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FOREWORD

The BTRE last reported on the general aviation sector in 1996[1], since when it has experienced significant changes.

This report sets out to profile the general aviation industry, describe trends in industry activity, and as far as possible explain these trends. The report is primarily based on survey data from the BTRE's annual General Aviation Survey and CASA, as well as industry consultation.

This project was undertaken by Russell Thomson with assistance from Mark Cregan and John Streeter under the supervision of Tim Risbey.

BTRE would like to extend its gratitude to CASA for their assistance, advice and the provision of data, in particular Stephen Ginpil and Eugene Holzaphel. In addition, the BTRE would especially like to thank all the air operators, airport managers, maintenance organisations and officials from various aviation associations that kindly provided their time to share their views on their industry, in some cases providing essential data.

Phil Potterton
Executive Director
Bureau of Transport and Regional Economics
April 2005

1 Bureau of Transport and Communication Economics 1996, *General Aviation Flying in Australia*, Report 95, AGPS, Canberra.

AT A GLANCE

- Hire and reward—commercial—general aviation (training, charter and aerial work) comprises about two thirds of general aviation flying hours. In 2004 it comprised over 700 active operators, employed about 4700 people, and had a turnover of $1.05 billion. In addition, there were about 300 primarily general aviation maintenance operators which employed approximately 2000 people.
- Non-hire and reward general aviation—business, private and sports aircraft flying—comprises about one third of flying hours.
  - Overall, general aviation activity trends have been flat. Commercial hours increased by 3 per cent while non-hire and reward hours decreased by 2 per cent between 1993 and 2003
  - In the commercial sectors, training—excluding sports—and charter have seen relatively level trends in hours over this period.
  - In the non-commercial sector, sports aircraft hours increased 52 per cent, while business and private flying decreased 20 per cent, the former stabilising after 2000.
- The use of helicopters for all purposes has increased and there has been significant growth in the number of amateur built aircraft.

Driving these trends:

- The cost of aircraft and parts has increased significantly, largely due to liability issues in the United States, without significant offsetting technological improvement. The cost of maintaining type certified aircraft is also higher due to the need for more maintenance as the fleet ages and the need to used certified parts. Landing and parking costs have also increased substantially.
- Sports aviation growth is being driven by the low costs of buying, maintaining and operating these aircraft compared to type certified aircraft, and by product innovation. However, there has been no published detailed analysis of safety outcomes for sports aviation.
- Although difficult to quantify, competition from regular passenger transport services and improved road transport have had the effect of reducing general aviation flying hours.

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EXECUTIVE SUMMARY

This report sets out to profile significant sectors of the general aviation industry, identify the major changes in the operating environment affecting general aviation, identify and explain—where possible—trends in sector activity.

This study defines general aviation as the activity of aircraft that perform non scheduled flying. This includes some aircraft that fly on regular public transport services—so long as they also undertake some non-scheduled flying activity—but excludes regular public transport hours flown from the activity analysis. This study considers both 'traditional' CASA VH[2] registered, type certified aircraft; and sport aircraft including ultralights, gliders and hang gliders.

The general aviation industry is a complex amalgam of groups and individuals that share a common interest in the operation of small aircraft. Perhaps the most important demarcation is between commercial—hire and reward flying—and non hire and reward flying. While there is significant interrelation between these two groups, different regulatory requirements govern each group and different factors influence demand for each type of flying.

Overall, general aviation trends have been flat.

Hire and reward—or commercial—general aviation comprised 65 per cent of general aviation flying hours in 2003—with total hire and reward hours increasing by 3 per cent between 1993 and 2003. The commercial general aviation industry had a turnover of $1.05 billion in 2004.

Commercial general aviation contributes a wide range of inputs to the economy including charter, pilot training and a wide array of aerial work activities. Hire and reward flying is a competitive market with many small firms, and is facing rising costs and increasing competition from road travel and low cost airlines. Stakeholders suggested that operating margins are low and that some operators either choose to operate at or even below cost, or lack sufficient business training to manage the complex costs and risks associated with aviation.

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2 Under the *Civil Aviation Act 1988* and Part 47 of the Civil Aviation Safety Regulations, Australian aircraft on the CASA register are given a nationality identification number starting with the code "VH". In this report they are referred to as a group as VH registered aircraft.

Non hire and reward flying includes recreational and business flying—flying associated with a business or profession, but not directly for hire or reward. Non-hire and reward flying comprised 35 per cent of all hours in 2003—with total non-hire and reward flying hours decreasing by 2 per cent between 1993 and 2003. There were two distinct sub-trends—sports aircraft hours increased 52 per cent, while business and private flying decreased 20 per cent.

A recreational aviator in 2005 has the choice of a large number of different aircraft types to meet their needs, depending on their priorities and their budget. Further, aviation as a recreational pursuit competes with a growing array of alternative leisure pursuits.

Business flying includes a mix of flying by individual business people who fly themselves and companies operating corporate aircraft. Both groups can now choose from travel options—road transport and regular public transport—that may be more convenient or cheaper than traditional general aviation flying.

THE GENERAL AVIATION OPERATING ENVIRONMENT

Key influences on general aviation have been: increased costs, significant improvement in transport substitutes—such as regular passenger air transport and road transport—and the advent and growth in the number of sport aircraft such as ultralights.

Even 15 years ago, general aviation enjoyed a range of cost advantages. Aircraft, maintenance and fuel were significantly less expensive in real terms. Airports were government owned and generally operated on a non-commercial basis—reducing the cost to general aviation businesses and small users.

Over the last two decades there have been a number of significant contributors to these increased costs:

- Liability issues affecting US aircraft manufacturers contributed to very large increases in the price of type certified aircraft and certified spare parts
- Increased user charges resulting from microeconomic reform—manifest as privatisation of airports[3] as well as the removal of network pricing and moves to user pays policies. These changes led to price increases in tower fees, landing, parking and other infrastructure charges as well as commercial rents at many aerodromes[4].

3 A condition of the sale of former Federal Airports Corporation airports was that the airport lessees offer access to aircraft operators on reasonable commercial terms. Under the FAC, access and pricing for general aviation users were on a non-commercial basis.

4 The price impacts have been the most consistent at former Federal Airport Corporation aerodromes which in 2003 accounted for around 50 per cent of all VH registered fixed wing movements and around 20 per cent of all rotary wing movements.

The emergence and growth of sport aircraft types has been a key influence on the general aviation industry over recent years. As one stakeholder consulted put it, in the 1970s if somebody wanted to fly, there was only one option—today the recreational aviator has the choice of a large number of different aircraft types depending on their priorities and their budget. It is important to note that, in general, non-type certified sport aviation aircraft have been less affected by these increased costs related to liability issues and user charges.

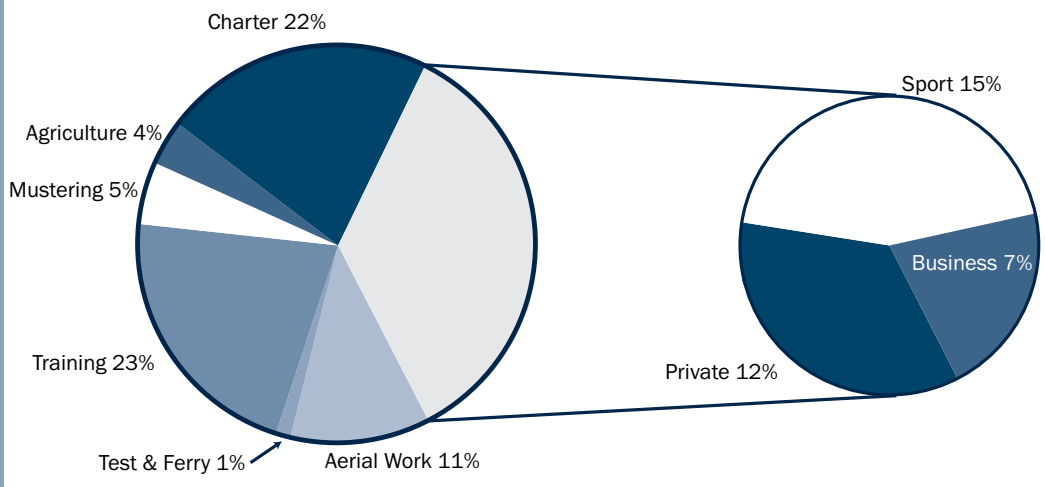
At the same time that costs have been increasing, regular passenger air transport fares have been coming down and the competitiveness of road transport has improved. Although difficult to quantify, competition in the domestic market from regular passenger transport services and improved road transport have had the effect of reducing general aviation flying hours, particularly in south eastern Australia.

Other factors that are likely to have influenced the trends in general aviation and their geographic distribution include demographic shifts, the performance of rural industries including farming, mining and resource industries, movements in the exchange rate, as well as international demand for commercial pilot training. Avgas contamination in December 1999 and January 2000 also affected general aviation activity.

NON HIRE AND REWARD FLYING

Non-hire and reward flying includes private, sports and business[5] flying. Including all flying in sport aircraft, non-hire and reward activities constituted around 680 000[6]—35 per cent—of all flying hours in 2003 (Figure E-1).

FIGURE E-1 TOTAL GENERAL AVIATION ACTIVITY IN HOURS 2003



Note *Sports hours includes hours flown by ultralights, hang gliders, gliders and autogyros. Figures for sport aircraft may include a higher degree of error than other activities.*

Source *BTRE General Aviation Survey 2003, Recreational Aviation Australia, Hang Gliders Federation of Australia, Australian Sports Rotorcraft Association Inc*

5 Flying associated with a business or profession, but not directly for hire or reward.

6 Data limitations mean aggregate figures should be considered as estimates only. Figures for sport aircraft are estimates with varying degrees of accuracy.

While non-hire and reward flying hours decreased by approximately 2 per cent between 1993 and 2003, there were two distinct sub-trends—sports aircraft hours increased 52 per cent, while business and private flying decreased 20 per cent.

In 2003 there were approximately 5700 type certified aircraft and 530 amateur built aircraft that performed private or business flying. The Australian fleet of sport aircraft—registered ultralights[7], trikes, gliders and motor-gliders—is approximately 3200, as well as at least another 3000 hang gliders.

Recreational flying

Recreational flying—including private and sports hours—constitutes about one quarter of all general aviation activity. Some key trends in recreational flying over the period 1993 to 2003 include:

- An overall increase in recreational flying of approximately 56 000 hours—about 13 per cent—excluding gliders.
- A decline of 46 000 hrs—about 19 per cent—in the number of private hours flown by VH registered, type certified fixed wing aircraft.
- A total increase of 13 000 hours flown by home built aircraft—a 116 per cent increase.
- An increase of 8600 hours flown by type certified rotary wing aircraft—a 131 per cent increase.
- An increase of approximately 38 500 hours by hang gliders—a 45 per cent increase.
- An estimated net increase of around 82 000 hrs—52 per cent—in the number of hours flown by sport aircraft excluding gliders.

The main influences on recreational flying are likely to be increased costs and the price competitiveness of substitutes such as regular passenger transport and ultralights. Private flying is likely to be sensitive to price because it is a leisure activity and involves essentially discretionary spending. Advances in ultra-light flying, a lower cost alternative, appear to be accentuating the decline in activity by VH registered, type certified fixed wing aircraft. The cost increases resulting from airport privatisation may also be leading to the relocation of some aircraft from capital city secondary airports to more distant regional airports.

Business flying

Flying for business purposes is defined as flying associated with a business or profession but not directly for hire and reward. In the

7 Figures for ultralights are from October 2004

case of business flying, activity analysis has indicated a decline of 74 000 hours—38 per cent—in the number of business hours flown in VH registered type certified fixed wing aircraft over the period 1993 to 2003. This does not include any business hours that may have been flown in sports aircraft.

Business flying is likely to be influenced by many of the same issues as private flying. Discussions with general aviation operators indicate that—certainly in the last 3 years—a major driver has been the low cost and ease of travel on domestic regular public transport compared with the relative high cost of operating a fixed wing light aircraft. However, the growth in business helicopter activity is occurring against rising costs and it seems that demand factors are dominant in explaining this trend.

HIRE AND REWARD

Total hire and reward—commercial—flying hours increased by approximately 3 per cent between 1993 and 2003.

Hire and reward flying includes training, charter and aerial work such as aerial photography and surveying. Only holders of CASA issued air operators' certificate can perform hire and reward flying.

In 2004, there were approximately 715 active aircraft operators—employing some 4700 people—with a total annual turnover in excess of one billion dollars. A further approximately 300 businesses—employing around 2000 people—primarily providing maintenance to the general aviation industry.

Commercial—hire and reward—general aviation activities accounted for approximately 1.26 million hours of flying in 2003, or 65 per cent of all flying hours. This excludes hours flown by sport aircraft and regular public transport hours flown by aircraft in the general aviation fleet.

Charter and training account for around 22 per cent each of total hours flown by general aviation aircraft; aerial work constitutes a further 11 per cent and the remainder is divided between aerial agriculture (4 per cent) and aerial mustering (5 per cent). Test and ferry accounted for 1 per cent.

Charter

Charter includes the carriage of cargo or passengers on non-scheduled operations by the aircraft operator, or the operator's employees, in trade or commerce, but excludes regular public transport operations. Charter can only be performed in type certified commercially produced aircraft.

Key markets for charter include business and the corporate sectors—such as fly-in fly-out mining operations and bank runs—and the leisure tourist market including joy flights and tours.

The key features of the charter market include:

- Flight charter is a competitive market, with over 280 firms operating.
- The decade to 2003 saw a level overall trend in total charter hours flown.
- Charter in rotary wing aircraft has been growing over the decade.
- The decade to 2003 saw an apparent shift toward larger aircraft.
  - This shift has lead to a 24 per cent increase in aggregate annual potential payload over the decade to 2003.
  - The growth in payload appears to have peaked in 1999 after which it has followed a downward trend.

Increasing real costs of charter, combined with reducing regular public transport fares—resulting from domestic airline deregulation—are likely to be key factors in explaining this trend.

Training

Flight training schools in Australia cater for recreational pilots and aspiring professional pilots. Universities offering professional pilots courses and overseas students comprise two important sectors of the training market. Training for CASA issued licences must be performed in type certified production aircraft. However training to fly a glider, ultralight, hang glider or powered hang glider can be performed in these aircraft respectively.

Flight training is a competitive market, with at least 149 Air Operators' Certificate holders flying predominantly for the purpose of flight training. Some trends in CASA certified flight training are outlined in the following.

- A relatively level trend in total training hours flown.
- Training in rotary wing aircraft has been growing over the decade.

Key influences on the training market are likely to be:

- Cheaper alternatives such as ultralights are likely to be taking up a share of the recreational market – this will flow on to the training market through reduced demand for flight training for recreational pilots.
- Overseas students and professional pilot courses run by tertiary institutions provide a stable base level of demand for some operators—with some reporting significant growth, particularly in Western Australia.

- Australia competes internationally for commercial pilot training and this market is sensitive to exchange rate fluctuations.

Aerial work

Aerial work includes a great range of aerial activities—technically including both aerial agriculture and mustering—however these are discussed separately. Activities encompassed by aerial work as defined in this report include: aerial survey and photography, spotting, search and rescue, ambulance, towing (including glider, target and banner towing) and other aerial work including advertising, cloud seeding, fire fighting, and coastal surveillance.

Aerial work performed on a hire and reward basis must be performed in type certified aircraft by an Air Operators' Certificate holder. Aerial work, including aerial agriculture, is a competitive market with about 285 small firms—74 per cent of these firms operating three or fewer aircraft.

Key features of the CASA certified aerial work are outlined in the following.

- Aerial work hours flown have remained relatively static over the decade to 2003. Within this there has been significant substitution between work types.
- Aerial work hours in rotary wing aircraft has been growing.

Aerial agriculture and mustering

Aerial agriculture is mostly conducted in dedicated aircraft. Mustering is primarily conducted in rotary wing aircraft. In 2003–2004, 245 aerial agricultural establishments employed just under 1000 people. The aerial agriculture industry had a gross turnover of $277 million in 2003–2004.

Key features of the agriculture and mustering are outlined in the following.

- Aerial agriculture hours increased over the first half of the decade to 2003 followed by decline in the second half.
- Aerial mustering has maintained a relatively steady trend over the decade to 2003.
- There is increasing use of turbine powered aircraft in aerial agriculture.

Aerial agriculture activity is susceptible to primary product price trends and climatic conditions such as drought.

PART I—INTRODUCTION

AIM

This report aims to achieve three things:

- To profile the general aviation industry; to identify and describe the main industry sectors, employment and the aircraft fleet.
- Identify changes in the operating environment that are affecting general aviation. These include changes to inputs to general aviation such as aircraft, maintenance, fuel, infrastructure, insurance and regulation.
- Outline and where possible explain recent trends in Australian general aviation activity. In order to explain these trends an attempt is made to comment on how the environmental changes have affected the different sectors within the general aviation industry.

APPROACH

To determine the issues affecting general aviation two approaches were taken. One was to examine input costs, where possible using primary data sources like airport charge sheets. The second was simply to ask operators—consultations were conducted with 37 air operators, airport managers and maintenance organisations, and several industry associations. For an overview of the consultation process see Appendix A.

Industry structure has been analysed from secondary research as well as drawing on survey data collected by CASA on general aviation air operators.

Trends in flying activity are presented. This trend analysis was based data collected and estimated in the BTRE's General Aviation Survey[8]—an annual survey covering non regular public transport operators of aircraft on the CASA aircraft register—and data provided by sports aircraft associations. An attempt is made to explain these trends by considering how the issues identified have affected the different market sectors. However, it should be noted that flying hours are not the only indicator of industry performance. Importantly, an hour of activity in

8 For more detail on the BTRE's General Aviation Survey and results, see www.btre.gov.au

any given aircraft is not necessarily a substitute for an hour in another. For example, larger, faster aircraft may be able to perform the same transport task in less time. Similarly, no amount of flying in fixed wing can substitute for an hour in a rotary wing aircraft if the task characteristics require a rotary wing aircraft.

DEFINITION OF GENERAL AVIATION

The general aviation industry is a complex amalgam of groups and individuals that share a common interest in the operation of small aircraft. There is no easily demarcated general aviation industry. Instead general aviation is commonly defined along two primary lines, namely:

- Aircraft
  - General aviation typically refers to small—usually piston engine—aircraft of perhaps 5.7 tonne or less
- Activity
  - Typically general aviation activity is defined as all non-scheduled flying activity such as charter and training, thereby excluding all regular public transport operations.[9]

These two dimensions are not necessarily consistent. Aircraft engaged in typically general aviation activity may also fly some regular public transport operations and conversely, some large turbine aircraft may perform some typically general aviation activity such as training or charter. This study has used a definition based on activity—excluding aircraft that fly purely[10] for regular public transport purposes from the general aviation fleet, but including aircraft that performed some scheduled flying activity and large turbine aircraft used for general aviation activities such as charter.

This study does not consider regular public transport hours flown. Regular public transport hours flown by aircraft which performed general aviation activities decreased from over 152 000 hours in 1993 to 83 500 hours in 2003.

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9 Regular public transport comprises all air service operations in which aircraft are available for the transport of members of the public, or for use by members of the public for the transport of cargo (freight and/or mail) which are conducted in accordance with fixed schedules to and from fixed terminals over specific routes.

10 The majority of the aircraft that fly purely for regular public transport purposes are large aircraft – in 2003 there were only six aircraft engaged only in regular public transport services that were below 5.7 tonnes maximum takeoff weight.

This study also considers both CASA VH[10] registered aircraft as well as sport aircraft—as many of the functions of VH registered, type certified fixed wing aircraft can be performed by aircraft such as ultralights.

GENERAL AVIATION SECTORS

The general aviation industry is a complex amalgam of groups and individuals that share a common interest in the operation of small aircraft. Perhaps the most important demarcation this report observes is between commercial—hire and reward flying—and non hire and reward flying. To operationalise this definition where possible this report considers:

- Hire and reward refers to all activities undertaken by commercial air operators—or more specifically, holders of air operators' certificates
- Non hire and reward refers to other flying activity—this includes recreational flying—flying for private purposes in sport aircraft and VH registered aircraft—as well as business flying.

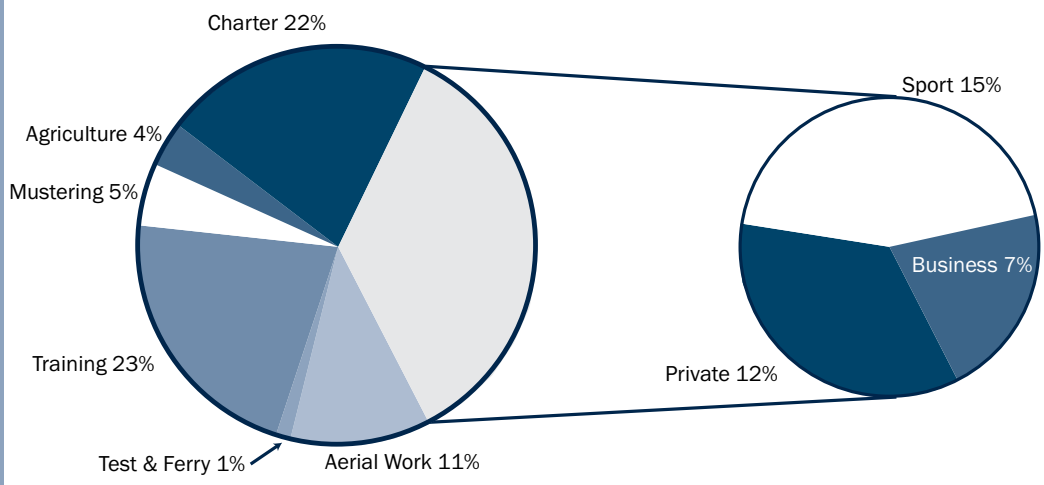
These two groups must fulfil substantially different regulatory requirements. Further, demand for each type of flying is influenced by largely different factors.

Flying for business purposes does not neatly fit the commercial–recreational split. Business flying is—by definition—a business input. However, if it is not conducted on a hire and reward basis then it is not possible to quantify its cost and it is difficult to conduct any meaningful analysis of the trends. Business flying can include a range of activities and it is a substitute for some hire and reward flying activities and private flying. For example, a flight from Dubbo to Sydney will be reported as private flying if it is undertaken solely for pleasure, or possibly business flying if it includes a business meeting. However, the same flight will be reported as charter if the plane and pilot are hired—irrespective of the purpose of the journey.

It should also be noted that there is substantial interrelation between these two groups. For example, recreational aviators generate demand in the commercial training sector. Further, owners of VH registered, type certified fixed wing aircraft that fly for non-hire and reward purposes often cross-hire their aircraft to commercial aircraft operators.

11 Under the *Civil Aviation Act 1988* and Part 47 of the Civil Aviation Safety Regulations, Australian aircraft on the CASA aircraft register are given a nationality identification number starting with the code "VH". In this report they are referred to as a group as VH registered aircraft.

FIGURE I-1 TOTAL GENERAL AVIATION ACTIVITY IN HOURS 2003



Note *Sports hours includes hours flown by ultralights, hang gliders, gliders and autogyros. Figures for sport aircraft may include a higher degree of error than other activities.*

Source *BTRE General Aviation Survey 2003, RAA, HGFA, ASRA*

As can be seen from figure I-1 (page 4), non-hire and reward activities constitute around 680 000 or 35 per cent of all flying hours.[12] About half of this 680 000 hours is conducted in type certified aircraft.

Hire and reward flying includes training, charter and aerial work such as aerial photography and surveying. Only holders of CASA issued air operators' certificate can perform hire and reward flying.

Commercial general aviation activities account for approximately 1.26 million hours of flying or 65 per cent of all flying hours—this excludes hours flown for training in sport aircraft as well as hours flown for the purpose of regular public transport.

Of this 1.26 million hours, charter and training account for around 34 per cent and 33 per cent respectively; aerial work constitutes a further 18 per cent and the remainder is divided between aerial agriculture (6 per cent) and aerial mustering (8 per cent). Test and ferry accounted for 2 per cent.

HIRE AND REWARD: COMMERCIAL AIR OPERATORS

To operate an aircraft on a hire and reward basis, businesses are required to hold a current air operators certificate issued by CASA. In 2004 there

12 This includes sport aircraft hours, private and business hours. Figures for sport aircraft are estimates with varying degree of accuracy.

were approximately[13] 715 active commercial aircraft operators that performed predominantly general aviation flying activities.[14]

While this report defines general aviation to include ultralights, gyroplanes, hang gliders and gliders, the discussion of commercial general aviation does not take into account these aircraft and associated businesses unless otherwise stated. This could make a significant difference to figures reported for training and business flying.

The industry is characterised by a large number of small operators. Approximately 64 per cent of all operators are running three or fewer aircraft.

Commercial aircraft operators turn over $1.05 billion in 2003–2004. This figure has remained quite stable over the past four years. Non-scheduled aviation aircraft operators employ over 4700 people.[15]

MAINTENANCE

Maintenance is a vital input to general aviation. Maintenance of type certified aircraft must be conducted by CASA certified Licensed Aircraft Maintenance Engineers (LAMES) and only approved (certified) parts can be used. Ultralights, gyroplanes, hang gliders and gliders engaged in commercial flight training can be maintained by holders of certificates issued by the respective administrative body.

Organisations engaged in maintenance of type certified aircraft must hold a current Certificate of Approval from CASA. There are approximately 380 maintenance organisations with current certificates of approval that primarily perform maintenance on general aviation aircraft—more than 20 per cent of these organisations also hold a current air operators certificate.

An estimated 2000 people are employed in maintaining small fixed wing aircraft, balloons and rotary wing aircraft—excluding those solely engaged in the maintenance of components only. A large number of these general aviation maintenance organisations are small businesses employing up to five staff.

13 The precise number is difficult to estimate due to the large number of business start-ups and closures.

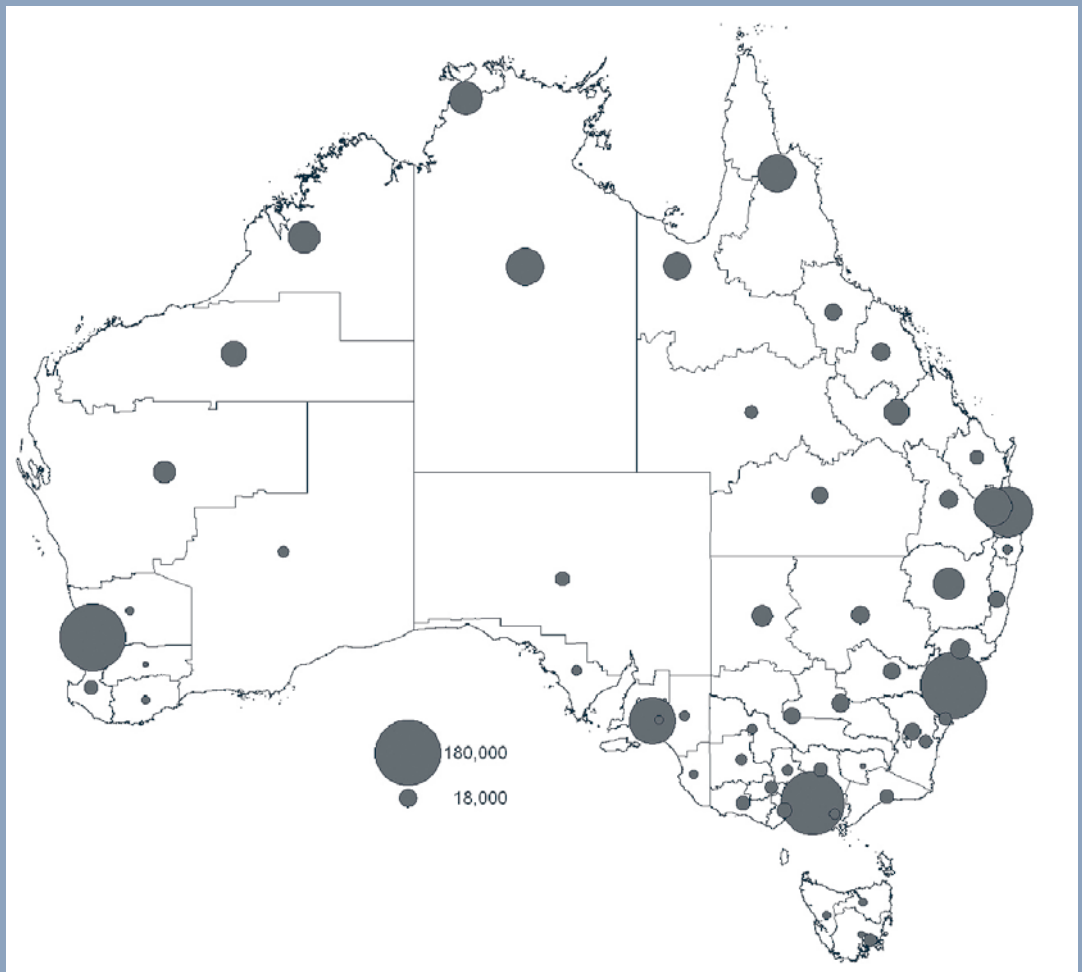
14 CASA STI Database.

15 IBISWorld Business Information (www.ibisworld.com.au).

WHERE IS GENERAL AVIATION OCCURING?

Figure I-2 depicts the distribution of all general aviation flying hours across Australia and highlights the importance of flying by aircraft based in Melbourne, Sydney, Perth and greater Brisbane[16]. These areas account for 37 per cent of all flying activity.

FIGURE I-2 TOTAL HOURS PERFORMED IN VH REGISTERED AIRCRAFT BY STATISTICAL DIVISION 2003



a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*
b. *Does not include aircraft registered with Recreational Aviation Australia, HGFA, GFA – ultralights, microlights (trikes), hang gliders, gliders and motorgliders.*
c. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*
d. *Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.*

Source BTRE General Aviation Survey 2003

16 Greater Brisbane includes the statistical district of Moreton which incorporates both the Sunshine Coast and the Gold Coast.

CHAPTER 1

GENERAL AVIATION AIRCRAFT TYPES

This section outlines the main types of aircraft engaged in non scheduled aviation, the weight and operational restrictions that apply to each category and the regulations affecting their maintenance—which in turn influence their operating costs.

Some key types of aircraft engaged in non-scheduled aviation include:

- commercially produced type certified aircraft
- amateur built aircraft
- gliders
- ultralights
- hang gliders, paragliders and powered hang gliders; and
- gyroplanes.

The regulation and administration of the operation of these aircraft types is complex and constantly evolving. It is not the intention of this report to provide a detailed description of the regulation covering these aircraft types. However, an overview of these broad categories provides context for the subsequent discussion of recent trends in general aviation.[17]

Table 1-1 outlines some of the general features of each group. The degree to which these groups are substitutes depends largely on the flying activity being performed. In other words, the user's intended purpose will determine the extent to which one aircraft type could be used instead of another.

17 See also CASA 2000c.

TABLE 1.1 SUMMARY OF AIRCRAFT TYPES

	Commercially Produced	Amateur Built	Ultra Lights	Gliders / Motor-gliders	Hang Gliders / Powered Hang Gliders
Number of aircraft 2003	7881(a)	556(a)	~1800	~1100	~3400
Activities Restriction	No general restrictions.	Only private	Private / ultra light training	Private / glider training	Private / hang glider training
Weight Restrictions	Normal limited to 5700 kg. Commuter limited to 8640 kg. Transport no limit.	None	Maximum takeoff weight 544kg	None	Hang-glider empty 70kg
Airspace	None	Special requirements to fly over populated areas	Many cannot fly in controlled air-space (b)	Special provisions for flight in controlled airspace	Special provisions for flight in controlled airspace
Relative Operating Costs (c)	Very high	Low	Low	Medium	Very low
Relative Purchase Price	Very high	Depends on aircraft	Low	Low	Very low
Data Issues	Number and Hours flown quite robust	Number and hours flown quite robust	Number of airframes is robust. Hours estimated.	Hours unknown since 1999. Airframes known.	Hours flown robust, however, number of airframes estimated from membership.

a. Active aircraft only. Includes BTRE estimates.
b. As they do not have the required avionics.
c. Based on requirement for type certified parts and the need for CASA certified LAMES to conduct maintenance.

Source BTRE

COMMERCIALLY PRODUCED TYPE CERTIFIED AIRCRAFT

Commercially produced aircraft are in some ways the most important constituent of the Australian general aviation fleet. In 2003 there were approximately 7880 commercially produced aircraft (Table 1-1). Hire and reward activities can generally only be performed in type certified VH registered aircraft—with the exception of training which can occur in most aircraft types. Private and business flying, on the other hand, can be conducted in sport aircraft such as ultralights and amateur built aircraft.

The most common fixed wing aircraft manufacturers on the CASA register are Cessna, Piper, Beechcraft and De Havilland. The most common manufacturer of rotary wing aircraft is Robinson.

AMATEUR BUILT AIRCRAFT

One of the significant areas of growth in the VH registered general aviation fleet is in the number of amateur built and experimental aircraft. The number of amateur built aircraft—including inactive aircraft—has increased by 114 per cent between 1993 and 2003, albeit from a low base.

Amateur built aircraft have no weight or capacity limit—however, they are subject to operational restrictions. They cannot be used for any hire and reward activity or to carry fare paying passengers. However, the builder of the plane can use that aircraft for training purposes. Amateur built aircraft are restricted to operating according to day visual flight rules and may not be flown over populous areas, but approvals to waive both provisions can be obtained. The original builder of amateur built aircraft can perform maintenance on their plane which reduces operating costs considerably (CASA 2000a).

Box 1.1 The Sport Aircraft Association of Australia

The Sport Aircraft Association of Australia (SAAA)—originally the Ultra Light Aircraft Association—was formed in 1956 as an association for people interested in building their own aircraft. The name change in the mid 1970s was intended to better reflect the broader range of aviation interests of its members and to differentiate the association from the then newly emerging ultralight movement.

Today the SAAA's objective is to promote and support amateur aircraft building. As part of this, the SAAA runs the Technical Counsellors program whose aim is to ensure the safety and dependability of amateur built aircraft. The program can also provide ongoing technical advice to home builders.

Source Sport Aircraft Association of Australia (<http://www.saaa.com/>).

History of amateur built aircraft

Prior to 1998, airworthiness certificates were issued to amateur built aircraft under the Amateur Built Aircraft Acceptance (ABAA) category. The ABAA system was very restrictive and highly regulated. The ABAA required that:

- the builder begin with approved plans;
- CASA to approve the facilities used to manufacture the aircraft and to conduct inspections at several stages during the construction as well as on completion;

- aircraft to have maximum takeoff weight of 1500kg or less and have no more than four seats.

ABAA is a pseudo type certification. All maintenance on ABAA aircraft must still be done by a Licensed Aircraft Maintenance Engineer (LAME).

Since 1998 amateur built aircraft can be issued a Certificate of Airworthiness under the category of Special Certificates of Airworthiness —Experimental (CASA 2000b). Under the experimental certificate the builder of the aircraft is entirely responsible for airworthiness. This was a major change as the original builder could now perform maintenance on their plane.

CASA is currently developing a third generation of regulation that will cater for many amateur builders—Light Sport Aircraft (LSA). This may have significant effects on the administration of both amateur built as well as ultralight aircraft.

BALLOONING

The Australian Ballooning Federation administers sport ballooning in Australia including training, licensing and maintenance. CASA is responsible for commercial ballooning in Australia. Over 80 per cent of ballooning hours recorded in 2003 were conducted for charter purposes.

In 2003 there were 338 balloons registered in Australia, of which 212 recorded some flying activity. This included six amateur built balloons.

GLIDERS

The Gliding Federation of Australia (GFA) administers gliders on CASA's behalf under a memorandum of understanding. Gliders and motor gliders are a valid substitute for some forms of recreational flying. Glider training hours can count toward the minimum hour requirement for a CASA issued private pilots licence. In 2003 there were 1084 registered gliders. This number has remained relatively static over the previous decade. GFA estimate the number of active aircraft at around 650. Gliders have VH registration; however, they are not included in the BTRE annual General Aviation Survey.

ULTRALIGHTS

There are currently around 1800 ultralights registered in Australia. Recreational Aviation Australia (RAA) maintains the register of ultralight aircraft. CASA has also delegated to RAA the responsibility for pilot and maintenance licensing. Aircraft registered with RAA must have a maximum takeoff weight no greater than 544kg.

Except for ultralight training, ultralights cannot be used for any hire and reward activities or to carry fare paying passengers. For personal flying, ultralights are becoming an increasingly viable substitute to fully type certified aircraft. Ultralight training hours can count toward the minimum hour requirement for a CASA issued private pilots licence. Ultralights must have appropriate avionics to fly in controlled airspace.

The recent history of ultralights can be characterised as increasing technical sophistication, safety and performance with a tradition of keeping costs to a minimum for the personal flying and training sectors. However, there has been no published detailed analysis of safety outcomes. The ultralight sector appears to have been an important proving ground for new type certified light sports aircraft.

History of ultralight aircraft

Sharing its genesis with hang gliding in the 1960s, ultralight flying in Australia has undergone enormous change and experienced rapid growth over the past 20 years. This trend is likely to continue. To illustrate the revolution in ultralight flying it is interesting to consider that:

- In 1984 ultralight pilots had to teach themselves how to fly, operate at a maximum height of just 300 feet above ground level and at least 300 metres from a public road. At that time the aircraft had a maximum empty weight of 115kg.
- Training only became permitted when two seater ultralights were legalised in 1985.
- It was only in 1990, following the recommendations of the 1987 House of Representatives Standing Committee on Transport—Sport Aviation Safety, that the maximum altitude of ultralight operations was increased to 5000 feet. At this time a minimum height of 500 feet above ground level was also introduced—a height that was previously the maximum.

GYROPLANES

Australian Sports Rotorcraft Association Inc (ASRA) currently administers gyroplanes (CAO 95.12.1). ASRA also certify technical advisors who are able to approve maintenance performed on rotorcraft that perform training activities.

Currently gyroplanes must fly below 300 feet above ground level. By law they can only be used for private flying and for training. Anecdotally it has been suggested that gyroplanes may be being used for mustering —where their manoeuvrability and low cost are an advantage and the relatively low height restraint is not a limitation.

Currently limited statistics are available on gyroplanes. In November 2004 there were 240 gyroplanes registered with the ASRA. However, the ASRA advised that there may be many more unregistered planes—possibly even double this figure.

HANG GLIDERS

The Hang Gliding Federation of Australia (HGFA) maintains the registration of hang gliders, paragliders, and powered hang gliders (microlights). It is likely that non-powered hang gliders are limited substitutes for traditional recreational flying and the flight training for the equivalent recreational purposes.

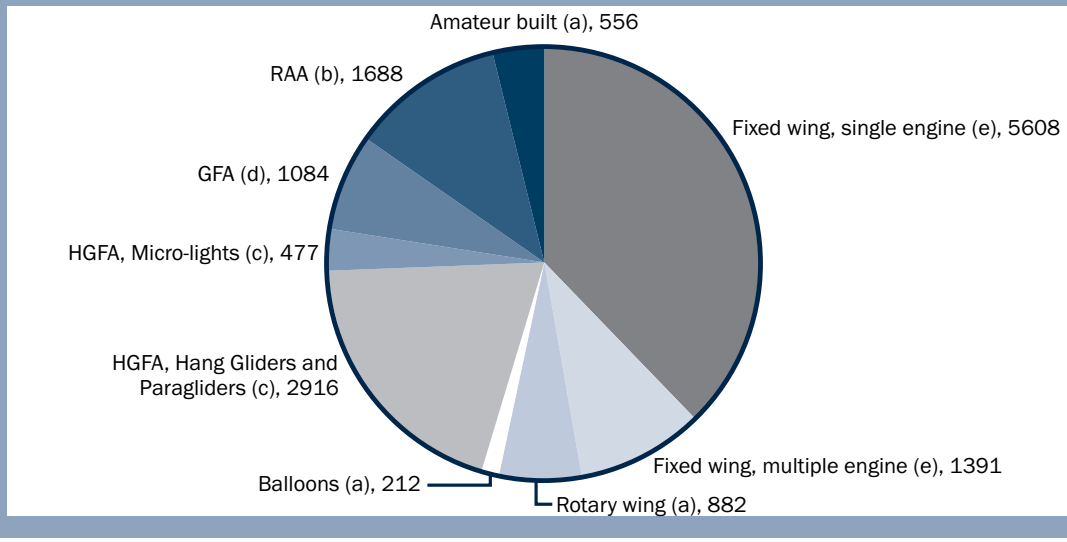
However, powered hang gliders—otherwise known as microlights or trikes—can in some cases be registered with RAA. In 2003 about 480 microlights were registered—up from 104 in 1993.

CHAPTER 2

THE AUSTRALIAN GENERAL AVIATION FLEET

Figure 2-1 illustrates the composition of the fleet in 2003. The majority of the amateur built planes are fixed wing single engine[18] aircraft.

FIGURE 2-1 THE GENERAL AVIATION FLEET IN 2003



a. *Figures for VH registered aircraft covered by the BTRE survey include only active aircraft.*
b. *It was not possible to differentiate between active and inactive ultralights. However, an annual renewal fee is payable on ultralights and this is likely to ensure that decommissioned aircraft are not included.*
c. *The number of hang gliders is subject to a large degree of error as it is estimated from the HGFA membership. As trikes (micro-lights) must be registered, their numbers (477) will be more accurate.*
d. *Figure includes aircraft that fly regular public transport services that also undertake non-scheduled flying activity.*

Source BTRE General Aviation Survey 2003; HGFA; GFA; RAA

Aircraft on the CASA register are registered in perpetuity and there is no annual registration or renewal fee associated with being on the register. For this reason, there are many aircraft on the register that do not perform any flying. Some of these have been retired, others are still under construction. In the 2003 BTRE General Aviation Survey, 1743

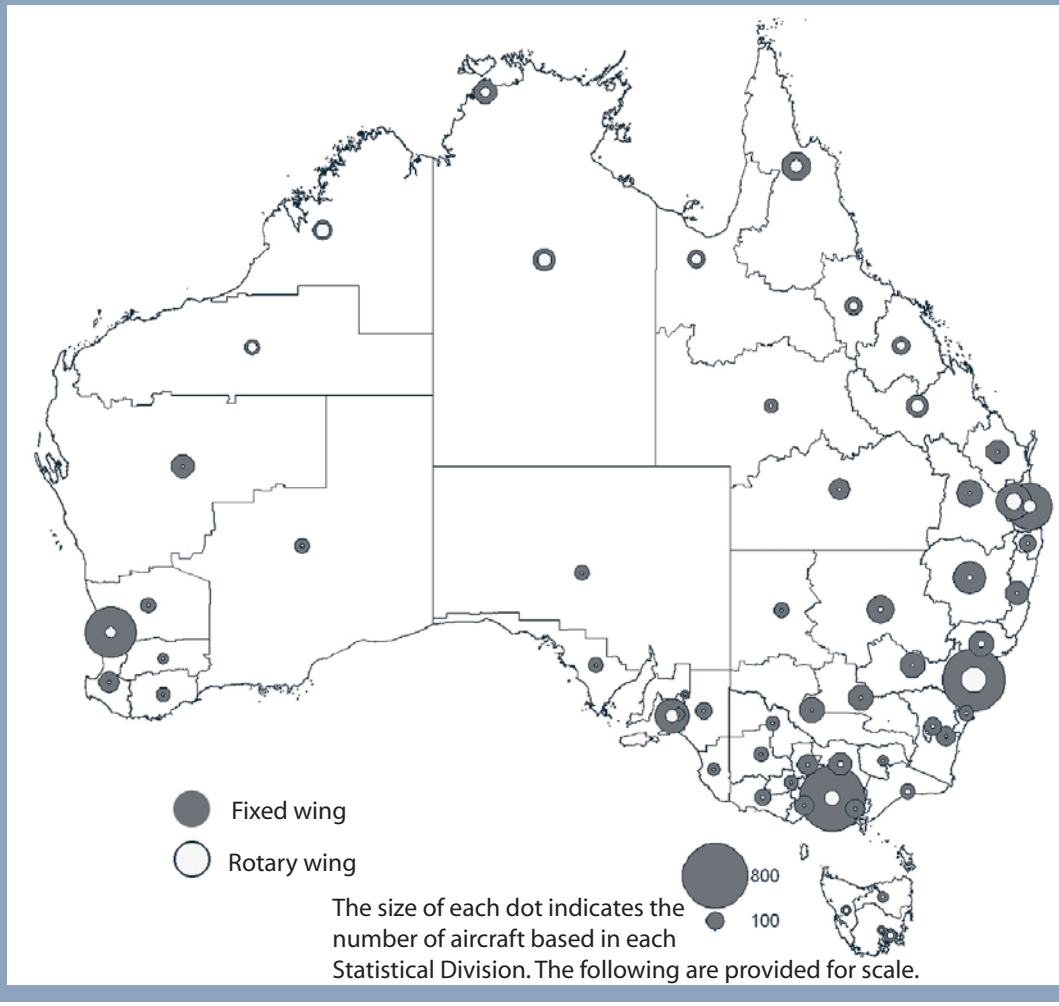
18 Includes 27 helicopters and three multi-engine fixed wing aircraft.

aircraft performed—or were estimated to perform—no flying at all. This represented 17 per cent of general aviation aircraft on the CASA register. For most purposes it is useful to consider trends in the active fleet as some of these inactive aircraft may not be completed—built or restored—for many years.

THE GEOGRAPHY OF THE GENERAL AVIATION FLEET

Figure 2-2 illustrates the location of active VH registered fixed and rotary wing aircraft in Australia including amateur built aircraft, but not gliders. While figure 2-2 illustrates the reported base of operation, it is important

FIGURE 2-2 THE LOCATION OF FIXED AND ROTARY WING AIRCRAFT IN AUSTRALIA—2003



a. The dark dots indicate the location of fixed wing VH registered aircraft—excluding gliders—and the light dots indicate the location of rotary wing aircraft.

b. Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft are located. This is because aircraft have been located using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of aircraft by locality.

c. Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.

Source BTRE General Aviation Survey 2003.

to note that the nature of air transport is such that many of the aircraft represented in a given Statistical Division will service other Statistical Divisions. However, the home base of an aircraft may well provide a useful indication of the distribution of activity as well as the distribution of support industries. The map illustrates the large number of aircraft that are based within state capitals—in particular, Melbourne, Sydney, Perth and Brisbane.

Figure 2-2 shows the concentration of aircraft in capital cities. Melbourne, Sydney, greater Brisbane—including Gold and Sunshine Coasts—accounted for 37 and 39 per cent of all fixed wing and rotary wing aircraft respectively in 2003.

Around 39 per cent of all aircraft are based in capital city statistical divisions. For ultralights this figure is only 31 per cent. If Newcastle, Wollongong, Gold Coast and the Sunshine Coast districts are included with the capitals, then the figure for all aircraft increases to 47 per cent.

Figure 2-3 (page 16) illustrates the base location of ultralights in Australia. It should be noted in observing this figure that these aircraft may be 'trailerable'—enabling them to be operated at sites distant from the registered owner's address.

It has not been possible to map the distribution of aircraft registered with the HGFA, the ASRA or the GFA.

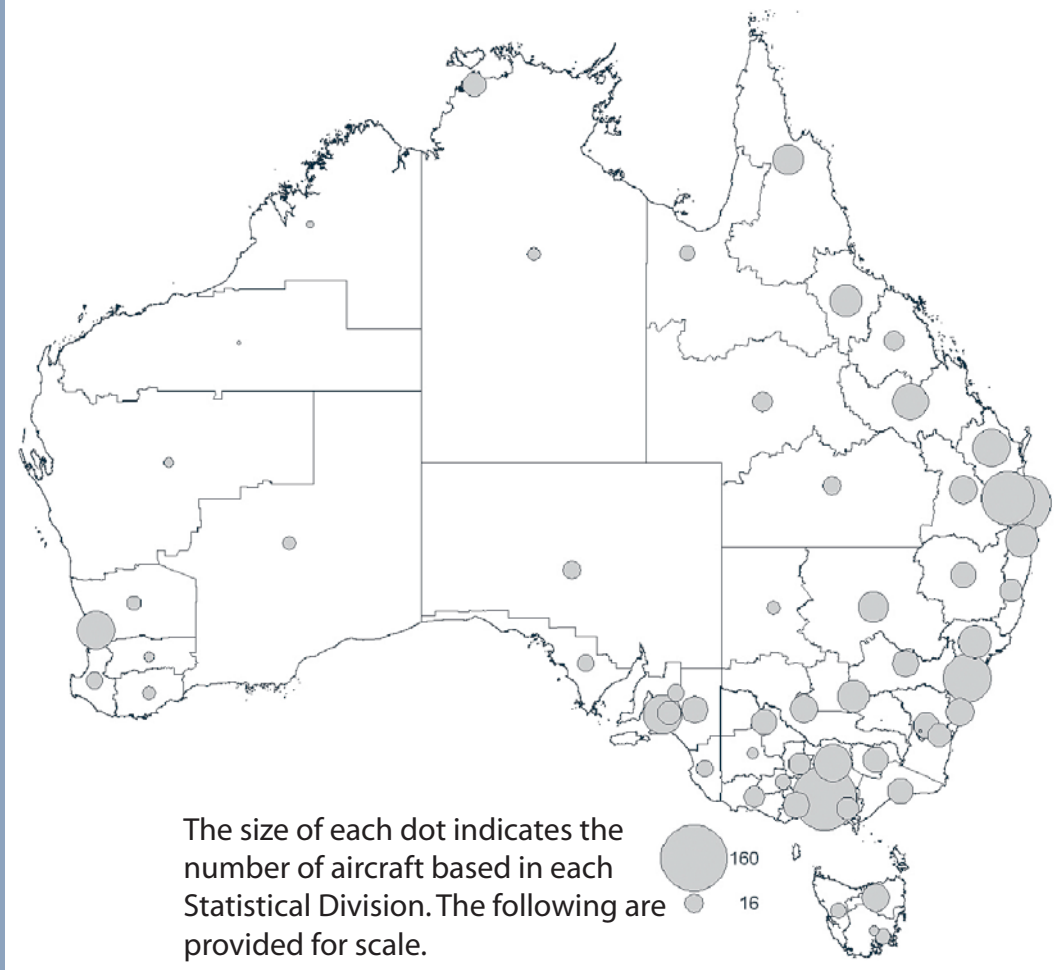
HOW THE GENERAL AVIATION FLEET IS CHANGING OVER TIME

The evolution of the general aviation fleet sheds some insight on the effects the changes identified in the operating environment—see Part II—are having on the sector. Figure 2-4 (page 17) illustrates the general aviation fleet in 1993 and 2003.

What is evident from Figure 2-4 is both the decline of traditional VH registered type certified fixed wing aircraft and the apparent growth of amateur built aircraft and sport types including ultralights. The number of gliders is an exception to this. Industry consultation suggests that the past decade could be characterised as decline in activity until about 2001 when the GFA undertook a concerted effort to recruit new members.

It should be noted that there are many second hand additions to the fleet each year and that second hand planes are both imported and exported. VH registered aircraft were exported at a rate of around 120 per year over the ten years to 2003. Indeed, the VH registered fleet displays a reasonable degree of turnover or churn. Nearly 3100 aircraft (30 per cent) on the CASA register in 2003 were not registered in 1993 and approximately another 600 aircraft have come and gone in the same period.

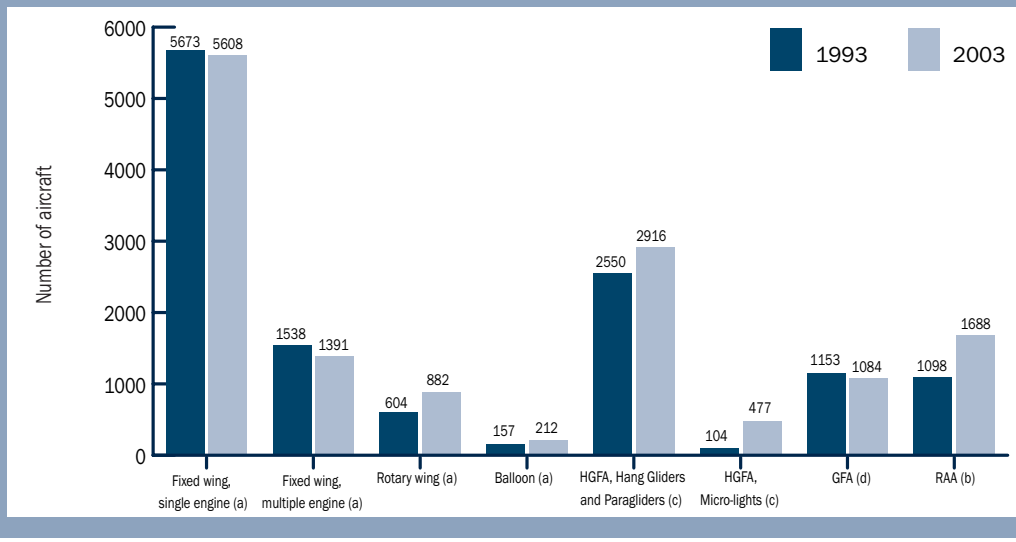
FIGURE 2-3 THE LOCATION OF ULTRALIGHT AIRCRAFT IN AUSTRALIA—2004



a. *There are 26 aircraft omitted from this chart as their locations could not be mapped.*
b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft were operated. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of aircraft by locality.*

Source *RAA.*

FIGURE 2-4 COMPARISON OF THE GENERAL AVIATION FLEET, 1993–2003



a. *Figures for VH registered aircraft covered by the BTRE survey include only active aircraft.*
b. *It was not possible to differentiate between active and inactive ultralights, however, annual renewal fee is payable on ultralights are likely to ensure decommissioned aircraft are not included.*
c. *The number of hang gliders is subject to a large degree of error as it is estimated from the HGFA membership. As trikes (micro-lights) must be registered, their numbers will be more accurate.*
d. *It was not possible to differentiate between active and inactive gliders. GFA estimate the number of active aircraft at around 650, with a further 250 aircraft undergoing maintenance or restoration.*

Source *BTRE General Aviation Survey 2003; HGFA; GFA; RAA*

Box 2.1 The aging VH registered fixed wing general aviation fleet

The average age of most of the VH registered fleet has increased one year for each calendar year over the past decade or so. Between 1993 and 2003 the average age of active fixed wing VH registered aircraft has increased from 21 to 29 years. The average rotary wing aircraft has aged from 13 to 17 years over the same time period.

This aging of the fixed wing fleet reflects minimal replacement of old with new aircraft. The rising capital costs of new aircraft (see part II—Type certified aircraft prices) will be contributing to this. However, while the whole plane may not be replaced at one time, many of the components of the plane must be replaced at specified intervals. The manufacture date may indicate the plane is over 20 years old though the average age of the components of which it is comprised—including parts of the airframe—is likely to be far less.

The consensus amongst industry stakeholders consulted was generally that properly maintained older planes could continue to perform as well as they ever have. Some stakeholders did observe rising—and perhaps increasingly unpredictable—maintenance costs.

The cost to maintain an aircraft increases as the aircraft ages. Operators trade off these increased maintenance costs with the

opportunity cost of capital required to buy or lease new aircraft. In general, the commercial advantages offered by new planes have not been sufficient to outweigh the capital expense of purchasing new aircraft for many general aviation operators. This is due to minimal technological advances in most commercially produced aircraft over the last two decades—at least until very recently. Many industry stakeholders consulted believed that new type certified, fixed wing planes offered virtually the same product at about double the cost of an equivalent 'old' plane.

Some industry stakeholders consulted noted that very recent advances in light sport aircraft may provide sufficient cost advantages to warrant more fleet replacement for training operators. The cost advantages deriving from lower fuel consumption will be accentuated by the rising price of fuel.

PART II

THE GENERAL AVIATION OPERATING ENVIRONMENT

Key influences on general aviation have been:

- increased costs
- significant improvement in transport substitutes—such as regular passenger air transport and road transport
- the advent and growth in the number of sport aircraft—such as ultralights
- competition from a growing array of alternative leisure pursuits.

Even 15 years ago, general aviation enjoyed a range of cost advantages. Aircraft, maintenance and fuel were significantly less expensive in real terms. Airports were government owned and generally operated on a non-commercial basis—reducing the cost to general aviation businesses and small users. Examples included offering large concessions for prepayment of landing fees and entering into long term, non-commercial lease agreements.

Significant contributors to these increased costs include:

- Liability issues affecting US aircraft manufacturers contributed to very large increases in the price of type certified aircraft and certified spare parts
- Increased user charges resulting from microeconomic reform—manifest as privatisation of airports as well as the removal of network pricing and moves to user pays policies. These changes led to price increases in tower fees, landing, parking and other infrastructure charges as well as commercial rents at many aerodromes.[19]

The emergence and growth of sport aircraft types has been a key influence on the general aviation industry over recent years. As one stakeholder consulted put it, in the 1970s if somebody wanted to fly,

19 A condition of the sale of former Federal Airports Corporation airports was that the airport lessees offer access to aircraft operators on reasonable commercial terms. Under the FAC, access and pricing for general aviation users were on a non-commercial basis. The price impacts have been the most consistent at former Federal Airport Corporation aerodromes which in 2003 accounted for around 50 per cent of all fixed wing movements and around 20 per cent of all rotary wing movements.

there was only one option, today the recreational aviator has the choice of a large number of different aircraft types depending on their priorities and their budget.

Sports aviation growth is being driven by the low costs of buying, maintaining and operating these aircraft compared to type certified aircraft, and by product innovation.

It is important to note that, in general, non-type certified sport aviation aircraft have been less affected by increased costs related to liability issues and user charges. In particular, they have not been affected to the same degree by increases in aircraft and parts prices as they operate under different regulatory arrangements.

At the same time that the cost of general aviation has been increasing, regular passenger air transport fares have been coming down and road transport has been improving. Improvements in road transport—both in road infrastructure and in the quality, safety and comfort of vehicle travel—are likely to have impacted on mode choice, particularly over the longer term. The minimal advances in comfort, safety and technology in most small piston aircraft is notable against the significant advances over the last four decades in the average passenger car. Although difficult to quantify, competition in the domestic market from regular passenger transport services and improvements in road transport have had the effect of reducing general aviation flying hours—particularly in south eastern Australia.

Other factors that are likely to have influenced the trends in general aviation and their geographic distribution include:

- regional differences in economic and population growth
- the performance of rural industries including farming, mining and resource industries
- fluctuations in the exchange rate
- international demand for commercial pilot training
- the Avgas contamination in December 1999 and January 2000 also affected general aviation activity.

CHAPTER 3

AIRCRAFT

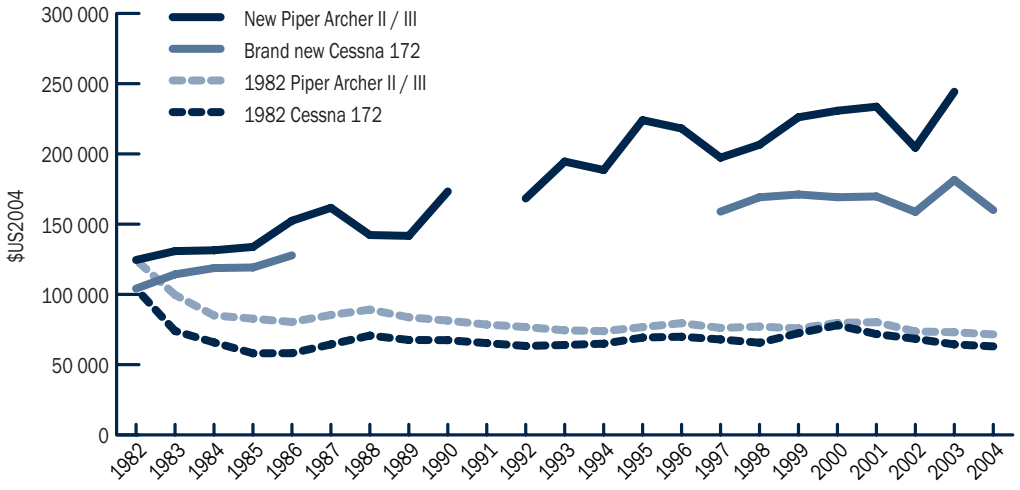
The price of commercially produced aircraft has increased significantly over the 20 years to 2004, largely as a result of liability issues in the North American aircraft industry. Capital costs are crucial in determining fleet replacement.

COMMERCIALLY PRODUCED AIRCRAFT PRICES

Historically, most Australian type certified aircraft have come from the United States of America (US), and hence have been influenced by trends in the US general aviation market. This study reviewed the sale price of commercially produced general aviation aircraft in the US. As there is a significant amount of international transfer of aircraft, this series provides a reasonable approximation of the price of similar planes in Australia.

Figure 3-1 depicts the change in price for two of the most common general aviation type certified aircraft, the Piper Archer 181[20] (PA28) and

FIGURE 3-1 REAL AIRCRAFT PRICES ($US2004), 1982–2004



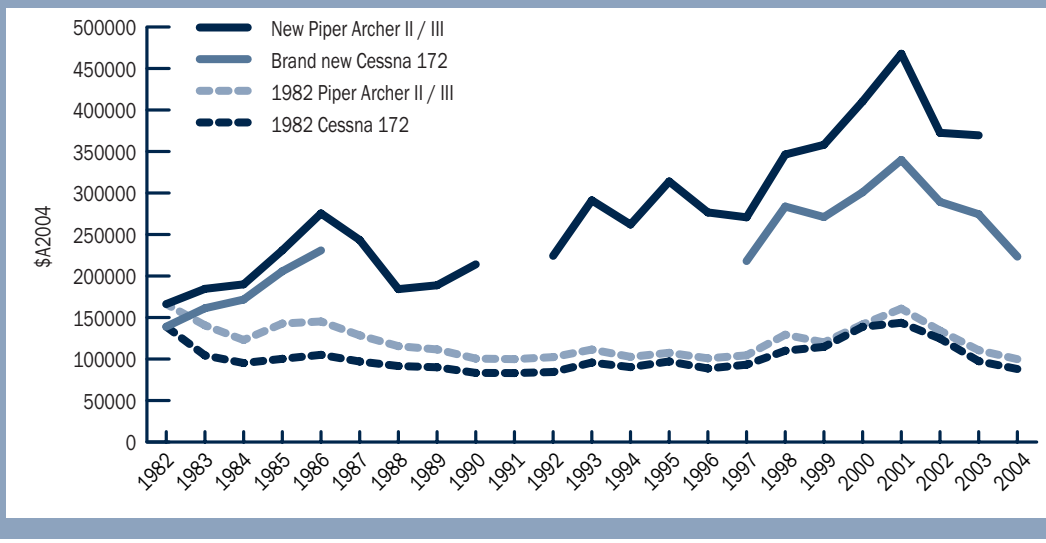
Source *US Dept. of Labor, Bureau of Labor Statistics, Aircraft Bluebook Price Digest, Reserve Bank of Australia, Australian Bureau of Statistics (ABS) (cat no. 6401.01A, 5368.012)*

20 In 2003 there were 987 Cessna 172s and 810 PA28s. These prices are for the PA 28 191.

Cessna 172. This series shows a very large real price increase in the price of these two aircraft. A 2001 report by the United States General Accounting Office (GAO) identifies “escalating costs associated with product liability” as a key driver of these cost increases. It also notes that the rapid increase in cost between 1975 and 1990 was “not accompanied with advances in safety features or technology”. (US GAO 2001)

In 1994 the US Government enacted the General Aviation Recovery Act (GARA) which applied to aircraft of 20 seats or less. The GARA limited product liability to 18 years on aircraft, parts and components. Between 1994 and 2001 manufacturing activity increased rapidly. In the US, hours flown have increased, although less sharply. The GAO report suggests that the continued increase in prices can in part be attributed to increased investment in technology. However, industry stakeholders consulted by the Bureau noted the absence of technological difference between new and older light aircraft.

FIGURE 3-2 REAL AIRCRAFT PRICES ($A2004), 1982–2004



Source Aircraft Bluebook Price Digest, Reserve Bank of Australia, ABS (cat no. 6401.01A, 5368.012).

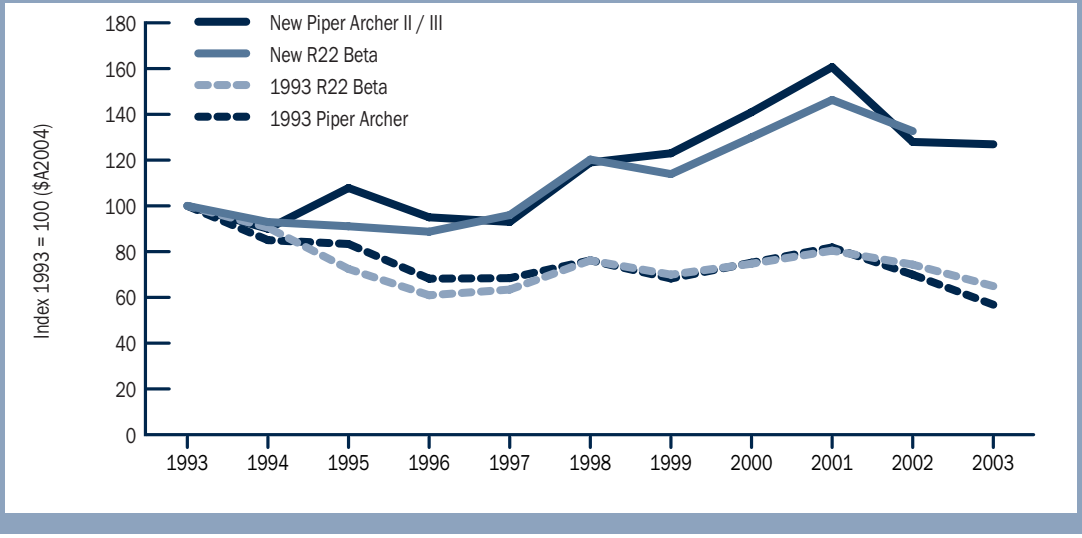
Fluctuations in the exchange rate magnify the level of volatility in aircraft prices. The chart above depicts the value in Australian dollars of the same two aircraft as above. The most notable effect of exchange rate movements is that it appears to have accentuated the peak around 2001, and has led to a decline in new aircraft prices in the subsequent years as the Australian dollar appreciated against the US dollar.

Figure 3-2 reveals real increases in price in the order of 150 per cent between 1982 and 2004. The chart also shows that the real price of used planes has remained relatively constant over the 21 years in real terms—this means the price of used aircraft declines very slowly if at all. This slow depreciation reflects the large ongoing investments in

maintenance and often considerable added value due to installation of high cost avionics, as well as the increases in new aircraft prices. Much of the value in used planes is embodied in components with a fixed service life—that is, components that require replacement after a regulated number of service hours.

It is noteworthy that the relative change in the price of common helicopters is similar to that of fixed wing aircraft (Figure 3-3). Therefore, the recent growth in the number of rotary wing aircraft has occurred despite significant increases in the real cost of new aircraft– as will be discussed in later sections.

FIGURE 3-3 RELATIVE PRICE OF ROTARY TO FIXED WING AIRCRAFT, 1993–2003



Source *Aircraft Bluebook Price Digest, Reserve Bank of Australia, ABS (cat no. 6401.01A, 5368.012).*

NON-TRADITIONAL AIRCRAFT PRICES

Sport aircraft are substantially cheaper to buy than type certified VH registered aircraft. Ultralight aircraft vary in cost. A very simple powered hang-glider can cost under $10 000 while a fully optioned Jabiru capable of being VH registered can cost around $80 000. Costs are increasing in this area – a new AirBorne Edge trike can cost $40 000 to $50 000. Ultralights also use less fuel than their heavier VH counterparts—up to perhaps 15 litres per hour for a more sophisticated aircraft. Many ultralights do not run on Avgas (see chapter 6).

Box 3.1 The growth of some Australian aircraft manufacturers

Gippsland Aeronautics commenced operations at the Latrobe Regional Airport in Morwell in the 1970s as an aircraft maintenance and modification business. The company has two certified aircraft designs—the GA200 and GA8 Airvan. The GA200 achieved Australian Civil Aviation Authority certification to US airworthiness standards in 1991 and US certification in 1997. The GA8 Airvan is a utility transport designed to replace the Cessna 206/207 and DHC Beaver. It was type certified by CASA in December 2000 and it has since been certified by both the United States FAA and Transport Canada.

A total of 45 GA200 aircraft have been manufactured—28 of these have been exported. A total of 64 GA8 aircraft have been produced to date with 39 exported to ten different countries. The company currently produces 20 to 25 aircraft per year, employing 115 staff with an annual payroll of AU$5 million. The company is planning an expansion program to meet sales demands.

Jabiru Aircraft Pty Ltd is a privately owned Australian company formed in 1988 and has developed into both an aircraft and aircraft engine manufacturer. The Jabiru LSA 55/2K model aircraft was type certificated by the Australian Civil Aviation Authority in 1992. Soon after their engine manufacturer ceased production and Jabiru developed their own lightweight aircraft engine. This new engine was approved for installation in Jabiru aircraft in March 1993. Jabiru is producing airframes at the rate of 100 per year and 2200cc engines at the rate of 360 per year. Aircraft and kits have been sold to 16 countries and engines to 31 countries. The Jabiru range currently includes:

- Jabiru Type Certificated, factory manufactured aircraft.
- Jabiru amateur-built or experimental kits
- Jabiru aircraft engines

Jabiru also manufacture their own propellers, wheels and brakes and control system components. Jabiru engines are being used in most popular light aircraft and experimental aircraft types.

Kavanagh Balloons developed their first balloon in 1968. In 1993 it established a purpose built factory with a launch field just north of Sydney. Kavanagh designs range from a two person 56,000 cubic feet balloon to the 20 person, 400,000 cubic feet passenger balloon. Kavanagh have produced a total of 315 balloons to date and have exported to seven different countries. A full time staff of ten produced a total of 12 balloons in 2004.

Source Company websites, company personal communications.

CHAPTER 4

MAINTENANCE

Maintenance is a vital input to general aviation. In the case of type certified aircraft, maintenance costs are rising while the aging fleet is meaning more maintenance is required. For sport aircraft these costs are likely to be far lower.

Maintenance of type certified aircraft must be conducted by CASA certified Licensed Aircraft Maintenance Engineers (LAMES) and only approved (certified) parts can be used.

Organisations engaged in maintenance of type certified aircraft must hold a current Certificate of Approval from CASA.

Ultralights, gyroplanes, hang gliders and gliders engaged in commercial flight training can be maintained by holders of certificates issued by the respective administrative body.

For these reasons maintenance costs of type certified aircraft are relatively high. Anecdotally, stakeholders agreed that the cost of maintenance has increased significantly over recent years. Sport aircraft types have not been as affected by increased maintenance costs.

CERTIFIED MAINTENANCE ORGANISATIONS

Many Certificate of Approval holders perform maintenance on a range of aircraft—from large regular public transport turbo-prop or even jet aircraft right down to small typically general aviation aircraft or even ultralights. In order to isolate the maintenance organisations that are related to general aviation, we took all Certificate of Approval holders that most commonly perform maintenance on:

- fixed wing aircraft with seating capacity of fewer than 10 seats
- balloons; and
- rotary wing aircraft.

In 2004 there were approximately 380 maintenance organisations with a current certificate of approval holders that primarily performing

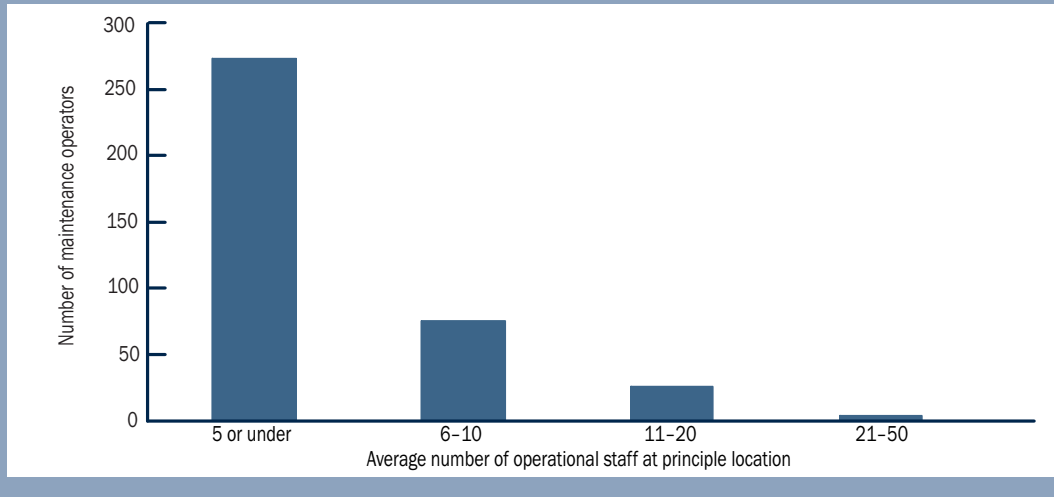
maintenance on general aviation aircraft. Approximately 88 organisations held *both* active maintenance Certificate of Approval *and* current air operators certificates.

Maintenance organisations display a similar market structure to aircraft operators with large number of small businesses employing up to five staff. The industry structure of general aviation maintenance organisations is depicted below.

Based on the ranges depicted in figure 4-1, an estimated 2000 people are employed in maintenance of small fixed wing aircraft, balloons and rotary wing aircraft. This does not include individuals employed by Certificate of Approval holders that engage in the maintenance of components only.

Maintenance organisations consulted noted that aircraft owners are prepared to fly significant distances—a few thousand kilometres—to have maintenance performed. This implies that there are no physical barriers to industry consolidation.

FIGURE 4-1 INDUSTRY STRUCTURE OF GENERAL AVIATION MAINTENANCE ORGANISATIONS, 2004

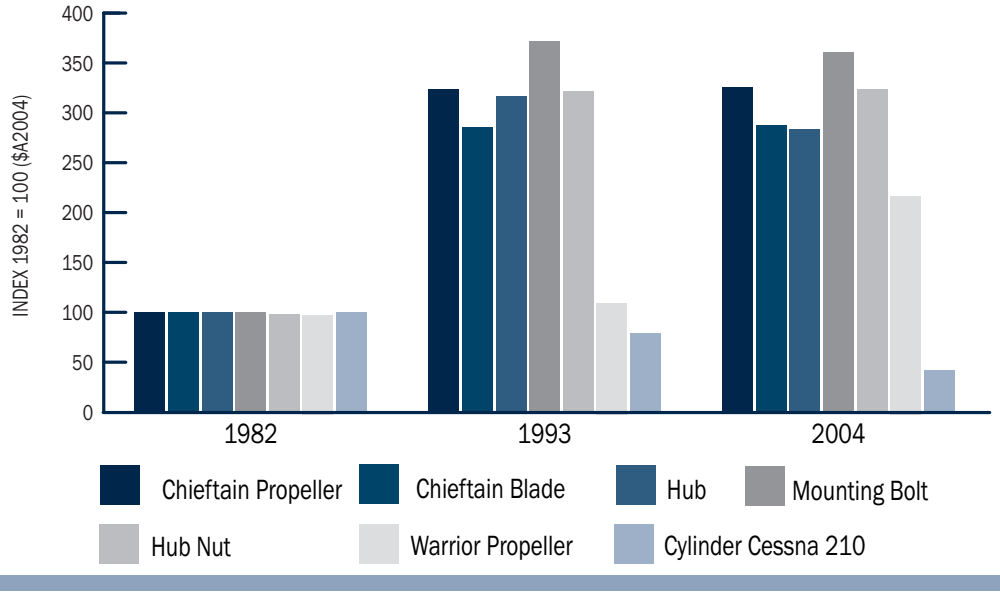


Source *CASA STI Database.*

CERTIFIED PARTS

In general the cost of the certified parts examined has increased substantially over the past 20 years—with some parts more than tripling in price (figure 4-2). There has been very little increase, and even some decrease, in the price of parts over the past 11 years.

FIGURE 4-2 REAL PRICES OF SELECTED AIRCRAFT PARTS, 1982–2004



Note *Parts prices converted to Australian dollars and deflated using ABS implicit price deflators.*

Source *Industry sources; ABS (cat. no. 5206.053, 5368.012), Reserve Bank of Australia.*

The parts considered were all produced in the United States of America (US) and it is likely that price rises resulted from liability issues that affected general aviation in the US as described in chapter 3.

Following the passing of the US *General Aviation Recovery Act* (GARA) in 1994 the manufacturer's liability on parts and aircraft was limited to 18 years. Following the passage of the GARA the pace of aircraft manufacturing increased. While the real price of aircraft continued to rise, it is possible that the GARA had a greater effect on the price of parts.

LABOUR

The cost of labour has been estimated from industry consultation. In 1994 labour was charged out at $40 per hour, increasing to $65 per hour by 2004 in current prices. In real terms this represents an approximate increase of 21 per cent—1.9 per cent per year. This price includes overheads.

Box 4.1 The supply of licensed aircraft maintenance engineers

Current situation

Evidence suggests that while there may be local difficulties in attracting the appropriate professional to a position, there is unlikely to be a **current aggregate** shortage of Licensed Aircraft Maintenance Engineers (LAMES). None of the consulted maintenance organisations indicated

the ability to attract staff was the primary issue currently facing their business. However, low wages were identified as a deterrent to entry to the industry.

Future trends

The aging demographic of maintenance professionals was raised by a number of organisations consulted. The Australian Licensed Engineers Association believed there would be a national shortage of LAMES in about 2 years. The Association said that the average age of its members was over 50 and there were not enough new apprentices—given that it can take up to eight years to gain the necessary licenses and experience. The industry has a low profile and people were looking elsewhere for a career as apprentice wages were non-competitive—the new CASA license fee structure was considered to be an added disincentive—and working conditions were unfavourable when compared to IT or finance.

On 12 July 2004 CASA increased rates for existing charges for regulatory services covered by fees regulations. Several stakeholders said that these fee increases had a major impact on the cost of becoming a LAME. Indicative estimates show that these fee changes increased the administrative cost of licences for a general aviation Avionics Engineer from around $1 500 to approximately $3 800.

The 12 July 2004 increases in charges followed a 2003–04 review of CASA's long term funding arrangements which found that fee levels were well below the cost of providing services. CASA had also absorbed the cost of GST where applicable (CASA 2003–2004 Annual Report).

Stakeholders also raised a number of issues that may discourage young people from seeing aircraft maintenance as a viable career path:

- the low wages paid to trainees and even LAMES;
- a perceived societal change away from blue collar employment; and
- the perceived instability of the aviation sector as a career path—a perception exacerbated by the collapse of Ansett.

According to CASA annual reports, the total number of Licensed Aircraft Maintenance Engineers has grown over the period 1996–97 to 2003–04 by around 15 per cent. However, there is no way of knowing how many of these are engaged in the maintenance of general aviation aircraft.

MAINTENANCE COSTS OF SPORT AIRCRAFT

In general the maintenance costs of non-type certified sport aircraft are substantially lower than for type certified aircraft.

Non-certified parts are far less expensive. A parts supplier identified a bolt that could be sold in either type certified or non-type certified form with the former costing eight times more. Ultralights and amateur built aircraft do not require type certified parts to be used, significantly reducing the cost of their maintenance.

The operating costs of amateur built aircraft are significantly lower than for commercially produced type certified aircraft. The original builder can perform maintenance and is not restricted to using certified parts. This has the effect of significantly reducing operating costs. If an amateur built plane is sold it can be granted another type of Experimental Air Operators Certificate. However, maintenance cannot be performed by the new owner.

The running costs of ultralight aircraft are also substantially below those of type certified aircraft as individuals can maintain their own aircraft so long as it is only used for personal use. Ultralights that are used for training purposes must be maintained by holders of level II maintenance certificate, issued by RAA. The cost of this level II certificate is lower and subject to less regulatory complexity compared to the LAME certificate.

Similar to ultralights, gyroplanes used for training purposes need to be maintained by ASRA accredited technical advisors – themselves likely to be significantly cheaper than LAMES. Gyroplanes are not required to use type certified parts.

CHAPTER 5

AERODROMES

Reflecting its diverse nature, non-scheduled aviation utilises a wide range of infrastructure types, from large metropolitan secondary airports to small privately owned rural grass strips. Some other forms of general aviation do not require any purpose built infrastructure at all.

The biggest changes occurring in the past 15 years relevant to this report affected larger aerodromes that are used by most VH registered general aviation aircraft. Essentially these changes have resulted from the transfer of ownership of aerodromes to private owners and to local councils.

The most notable effect has been an increase in infrastructure charges at some airports. It is also apparent that commercial rents have increased—ostensibly on the basis of bringing them in line with comparable leases to non-aviation businesses in the same area. The magnitude of price rises varies greatly between locations—some locations experienced minimal or even negative real price changes.

Not surprisingly any price increases will not have been popular amongst airport users. In some circumstances increases may have had a significantly detrimental effect on aviation businesses—particularly if the businesses were marginal prior to the increase. It has also been suggested that some businesses and recreational flyers will have shifted their base of operation—making individual trade offs between infrastructure cost, quality and location. However, some general aviation organisations at airports can face considerable costs associated with relocating. For instance, they may not be able to recover sunk capital costs, for example buildings, and may be subject to fulfilling obligations stipulated in leases that existed prior to privatisation such as the cost of removing all structures from the leased site.

AERODROME TYPES

It is useful to consider two groups of airports:

- Former Federal Airports Corporation (FAC) airports – these were the 22 major international, regional and general aviation airports[21] previously run by the FAC.
- Former Aerodrome Local Ownership Plan airports which include a further 234 smaller regional airports.

In 2003, in excess of 50 per cent of all VH registered fixed wing, and 20 per cent of all VH registered rotary wing movements, occurred at former FAC airports[22].

While all care has been taken to provide an accurate overview of airport infrastructure charges the figures below should be treated with caution. Airports employ a variety of ways to calculate use fees which are levied variously on landing, parking and leases and otherwise. In addition, some airports may offer discounts to the posted prices.

AERODROME LOCAL OWNERSHIP PLAN AERODROMES

The Aerodrome Local Ownership Plan (ALOP) was established in 1956. Under the programme the Commonwealth provided technical advice and financial assistance to 234 regional aerodromes. Financial assistance was given in the form of 50 per cent funding of the cost of approved maintenance works.

Between 1992 and 1993, 230 of the original 234 ALOP aerodromes were transferred, largely to local councils, along with $73.8 million of grants to provide councils with financial support for the future maintenance of their aerodromes.

With the transfer of ownership, local governments gained the ability and responsibility to make decisions regarding maintenance and capital expenditure. Many local governments currently subsidise the operation and maintenance of the aerodromes just as they do roads, parkland and sporting facilities.

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21 Airports that were administered by the FAC were: Kingsford Smith, Melbourne, Brisbane, Perth, Adelaide, Alice Springs, Canberra, Coolangatta, Darwin, Hobart, Launceston, Townsville, Mt Isa, Tennant Creek, Archerfield, Essendon, Jandakot, Moorabbin, Parafield, Bankstown, Camden and Hoxton Park.

22 Estimated from BTRE General Aviation Survey data and Airservices Australia aircraft movements data. This figure does not include movements at Mt Isa, Hoxton Park, Tennant Creek, or movements that occur outside the hours of tower operation.

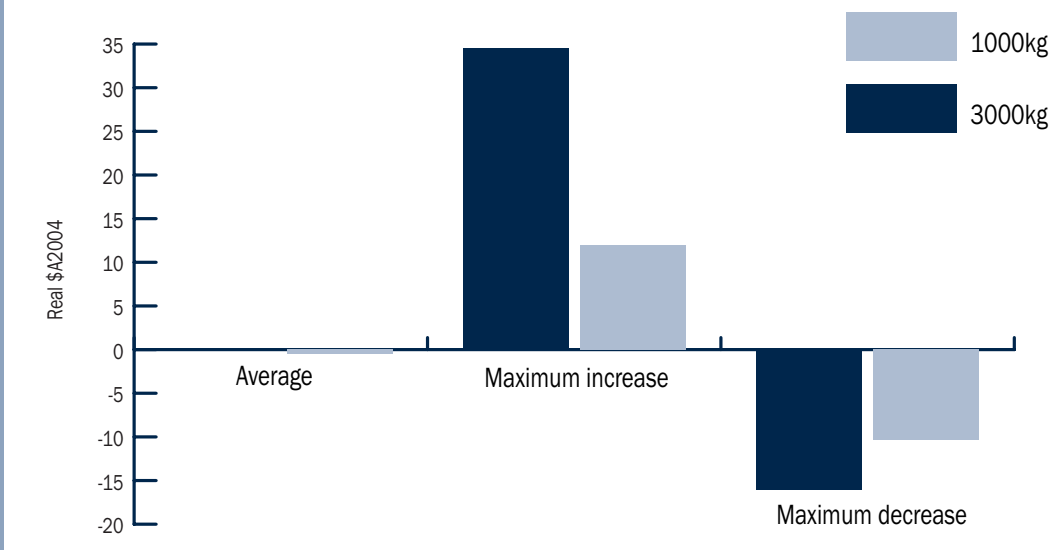
ALOP aerodromes: changes in the charges levied

Location specific charges were introduced at ALOP aerodromes in 1991 in preparation for the transfer to local government ownership. These charges only applied to aircraft powered by aviation turbine fuel (Avtur)[23] (Department of Transport and Communications 1993). No infrastructure charges were levied on Avgas powered aircraft prior to the Australian Government passing full financial responsibility for ALOP aerodromes to local governments in 1993.

Figure 5-1 depicts the changes in charges at a sample of 62 ALOP aerodromes between 1994 and 2004. The charges used in the analysis apply generally to all users of airports and do not include GST. Each aerodrome has its own system of charging. Many charge per tonne while others charge a flat fee. Some price-discriminate between Avgas and Avtur aircraft, or on the basis of aircraft weight or number of engines, between regular passenger transport and general aviation operations, or on the basis of local and itinerate aircraft. Where this was known, the charge was calculated for Avgas general aviation aircraft.

As is shown in figure 5-1 the average price for landing a three tonne aircraft—in real terms—increased by 0.5 per cent over the ten years, while for the sample of aerodromes the cost of landing a one tonne

FIGURE 5-1 CHANGES IN ALOP AERODROME LANDING FEES, 1994–2004 ($A2004)



Note *These are calculated using posted prices estimated across a range of different charging regimes for a sample of 62 aerodromes. These prices do not include GST.*

Source *Avdata Australia; ABS (cat no. 6401.1B)*

23 For explanation of fuel types see chapter 6.

aircraft actually decreased by around 6.2 per cent. Of 62 aerodromes, 21 have not changed their nominal prices since 1994.

As figure 5-1 demonstrates, there is significant variation between airports. The airport with the maximum price increase raised its landing fees for a three tonne aircraft by 177 per cent to $54 in 2004. The greatest increase in price experienced by a one tonne aircraft was at the same airport and of a similar magnitude. The airport with the greatest reduction in cost reduced the fees levied on a three tonne aircraft by 45 per cent.

ALOP Aerodromes: issues

Some organisations consulted noted that the collection of these landing fees is problematic. The ownership agreement of the aerodromes specifies that airport operators cannot deny users access to the airport. It was also conveyed that some airport users still believe that their access should be free of charge. It was also suggested that some ultralights currently do not pay landing fees—that is, it is not feasible to enforce charging as there is no public register of ultralight owners. Some commented that operators and pilots of VH registered aircraft believed this to be unfair.

Funding airport infrastructure maintenance and development is an issue for many of the new owners. In many circumstances local governments currently subsidise the operation and maintenance of the aerodromes—and this will continue to require balancing against other council expenditure.

Managing the growth in traffic is an issue for some small aerodromes. Growing demand has resulted from the relocation of aircraft from metropolitan airports as well as local population growth.

FORMER FEDERAL AIRPORTS CORPORATION AERODROMES

The FAC managed 22 major international, regional and general aviation airports prior to 1997. The FAC levied a uniform tariff on general aviation users known as the General Aviation Infrastructure Tariff.

Between 1997 and 2002 all FAC airports were leased to private operators. Following privatisation, the new commercially focused airport owners sought to achieve commercial returns from their new assets. In many cases owners encouraged the development of non-aviation related use of some airport land. In general, it would appear that rents paid on existing leases have also increased.

Before 1997, under the FAC, airside revenue generated was insufficient to cover maintenance and capital investment at some airports. In 2004, some former FAC airport operators noted that the airside aspect of the business remained subsidised by other revenue sources.

Former FAC aerodromes: changes to landing and parking charges

The FAC levied a uniform tariff on general aviation users known as the General Aviation Infrastructure Tariff (GAIT). To be charged under the GAIT system, aircraft had to be under 10 000kg. The GAIT covered both landing and parking at any approved GAIT airport[24].

The study compared the charging structure of eleven[25] former FAC airports in 1997 and 2004. The major general aviation airports were chosen as well as a number of former FAC regular public transport/general aviation airports on the basis of the number of movements of aircraft under 7000kg reported by Airservices Australia.

In 1997 the GAIT was $5.34 per tonne maximum takeoff weight per day. This equates to $1949 per annum for an aircraft of 1 tonne maximum takeoff weight—equivalent to $2,324 in 2004 dollars. However a range of discounts applied. For example, if 12 months or more was paid in advance the charge was reduced to only $702 per annum—equivalent to only $1.92 per day. In 2004 dollars these figures become $857 ($2.35 per day).

Today these airports are owned and operated by a range of separate entities. A range of different charging schemes are employed making it difficult to compare like with like. Of the eleven airports, five continue to charge an infrastructure access charge—where landings are not an additional charge. The other six charging on a per landing basis with—in some cases—additional fees for parking.

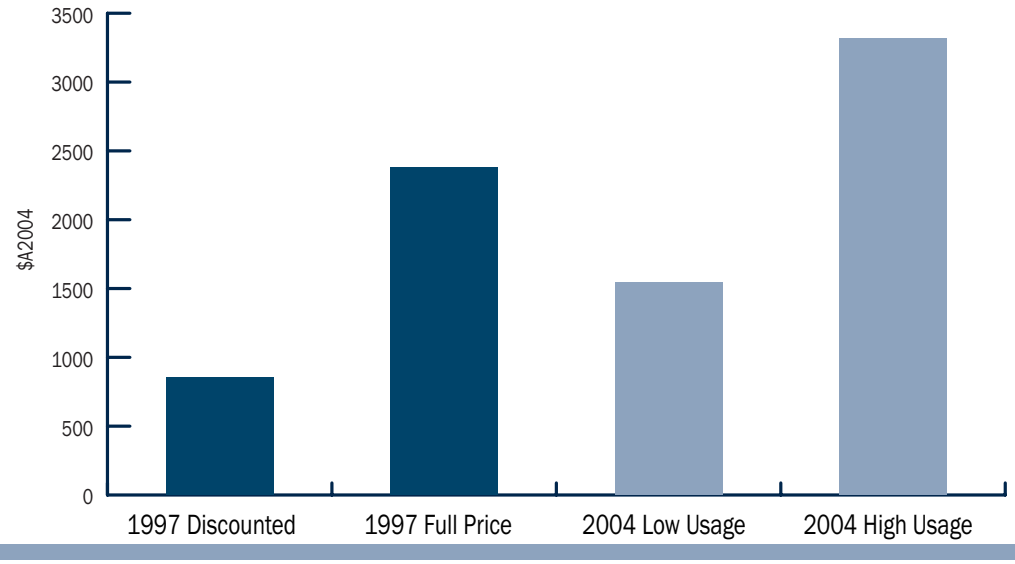
In order to compare these, we calculated the costs for hypothetical low usage (LU) and high usage (HU) aircraft. In this case, high usage is defined as 365 movements a year, while low usage is defined as only 12 movements a year.

Figure 5-2 shows real ($2004) charges at the sample of eleven former FAC airports in dollars per tonne per year. The dark bars indicate the charges in 1997 with the discounted bar payable by users who paid 12 months in advance. The light bars on the right of the graph show the annual charges payable per tonne for low capacity and high usage aircraft. As can be seen from figure 5-2 the increase is greater for high

24 Alice Springs, Canberra, Coolangatta, Darwin, Launceston, Townsville, Mt Isa, Tennant Creek, Archerfield, Essendon, Jandakot, Moorabbin, Parafield, Bankstown, Camden and Hoxton Park.

25 Adelaide, Coolangatta, Darwin, Canberra, Camden, Jandakot, Bankstown, Moorabbin, Parafield, Archerfield and Essendon.

FIGURE 5-2 REAL INFRASTRUCTURE CHARGES AT SELECTED FORMER FAC AIRPORTS, 1997 and 2004 ($A2004)



Source BTRE estimates, ABS (cat no. 6401.1B).

usage aircraft owing primarily to the airports that charge on a per landing basis. However, even low usage aircraft can be expected to pay substantially more than the 1997 discounted rate.

For the six aerodromes that charge a daily infrastructure charge, the average price is $2 302 per tonne per day (excluding GST).

Another change not captured in Figure 5-2 is that under the former FAC policy of network charging, an aircraft owner paid GAIT for the year and could land and park their aircraft at any FAC airport. Today an aircraft owner based at a former FAC airport and flying into another former FAC airport will face fees at their destination having already paid access charges at their regular base.

Former FAC aerodromes: commercial leases and rents

In many circumstances, the rents levied on hangers, commercial premises and land have been increased by new airport owners. These leases are commercial agreements between airport owners and their tenants and therefore we are not able to comprehensively report on changes.

At some aerodromes, airport planning included the relocation of some businesses from one location on the aerodrome to another. Some tenants believed that price increases were aimed at forcing them to relocate either on airport, or to another location. Some felt that the new accommodation provided for their business would involve paying rent on both land and structures with the end result of greatly increased

rents. A few operators at some airports believed that airport owners intended to price them out in order to redevelop the airport real estate for commercial or residential purposes.

General aviation stakeholders consulted indicated that:

- Many rents have increased significantly. This is seen to reflect:
  - the fact that former FAC rents were set at very low levels;
  - the more commercial approach taken by airport owners, pricing rents at levels more commensurate to commercial rates at off-airport locations.
- In some cases there may be significant differences in these increases between tenants and between airports.
  - One aero club consulted felt they were given a particularly generous deal on the basis of their not for profit status.
- Some airport owners believed that the general aviation tenants still received favourable rents when compared to other tenants and non-aviation related businesses.
- Many operators consulted seemed understanding of the need for airport managers to derive a commercial return from their assets.

Some stakeholders believed that the process of rental increases at some airports generated animosity, in particular, the inconsistency of methods used to calculate rent increases for each tenant, and that the rent review process is not transparent.

Another issue identified is inefficient land use. Many leaseholders objected to paying rent on wasted space around inefficiently planned buildings—many designed decades ago when the airports were Commonwealth owned.

CONSEQUENCE OF THE CHANGE

As can be seen from the discussion above aerodromes have undergone a wide range of changes. Many aerodromes – though not all – have increased their infrastructure fees reflecting the commercial values placed on them by their new owners. Not surprisingly any price increases will not have been popular among users. In some circumstances increases may have had a significantly detrimental effect on aviation businesses – particularly if the businesses were only marginally viable prior to the increase. Fees at other airports have declined, presumably reflecting decisions of new owners based on commercial factors or other management goals.

It is likely that these price changes will have lead to some spatial reorganisation of general aviation activity. Price sensitive recreational fliers and infrequent users may have moved away from higher cost aerodromes—trading off reduced costs for less convenience of location and perhaps more limited infrastructure.

Many operators face significant costs in relocating. Some tenants have leases that were signed long before privatisation. Many tenants are likely to lose significant sunk capital costs such as buildings if they choose to relocate.

CHAPTER 6

AVGAS AND EXCISE

In 2003 around 87 per cent of the active general aviation fleet ran on aviation gasoline (Avgas) and these piston engine aircraft performed around 78 per cent of total hours. These proportions have declined from 90 and 86 per cent respectively in 1993. Relatively few hours of regular public transport aviation are conducted on Avgas—approximately 30 000 hours. Avgas is a specific input to general aviation flying. However, just under sixty per cent of rotary wing aircraft and only a few percent of ultralights run on Avgas.

Fuel is an important input cost. The consumption of Avgas per hour varies between aircraft. Medium four seat aircraft might burn around 35–40 litres an hour, a larger twin engine aircraft might consume over 100 litres an hour. At a price of around $1.00 to $1.20 per litre (December 2004), it is perhaps not surprising that many in the industry highlighted the impact that rising fuel costs have had on general aviation businesses.

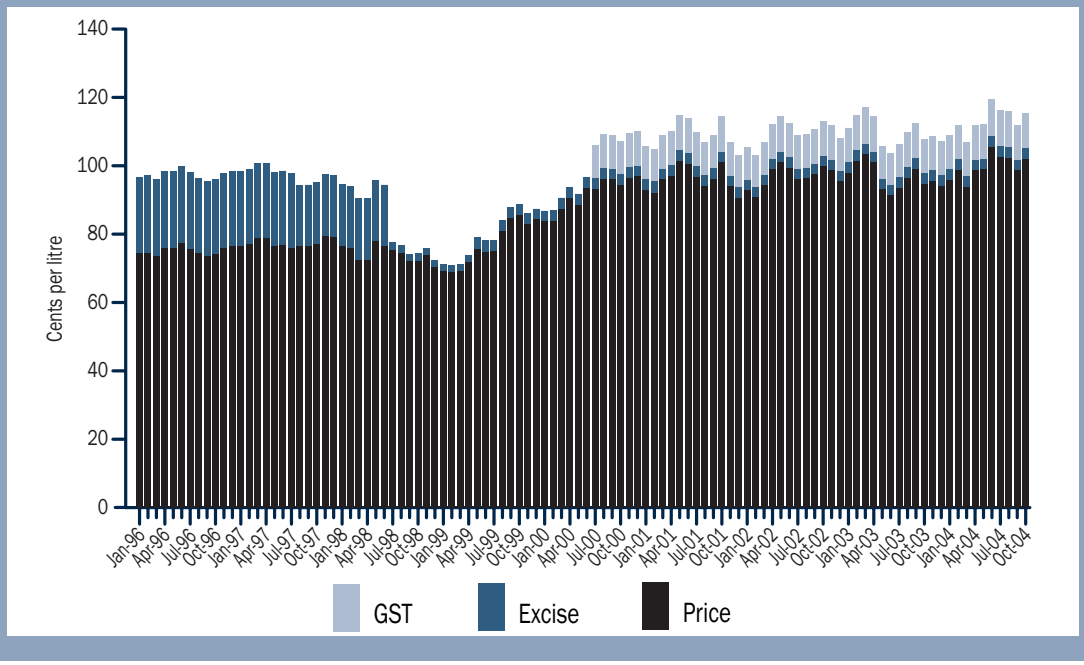
Avgas prices

Figure 6-1 depicts real changes—in 2004 dollars—in retail Avgas prices between June 1996 and October 2004. The price depicted may differ to that paid by aircraft operators for two reasons. First, many large customers of Avgas receive a discount off the fuel price. Second, consumers outside Melbourne and Sydney will pay additional transport and delivery costs.

With the subsequent addition of GST, the real price of Avgas was up around 20 per cent over the eight year period. GST may have had a larger impact on recreational fliers than those flying for business and hire and reward—given that many in the latter groups could claim input credits.

In June 1997 the Avgas excise was approximately $0.18 per litre. Between 1 July 1997 and 1 July 1998, Airservices Australia introduced location specific pricing for terminal navigation, enroute and rescue and fire fighting services. Fee for service was accompanied by a total reduction in Avgas excise of 16.292 cents. Figure 6.1 depicts the rise

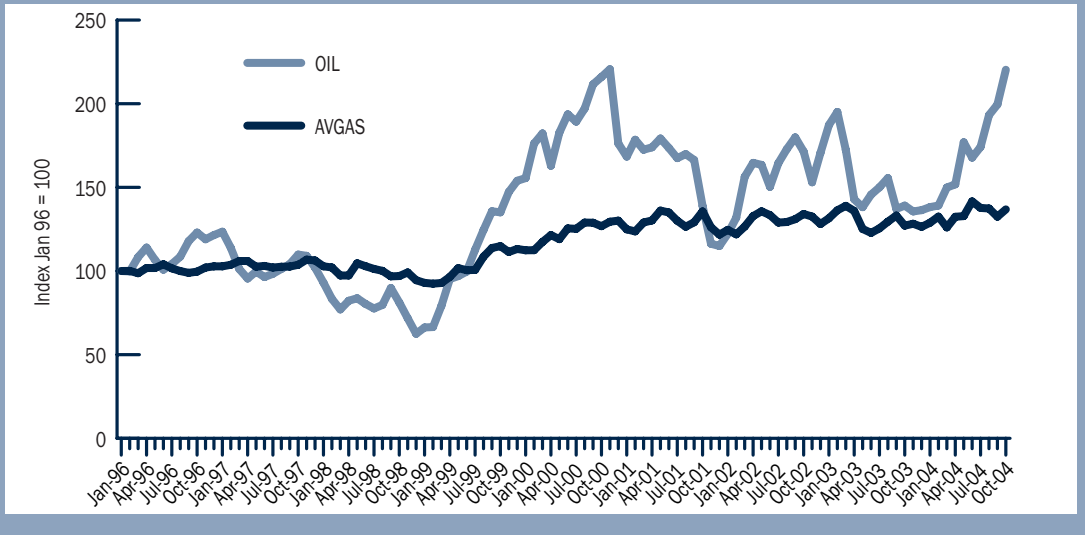
FIGURE 6-1 AVGAS PRICE JUNE 1996–OCTOBER 2004 ($A2004)



Source *ABS (cat no. 6401.1B); Shell Aviation; ATO personal communications; ATO 2003.*

in the underlying real cost of Avgas following this excise reduction. The retail price of Avgas had regained the 1 July 1997 level within about 3 years—this rise in the base cost of Avgas between January 1999 and July 2000 coincided with an increase in the crude oil price (Figure 6-2).

FIGURE 6-2 REAL PRICE OF AVGAS AND CRUDE OIL JUNE 1996–OCTOBER 2004 ($A2004)



Source *Energy Information Administration - Petroleum Marketing Monthly; Shell Aviation; ABS (cat no. 5368.012, 6401.1B).*

Avgas contamination

In December 1999 and January 2000 about 2,200 piston engine aircraft were affected by AVGAS 100/130 contaminated with ethylene diamine. This Avgas was refined at the Mobil Altona Refinery in Victoria and distributed between November and December 1999 throughout Victoria, New South Wales and most of Queensland. The 2001 CASA Regulation Impact Statement states:

> Ethylene diamine causes a sticky black substance to be deposited in aircraft fuel systems, affecting fuel delivery and engine performance. A number of aircraft had lost power due to the contamination. Experience has shown that about 20 per cent of all aircraft accidents are due directly or indirectly to engine failure, and CASA considered this problem to pose a serious threat to safety.

The result was a grounding of all aircraft that had received contaminated fuel until it could be proved that an aircraft was not contaminated, or it could be shown that the aircraft was decontaminated. CASA note that there were unlikely to be any lasting effects on aircraft once the ethylene diamine had been removed at an average cost of around $180 per aircraft.

However, many industry stakeholders consulted felt that general aviation was still feeling the impact of ethylene diamine contamination. As well as the financial loss resulting from the aircraft being grounded, many believe the ethylene diamine contamination has had a lasting effect on the reputation of their operations—especially given it came at a time the industry was adjusting to other changes in the operating environment outlined in this report.

A class action against Mobil was settled on the basis of a settlement scheme—a process of assessment of claims. All but a few claims have now been resolved.

CHAPTER 7

TERMINAL NAVIGATION, EN ROUTE AND RESCUE AND FIRE FIGHTING SERVICES

Prior to 1998 the cost of terminal navigation, en route services, rescue and fire fighting was recovered through the Avgas excise. In June 1997 the Avgas excise was approximately $0.18 per litre. Under network charging, those that did not use these services subsidised those that did—it was also not possible to differentiate between the cost of providing services in different locations.

Airservices Australia introduced location specific pricing between 1 July 1997 and 1 July 1998. The introduction of fees for services was accompanied by a total reduction in Avgas excise of 16.292 cents. Of this 16.292 cents; 13.092 cents per litre was attributed to terminal navigation charges, 2.6 cents to enroute charges and 0.6 cents to airport rescue and fire fighting.

Airport rescue and fire fighting and enroute charges

The majority of non scheduled aviation will not incur airport rescue and fire fighting charges because of weight and location criteria for charging. Airport rescue and fire fighting charges are only paid where the facilities exist[26] and an aircraft has a maximum takeoff weight of 2.5 tonnes or more.

Most general aviation activity are likely to avoid enroute charges as enroute charges are only levied on aircraft flying under Instrument Flight Rules. Qualified pilots may also choose to fly Instrument Flight Rules in order to maintain their hours or improve safety—for example, in adverse weather conditions.

General aviation operators providing aero-medical services have also been eligible to apply for a subsidy with respect to enroute charges.[27]

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26 Adelaide, Alice Springs, Brisbane, Cairns, Canberra, Coolangatta, Darwin, Hobart, Launceston, Mackay, Melbourne, Perth, Rockhampton, Sydney.

27 The Department of Transport and Regional Services manages a programme that subsidises enroute air traffic control charges incurred by around 30 small regular public transport airlines and aeromedical service operators such as the Royal Flying Doctor Service. The 3.5 year programme commenced 1 January 2002.

The Federal Government exempts regional airlines operating aircraft with a maximum take-off weight of 15 tonnes or less and aeromedical operators from enroute charges. This saved the aviation industry $6.0 million in 2002–2003.

On the small amount of general aviation that does attract these charges, the increase in enroute and airport rescue and fire fighting charges would constitute a significant increase in costs.

Tower fees

Many airports with significant general aviation traffic have towers, therefore the introduction of tower fees will have affected a great number—but not all—general aviation movements.

As outlined above, prior to 1998 tower fees were recouped through network charging. Revenue was collected as a uniform levy on Avgas sales. That is, all users were charged the same regardless of whether they utilised tower services or not.

When tower fees were first introduced in 1998 they were $6.75 per tonne at general aviation airports. These charges had increased to $7.42 by 2004. This represents a real decline of around 8 per cent over six years.

Following the removal of excise, users that do not utilise tower assisted landings would certainly have been better off under the user pays system. For users that do use tower services the comparison is still not straight forward, as it depends on the weight of the aircraft, its flying time between landings and its fuel consumption while flying. In order to illustrate this effect Figure 7-1 depicts the changes to the average aircraft that operates on Avgas. It assumes that the aircraft weighs 1.4 tonnes and uses 40 litres of fuel *between landings*—these are the average for all aircraft that operate on Avgas in the fleet.

As can be seen from figure 7-1, the net effect of this change in tower charges will, in general, be adverse in places where there are towers but significantly positive in places where there are no towers. More than 80 per cent[28] of fixed wing general aviation movements occur at airports with towers. For rotary wing aircraft this figure is around 32 per cent.

Tower fees at many major general aviation airports[29] have been subsidised by the Australian Government. This has resulted in all landings being charged at an equal rate at these airports. The Australian Government has recently announced the removal of this subsidy.

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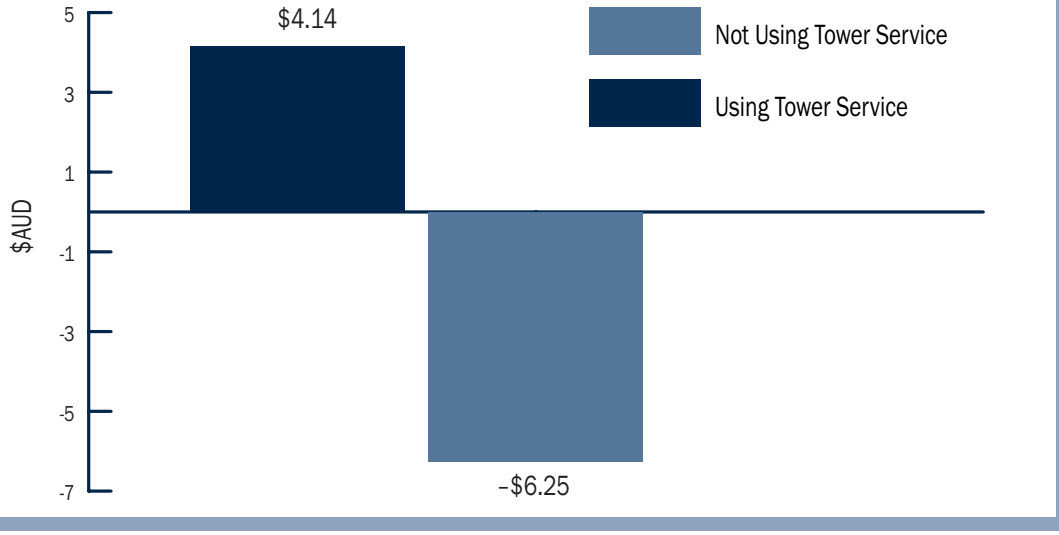
28 This compares total movements reported by general aviation aircraft from the BTRE General Aviation Survey with all movements at former FAC general aviation airports as well as movements under 7 000 kg at other airports with a tower. Not included in this are movements that occur outside tower operating hours.

29 Albury, Alice Springs, Archerfield, Bankstown, Camden, Coffs Harbour, Essendon, Hobart, Jandakot, Launceston, Mackay, Maroochydore, Moorabbin, Parafield, Rockhampton, Tamworth.

FIGURE 7-1 DIFFERENCE IN TOTAL EXPENSE PER FLIGHT FOLLOWING THE REMOVAL OF NETWORK PRICING 1996–2003



Note *This figure represents the shadow fee paid by a hypothetical aircraft burning 40 litres of Avgas per landing. This was the average Avgas sales per landing calculated using national Avgas sales data and the BTRE General Aviation Survey. In practice this figure will vary depending on the duration of each flight and the aircraft type. These figures are calculated for an aircraft weighing 1.4 tonnes—approximately the average weight of an aircraft that runs on Avgas.*

Source *BTRE estimates.*

CHAPTER 8

CHANGES TO OTHER INDUSTRY INPUTS

Insurance costs

Insurance premiums are calculated taking into account a range of factors including: the value of hull insured, hull rate (the rate levied for insurance on the hull), liability limit, liability premium, taxes and charges.

Example insurance calculations provided to the BTRE by QBE Insurance indicate that—on the whole—hull rates as a per cent of aircraft value have decreased. However, at the same time—as has been noted in earlier sections—the value of aircraft has increased significantly over the past 10 years. The result of this will be that many operators will find themselves paying more to insure the same aircraft.

In general liability premia have remained relatively constant. An exception to this would have been increases in charter premiums charged by insurers following changes to the *Civil Aviation Carriers Liability Act* in 1996. The changes to the Act made cover mandatory and non voidable, and increased the liability limit from $180,000 to $0.5 million per passenger.

On top of these changes, state taxes have varied somewhat over the period and since 2000 a Goods and Services Tax (GST) of 10 per cent has been added.

While data for intervening years was not available, the examples in Table 8-1 suggest that in real terms insurance premiums are relatively similar today to ten years ago. It is noteworthy that these are all premiums paid on aircraft of increasing value. QBE Insurance have advised that—while premiums rose following the events of September 11—they have since returned to pre September 11 levels. This is supported by the available data.

TAXATION

Many industry stakeholders consulted noted the impact of Goods and Services Tax (GST) on the cost of operations. Businesses can claim input credits on GST paid for flying conducted for commercial purposes.

TABLE 8.1 CHANGE IN INSURANCE PREMIUMS OVER THE DECADE TO 2004

	1994 (in $2004 dollars)			2004		
	Aircraft value	Liability limit (millions)	Premium	Aircraft value	Liability limit (millions)	Premium
1978 Cessna 172. Private Use	65,000	1.3	2,000	70,000	1.0m	3,000
1979 Piper Chieftain Charter	312,000	6.49	8,000	350,000	5.0m	11,000
1978 Cessna 152 Training	39,000	1.3	2,000	50,000	1.0m	3,000
Robinson R22 Mustering	195,000	1.3	32,000	200,000	1.0m	42,000

Source *Industry sources.*

The GST is not payable on flight training for commercial pilots. Some stakeholders also noted that the administrative imposition of the GST has adversely affected some smaller operators.

A few operators nominated accelerated depreciation as a means of assisting operators purchase new aircraft. Industry stakeholders noted that depreciation periods were lower in the mid to late seventies, which contributed to the greater growth in fleet numbers.

Accelerated depreciation was replaced on 21 September 1999 by effective life depreciation as part of reforms to the capital allowances system in the New Business Tax System. This change reduced the maximum depreciation rates that could be claimed by taxpayers. It was part of taxation reforms that partly funded the lowering of the company tax rate from 36 per cent to 30 per cent (Costello 1999). Using the prime cost method and the safeharbour effective lives determined by the Tax Commissioner, maximum depreciation rates:

- for aircraft predominantly used for agricultural spraying or dusting—reduced from 40 per cent to 25 per cent based on four years effective life (diminishing value from 60 per cent to 37.5 per cent)
- for general use aircraft—reduced from 20 per cent to 12.5 per cent based on eight years effective life (diminishing value from 30 per cent to 18.75 per cent)
- for gliders—were set at 10 per cent based on 10 years effective life (diminishing value 15 per cent) (Australian Taxation Office 1992 and 2002).

In 2002 changes to the effective lives of depreciable assets—including legislative caps for aeroplanes and helicopters—further reduced maximum depreciation rates (Australian Taxation Office 2000, 2002

and 2003)[30], From 1 July 2002 the maximum depreciation rates for aeroplanes or helicopters:

- predominantly used for agricultural spraying, dusting, or mustering—reduced to 12.5 per cent based on a legislative cap of 8 years on effective life (diminishing value 18.75 per cent)
- for general use—reduced to 10 per cent based on a legislative cap of 10 years effective life (diminishing value 15 per cent).

THE SUPPLY OF PILOTS

Flight training provides an essential input to the whole aviation market, including commercial regular public transport operations. CASA annual reports between 1997 and 2003 indicate that number of most types of licenses declined. However, the number of current air transport licences increased.

Some industry stakeholders consulted nominated the inability to attract and keep staff as a significant issue affecting their business—in particular Chief Flying Instructors and Chief Pilots. Air operators in remote parts of Australia indicated a general inability to attract quality personnel. Chief Pilots must be approved by CASA for an Air Operators' Certificate holder to operate. Reasons given for this being an issue included.

- The time taken to complete the CASA approval process contributes to significant business costs, particularly when replacing a Chief Pilot.
- Some in the industry believed recent growth in the regular public transport sector was drawing skilled and experienced pilots away from general aviation.

Several in the industry noted the low salaries paid to most pilots in particular those starting out in the industry. Competition for jobs at the bottom end of the market was described as fierce. Many new commercial pilots choose to relocate to remote parts of northern Australia where the job market was described as less competitive. The shortage of pilots described by some stakeholders appears at odds with generally low wages.

30 If an aircraft owner uses the Tax Commissioner's determination of effective life for an aircraft acquired from 1 July 2002, then the aircraft's effective life is taken as the lesser of that in the determination and the legislative cap.

CHAPTER 9

GENERAL AVIATION AND REGULATION

Aviation is a highly regulated industry. Regulators face the difficult task of balancing the direct and indirect cost of regulation with safety and security outcomes. It is beyond the scope of this report to provide a detailed assessment of the effect of regulation on general aviation—or its effectiveness in achieving safety outcomes. Importantly this study entirely omits any evaluation of the benefits of the current conduct of safety regulation. The section below provides a very brief overview of the regulatory framework and recent relevant changes—essentially to provide context to the regulatory issues raised during industry consultation. For details of this consultation see Appendix A.

REGULATORY FRAMEWORK

The Civil Aviation Safety Authority (CASA), the Department of Transport and Regional Services—which includes the Office of Transport Security and the Australian Transport Safety Bureau—and Airservices Australia constitute a tripartite structure for providing safe aviation in Australia.

CASA was formed in 1995 when the Australian Civil Aviation Authority was split into CASA and Airservices Australia. CASA's primary function is to conduct the safety regulation of civil air operations in Australia and the operation of Australian aircraft overseas. CASA is responsible for, inter alia, certifying aircraft, maintenance organisations and air operators and licensing pilots and engineers. It is also required to provide comprehensive safety education and training programmes, cooperate with the Australian Transport Safety Bureau, and administer the *Civil Aviation (Carriers' Liability) Act 1959*.

In addition, the general aviation industry is also affected by other legislation and regulations. These include airspace regulations[31], the *Aviation Transport Security Act 2004* and Aviation Transport Security Regulations 2005, the *Airports Act 1996* (administered by the

31 The airspace regulation functions vested with Airservices Australia are currently being extracted to sit within a separate Airspace Directorate (Anderson 2004).

Department of Transport and Regional Services), and potentially state and local government planning laws.

RECENT MAJOR CHANGES AFFECTING GENERAL AVIATION

It is beyond the scope of this report to detail all current regulatory reforms. The following regulatory changes of particular relevance to general aviation are outlined to provide context to the discussion of stakeholder issues:

- CASA Regulatory reform programme
  - The Civil Aviation Regulations 1988 and Civil Aviation Safety Regulations 1998, made under authority of the *Civil Aviation Act*, provide for general regulatory controls for the safety of air navigation. The Civil Aviation Act and the Regulations empower CASA to issue Civil Aviation Orders on detailed matters of regulation. CASA is currently implementing a process—the Regulatory Reform Programme—to bring the 1988 Regulations and Civil Aviation Orders into the 1998 Regulations. It is important to note that many of the changes likely to affect general aviation operators and businesses are still to be implemented.
- New CASA enforcement provisions (effective 21 February 2004)
  - Including a voluntary reporting system and demerit point system based on the system used by some States for motor vehicle drivers licenses
- CASA cost recovery
  - On 12 July 2004 CASA increased the rates for existing charges for regulatory services. In accordance with the Australian Government's cost recovery policy, CASA will be undertaking a detailed activity based review of regulatory services provided to the aviation industry. The aim is to phase in full cost recovery from 1 July 2005 (CASA 2003–2004 Annual Report).
- National Airspace System
  - The Australian Government adopted the National Airspace System (NAS) in May 2002. The NAS is a new Australian airspace architecture within an International Civil Aviation Organisation framework that is based on the United States National Airspace System. The NAS Implementation Group is responsible for implementing the NAS[32]. Implementing the NAS entails a large

32 http://www.dotars.gov.au/airspacereform/index.htm and http://www.airservices.gov.au

number of changes to airspace, some of which have had—and will in the future have—an impact on general aviation pilots.

- New aviation security measures (effective 10 March 2005)
  - Following the September 11 terrorist attacks, the Australian Government introduced a range of measures aimed at enhancing security in the aviation industry. The Office of Transport Security, part of the Department of Transport and Regional Services, is implementing these measures. Measures include requirements for small aircraft to have anti-theft measures in place and for pilots to have photographic pilot licenses.

Box 9.1 Fatal accident trends

ATSB (2004) observed that the majority of Australian civil fatal aircraft accidents occur in general aviation operations. This study examined VH-registered civil general aviation fatal accidents for the period 1991 to 2000 inclusive. The report found that:

- There were 215 fatal accidents and 413 associated fatalities between 1991 and 2000.
- Over the ten-year period there were 1.2 general aviation fatal accidents per 100,000 hours flown.
- The annual fatal accident rate decreased from 1.6 fatal accidents per 100,000 hours flown in 1991 to 0.9 in 2000. ATSB observed that—while the decrease to 2000 was not statistically significant—data to the end of 2002 did indicate a statistically significant decrease.

ATSB has also compared fatal accident trends in Australia with similar trends for the USA and Canada (ATSB undated). Currently fatal accidents are the only type of accidents that have a common definition. ATSB found that:

- Australia's general aviation fatal accident rate per 100 000 flight hours for the year 2000 was the lowest of the three countries reported.
- Australia's general aviation fatal accident rate per 100 000 flight hours has been below the Canadian and US rate for all years except for 1994 and 1998.
- Australia's general aviation fatality rate per 100 000 flight hours has been below the Canadian and US rate for all years except for 1990 and 1999.

- Canadian and US rates have improved in recent years and are closer to Australia's rates.

CASA (2004) has also analysed fatal general aviation accidents between 1991 and 2000. This excluded sports aviation and a small number of fatal regular public transport accidents. Of the 196 fatal accidents and 379 fatalities, CASA observed that non-commercial flights—private/recreational flights or those involving personal business—accounted for approximately 53 per cent of accidents and 59 per cent of fatalities. Charter activities accounted for an additional 17 per cent of fatal accidents and 22 per cent of fatalities.

Both analysis excluded sports aviation sector and there is no published detailed analysis of sports safety outcomes in Australia. As noted elsewhere in this report, sports aviation grew significantly between 1993 and 2003 both in terms of the number of registered aircraft and total hours flown. The increase in reported sports hours more than offset the decline over the same period in private flying in VH registered type certified fixed wing aircraft.

SUMMARY OF ISSUES RAISED BY INDUSTRY OPERATORS

A significant number of operators raised issues relating to regulation. For details on the consultation process please see Appendix A. Most related to on-going or current issues experienced by the individuals consulted. Given the nature of the consultation process, it has not been possible to validate or confirm the facts of individual cases. However, the following discussion focuses on issues that appeared to be more generalised.

A lack of consistency in the application of regulation—particularly in the administration of Air Operators' Certificates—was the issue most commonly raised and seemingly of greatest concern to stakeholders. Second level issues include: several operators felt regulations are too inflexible; the costs of delays in the approval processes for chief pilots and chief engineers; and the perceived irrelevance of some aspects of regulation. These issues are discussed below.

Inconsistency

Many operators complained about inconsistent application of regulation. The most common example cited was that the interpretation of the relevant regulation would change at the time that local inspectors changed. This meant the business may have to expend resources adapting to the new requirements. Some business operators cited

examples where different advice was provided concurrently by Area Offices and the head office in Canberra. The need for consistency has been acknowledged by CASA:

> Consistency in regulatory approach and decision making is a challenge for CASA, which is a national organisation with a large number of staff dispersed across offices located across the country. Current programs for reforming safety standards, improving surveillance techniques and introducing new enforcement tools add to this challenge. While progress has been made over the past couple of years, actual and perceived inconsistency continues to be a strong source of grievance in the industry. (CASA 2003–2004 Annual Report).

Related to this issue, some operators felt that there is no viable means of recourse to challenge rulings or administrative decisions—given the time delays and cost of legal appeals. However, CASA noted that the current process and costs of appeals to the Administrative Appeals Tribunal are the same as those faced by non-aviation businesses or individuals that wish to appeal administrative decisions made by the Australian government (CASA, personal communication).

Inflexibility

Several operators believed that CASA processes can be unnecessarily inflexible—particularly for minor changes to the operations specified in an Air Operators Certificate.

Approval process for replacing key staff

A specific issue frequently noted was the CASA approval process for chief pilots, chief flying instructors and chief engineers. Of particular concern, given the commercial cost of significant delays, was the time taken to complete the approval process.

CASA regards the chief pilot and chief flying instructors as key safety positions and stated that it was obligated to assure itself that the nominated person could do the job. It believed that some industry operators did not undertake adequate contingency planning to cover the significant business risk posed by the loss of one of these key personnel (CASA, personal communication).

Relevance

Some stakeholders also questioned the relevance to air safety of some regulatory measures. They felt that CASA is involved in regulating aspects

of their business that are not directly related to the safe operation of aircraft—for example, occupational health and safety.

A need for more enforcement

A number of stakeholders suggested increasing enforcement action to reduce the number of 'dodgy' operators that, for example, might operate below cost for a few years before going out of business, or in the case of maintenance organisations, cut corners to reduce costs. People that raised this issue were concerned about both the 'unfairness' of competition as well as the possibility that such operators might compromise safety.

PART III

NON HIRE AND REWARD FLYING

Non-hire and reward flying includes recreational flying and business flying. Recreational flying is flying for private pleasure, sport or recreation, or personal transport. Business flying encompasses flying by the aircraft owner, the operator's employees or the hirer of an aircraft, where this flying is for business or professional reasons but not directly for financial reward.

Private pilots do not in general generate a direct economic output through their participation in general aviation. However, private flying generates business for aircraft maintenance organisations and flight schools. Many aircraft are used for both commercial activities and private flying. In this way private pilots contribute to the overall sustainability of the general aviation industry.

It is difficult to put a figure on the number of people engaged in this type of aviation as any holder of a current pilots licence can fly privately, subject to the conditions of the license.

In 2004 there were a total of around 33 000 current CASA licensed pilots. Of these CASA issued licenses, around 15 000 were private pilot licences. It is likely that many of the 10 000 holders of commercial and regular public transport pilot licences also fly for private purposes.

In addition, bodies administering sport aircraft such as ultralights and balloons also issue pilots with certificates to fly. In November 2004 there were 4856 ultralight pilot licences and 2329 licensed hang glider pilots—853 of which were licensed to fly microlights. It is not possible to combine CASA and sports pilot license numbers as pilots can hold both license types.

Non-hire and reward flying—including all sports flying—constituted around 680 000 hours or 35 per cent of all flying in 2003.[33]

33 This includes sport aircraft hours, private and business hours. Figures for sport aircraft are estimates with varying degree of accuracy. Sport aircraft hours include training.

Analysis of the available data suggests that the overall trend has been relatively flat. While total hours decreased by 2 per cent between 1993 and 2003, there were two distinct sub-trends—sports aircraft hours increased 52 per cent, while business and private flying decreased 20 per cent.

About half of this 680 000 hours is conducted in type certified aircraft.

In 2003 there were approximately 5700 type certified aircraft and 530 amateur built aircraft that performed private or business flying. The Australian fleet of sport aircraft registered ultralights[34], trikes, gliders and motor-gliders—is approximately 3200 as well as at least another 3000 hang gliders.

34 Figures for ultralights are from October 2004.

CHAPTER 10

RECREATIONAL FLYING

A recreational aviator in 2005 has the choice of a large number of different aircraft types depending on their priorities and their budget. Further, aviation as a recreational pursuit competes with a growing array of alternative leisure pursuits.

Recreational flying includes flying for private pleasure, sport or recreation. This includes parachute dropping, or personal transport not associated with a business or profession. Recreational flying is conducted in traditional VH registered aircraft as well as alternatives such as ultralights, gliders, hang gliders and gyroplanes. For further detail on these aircraft types see chapter 3.

Activity analysis has indicated the following trends over the period 1993–2003:

- An overall increase in recreational flying of 56 000 hours—about 13 per cent—excluding gliders.
- A decline of 46 000 hours—about 19 per cent—in the number of private hours flown by VH registered, type certified fixed wing aircraft.
- A total increase of 13 000 hours flown by VH registered home built aircraft—a 116 per cent increase.
- An increase of 8600 hours flown by VH registered, type certified rotary wing aircraft—a 131 per cent increase.
- An increase of approximately 38 500 hours by hang gliders—a 45 per cent increase.
- An estimated net increase of around 82 000 hrs—52 per cent—in the number of hours flown by sport aircraft excluding home built aircraft and gliders.

Data limitations around the recording of hours performed in sport aircraft categories make estimating the overall trend in non-hire and reward

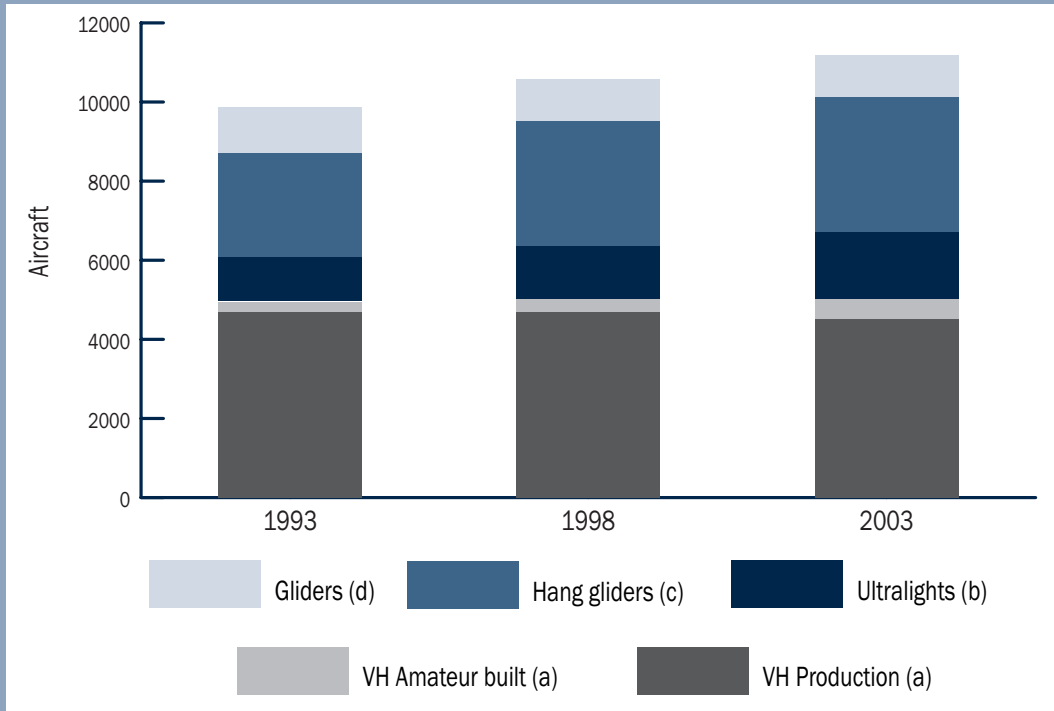
activity problematic. The main influences on recreational flying are likely to be:

- Very large real increases in the costs of maintenance, certified parts and new type certified planes.
- Significant real increases in the costs of other inputs including fuel.
- Significant growth in sport aircraft numbers and hours flown owing to their apparent cost advantages.
- The relocation of aircraft from capital city secondary airports to more distant airports due to cost.

RECREATIONAL AIRCRAFT

Figure 10-1 depicts the changes in the aircraft fleet performing private flying. The VH registered 'production' aircraft included here are all aircraft on the CASA register that reported some flying for private purposes. The majority of VH registered type certified aircraft that

FIGURE 10-1 AIRCRAFT ENGAGED IN PRIVATE FLYING, 1993–2003



a. Figures for VH registered aircraft in this figure include only active aircraft.
b. It was not possible to differentiate between active and inactive ultralights, however, the annual renewal fee payable on ultralights is likely to ensure decommissioned aircraft are not included.
c. The number of hang gliders is estimated from the HGFA membership and is therefore subject to a significant degree of error. The number of trikes (micro-lights) is more accurate as they must be registered.
d. It was not possible to differentiate between active and inactive gliders. The GFA estimate the number of active aircraft at around 650, with a further 250 aircraft undergoing maintenance or restoration.

Source BTRE General Aviation Survey 1993, 1998 and 2003; HGFA; GFA; RAA.

perform private flying are small single engine planes (74 per cent). These type certified fixed wing planes have an average age of around 30 years. Amateur built aircraft have an average age of only 10 years.

Figure 10-1 includes all ultralights and an estimate of the number of hang gliders and gliders. In 2003, 14 per cent of all aircraft registered with HGFA were microlights. Gyroplanes were not included as data were not available for all years. The ASRA advised that there are currently 240 gyroplanes registered, however, there may be many more unregistered planes—perhaps even double this figure.

Figure 10-1 illustrates the main trend in private and recreational flying. Essentially, there has been a shift away from recreational flying in VH registered, type certified fixed wing aircraft towards home built and sport aircraft such as ultralights.

The main reasons for this shift are likely to be the increased cost of flying in VH registered aircraft coupled with the increased quality and performance of low cost sport aviation alternatives. Private flying is a recreational pursuit and hence constitutes discretionary spending. As a result, the demand for private flying is expected to be sensitive to increased costs. As was noted in previous chapters, the cost of buying and operating VH type aircraft has increased substantially over the past 10 to 20 years. Other evidence that may support this is the growing number of amateur built planes.

THE LOCATION OF RECREATIONAL FLYING

Figure 10-2 (page 62) illustrates the distribution of private flying in all VH registered aircraft in Australia. Omitted from the figure are hours flown by sports aircraft—these account for about half of all recreational hours.

Figure 10-2 (page 63) clearly shows that the hours operated by VH registered aircraft are distributed in a similar manner to population—Melbourne, Sydney, Perth and greater Brisbane[35] accounted for 38 per cent of all flying activity in 2003.

TRENDS IN RECREATIONAL FLYING

Figure 10-3 (page 85) depicts an increase in the number of aircraft performing private flying. In this case gliders have been omitted as there was no complete time series of glider activity available.

Overall estimates of hours support the trend indicated by the number of aircraft (Figure 10-1) even though active sport aircraft could not be

35 Greater Brisbane includes the statistical district of Moreton which incorporates both the Sunshine Coast and the Gold Coast.

FIGURE 10-2 LOCATION OF PRIVATE FLYING HOURS IN VH REGISTERED AIRCRAFT, 2003

a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*

b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*

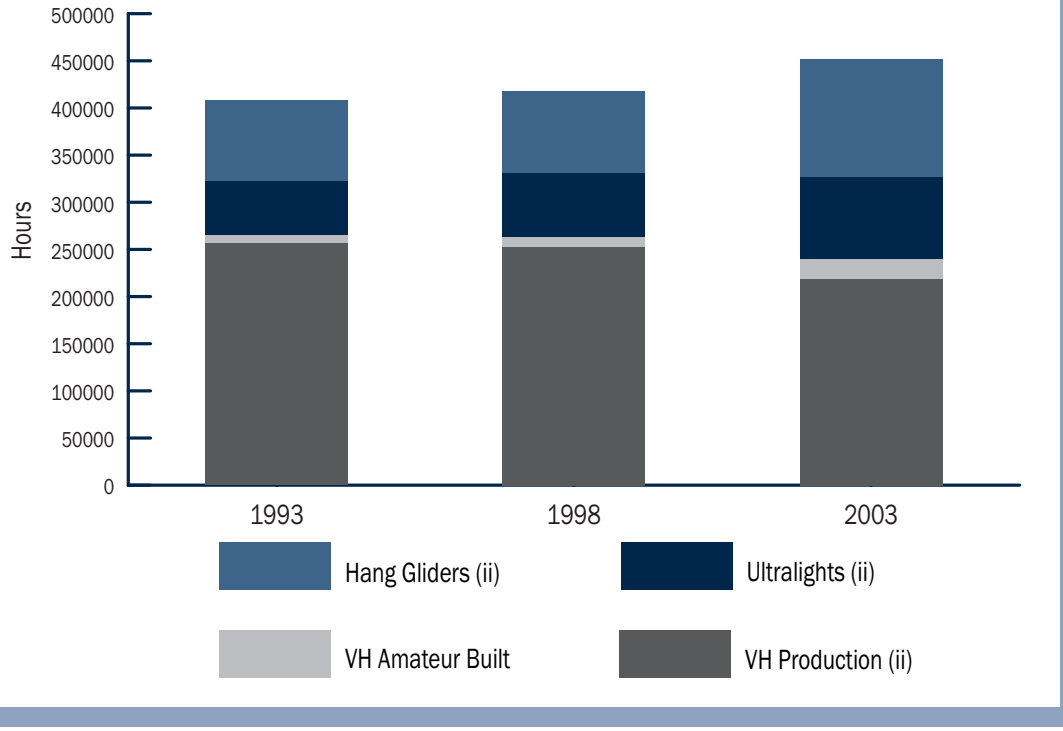
c. *Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.*

Source BTRE General Aviation Survey 2003

isolated from inactive aircraft. Overall the trend appears to be growth in sport aircraft hours and moderate decline in private flying in VH registered type certified aircraft.

On average, only around 40 per cent of the time that type certified aircraft spend in the air is performing private flying. The greatest other use of these aircraft is training, which constitutes a further 37 per cent of their air time. Amateur built aircraft—including 22 rotary and 3 multi engine aircraft—are the exception; these on average spend around 90 per cent of their flying time performing private flying.

FIGURE 10-3 PRIVATE FLYING HOURS BY AIRCRAFT TYPE, 1993–2003



Source *BTRE General Aviation Survey 1993, 1998 and 2003; HGFA; GFA; RAA (BTRE Digest of Statistics)*

The following sections describe some of the underlying trends in recreational aviation.

The growth in amateur built planes

Figure 10-4 (page 64) shows the growth in homebuilt aircraft numbers and activity. Homebuilt aircraft are predominantly used for recreational purposes. Private, or recreational flying, accounts for the greatest proportion of hours—around 82 per cent. Business flying accounts for a surprising 10 per cent of hours. Test and ferry accounts for a further 6 per cent of the remaining hours, far higher than the VH registered fleet average of 1.2 per cent. This may reflect the fact that many of these planes are currently being built and tested.

Between 1993 and 2003 the proportion of home built aircraft that are active has decreased from 74 per cent to 64 per cent. This may reflect an increase in the number of home built aircraft currently being built. If this is the case it is likely that hours flown by amateur built aircraft will increase over the coming few years as these new planes are completed.

FIGURE 10-4 HOME BUILT AIRCRAFT IN AUSTRALIA 1993–2003: NUMBER OF AIRCRAFT AND PRIVATE HOURS FLOWN

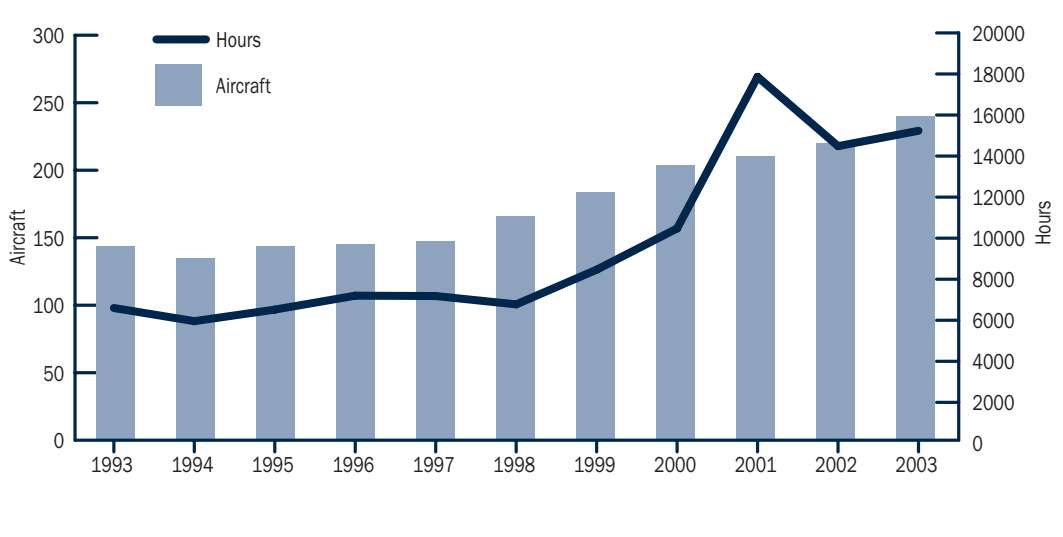
Note *Includes some amateur built rotary wing aircraft*

Source *BTRE General Aviation Surveys 1993–2003*

Growth in private use of rotary wing aircraft

Figure 10-5 shows the quite dramatic growth in the private use of rotary wing aircraft. While still constituting only 6.5 per cent of all private hours this represents a 130 per cent increase over the 10 years. There has

FIGURE 10-5 PRIVATE FLYING IN TYPE CERTIFIED ROTARY WING AIRCRAFT, 1993–2003



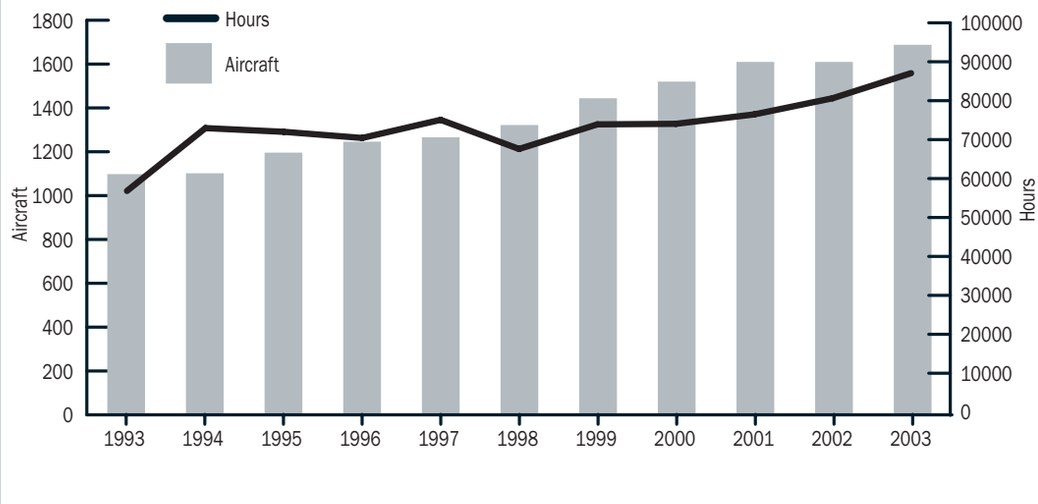
Source *BTRE General Aviation Surveys 1993–2003*

also been growth in the number of amateur built helicopters—this increased from 8 aircraft in 1994 to 61 aircraft in 2004.

Growth in ultralight numbers and hours

Figure 10-6 shows the increase in aircraft and hours. The high variance in the hours flown may reflect inaccuracies in the reporting of hours. As noted earlier, ultralights can perform recreational flying, training or even business flying. It has not been possible to disaggregate between these as the purpose of flying hours is not recorded for ultralights.

FIGURE 10-6 PRIVATE FLYING IN ULTRALIGHT AIRCRAFT, 1993–2003



Note *2003 figure—hours are for year to October 2004, airframes 2003.*

Source *Recreational Aviation Association of Australia.*

Where is the change occurring?

As can be seen in figure 10-7 (page 66), several Statistical divisions display growth while others show decline.

The differing infrastructure charges between airports in different regions may be responsible for aircraft moving from expensive metropolitan aerodromes to more affordable regional airstrips. Shifting demography and population is also likely to be a key driver of these regional differences in growth rates.

It has not been possible to assess the location of change of hours for aircraft registered with RAA, the HGFA, ASRA or GFA.

FIGURE 10-7 CHANGE IN PRIVATE FLYING HOURS IN VH REGISTERED AIRCRAFT BY LOCATION, 1993–2003

a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*
b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*
c. *Registered aircraft that could not be mapped are not included in this figure. In 2003 there were 18 aircraft—which flew 72 hours—that could not be allocated. This compares with 25 aircraft—which flew 2674 hours—in 1993.*

Source BTRE General Aviation Surveys 1993 and 2003

CHAPTER 11

BUSINESS FLYING

Flying for business purposes is defined as flying associated with a business or profession but not directly for hire and reward.

As noted earlier, flying for business purposes does not neatly fit the commercial—recreational split. Business flying is—by definition—a business input. However, if it is not conducted on a hire and reward basis then it is not possible to quantify its cost. It is difficult to conduct any meaningful analysis of the trends in business travel. Business flying can include a range of activities and it is a substitute for some hire and reward flying activities and private flying. For example, a flight from Dubbo to Sydney will be reported as private flying if it is undertaken solely for pleasure, or possibly business flying if it includes a business meeting. However, the same flight will be reported as charter if the plane and pilot are hired—regardless of the purpose of the journey.

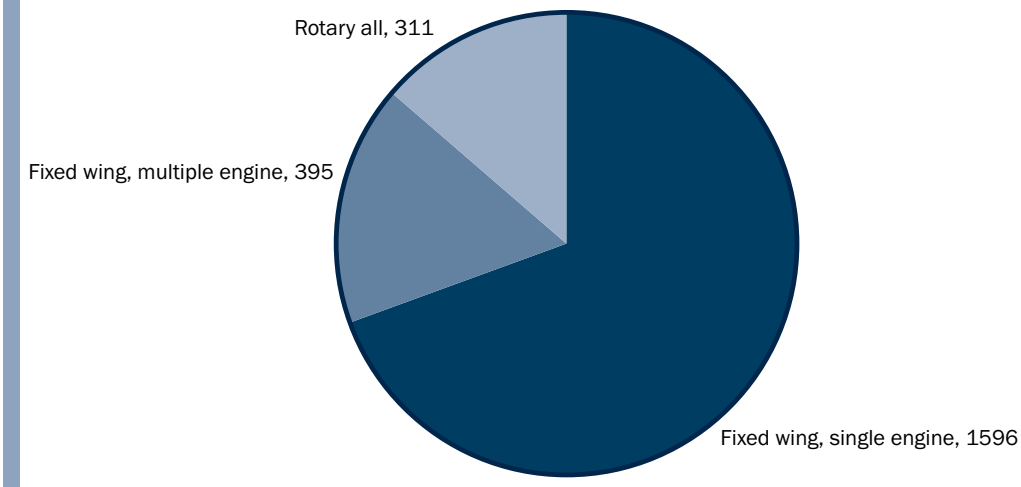
Most business flying is likely to be conducted in VH registered aircraft. Business flying is more likely than recreational flying to comprise point to point flights—as opposed to circular flights to and from the same airport. A point to point flight is conducted to get from point A to point B. A circular flight involves taking off and landing at the same aerodrome. A circular flight might be conducted as a joy flight or for personal flight practice. It is likely that point to point flying is most appropriate in traditional VH registered aircraft due, inter alia, to airspace restrictions on ultralights and other sport aircraft. This is supported by the fact that the average flight time for fixed wing aircraft that only perform business flying is almost double that of fixed wing aircraft that only perform private flying.

VH REGISTERED AIRCRAFT USED FOR BUSINESS FLYING

Business flying is primarily conducted in small, single engine fixed wing aircraft. Nearly 14 per cent of all business hours are conducted in rotary wing aircraft. This is substantially higher than the 7 per cent of private flying conducted in rotary wing aircraft. Similarly 20 per cent of business

flying is conducted in multi-engine fixed wing, around double the proportion of private flying conducted in multi-engine fixed wing aircraft. The fixed wing aircraft clocking the most business hours in 2003 appeared to belong to resource companies.

FIGURE 11-1 VH REGISTERED AIRCRAFT PERFORMING BUSINESS FLYING, 2003



Source BTRE General Aviation Survey 2003

WHERE IS BUSINESS FLYING OCCURRING?

Figure 11-2 depicts business by locality. Perhaps the most striking feature of this is the wide distribution across the regions. For business flying, aircraft based in Melbourne, Sydney, greater Brisbane—including Gold and Sunshine Coasts— Perth and Adelaide account for only 31 per cent of hours. This compares to the general aviation average of 39 per cent

TRENDS IN BUSINESS FLYING

As can be seen from figure 11-3, business flying has been characterised by a consistent decline between 1993 and 2000, followed by slight upturn for the last three years. It is also noteworthy that the use of helicopters for business purposes has steadily increased—hours have grown 23 per cent over the period. This growth is primarily in single engine rotary wing aircraft.

Business flying is likely to be influenced by many of the same issues as private flying. Discussions with general aviation operators indicate that—certainly in the last 3 years—the low cost and ease of travel on domestic regular public transport compared with the relative high cost of operating a light plane has been a major factor. Also, as noted in chapter 5, the new infrastructure charging arrangements impose greater cost increases

FIGURE 11-2 LOCATION OF BUSINESS FLYING HOURS IN VH REGISTERED AIRCRAFT, 2003

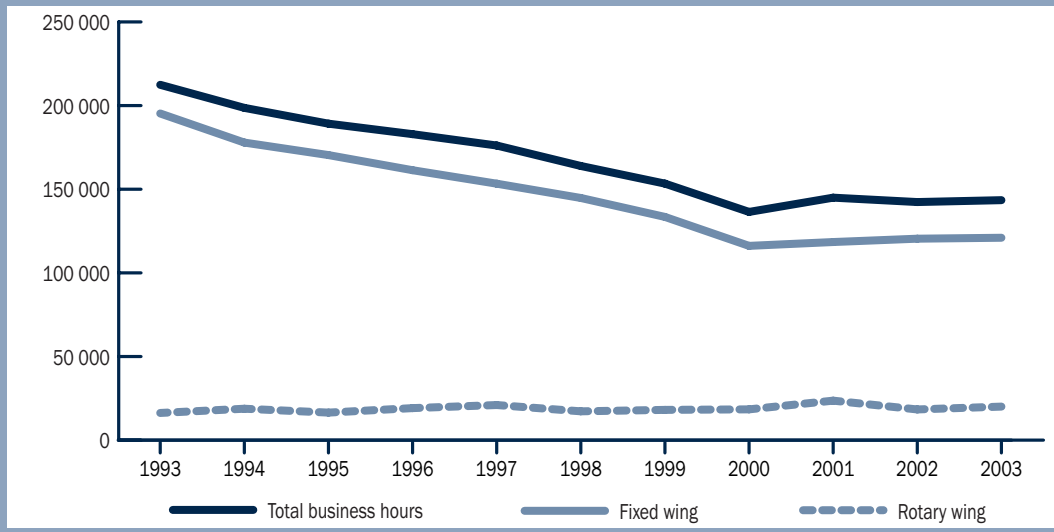
a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*
b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*
c. *Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.*

Source BTRE General Aviation Survey 2003

on point to point flying than circular flights. Finally as noted above, business flying is a substitute for both private and hire and reward flying—hence it is subject to variation due to changing operational arrangements and reporting.

Two candidates for explaining the upturn in 2001 are the collapse of Ansett and the introduction of the GST. The introduction of GST may provide an incentive to report flying as business in order to capture input credits.

FIGURE 11-3 BUSINESS FLYING HOURS IN AUSTRALIA BY AIRCRAFT TYPE, 1993–2003



Source BTRE General Aviation Survey 2003

The growth in business helicopter activity is occurring against rising costs. Rotary wing aircraft are more expensive to operate and rotary wing training is more expensive. Therefore it seems likely that demand factors are dominant in explaining this growth. Many of the rotary wing aircraft flying the most business hours appeared to belong to resource companies and other rural industries. Helicopter operators consulted felt that the unique flying characteristics of helicopters were the main attraction of rotary wing aircraft.

Considering the change in business hours recorded by statistical division, figure 11-4 illustrates that the greatest decline in absolute terms in business hours occurred in the greater Sydney region. It also shows that there are several statistical divisions that experienced an increase in the number of hours performed for business purposes.

FIGURE 11-4 CHANGE IN BUSINESS FLYING HOURS IN VH REGISTERED AIRCRAFT BY LOCATION, 1993–2003

a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*
b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*
c. *Registered aircraft that could not be mapped are not included in this figure. In 2003 there were 18 aircraft—which flew 72 hours—that could not be allocated. This compares with 25 aircraft—which flew 2674 hours—in 1993.*

Source BTRE General Aviation Survey 1993 and 2003

PART IV

HIRE AND REWARD FLYING: COMMERCIAL AIRCRAFT OPERATORS

Hire and reward—commercial—general aviation contributes a wide range of inputs to the economy. The commercial general aviation industry includes over 700 active operators—employing about 4700 people—and had a turnover of $1.05 billion in 2004. Within this category there are distinct sectors including charter and pilot training, and a wide array of aerial work.

Hire and reward flying is facing rising costs and increasing competition from transport substitutes including road travel and low cost airlines. Commercial general aviation is a competitive market with many small firms. Stakeholders have suggested operating margins are low and that some operators either choose to operate at or even below cost—or lack sufficient business training to manage the complex costs and risks associated with aviation.

HIRE AND REWARD ACTIVITIES

Commercial operators fly for hire and reward. Typical hire and reward activities include:

- Charter operations
  - Carriage of cargo or passengers on non-scheduled operations by the aircraft operator, or the operator's employees, in trade or commerce, but excluding regular public transport operations.
- Flying training
  - Flying under instruction for the issue or renewal of a licence or rating, aircraft type endorsement or conversion training. Includes solo navigation exercises conducted as part of a course of applied flying training.
- Aerial work
  - Includes aerial survey and photography, spotting, search and rescue, ambulance, towing—including glider, target and banner towing, and

other aerial work—including advertising, cloud seeding, fire fighting, parachute dropping, and coastal surveillance.

- Agricultural spraying

– 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.

- Aerial stock mustering

It should be noted that aerial work—including agriculture and mustering—can be done by private pilots but this cannot be done on a hire and reward basis.

INDUSTRY STRUCTURE

In 2004 there were approximately[36] 715 active commercial aircraft operators performing predominantly general aviation flying activities[37]. To operate an aircraft on a hire and reward basis, businesses are required to hold a current air operators certificate issued by CASA. Many operators hold certificates to perform multiple activities. Indeed, the most common air operating certificate allows both aerial work and charter operations. The figure below depicts the number of operations disaggregated by the *primary* type of operation[38].

The charter category illustrated in figure IV-1 includes six cargo and 94 joy flight operators. The aerial work category includes aerial agriculture. In the 1999–2000 financial year an estimated 215 businesses reported aerial agriculture—including mustering—as their primary source of income.

The industry is characterised by a large number of small operators. This is illustrated by figure IV-2 which depicts aircraft operators for all operation types. Approximately 64 per cent of all operators are running three or fewer aircraft. It appears that training is to some degree an exception to this trend with on average significantly larger fleets.

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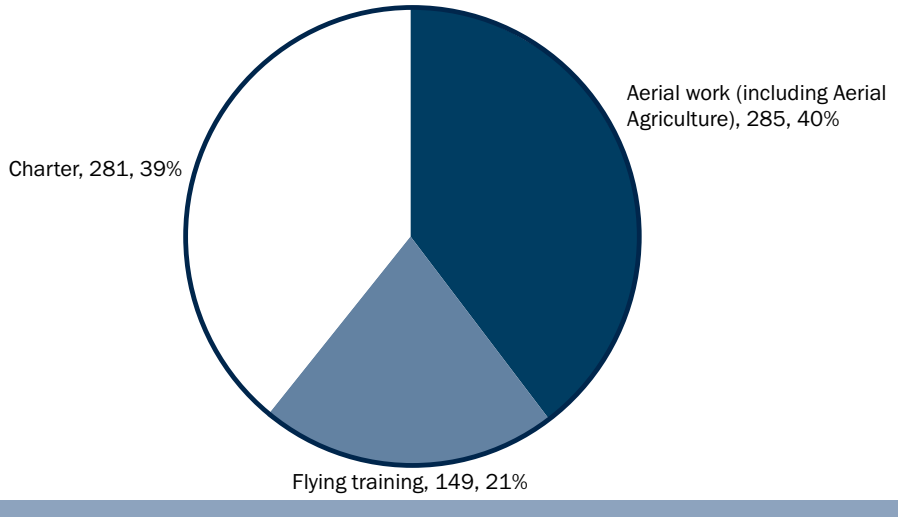
36 A precise number is difficult to estimate due to the large number of business start-ups and closures.

37 This report defines general aviation to include ultralights, gyroplanes, hang-gliders and gliders. It is important to note that the discussion here does not take into account these aircraft and associated industry unless otherwise stated. These could make a significant difference to figures reported for training and business flying.

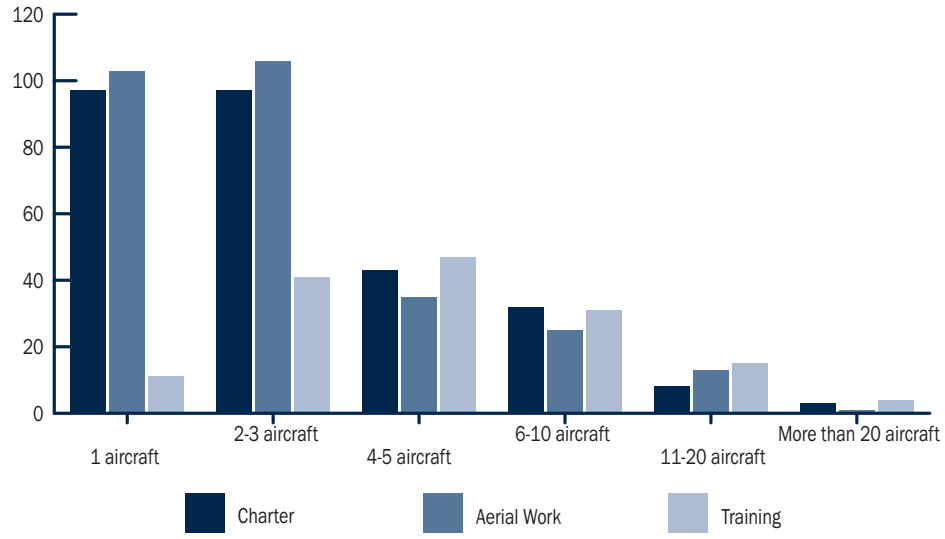
38 CASA safety trend indicator data is a based on a survey completed by CASA inspectors whereby operators are classified by the primary type of activity undertaken—operator categorisations are therefore the opinion of the inspector. This differs from the BTRE General Aviation Survey which categorises hours flown according to the trip purpose reported by the aircraft owner.

FIGURE IV-1 COMMERCIAL AIRCRAFT OPERATORS IN AUSTRALIA 2004, BY PRIMARY ACTIVITY



Source *CASA STI Database*

FIGURE IV-2 FLEET SIZE BY PRIMARY OPERATIONAL ACTIVITY, 2004



Source *CASA STI survey responses.*

The proportion of helicopter operators that operate only one aircraft at around 41 per cent is slightly higher than for fixed wing aircraft. Approximately 75 per cent of helicopter operators operate three aircraft or less.

BUSINESS START-UPS AND CLOSURES

A high degree of entry and exit is evident in general aviation businesses. About seven percent of all aircraft operators covered by the CASA safety trend indicator survey had been in existence 12 months or less at the time of their last survey.

Several stakeholders raised the issue that many businesses are operated by enthusiasts who are willing to run their operations at or even below cost. This was raised many times by operators who felt they lost business as a result.

INDUSTRY SIZE

As can be seen from table IV-1, aircraft operators turn over around one billion dollars a year. This figure has remained quite stable over the past four years. Non-scheduled aviation aircraft operators employ over 4700 people.[39]

TABLE IV-1 GROSS INDUSTRY TURNOVER $A2004 (MILLIONS)

	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	
Industry Turnover	984.1	998.2	1043.9	998.3	1050.7	$m
Industry Gross Product	490.9	504.8	529.1	508.9	538.8	$m
Number of Establishments	889	898	903	886	885	Units
Number of Enterprises	774	785	788	775	772	Units
Employment	4705	4740	4767	4722	4762	Units
Total Wages	258.4	262.4	269.1	262.2	271.1	$m

Note includes aerial agriculture and non-scheduled air transport. The number of enterprises above (772) is different from the 715 quoted previously due to the different methods used to estimate the figure. This includes differences in the definitions of active operators and start ups and closures.

Source IBISWorld Business Information (www.ibisworld.com.au)

Not including aircraft maintenance and manufacture or aerial agriculture, the general aviation industry generated around $70m in exports in 2003–2004.

39 IBISWorld Business Information (www.ibisworld.com.au)

CHAPTER 12

PILOT TRAINING

Flight training schools in Australia cater for recreational pilots and aspiring professional pilots. Overseas students and professional pilot courses comprise two important sectors of the training market.

Training for CASA issued licences must be performed in type certified production aircraft. However training to fly a glider, ultralight, hang glider or powered hang glider can be performed in these aircraft respectively.

Flight training in VH registered aircraft accounts for around 22 per cent of all general aviation activity measured in hours.

Key features of the CASA certified flight training are outlined in the following.

- There is a relatively level trend in total training hours flown in VH registered aircraft.
- Training in rotary wing aircraft showed overall growth over the decade to 2003.
- Training in turbine aircraft constitutes a very small but growing proportion of total training hours.
- Flight training is a competitive market, with at least 149 Air Operators' Certificate holders flying predominantly for the purpose of flight training.
- Sport aircraft such as ultralights constitute a cheaper alternative and are likely to be taking up a share of the recreational market—this will have flowed on to the training market through reduced demand for flight training for recreational pilots.
- Overseas students and professional pilot courses run by tertiary institutions provide a stable base level of demand for some operators.

TRAINING ORGANISATIONS

Eighty per cent of flight schools operate between two and ten aircraft. The most common fleet size of training organisations is four to five aircraft.

Most of the training fleet are not dedicated to performing training alone. For example, fixed wing aircraft that undertake flight training spend—on average—about half their hours performing training, with the remainder of their air time split between several activities. For rotary wing aircraft, one quarter of total hours in 2003 were spent performing training, with the remainder of their air time split primarily between charter (28 per cent) and aerial work (27 per cent).

However, there does appear to be a subset of relatively dedicated training aircraft. In the case of fixed wing aircraft, about 91 per cent of all training hours in 2003 were conducted by the 36 per cent of aircraft that flew more than 100 hours of training. This subset of aircraft spent 88 per cent of their time in flying training.

WHERE IS VH AIRCRAFT TRAINING OCCURING?

Fugure 12-1 illustrates the distribution of flight training allocated by the nominated home base of VH registered aircraft. As can be seen from figure 12-1, flight training occurs overwhelmingly in capital cities—with Perth, Melbourne, Sydney, greater Brisbane[40] and Adelaide accounting for 72 per cent of all training activity in 2003.

Some large flying schools in Australia include China Southern and Singapore Flying College based at Jandakot; BAE and General Flying Services, based at Parafield and Moorabbin respectively.

TRENDS IN VH FLIGHT TRAINING

Overall flight training hours in VH registered aircraft[41] have followed a relatively level trend over the decade to 2003. Underlying this aggregate trend in hours, training in fixed wing aircraft has decreased 5 per cent while training in rotary wing aircraft has increased by 12 per cent.

While training in turbine powered aircraft constitutes only four per cent of all training activity, this has been growing consistently over the decade to 2003. This is shown in figure 12-3. In 2003, the two biggest turbine training operators—China Southern and Singapore Flying College—accounted for nearly 9 000 of these hours.

40 The greater Brisbane area includes the statistical district of Moreton which incorporates both the Sunshine Coast and the Gold Coast.

41 Excluding gliders.

FIGURE 12-1 LOCATION OF TRAINING HOURS IN AUSTRALIA, 2003

a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*
b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*
c. *Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.*

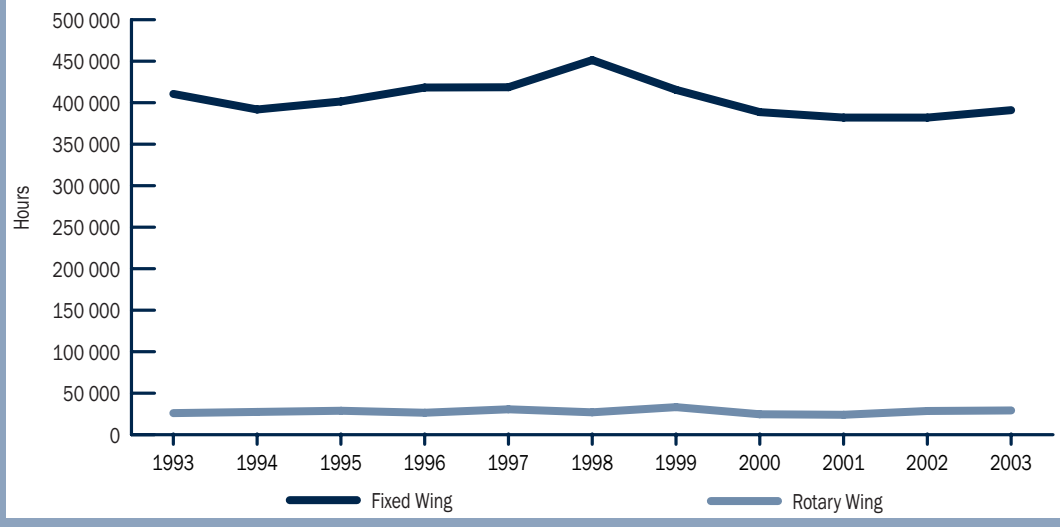
Source BTRE General Aviation Survey 2003

DEMAND

Flight training schools in Australia cater for recreational pilots and aspiring professional pilots.

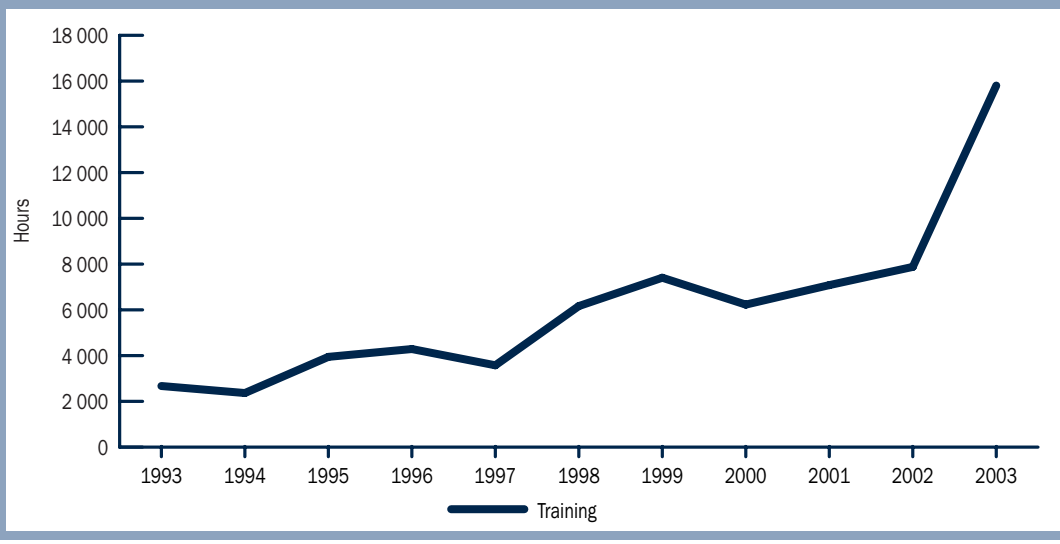
University offered professional pilot courses and overseas students comprise two important sectors of the training market for aspiring professional pilots. Some reported significant growth, particularly in Western Australia.

FIGURE 12-2 TRAINING HOURS IN VH REGISTERED AIRCRAFT, 1993–2003



Note Does not include training occurring in sport aircraft, except amateur built aircraft.
Source BTRE General Aviation Surveys 1993–2003

FIGURE 12-3 TRAINING HOURS PERFORMED IN TURBINE AIRCRAFT, 1993–2003



Source BTRE General Aviation Surveys 1993–2003

Industry stakeholders commented that they see considerable scope to attract more overseas student pilots. This is due to both growth in Asia and the lower prices charged by Australian schools. Australia competes internationally for commercial pilot training and this market is sensitive to exchange rate fluctuations.

Some stakeholders have commented that the demand for pilot training from aspiring professional pilots has been influenced by the Ansett

collapse which created the perception that pilot training is not a route to a stable career.

The demand for training for recreational purposes is likely to have been influenced by growth in sport aircraft flying—particularly ultralights. Ultralights represent a substitute for recreational flying. In addition, hours performed in ultralight training can be counted toward the minimum requirement for CASA private pilots licence. It has not been possible to consider trends in ultralight and other sport aviation flight training as detailed sports activity data is not collected. However, training for these recreational pursuits is likely to be commensurate to the total hours flown. An increase in sports flying—and consequently sports training—would be expected to flow through to reduced demand for flight training in VH registered, fixed wing aircraft.

Most flight training centres consulted felt positive about the continuing demand for flight training—particularly in the overseas student market. It has been suggested that the primary basis of competition is safety and service rather than price. There appears to be a wide range of prices charged for pilot training ranging from ~$175 to above $250 per hour. The total approximate cost of pilot licences is represented in Table 12-1.

TABLE 12-1 INDICATIVE COSTS OF PILOT LICENCES BY TYPE

Licence	Approximate Cost
Private visual flight rules	$12 000
Commercial	$25 000–$35 000 (regular public transport + 1500 hrs)
Instrument Rating	$8 000 to +$10 000
Rotary Wing Private	$25 000
Rotary Wing Commercial	$40 000–$45 000
Ultralight	$2 500–$3 500
Glider	$1 800–$3 000

Note *Costs are indicative only and generally include licensing fees and charges and average flying hours required to meet license requirements.*

Source *Industry consultation*

CHAPTER 13

AIR CHARTER

Charter includes the carriage of cargo or passengers on non-scheduled operations by the aircraft operator, or the operator's employees, in trade or commerce, but excluding regular public transport operations. Charter can only be performed in type certified aircraft. Air charter constitutes around 22 per cent of all general aviation activity measured in hours.

Key features of the charter market are outlined in the following.

- Flight charter is a competitive market, with over 280 generally small firms operating.
- The decade to 2003 saw a level overall trend in total charter hours flown.
- Charter in rotary wing aircraft has been growing over the decade.
- The decade to 2003 saw an apparent shift toward larger aircraft

– This shift has lead to a 24 per cent increase in aggregate annual potential payload over the decade to 2003

– The growth in potential payload appears to have peaked in 1999 after which it has followed a downward trend.

Increasing real costs of charter, combined with reducing regular public transport fares—resulting from entry of low cost airlines—is likely to be key in explaining this trend. Growth in fly in fly-out mining in larger aircraft may be concealing the extent of this decline.

Low fares from on going competition in the regular public transport market are likely to continue to erode the smaller end of the charter market.

CHARTER OPERATORS

Seventy per cent of air operators' certificate holders that predominantly fly for the purpose of charter utilise three or fewer aircraft. Approximately 35 percent of charter operators operate only one aircraft.

Most of the charter fleet are not dedicated to performing charter alone. For example, fixed wing aircraft that undertake flight charter spend—on average—64 per cent of their hours performing charter, with much of the

remainder split between regular public transport (14 per cent) and training (11 per cent). For rotary wing aircraft, the proportion of hours performing charter is approximately half—with the remainder split between aerial work (19 per cent), training (11 per cent) and mustering (9 per cent).

However, there does appear to be a subset of relatively dedicated charter aircraft. In the case of fixed wing aircraft, about 83 per cent of all charter hours in 2003 were conducted by 584 aircraft—61 per cent of all aircraft flying charter hours—that each flew more than 200 hours of charter per year. This subset of aircraft spent 91 per cent of their time flying charter. These 584 aircraft include 73 Piper PA-31, 69 Cessna 210s, 51 Cessna 206s, and 35 Cessna 310s. These aircraft all have an average maximum takeoff weight of around 3 tonnes or less.

Figure 13-1 shows the location of charter hours by the nominated aircraft home base—notably the large amount of charter hours in northern Australia.

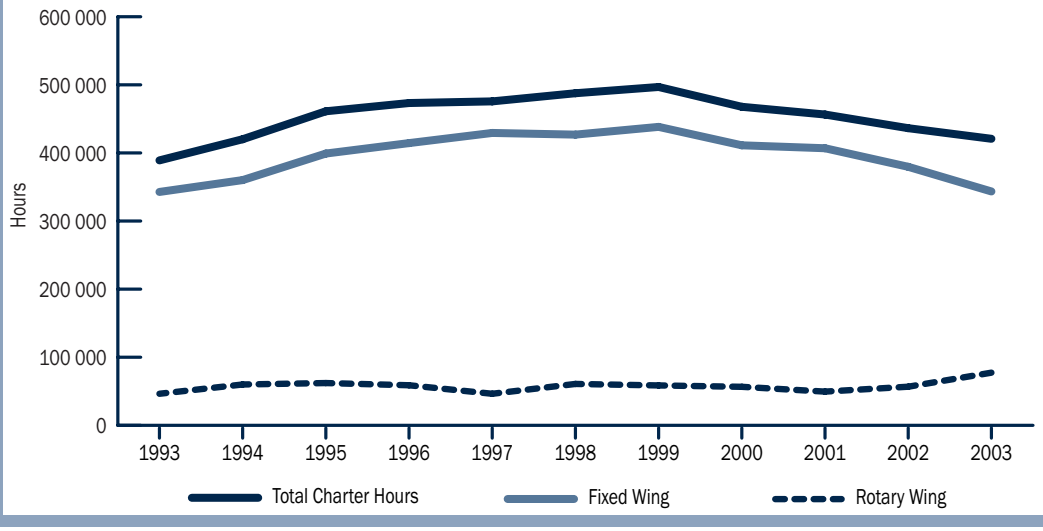
FIGURE 13-1 LOCATION OF CHARTER HOURS, 2003

a. The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.
b. Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.
c. Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.
Source BTRE General Aviation Survey 2003

TRENDS IN CHARTER FLYING

Overall charter hours have grown by approximately 9 per cent over the decade to 2003 (figure 13-2). Underlying this aggregate trend, charter hours in fixed wing aircraft have grown by only 0.2 per cent while rotary wing charter hours have increased by 67 per cent per cent.

FIGURE 13-2 CHARTER HOURS, 1993–2003



Note *Total includes balloons.*

Source *BTRE General Aviation Surveys 1993–2003*

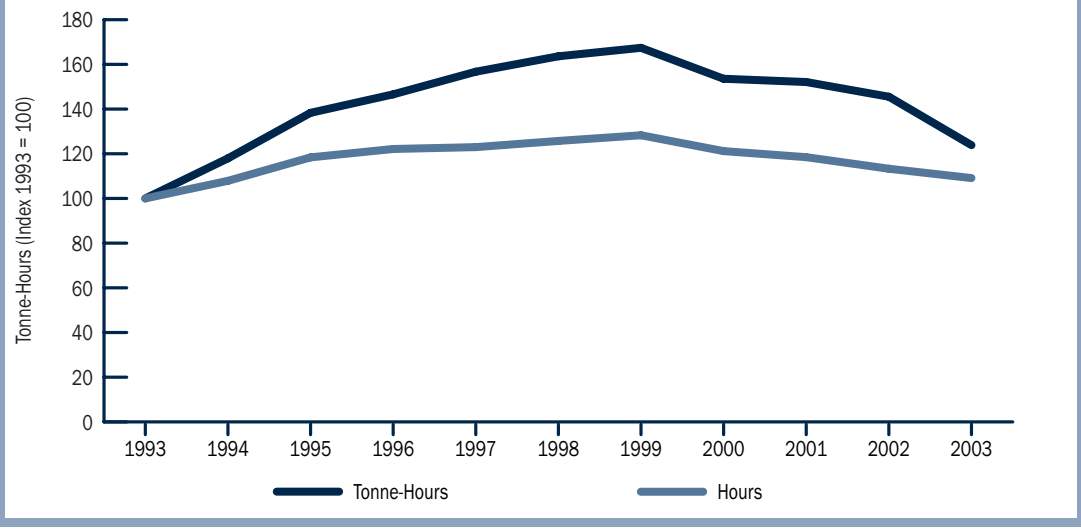
The average weight of aircraft performing charter has also been increasing. This increase in average weight means that the total potential payload—that is, the hours flown weighted by the capacity measured in maximum take of weight—has increased more than aggregate hours.

Figure 13-3 depicts an indexed series of total payload of charter flying against total hours. This trend in payload is characterised by strong growth up until 1999 followed by decline. The overall growth in payload is 24 per cent over the decade to 2003.

As can be seen in figure 16.2, the decade to 2003 also saw a significant increase in the number of hours performed by dedicated charter aircraft.

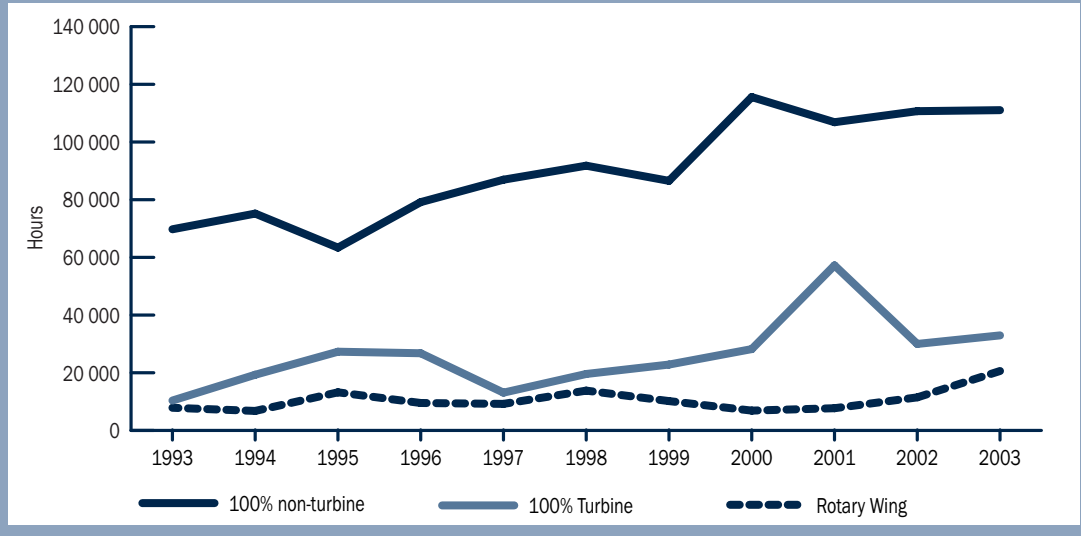
In 2003 dedicated charter aircraft flew 42 per cent of all charter hours, up from 23 per cent in 1993. As can be seen from figure 13-4, this is true of both turbine and non turbine fixed wing aircraft—as well to some extent for rotary wing aircraft. It may be that operators are becoming more specialised. That is, they may be choosing the planes most suited to the specific charter requirements.

FIGURE 13-3 TOTAL CHARTER—POTENTIAL PAYLOAD



Source BTRE General Aviation Surveys 1993–2003

FIGURE 13-4 CHARTER HOURS PERFORMED BY DEDICATED AIRCRAFT, 1993–2003

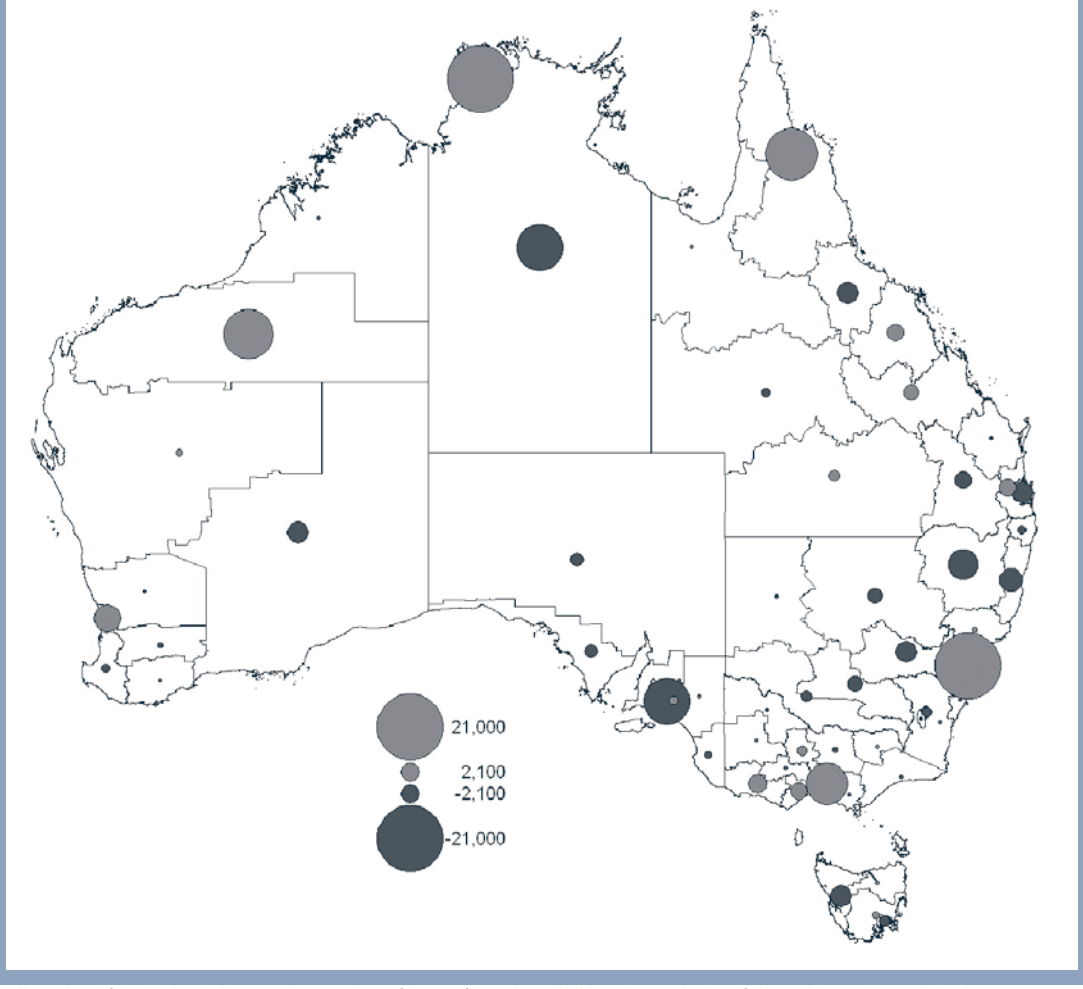


Source BTRE General Aviation Surveys 1993–2003

WHERE IS THE CHANGE IN CHARTER ACTIVITY OCCURING?

Considering the location of change in charter hours produces some surprising results. As might be expected there appears to be substantial growth in the north and north west of Australia. There has also been substantial growth in charter hours in the Sydney region between 1993 and 2003.

FIGURE 13-5 CHANGE IN CHARTER HOURS BY LOCATION, 1993–2003



a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*

b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*

c. *Registered aircraft that could not be mapped are not included in this figure. In 2003 there were 18 aircraft—which flew 72 hours—that could not be allocated. This compares with 25 aircraft—which flew 2674 hours—in 1993.*

d. *It should be noted that any shift of charter activity between aerodromes in the same statistical division—for example, from Bankstown to Camden or Kingsford Smith—will not be apparent in the figure.*

Source BTRE General Aviation Surveys 1993 and 2003

DEMAND

Key markets for charter include business and the corporate sector, including fly in fly out mining operations and bank runs, as well as the leisure tourist market including joy rides. Demand for charter derives from both business and government sectors, as well as from the leisure holiday market.

The primary influences on the demand for charter transport in the business market will include:

- The reduced price of regular public transport flying and improvements in road quality
  - These will tend to reduce demand for charter travel
- Growth in rural industries such as mining will tend to increase demand.
- Increase in the cost of flying deriving from increased maintenance, capital and other associated costs described in earlier sections
  - These are likely to have the greatest effect on the leisure charter market

Most stakeholders consulted believed the increasing affordability of regular public transport travel, combined with the increased cost of operating type certified general aviation aircraft, were primary drivers of the reduction in the charter market.

CHAPTER 14

AERIAL WORK

Aerial work includes a great range of aerial activities—technically including both aerial agriculture and mustering—however these will be discussed in chapter 15. Activities encompassed by aerial work as defined in this report include: aerial survey and photography, spotting, search and rescue, ambulance, towing (including glider, target and banner towing) and other aerial work including advertising, cloud seeding, fire fighting, parachute dropping, and coastal surveillance.

Aerial work performed on a hire and reward basis must be performed in type certified aircraft. Aerial work performed in VH registered aircraft constitute around 11 per cent of all general aviation activity measured in hours.

Key features of the CASA certified aerial work are outlined in the following.

- Total aerial work hours flown has remained relatively static over the decade to 2003, within this there has been significant substitution between work types.
- Aerial work in rotary wing aircraft has been growing.
- Aerial work, including aerial agriculture is a competitive market, with about 285 small firms, with 74 per cent of these operating three or fewer aircraft.

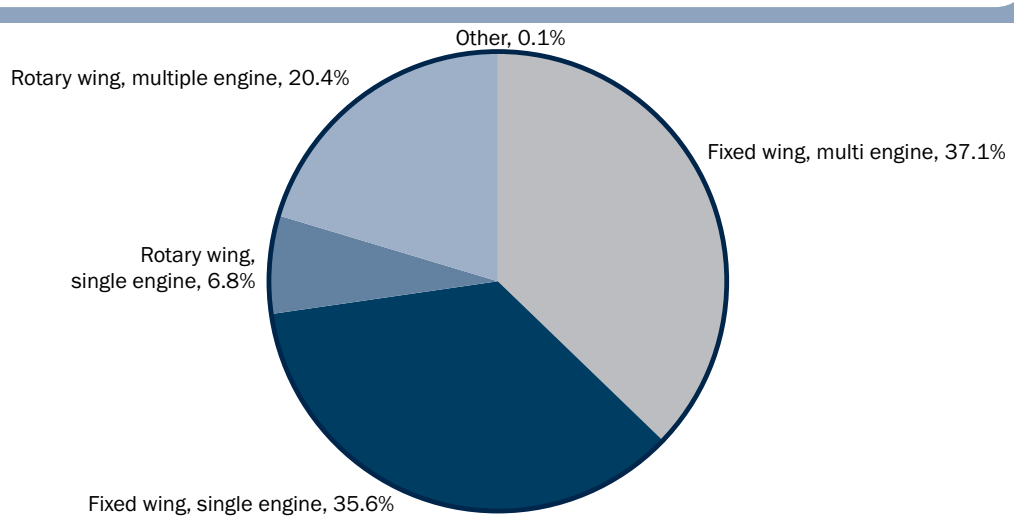
ORGANISATIONS AND AIRCRAFT PERFORMING AERIAL WORK

74 per cent of Air Operators' Certificate holders predominantly fly for the purposes of aerial work operate between three or fewer aircraft. Of the 285 Air Operators' Certificate holders that predominantly fly for the purposes of aerial work, 210 are engaged in aerial work that does not involve carrying passengers[42].

42 It is not possible to split out agricultural activities; these figures incorporate both mustering and aerial agriculture.

Most aerial work is conducted in fixed wing aircraft. However a significant amount—27 per cent—is conducted in rotary wing aircraft. Figure 14-1 depicts breakdown of aerial work by aircraft type on the basis of hours flown.

FIGURE 14-1 AERIAL WORK HOURS PERFORMED BY VH REGISTERED AIRCRAFT, 2003

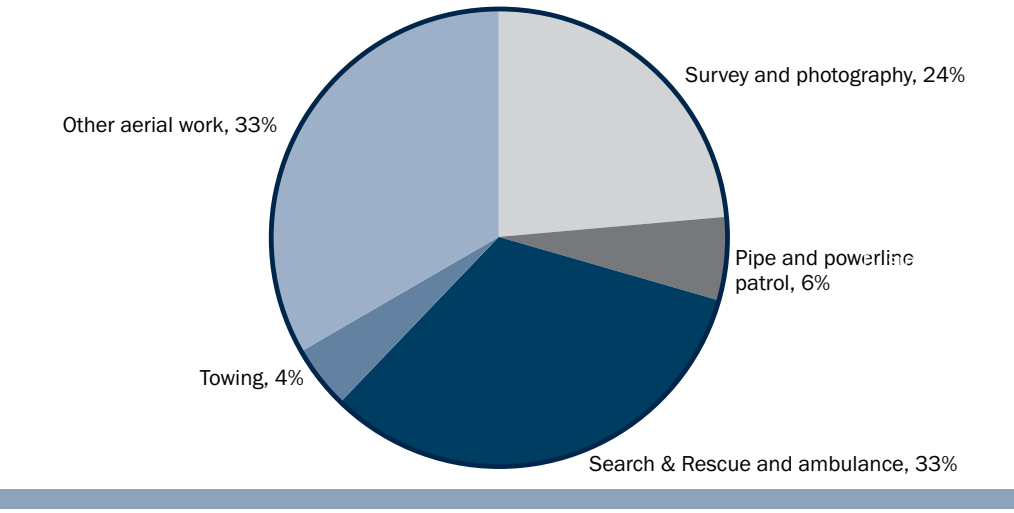


Source BTRE General Aviation Survey 2003

Most of the aerial work fleet are not dedicated to performing aerial work alone. For example, fixed wing aircraft that undertake aerial work spend, on average, about 60 per cent of their hours performing aerial work with the remainder split primarily between training (12 per cent) and charter (14 per cent). For rotary wing aircraft, the proportion of aerial work hours is just under 30 per cent with the remainder split between charter (22 per cent), mustering (21 per cent) and training (9 per cent).

As was noted previously aerial work comprises a wide range of activities. Figure 14-2 depicts the breakdown by hours for both fixed wing and

FIGURE 14-2 COMPOSITION OF AERIAL WORK BY ACTIVITY SUBGROUPS, 2003

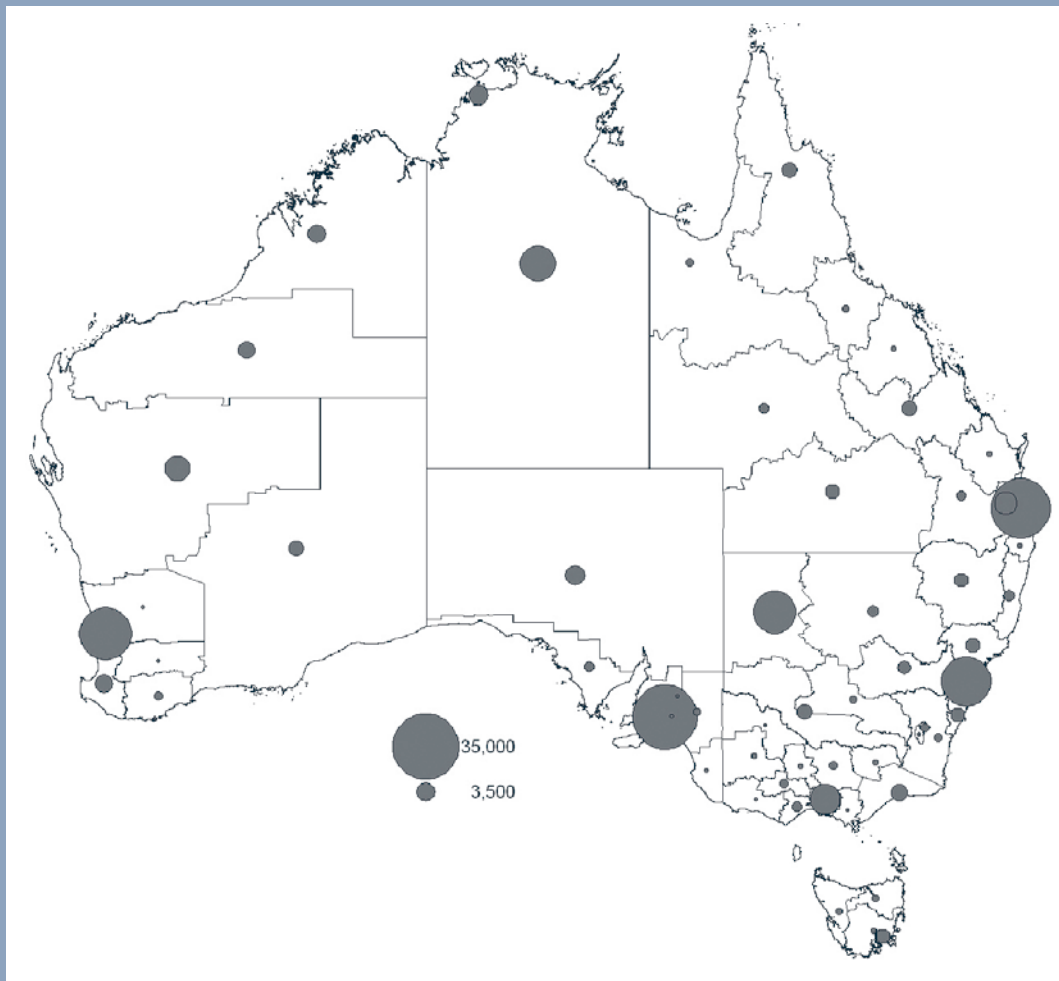


Source BTRE General Aviation Survey 2003

rotary wing aircraft. The category 'other aerial work' includes advertising, cloud seeding, fire fighting, parachute dropping, and coastal surveillance. The large proportion made up of miscellaneous aerial tasks grouped as 'other aerial work' highlights the disparate nature of this category and the difficulty in drawing generalisations. The largest known group of activities is search and rescue and ambulance.

Figure 14-3 depicts all aerial work hours by aircraft base location. It appears that a great deal of this activity occurs in Perth, Adelaide, Greater Brisbane and Sydney with some other significant regions in inland NSW and the Northern Territory.

FIGURE 14-3 LOCATION OF THE AERIAL WORK HOURS, 2003



a. The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.

b. Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.

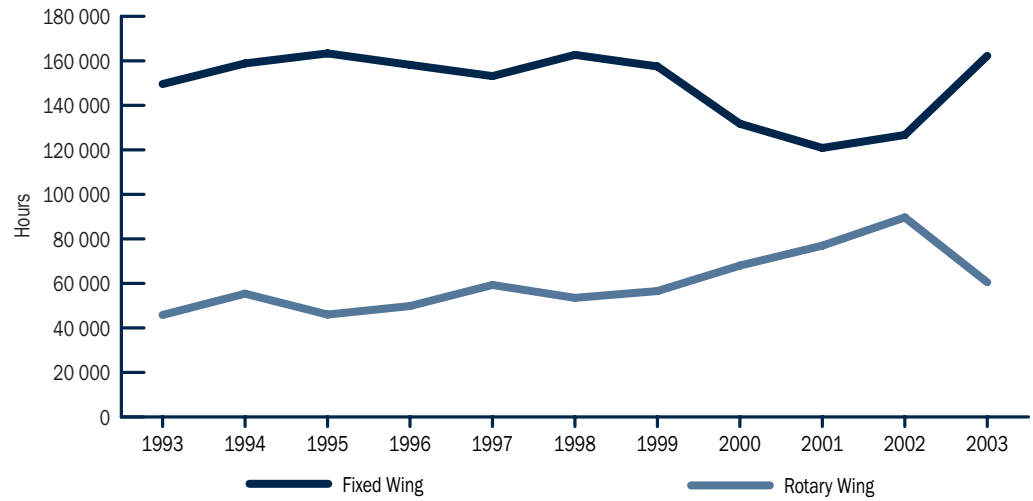
c. Some aircraft could not be mapped. This figure does not include 18 aircraft which flew 72 hours.

Source BTRE General Aviation Survey 2003

TRENDS IN AERIAL WORK

Overall aerial work hours have followed a relatively steady trend over the decade to 2003.

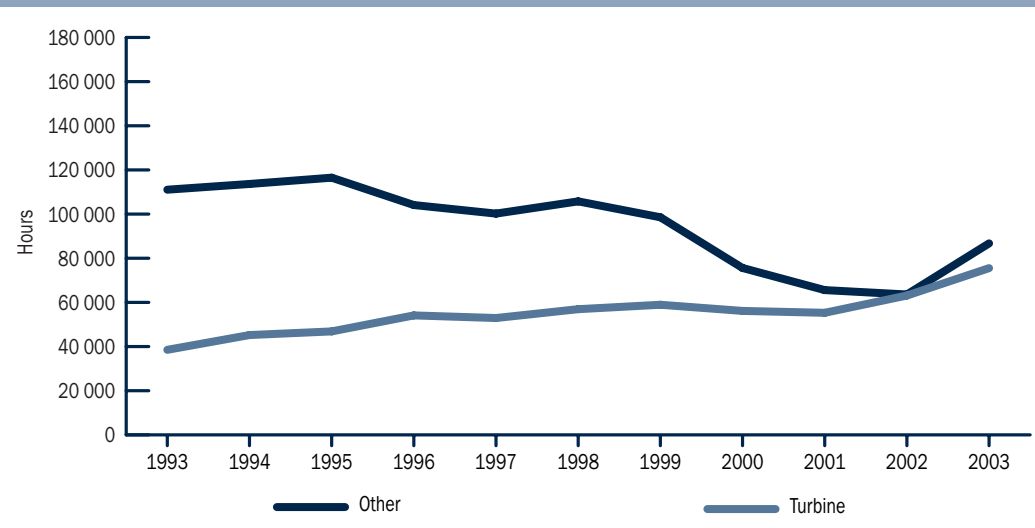
FIGURE 14-4 TRENDS IN AERIAL WORK HOURS, 1993–2003



Source BTRE General Aviation Surveys 1993–2003

The decline in fixed wing flying beginning in 1999–2000 is likely to have been a result of the Avgas contamination. This contamination resulted in the grounding of several thousand fixed wing aircraft. Turbine aircraft and the majority of rotary wing aircraft do not run on Avgas and as such were not affected by this contamination. For further information on the Avgas contamination please see chapter 6.

FIGURE 14-5 AERIAL WORK IN FIXED WING AIRCRAFT BY POWER, 1993–2003

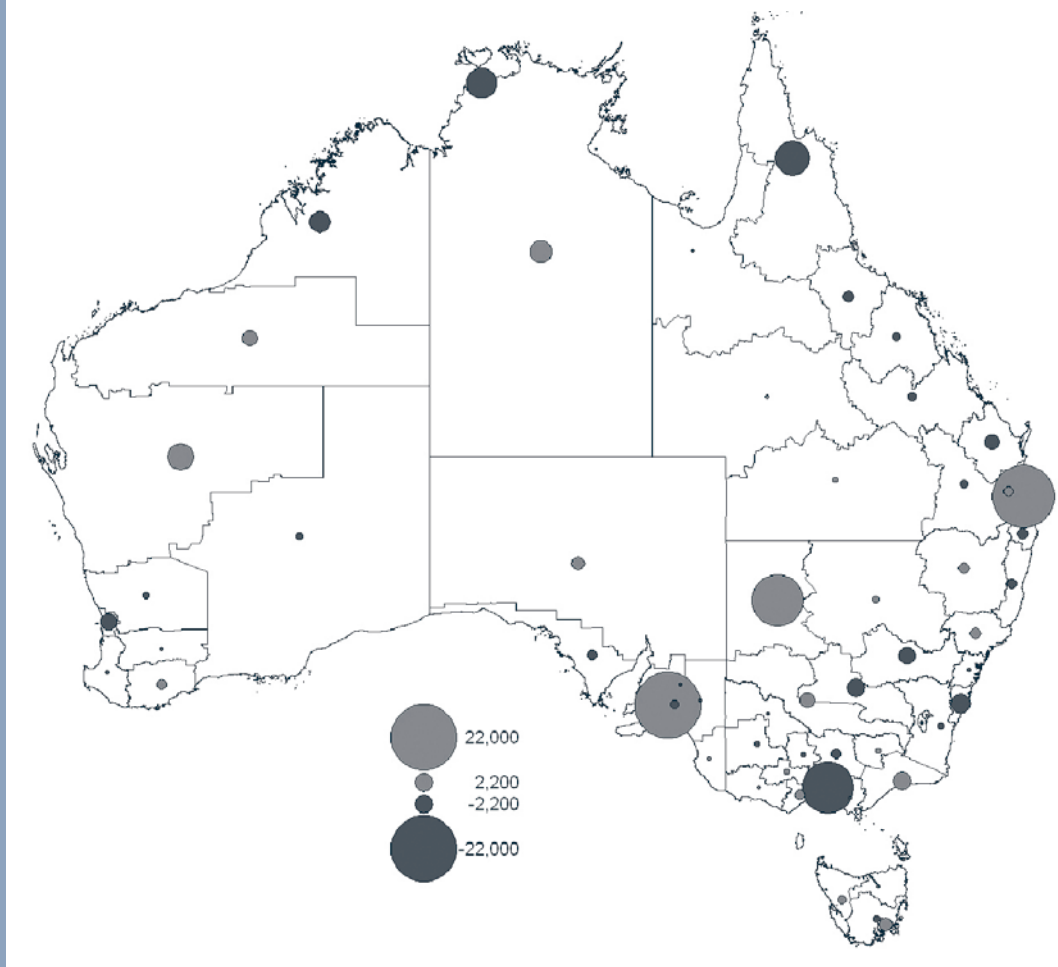


Source BTRE General Aviation Surveys 1993–2003

For fixed wing aircraft there is a trend of increasing use of turbine and turboprop aircraft. While the trend in piston powered fixed wings appears more or less uniform across all aerial work activities the growth in turbine aircraft derives primarily from increase in turbo-prop flying for ambulance purposes. This is a result of the addition of many turbine aircraft to the Royal Flying Doctor Service fleet.

As can be seen from figure 14-6, it appears that a great deal of the growth in aerial work has occurred in Adelaide and greater Brisbane and north west New South Wales. Melbourne appears to have experienced the greatest decline in aerial work hours.

FIGURE 14-6 CHANGE IN AERIAL WORK HOURS BY LOCATION, 1993–2003



a. *The size of each dot indicates the number of hours flown by all VH registered aircraft based in each statistical division in 2003. Dots below the map are provided for scale.*

b. *Map results should be treated with caution as the indicated locality may not accurately reflect where aircraft performed their hours. This is because hours flown have been allocated by locality using the postcode of reported aircraft base or—where this was not available—the postcode of the registered owner. It is also possible that errors in the reported postcodes have resulted in incorrect allocation of hours by locality.*

c. *Registered aircraft that could not be mapped are not included in this figure. In 2003 there were 18 aircraft—which flew 72 hours—that could not be allocated. This compares with 25 aircraft—which flew 2674 hours—in 1993.*

Source BTRE General Aviation Survey 1993 and 2003

DEMAND

The demand for aerial work is likely to be as diverse as the tasks performed. The cost of flying is likely to have affected all activities. Demand for recreationally based aerial work will be more influenced by increases in cost than aerial work constituting business inputs. Activities such as search and rescue, ambulance and fire fighting are likely to be relatively price inelastic –in other words, demand is unlikely to be significantly influenced by cost.

CHAPTER 15

AERIAL AGRICULTURE AND MUSTERING

Aerial agriculture and mustering are types of aerial work. Aerial agriculture includes agricultural spraying. These include operations involving the carriage and/or spreading of chemicals, seed, fertiliser or other substances including controlling for pests and disease.

Agricultural flying is usually undertaken in specialised type certified aircraft. Mustering is usually undertaken in rotary wing aircraft. Together, aerial agriculture and mustering account for around 9 per cent of all general aviation flying, about 3.5 per cent and 5.1 per cent respectively.

Aerial agriculture contributes to agricultural output in a number of ways[43]:

- It enables farming in terrain which would otherwise be unusable.
- It facilitates increased efficiency and quality of product.
- It acts as emergency response to insect plagues such as locusts, fungal attacks and bushfires.

Key features of the agriculture and mustering are outlined in the following.

- 245 aerial agricultural establishments employed just under 1000 people in 2003–2004.
- Aerial agriculture industry had a gross turnover of $277 million in 2003–2004.
- There is increasing use of turbine powered aircraft in aerial agriculture.

Aerial agriculture activity is susceptible to primary product price trends and climatic conditions such as drought.

AGRICULTURE AND MUSTERING OPERATORS

Aerial agriculture and mustering Air Operators' Certificates holders are not uniquely identified in the CASA safety trends indicator database so it is not possible to report the average fleet size. However, Australian

43 Rolland, D, 1996, Aerial Agriculture in Australia, IBIS, Sydney.

Taxation Office and IBIS data indicate that in 2003–2004 there were 245 establishments employing around 977 people. The total turnover is estimated to be $277 million. Aerial agriculture contributes to pastoral, cotton, and rice farming. A breakdown by segment is provided below.

TABLE 15-1 BREAKDOWN OF AERIAL AGRICULTURE BY CROP TYPE

Market Segment	Share
Pastoral	60 per cent
Cotton	20 per cent
Rice	5 per cent
Other	15 per cent

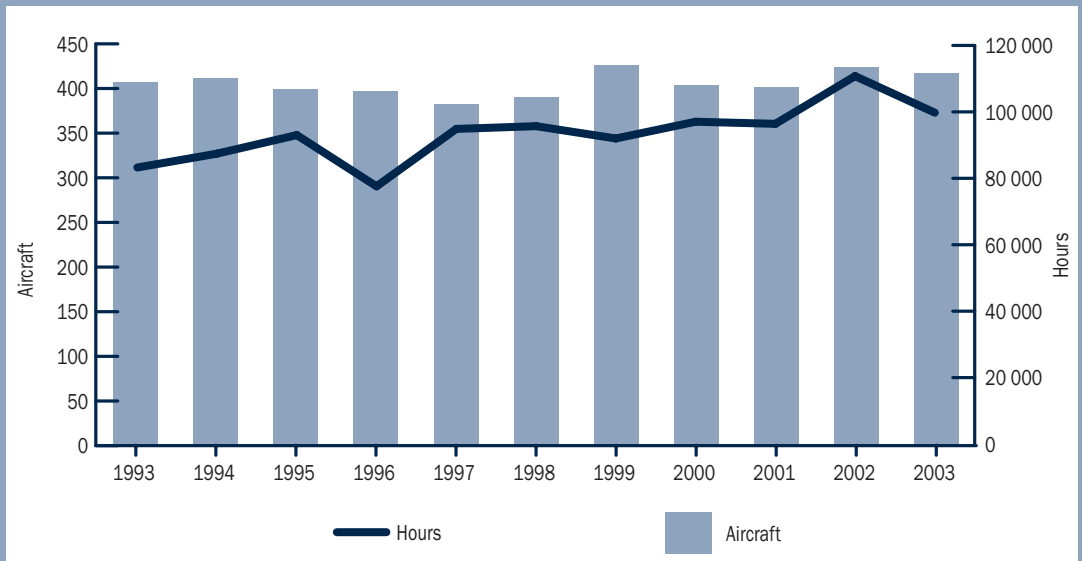
Source IBIS

MUSTERING

Mustering can be performed in type certified aircraft, though it can also be performed in non-type certified aircraft—as long as it is not undertaken on a hire and reward basis. In 2003, 417 type certified aircraft undertook mustering and on average these aircraft spend 70 percent of their flying time performing mustering. Almost two thirds of these aircraft—65 per cent—were helicopters.

As can be seen from figure 15-1, the number of hours flown for the purpose of mustering has increased by around 20 per cent over the decade to 2003. The number of aircraft has remained relatively steady—meaning that on average aircraft are doing slightly more hours.

FIGURE 15-1 VH REGISTERED AERIAL MUSTERING ACTIVITY, 1993–2003



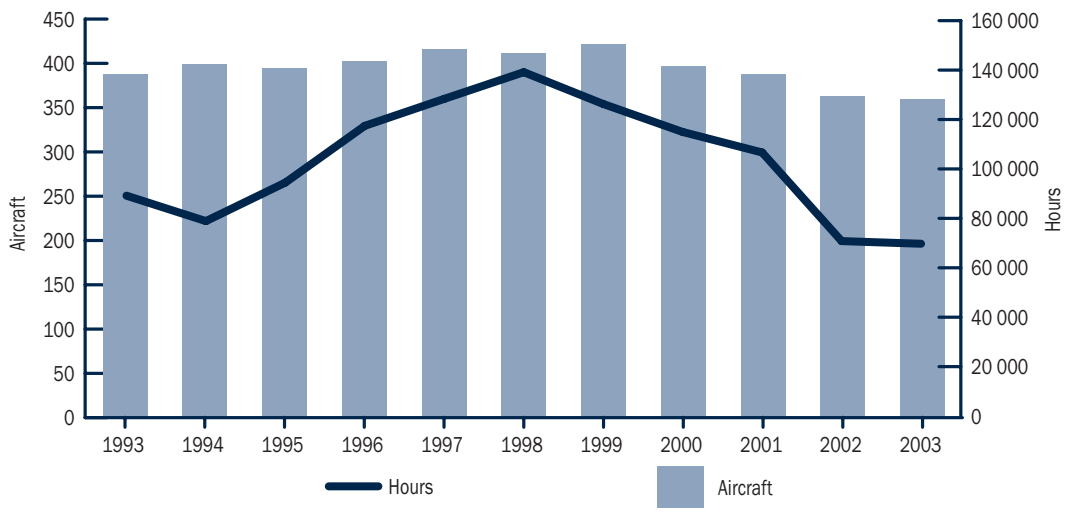
Source BTRE General Aviation Surveys 1993–2003

AERIAL AGRICULTURE

The fleet of aircraft that perform agricultural spraying appears to be more specialised. Approximately 90 per cent of this fleet—312 aircraft—are fixed wing aircraft. Of these fixed wing aircraft, 243 fly only for aerial agriculture.

Not surprisingly trends in agricultural flying appear to be heavily influenced by drought. Figure 15-2 depicts the hours flown and number of VH registered aircraft engaged in aerial agriculture between 1993 and 2003.

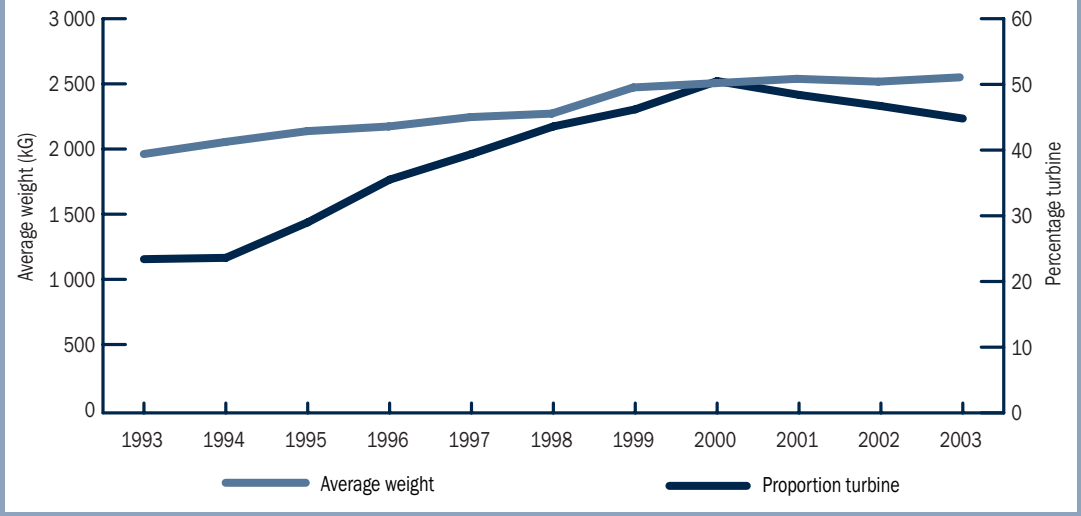
FIGURE 15-2 VH REGISTERED AERIAL AGRICULTURE ACTIVITY, 1993–2003



Source BTRE General Aviation Surveys 1993–2003

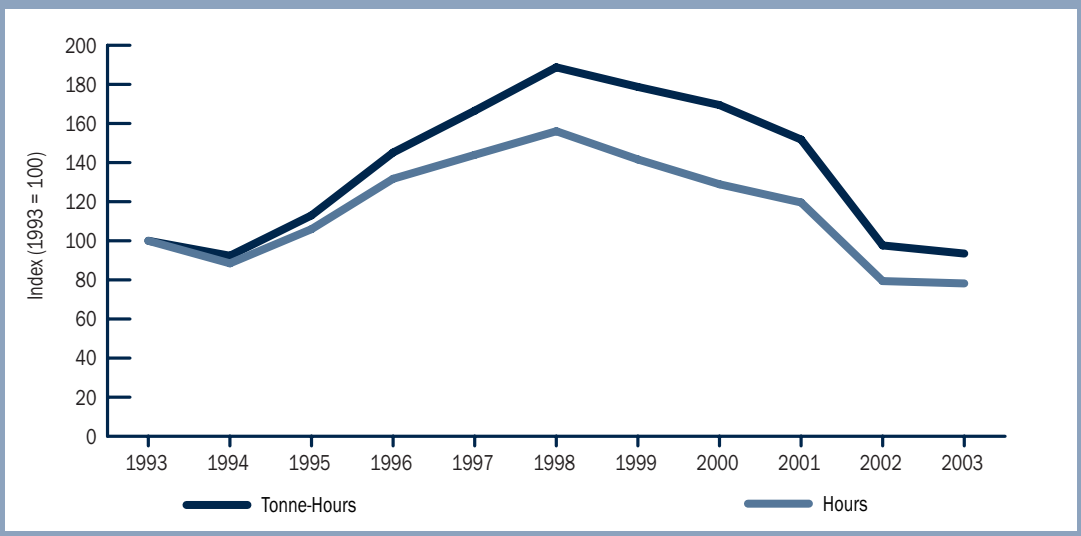
The key driver of aerial agriculture appears to be drought. Australia was in drought between 1991 and 1995. After this time, the hours flown for aerial agriculture have increased, as shown in figure 15-2. The effect of the more recent drought 2002-2004 can also be seen. Figure 15-2 also indicates that the number of aircraft performing agricultural flying has not fluctuated as widely as the number of hours. This is likely to be a result of the specialised nature of agricultural aircraft. Another trend in aerial agriculture is the increasing size of aircraft—illustrated by the increasing average maximum takeoff weight (figure 15-3). The increase in average weight has lead to payload increasing relative to hours flown (figure 15.4). In 2003, the total potential payload was still below the 1993 level.

FIGURE 15-3 CHANGES TO AIRCRAFT PERFORMING AERIAL AGRICULTURE, 1993–2003



Source BTRE General Aviation Surveys 1993–2003

FIGURE 15-4 AERIAL AGRICULTURE HOURS VERSUS POTENTIAL PAYLOAD, 1993–2003



Source BTRE General Aviation Surveys 1993–2003

DEMAND

As mentioned above agricultural flying and mustering are likely to be subject to variations in the conditions of their respective agricultural industries. Drought and other climatic conditions as well as shifts in commodity prices and on farm profit are strong influences on agricultural flying hours.

Changes to regulations affecting farm chemical uses also influence the demand for aerial agriculture.

Forces that are likely to affect aerial agriculture in the future include:

- The transition to a greater degree of self regulation for operators
- The introduction of genetically modified crops
- Changes to water use and pricing influencing the growing of rice and cotton which collectively constitute about 25 per cent of all agricultural aviation.

APPENDIX A

INDUSTRY CONSULTATION

The objective of industry consultations was to gather in a structured form the qualitative views of experienced industry stakeholders on the major issues affecting the general aviation industry. Important areas covered included:

- qualitative investigation of observed trends
- evaluate the relative importance of issues affecting operators
- fill gaps in our data.

Consultation was sought with air operators, aero clubs and maintenance businesses. Types of operators consulted included flight school operators, insurance providers, other airport managers and private aviators, and fuel suppliers. While it was not feasible to consult directly with recreational pilots, the BTRE did consult a number of aero-clubs on issues affecting both the club and their members.

This was in addition to meetings held with a number of specific interest groups and representatives—these were the:

- Aircraft Owners and Pilots Association
- Australian Licensed Aircraft Engineers Association.
- Aviation Maintenance Repair Overhaul Business Association

CONSULTATIONS WITH INDIVIDUAL ORGANISATIONS

Interviews were sought with representatives from individual organisations. These were conducted face-to-face wherever possible or via phone.

A semi-structured interview (survey) was used that including a mix of both open and closed questions. A few questions were the same for all respondents, however questions were modified for different organisation types.

Researchers deliberately maintained a flexible approach and some questions were open form—providing the flexibility to address issues raised by the respondent or to delve further into specific issues of interest. Respondents were free to raise issues not directly covered by the questions. In some cases questions were omitted due to time constraints.

Sample

Site visits were made at Moorabbin, Bankstown, Canberra, Coolangatta, Lismore and Tyagarah. Following the completion of site visits, additional telephone interviews using the same format were undertaken of operators at other locations.

In total the BTRE interviewed approximately 37 organisations. This sample is from a total in 2004 of approximately 715 active Air Operators' Certificate holders and 380 Certificate of Approval holders primarily performing maintenance on general aviation aircraft. This sample is about 5 per cent of all Air Operators' Certificate holders.

TABLE A-1 RESPONDENTS BY PRIMARY TYPE OF OPERATION

Airport	Maintenance / Parts	Training	Rotary Wing	Charter	Aero - Clubs	Other
7	8	5	5	6	4	2

The primary activity of many rotary wing operators was training, although these operators also performed charter, training, and aerial work

Key comments

All operators were asked to nominate 'the biggest issue facing their general aviation operation'. Operators raised a wide range of issues reflecting their diverse operations.

The most consistently raised issues included:

- increased costs
- issues associated with airport privatisation at former FAC airports
- aviation regulation.

Costs were seen as a significant issue to the majority of, but not all, operators. Most helicopter operators did not see costs as a major issue. When asked to nominate the specific input cost that has had the greatest affect most respondents nominated the compound affect. Many operators at the former FAC aerodromes visited raised infrastructure charging and rents as very important issues.

Many operators at some, but not all, recently privatised airports raised significant issues regarding their new landlords. Many operators nominated commercial lease agreements as the biggest issue facing their business. Rent increases were in some cases seen as unfair. Some operators felt they were being driven off the airport by high prices, or forced to relocate on-airport at significant cost, to enable alternate commercial development. Some stakeholders believed that the process of rental increases at some airports generated animosity, in particular, the inconsistency of methods used to calculate rent increases for each tenant, and that the rent review processes were not transparent. Increased airside charges were noted by nearly all operators–but not in terms of the most significant issue affecting their business.

However, some airport managers stated that they were cross-subsidising some general aviation businesses. Examples of this included general aviation related revenues not covering runway maintenance and significantly higher rents being achieved from on-airport business park developments.

Respondents who nominated regulation as the greatest issue affecting their business were probed further to determine the nature of the issue. In particular respondents were asked to decide between the issues:

- Cost of compliance
- Relevance of the regulation
- Consistency of application of the regulation
- Rate of change of the regulation

Where regulation was raised by respondents, the lack of consistency in the application of regulation was the issue most commonly raised—particularly in the administration of Air Operators' Certificates. Second order issues include: several operators felt that the application of regulations was too inflexible; the costs of delays in the approval processes for chief pilots and chief engineers; and the perceived irrelevance of some aspects of regulation.

Other issues raised by industry organisations during the consultation process included:

- Low regular public transport fares are seen as responsible for a decline in demand for charter, private and business flying
- ALOP aerodromes have difficulty collecting fees, especially from ultralights
- The aging fleet is only seen as an issue with respect to increased maintenance costs and lower reliability

- Apparent strong growth in some regions and aircraft types was confirmed
- Several stakeholders—including some operators—noted that general aviation businesses are often operated by people not necessarily trained in business management—commonly pilots and engineers
- Many stakeholders noted the industry runs on very low operating margins. Several stakeholders commented that some businesses are operated by enthusiasts who will fly at or even below cost.

CONSULTATIONS WITH INDUSTRY ASSOCIATIONS

Safety regulation

- A lack of consistency in the application of regulation by CASA was the most common regulatory issue raised.
- The Aviation Maintenance Repair Overhaul Business Association believed that regulation of aircraft should be focused on the minimum safe operating level as opposed to setting the maximum reliability level for everyone.
- The Aircraft Owners and Pilots Association said there was no differentiation between aircraft maintenance standards for VH registered aircraft used for private or recreational flying and commercial flying, yet there were different standards in place for non-VH registered aircraft—with similar or superior performance—used for private or recreational purposes.
- The Aviation Maintenance Repair Overhaul Business Association believed that increasing red tape and paperwork were not improving safety, rather they were only increasing the amount of lost productive time.

Costs

- The high cost of complying with CASA regulations was another common issue raised.
- The Aircraft Owners and Pilots Association believed that the high cost of complying with CASA regulation as compared to the regulations of other countries was the major issue.
- The Aircraft Owners and Pilots Association saw the high cost of certified parts as a major issue—this was attributed to regulatory compliance costs.

- The Aviation Maintenance Repair Overhaul Business Association saw aerodromes rent increases and commercial lease issues as important issues.

Licensed Aircraft Engineers

- The LAME workforce was ageing and the Australian Licensed Engineers Association believed there would be a national LAME shortage in about two years. The Association said that the average member age was over 50 and there were not enough apprentices to replace people as they retire—given it can take up to 8 years to gain the necessary licenses and experience. The industry has a low profile and people were looking elsewhere for a career. Apprentice wages were non-competitive and working conditions unfavourable compared to areas such as information technology or finance.
- The Australian Licensed Aircraft Engineers Association believed that CASA's new licensing fee structure was a factor deterring people from taking up a career as a LAME. The association believed that CASA's new fee structure—notably for exams—did not reflect the cost of providing the services.

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ABBREVIATIONS

ABAA	Amateur Built Aircraft Acceptance
ABS	Australian Bureau of Statistics
ALOP	Aerodrome Local Ownership Plan
ASRA	Australian Sports Rotorcraft Association Inc
Avgas	Aviation gasoline
Avtur	Aviation turbine fuel
BTRE	Bureau of Transport and Regional Economics
CASA	Civil Aviation Safety Authority
FAC	Federal Airports Corporation
GAIT	General Aviation Infrastructure Tariff
GAO	United States General Accounting Office
GARA	General Aviation Recovery Act 1994 (United States of America)
GFA	Gliding Federation of Australia
HGFA	Hang Gliding Federation of Australia
US	United States of America