Australian Government

Australian Transport Safety Bureau

AVIATION RESEARCH INVESTIGATION REPORT
B2005/0046

Aviation Safety Indicators

A report on safety indicators relating to Australian Aviation June 2005

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ABBREVIATIONS

ATPL:	Air Transport Pilot Licence
ASI:	Aviation Safety Indicators
ATSB:	Australian Transport Safety Bureau
BOS:	Breakdown of Separation
BTRE:	Bureau of Transport and Regional Economics
CASA:	Civil Aviation Safety Authority
CPL:	Commercial Pilot Licence
DOTARS:	Department of Transport and Regional Services
GA:	General Aviation
GAAP:	General Aviation Airport Procedures
HCRPT:	High Capacity Regular Public Transport
LAME:	Licensed Aircraft Maintenance Engineer
LCRPT:	Low Capacity Regular Public Transport
OASIS:	Occurrence Analysis and Safety Information System (ATSB's aviation database)
PPL:	Private Pilot Licence
PRD:	Prohibited, Restricted and Danger Areas
RPT:	Regular Public Transport
SCPL:	Senior Commercial Pilot Licence
TCAS:	Traffic Collision Avoidance System
TA:	Traffic Advisory (TCAS information warning)
RA:	Resolution Advisory (TCAS alert)
VCA:	Violation of Controlled Airspace

EXECUTIVE SUMMARY

This report presents data concerning Australian aviation activity, the aviation industry, aviation accidents and incidents and highlights broad trends and developments in aviation safety. The data are presented graphically in time series figures.

Data on aviation accidents and incidents were collected from the ATSB's aviation database. Data concerning aviation activity, the aviation industry, accidents and specific incident types were collected from three main sources: the Bureau of Transport and Regional Economics, part of the Department of Transport and Regional Services, the Civil Aviation Safety Authority and Airservices Australia.

The report includes data on:

1. Hours flown
2. Aircraft departures
3. Passenger movements
4. Aircraft movements at airports
5. Year of manufacture of aircraft
6. Age of aircraft
7. Flight crew licences
8. Aircraft maintenance engineer licences
9. Number of accidents, fatal accidents and fatalities
10. Accident rates
11. Fatal accident rates
12. Breakdown of separation and airprox incidents
13. TCAS resolution advisories
14. Birdstrike incidents
15. Violation of controlled airspace incidents

The total numbers of accidents and fatalities are also provided.

This report finds that:

- There were no fatalities recorded for high capacity regular public transport between 1993 and 2003. Low capacity regular public transport operations recorded a total of 17 fatalities. This was about 4 per cent of all aviation fatalities from 1993 to 2003.
- There is no trend evident in fatal accidents in low capacity regular public transport operations.

- There were 212 fatal accidents recorded in the general aviation category from 1993 to 2003; 99 per cent of all fatal accidents for the period were in general aviation.
- The general aviation annual accident rate (accidents per 100,000 hours flown) declined by 47.5 per cent from 15.1 in 1993 to 7.95 in 2003.
- The general aviation annual fatal accident rate (fatal accidents per 100,000 hours flown) declined by approximately 34 per cent from 1.29 in 1993 to 0.85 in 2003, although there was substantial fluctuation in the rate during the period.
- By far the greatest growth in activity in Australian aviation from 1993 to 2003 was in the high capacity regular public transport category.
- High capacity regular public transport hours flown increased by 37 per cent between 1993 and 2003. Over the same period, high capacity regular public transport departures increased by 26.4 per cent and the number of passengers carried on high capacity regular public transport increased by 52 per cent.
- Hours flown by GA fixed wing aircraft declined by 9.8 per cent, while rotary wing aircraft recorded a 38.8 per cent increase.
- There is no strong trend evident in breakdown of separation (BOS) and airprox incidents reported between 2000 and 2004. With regard to airspace, these incidents were reported as follows:
  - Class C airspace – 55.5 per cent
  - Class G airspace – 25.3 per cent
  - Class GAAP airspace – 9.9 per cent
  - Class D airspace – 4 per cent
  - Class A airspace – 4 per cent
  - Class E airspace – 1.3 per cent
- The majority of TCAS resolution advisories (RA) reported between 2000 and 2004 were routine operational alerts or false alarms. The number of RAs associated with a BOS/airprox incident has remained relatively low, varying from 0 to 5 recorded in any one quarter. It is not possible, therefore, to identify any strong trends. On average, there were 7.4 RAs associated with BOS/airprox incidents recorded each year.
- The number of violation of controlled airspace (VCA) incidents has fluctuated in the period between 2000 and 2004. There were 1,100 VCA incidents reported in 2000 and 1293 reported in 2004.
- The lowest number of violation of controlled airspace incidents (944) was reported in 2003 and the highest number (1,293) was reported in 2004.

- The number of birdstrike incidents reported between 2000 and 2004 varied significantly from one airport to another. Overall, the highest rates (number of incidents per 10,000 aircraft movements) were recorded at major airports (on average from 1.7 to 7.3) and regional aerodromes (on average from 0.7 to 7.4). The lowest rates were recorded at GAAP airports (on average from 0.16 to 1.3).

- The number of runway incursion incidents has increased from 2000 to 2004 and differs significantly from one airport to another.

Overall the data suggest that Australian aviation is very safe and that there has been an improvement in safety since 1993. The accident rate in the regular public transport category remains very low and the accident rate for general aviation shows a significant downward trend.

1 INTRODUCTION

About the Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an operationally independent body within the Australian Government Department of Transport and Regional Services and is Australia's prime agency for transport safety investigations. The bureau is entirely separate from transport regulators and service providers. The ATSB's objective is 'safe transport'. Its mission is to maintain and improve transport safety and public confidence through excellence in:

- independent transport accident and incident investigation;
- safety data analysis and research;
- safety communication and education.

The ATSB performs its functions in accordance with the provisions of the Transport Safety Investigation Act 2003 (TSI Act). Section 7 of the TSI Act indicates that the object of the Act is to improve transport safety through, among other things, independent investigations of transport accidents and incidents and the making of safety action statements and recommendations that draw on the results of those investigations. It is not the purpose of ATSB investigations to lay blame or provide a means for determining liability.

Background and Objective

Aviation Safety Indicators (ASI) were first produced in 1996 in response to the *Plane Safe* report, published in 1995 by the House of Representatives Standing Committee on Transport, Communications and Infrastructure. Produced jointly by the Civil Aviation Safety Authority (CASA), the then Department of Transport and Regional Development and the then Bureau of Air Safety Investigation (BASI), the first ASI contained 22 safety indicators. Indicators were divided into activity, industry, accident and incident rates. The same three agencies published ASI again in 1997, when 25 indicators were produced in the same four categories. A further integrated publication was not developed until 2003.

This report is solely the responsibility of the Australian Transport Safety Bureau (ATSB), although in developing the ASI 2002, the ATSB did consult with other Australian Government organisations, including CASA, Airservices Australia and the Department of Transport and Regional Services (DOTARS). This report is the result of a recognised need to consider the type of aviation safety data presently being collected and provide a benchmark for stakeholders of the safety of Australian aviation.

The objectives of this report are to provide:

- objective, statistical measures of the safety of Australian aviation (excluding sport and military operations);
- a document that highlights broad trends and developments that have occurred in aviation safety; and
- a document that offers a basis to compare aspects of Australian aviation safety against the safety of aviation in other countries.

This report commences with an explanatory note describing in brief the nature of aviation in Australia. Following this, the methods of data collection and analysis are presented. Some limitations of the conclusions of this report are then discussed. The ASI are then presented, divided into activity indicators, industry indicators, accident indicators and incident indicators. Finally, the report outlines conclusions based on the ASI.

Summary of the indicators

Flying activity indicators

The activity indicators show hours flown by categories and major types of operation, departures by the two major types of RPT operation, scheduled airline passenger movements (by definition, this information is only available for RPT operations) and aircraft movements at major airports and aerodromes around Australia (not necessarily complete for GA when towers are closed). Activity indicators provide contextual information on activity or risk exposure against which trends can be considered.

Industry indicators

The industry indicators contain information about the age of Australian registered aircraft, the numbers of flight crew licences, and the numbers of aircraft maintenance engineer licences.

Accident indicators

The accident indicators focus on accidents (rates and numbers), fatalities (rates and numbers) and fatal accident rates. These indicators demonstrate the trends that have occurred since 1993.

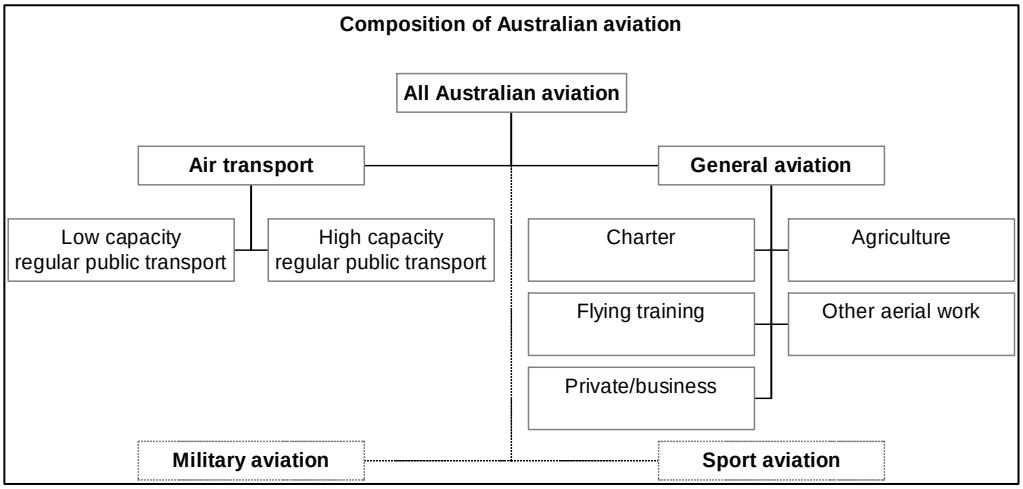
Incident indicators

Incidents are an occurrence, other than an accident, associated with the operation of an aircraft that affects or could affect the safe operation of the aircraft. Incidents include:

- breakdown of separations;
- TCAS Resolution Advisories;
- violations of controlled airspace;
- runway incursions; and
- birdstrikes.

Explanatory note

Australian aviation can be divided into four main categories: general aviation (GA), regular public transport (RPT), sport aviation, and military aviation. Sport aviation is not considered in this report as the ATSB does not currently include sport aviation in most ATSB statistics and data are less comprehensive. Military aviation is not included in ATSB statistics or considered in this report because it is overseen by military safety authorities. The ATSB's focus is based on Chicago Convention international obligations (including Annex 13) and the Australian Government emphasis on fare-paying passenger aviation.



Definitions and categories in this report refer to existing regulations.

Regular public transport is broadly defined as flight operations performed for remuneration and conducted to fixed schedules over specific routes, and on which seats and/or cargo space are available to the general public.

General aviation is defined as all non-scheduled flying activity in aircraft, with Australian registered aircraft allocated a VH-registration by CASA, but excluding VH-registered sailplanes (powered and non-powered). Ultralight aircraft, non VH-registered military aircraft, hang gliders, balloons and autogyros are also excluded.

Regular public transport is further divided into high capacity regular public transport (HCRPT) and low capacity regular public transport (LCRPT). A HCRPT aircraft fits the RPT description above and also has a maximum seating capacity exceeding 38 seats or maximum payload exceeding 4,200kg. A LCRPT aircraft also fits the RPT description above but has a maximum seating capacity less than or equal to 38 seats and a maximum payload not exceeding 4,200kg.

General aviation is divided further into charter, flying training, agriculture, other aerial work and private/business. Charter is defined as carriage of cargo or passengers on non-scheduled operations by the operator (or the operator's employees) in trade or commerce or scheduled operations that are not available to the public generally, but excluding regular public transport operations.

Flying training is defined for the purposes of this report as flying under instruction for the issue or renewal of a licence or rating, aircraft type endorsement or conversion training. Flying training includes solo navigation exercises conducted as part of a course of applied flying training. Agriculture operations are defined as operations involving the carriage and/or spreading of chemicals, seed, fertiliser or other substances for agricultural purposes, including operation for the purpose of pest and disease control.

Other aerial work includes all aerial survey and photography, spotting, aerial stock mustering, search and rescue, ambulance, towing (including, target and banner towing) and other aerial work, including advertising, cloud seeding, fire fighting, and coastal surveillance. Private/business covers flying by the aircraft owner, the operator's employees or the hirer of the aircraft for business or professional reasons but not directly in trade or commerce. It also includes flying for private pleasure, sport or recreation or personal transport not associated with a business or profession.

Four main government entities are involved in Australian aviation: the Civil Aviation Safety Authority (CASA), Airservices Australia (AsA), the Department of Transport and Regional Services (DOTARS) and the Australian Transport Safety Bureau (ATSB). CASA is the regulatory body, responsible for conducting the safety regulation of civil aviation operations in Australia and the operation of Australian aircraft overseas. Among other functions, CASA is also responsible for maintaining the register of Australian civil aircraft, or VH- registered aircraft. Airservices Australia is responsible for providing air traffic control, air navigation support and aviation rescue and fire fighting services at specific airports.

DOTARS is responsible for aviation security oversight and regulation, for environmental regulation of aircraft noise and for oversight of aerodromes. DOTARS also collects aviation economic and activity data and provides advice on aviation policy and on the governance of CASA and Airservices Australia to the Minister for Transport and Regional Services. The International Air Services Commission (IASC) secretariat is also part of DOTARS. The ATSB is responsible for independent no-blame investigation into aviation accidents and incidents, research and analysis and reporting on aviation safety.

Formed on 1 July 1999, the ATSB is an operationally independent multi-modal body located within DOTARS. Maintaining a clear organisational separation from transport regulators and other bodies that may be investigated, the role of the ATSB under the Transport Safety Investigation Act 2003 is to investigate, analyse and report openly on transport safety matters free of any conflict of interest. Transport safety investigations and analysis of safety data are conducted rigorously and without fear or favour, in accordance with International Civil Aviation Organization (ICAO) Annex 13 Standards and Recommended Practices.

2 METHODOLOGY

Data collection

Data were collected from four sources:

- ATSB accident and incident database (OASIS) – all aviation accidents and incidents reported to the ATSB and meeting defined criteria are entered into OASIS. This includes all fatal accidents.
- The Bureau of Transport and Regional Economics (BTRE), a bureau within DOTARS, which collects activity data from airline operators and aircraft owners under the authority of Air Navigation Regulation 12.
- Airservices Australia, which collects data associated with air traffic control service delivery.
- CASA, which collects data on all VH- registered aircraft, and pilot and engineer licences.

Data analysis

Data presented in this report are descriptive. Rates have been computed, generally using hours flown as the denominator, primarily to enable comparison between years and among different categories and types of operation.

Data have been presented in this report with the intention of identifying any possible trends or changes in variables – as such, the data are (where possible) in time series. Where appropriate, data have been presented graphically.

3 DATA LIMITATIONS

Although the best available information was used to prepare this report, the data sources such as the OASIS database and the aircraft register are dynamic and subject to change; therefore, there may be discrepancies involving recent data changes. When using the data contained within this report a number of additional limitations must be considered.

Flying activity indicators

- Hours flown data for General Aviation is based on the BTRE *General Aviation Survey*. The survey has a response rate of approximately 70 per cent while the remaining 30 per cent is estimated.
- Aerodrome movement data is only recorded during hours of tower operation.

Industry indicators

- Data on aircraft year of manufacture was based on the CASA *Civil Aircraft Register* extracted on 21 February 2005.
- At the time of compilation of this report data on flight crews with current medicals were only available for the years 2001, 2002, 2003 and 2004.
- At the time of compilation of this report data on new issues of flight crew licences were only available for the years 1994 to 2004.
- At the time of compilation of this report aircraft maintenance engineer data were only available for the years 1994 to 2004.

Accident and incident indicators

- The current design of the of the ATSB database (OASIS) database does not support the *event* model of storing data. The process of extracting data about some types of incidents is therefore relatively complex.
- The relatively small numbers involved reduce the ability to identify trends.
- At the time of compilation of this report incident data was only available for the years 2000 to 2004.
- The ATSB's data included in this report are based on incidents and accidents reported to the ATSB.

4 FLYING ACTIVITY INDICATORS

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- Figure 2: Regular public transport hours flown by industry category – 1993 to 2003
- Figure 3: Total general aviation hours flown by aircraft type– 1993 to 2003
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- Figure 5: Regular public transport passengers carried by industry category– 1993 to 2003
- Figure 6: Aircraft movements at GAAP aerodromes – 1993 to 2003
- Figure 7a: Aircraft movements at capital city airports – 1993 to 2003
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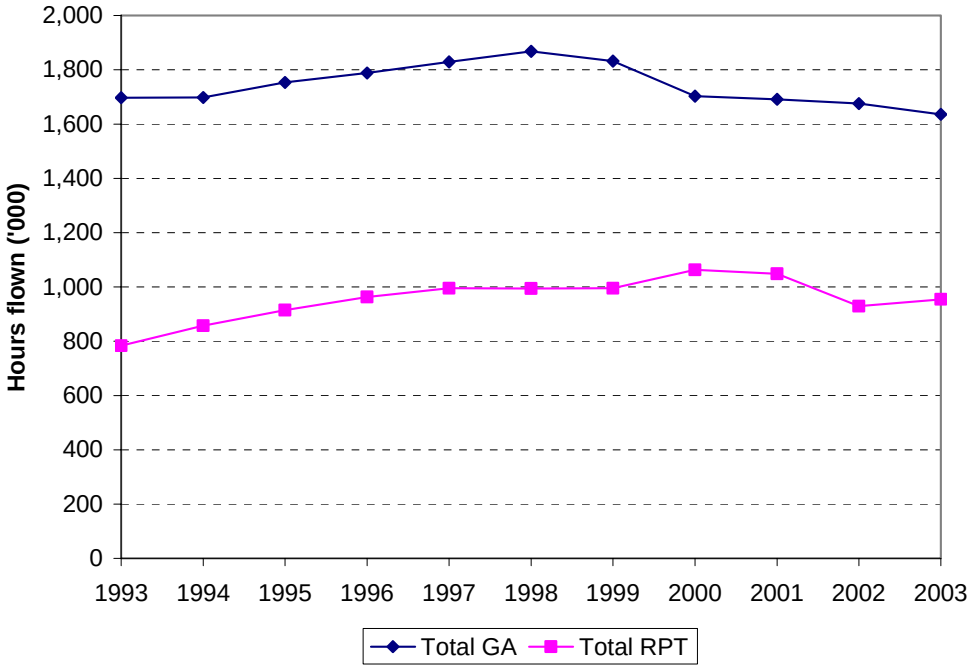
Figure 1: Hours flown by industry category – 1993 to 2003



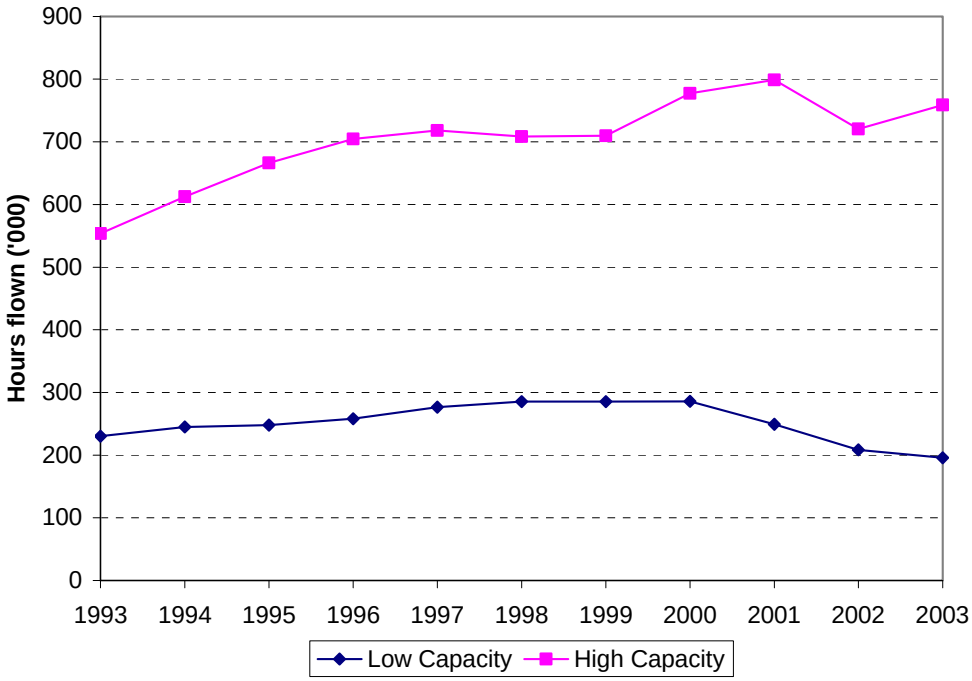
Source: BTRE

Figure 1 shows annual hours flown in Australian registered aircraft during the period 1993 to 2003 by regular public transport (RPT) and by general aviation (GA) (see also Appendix, tables 1A and 2A). These and all subsequent figures include fixed wing and rotary wing aircraft, but exclude sport and military aircraft.

Between 1993 and 2001 there was an average annual increase in hours flown in the RPT category of 3.7 per cent. In 2002 there was a drop of 11.4 per cent (down to 928,713 hours) compared with 2001. Following the decline, hours flown grew again in 2003, finishing the year 2.8 per cent higher than in 2002. In 1993, 783,906 hours were flown in the RPT category, while in 2003 this number had increased by 21.8 per cent to 954,513 hours.

Hours flown in the GA category increased from 1993 to 1998 at an average annual growth rate of 1.9 per cent. Between 1998 and 2003 the trend had reversed, with an average annual decline of 2.6 per cent. In 2003 there were 1,635,533 recorded hours flown.

Figure 2: Regular public transport hours flown by industry category – 1993 to 2003



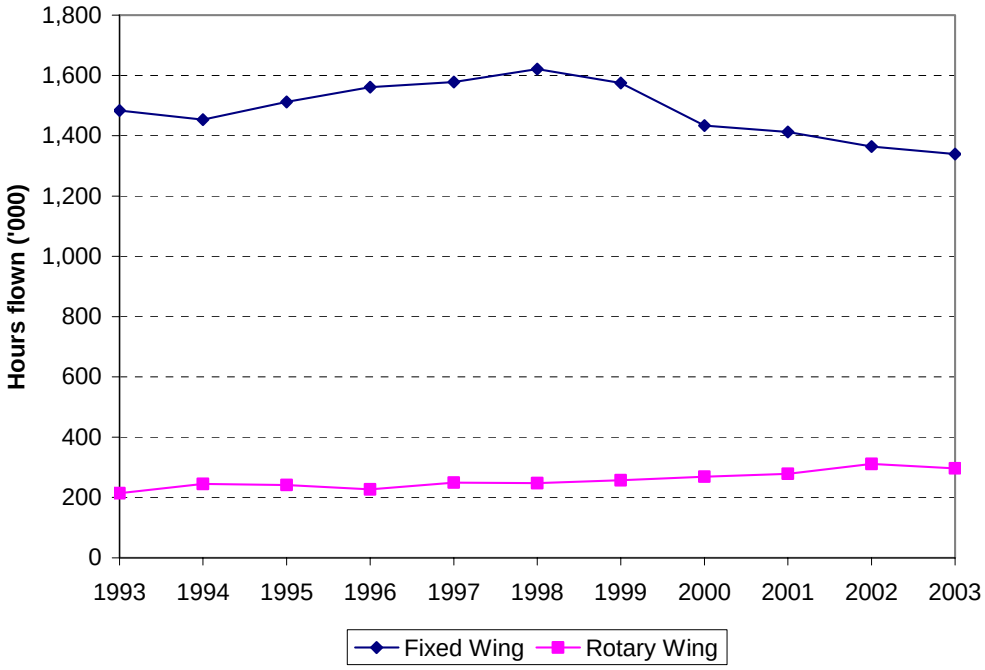
Source: BTRE

Figure 2 shows annual hours flown in the RPT category from 1993 to 2003 by low capacity regular public transport (LCRPT) and by high capacity regular public transport (HCRPT) (see also Appendix, table 1A)

Hours flown in HCRPT increased by 37 per cent between 1993 and 2003, despite a decline in 1998 and 2002. The average annual growth rate between 1993 and 2003 was 3.2 per cent. The reduction in activity in 2002 may reflect consequences of the closure of a major Australian airline, and security concerns after the attack on the World Trade Center, both of which happened near the end of 2001.

LCRPT hours flown grew every year between 1993 and 2000; then declined from 2001 to 2003. Hours flown in 2003 were 15 per cent lower than in 1993.

Figure 3: Total general aviation hours flown by aircraft type– 1993 to 2003



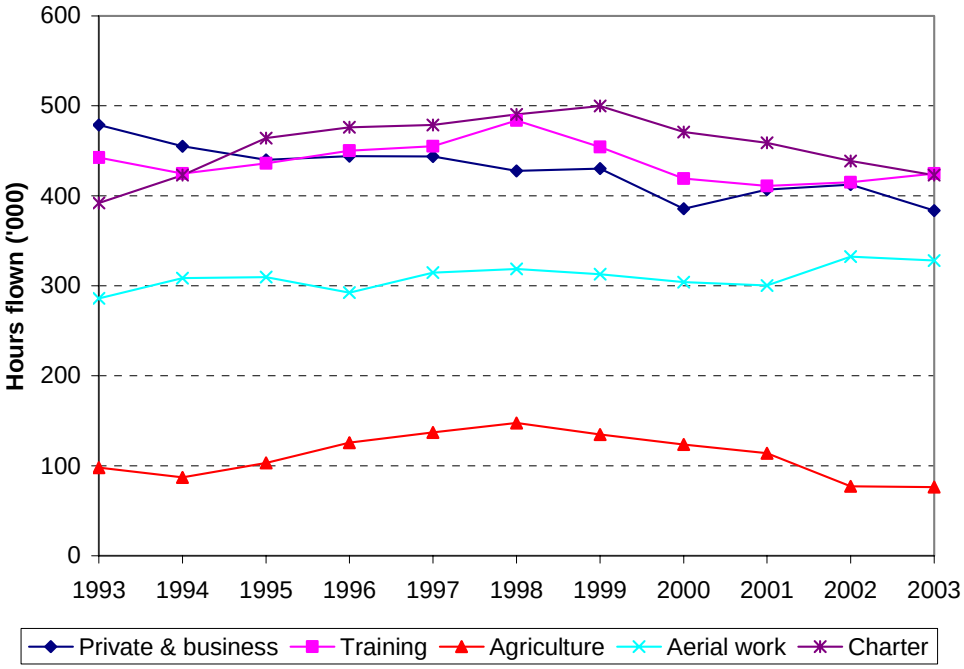
Source: BTRE

Figure 3 shows annual hours flown in the GA category from 1993 to 2003 by fixed wing and rotary wing aircraft types (see also Appendix, table 3A).

Between 1993 and 2003 rotary wing hours grew at an average annual rate of 3.3 per cent – from 213,746 in 1993 to 296,765 in 2003 – an increase of 38.8 per cent.

Hours flown in GA fixed wing operations increased every year between 1994 and 1998. This growth was followed by a decline from 1998 to 2003. As a result, hours flown by fixed wing aircraft in 2003 were 9.8 per cent lower than in 1993.

Figure 4: General aviation hours flown by industry category– 1993 to 2003



Source: BTRE

Figure 4 shows annual GA hours flown, divided by major types of operation, for the period 1993 to 2003 (see also Appendix, table 4A).

Charter operations recorded a steady growth between 1993 and 1999. The increase was followed by a decline between 1999 and 2003. Overall, hours flown in charter operations increased from 392,157 in 1993 to 423,087 in 2003, an increase of 7.9 per cent.

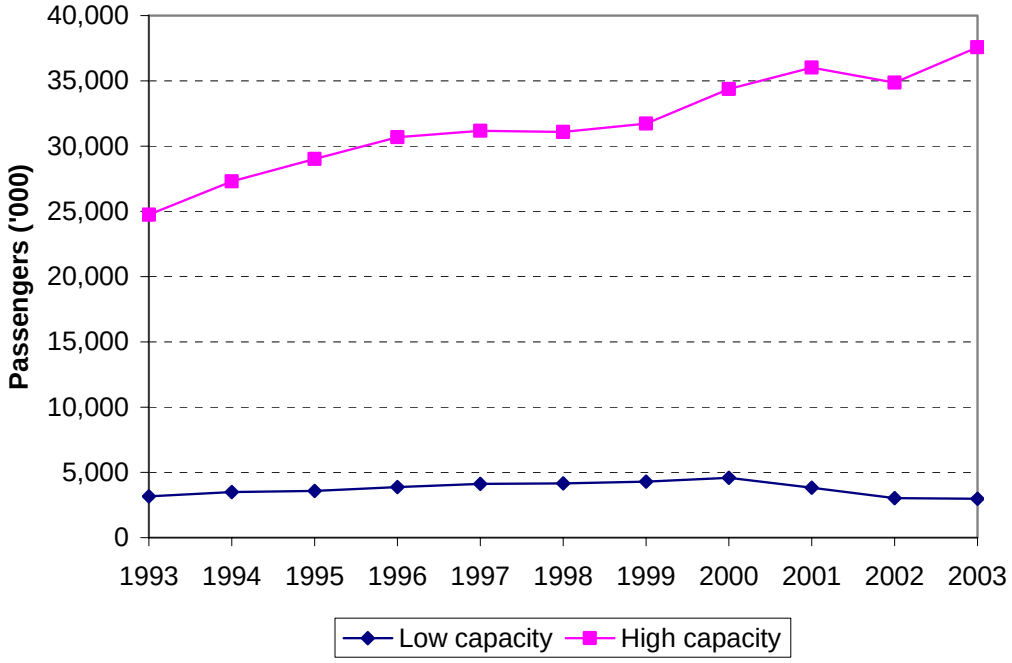
Agricultural operations recorded a increase in hours flown between 1993 and 1998 at an average annual rate of 8.5 per cent. Between 1998 and 2003, hours flown by agricultural operations declined by an average annual rate of 12.3 per cent. In 2003, the number of hours flown in agricultural operations was 22 per cent below the number flown in 1993.

The number of hours flown in aerial work operations increased from 285,951 in 1993 to 327,986 in 2003, an increase of 14.7 per cent.

Private/business operations recorded an overall decline, averaging 2.2 per cent annually, resulting in hours dropping from 478,724 in 1993 to 383,520 in 2003.

The number of hours flown in flying training decreased by 4 per cent – from 442,483 in 1993 to 424,659 in 2003.

Figure 5: Regular public transport passengers carried by industry category– 1993 to 2003



Source: BTRE

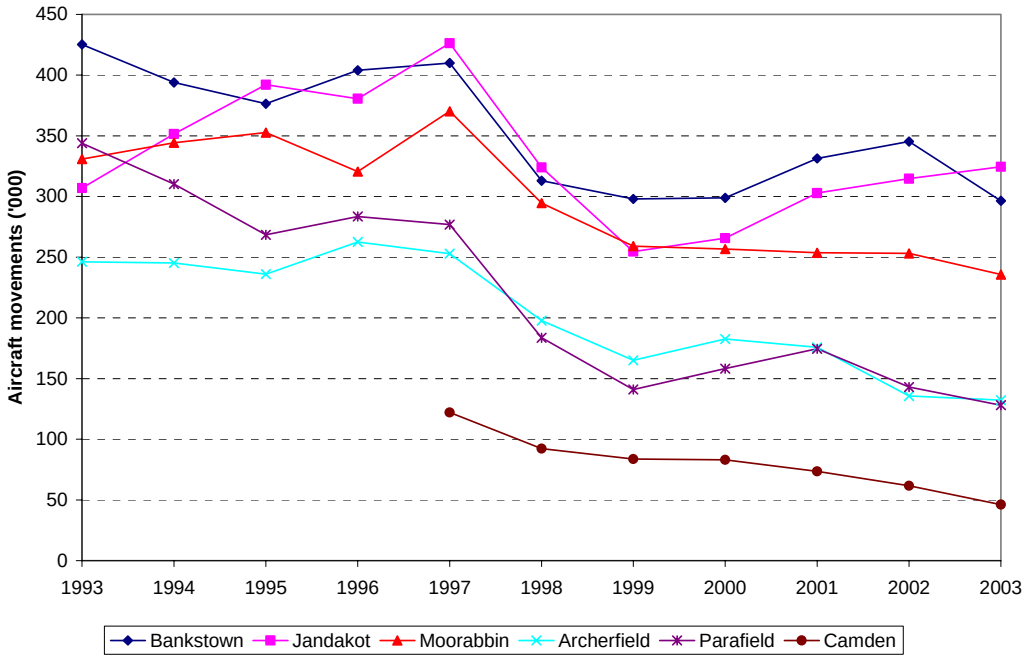
Figure 5 shows the total number of passengers carried annually on RPT flights from 1993 to 2003, divided between HCRPT and LCRPT (see also Appendix, table 5A).

The number of passengers carried on HCRPT flights increased significantly – by an average of 4.3 per cent annually – despite a small drop in 2002. In 1993, 24,728,473 passengers were carried by HCRPT operations. By 2003 this number had increased by 52 per cent to 37,575,438 passengers.

Passengers carried on LCRPT flights between 1993 and 2000 exhibited an increase, with an average annual growth rate of 5.5 per cent. The growth was followed by a sharp decline between 2000 and 2003 at an average annual rate of 13.3 per cent. Overall, the number of passengers carried by LCRPT decreased by 5.3 per cent from 3,156,825 in 1993 to 2,990,046 passengers in 2003.

The increase in passengers carried by HCRPT operations and the decrease in passengers carried by LCRPT are consistent with the trends in hours flown and departures for those types of operations.

Figure 6: Aircraft movements at GAAP aerodromes – 1993 to 2003



Source: Airservices Australia

Figure 6 shows total aircraft movements[1] at general aviation airport procedures (GAAP) aerodromes from 1993 to 2003. Movements at GAAP aerodromes primarily relate to GA activity.

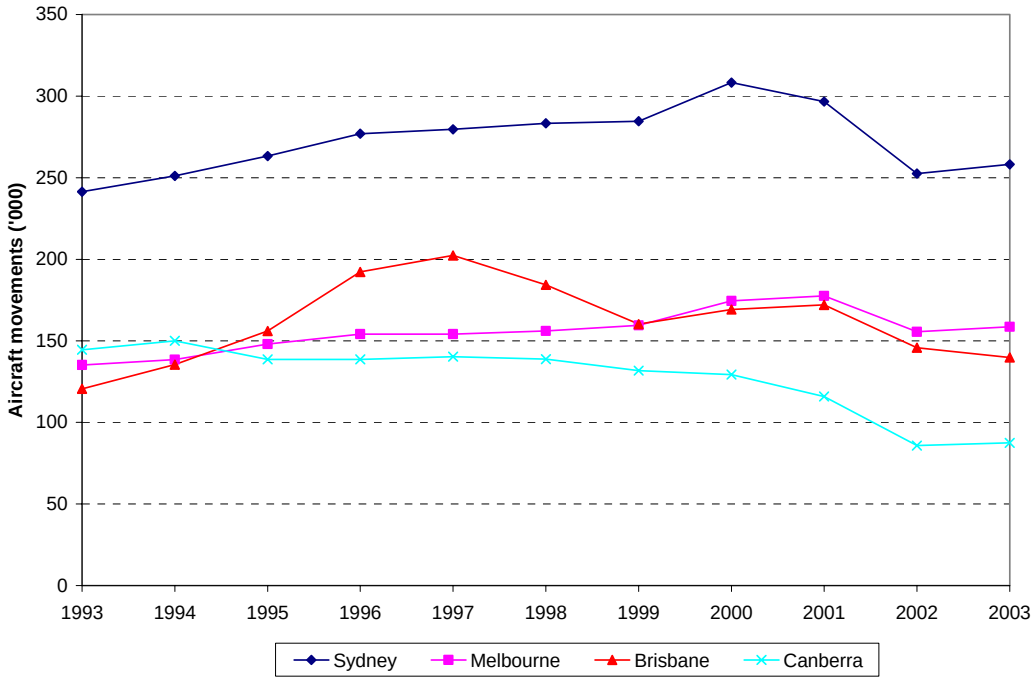
All GAAP aerodromes exhibited an overall decrease in activity over the period, with the exception of Jandakot, where there were 5.7 per cent more movements in 2003 than in 1993. Similarly, all GAAP aerodromes, without exception, recorded a significant decline in activity between 1997 and 1999. A large proportion of this decrease is attributed to changes in reporting procedures implemented in 1998. The accuracy of movements data since 1998[2] is thought to have improved considerably.

The greatest decline over the period was at Parafield, which recorded 62.7 per cent less movements in 2003 than in 1993. Archerfield, Bankstown and Moorabbin recorded 46.3 per cent, 30.3 per cent, and 28.8 per cent less movements respectively in 2003 than in 1993. Camden recorded 75.4 per cent less aircraft movements in 2003 than in 1997. There is no information available for Camden for the pre-1997 period.

[1] Actual movements at non 24-hour locations is likely to be higher than published as arrival data is only recorded during hours of tower operation.

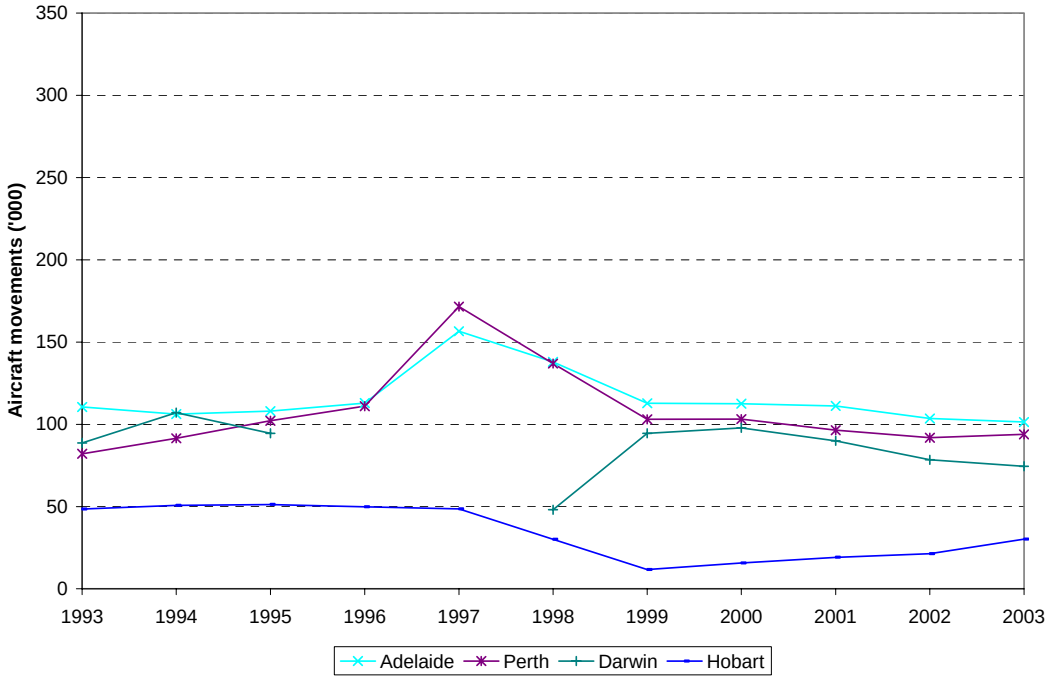
[2] Australian National Audit Office, *Air Traffic Data Collection*, Performance Audit Report No. 48, June 2001.

Figure 7a: Aircraft movements at capital city airports – 1993 to 2003



Source: Airservices Australia

Figure 7b: Aircraft movements at capital city airports – 1993 to 2004



Source: Airservices Australia

Figures 7a and 7b show total aircraft movements at the capital city airports from 1993 to 2003. Information for Darwin for 1996 and 1997 is not available. Aircraft activity at these airports comprises a mixture of RPT, GA and military operations.

Sydney remained the busiest airport throughout the period. Sydney and Melbourne exhibited similar trends with movements steadily increasing and peaking in 2000 for Sydney, and in 2001 for Melbourne. Sydney and Melbourne both recorded some growth in movements between 2002 and 2003. Overall, Sydney recorded 7.0 per cent more movements in 2003 compared with 1993 while Melbourne recorded 17.3 per cent more.

Aircraft movements also increased at Brisbane and Perth airports; 15.9 per cent and 14.4 per cent respectively.

Movements at Hobart and Canberra declined between 1993 and 2003 by 37.6 per cent and by 39.5 per cent respectively.

Darwin recorded a sharp increase in movements between 1998 and 1999 before flattening in 2000 and then declining between 2000 and 2003. Despite a surge between 1996 and 1999, Adelaide remained relatively steady.

With the exception of Hobart, all airports experienced a decline in activity in 2002.

5 INDUSTRY INDICATORS

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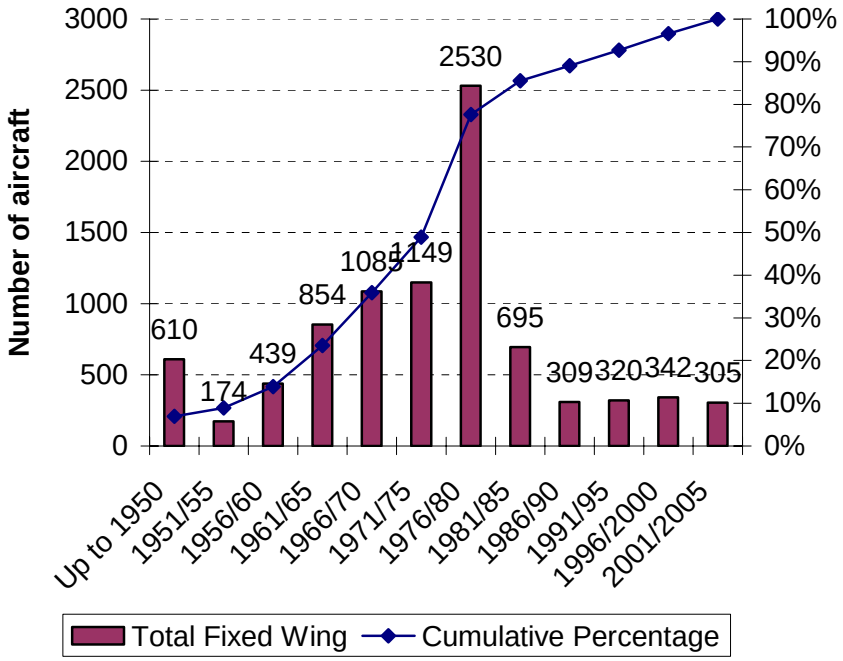
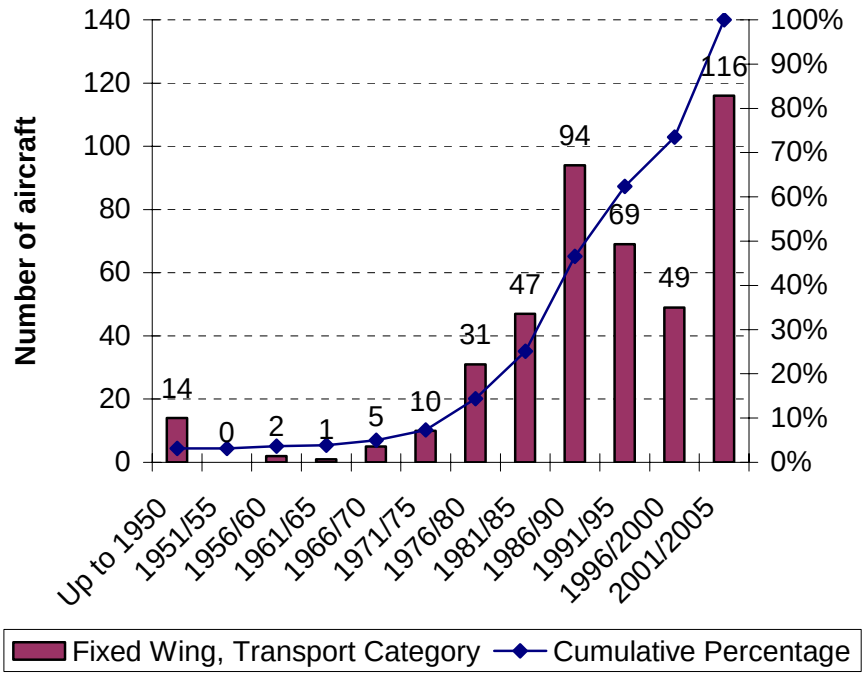
Figure 8a: Year of manufacture: total fixed wing aircraft – 1950 to 2005



Source: CASA

Figure 8a shows the year of manufacture for all 8,812 fixed wing aircraft registered in Australia (excluding military and amateur–built aircraft) as at 21 February 2005 (see also Appendix, table 7A). Approximately 50 per cent of registered fixed wing aircraft were manufactured before 1975 and approximately 80 per cent were manufactured prior to 1980.

Figure 8b: Year of manufacture: fixed wing aircraft, transport category – 1950 to 2005

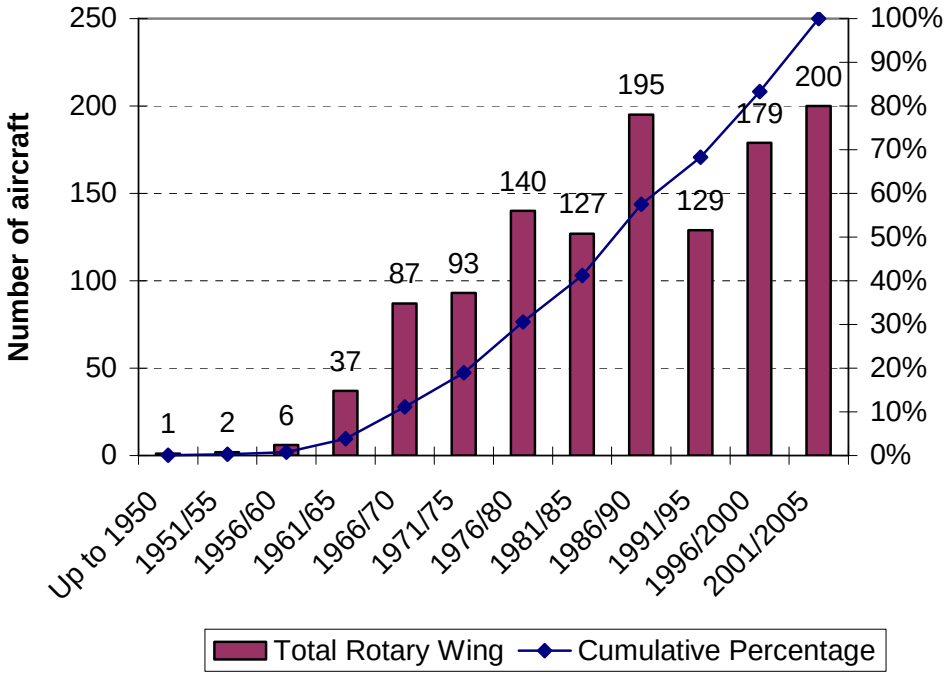


Source: CASA

Figure 8b shows the year of manufacture for transport category fixed wing aircraft, a subset of fixed wing aircraft (see also Appendix, table 8A). These aircraft are designed to the more demanding 'transport' category standards with the majority being used in RPT operations. There were 438 aircraft of this type registered as at 21 February 2005.

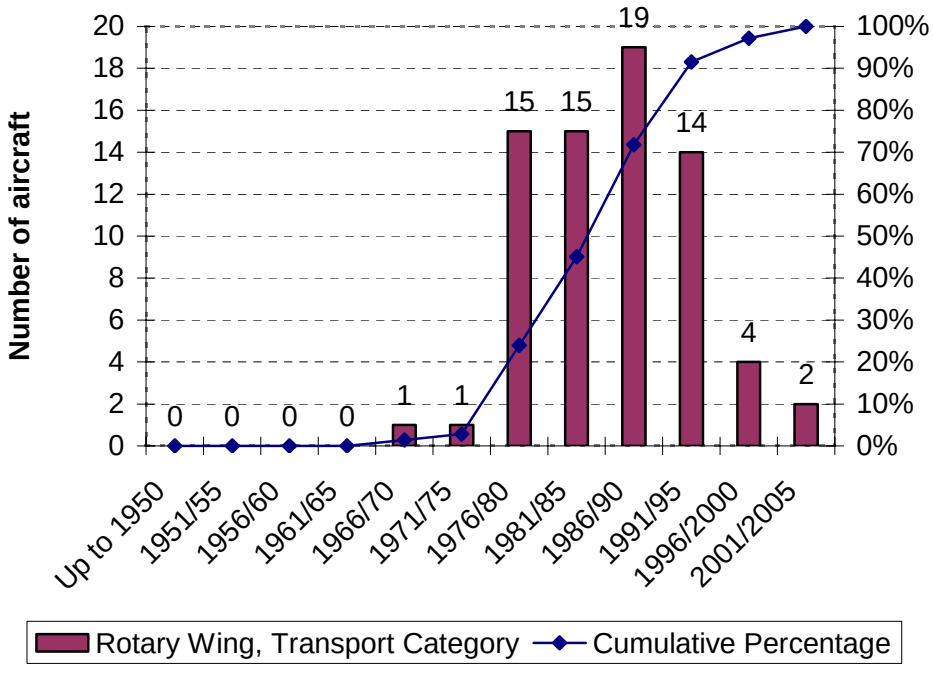
In general, these aircraft are much newer compared with all fixed wing aircraft, with the average for year of manufacture being in the late 1980s. About 26 per cent of the aircraft were manufactured after 2000. Only about 14 per cent of the aircraft were manufactured prior to 1981.

Figure 9a: Year of manufacture: total rotary wing aircraft – 1950 to 2005



Source: CASA

Figure 9b: Year of manufacture: rotary wing aircraft, transport category – 1950 to 2005



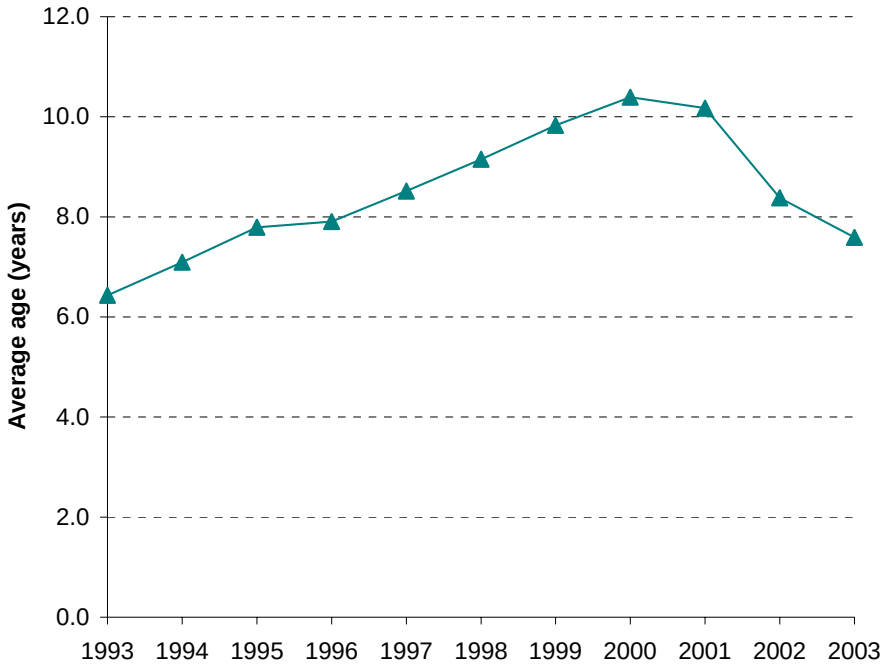
Source: CASA

Figure 9a shows the year of manufacture for all 1,196 rotary wing aircraft registered in Australia (excluding military and amateur-built aircraft) as at 21 February 2005 (see also Appendix, tables 7A, 8A).

Compared with fixed wing aircraft, the average rotary wing aircraft is much newer, with approximately 60 per cent manufactured after 1980.

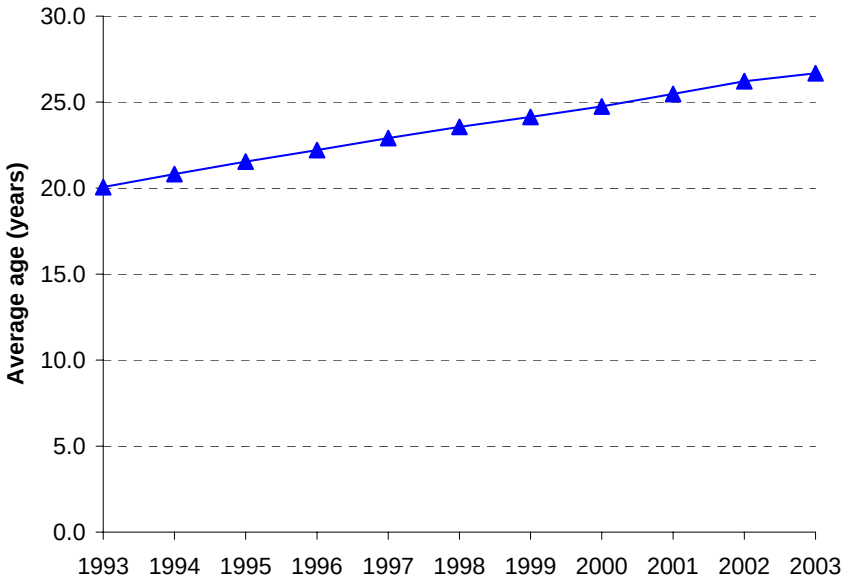
Figure 9b shows data from the small number of ‘transport’ category helicopter aircraft (71 in total). Although the average age of these aircraft is approximately the same as that of other helicopters on the register, the distribution of the population is smaller, with most aircraft being between 10 and 30 years old.

Figure 10a: Average age of aircraft – Major Australian Airlines, at December each year – 1993 to 2003



Source: BTRE

Figure 10b: Average age of aircraft – general aviation and regional airlines, at December each year[3] – 1993 to 2003



Source: BTRE

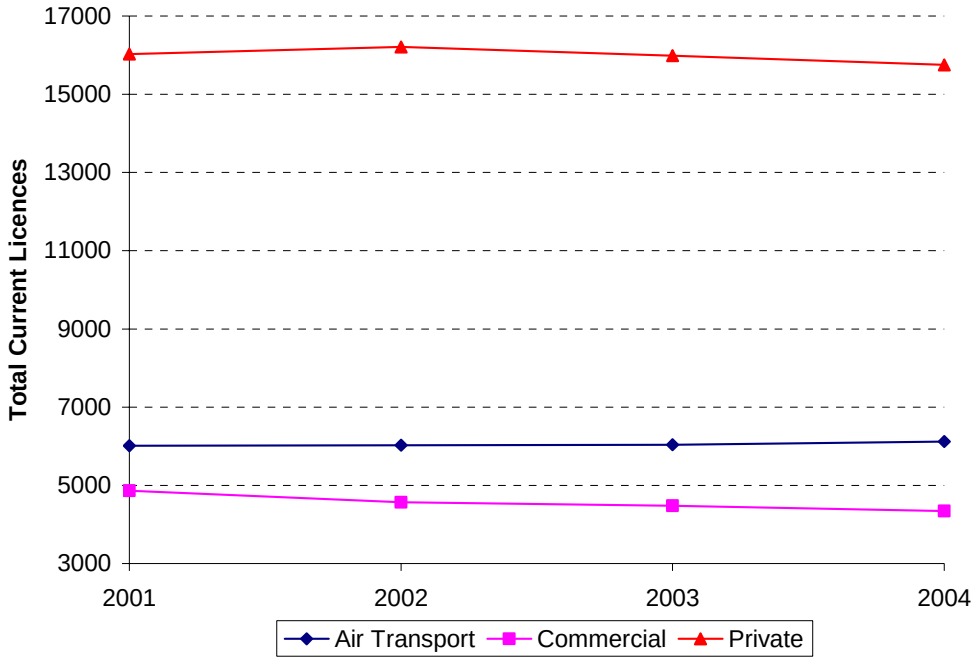
[3] Note: It was not possible to separate general aviation aircraft data from regional airline aircraft data

Figures 10a and 10b show the average age of aircraft operated by Australian Airlines, and GA and Regional Airlines respectively (see also table 6A in the Appendix).

The average age of aircraft in the Major Australian Airline category is significantly lower than that for aircraft in the GA and Regional Airlines category. For the period under review, the average age for GA and Regional Airline aircraft has steadily increased.

In contrast, the average age of aircraft in the Major Australian Airline category increased from 6.4 years in 1993 to 10.4 years in 2000. However, from 2001 onwards, the average aircraft in this category was decreasing in age each consecutive year, reaching an average age of 7.5 years in 2003.

Figure 11: Fixed wing flight crew licence holders with current medicals – 2001 to 2004[4]



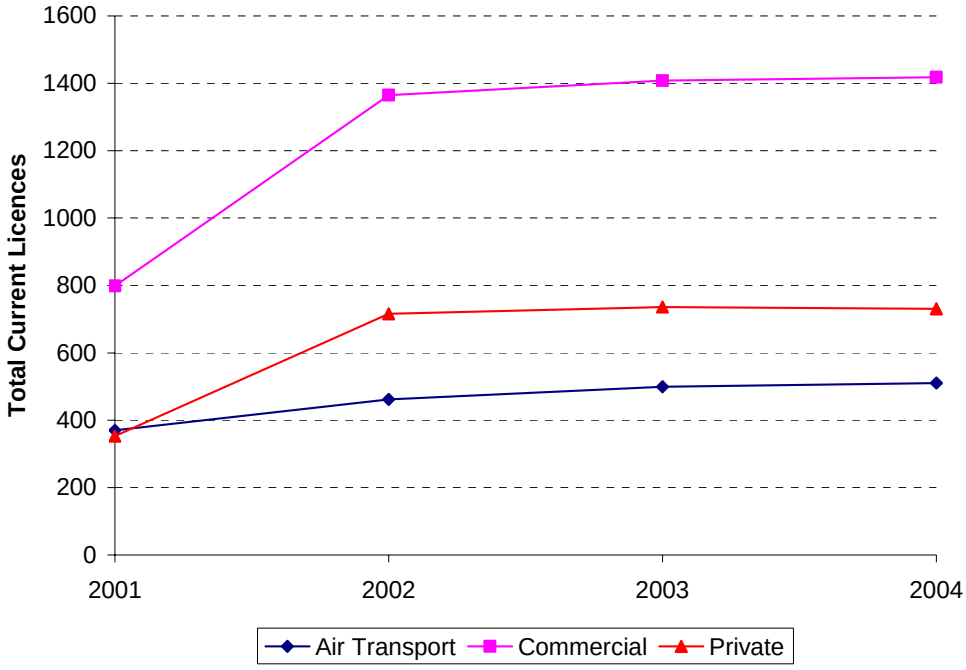
Source: CASA

Figure 11 shows the total number of flight crew licence holders for the fixed wing aircraft who hold a current medical rating. It should be noted that individuals holding more than one licence have been counted in the category of the most advanced licence held. Thus, holders of both a Private Pilot Licence (PPL) and Commercial Pilot Licence (CPL) have been counted only in the CPL category.

In the fixed wing category there has been a slight increase in the number of Air Transport category licence holders (1.8 per cent) – from 6,012 licence holders to 6,121 over the period 2001–2004. The number of PPL holders has dropped slightly (by 1.7 per cent) – from 16,027 to 15,750 over the period 2001 to 2004. The most significant change has been in the number of CPL holders, which has dropped from 4,865 to 4,347 (10.6 per cent) over the period.

[4] Data as at 8 August 2001 and, 1 December 2002, 2003 and 2004. Air Transport category includes Air Transport Pilot Licence (ATPL) holders and a small number of Senior Commercial Pilot Licence (SCPL) licence holders.

Figure 12: Rotary wing crew licence holders with current medicals – 2001 to 2004[5]



Source: CASA

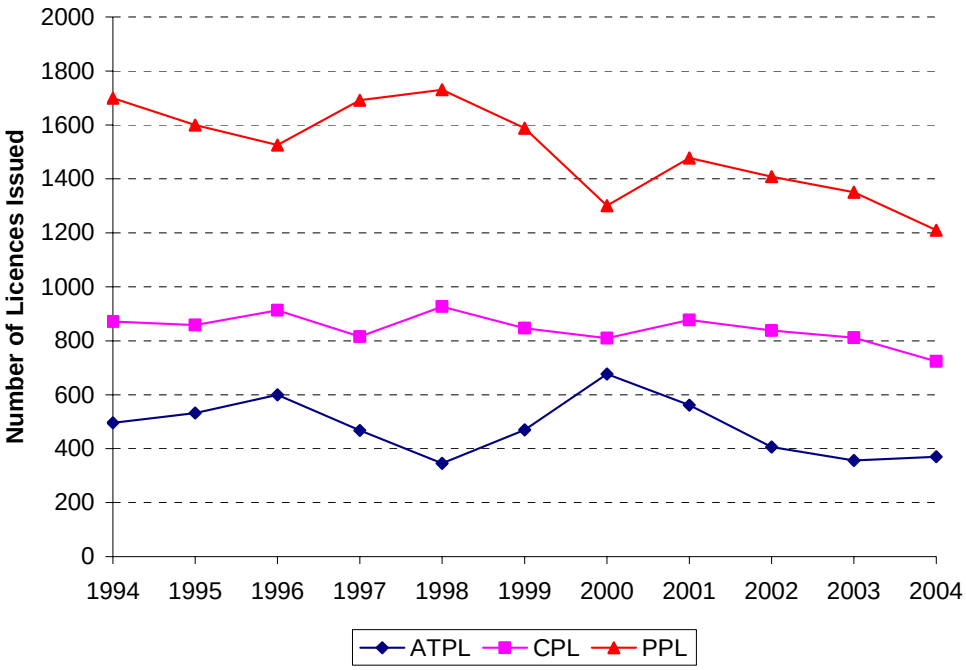
Figure 12 shows the total number of flight crew licence holders for a rotary wing aircraft who hold a current medical rating.

Over the period, there has been a general increase in the number of individuals with current medicals holding all classes of licence in the rotary wing category.

The holders of a PPL recorded the highest increase in the number of licences (107 per cent), followed by CPL and Air Transport Category licence holders (77.5 per cent and 37.8 per cent respectively) over the reported period.

[5] Data as at 8 August 2001 and, 1 December 2002, 2003 and 2004. Air Transport category includes Air Transport Pilot Licence (ATPL) holders and a small number of Senior Commercial Pilot Licence (SCPL) licence holders.

Figure 13: Fixed wing flight crew licences: new issues – 1994 to 2004

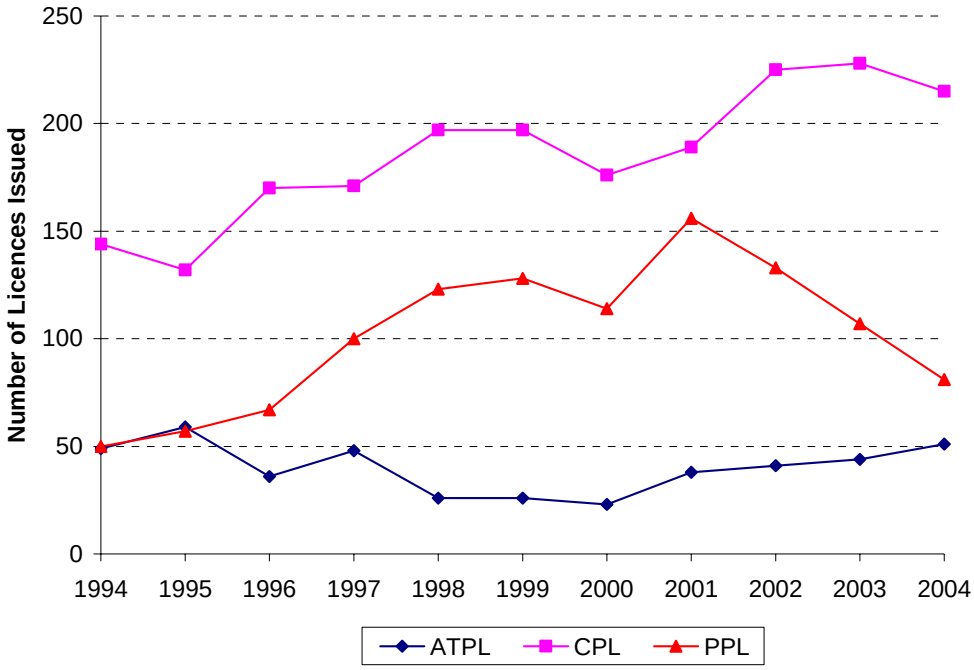


Source: CASA

Figure 13 shows the number of flight crew licences issued for fixed wing aircraft from 1994 to 2004 (see also Appendix, table 16A).

The number of new licences issued between 1994 and 2004 has declined for all licences in the fixed wing category – by 25.4 per cent, 16.9 per cent and 28.8 per cent for ATPL, CPL and PPL categories respectively. The largest number of licences issued has been in the PPL category, followed by the CPL and ATPL categories.

Figure 14: Rotary wing flight crew licences: new issues – 1994 to 2004



Source: CASA

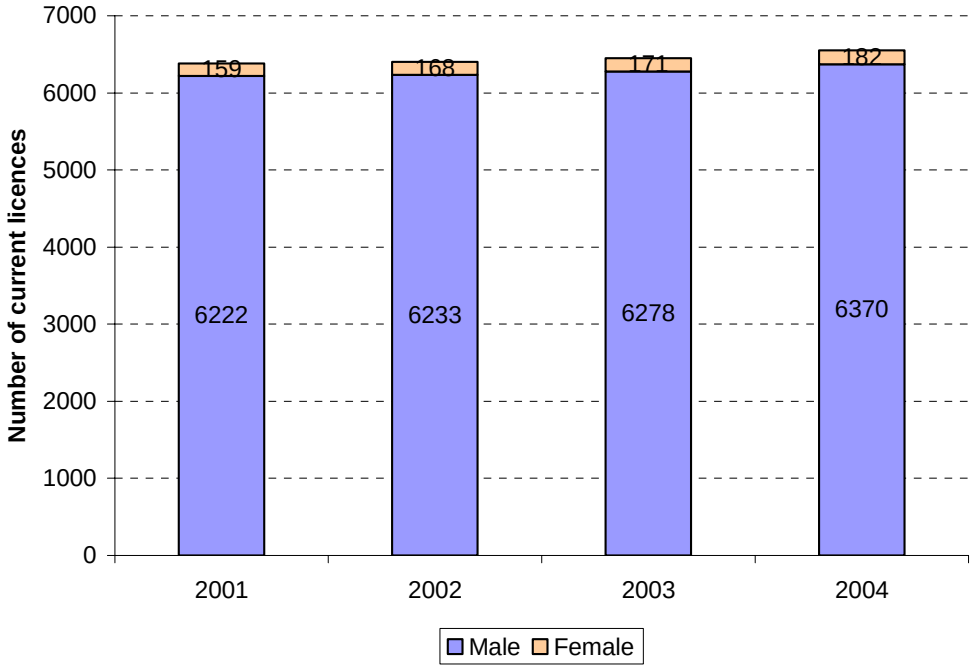
Figure 14 shows the number of flight crew licences issued for rotary wing aircraft from 1994 to 2004 (see also Appendix, table 17A).

The largest numbers of rotary wing licences were issued in the CPL category. Despite some reductions over the period, overall this category exhibited an upward trend. The number of CPL licences issued in 2004 was 49.3 per cent higher than in 1994.

The number of rotary wing PPL licences issued grew by 212 per cent – from 50 to 156 licences over the period 1994 to 2001. This trend was reversed between 2001 and 2004. By 2004, the number of these licences had dropped to 81. Overall, the number of PPL licences in 2004 was 62 per cent higher than in 1994.

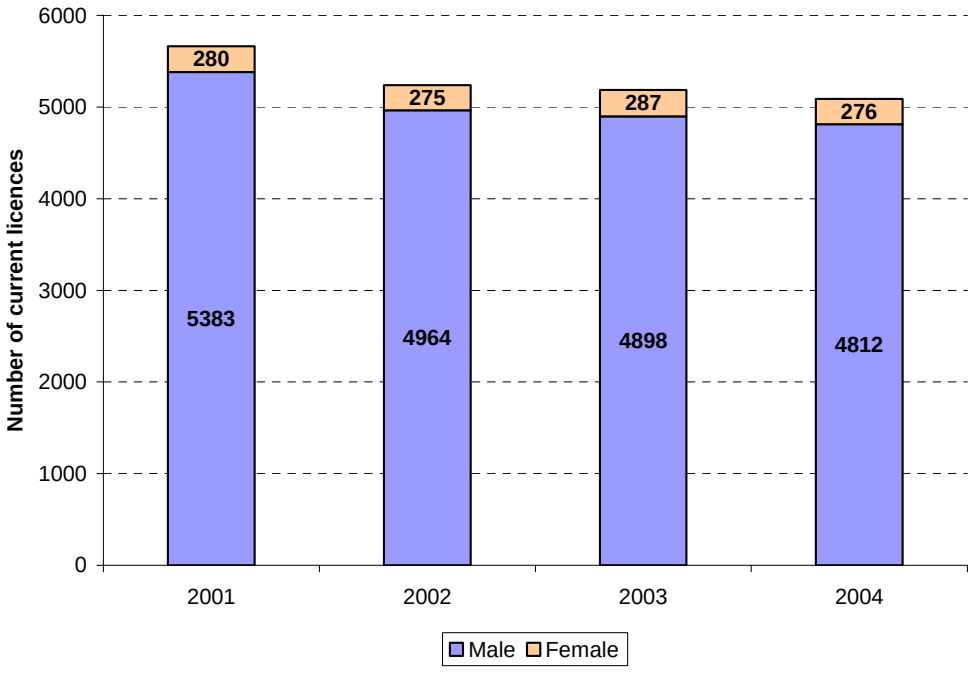
After 1997, the number of rotary wing ATPL licences issued was in decline. This downward trend was reversed after 2000. The number of ATPL licences issued in 2004 was almost the same as in 1994 (51 and 50 licences respectively).

Figure 15: Air transport crew licences with current medicals – 2001 to 2004 by gender



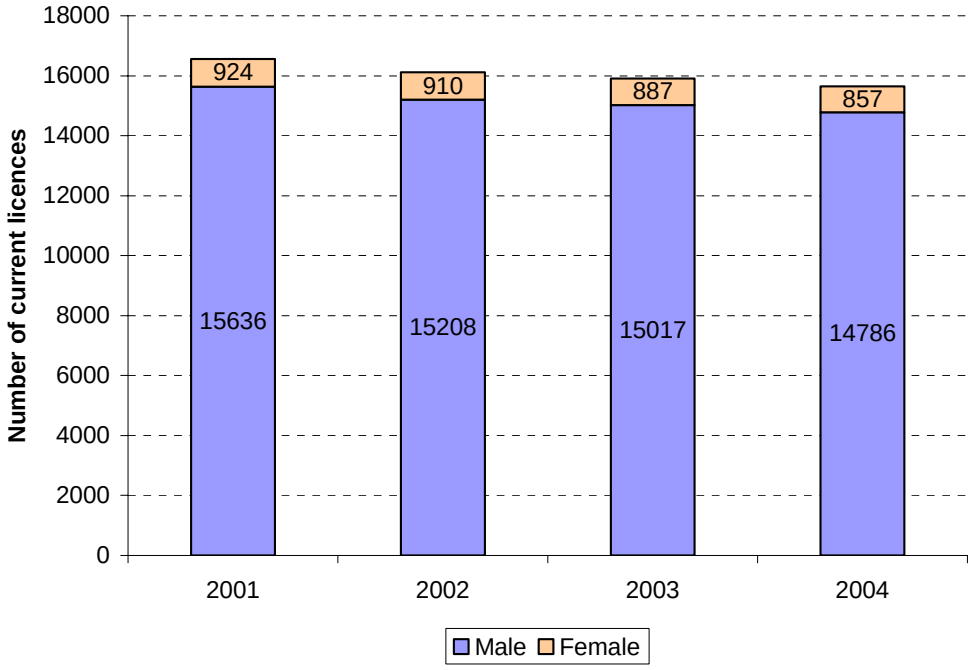
Source: CASA

Figure 16: CPL flight crew licences with current medicals – 2001 to 2004 by gender



Source: CASA

Figure 17: PPL flight crew licences with current medicals – 2001 to 2004 by gender

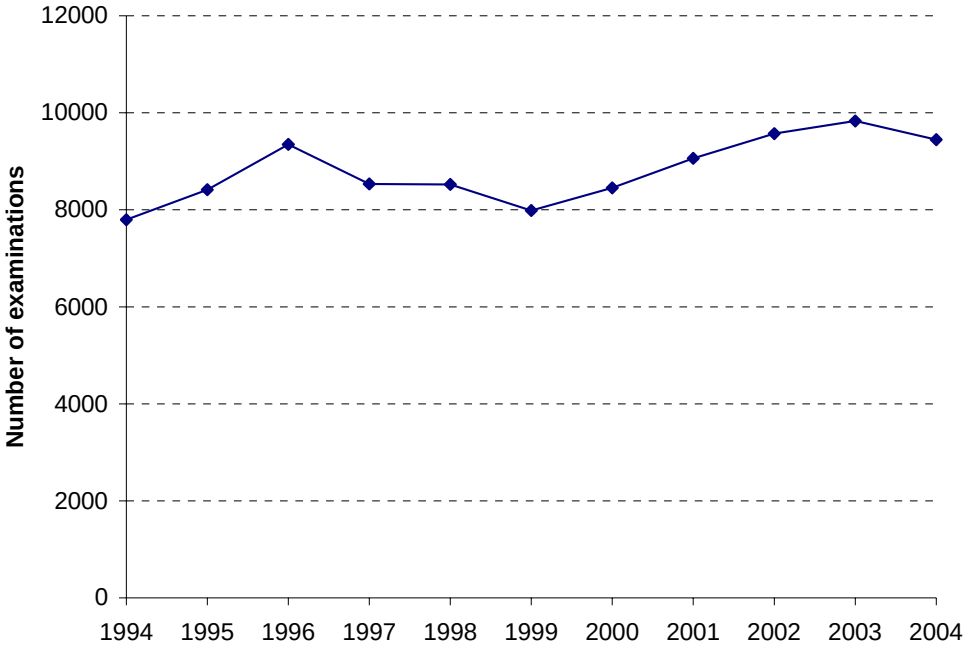


Source: CASA

Figures 15, 16 and 17 show the number of licence holders in the ATPL, CPL and PPL categories with valid medicals, grouped by gender, during the period 2001 to 2004. The groups are sorted by highest licence held, so a pilot with both a CPL and a PPL is not counted in the PPL population. The air transport category includes ATPL licence holders and a small number of SCPL licence holders.

The majority of licences are held by male pilots. On average, in the reported period, the highest ratio of female to male pilots was recorded in the PPL category – 5.9 per cent. The commercial female-pilots' ratio was slightly lower – 5.4 per cent. For Air Transport, the average percentage of female licence holders over the reported period was 2.7 per cent.

Figure 18: Total number of examinations attempted for all AME classifications – 1994 to 2004



Source: CASA

Figure 18 shows the number of times various examinations for Aircraft Maintenance Engineer (AME) licences were attempted from 1994 to 2004. One of the conditions of eligibility for an Aircraft Maintenance Engineers Licence is completion of examinations that relate to the type of licence category being sought. Examinations[6] can be attempted in the following categories:

- airframes;
- engines;
- radio;
- electrical; and
- instruments.

It should be noted that the same individual can sit examinations in more than one classification and that the same classification of examination may be attempted more than once in the event of a failure.

The number of examination attempts increased by 21.2 per cent between 1994 and 2004.

[6] The number of examinations required to get a licence depends on the category of licence sought.

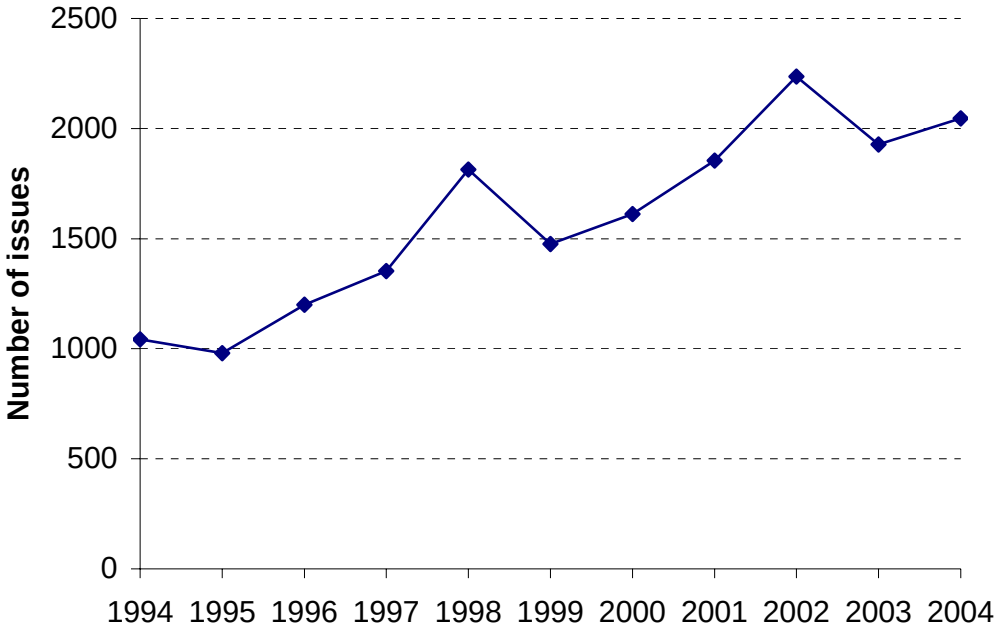
Figure 19: AME licences: new issues and expiries – 1994 to 2004

Source: CASA

Figure 19 shows the number of Aircraft Maintenance Engineers who where issued with a licence (in any category) for the first time. It also shows the number of individuals whose licences have expired.

Over the reported period the number of newly issued licences has been variable. However, over the period 2001 to 2004, the number of new licences issued has decreased each year. On the other hand, the number of expired licences has increased since 1998 with the exception of 2002. If this trend continues, there will be a net decrease in the total number of licensed AME holders starting from 2004.

Figure 20: Total LAME ratings issued for 'specific' aircraft types – 1994 to 2004



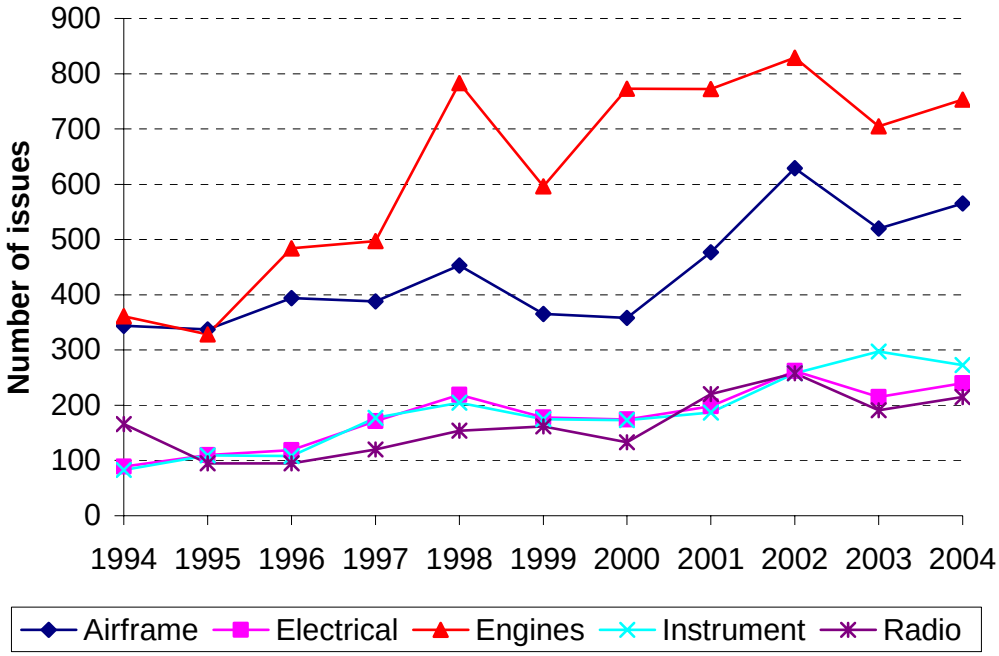
Source: CASA

Figure 20 shows the total number of aircraft ratings issued for 'Specific' aircraft types. Ratings refer to the type of aircraft on which Licensed Aircraft Maintenance Engineers (LAMEs) are able to certify maintenance.

For the most part, 'specific' aircraft ratings relate to a specific type of aircraft, engine or system, whereas 'group' ratings mainly refer to GA aircraft and do not cover specific aircraft types or models.

The total number of 'specific' type ratings has increased significantly since 1994. The number of ratings issued in 2004 was 96 per cent higher than in 1994.

Figure 21: LAME ratings issued for 'specific' aircraft types – 1994 to 2004 by category



Source: CASA

Figure 21 shows the number of aircraft ratings issued for 'specific' aircraft types by category from 1994 to 2004 (see also Appendix, table 14A). The number of ratings issued in 2004 was higher than in 1994 for all categories.

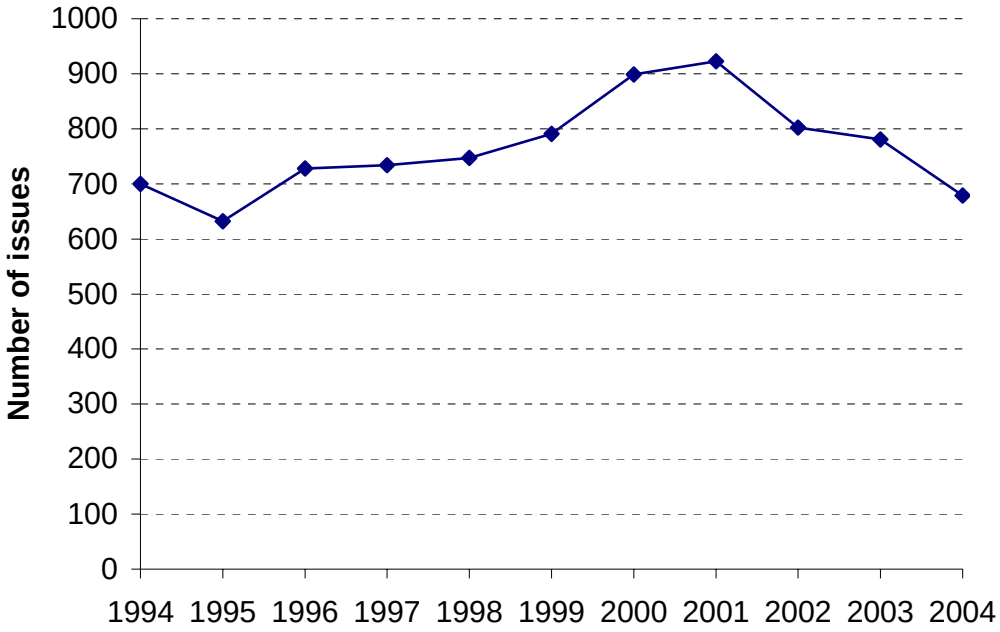
Table 1: LAME ratings issued for 'specific' aircraft types issued in 1994 and 2004

Licence category	1994	2004	2004/1994 change (%)
Instrument	83	273	228.9
Electrical	89	240	169.7
Engines	361	753	108.6
Airframe	344	565	64.2
Radio	166	215	29.5
Total	1043	2046	96.2

Source: CASA

The highest growth in the number of ratings issued was recorded in the 'instrument' category, followed by the 'electrical' category – 228.9 and 169.7 per cent respectively. The 'radio' category exhibited the lowest ratings' growth over the reported period – 29.5 per cent.

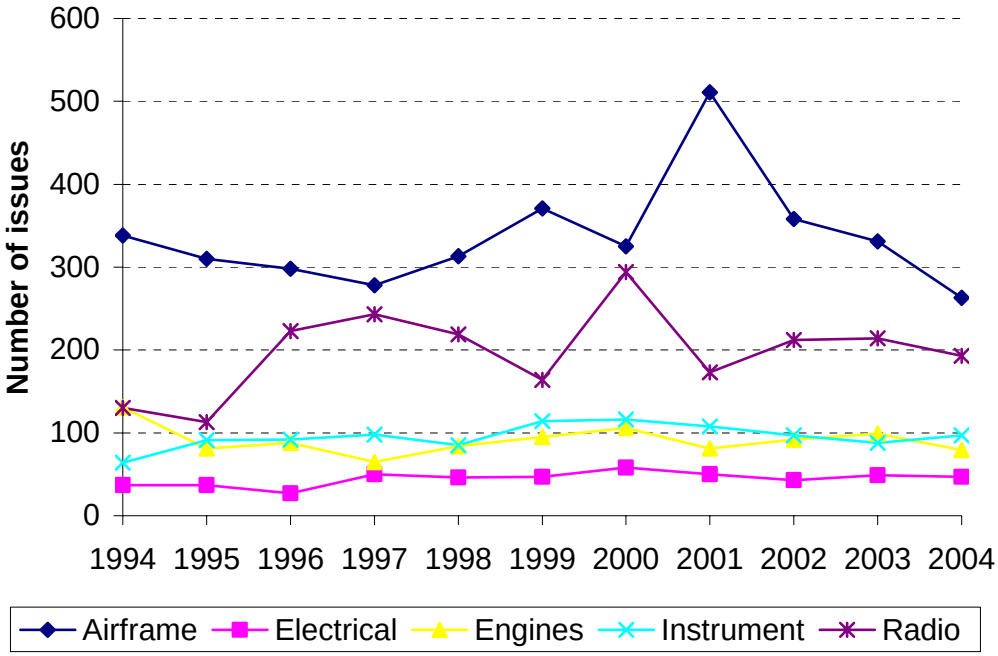
Figure 22: Total LAME ratings issued for 'group' aircraft types – 1994 to 2004



Source: CASA

Figure 22 shows the total number of aircraft ratings issued for 'group' aircraft types (see also Appendix – table 15A). The total number of ratings issued grew significantly each year between 1995 and 2001. Since 2001 there has been a decrease in the number of ratings issued. As a result, the total number of aircraft ratings issued in 2004 was 3 per cent lower than in 1994.

Figure 23: AME ratings issued for 'group' aircraft types – 1994 to 2004 by category



Source: CASA

Figure 23 and table 2 show the number of aircraft ratings issued for 'group' aircraft types by category. The 'instrument' and 'electrical' categories recorded a steady growth in the number of ratings issued. In the 'radio' category the number of ratings issued in 2003 was 48.5 per cent higher than in 1994. The 'airframe' and 'engine' category recorded a decline in ratings issued. The number of ratings issued in 2004 was 22.2 per cent lower for the 'airframe' category and 39.7 per cent lower for the 'engine' category, than in 1994.

Table 2: LAME ratings issued for 'group' aircraft types – 1994 and 2004

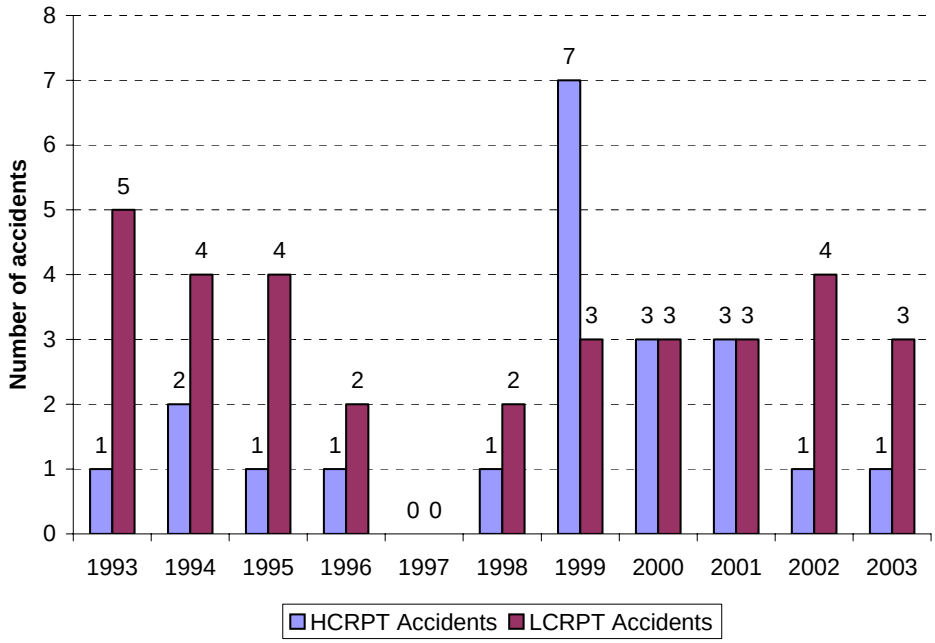
Licence category	1994	2004	2004/1994 change (%)
Instrument	64	97	51.6
Radio	130	193	48.5
Electrical	37	47	27
Airframe	338	263	-22.2
Engines	131	79	-39.7
Total	700	679	-3

Source: CASA

6 ACCIDENT INDICATORS

- Figure 24: Regular public transport accidents – 1993 to 2003
- Figure 25: General aviation accidents – 1993 to 2003
- Figure 26: Total general aviation fatal accidents and fatalities – 1993 to 2003
- Figure 27: GA accident rates – 1993 to 2003
- Figure 28a: Annual accident rates by industry category – 1993 to 2003
- Figure 28b: General aviation accident rates by industry category – 1993 to 2003
- Figure 29: Total general aviation fatal accident rate – 1993 to 2003
- Figure 30a: General aviation fatal accident rates by industry category– 1993 to 2003
- Figure 30b: General aviation fatal accident rates by industry category– 1993 to 2003

Figure 24: Regular public transport accidents – 1993 to 2003



Source: ATSB

Figure 24 compares the number of accidents involving high capacity and low capacity regular public transport between 1993 and 2003 (see also table 3). The indicator is expressed as the actual number of accidents per calendar year involving Australian registered aircraft.

As figure 24 suggests, over the reported period accidents were relatively rare in the HCRPT category. No accidents were recorded in 1995, 1996 and 1997. The highest number of accidents was recorded in 1999 (six). In all other years the number of accidents varied between one and three. As can be seen from table 3, HCRPT recorded no fatal accidents or fatalities between 1993 and 2004.

Accidents were also low in the LCRPT category, with a maximum of five accidents recorded in any one year. There were three fatal accidents over the reported period, resulting in a total of 17 fatalities.

Table 3: Accidents, fatal accidents and fatalities to Australian regular public transport aircraft, 1993 – 2004

RPT		*1993*	*1994*	*1995*[7]	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
High Capacity	***Accidents***	1	2[8]	1[9]	1[10]	0	1	7[11]	3[12]	3	1	1
	Fatal Accidents	0	0	0	0	0	0	0	0	0	0	0
	Fatalities	0	0	0	0	0	0	0	0	0	0	0
Low Capacity	***Accidents***	5	4	4	2	0	2	3	3	3	4	3
	Fatal Accidents	1	0	1	0	0	0	0	1	0	0	0
	Fatalities	7	0	2	0	0	0	0	8	0	0	0

[7] Two fatalities recorded against low capacity transport were the result of an RPT training accident.

[8] Includes one accident occurred overs seas to Australian registered aircraft.

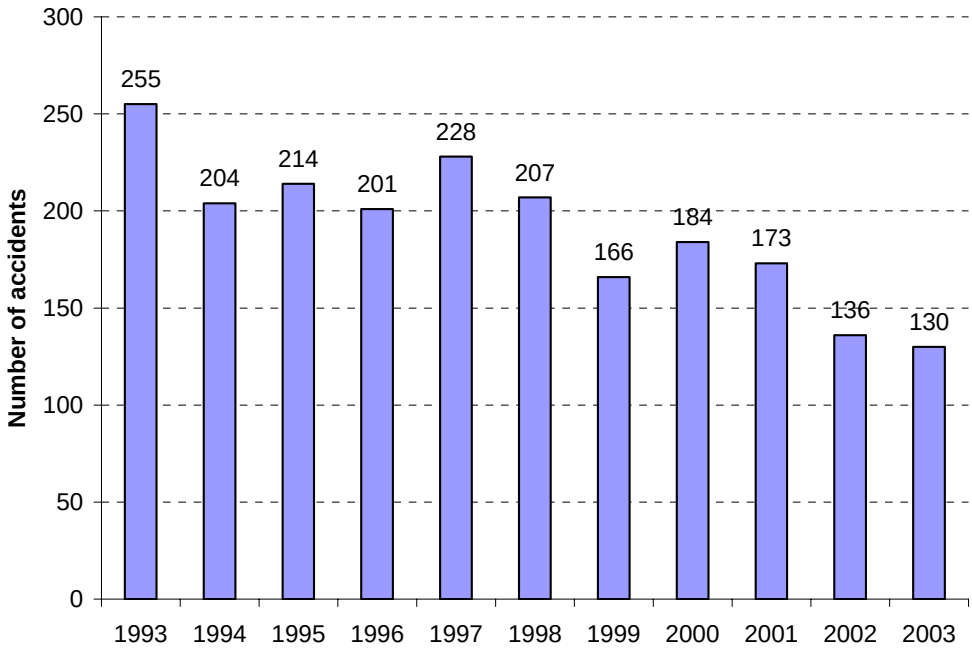
[9] Accident occurred over seas to Australian registered aircraft.

[10] Accident occurred over seas to Australian registered aircraft.

[11] Includes one accident that occurred over seas to Australian registered aircraft.

[12] Includes two accidents that occurred over seas to Australian registered aircraft.

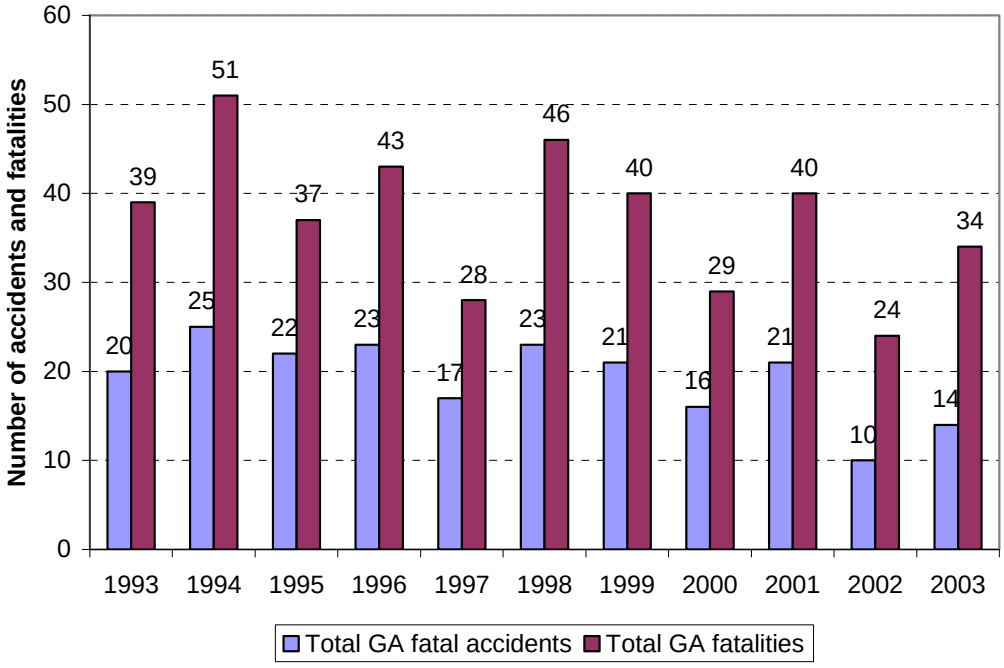
Figure 25: General aviation accidents – 1993 to 2003



Source: ATSB

Figure 25 shows the total number of GA accidents between 1993 and 2003. Accidents have declined since a high in 1993. The lowest number of accidents over this period occurred in 2003. As an indicator, the number of accidents attracts a lot of public interest. However, it does not take into account flying activity. In order to compare the accident level on a calendar year basis, rates need to be calculated.

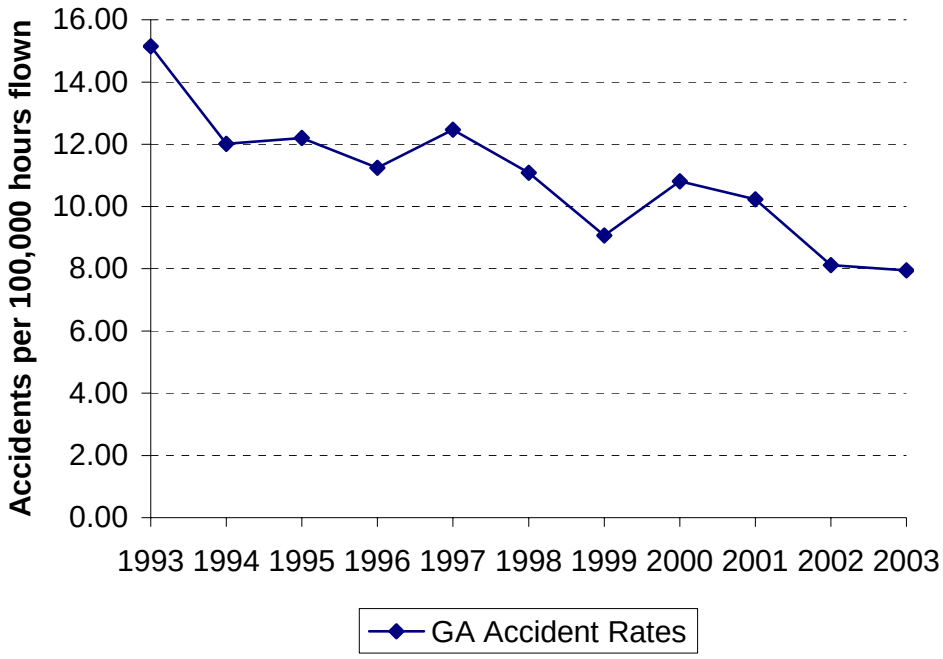
Figure 26: Total general aviation fatal accidents and fatalities – 1993 to 2003



Source: ATSB

Figure 26 shows the total number of GA fatal accidents and fatalities between 1993 and 2003. Fatal accidents and fatalities fluctuated over the reported period. The highest number of fatal accidents occurred in 1994, and the lowest number in 2002. Similar to fatal accidents, the highest number of fatalities was recorded in 1994, and the lowest in 2002.

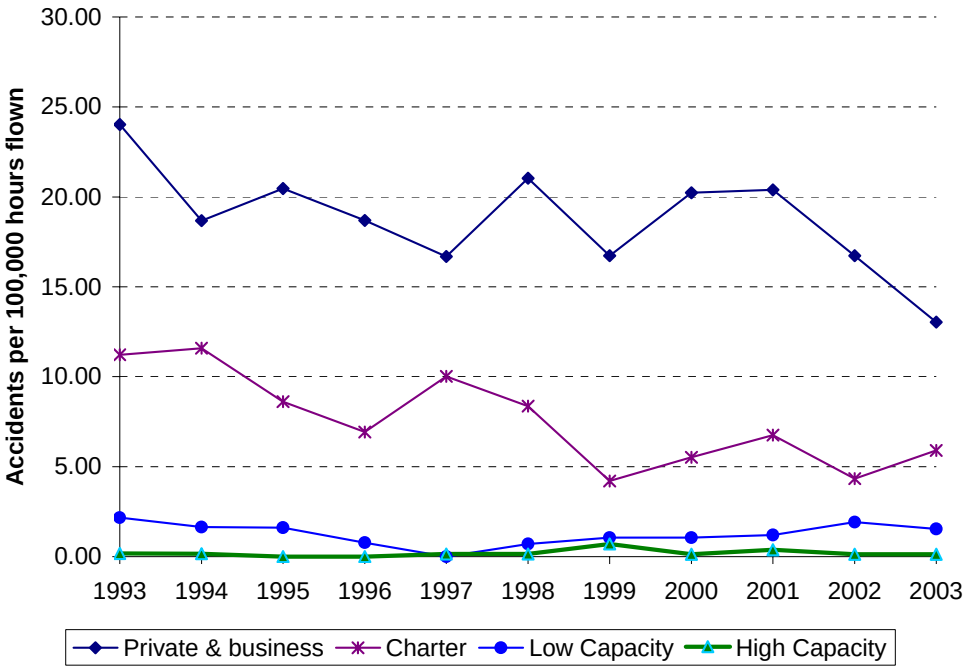
Figure 27: GA accident rates – 1993 to 2003



Source: ATSB

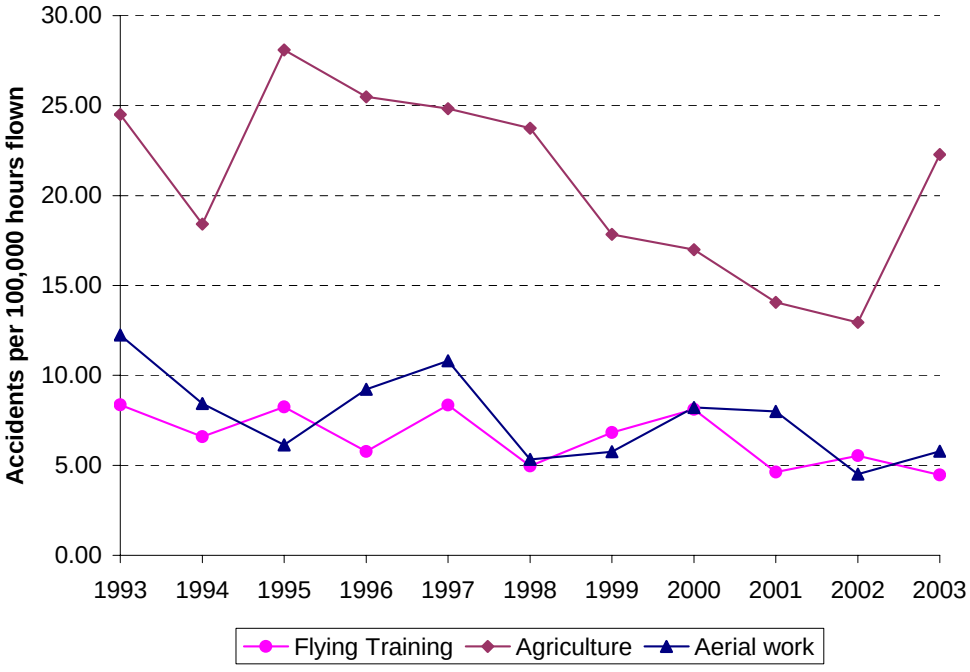
Figure 27 shows the GA accident rate calculated as accidents per 100,000 hours of operation. Despite fluctuations, the rate indicates a downward trend. The average annual rate of decline is approximately 6 per cent.

Figure 28a: Annual accident rates by industry category – 1993 to 2003



Source: ATSB

Figure 28b: General aviation accident rates by industry category – 1993 to 2003



Source: ATSB

There is debate about which activity indicator is more valid to calculate the rates – the number of departures or the number of flying hours. The majority of aviation accidents take place during take-off, the initial climb, the landing approach and the landing phases of flight. It is believed that using flying hours could potentially distort the rates, as the number of hours varies from flight to flight. However, departure data are not readily available and previous comparisons have indicated the use of either activity indicator results in very similar trends[13]. Therefore, this report uses flying hours as the denominator.

Figures 28a and 28b show the accident rates of all aviation industry categories. The rate of accidents is calculated as the number of accidents per 100,000 hours flown.

The accident rate for the HCRPT and LCRPT category has remained very low over the reported period.

The highest rates of accidents occurred in the private/business and agricultural categories. In 2003 there were 13.0 accidents per 100,000 hours of private/business operations and 22.3 accidents per 100,000 hours flown of agricultural operations.

The annual accident rate declined significantly for agricultural operations between 1995 and 2002. However, the rate increased by 72.1 per cent in 2003 compared with 2002.

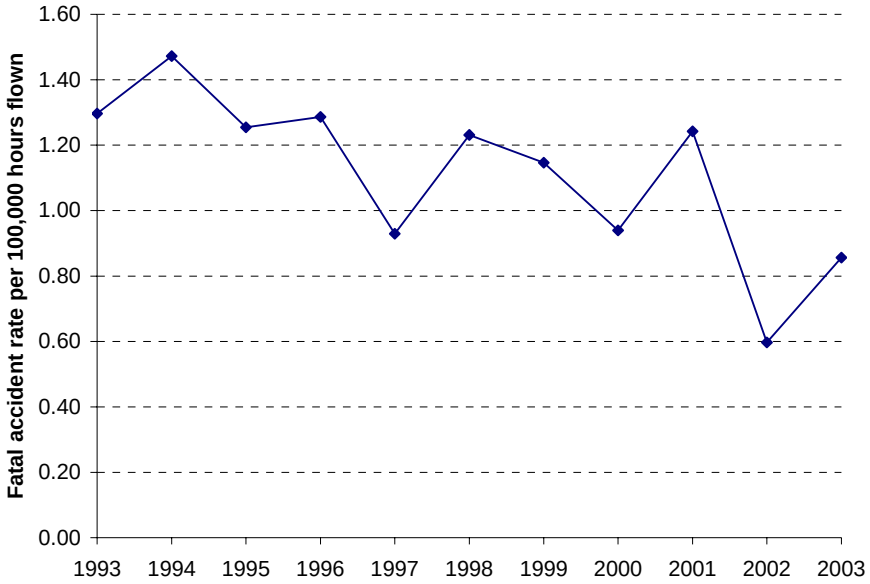
Despite some variations in annual rates, private/business operations recorded a slight overall downward trend recording 24.0 accidents in 1993 compared with 13.0 in 2003.

Overall, the annual accident rate per 100,000 hours flown for Aerial work operations decreased from 12.2 in 1993 to 5.8 in 2003. However, the lowest rate was recorded in 1998 (5.3 accidents per 100,000 hours flown).

The number of accidents per 100,000 hours among charter operations trended downwards from 11.2 in 1993 to 5.9 in 2003.

[13] Australian Transport Safety Bureau, Aviation Safety Indicators 2002 report, November 2003.

Figure 29: Total general aviation fatal accident rate – 1993 to 2003



Source: BTRE

Figure 29 shows the fatal accident rate per 100,000 hours for all general aviation operations, that is agricultural, flying training, charter, other aerial work and private/business. The annual fatal accident rate for general aviation varied between 0.6 and 1.5 fatal accidents per 100,000 hours. Despite fluctuations in the number from year to year, there was a decline in rates between 1993 and 2003. The average annual rate of decline per 100,000 hours was approximately 3.8 per cent.

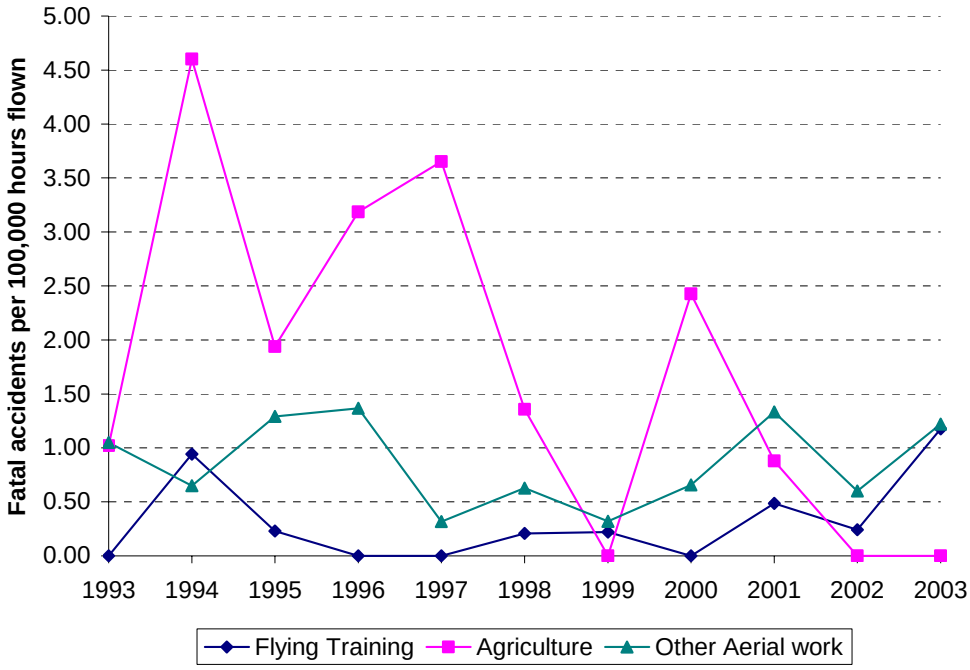
Table 4: Fatal accidents as a percentage of total accidents by industry category, 1993 to 2003

Industry Category	***Fatal/Total Accidents (%) 1993 – 2003***
Flying Training	4.8
Agriculture	8.5
LCRPT	9.1
Charter	10.6
Other Aerial Work	11.2
Private/Business	11.9

Table 4 shows the average proportion of fatal accidents to total accidents for the various industry categories during the period 1993 to 2003.

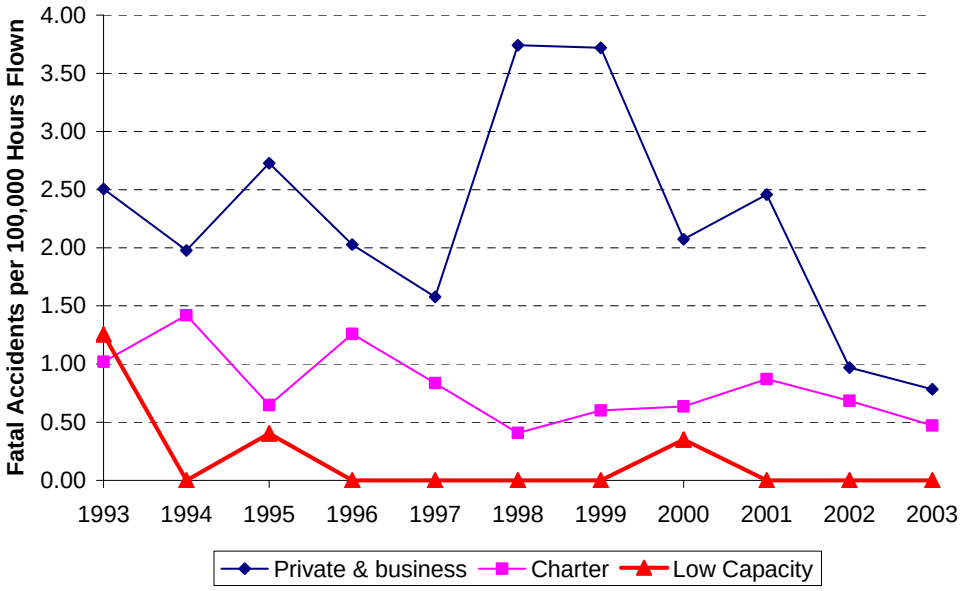
The measure indicates how many accidents out of 100 would be fatal accidents. The percentages suggest that about one in twenty accidents would be fatal for the flying training category, and approximately one in ten for other industry categories.

Figure 30a: General aviation fatal accident rates by industry category– 1993 to 2003



Source: ATSB

Figure 30b: General aviation fatal accident rates by industry category– 1993 to 2003



Source: ATSB

Figures 30a and 30b show the fatal accident rates for industry categories between 1993 and 2003. The rate is calculated as the number of fatal accidents per 100,000 hours of operation.

There were no fatal accidents involving Australian registered HCRPT aircraft over the recorded period (the last HCRPT fatal accidents were in 1960s).

The average fatal accident rate for LCRPT aircraft was 0.18 fatal accidents per 100,000 hours and the corresponding figure for charter operations was 0.86. Thus, the fatal accident rate for charter operations was nearly five times that for LCRPT.

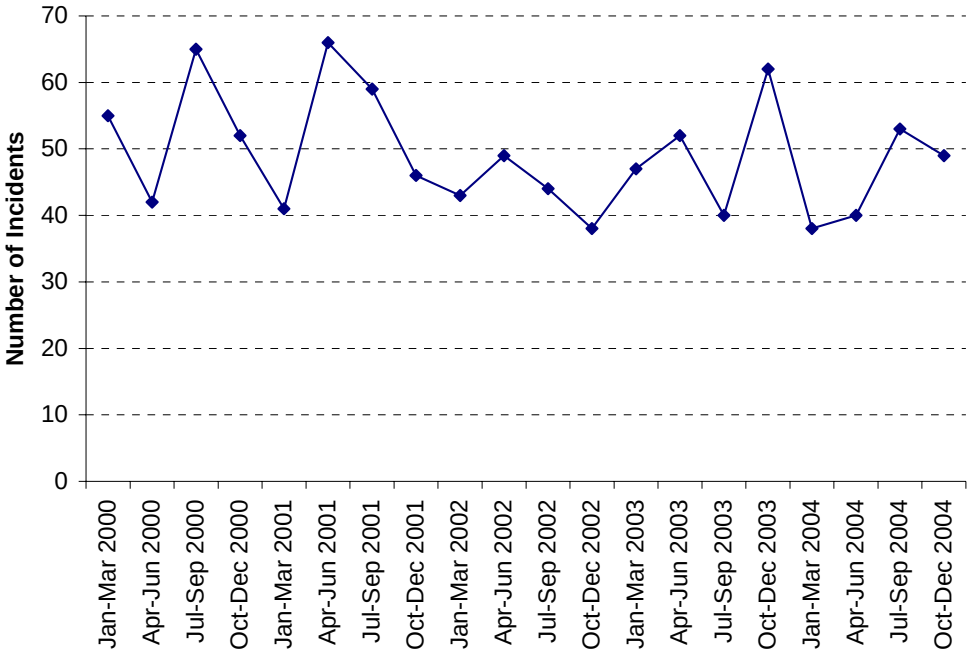
The highest fatal accident rates were recorded in the agricultural and private/business industry categories. Agricultural industry fatal accident rates varied between 0 and 4.6 (on average 2.38); private/business industry rates varied between 0.78 and 3.74 (on average 1.73).

The flying training industry category exhibited the second lowest rates varying between 0.0 and 1.2 fatal accidents per 100,000 hours. As numbers fluctuated over the reported period, it is difficult to discern any trend for the flying training industry category.

The data do not show any significant increase or decrease for the other aerial work industry category. The fatal accident rate varied between 0.3 and 1.5 with an average of 0.86 fatal accidents per 100,000 hours over the reported period.

7 INCIDENT INDICATORS

Figure 31: Breakdown of separation and airprox incidents – 2000 to 2004



Source: ATSB

In accordance with regulation 2.3 of the *Transport Safety Investigation Regulations* (TSI) *2003*, a breakdown of separation (BOS) has since July 1999 been defined as:

'a failure to maintain a recognised separation standard (vertical, lateral or longitudinal) between aircraft that are being provided with an air traffic service separation service'

In certain circumstances, a BOS may occur even if only one aircraft is under the control of an air traffic service.

An airprox is defined under regulation 2.2 of the TSI as:

'an occurrence in which 2 or more aircraft come into such close proximity that a threat to the safety of the aircraft exists or may exist, in airspace where the aircraft are not subject to an air traffic standard or where separation is a pilot responsibility.'

The provision of air traffic control separation standards depends on airspace classification and the category of flight, namely visual flight rules (VFR) or instrument flight rules (IFR). Table 20A in the Appendix details the services and requirements for the various classes of airspace used in Australia as outlined in the Aeronautical Information Publication ENR 1.4.

Figure 31 shows the number of incidents involving BOS and airprox incidents for 2000 to 2004[14]. It should be noted that airspace categories have changed in

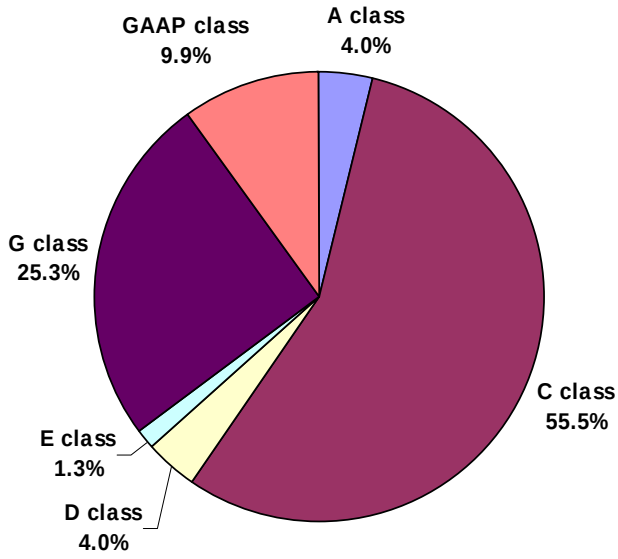
[14] Sixteen incidents occurred in restricted areas which were not included in the dataset.

the period 2000 to 2004[15]. The number of incidents fluctuated over the reported period, therefore, it is difficult to identify a trend. The highest number of incidents was recorded over the second quarter of 2001 followed by the third quarter of 2000 (66 and 65 respectively). The lowest number of incidents was recorded in the last quarter of 2002 and in the first quarter of 2004 (38 incidents).

The ATSB collects data not only from civil airports and aerodromes but also from military aerodromes; therefore, BOS data collected by the ATSB is different from the data collected by Airservices Australia.

[15] Australian Transport Safety Bureau, *National Airspace System Stage 2b:* A*nalysis of available data*, aviation research report, July 2004.

Figure 32: Breakdown of separation and airprox incidents – 2000 to 2004 by airspace class

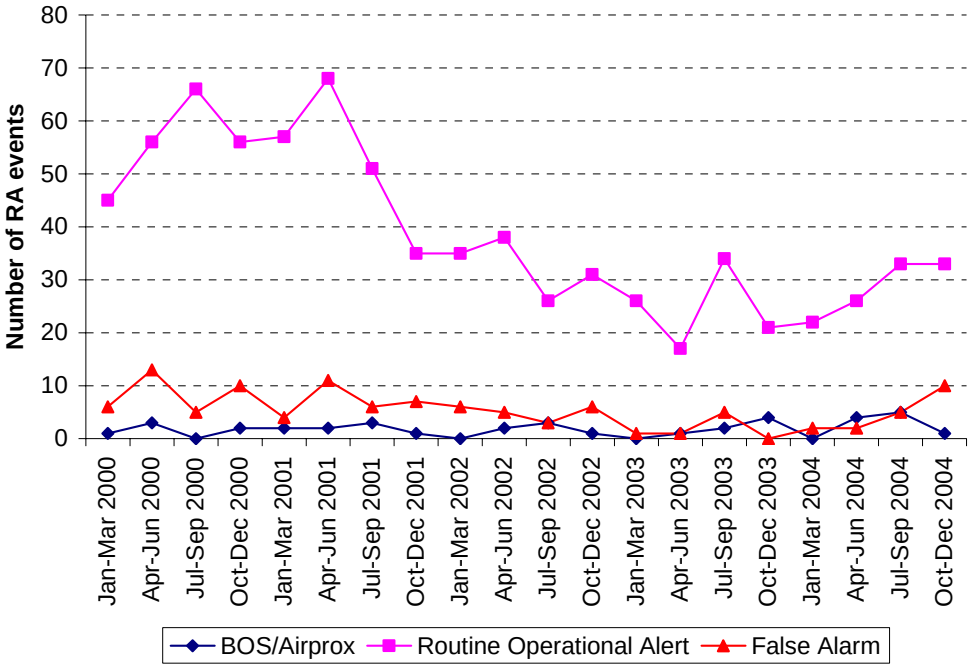


Source: ATSB

Figure 32 shows the number of BOS and airprox incidents by airspace class from 2000 to 2004. The percentages suggest that approximately 56 per cent of incidents were in Class C airspace. Approximately one third of incidents occurred in Class G and GAAP airspace (25.3 and 9.9 per cent respectively). The smallest number of incidents were recorded in Class E (1.3 per cent), followed by Class A and Class D airspace (4 per cent). As VFR flights are not permitted in Class A airspace, all incidents that occurred in this airspace were BOS incidents. Similarly, most incidents in Class G and GAAP airspace were airprox incidents as air traffic separation in this airspace is either not provided and or is a pilot responsibility, except for IFR aircraft that do not have a visual reference.

Caution should be exercised in drawing conclusions regarding levels of risk based on numbers of BOS and airprox events. Consideration of such numbers without taking account of air traffic density in each airspace class and changes in airspace boundaries may not give a consistent or reliable indication of the level of risk of a midair collision.

Figure 33: TCAS Resolution Advisories – 2000 to 2004



Source: ATSB

The Civil Aviation Regulations 1988 (regulation 262AC) state that:

'after 31 December 1999, the pilot in command of an Australian aircraft that is a turbine-powered commercial aeroplane must not begin a flight if the aircraft is not fitted with an approved TCAS II that is serviceable.'

Traffic Collision Avoidance System equipment (TCAS) provides a visual display and two levels of alert to flight crews regarding the risk of a mid-air collision. TCAS is primarily designed to provide an additional defence for pilots in assessing potential conflicts with other aircraft in any airspace.

A lower level of alert is an informing warning called a traffic advisory (TA). This type of alert is an indication provided to the pilot showing the approximate relative positions of transponding aircraft which may become a threat.

A higher level of alert is called a resolution advisory (RA) and is an instruction to reduce the risk of a midair collision (e.g. descend or climb away from target aircraft). The ATSB considers that a RA is an indication of a potential safety deficiency and the *Transport Safety Investigation Regulations 2003* (and predecessor legislation) require the reporting of all resolution advisories to the ATSB. The ATSB classifies TCAS RA in three main categories:

Routine operational alert – event with a high degree of closure between aircraft which nonetheless are complying with a separation standard.

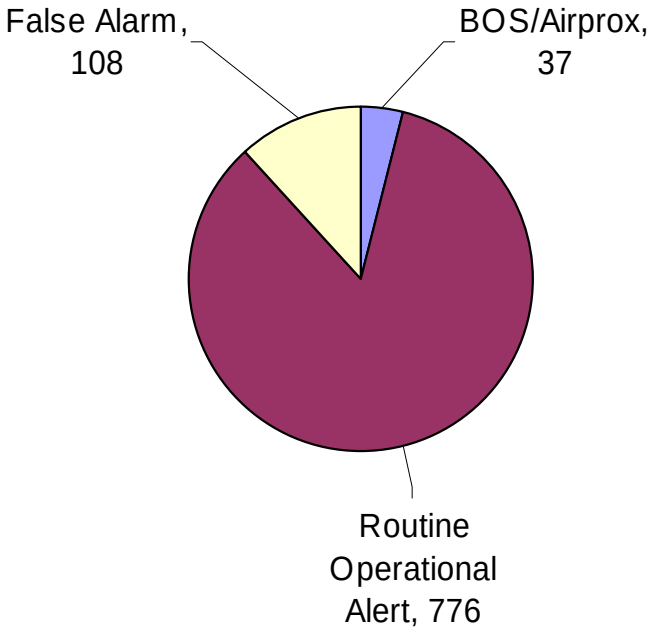
False alarm – event when a RA was activated with no other traffic in the near vicinity.

TCAS associated with a BOS/airprox incident– event when a RA assisted the pilot in identifying a potential conflict, and where either a separation standard has been broken or an avoiding manoeuvre has been required.

A high proportion of RAs are not serious or indicative of a major safety problem – for example, in the vicinity of an aerodrome, aircraft may sometimes come within the RA parameter alert range while being appropriately separated by air traffic control. Similarly, high rates of closure between aircraft which nonetheless are complying with a separation standard can result in a RA alert.

Figure 33 shows the number of TCAS RA occurrences reported to the ATSB during 2000 to 2004. The majority of RAs reported were *routine operational alerts* or *false alarms*. The number of TCAS RAs associated with a BOS/airprox incident has remained relatively low, varying from 0 to 5 in any one quarter. It is not possible, therefore, to identify any strong trends. On average, there were 7.4 RAs associated with BOS/airprox incidents recorded each year.

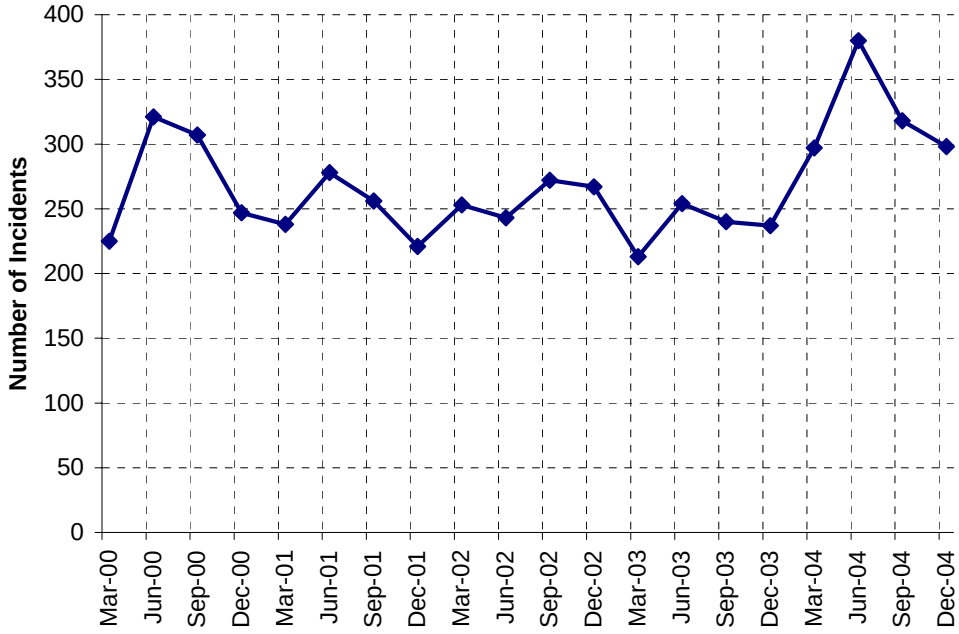
Figure 34: TCAS Resolution Advisories – 2000 to 2004



Source: ATSB

Figure 34 shows the types of TCAS RAs reported to the ATSB between 2000 and 2004. Approximately 84 per cent of RAs were routine operational alerts, 12 per cent were false alarms and only 4 per cent of RAs were associated with actual BOS/airprox incidents.

Figure 35: Reported violation of controlled airspace Incidents – 2000 to 2004



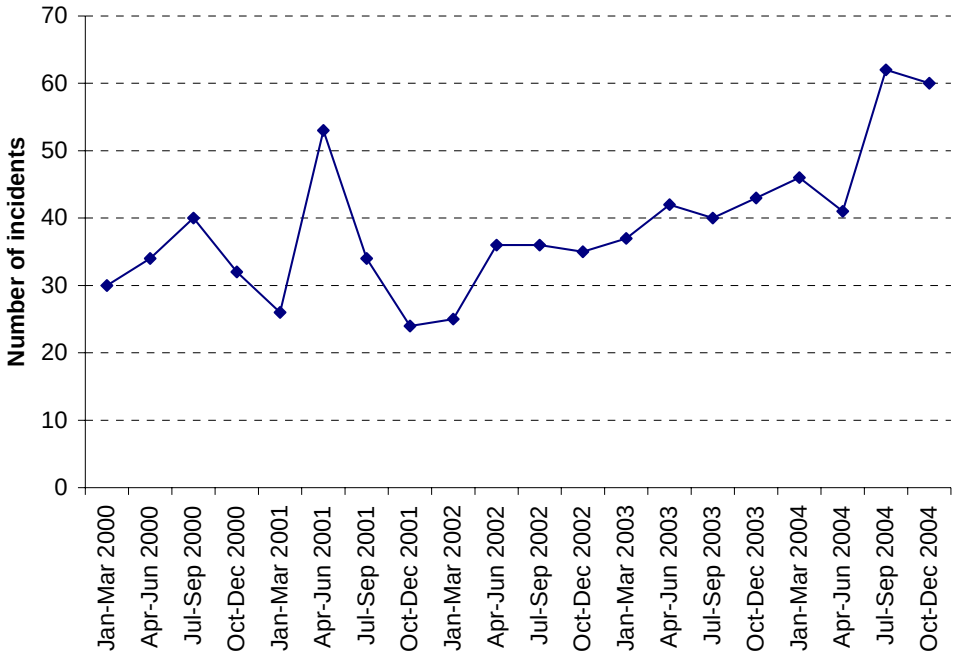
Source: Airservices Australia

The ATSB defines a violation of controlled airspace according to the Transport Safety Investigation Regulations 2003 as 'unauthorised entry of an aircraft into airspace for which clearance is required, or to which entry is prohibited.' Unauthorised aircraft in controlled airspace can result in conflict with other aircraft.

Figure 35 shows the number of VCA incidents per quarter reported to Airservices Australia from 2000 to 2004 (see also Appendix, table 15A). The lowest number of incidents over a full year period was usually recorded in the first and the fourth quarters, while the second and the third quarters exhibited an increase in incidents.

In 2004, there were 1,293 VCA incidents reported, which was the highest number recorded over the reported period. The lowest number, 944, was reported in the previous year. There were about 18 per cent more VCA incidents in 2004 than in 2000 and about 37 per cent more than in 2003.

Figure 36: Reported runway incursions incidents – 2000 to 2004



Source: ATSB

The definition of a runway incursion used by the ATSB according to the *Transport Safety Investigation Regulations 2003*, is:

'a runway incursion means any intrusion of an aircraft, vehicle, person, animal or object on the ground within a runway strip or helicopter landing site that creates a collision hazard or results in a reduction of safety for aircraft.'

Figure 36 depicts the total number of all runway incursion incidents reported to the ATSB from 2000 to 2004. The number of these incidents shows an increase, particularly after a low point in late 2001.

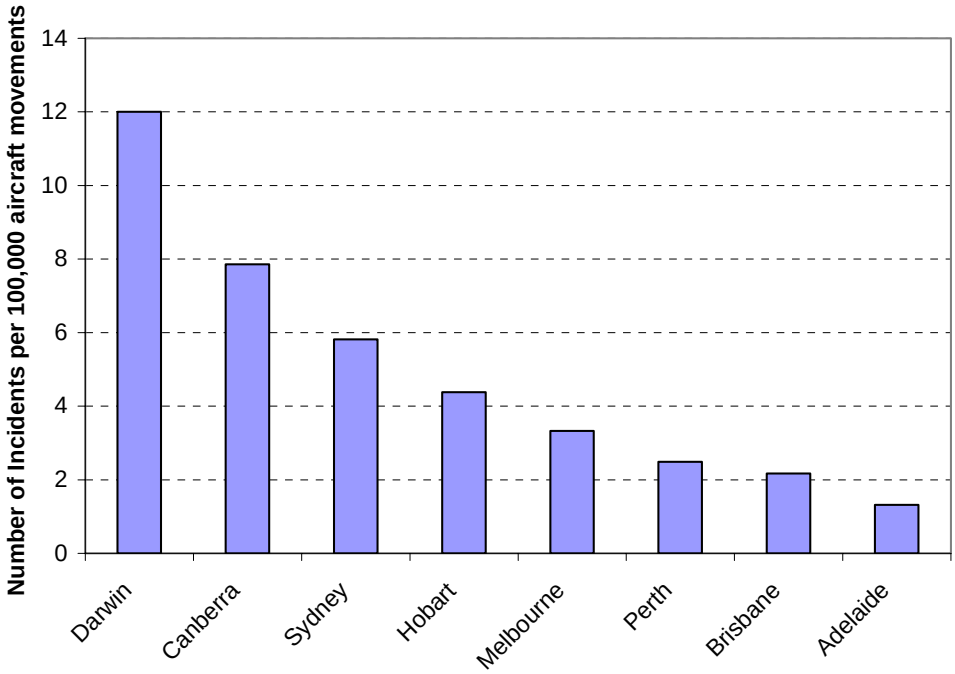
The following charts and tables show the runway incursion incident rates for capital city airports and major GA aerodromes.

Table 5: Runway incursions at capital city airports – 2000 to 2004

Airport	*Total runway incursions*	*Total aircraft movements*	*Incursions per 100,000 aircraft movements*
Darwin	50	416,534	12.0
Canberra	39	496,424	7.9
Sydney	81	1,392,494	5.8
Hobart	5	114,104	4.4
Melbourne	28	841,172	3.3
Perth	12	481,960	2.5
Brisbane	17	782,616	2.2
Adelaide	7	531,856	1.3

Source: ATSB

Figure 37: Runway incursion rates at capital city airports – 2000 to 2004



Source: ATSB

Figure 37 shows runway incursion incident rates at capital city airports. The rate is calculated as the number of runway incursion incidents per 100,000 aircraft movements over the 2000 to 2004 period (see also table 4 above).

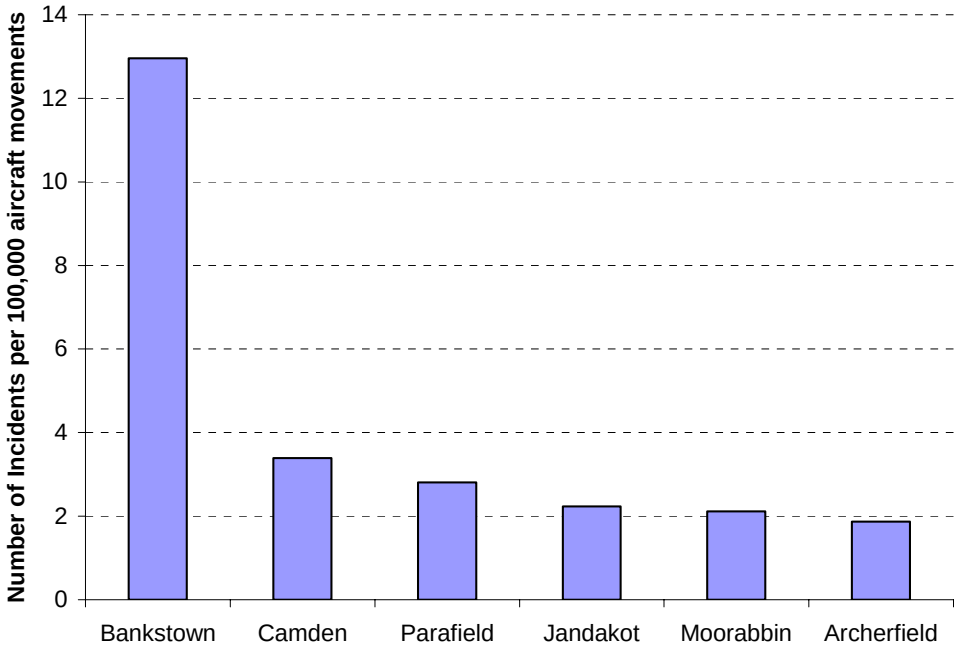
The highest rates occurred at Darwin and Canberra airports. Darwin's rate was significantly higher than that of other airports. Adelaide had the lowest rate in this category.

Table 6: Runway Incursions at GAAP Airports, 2000–2004

Airport	*Total rwy incursions*	*Total aircraft movements*	*Incursions per 100,000 aircraft movements*
Bankstown	195	1,505,222	13.0
Camden	10	294,880	3.4
Parafield	21	749,142	2.8
Jandakot	34	1,521,974	2.2
Moorabbin	26	1,228,134	2.1
Archerfield	14	749,020	1.9

Source: ATSB

Figure 38: Runway incursion rates at GAAP airports – 2000 to 2004

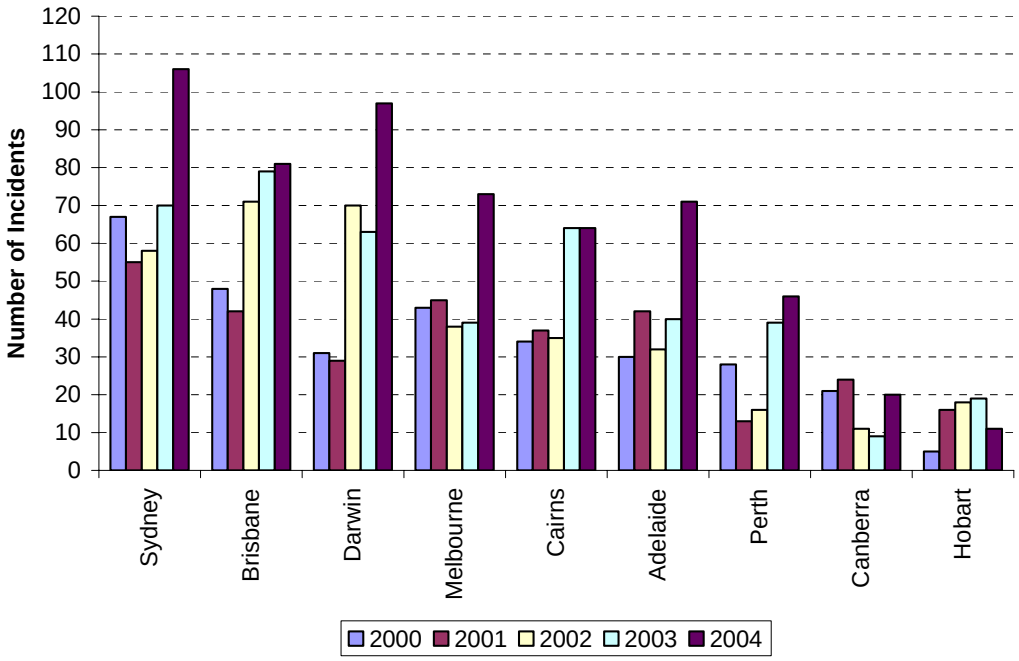


Source: ATSB

Figure 38 shows runway incursion incident rates at GAAP airports. The rate is calculated as the number of runway incursion incidents per 100,000 aircraft movements over the 2000 to 2004 period (see also table 5 above).

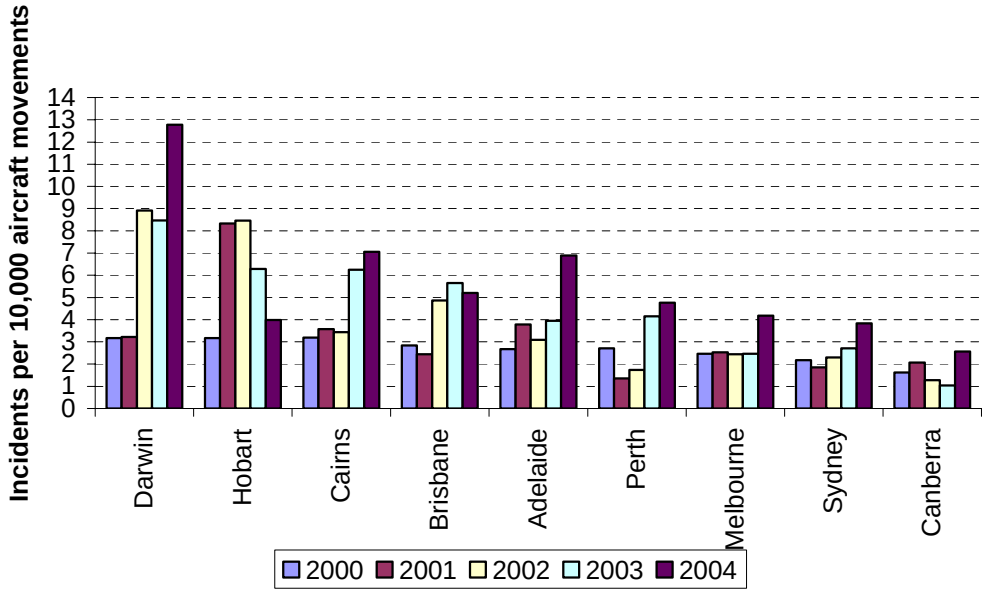
Of the GAAP airports, Bankstown's rate was significantly higher than that of any other GAAP airports. Archerfield had the lowest rate in this category.

Figure 39: Birdstrike incidents at capital city airports – 2000 to 2004



Source: ATSB

Figure 40: Birdstrike incident rates at major airports – 2000 to 2004



Source: ATSB

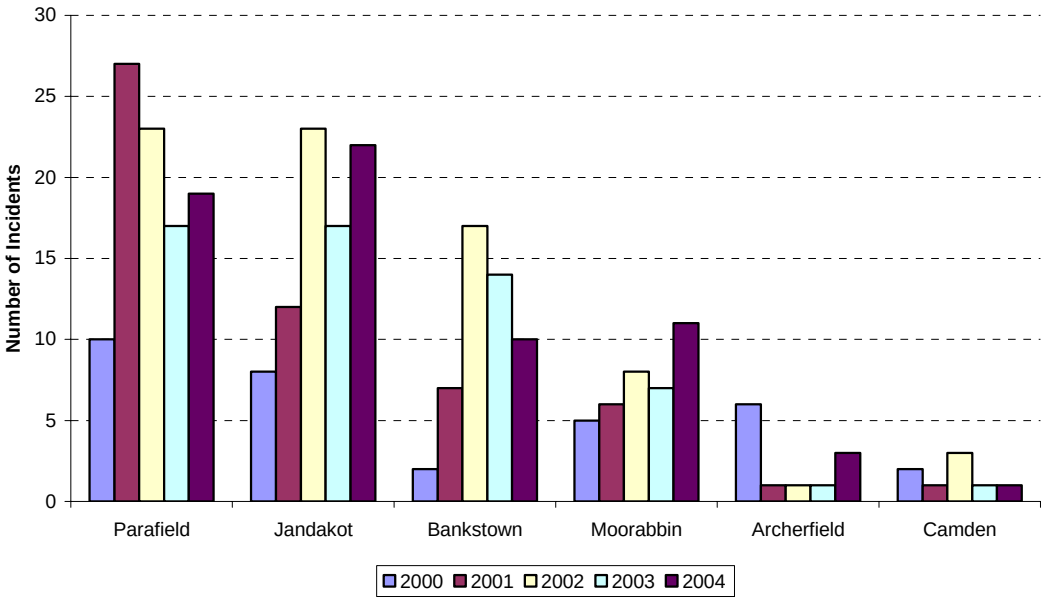
Figure 39 shows the number of reported birdstrike incidents that occurred at Australian capital city airports within a five-kilometre radius from the aerodrome between 2000 and 2004 (see also Appendix, table 12A).

Despite continuing efforts, birdstrikes continue to be a serious problem. Damage to an aircraft hull and engine caused by a birdstrike can be a significant threat to flight safety. Birdstrikes can potentially cause an engine failure on a Boeing 747 if it ingests several large birds.

Figure 39 and the following charts depict the data sorted by average number of incidents or rates in descending order. On average, Sydney reported the highest number of birdstrike incidents and Hobart reported the lowest number.

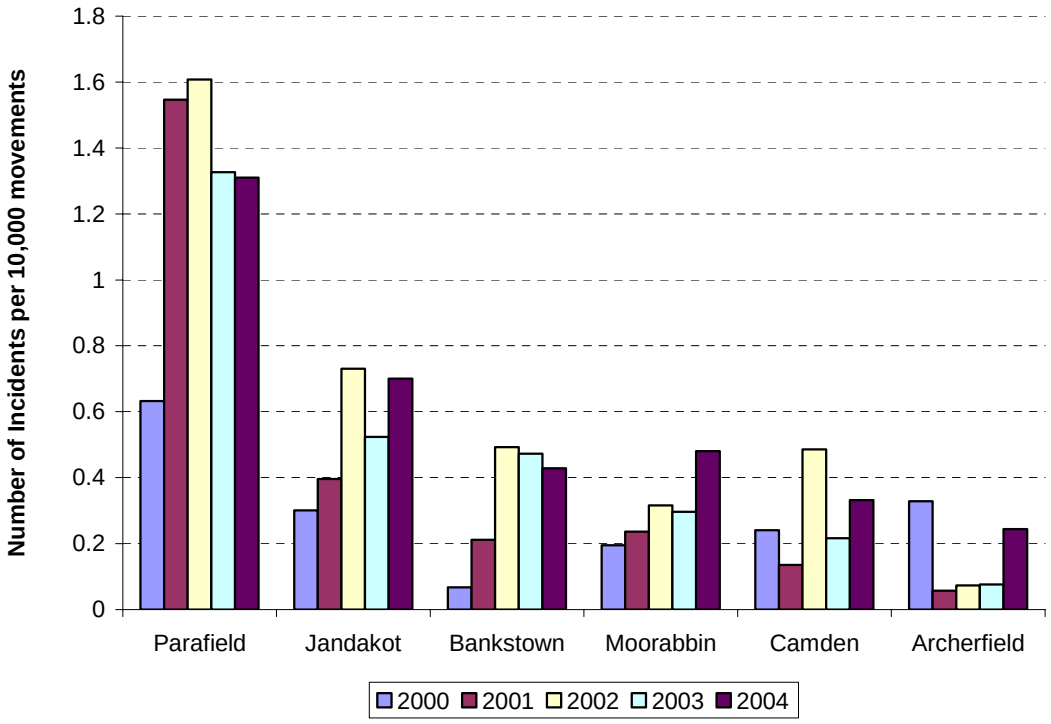
However, to compare aerodromes, incident rates should be used. Rates allow a comparison of aerodromes based on flying activity. The rate is calculated as the number of incidents per 10,000 movements of aircraft. Figure 40 suggests that, on average, the highest rates occurred at Darwin followed by the Hobart aerodrome. Canberra recorded the lowest rates.

Figure 41: Birdstrike incidents at GAAP aerodromes – 2000 to 2004



Source: ATSB

Figure 42: Birdstrike incident rates at GAAP aerodromes – 2000 to 2004



Source: ATSB

Figure 41 shows the number of birdstrike incidents that occurred at GAAP airports within a five-kilometre radius from the aerodrome between 2000 and 2004 (see also Appendix, table 13A).

Parafield and Jandakot have the highest number of reported birdstrikes of all GAAP aerodromes. Camden reported the lowest numbers. No birdstrikes were reported by Cambridge in 2000 and 2002.

Figure 42 suggests that, on average, the highest birdstrike incident rates were recorded at Parafield followed by Jandakot. Archerfield recorded the lowest rates. The rate is calculated as the number of incidents per 10,000 movements of aircraft.

8 CONCLUSIONS

Overall, the number of hours flown in RPT increased in the period 1993 to 2003, reflecting an increase in HCRPT in all years except 1998 and 2002. Overall the number of hours flown by LCRPT operations reduced although there was an increase in hours between 1993 and 1998.

HCRPT operations have maintained a zero fatality rate (since the 1960s) and the number of accidents has remained low. LCRPT fatal accidents were relatively low throughout the period, with eight of the eleven years recording zero fatalities. Accidents in the LCRPT sector have remained low and stable. The relatively low numbers of accidents in the RPT category makes it difficult to determine any trends in overall safety relatively to industry activity.

The number of hours flown in the GA category recorded an overall decrease between 1993 and 2003 despite an increase in all years to 1998. Within the GA category aerial work and charter categories recorded an overall increase in hours while all other categories decreased.

Overall GA operations showed a decrease in the number of accidents, the rate of accidents per 100,000 hours flown and the rate of fatal accidents per 100,000 hours flown between 1993 and 2003. To varying degrees the rate of accidents per 100,000 hours flown declined in all GA industry categories with the largest decrease being recorded in the other aerial work category. The increase in the rate of accidents in the agriculture category in 2003 is of some concern.

Current information holdings do not permit reliable analysis of incident trends and developments based on time series data. As the number of VCA and BOS incidents has been fluctuating from 2000 to 2004, it is not possible to identify strong trends.

The majority of TCAS RAs reported between 2000 and 2004 were either routine operational alerts or false alarms. The number of BOS/airprox RAs has remained relatively low, varying from 0 to 5 in any one quarter. On average, there were 7.4 RAs associated with BOS/airprox incidents recorded each year.

The number of birdstrike incidents reported between 2000 and 2004 varies significantly from one airport to another. Overall, the highest rates were recorded at major airports and regional aerodromes. The lowest rates were recorded at GAAP airports. Among the capital city airports Darwin recorded the highest rate of runway incursions per 100,000 aircraft movements, while Adelaide recorded the lowest rate (12 and 1.3 respectively). Among the major GA airports, Bankstown recorded the highest rate of runway incursions, while Archerfield recorded the lowest rate (13.0 and 1.9 respectively).

Overall, the data suggest that Australian aviation is very safe and that there was an improvement in safety over the reported period. However, there is no room for complacency. One major high capacity RPT fatal accident would have a dramatic negative impact on aviation safety.

9 APPENDIX

Table 1A: Annual hours flown ('000) in regular public transport by type of operation– 1990 to 2003

	Regular Public Transport		
	Low Capacity	***High Capacity***	***Total RPT***
1993	230426	553480	783,906
1994	244868	612478	857,346
1995	248074	666142	914,216
1996	258241	704,510	962,751
1997	276686	718,160	994,846
1998	285524	708,511	994,035
1999	285440	709,486	994,926
2000	285667	777,183	1,062,850
2001	249247	798,843	1,048,090
2002	208410	720,303	928,713
2003	195,848	758,665	954,513

Source: BTRE

Table 2A: Annual hours flown ('000) in general aviation by type of operation – 1993 to 2003

	General Aviation					
	Private & business	***Training***	***Agriculture***	***Aerial work***	***Charter***	***Total GA***
1993	478,724	442,483	97,908	285,951	392,157	1,697,224
1994	455,152	424,685	86,918	308,385	422,940	1,698,079
1995	439,947	436,205	103,213	309,672	464,246	1,753,283
1996	443,981	450,210	125,564	292,415	476,148	1,788,317
1997	443,693	455,005	136,912	314,473	478,715	1,828,799
1998	427,720	483,855	147,402	318,804	490,572	1,868,353
1999	430,260	454,285	134,531	312,949	499,757	1,831,782
2000	385,703	419,086	123,587	304,006	470,798	1,703,178
2001	406,952	410,916	113,828	300,231	458,928	1,690,856
2002	412,609	414,980	77,255	332,515	438,625	1,675,985
2003	383,520	424,659	76,302	327,986	423,087	1,635,553

Source: BTRE

Table 3A: Hours flown in Australian general aviation by fixed and rotary wing aircraft – 1993 to 2003

	Fixed Wing	*Rotary Wing*
1993	1,483,478	213,746
1994	1,453,086	244,993
1995	1,512,020	241,263
1996	1,560,961	227,356
1997	1,579,018	249,781
1998	1,620,739	247,614
1999	1,574,389	257,393
2000	1,433,623	269,555
2001	1,412,419	278,437
2002	1,364,251	311,734
2003	1,338,788	296,765

Source: BTRE

Table 4A: General aviation hours flown by industry category– 1993 to 2003

	General Aviation					
	Private & business	***Training***	***Agriculture***	***Aerial work***	***Charter***	***Total GA***
1993	478,724	442,483	97,908	285,951	392,157	1,697,224
1994	455,152	424,685	86,918	308,385	422,940	1,698,079
1995	439,947	436,205	103,213	309,672	464,246	1,753,283
1996	443,981	450,210	125,564	292,415	476,148	1,788,317
1997	443,693	455,005	136,912	314,473	478,715	1,828,799
1998	427,720	483,855	147,402	318,804	490,572	1,868,353
1999	430,260	454,285	134,531	312,949	499,757	1,831,782
2000	385,703	419,086	123,587	304,006	470,798	1,703,178
2001	406,952	410,916	113,828	300,231	458,928	1,690,856
2002	412,609	414,980	77,255	332,515	438,625	1,675,985
2003	383,520	424,659	76,302	327,986	423,087	1,635,553

Source: BTRE

Table 5A: Low capacity and high capacity transport by passengers carried – 1993 to 2003

	Low capacity	*High capacity*
1993	3,156,825	24,728,473
1994	3,496,234	27,287,665
1995	3,580,628	29,017,406
1996	3,881,465	30,686,258
1997	4,111,928	31,163,088
1998	4,161,750	31,081,674
1999	4,300,704	31,724,188
2000	4,586,567	34,375,306
2001	3,835,330	36,012,951
2002	3,026,459	34,858,432
2003	2,990,046	37,575,438

Source: BTRE

Table 6A: Age of Australian-registered aircraft – 1993 to 2003

At December each year	*GA and Regional Airline*				*Major Australian airlines*		
	Total years of age	*Number of aircraft*	*Average age*		*Total years of age*	*Number of aircraft*	*Average age*
1993	183,697	9,159	20.1		1,042	162	6.4
1994	192,471	9,248	20.8		1,241	175	7.1
1995	201,386	9,350	21.5		1,387	178	7.8
1996	211,693	9,528	22.2		1,439	182	7.9
1997	221,966	9,690	22.9		1,524	179	8.5
1998	231,338	9,820	23.6		1,638	179	9.2
1999	245,474	10,168	24.1		1,740	177	9.8
2000	255,581	10,325	24.8		2,078	200	10.4
2001	265,022	10,402	25.5		1,678	165	10.2
2002	274,027	10,455	26.2		1,550	185	8.4
2003	284,660	10,671	26.7		1,459	194	7.5

Source: BTRE

Table 7A: Fleet size — Fixed and rotary wing Australian aircraft by the year of manufacture

Year of Manufacture	*Up to 1950*	*1951/55*	*1956/60*	*1961/65*	*1966/70*	*1971/75*	*1976/80*	*1981/85*	*1986/90*	*1991/95*	*1996/2000*	*2001/2005*	*Total fixed/rotary wing*
Total Rotary Wing	1	2	6	37	87	93	140	127	195	129	179	200	1196
Cumulative Percentage	0.08%	0.25%	0.75%	3.85%	11.12%	18.90%	30.60%	41.22%	57.53%	68.31%	83.28%	100.00%	100.00%
Total Fixed Wing	610	174	439	854	1085	1149	2530	695	309	320	342	305	8812
Cumulative Percentage	6.92%	8.90%	13.88%	23.57%	35.88%	48.92%	77.63%	85.52%	89.03%	92.66%	96.54%	100.00%	
Total by age group: fixed/rotary	611	176	445	891	1172	1242	2670	822	504	449	521	505	10008
Percentage by age group	6.11%	1.76%	4.45%	8.90%	11.71%	12.41%	26.68%	8.21%	5.04%	4.49%	5.21%	5.05%	100%

Source: CASA aircraft register

Table 8A: Fleet size — Fixed and rotary wing Australian aircraft – transport category, by the year of manufacture

Year of Manufacture	*Up to 1950*	*1951/55*	*1956/60*	*1961/65*	*1966/70*	*1971/75*	*1976/80*	*1981/85*	*1986/90*	*1991/95*	*1996/2000*	*2001/2005*	*Total fixed/rotary wing*
Rotary Wing – Transport Category	0	0	0	0	1	1	15	15	19	14	4	2	71
Cumulative Percentage	0.00%	0.00%	0.00%	0.00%	1.41%	2.82%	23.94%	45.07%	71.83%	91.55%	97.18%	100.00%	100.00%
Fixed Wing –Transport Category	14	0	2	1	5	10	31	47	94	69	49	116	438
Cumulative Percentage	3.20%	3.20%	3.65%	3.88%	5.02%	7.31%	14.38%	25.11%	46.58%	62.33%	73.52%	100.00%	
Total by age group: fixed/rotary	14	0	2	1	6	11	46	62	113	83	53	118	509
Percentage by age group	2.75%	0.00%	0.39%	0.20%	1.18%	2.16%	9.04%	12.18%	22.20%	16.31%	10.41%	23.18%	100%

Source: CASA aircraft register

Table 9A: Accidents, fatal accidents and fatalities to all Australian-registered regular public transport aircraft – 1993 to 2004

Air Transport		*1993*	*1994*	*1995#*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
High Capacity	Accidents ()*	1	1(1)	0(1)	0(1)	0	1	6(1)	1(2)	3	1	1
	Fatal Accidents	0	0	0	0	0	0	0	0	0	0	0
	Fatalities	0	0	0	0	0	0	0	0	0	0	0
Low Capacity	Accidents	5	4	4	2	0	2	3	3	3	4	3
	Fatal Accidents	1	0	1	0	0	0	0	1	0	0	0
	Fatalities	7	0	2	0	0	0	0	8	0	0	0

The two fatalities recorded against Low Capacity Air Transport in 1995 were the result of an RPT training accident, not a regular service.

The 1993 fatal accident involved a Piper PA31-350 Navajo Chieftain aircraft, VH-NDU, at Young aerodrome, NSW, where 7 people were fatally injured. The 2000 fatal accident involved a Piper PA31-350 Chieftain aircraft, VH-MZK, close to Whyalla aerodrome, SA, where 8 people were fatally injured.

* accidents that involved Australian aircraft overseas are shown in brackets

Source: ATSB

Table 10A: Accidents, fatal accidents and fatalities to all Australian-registered general aviation aircraft – 1993 to 2003

GENERAL AVIATION		*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*Total*
Charter	Accidents	44	49	40	33	48	41	21	26	31	19	25	**377**
	Fatal Accidents	4	6	3	6	4	2	3	3	4	3	2	**40**
	Fatalities	8	22	8	13	8	7	10	11	10	8	8	**113**
Agriculture	Accidents	24	16	29	32	34	35	24	21	16	10	17	**258**
	Fatal Accidents	1	4	2	4	5	2	0	3	1	0	0	**22**
	Fatalities	1	4	2	4	6	2	0	3	1	0	0	**23**
Flying Training	Accidents	37	28	36	26	38	24	31	34	19	23	19	**315**
	Fatal Accidents	0	4	1	0	0	1	1	0	2	1	5	**15**
	Fatalities	0	4	1	0	0	1	1	0	2	1	7	**17**
Other Aerial Work	Accidents	35	26	19	27	34	17	18	25	24	15	19	**259**
	Fatal Accidents	3	2	4	4	1	2	1	2	4	2	4	**29**
	Fatalities	4	5	6	5	2	3	2	6	8	5	11	**57**
Private/Business	Accidents	115	85	90	83	74	90	72	78	83	69	50	**889**
	Fatal Accidents	12	9	12	9	7	16	16	8	10	4	3	**106**
	Fatalities	26	16	20	21	12	33	27	9	19	10	8	**201**

Source: ATSB For more information refer to: ATSB, *General aviation fatal accidents: How do they happen?*, June 2004

Table 11A: Birdstrike incidents at major aerodromes, includes birdstrikes up to 5 km radius from the aerodrome – 2000 to 2004

Location	***2000***	***2001***	***2002***	***2003***	***2004***
Adelaide	30	42	32	40	71
Brisbane	48	42	71	79	81
Cairns	34	37	35	64	64
Canberra	21	24	11	9	20
Gold Coast*	11	23	19	37	24
Darwin	31	29	70	63	97
Hobart	5	16	18	19	11
Melbourne	43	45	38	39	73
Perth	28	13	16	39	46
Sydney	67	55	58	70	106
Total	318	326	368	459	593

** Formerly Coolangatta Aerodrome*

Source: ATSB

Table 12A: Birdstrike incidents at GAAP aerodromes, includes strikes up to 5 km radius from aerodrome – 2000 to 2004

Location	***2000***	***2001***	***2002***	***2003***	***2004***
Archerfield	6	1	1	1	3
Bankstown	2	7	17	14	10
Camden	2	1	3	1	1
Jandakot	8	12	23	17	22
Moorabbin	5	6	8	7	11
Parafield	10	27	23	17	19
Total	33	55	75	58	66

Source: ATSB

Table 13A: Reported violation of controlled airspace incidents by quarters – 2000 to 2004

	March	*June*	*September*	*December*	*YEARLY*
2000	225	321	307	247	1100
2001	238	278	256	221	993
2002	253	243	272	267	1035
2003	213	254	240	237	944
2004	297	380	318	298	1293
Grand Total	1226	1476	1393	1270	5365

Source: Airservices Australia

Table 14A: Number of LAME aircraft ratings issued for 'specific' aircraft types – 1994 to 2004

Category	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
Airframe	344	337	394	388	453	365	358	477	629	520	565
Electrical	89	110	119	171	219	178	174	198	262	215	240
Engines	361	328	484	497	783	596	773	772	829	705	753
Instrument	83	109	108	177	205	175	173	187	258	297	273
Radio	166	95	95	120	154	162	133	220	258	191	215
Total	1043	979	1200	1353	1814	1476	1611	1854	2236	1928	2046

Source: CASA

Table 15A: Number of LAME aircraft ratings issued for 'group' aircraft types – 1994 to 2004

Category	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
Airframe	338	310	298	278	313	371	325	511	358	331	263
Electrical	37	37	27	50	46	47	58	50	43	49	47
Engines	131	81	88	65	84	95	106	81	92	99	79
Instrument	64	91	92	98	85	114	116	108	97	88	97
Radio	130	113	223	243	219	164	294	173	212	214	193
Total	700	632	728	734	747	791	899	923	802	781	679

Source: CASA

Table 16A: Fixed wing flight crew licences: new issues – 1994 to 2004

	1994	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
ATPL	496	532	600	468	346	470	677	562	406	356	370
CPL	871	858	913	815	927	847	810	877	838	812	724
PPL	1699	1600	1525	1691	1730	1588	1301	1478	1408	1351	1210

Source: CASA

Table 17A: Rotary wing flight crew licences: new issues – 1994 to 2004

	1994	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***2002***	***2003***	***2004***
ATPL	49	59	36	48	26	26	23	38	41	44	51
CPL	144	132	170	171	197	197	176	189	225	228	215
PPL	50	57	67	100	123	128	114	156	133	107	81

Source: CASA

Table 18A: Classes of airspace – services and requirements

Class	*Type of flight*	*Separation provided*	*Service provided*	*Speed limitation*	*Radio communication requirements*	*Subject to an ATC clearance*
A	IFR VFR not permitted	All aircraft	ATC service	N/A	Continuous two-way	Yes
	VFR not permitted					
C	IFR	IFR from IFR IFR from VFR IFR from Special VFR	Air traffic control service	N/A	Continuous two-way	Yes
	VFR	VFR from IFR	1. ATC service for separation from IFR 2. VFR / VFR traffic information (and traffic avoidance advice on request).	250 KT IAS below 10,000 FT AMSL. (NA to MIL ACFT)	Continuous two-way	Yes
	Special VFR	Special VFR from Special VFR	ATC service when visibility is less than VMC	250 KT IAS below 10,000 FT AMSL. (NA to MIL ACFT)	Continuous two-way	Yes
D	IFR	IFR from IFR IFR from Special VFR	ATC, traffic information about VFR Flights	250 KT IAS below 10,000 FT AMSL. *	Continuous two-way	Yes
	VFR	NIL	ATC service, traffic information on all other flights.	250 KT IAS below 10,000 FT AMSL. *	Continuous two-way	Yes
	Special VFR	Special VFR from Special VFR when visibility is less than VMC	ATC service	250 KT IAS below 10,000 FT AMSL *	Continuous two-way	Yes
	All flights	Taking off and/or landing at controlled aerodromes	ATC service	250 KT IAS below 10,000 FT AMSL *	Continuous two-way	Yes

Source: Airservices Australia, AIP book – part 2 – En Route (effective 17 March 2005)

* *Not applicable to military aircraft*

Table 19A: Classes of airspace – services and requirements

Class	*Type of flight*	*Separation provided*	*Service provided*	*Speed limitation*	*Radio communication requirements*	*Subject to an ATC clearance*
E	IFR	IFR from IFR	ATC service and traffic information on VFR flights as far as is practicable	250 KT IAS below 10,000 FT AMSL. *	Continuous two-way	Yes
	VFR	Nil	Radar information service (RIS) on request	250 KT IAS below 10,000 FT AMSL. *	Continuous two-way	No
G	IFR	Nil	Flight information service	250 KT IAS below 10,000 FT AMSL. *	Continuous two-way	No
	VFR	Nil	Flight information service	250 KT IAS below 10,000 FT AMSL. *	VHF ratio required for OPS above 5,000FT AMSL and MBZ OPS. If carried, radio must be used for CTAF area OPS	No
				250 KT IAS below 10,000 FT AMSL. *	VHF radio required for OPS in reduced VMC	No
GAAP CTR	IFR	In IMC: IFR from IFR IFR from VFR	ATC service	250 KT IAS	Continuous two-way	Yes
	VFR	Nil	ATC service	250 KT IAS	Continuous two-way	Yes

Source: Airservices Australia, AIP book – part 2 – En Route (effective 17 March 2005)

* *Not applicable to military aircraft*

10 GLOSSARY OF TERMS

Accident

An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight until such time as all persons have disembarked, in which:

a) person is fatally or seriously injured as a result of:

- being in the aircraft,
- direct contact with any part of the aircraft including parts which have become detached from the aircraft, or
- direct exposure to a jet blast.

except when the injuries are from natural causes, self inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft incurs substantial damage or is destroyed; or

c) the aircraft is missing or is completely inaccessible.

NOTE: An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Agricultural operations

Operations involving the carriage and/or spreading of chemicals, seed, fertiliser or other substances for agricultural purposes, including operation for the purpose of pest and disease control.

Aircraft movement

A takeoff (aircraft departure) or a landing (arrival) is recorded as one aircraft movement. A ‘touch and go’ operation is counted as two movements.

Charter operations

Carriage of cargo or passengers on non-scheduled operations, or scheduled operations that are not available to the public generally, by the aircraft operator, or the operator’s employees, in trade or commerce, but excluding regular public transport operations.

Departure

A takeoff, recorded by Airservices Australia, by an aircraft from an airport or aerodrome.

Flying training

For the purposes of this report, flying under instruction for the issue or renewal of a licence or rating, aircraft type endorsement or conversion training. Flying training includes solo navigation exercises conducted as part of a course of approved flying training.

General aviation (GA)

For the purposes of this document, general aviation has been defined as all non-scheduled flying activity and scheduled flying that is not available to the public generally in aircraft, with Australian registered aircraft allocated a VH-registration by CASA, excluding VH-registered sailplanes (powered and non-powered). Ultralight aircraft, hang gliders, balloons and autogyros are also excluded.

High capacity regular public transport (HCRPT)

A high capacity RPT aircraft is defined as an aircraft that is certified as having a maximum seating capacity exceeding 38 seats or a maximum payload exceeding 4,200kg.

Hours flown

Hours flown are calculated on a ‘chock to chock’ (wheel start to wheel stop) basis, and therefore includes taxiing time.

Incident

An occurrence, other than an accident, associated with the operation of an aircraft that affects or could affect the safet operation of the aircraft.

International airline

Operators of scheduled international RPT, excluding charter traffic.

Low capacity regular public transport (LCRPT)

A low capacity RPT aircraft is defined as being certified as having a maximum seating capacity less than or equal to 38 seats and a maximum payload less than or equal to 4,200kg.

Other aerial work

Includes all aerial survey and photography, spotting, aerial stock mustering, search and rescue, ambulance, towing (including, target and banner towing) and other aerial work, including advertising, cloud seeding, fire fighting and coastal surveillance.

Passenger movement

A passenger arrival or departure.

Private/business flying

Encompasses flying by the aircraft owner, the operator's employees or the hirer of the aircraft for business or professional reasons, but not directly in trade or commerce and; flying for private pleasure, sport or recreation, or personal transport not associated with a business or profession.

Regional airline

Operators of scheduled regional RPT services, excluding charter services. This includes those airlines performing RPT services and whose fleets contain exclusively low capacity aircraft.

Regular public transport (RPT)

All air service operations in which aircraft are available for the transport of members of the public generally, or for use by members of the public generally for the transport of cargo (freight and/or mail), for trade or commerce and which are conducted in accordance with fixed schedules to and from fixed terminals over specific routes with or without intermediate stopping places between terminals. Charter or other non-scheduled operations are excluded.

Transport category

In general terms, aircraft in the Transport category are having a maximum seating capacity exceeding 38 seats or a maximum payload exceeding 4,200kg and aircraft that are certified for use in RPT operation.

VH-registered aircraft

Any aircraft certified by CASA to appear on the civil aviation register.

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