Number of People within each ANEI Contour shown by Suburb

Run No	Suburb Name	Population	Contour (ANEF)				
			>=20	>=25	>=30	>=35	>=40
N407	Annandale	7700	1000	100	0	0	0
N407	Arncliffe	11800	300	0	0	0	0
N407	Banksia	1900	800	200	0	0	0
N407	Bexley	17800	6100	2300	0	0	0
N407	Botany	4700	1700	200	0	0	0
N407	Drummoyne	9500	2600	0	0	0	0
N407	Eastlakes	7400	400	0	0	0	0
N407	Enmore	1800	1800	0	0	0	0
N407	Hurstville	17700	2800	0	0	0	0
N407	Kurnell	2400	900	200	0	0	0
N407	Kyeemagh	800	400	0	0	0	0
N407	Leichhardt	15900	10500	3900	0	0	0
N407	Lewisham	4600	600	0	0	0	0
N407	Lilyfield	2100	400	0	0	0	0
N407	Marrickville	16700	15400	5500	1600	0	0
N407	Marrickville South	11300	3200	100	0	0	0
N407	Mascot	8500	6200	500	0	0	0
N407	Newtown	11700	5500	0	0	0	0
N407	Petersham	6300	6000	2000	400	0	0
N407	Rockdale	9900	4700	2700	600	0	0
N407	Rosebery	4900	100	0	0	0	0
N407	Rozelle	6100	100	0	0	0	0
N407	St Peters	2900	2700	500	0	0	0
N407	Stanmore	6400	5800	2700	900	0	0
N407	Sydenham	1100	1100	1100	1000	500	0
N407	Tempe	3500	3400	2100	500	0	0



**Totals**

Run No	Name	Population	Contour (ANEF)				
			>=20	>=25	>=30	>=35	>=40
N407		84500	24100	5100	500	0	

**Notes**

1. Contour and suburb population counts have been rounded to the nearest 100. Totals of the rounded individual suburb counts may not agree exactly with the rounded totals.
2. Suburbs with all contour populations less than fifty before rounding are included in the above listing and are listed as having zero population within each contour.
3. A suburb may intersect a contour but have no population under the contour. This can occur because the population distribution within a suburb is modelled to ensure that there is no significant population in parks and uninhabited areas.

**Data and methodology**

Suburb and contour population counts are approximations based on Census District (CD) populations from the 1996 Census and suburb boundary information from MapInfo Australia. Populations are calculated according to the proportion of the area of overlap of a suburb/contour and a CD to the CD total area. Some editing of CD boundaries and populations was performed to more accurately reflect population distribution in critical areas (close to the airport or flight paths).