

Cairns Airport

Aircraft Noise Information Report

Quarter 1 2016 (January to March)

Version Control

Version Number	Detail	Prepared by	Date
1	-	Environment	May 2016

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This report contains a summary of data collected over the specified period and is intended to convey the best information available from the NFPMS at the time. The system databases are to some extent dependent upon external sources and errors may occur. All care is taken in preparation of the report but its complete accuracy cannot be guaranteed. Airservices Australia does not accept any legal liability for any losses arising from reliance upon data in this report which may be found to be inaccurate.

Cairns Basin - Aircraft Noise Information Report

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1 Purpose

This report summarises data for Quarter 1 of 2016 (January to March) from Airservices' Noise and Flight Path Monitoring System (NFPMS) and Noise Complaints and Information Service (NCIS) for the Cairns area (Cairns Airport).

1.1 Cairns Airport

Cairns Airport is located 5.5 km north of the Cairns central business district (CBD) (see Figure 1). The airport is surrounded by high terrain from the south-east through to the north-west with Lumley Hill (1120ft) 1 km due west. Operations at Cairns are a mixture of Airport Regular Passenger Transport (RPT), charter and pilot training. Seaplanes and helicopters also operate nearby out of Cairns harbour, 0.5 km east of the CBD. During Quarter 1 of 2016, there were around 25,030 aircraft movements at Cairns Airport. More information about Cairns Airport is available from the Airservices website at www.airservicesaustralia.com/aircraftnoise/airport-information/.

1.2 Aircraft noise monitoring at Cairns

Airservices NFPMS captures and stores radar, flight plans and noise data. The NFPMS covers eight city regions around Australia. For the Cairns region, noise data is captured by three noise monitors - also known as Environmental Monitoring Units (EMUs) located at Cairns North, Holloways Beach and Yorkeys Knob.



Figure 1: Location of Cairns Airport. Runway orientation for airport is shown in the insert. Noise monitoring sites are shown as red dots.

Figure 1 shows runway configuration at Cairns Airport. The main runway at Cairns Airport, 15/33, is approximately 3.1 km long, orientated north-northwest to south-southeast. There is a smaller 0.9km long runway, 12/30, orientated northwest to southeast, which is primarily used by propeller aircraft.

Information about runway selection is available on the Airservices website at www.airservicesaustralia.com/aircraftnoise/factsheets/.

2 Flight patterns

2.1 Jet aircraft

Jets operating at Cairns Airport are a mixture of twin engine narrow body (Boeing 737, Boeing 752, Embraer ERJ-190 and Airbus A320) and wide body (Boeing 777, Boeing 767 and Airbus A330) aircraft. On occasion, a four engine wide bodied jet, such as Boeing 747 will fly into Cairns.

Figure 2 below shows jet aircraft track plots for arrivals and departures in the Cairns region. Noise monitors (EMUs) are shown as yellow circles.

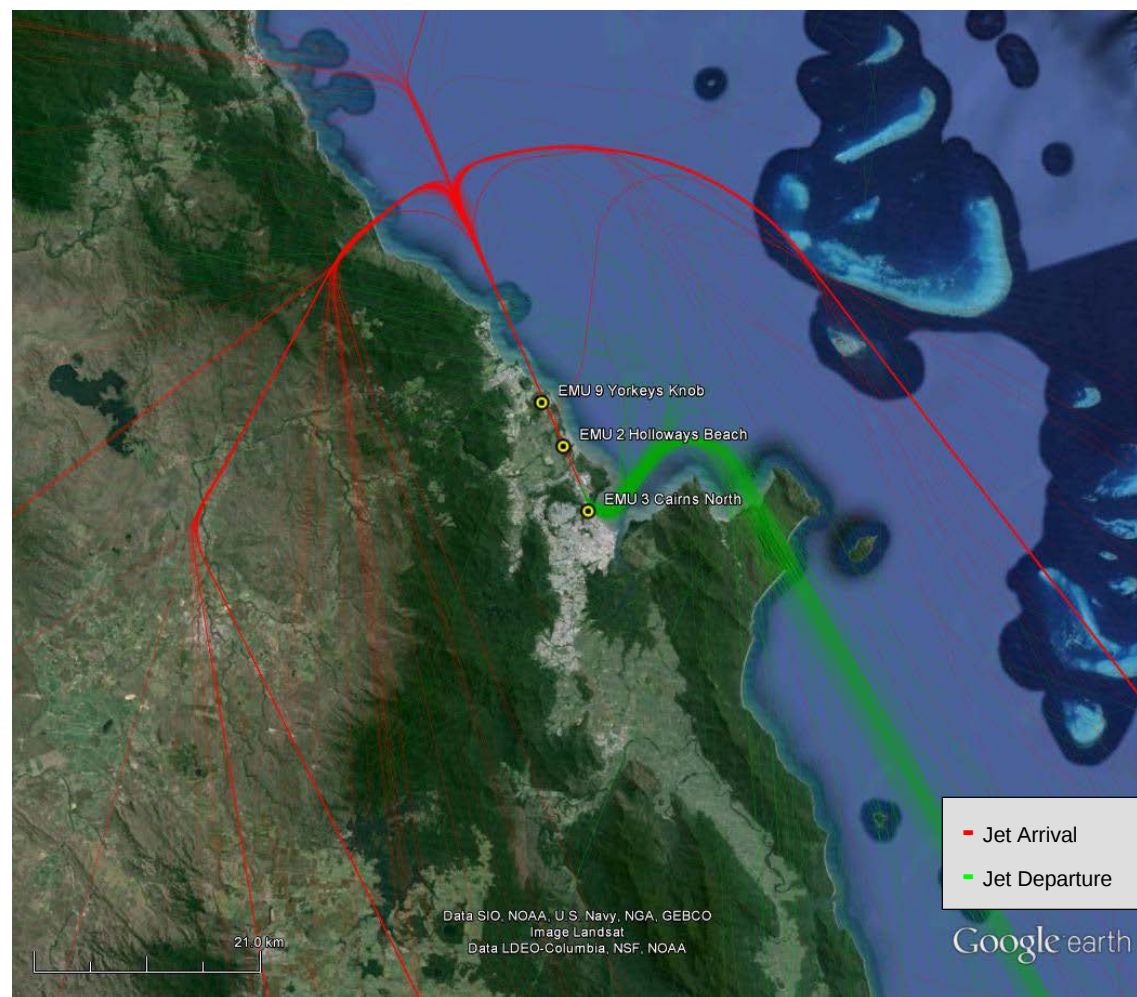


Figure 2: Jet paths for the Cairns region

Key points shown by Figure 2 are:

- Most jet approaches are made from the north.
- There are two arrival patterns for jets that arrive from the north, this includes a straight in approach in line with the runway or, in good weather conditions an approach to the airport from the north-east crossing the coast at Richters Creek.
- Arrivals from the north are over the ocean, avoiding residential areas until the last 10km.
- Southern approaches are straight in from the south-east.
- Most jet departures are to the south. Aircraft turn to the east over water soon after take off to minimise the noise impacts for residential areas.

2.2 Non jet aircraft

Figure 3 shows non jet tracks (arrivals and departures) in the Cairns region. Noise monitors (EMUs) are shown as yellow circles.

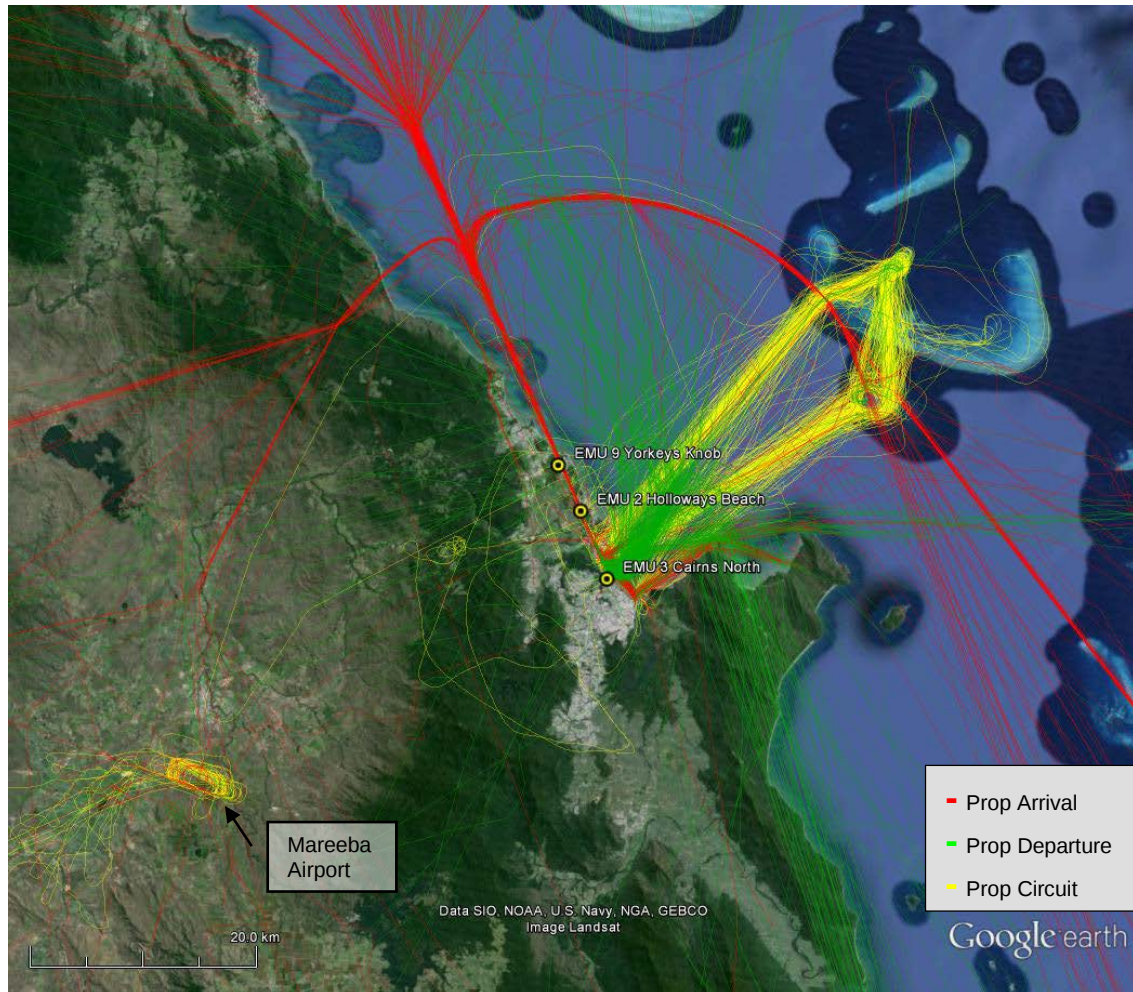


Figure 3: Non-jet flight paths for the Cairns region

Key points shown by Figure 3 are:

- It is clear that although jet aircraft tend to operate along defined paths, when smaller aircraft are included on the map, there are very few areas of Cairns that are not overflown by aircraft at some stage.
- Sightseeing trips to the Great Barrier Reef are clear, as are circuit training operations at Mareeba Airport west of Cairns.

3 Aircraft Movements and Altitude

3.1 Jet Arrivals / Departures by Altitude

Figure 4 below shows jet aircraft track plots for arrivals and departures at Cairns Airport coloured by altitude. Noise monitors (EMUs) are shown as grey circles.

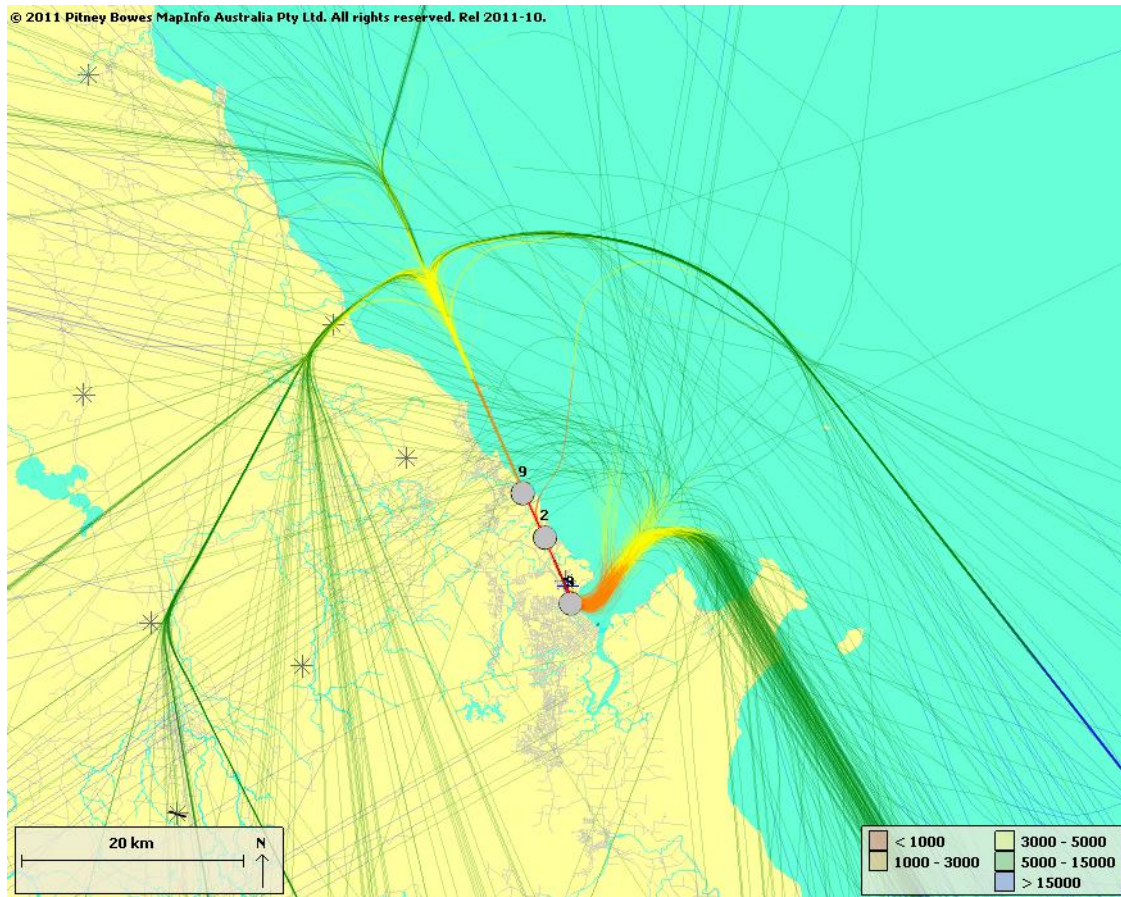


Figure 4: Jet arrivals and departures for the Cairns region

The key point shown by Figure 4 is:

- Jet aircraft operations tend to avoid residential areas. However, aircraft taking off to the north fly over residential areas at altitudes below 1000ft before crossing over the ocean.

3.2 Non-Jet Arrival / Departures by Altitudes

Figure 5 below shows non jet tracks (arrivals and departures) for the Cairns region coloured by altitude. Noise monitors (EMUs) are shown as grey circles.

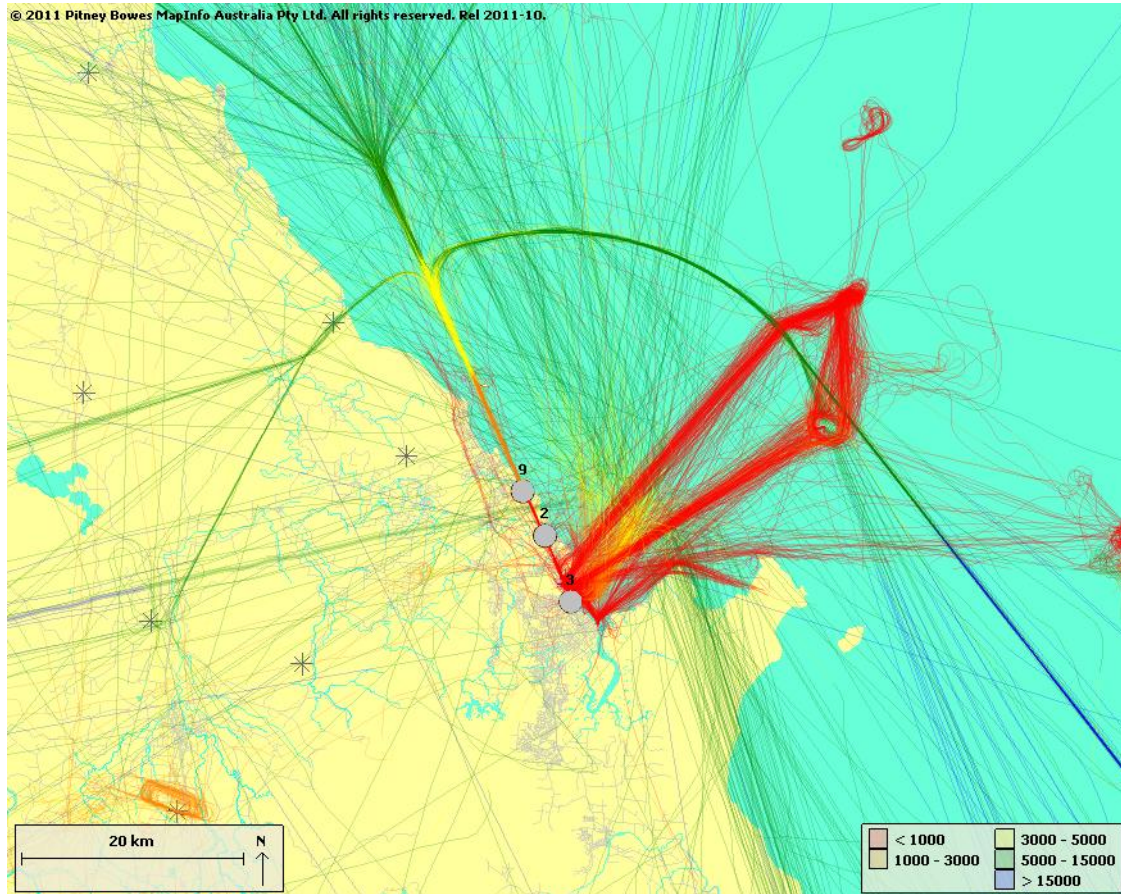


Figure 5: Non jet arrivals and departures for the Cairns region

Key points shown by Figure 5 are:

- Propeller aircraft and helicopters tend to fly over residential areas at altitudes below 3000ft more than jet aircraft.
- Movements from Cairns airport to the reef islands (tracks north-east of the airport) are conducted below 3000ft, with a significant number below 1000ft.

3.3 Track density plots

The track plots in the preceding section show that residents living up to 10 km to the north, and 10 km to the south of Cairns Airport, which are in line with the airport's runways are regularly overflown by jet aircraft below 5000ft. However, beyond this the regularity of flight path use is not visible from the track plot display. A track density plot can be useful in showing the underlying track patterns.

A track density plot is a map which displays the pattern of aircraft flight tracks passing over the region around the airport. The region is divided into a set of small grid elements and the number of flights passing over each grid element is summed. Each grid element is coloured according to the number of overflights.

The next map shows a track density plot for all movements over the Cairns Basin for Quarter 1 of 2016. The grid size adopted is 200m x 200m. The colour coding from green to red represents the range of two to 20 flight tracks per day (182 to 1820 flight track for the quarter). If any grid element is not colour coded, the number of aircraft flight tracks passing over that element during the quarter was less than two per day on average. Note the absence of a colour for a grid element does not mean the grid element is free of aircraft overflights. The grey circles show the location of each noise monitor (EMU).

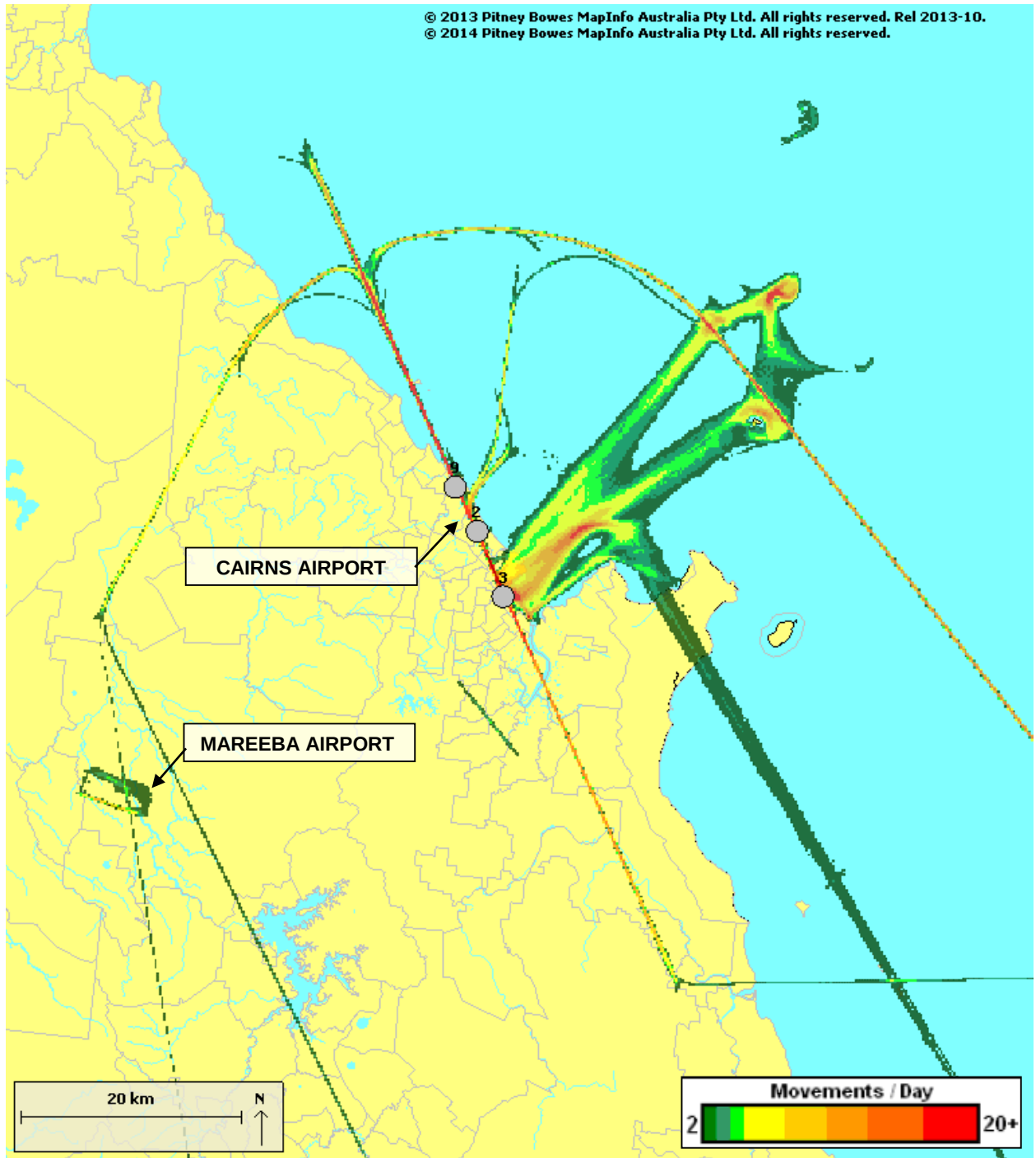


Figure 6: Track density plot for the Cairns region, Quarter 1 of 2016

Key points shown are:

- Operations were concentrated to the east (over the ocean) and north of the airport.
- The majority of operations were in the Runway 15 direction (arrivals from the north onto Runway 15 and departures off Runway 15 to the south). This is in line with the noise abatement procedures at the airport.
- Mareeba Airport operations are visible to the south-west of Cairns Airport.

4 Airport Statistics and Noise Events

4.1 Cairns Airport

Figure 7 shows aircraft movements at Cairns Airport for the 12-month period to the end of Quarter 1 of 2016 (and three-year averages for each month).

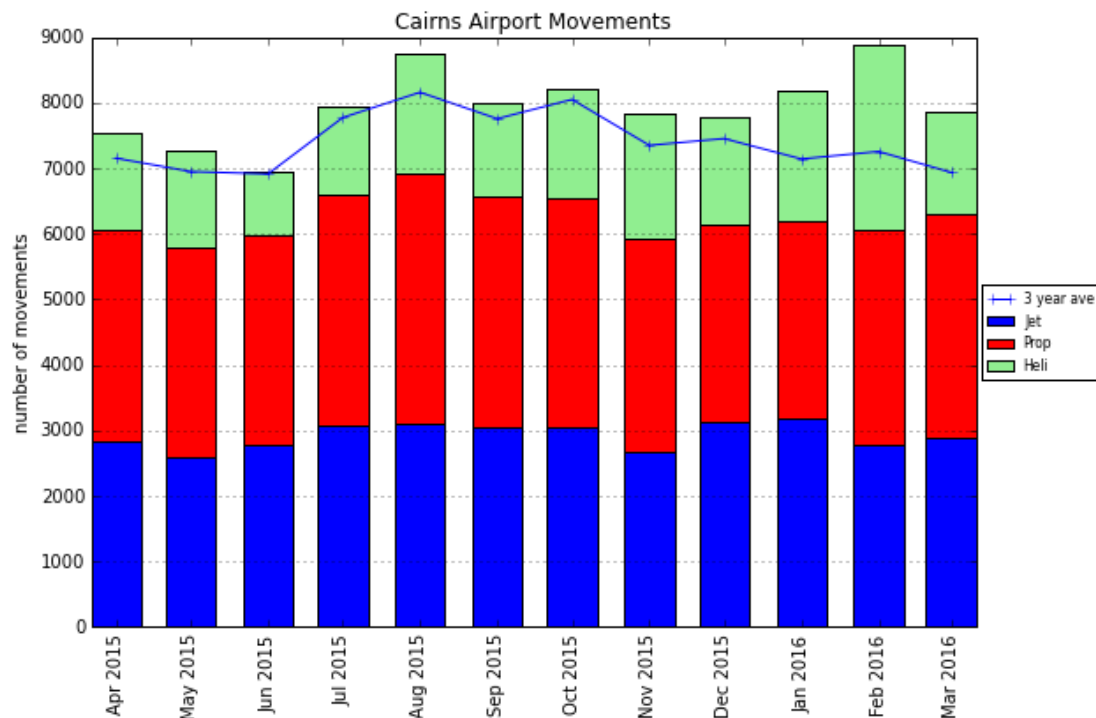


Figure 7: Aircraft movements at Cairns Airport to Quarter 1 of 2016 (and three-year averages for each month).

Key points shown are:

- Total movement numbers in Quarter 1 of 2016 at Cairns Airport were slightly above the three-year average
- February 2016 showed a significant growth in helicopter movements
- Around 45% of movements were propeller aircraft, 40% jets and 15% helicopters.

4.1.1 Runway Usage

Figure 8 to Figure 11 show runway usage for arrivals and departures at Cairns Airport for the year up to the end of Quarter 1 of 2016 (and three-year average per month from 2013–2015).

Runway selection is based on weather conditions, traffic volume and noise abatement procedures. As the wind changes, the runway in use may change as aircraft primarily take off and land into the wind for safety and performance reasons.

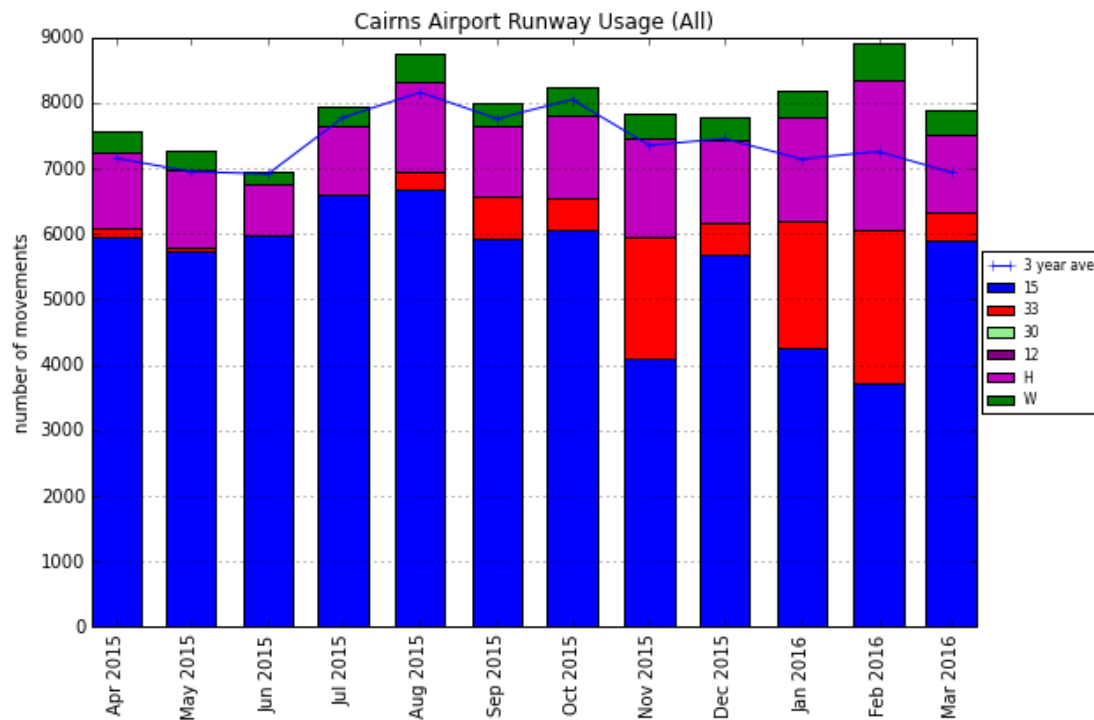


Figure 8: Runway usage (All) at Cairns Airport to Quarter 1 of 2016 (and three-year averages for each month).

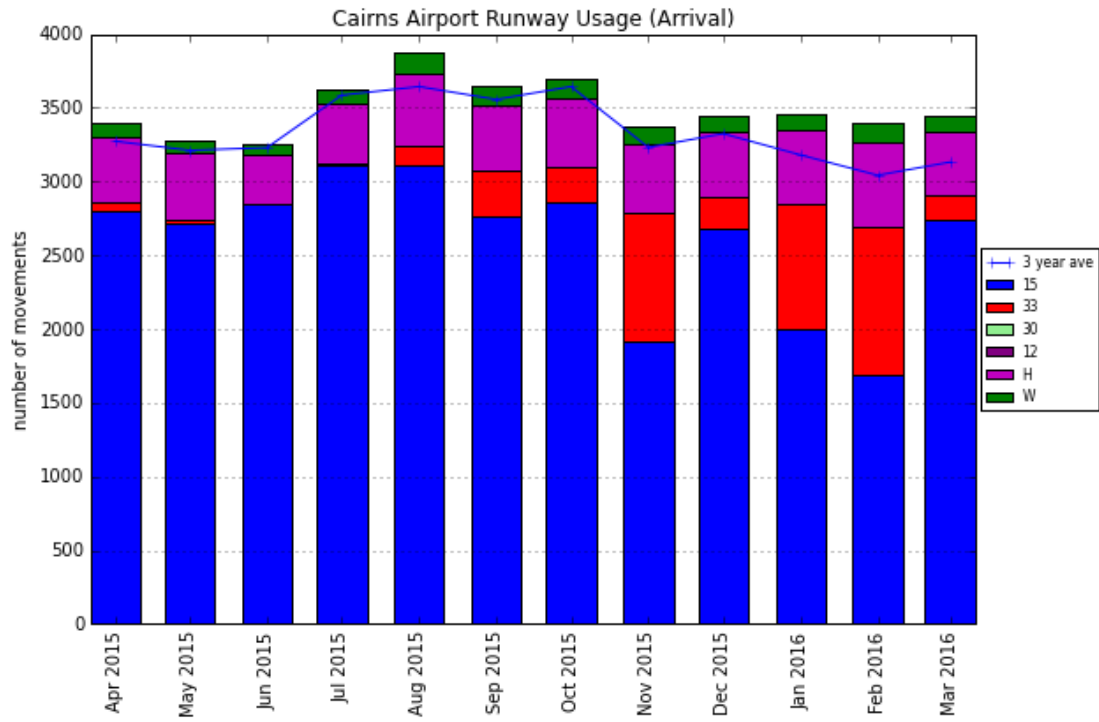


Figure 9: Runway usage (Arrivals) at Cairns Airport to Quarter 1 of 2016 (and three-year averages for each month).

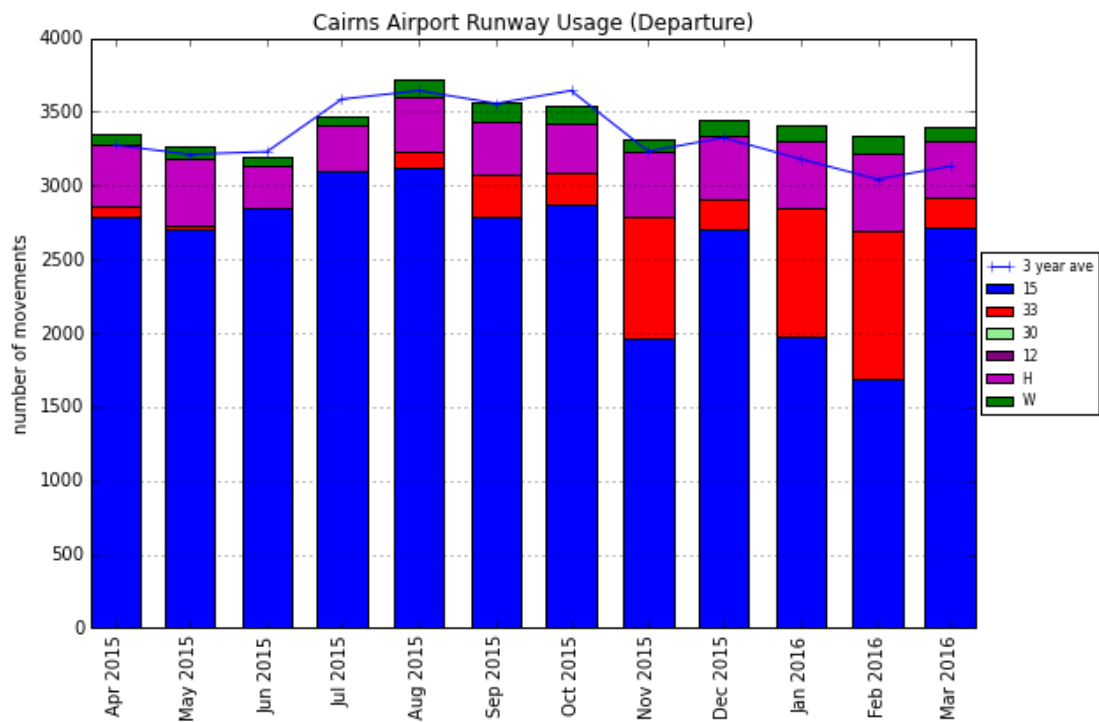


Figure 10: Runway usage (Departures) at Cairns Airport to Quarter 1 of 2016 (and three-year averages for each month).

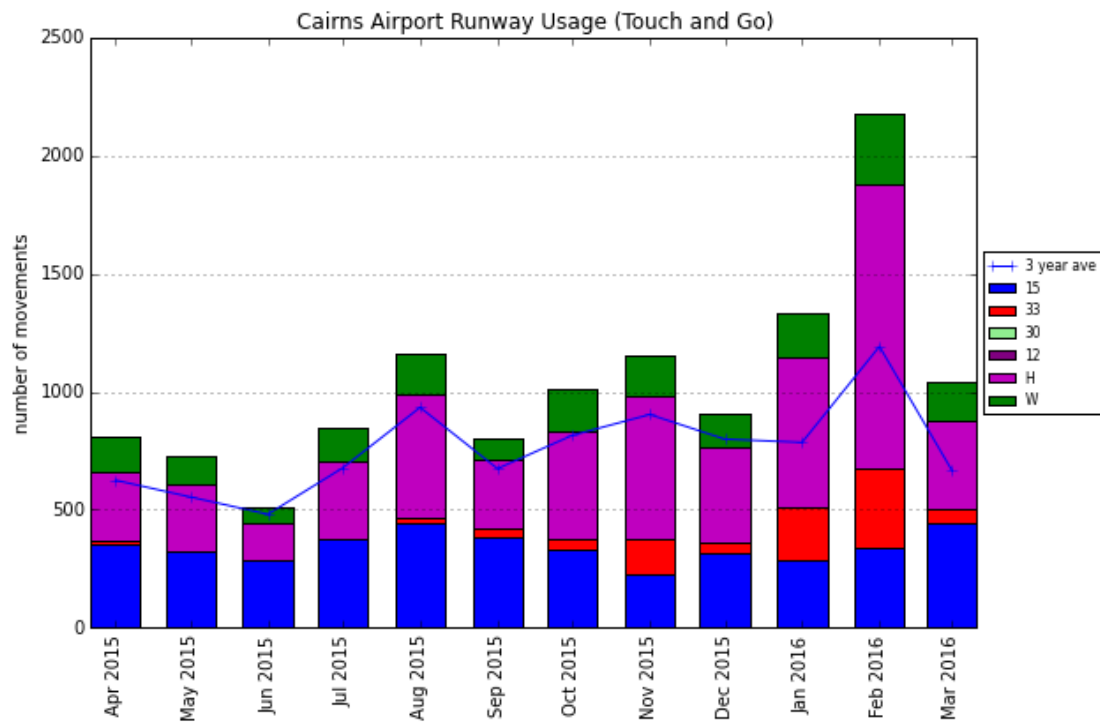


Figure 11: Runway usage (Touch and Go) at Cairns Airport to Quarter 1 of 2016 (and three-year averages for each month).

- The key point shown by Figures 8 to 11 is that in Quarter 1 of 2016, the significant majority of fixed wing aircraft took off to the south and arrived from the north.
- During Quarter 1 of 2016, Runway 15 was used for approximately 70% of all movements with an increase on Runway 33.

4.2 Noise Monitoring

Airservices collects noise and operational data from noise monitors (EMUs) around Cairns Airport. This data can be expressed in a number of ways, to show average noise during a period, background noise levels and number of noise events over a certain threshold.

Sound 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).

Figure 12, Figure 13 and Figure 14 show data from the three Cairns noise monitors for the last fifteen months (see Figure 1 for the location of EMUs). The terms used within each of these Figures are:

N65: The average number of daily noise events caused by aircraft that are over 65dB(A). Figures for N70, N80 and N90 are also provided.

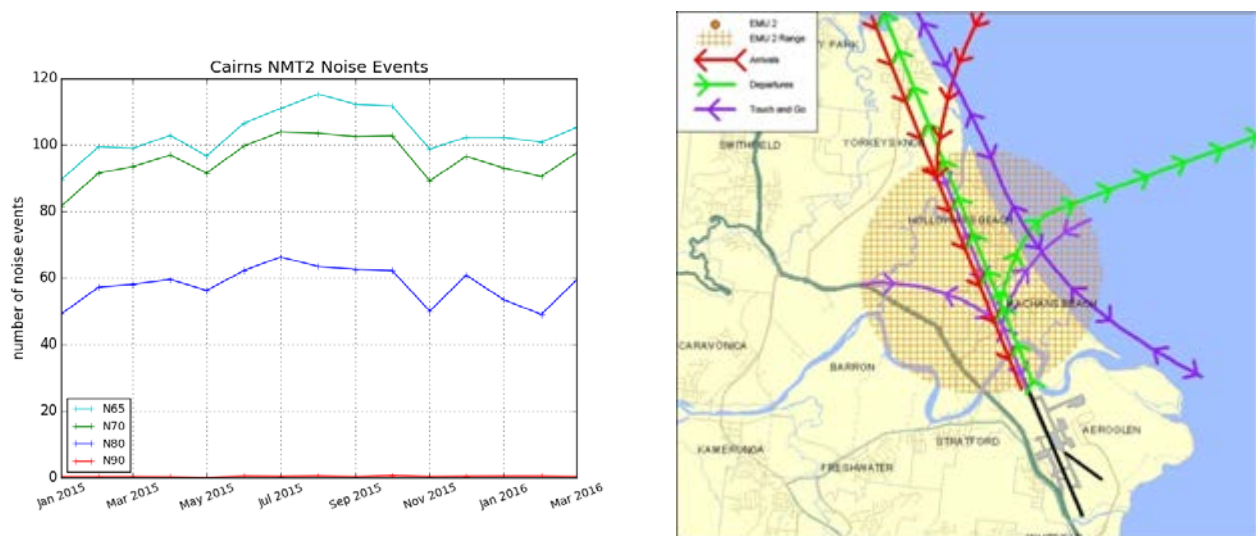


Figure 12: Average daily noise events at EMU 2 (Holloways Beach) from Quarter 1 of 2014 to Quarter 1 of 2016

The key points shown are:

- This monitor captures mainly arrivals to Runway 15 and departures from Runway 33.
- The number of aircraft noise events recorded by EMU 2 reflects the pattern of seasonal use of Runway 15 for arrivals, with more events recorded in the dry season than the wet season.



The key points shown are:

-
- Cairns NMT3 Noise Events**
- | Month | N65 | N70 | N80 | N90 |
|----------|-----|-----|-----|-----|
| Jan 2015 | 108 | 83 | 38 | 1 |
| Feb 2015 | 121 | 83 | 38 | 1 |
| Mar 2015 | 104 | 70 | 30 | 1 |
| Apr 2015 | 106 | 77 | 35 | 1 |
| May 2015 | 95 | 65 | 29 | 1 |
| Jun 2015 | 104 | 72 | 32 | 1 |
| Jul 2015 | 110 | 74 | 35 | 1 |
| Aug 2015 | 130 | 88 | 42 | 1 |
| Sep 2015 | 124 | 89 | 41 | 1 |
| Oct 2015 | 127 | 81 | 36 | 1 |
| Nov 2015 | 132 | 90 | 42 | 1 |
| Dec 2015 | 109 | 78 | 39 | 1 |
| Jan 2016 | 120 | 92 | 43 | 1 |
| Feb 2016 | 107 | 81 | 34 | 1 |
| Mar 2016 | 111 | 81 | 37 | 1 |

- This monitor captures mainly arrivals to Runway 33 and departures from Runway 15.

4.3 Historic Cairns Runway Statistics

Historic movement data is given below for the most frequently used runways at Cairns Airport.

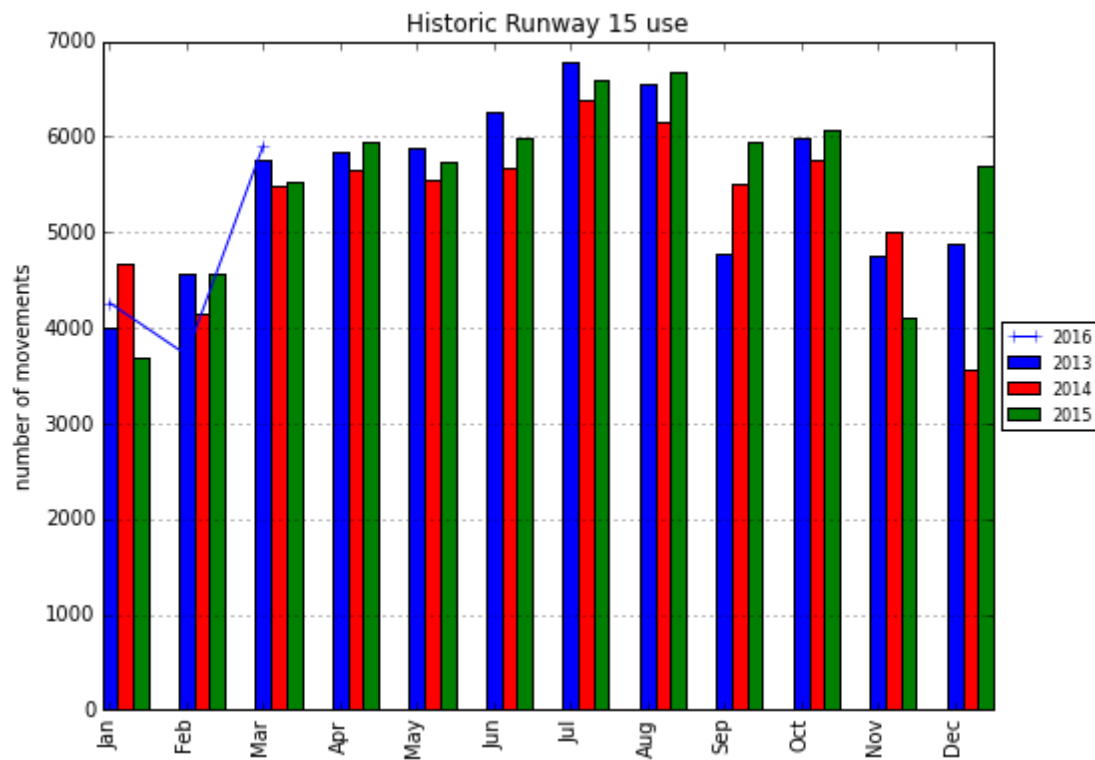


Figure 15: Runway 15 usage at Cairns Airport 2013 to 2016

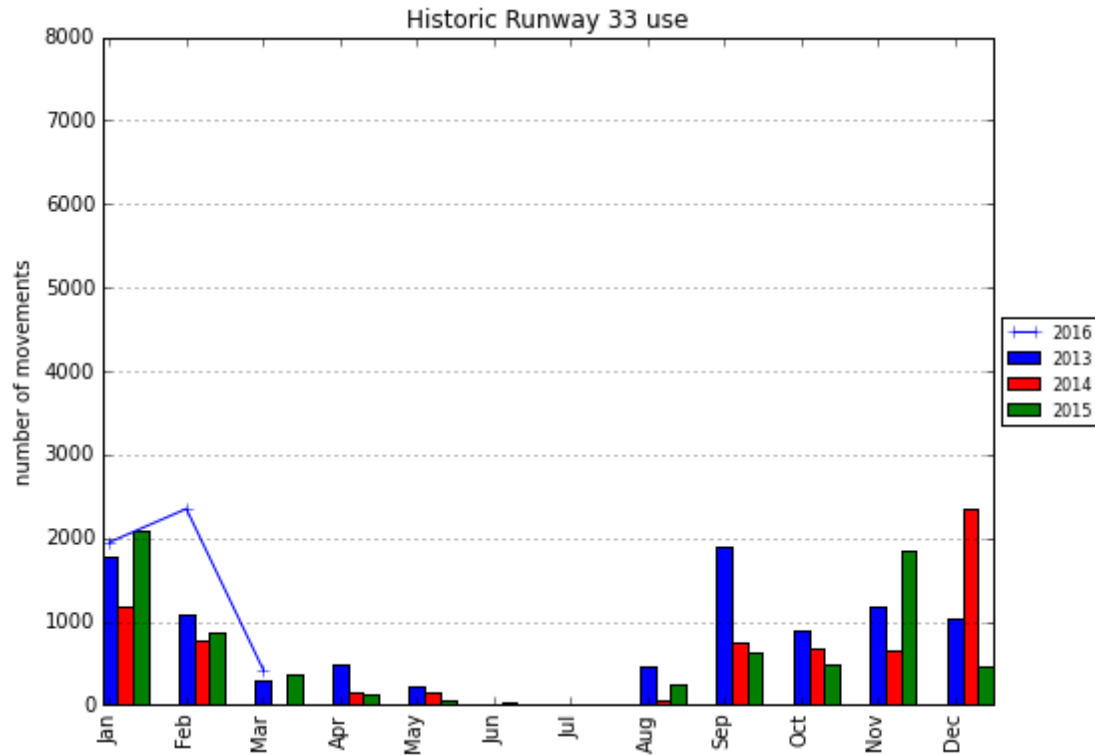


Figure 16: Runway 33 usage at Cairns Airport 2013 to 2016

Key point shown in Figure 15 and Figure 16 are:

- Prevailing winds mean that the Runway 15 direction is used the most throughout the year, with almost no movements at all on Runway 33 during the dry season months.
- Runway 33 use peaks between September and January, though even during these months its use is still well below that of Runway 15.

4.4 Night Movements

Figure 17 (below) shows aircraft movements during night hours (11.00pm to 06.00am) at Cairns Airport from April 2015 to March 2016, by aircraft category and shows the aircraft type usage.

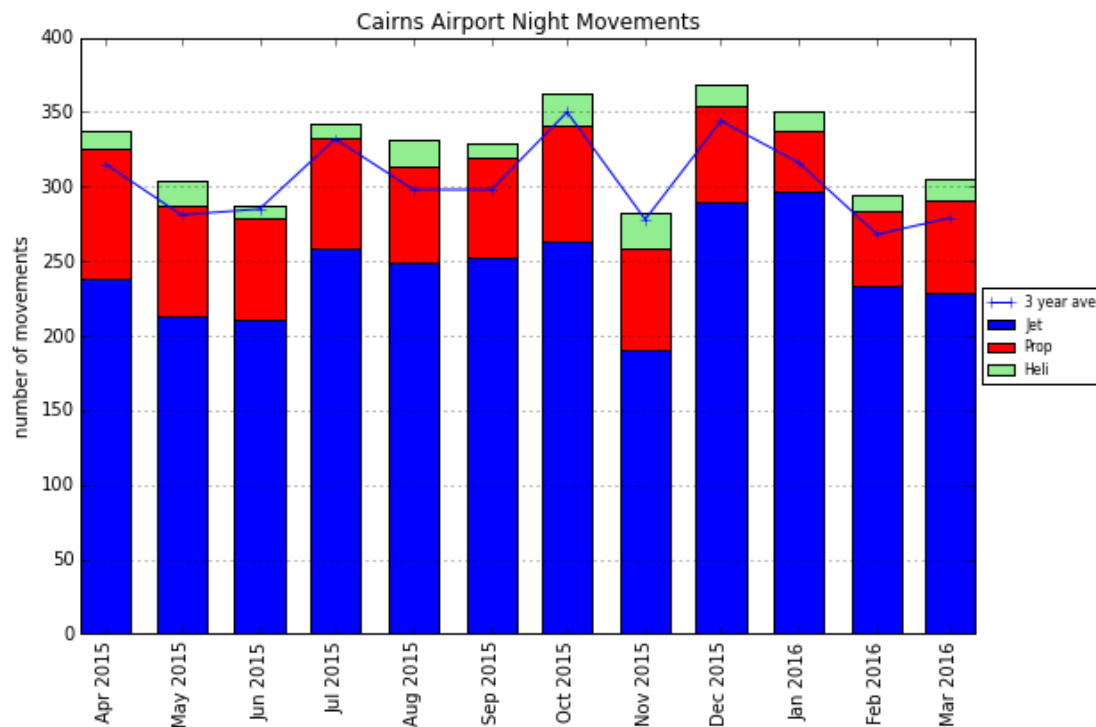
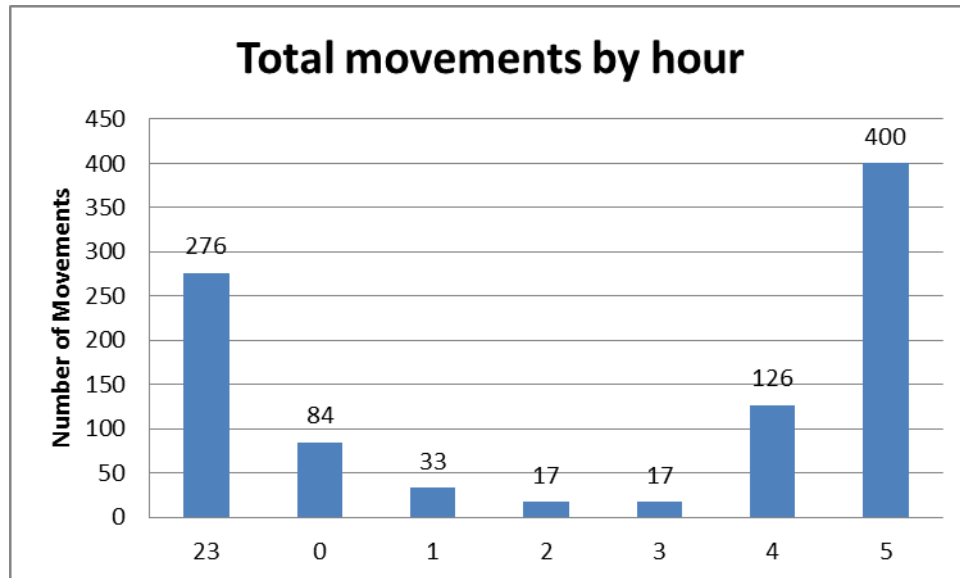


Figure 17: Night movements (11.00pm to 6.00am) at Cairns Airport to Quarter 1 of 2016 by aircraft category (and three-year averages for each month)

Figure 18 shows the total aircraft movements during night hours (11.00pm to 06.00am) at Cairns Airport from January to March 2016 (3 months), by hour.



**Figure 18: Night movements (11.00pm to 6.00am) at Cairns Airport
January to March 2016 (3 months) by hour**

Table 1: Details of aircraft operating during the night-time (11:00pm to 6:00am) at Cairns Airport for the period January to March 2016 (3 months).

Aircraft Type (J = Jet, P = Prop, H = Hel)	Hour							
	23	0	1	2	3	4	5	Totals
(blank)	3	-	-	-	-	-	-	3
A139 (H)	4	13	6	2	1	-	4	30
A320 (J)	219	40	9	1	1	-	34	304
AC50 (P)	1	-	-	-	-	3	6	10
AT45 (T)	-	-	1	-	-	-	-	1
B190 (T)	-	-	-	-	-	-	3	3
B712 (J)	14	2	2	1	-	1	-	20
B733 (J)	-	-	-	-	-	-	28	28
B738 (J)	1	1	1	-	-	-	152	155
B752 (J)	1	1	1	-	-	-	-	3
B788 (J)	-	-	-	-	1	107	45	153
BE20 (T)	19	20	9	7	4	5	11	75
C208 (T)	2	-	-	-	-	1	5	8
C310 (P)	-	-	-	-	-	1	-	1
C402 (P)	-	1	-	-	1	3	13	18
C404 (P)	-	-	-	-	-	-	3	3
C525 (J)	-	-	-	-	-	-	1	1
CL30 (J)	-	1	1	-	-	-	-	2
CL60 (J)	1	-	-	1	-	-	-	2
CRJ2 (J)	-	-	-	-	-	-	1	1
D328 (T)	1	-	-	1	-	1	1	4
DH8A (T)	-	-	-	1	-	-	-	1
DH8B (T)	3	-	-	-	-	-	2	5
DH8D (T)	2	-	-	-	-	-	11	13
E190 (J)	-	-	-	-	-	-	65	65
F100 (J)	-	-	2	-	1	-	5	8
F70 (J)	-	-	-	-	3	-	1	4
FA50 (J)	-	-	-	1	-	-	-	1
GA8 (P)	-	-	-	-	-	-	1	1
GLF5 (J)	2	-	1	-	-	-	-	3
H25B (J)	-	-	-	1	-	1	-	2
HEL (H)	2	3	-	-	3	-	-	8
LJ45 (J)	1	2	-	1	2	-	1	7
M20P (P)	-	-	-	-	-	-	1	1
PA31 (P)	-	-	-	-	-	3	1	4
SW4 (T)	-	-	-	-	-	-	5	5
Total	276	84	33	17	17	126	400	953

The key points shown by Figures 17 and 18 and Table 1 are:

- Majority of all operations at Cairns airport are propeller aircraft, including the night period (23:00-6:00)
- The movements from jets were primarily twin engine jets (Airbus A320, Airbus A330, Boeing 737 and Boeing 787).
- As compared with previous quarters, there was a significant increase in flights between 11.00pm and 12.00am and a significant decrease in flights between 05.00am and 06.00am. This is believed to be due to airline schedule changes.

5 Complaints Data

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. Each complaint, enquiry or request for information is referred to as a contact and each person who makes contact with the NCIS is referred to as a complainant. For this report, only complainants making complaints have been included.

5.1 NCIS Complainants by suburb

The NCIS received contacts from 7 complainants for Cairns Airport during Quarter 1 of 2016. Complainant density maps are used to show the number of complainants from each suburb, with suburbs coloured according to how many complainants had contacted the NCIS during the quarter. The data does not include complainants who contacted other organisations (e.g. airports).

Table 2 provides a breakdown of suburbs from Quarter 1 of 2016 with 5 or more complainants. As no suburb had 5 or more complainants no individual suburb has been identified in the table.

Figure 19 shows complainant density with flight tracks overlaid for Cairns Basin for Quarter 1 of 2016.

The following data is derived from a dynamic database and is correct as at 15th April 2016 and may change without notification.

Table 2: Recorded Cairns Airport Complainants by Suburb for the last 4 Quarters

Suburb	Quarter 2 2015	Quarter 3 2015	Quarter 4 2015	Quarter 1 2016
-	-	-	-	-
Total Complainants	4	11	7	7

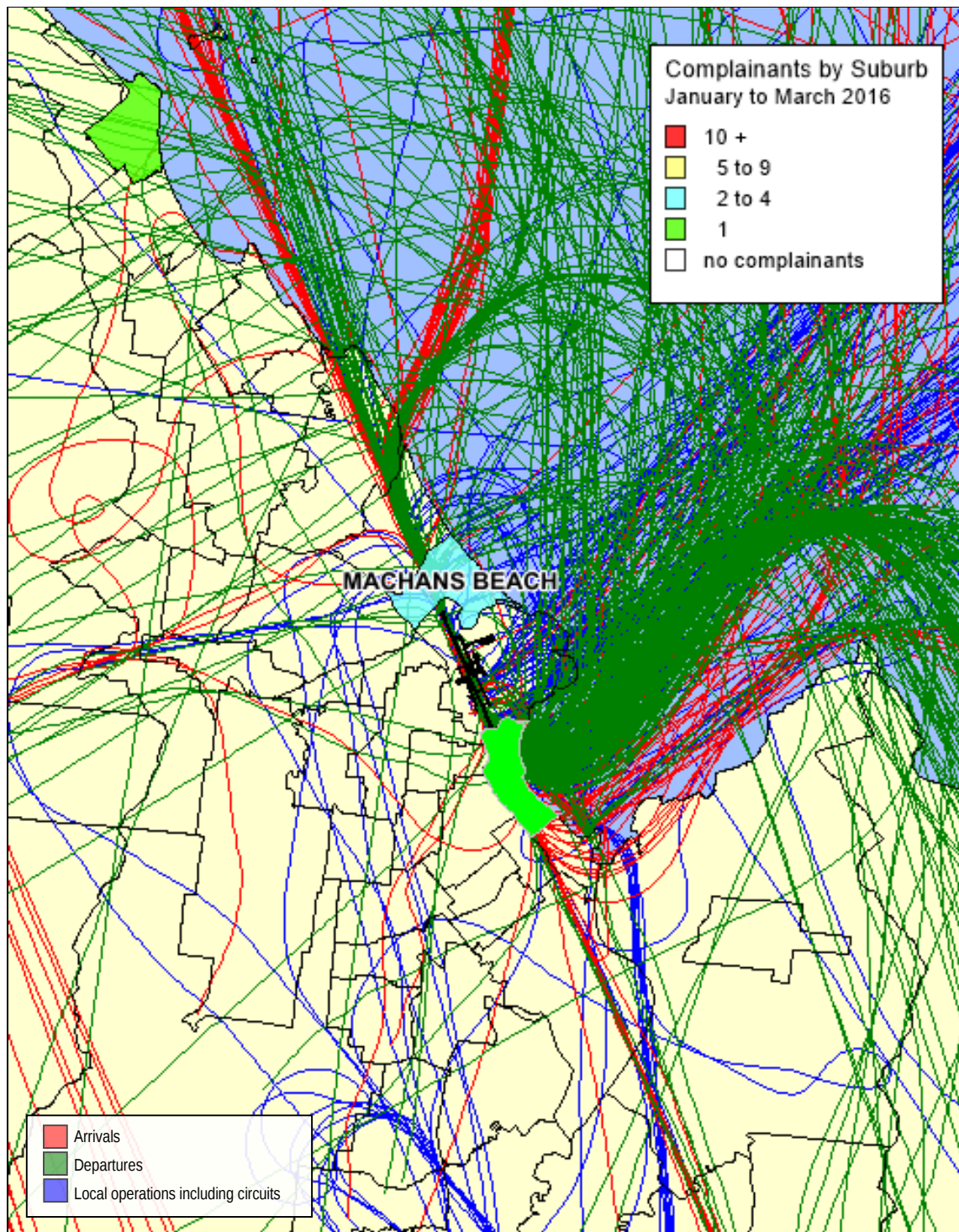


Figure 19: Cairns Airport complainant density by suburb with an overlay of tracks for sample period 1st to 3rd March 2016

The key points shown in Figure 19 are:

- Cairns Airport operations continue to generate very few contacts from complainants. Helicopter activity was the most complained-of issue.
- Most complaints are from suburbs under the approach path to Runway 15 or the departure path off Runway 33.
- Complaints are on par with the last Quarter and were primarily focused around helicopters

6 Airservices update

6.1 Community Aviation Consultation Groups

Airservices attends meetings of the Cairns Airport Environmental Consultative Committee to provide information to the community and assist in discussions on aviation matters. Appendix 1 provides a summary of issues raised by Airservices at meetings since September 2014.

6.2 Noise improvements

Airservices has developed a process to investigate aircraft noise improvements across Australia. Working with the community and the aviation industry, Airservices will assess the benefits of noise improvement proposals and implement them if feasible.

Airservices will assess the potential safety, efficiency and environmental impacts of proposals. We will seek community views throughout this process to help inform decisions. Safety remains our top priority and any change would have to meet rigorous Air Traffic Control requirements. This means that it may not be possible to implement some proposals.

Airservices would only implement a new procedure or a trial after a comprehensive community engagement process, including consultation with community forums. We would also discuss potential changes with the aviation industry. Airservices will publish details of any changes to procedures or trials on its website. Appendix 1 provides details of a noise improvement that was implemented at Cairns in 2013.

6.3 Key Issues and initiatives identified and/or investigated by Airservices

Key issues for this airport include:

- Night time flights
- Helicopter operations north of the airport and from the helipad on the Pier
- Arrivals over the city
- Arrivals from the north
- Smart Tracking
- Flights over Richter's Creek

Initiatives identified and/or investigated by ASA include:

- ASA has moved the 'reporting point' for helicopters at Palm Cove, so that it is further away from residential areas, to reduce noise impacts.
- ASA is introducing RNP (Smart Tracking) around Australia for various airports, including Cairns. Procedures will be made ICAO endorsed, including a review of the proposed Richter's Creek Corridor (timeframe approx. 18 months).

Helicopters - the airport, ASA and the Pier helipad operator have met to discuss mitigation measures, including routes that avoid residential areas and use of quieter aircraft at sensitive times.

7 Contact us

To lodge a complaint or make an enquiry about aircraft operations, you can:

- go to WebTrak (www.airservicesaustralia.com/aircraftnoise/webtrak/)
- use our online form (www.airservicesaustralia.com/aircraftnoise/about-making-a-complaint/)
- e-mail ncis@airservicesaustralia.com
- telephone 1800 802 584 (freecall) or 1300 302 240 (local call –Sydney)
- fax (02) 9556 6641 or
- write to Noise Complaints and Information Service, PO Box 211, Mascot NSW 1460.

Airservices welcomes comments about this report. Please contact us via e-mail at ncis@airservicesaustralia.com if you would like to provide feedback.

Appendix 1: Airservices updates

Information provided at Cairns Airport Environmental Consultative Committee meetings

10 February 2016

Quarter 4 2015 Aircraft Noise Information Report (ANIR) data was presented to the meeting. Airservices advised there had been seven complainants for the quarter and that the main issues raised were around helicopters and aircrafts involved in military exercises.

A letter was issued by Airservices on 9 November 2015 to airline operators to confirm that they do and will continue to comply with the requirements of the RWY 15 SWIFT EIGHT Standard Instrument Departure (SID) on every departure, unless there are critical reasons not to do so (i.e. an emergency or weather diversions).

25 November 2015

Quarter 3 2015 ANIR data was presented to the meeting. Airservices advised that there had been 11 complainants for the quarter and that the main issues raised are around ground running, helicopters and aircrafts involved in military exercises. Total movement numbers in Q3 were slightly below the three-year average. Around 45% of movements were propeller aircraft, 40% jets and 15% helicopters.

A letter was issued to airline operators to confirm that they do and will continue to comply with the requirements of the SID on every departure, unless there are critical reasons not to do so (i.e. an emergency or weather diversions).

21 May 2015

Airservices provided a summary of Quarter 1 2015 ANIR data, advising that there had been seven complainants for the quarter and that issues ranged from Helicopters to arrivals to Runway 33.

Smart Tracking over the Richter's Creek Corridor was discussed, and issues such as loud arrivals and SID compliance for departures off Runway 15 over the esplanade were raised by community members. Airservices committed to discussing these issues further at future meetings.

Noise improvements

Airservices has moved the 'reporting point' for helicopters at Palm Cove, so that it is further away from residential areas, to reduce noise impacts. A list of these initiatives is at Appendix 2.

Appendix 2 Noise Improvement Investigations

Cairns Noise Improvement Investigations

Can the reporting point be moved over water to reduce helicopter movements over Palm Cove?	June 2014	Analysis showed around 5 helicopters per day fly over Palm Cove. Investigation conducted and a change was delivered.
Can a waypoint be inserted on the departure track out of Cairns to avoid Yarrabah	May 2014	Analysis showed that few aircraft actually fly over the township and those that do are at around 8,000ft so few noise issues. Investigation closed with no change
Can the Smart Tracking (RNP) arrivals tracking to Rwy 15 include a kink to avoid the suburb of Holloway's Beach?	November 2013	Work was undertaken to widen Smart Tracking and ICAO endorsed the procedure process. Investigation conducted and a change was delivered.