EXECUTIVE SUMMARY

Purpose
This study into the state of the aviation workforce in Australia was undertaken by TLISC on behalf of the Commonwealth’s Department of Infrastructure and Regional Development. The study sought to identify the industry’s workforce and skill needs and the actions that can be taken by industry to meet those needs.

There is a requirement - recognised by industry and government alike - to support the effective, safe growth of the aviation industry in Australia. The industry is under considerable pressure to adapt in a dynamic environment with rapidly growing cargo and passenger traffic, stringent regulations and fast-paced technology innovation. As such, the availability of trained staff is crucial to the industry's ongoing viability.

This report provides analysis and recommendations that may inform future government policy regarding skills development and training policies for aviation. Furthermore, the report identifies potential opportunities for expansion of the Australian aviation training market.

About the Author
The Transport and Logistics Industry Skills Council (TLISC) was contracted by the Department of Infrastructure and Regional Development to carry out the Aviation Workforce Skills Study. During the project period, TLISC changed its name to Australian Industry Standards. More detail about this is provided at the end of the report.

REPORT STRUCTURE

PART I provides a descriptive statistical analysis of the aviation workforce in Australia. This section considers the size of aviation employment, the cost of staff and the demographics of the workforce.

PART II comprises a survey of issues impacting on the sector and its skills requirements. Scenarios for future labour demand are provided.
Part III considers the impact of aviation training in Australia, incorporating publicly funded VET enrolments, the cost of training, industry views, the quality of training delivery, challenges facing training providers and the shortage of trainers and assessors.

Part IV provides an assessment of the Australian aviation training brand and the capacity of the sector to meet demand from international students. Regional skills are considered and the opportunities for skills integration, labour mobility, recognition of prior learning and licence conversions are addressed.

The Aviation Workforce Skills Study has been produced with the assistance of funding provided by the Commonwealth Government through the Department of Infrastructure and Regional Development. The views expressed are those of the author, and do not necessarily reflect the views of the Department or the Commonwealth.
The Aviation Industry underpins Australian business and tourism and has estimated annual revenue of A$46 billion, adding an estimated A$15.3 billion to the Australian economy in 2015-16 (IBISWorld). The industry employs almost 90,000 people across its five main sub-sectors: domestic commercial aviation, international commercial aviation, general aviation, air-freight transport and aviation support infrastructure.

Domestic commercial passenger transport is a critical part of Australia’s economy, with the Sydney–Melbourne and the Sydney–Brisbane routes respectively ranking as the world’s fourth and 13th busiest routes by seat capacity. The industry is well placed to benefit from the fast increasing air passenger numbers in the Asia-Pacific region, with important flow-on effects for Australian tourism.

The share of aviation in freight transport is growing rapidly, in part due to strong growth in high-value, time-sensitive parcel traffic. New transport hubs are increasingly being developed in the immediate vicinity of airports.

The Aviation Industry brings essential and critical services to rural and remote areas across Australian states and territories.

Figure E.1 below shows the growth in the Aviation workforce since 1985. While the Airport Operations workforce has remained mostly flat during this period, Freight and Passenger transport services have grown to meet demand.
THE AVIATION INDUSTRY EMPLOYS ALMOST 90,000 PEOPLE
FIGURE E.2
PROJECTED AND HISTORICAL AVIATION WORKFORCE 2007-2021
SOURCE: IBISWORLD
The size of an industry’s workforce is established by the Australian Bureau of Statistics (ABS) using two different approaches. The Labour Force survey, which provides a 30-year view of the industry, assigns each industry category based on the main job of the respondent. The Australian industry dataset on which the following workforce projections are based, uses a top down approach where industries are primarily classified by the single predominant industry class associated with a business’ ABN. An industry’s workforce therefore is bounded in the first instance (Figure E.1) by the occupations of workers and in the second by the primary business of an enterprise (Figure E.2). The different approaches can therefore result in quite different workforce figures.

This report distinguishes these approaches using the terms Workforce – Occupation based, and Workforce – Employer based.

Figure E.2 identifies that the Aviation workforce is projected to fall slightly in 2017 but should increase by 2 per cent by 2021. The demographics of the Aviation workforce are explored in greater detail in Part I of the report.

The Aviation Industry in Australia is highly regulated, where streamlined knowledge, skills and processes (sanctioned by regularly reviewed licensing and accreditation) are paramount to ensuring the safety, security and productivity of operations. The lower proportion of workers holding bachelor-level and postgraduate qualifications highlights the operational focus of the majority of the workforce engaged in aviation-related occupations. 53 per cent of aviation workers hold a vocational education qualification as their highest level of study, compared with 29 per cent for the overall Australian working population.
KEY FINDINGS

The Aviation Workforce Skills Study identified a wide range of issues related to Australia’s aviation environment to be considered by policy makers and industry stakeholders. These include:

1. There is strong evidence of an identified need for an industry-wide approach to aviation workforce planning and development, supported by streamlined policy and regulation. This includes the collation, aggregation and sharing of all relevant aviation occupational licensing and training data with all state and federal agencies with an interest in aviation workforce skilling outcomes.

2. The current costs barriers faced by individuals and businesses are well understood. However, there is a need for the industry to invest more in its current and future workforce through public and private funding mechanisms.

3. A significant proportion of Aviation Training Package VET delivery is not subsidised by Commonwealth or State/Territory funding. The Aviation Industry attracts as much Government funding (15 per cent) as International fees for service, with the remaining 70 per cent funded by industry (employers and students). Vocational aviation students bear four times the fees of the average student, with costs located in the 99th percentile of the student population.

4. In 2015 the Aeroskills Training package attracted a significant amount of government funding with 66 per cent of training delivery involved Commonwealth and/or State and Territory funding, with the remainder funded by industry, however this needs to be considered against a general backdrop of a significant reduction in the amount of training delivered.

5. Government funding for the Aeroskills Training Package training reduces from 2011 onwards and there is evidence of a consequent upswing in industry-funded training delivery. In practical terms, industry have increased their financial investment in skilling the workforce, following a reduction in available government funding. The trend continues into 2015.

6. Since the introduction of VET FEE-HELP in 2009, the number of aviation students using government loans has risen each year, but the number of licences issued has not. The drop in licences issued suggests that the favourable interest conditions of government loans aren’t a sufficient incentive for students. 70 per cent of the total training delivery at VET level is paid for without accessing any form of Government funding.

7. Examination of tertiary aviation qualifications data identifies that the average post-subsidy debt per student has steadily increased, along with the popularity of the qualifications while upfront payments have fallen slightly. Aviation degrees are heavily subsidised at a Commonwealth and State/Territory level.
8. The current gender distribution of the aviation workforce is unlikely to change in the short term, and unlikely to change in the medium to long term in the absence of targeted initiatives from the industry to encourage more female participation across all aspects of the industry.

9. Significant issues were raised during industry consultation regarding the status of aviation safety regulatory reform in Australia and the potential impact of these on key occupations involved in the reforms at the employer and individual level.

10. The implementation of current regulatory reforms into industry operations was continually raised as a concern, with many industry stakeholders questioning the cost/benefit ratio of the reforms for the industry with the potential outcome being even less budget available for staff training in the future.

11. Some survey respondents pointed to the need for greater centralisation and co-ordination in workforce planning across the aviation industry, to better inform regulatory and policy decisions that may affect the industry in the future.

12. Access to a wide range of data sources related to aviation occupations, licencing data and publicly-funded tertiary and VET funding information is critical for policy makers to make informed decisions related to aviation skilling strategies.

13. During the extensive industry consultation conducted as part of this study, the role of government training funding and support was consistently highlighted as critical to the long-term survivability of the industry.

14. Strong international opportunities for Australian aviation training providers, both in terms of overseas operations and involvement in capacity building efforts, have been identified through survey responses and industry intelligence and feedback.

15. Training providers overwhelmingly estimate that, while aviation flight training in Australia is widely recognised as being high quality compared with other countries, this quality comes at a high financial cost.

16. In the field of aircraft manufacturing and engineering, Australia is considered a leader in the provision of through-life services, particularly applied to military aircraft. In addition, there are several engineering and engineering training areas in which Australia possesses significant, internationally-recognised expertise that holds sizeable potential for international growth.

17. One-third of Australian employers surveyed for this study who had recruited overseas-trained candidates reported encountering knowledge and skills gaps compared with Australian standards that caused moderate or serious problems for business operations. A commonly cited knowledge gap across occupations relates to Australian regulations-this impact on job responsibilities often requires additional training.
A PwC survey of airline CEOs identified that availability of key skills was cited as a major area of concern for 37 per cent of airline CEOs, compared with 21 per cent for CEOs across all industries. It found that the vast majority of airline CEOs felt their organisation was not well prepared to face the required changes in human resources (86 per cent) and in information technology (75 per cent). While this places the industry at risk if not adequately addressed, there are also potentially significant competitive advantages for the Australian aviation industry if it manages to get this right.

**AVIATION SECTOR SUMMARIES**

The following aviation sector-specific summaries have been developed to outline key themes that are explored in greater detail within the report:

- Key Workforce Characteristics
- Flight Operations
- Aviation Maintenance
- Aerodrome Operations
- Regional Aviation
KEY WORKFORCE CHARACTERISTICS

• The most recent available figures from the Civil Aviation Safety Authority show the Aviation Industry employed just under 55,000 workers in 2013 which, although based on a compulsory survey, is likely to be an underestimate. This concern about underestimation is given weight by the Aviation workforce figures published by IBISWorld, which estimates a total workforce size of 89,243.

• The vast majority of aviation workers are employed in a permanent position.

• The distribution of employment by job category in Australian airlines is consistent with the distribution observed for most foreign airlines in the ICAO dataset.

• Australian airlines generally have a higher share of staff expenditure as a percentage of total operational expenditure across all types of airlines, compared with similar airlines in other countries (including Western countries with a high cost of living).

• While the age distribution in the aviation industry is relatively close to the national average, it recorded the fastest growth in the share of workers aged 45 years and over of all transport and logistics sectors between 2006 and 2011. A continuation of this trend would pose significant challenges to businesses, particularly regarding succession planning and workforce upskilling related to adapting to new technology, particularly in operational aircraft maintenance roles.

• Women represent about 20 per cent of the overall aviation workforce. This is significantly lower than the 46 per cent share of female employment generally observed across all industries in Australia. The 20 per cent figure is largely driven by the significantly higher number of female workers in the Flight Attendant occupation, as women make up less than 10 per cent of the employed workforce in most other specialist aviation occupations.

• The majority (53 per cent) of aviation workers hold a vocational education qualification as their highest level of study, compared with 29 per cent for the overall Australian working population. In contrast, only 27 per cent of the aviation workforce holds no post-high school qualifications, compared with 40 per cent for the overall Australian working population.
FLIGHT OPERATIONS SUMMARY

• While commercial Aeroplane and Helicopter Pilots are in high demand, the occupation cannot be qualified as being in shortage due to the large number of candidates with basic licences and skill sets acquired as recreational or General Aviation (GA) pilots.

• There is a demonstrated chronic shortage of Flight Instructors and Flight Examiners for both aeroplanes and helicopters. Similar shortages are experienced in other Western Countries, with fierce competition for some specialist skill sets. Multi-crew training and advanced simulator training skills are in particularly high demand.

• There was an annual growth rate of 2.2 per cent over the period 2010-15 for female pilots, which far exceeded the almost static 0.01 per cent annual rate among males. There is a clear reduction in females in the pilot workforce as the licence increases in seniority, with most annual gains since 2010 restricted to lower classifications of licence.

• The “poaching” of pilots is an issue affecting industry’s willingness to invest in training.

• Industry costs of pilot training and skill development to captain level—including flight hours, experience, simulator time, and salary/wages as first officer—is considered significant.

• Cadet programs that incorporate flying time requirements have proven to be successful in encouraging and supporting new entrants, ensuring they are able to gain the required qualifications and develop the company-specific skills desired by employers. Bonded cadetships are increasingly prevalent across the industry (eg: Rex, Virgin, British Airways).

• Airlines are targeting lifestyle factors to attract and retain staff at the appropriate time in their career.

• There is a need for an industry-wide approach and strategy to training the pilots needed.

• Flight training schools have raised significant concerns regarding the dual costs of maintaining separate RTO and Flying School accreditation, with many questioning the cost/benefit ratio of continued operations. High compliance costs drive up training costs, which flow-on to the Aviation Industry.

• 47 per cent of Flight Attendants do not hold any post-school qualifications, compared with 40 per cent for the overall Australian working population.
AVIATION MAINTENANCE SUMMARY

- Aircraft maintenance engineering vacancies advertised online have decreased by more than half since 2006. Employment in these occupations has been more dramatically affected by peaks and troughs over time than the average labour market trend, indicating a higher-than-average vulnerability of the profession to economic downturns.

- The offshoring and/or outsourcing of aircraft maintenance functions by Australian airlines in recent years has had a tremendous effect on the maintenance engineering training landscape. Several generalist engineering training providers have stopped their Aviation courses. There is significant concern within the industry that closing engineering training facilities will impede the ability of training providers and maintenance businesses to rebound or take advantage of international growth opportunities.

- The recovery in demand for Maintenance Engineers after the GFC was reversed in mid-2012, as Australian airlines offshored some engineering functions to reduce operational costs. However, the contraction of the aircraft engineering labour market is further compounded by the reduced maintenance schedules applicable to new aircraft.

- Despite the contraction of the aircraft maintenance labour market in Australia, experienced Aircraft Maintenance Engineers with current licensing remain in very high demand due to the very specific skill sets involved and the dwindling number of engineering trainees in recent years. In particular, the uptake of new digital equipment has led to the restructure of many maintenance functions, requiring existing workers to upskill or retrain.

- A majority of industry stakeholders and training providers operating in the Aviation Maintenance sector described a shortage of Aircraft Maintenance Engineering trainers, and fierce competition for skilled and experience aircraft maintenance engineers across all specialties. This is to be put in the context of a generalised dearth of engineering candidates with the required mechanical aptitudes.

- Some employers (particularly in rural and remote areas) express concern that their investment in training apprentices may be lost as graduates move on to more attractive positions, leading to chronic skill leakages in areas requiring specialist skills.

- Aviation maintenance training schools have raised significant concerns about the impact of regulatory compliance (Aviation and VET) costs on their ongoing business viability.

- Certificates III and IV are the highest-level qualifications held by the majority Aircraft Maintenance Engineers, ranging between 60 per cent and 72 per cent across all maintenance engineering specialties.

- Issues were also raised about differences in availability of training or access to engineering services on a state or territory basis. The issues raised related to regulatory and/or licensing challenges in particular locations that were not experienced to the same extent elsewhere in Australia.
AERODROME OPERATIONS SUMMARY

• There is strong demand for ground operations occupations at airports, including Aircraft Baggage Handlers, Airline Ground Crew, Load Controllers, and Airports Works Safety Officers. The demand for these occupations is primarily driven by airport growth, with most major capital city airports being expanded or planned for expansion.

• High staff turnover rates are a challenge and risk for the viability of aerodrome operations. The annual employee replacement rate is estimated to be 25 per cent, indicating a lack of depth and experience in many operational and support roles.

• There are 250 airports with Regular Public Transport (RPT) and 2,000 smaller airfields and landing strips within the Australian aviation environment.

• In recent years there has been a decline in regional airports with RPT services, with a net decrease of 20 airports since 2005 (45 airports were closed while 25 opened). Rural and remote areas in Queensland and the Northern Territory were particularly affected.

• 60 per cent of Airline Ground Crew and Aircraft Baggage Handlers do not hold any post-school qualifications. This is also the case for 51 per cent of Aircraft Refuellers.

• Deloitte Access Economics estimates that there are 6,900 Full Time Equivalents (FTE) employed in core airport operations.

REGIONAL AVIATION SUMMARY

• Regional Aviation infrastructure remains an issue, principally around meeting regulatory requirements and ensuring that sufficient staff have access to affordable and necessary training to meet regulatory compliance. This is compounded by a rapidly ageing workforce in many key occupations.

• Many stakeholders reported that access to high-quality aviation maintenance services for General Aviation operations is often problematic. Vacancies may remain unfilled in rural and remote areas, where local demand associated with general aviation (particularly agricultural aviation services and FIFO transport) might not be sufficient to allow for full-time work throughout the year.

• Business management issues, including higher operational and construction costs and accessing skilled and potentially trainable workforce within regional areas, are issues of considerable concern. The impact of workforce retention was cited by many as an ongoing challenge to recruit and then retain capable employees.

• A lack of access to training and/or other funding available to the agricultural sector is a problem for businesses offering aerial agricultural services.
RECOMMENDATIONS:

Australian Industry Standards makes these recommendations following consideration of the findings of the Aviation Workforce Skills Study:

1. The Aviation Industry is encouraged to continue its already significant financial and operational investment in the development of the Aviation workforce.

2. Greater collaboration between the Aviation Industry and Governments regarding future regulatory changes to ensure:
   a. better understanding of the potential impacts on the workforce
   b. future training requirements are accounted for
   c. potential Aviation or Education regulatory impediments are addressed.

3. Improved data sharing between government agencies to assist the Aviation Industry to more accurately forecast future workforce demand and associated supply of skills training.

4. Commonwealth, and State and Territory Governments to consider the findings of the Aviation Workforce Skills Study in their considerations about funding allocation.

5. Opportunities for greater collaboration between the Aviation Industry and its training suppliers, are encouraged ensuring involvement of:
   a. Flying Training Schools
   b. Registered Training Organisations – public and private
   c. Higher Education Institutions – public and private
   d. Secondary Schools

Other specialist trainers, assessors, instructors, examiners and testing officers

6. Consideration of innovative approaches to address identified challenges which may involve development of location-based regional initiatives to address localised issues in the supply of aviation services and access to training.

7. Opportunities to strengthen the reputation of Australian Aviation Training in the Asia-Pacific region to be explored through joint Government / Industry efforts.
PART I

STATISTICAL ANALYSIS OF THE AVIATION WORKFORCE IN AUSTRALIA
SIZE OF AVIATION EMPLOYMENT IN AUSTRALIA
  » AVIATION EMPLOYMENT BY JOB TYPE
  » AUSTRALIAN AIRLINES’ EXPENDITURE ON STAFF

INDUSTRY DEMOGRAPHICS
  » WORKFORCE AGE PROFILE
  » WORKFORCE GENDER DISTRIBUTION
  » LICENSING ANALYSIS
  » COUNTRY OF ORIGIN
  » HOURS WORKED
  » EDUCATIONAL ATTAINMENT
1. SIZE OF AVIATION EMPLOYMENT IN AUSTRALIA

AVIATION EMPLOYMENT BY JOB TYPE

The most recent available figures from the Civil Aviation Safety Authority’s (CASA) Air Operator Certificate (AOC) Holders Safety Questionnaire* show that the aviation industry employed just under 55,000 workers in 2013. These figures include non-technical and administration positions (the largest category), as well as a small number of voluntary and unpaid workers (Table 1.1). *CASA advise that although this questionnaire is compulsory, annual return rate is less than 100 per cent and hence figures may be an underestimate. This concern about underestimation is given weight by the Aviation workforce figures published by IBISWorld who estimate a total workforce size of 89,2431.

The vast majority of aviation workers are employed in a permanent position. The share of casual contracts is highest among Pilots (8.6 per cent) and Cabin Crew (8.2 per cent). Aircraft Engineering and Maintenance roles have the highest proportion of temporary and contract positions, at 8.1 per cent.

<table>
<thead>
<tr>
<th>Position</th>
<th>Permanent</th>
<th>Temporary/contract</th>
<th>Casual</th>
<th>Voluntary/unpaid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground operations</td>
<td>8,851</td>
<td>194</td>
<td>535</td>
<td>163</td>
<td>9,743</td>
</tr>
<tr>
<td>Pilots</td>
<td>9,263</td>
<td>405</td>
<td>918</td>
<td>138</td>
<td>10,724</td>
</tr>
<tr>
<td>Cabin crew</td>
<td>11,990</td>
<td>14</td>
<td>1,079</td>
<td>52</td>
<td>13,135</td>
</tr>
<tr>
<td>Engineering/maintenance</td>
<td>6,878</td>
<td>620</td>
<td>172</td>
<td>11</td>
<td>7,681</td>
</tr>
<tr>
<td>All other employees</td>
<td>12,293</td>
<td>382</td>
<td>736</td>
<td>71</td>
<td>13,482</td>
</tr>
<tr>
<td>TOTAL</td>
<td>49,275</td>
<td>1,615</td>
<td>3,440</td>
<td>435</td>
<td>54,765</td>
</tr>
</tbody>
</table>

1IBISWorld Reports: Airport Operations in Australia - I5220, Domestic Airlines in Australia - I1402, International Airlines in Australia - I4901, Air freight Services in Australia - OD1577, Non-scheduled Air Transport in Australia - I4903
Figure 1.1 shows the evolution of the distribution of employment by job category in Australian airlines between 2002 and 2010, as recorded by the International Civil Aviation Organization (ICAO). The figures recorded in 2010 are consistent with the distribution observed for most foreign airlines in the ICAO dataset, with Pilots representing around 7.5 per cent of the total workforce; Cabin Crew between 23 and 25 per cent; Maintenance personnel 16 per cent; and Ticketing and Sales personnel 8.7 per cent.

The share of Maintenance and Overhaul personnel in airlines’ workforces has historically been higher in Australia compared with other countries. However, the share of maintenance workers has consistently decreased between 2002 and 2010, and has continued to decrease since, with big airlines increasingly outsourcing and/or offshoring the maintenance of their fleet.

The share of Ticketing and Sales personnel also markedly declined in the same period due to the rise and normalisation of online booking systems. Overall, the Maintenance and Ticketing workforces were reduced by more than 23 per cent between 2002 and 2010.

**Figure 1.1**

SHARE OF EMPLOYMENT IN AUSTRALIAN AIRLINES BY OCCUPATION TYPE, 2002–10.

AUSTRALIAN AIRLINES’ EXPENDITURE ON STAFF

Figure 1.2 shows the share of staff expenditure in major Australian airlines’ total operational expenditure since 2009. There is significant variation in the share of staff expenditure between airlines, which is consistent with the variation observed in other regions, with three ‘tiers’ of airlines emerging. It is notable that Australian airlines generally have a higher share of staff expenditure across all types of airlines, compared with similar airlines in other countries (including Western countries with a high cost of living).

Typically, domestic and regional airlines spend the most on their workforce as a percentage of their total expenditure, ranging from about 28 to 35 per cent for European and American airlines. Domestic and regional airlines do not have access to the same economies of scale afforded to larger airlines, which generally run larger aircraft and can amortise the cost of training equipment and workforce management costs across their larger workforce.

**FIGURE 1.2**


*Source: TLSC (2015). Compiled from various sources.*
By comparison, Australian regional airlines spend up to 40 per cent of their operational expenditure on staff-related costs, highlighting the impact of Australia’s low population density. Established international airlines come second (typically spending around 20-25 per cent of total expenditure), while budget domestic and international airlines have the lowest share of staff expenditure (9-15 per cent).

Again, Australian airlines are consistently in the upper bracket compared with similar overseas airlines. Qantas’ staff expenditure, which sits at around 25 per cent of total expenditure, is slightly higher than the rate observed in other large airlines in Western countries (such as British Airways, United Airlines and Lufthansa). However, it is significantly higher than the levels of staff expenditure observed for established Asian airlines (such as Cathay Pacific and Singapore Air), which range between 15-20 per cent of total expenditure.

The rate of staff expenditure has steadily increased for regional Australian airlines since 2009, while it has remained relatively stable for Australia’s main international airlines (Qantas and Virgin Australia). Overall, the gap is widening between the top and bottom tiers of airlines.
2. INDUSTRY DEMOGRAPHICS

WORKFORCE AGE PROFILE

Figure 1.3 compares the age distribution of the aviation workforce as counted in the 2006 and 2011 Census. The ‘Air and Space Transport’ division of the Australian and New Zealand Standard Industrial Classification (ANZSIC), along with its subdivisions, is used as a proxy for the aviation industry.

The proportion of aviation workers aged under 25 or over 50 is lower than average figures across all industries (Figure 1.4). The lower proportion of young workers can be attributed to the time, cost and minimum age required to obtain aviation-related qualifications and certifications. The lower proportion of older workers can be attributed to age limits or age-related medical requirements for certain occupations and, particularly in the case of airport workers, transitions to less physically demanding jobs.

While the age distribution in the Aviation Industry is relatively close to the national average, it recorded the fastest growth in the share of workers aged 45 years and over of all transport and logistics sectors between 2006 and 2011 (Figure 1.5).
A continuation of this trend would pose significant challenges to businesses, particularly regarding succession planning and workforce upskilling. During the industry consultation phase of this study, several stakeholders indicated that adapting to new technology was difficult for some of their older staff, particularly in operational aircraft maintenance roles where the growing importance of electro-technical skills are changing the nature of the work.
WORKFORCE GENDER DISTRIBUTION

Women represent about 20 per cent of the overall Aviation workforce (Table 1.2). While this is significantly lower than the 46 per cent share of female employment generally observed across all industries in Australia, the Aviation Industry has the highest rate of female participation across all transport and logistics industry sectors. The 20 per cent figure is largely driven by the large number of female workers in the Flight Attendant occupation (69 per cent in 2012), as women make up less than 10 per cent of the employed workforce in most other specialist aviation occupations.

TABLE 1.2

SHARE OF FEMALE EMPLOYMENT BY KEY AVIATION OCCUPATIONS, 2002 AND 2012.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2002</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aviation transport sector</td>
<td>19%</td>
<td>20%</td>
</tr>
<tr>
<td>Aeroplane/Helicopter Pilot/Flying Instructor</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Flight Attendant</td>
<td>68%</td>
<td>69%</td>
</tr>
<tr>
<td>Air Traffic Controller</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Aircraft Maintenance Engineer</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Baggage Handler/Aircraft Refueller/Other Ground Crew</td>
<td>3%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Figure 1.6 shows that Workforce participation among women in Aviation has nearly doubled from 20 per cent to 38 per cent since 1985.
The proportion of female workers is higher in larger businesses, as evidenced by figures published by the Workplace Gender Equality Agency (WGEA), which collects data from private-sector businesses employing 100 or more employees (Table 1.3). These larger businesses are more likely to have larger corporate centres where the share of female workers is typically greater than in operational roles.

Such businesses are also more likely to have developed and implemented recruitment and workforce development strategies to attract and retain a more diverse workforce.

The share of female holders of new CASA licences is consistently below 10 per cent across all types of pilot and maintenance licences. This further demonstrates that female participation in specialist aviation occupations (with the exception of Flight Attendants) is significantly lower than female participation in the broader aviation industry.

For initial Aeroplane Pilot licences, the highest share of new female licensees in 2015 is observed for private licences (9 per cent), while Command – Single Engine Instrument Rating licences have the lowest share of female holders at 6 per cent.

Female participation is significantly lower for Helicopter Pilots, with women making up a maximum of 5.5 per cent of newly licensed pilots (commercial licence), and no Co-pilot or Command – Single Engine Instrument Rating delivered to a female pilot.

Aircraft maintenance-related licences have the lowest share of female holders: only 2.2 per cent of new Multi-Crew Pilot Licence (MPL) licensees are women (less than the current workforce distribution), similar to the 2.6 per cent observed for Maintenance Authority licences. These figures indicate that the current gender distribution of the aviation workforce is unlikely to change in the short term, and unlikely to change in the medium to long term in the absence of targeted initiatives from the industry.

Detailed tables, showing the share of female holders of initial pilot and maintenance licences since 2010, are provided in Appendix 1.
LICENSING ANALYSIS

The renewal of medical certificates provides a remarkably clear insight into the composition of the wider licence-holding population (Figure 1.7).

* Notes to Figure 1.7:

Class 1 medical certificate renewals are an annual requirement for Commercial, Air Transport and Multi-Crew Pilots as well as Flight Engineer licence holders and therefore represent the full population of licence holders of that type. Air Transport Pilots over 60 years of age have to review their medical every six months.

Class 2 certificates are renewed on an age-related basis and apply mainly to private and student pilots.

Class 3 certificates apply to Air Traffic Controllers and Flight Service Officers and are renewed every two years, and represent half of the total population for that licence. The plot represents all three types summed, taking account of duplicate certification.

The most obvious feature of the data is how static the population is across each parameter. This is partly due to the inertia of large numbers; that is, the annual variation is masked by the size of the population. Supporting CASA data (Figure 1.8) suggests, however, that the population of licence holders has been relatively stable for at least 15 years.

* Total population of flight crew licence holders with current medical certificates.
* The spike in 2010-11 is due to a change in how this figure was calculated.
* Note to Figure 1.8: Over the four-year period from 1 September 2014, all pilot licences will be converted to the new format under new Civil Aviation Safety Regulations. A reduction in licences is noted at that time.

To maintain a reasonably static population, the number of licences issued must approximate the number of retiring licence holders, acting as a replacement rate for the population. The data also shows that this replacement rate has increased from 14 per cent for the first five years of the century to 20 per cent for the following decade, another indicator of an ageing population (Figure 1.9). The step-change increase in licence issues in 2005–06 (Figure 1.8, yellow indicator) can perhaps even be seen in the elevated 25–29 year old cohort of the age profile in Census 2011 (Figure 1.9, yellow indicator).
From the medical certificate renewal data, we can see that female licence holders experienced an annual growth rate of 2.2 per cent over the period 2010–15, which far exceeded the almost static 0.01 per cent annual rate among males. The net growth over the period was therefore comprised almost entirely of female additions (93 per cent).
It is not all good news, however. A longer view of the data shows that the proportion of female Air Transport Professionals has changed very little in nearly 30 years (Figure 1.10). Across all licence types, female licence holders are on average six years younger than their male counterparts (Figure 1.11). However, low average age at higher licences is actually due to the lack of females at these levels. There is a clear tendency for females to reduce in representation as the licence increases in seniority, with most annual gains since 2010 restricted to lower licences (Figure 1.12).

*Air Transport Professionals unit group, as above.*
GENDER BY LICENCE TYPE.

SOURCE: CASA LICENSING STATISTICS

**FIGURE 1.12**

<table>
<thead>
<tr>
<th>Licence Type</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Engine</td>
<td>Male</td>
</tr>
<tr>
<td>Copilot</td>
<td>Female</td>
</tr>
<tr>
<td>Multi Engine</td>
<td>Male</td>
</tr>
<tr>
<td>Commercial</td>
<td>Female</td>
</tr>
<tr>
<td>Private</td>
<td>Male</td>
</tr>
<tr>
<td>Class 1</td>
<td>Female</td>
</tr>
<tr>
<td>Class 2</td>
<td>Male</td>
</tr>
<tr>
<td>Class 3</td>
<td>Female</td>
</tr>
<tr>
<td>FCL Instrument Rating</td>
<td>Male</td>
</tr>
<tr>
<td>Flight Crew Licence (FCL)</td>
<td>Female</td>
</tr>
<tr>
<td>Medical Certificates</td>
<td>Male</td>
</tr>
<tr>
<td>Present</td>
<td>Female</td>
</tr>
</tbody>
</table>

Male
Female
COUNTRY OF ORIGIN

Figure 1.13 provides a summarised breakdown by country of birth of the aviation workforce by sector in Australia, as recorded in the 2011 Census. ‘MESC’ stands for ‘main English-speaking countries’, which include the United Kingdom, Ireland, Canada, New Zealand, South Africa and the United States. ‘OTMESC’ stands for ‘other than main English-speaking countries’ and includes all other countries apart from Australia.

**FIGURE 1.13**

**EMPLOYMENT BY COUNTRY OF BIRTH (2011 CENSUS).**

*Source: Census 2011*

Overall, the proportion of aviation workers born outside of Australia tends to be slightly higher than the remainder of the working population (28.8 per cent compared with 27.7 per cent across all aviation sectors). Among these overseas-born workers, the proportion of workers coming from main English-speaking countries is generally slightly greater in the Aviation Industry than observed for all aggregated industries (44 per cent compared with 43 per cent).

However, the picture is somewhat different in the aircraft manufacturing and maintenance sector, where 34.5 per cent of the workers were born outside of Australia. The sector also has a higher-than-average proportion of workers born in non-main English-speaking countries, standing at nearly 20 per cent of the aircraft manufacturing and maintenance workforce.
HOURS WORKED

Figure 1.14 shows the average weekly hours actually worked by workers in available aviation occupations, compared with all occupations.

While full-time aviation workers tend to work fewer hours than the average for all occupations, part-time aviation workers tend to work longer hours. Female Air Transport Professionals and Aircraft Maintenance Engineers report working significantly more hours on average than their male counterparts, both when employed full-time and part-time. Meanwhile, male Flight Attendants work more weekly hours on average than their female colleagues.
FULL-TIME STATUS

The distribution of aviation workers by full-time status is shown in Figure 1.15 for select occupations. Overall, aviation workers are more likely to work full-time compared with the average Australian workforce. Aircraft Maintenance Engineers overwhelmingly work full-time (96.8 per cent). The Flight Attendant occupation has the largest share of part-time workers at 36.3 per cent, slightly more than the average for all occupations (30.5 per cent).

**Figure 1.15**

**FULL-TIME STATUS OF WORKERS EMPLOYED IN SELECT AVIATION OCCUPATIONS.**

*Source: Census 2011*
EDUCATIONAL ATTAINMENT

The majority (53 per cent) of aviation workers hold a vocational education degree as their highest level of study, compared with 29 per cent for the overall Australian working population (Figure 1.16). In contrast, only 27 per cent of the aviation workforce holds no post-high school qualifications, compared with 40 per cent for the overall population.

This reflects the highly regulated nature of the aviation industry, where streamlined knowledge, skills and processes (sanctioned by regularly reviewed licensing and accreditation) are paramount to ensuring the safety, security and productivity of operations. Interestingly, while the proportion of workers holding a Certificate I or II as their highest qualification is generally negligible across all industries, none were recorded within the aviation industry.
The lower proportion of workers holding bachelor-level and postgraduate qualifications highlights the operational focus of the majority of the workforce engaged in aviation-related occupations.

Figure 1.17 shows the highest qualifications attained by workers in major aviation occupations, grouped by general attainment level (higher education, vocational education, high school and below). Aeronautical Engineers have the highest-level qualifications by a large margin, being seven times more likely to hold a postgraduate degree than the rest of the aviation workforce, and more than three times as likely to hold a bachelor degree. They are followed by Air Traffic Controllers, then Pilots and Flying Instructors, who for the majority hold at least diploma-level qualifications.

On the other side of the spectrum, 60 per cent of Airline Ground Crew and Aircraft Baggage Handlers do not hold any post-school qualifications. This is also the case for 51 per cent of Aircraft Refuellers and 47 per cent of Flight Attendants. Certificates III and IV are the highest-level qualifications held by the majority Aircraft Maintenance Engineers, ranging between 60 per cent and 72 per cent across all maintenance engineering specialties.

**EDUCATIONAL ATTAINMENT PROFILE OF KEY AVIATION OCCUPATIONS.**

*SOURCE: CENSUS 2011*
PART II

LABOUR DEMAND AND SKILL NEEDS FOR THE AUSTRALIAN AVIATION INDUSTRY

IMAGE SOURCE: QANTAS
1 BACKGROUND: BUSINESS ISSUES AND HISTORICAL LABOUR DEMAND

» MAJOR BUSINESS ISSUES
» MAJOR WORKFORCE ISSUES
» HISTORICAL DEMAND FOR AVIATION OCCUPATIONS
» LABOUR ISSUES
» SKILLS IN DEMAND

2 SCENARIOS FOR FUTURE LABOUR DEMAND

» MARKET GROWTH FORECASTS
» IMPACT OF SKILL SHORTAGES
» EMERGING SKILLS
1. ISSUES AND HISTORICAL LABOUR DEMAND

MAJOR BUSINESS ISSUES

PricewaterhouseCoopers' (PwC) 2014 international survey of airline CEOs identified the top three business risks to company growth worldwide:

- Energy costs were a major concern for 74 per cent for airline CEOs, compared with 19 per cent for all CEOs.
- Data security was cited by 37 per cent of airline CEOs, compared with 14 per cent of all CEOs.
- Availability of key skills was cited as a major area of concern for 37 per cent of airline CEOs, compared with 21 per cent for all CEOs.

The PwC survey also identified airline CEOs’ priority areas for change: data management and analytics; customer growth and retention strategy; technology investment; and channels to market.

In order to respond to the changes in the business environment, the vast majority of airlines are devising or implementing significant change programs in several key areas. The scale of these change programs puts additional pressure on airlines’ recruitment and training functions.

The vast majority of airline CEOs felt their organisation was not well prepared to face the required changes in human resources (86 per cent) and in information technology (75 per cent). While this places the industry at risk of not adequately addressing the business threats mentioned above, there are potentially significant competitive advantages for the Australian Aviation Industry if it manages to get this right.
MAJOR WORKFORCE ISSUES

The resourcing risk was also cited as a significant issue by the largest number of industry respondents to an industry scanning survey conducted by TLISC in 2015, which received responses from a wide range of businesses across the aviation industry. Major workforce issues identified by industry respondents to the survey are summarised in Figure 2.1.

**FIGURE 2.1**

MAJOR WORKFORCE ISSUES IDENTIFIED BY AVIATION EMPLOYERS.

*Source: TLISC (2015)*

<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attracting skilled workers</td>
<td>52.0%</td>
</tr>
<tr>
<td>Ageing workforce</td>
<td>40.0%</td>
</tr>
<tr>
<td>Diversity of workforce</td>
<td>28.0%</td>
</tr>
<tr>
<td>Turnover and retention</td>
<td>16.0%</td>
</tr>
<tr>
<td>Absenteeism</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

Workforce ageing and succession planning was the second most widespread issue, affecting nearly half of respondents. This highlights the real impact on aviation businesses of the rapid rate of ageing of their workforce identified in Part I.

A lack of diversity in the workforce posed significant challenges to more than a quarter of employers, further compounding recruitment difficulties through reducing the pool of available candidates at various experience and skill levels. High turnover rates have less of an operational impact overall across the industry, with only 16 per cent reporting significant impact on their business.

However, high turnover rates are disproportionately affecting aerodrome operators (particularly regionally), which were under-represented among the survey respondents. Absenteeism was only an issue for 8 per cent of employers, the least of all transport and logistics industries.
HISTORICAL DEMAND FOR AVIATION OCCUPATIONS

The Internet Vacancy Index (IVI), published monthly by the Department of Employment’s Labour Market Information Portal, is based on a count of online job advertisements lodged on SEEK, CareerOne and Australian JobSearch and covers around 350 occupations. (The IVI does not include vacancies advertised through other online job boards, employer websites, newspapers, word of mouth, or in shop windows. It also does not distinguish when multiple positions are advertised within a single advertisement). Figure 2.2 below shows the size of the labour force demand for aviation occupations for the past 15 years.

SIZE OF HISTORICAL LABOUR DEMAND FOR AVIATION OCCUPATIONS,
BASED ON DATA FROM THE INTERNET VACANCY INDEX.

SOURCE: LMIP
Figure 2.3 displays the evolution and overall trend of the Internet Vacancy Index (IVI) for tracked aviation occupations since 2006. The overall IVI score for all occupations across all industries is provided in Figure 2.4 for comparison.

**FIGURE 2.3**


**SOURCE: LMIP (2015)**

**FIGURE 2.4**

INTERNET VACANCY INDEX (IVI) FOR ALL OCCUPATIONS/INDUSTRIES, AUSTRALIA, 2006–15.

**SOURCE: LMIP (2015)**
Aircraft maintenance engineering vacancies advertised online have decreased by more than half since 2006. The recovery in demand for Maintenance Engineers after the GFC was reversed in mid-2012, as Australian airlines offshored some engineering functions to reduce operational costs. The contraction of the aircraft engineering labour market was highlighted as a key issue by Manufacturing Skills Australia (MSA) in its 2015 Environmental Scan, noting the issue was further compounded by the reduced maintenance schedules applicable to new aircraft.

While the IVI for aircraft maintenance engineering occupations roughly followed the downward trend observed across all industries, these occupations were more dramatically affected by peaks and troughs over time, indicating a higher-than-average vulnerability of the profession to economic downturns.

Vacancies advertised online for other Air Transport Professionals have by comparison remained relatively stable, although they are also on a downward trend. The low number of vacancies recorded for this category indicates that most vacancies are advertised through other channels, such as employer websites or direct engagement through recruitment and temping agencies.
LABOUR ISSUES

Table 2.1 provides a summary of the aviation-related occupations that have been identified as being in high demand or in shortage in TLISC's and Manufacturing Skills Australia's (MSA) Environmental Scans since 2010.

There is a shortage of Flying Instructors and Approved Testing Officers/Flight Examiners, evidenced by a large number of industry and pilot submissions. Grade 2 and Senior Flight Instructors are particularly sought after, as are Instructors across the grade ranges with specialist skills (such as instrument-rated helicopter pilot training or multi-engine training), with several employers reporting the need to recruit suitably experienced instructors from overseas.

The pay structures across the aviation industry do not adequately differentiate between the role of the Flight Instructor and commercial operations to entice the most experienced commercial pilots into instruction roles. Flying Instructor shortages are observed in many other Western countries, and are similarly attributed to pay disparity. It is also often remarked that flying instruction is the preferred pathway for junior Pilots to gain flight hours by immediately undergoing Flight Instructor training after gaining their commercial pilot licence.

Shortages in Approved Testing Officers/Flight Examiners (ATO/FE) represent a significant risk for operational disruption across the industry due to the flow-on effects on the timeliness of flight crew licensing and licence renewal. In this case, there appears to be insufficient numbers of skilled and experienced ATOs/FEs to support industry requirements.

Skilled Aeroplane and Helicopter Pilots with commercial licences are in high demand in Australia and internationally. Licenced Pilots with Instrument Flight Rules (IFR) Captain status are in very high demand and relatively low supply due to the difficulty of achieving a suitable skill level outside of airline training. Some specialist Pilot skill sets are also in particularly high demand, including emerging skills areas such as multi-crew skills, High Capacity Helicopter Pilot and Unmanned Air Vehicle (UAV) skills.

While strong growth in the demand for Pilots is predicted in the medium to long term, there is a sizeable pool of candidates with initial or general aviation training for the industry to choose from and upskill to the required job specifications.

There is strong demand for ground operations occupations at airports, including Aircraft Baggage Handlers, Airline Ground Crew, Load Controllers, and Airports Works Safety Officers. The demand for these occupations is primarily driven by airport growth, with most major capital city airports being expanded or planned for expansion.

These occupations are characterised by very high turnover rates, in a large part due to unattractive working conditions. These may include low pay, shift work, physically demanding duties in some cases, unattractive geographic location of the place of work, as well as an increasing casualisation of employment contracts – with chronic underemployment as its corollary.
The resulting transient nature of this workforce leads to temporary, localised shortages. Rural and remote airports tend to be more affected by such temporary shortages due to the competition from more highly paid industries (particularly extractive industries) for similarly skilled positions.

Despite the contraction of the aircraft maintenance labour market in Australia, experienced Aircraft Maintenance Engineers with current licensing remain in very high demand due to the very specific skill sets involved and the dwindling number of engineering trainees in recent years. In particular, the uptake of new digital equipment has led to the restructure of many maintenance functions, requiring existing workers to upskill or retrain.

Some employers reported upskilling was a challenge for some older workers. More generally, specialist maintenance skill sets remain highly sought after, with localised shortages where the pool of trained candidates is limited. This is notably the case for Electronic Instrument Trades Workers and Instrument Technicians, which have been identified by MSA as being in critical demand in 2015.

Aircraft Maintenance Engineering Trainers and Assessors are in shortage across Australia, as identified by TLISC and MSA in industry scanning exercises over past years. These shortages are broadly caused by the similar reasons identified for the shortage in Flying Instructors (low remuneration compared with operational industry pay scales), and aggravated by the small number of experienced, licensed engineers with the breadth and depth of knowledge and skill required for such training positions. This poses significant challenges to maintenance engineering training organisations, particularly in regional areas.
### AVIATION OCCUPATIONS IDENTIFIED AS IN HIGH DEMAND/SHORTAGE, 2010–15

**Source:** TLISC/MSA (2010–15)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Flight Operations</strong></td>
<td></td>
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<tr>
<td>231111</td>
<td>Aeroplane Pilot</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>231113</td>
<td>Flying Instructor (Aeroplane/Helicopter)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>451711</td>
<td>Flight Attendant</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Ground / Aerodrome Operations</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>231112</td>
<td>Air Traffic Controller</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>721911</td>
<td>Aircraft Baggage Handler, Airline Ground Crew, Load Controller</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>721911</td>
<td>Airport Reporting Officer</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>721911</td>
<td>Works Safety Officer</td>
<td></td>
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<td></td>
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<tr>
<td>132311</td>
<td>Human Resources Manager</td>
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<td></td>
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<tr>
<td>132111</td>
<td>Corporate Services Manager</td>
<td></td>
<td></td>
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<tr>
<td><strong>Maintenance</strong></td>
<td></td>
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<tr>
<td>323111</td>
<td>Aircraft Maintenance Engineer (Avionics)</td>
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<td></td>
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</tr>
<tr>
<td>323112</td>
<td>Aircraft Maintenance Engineer (Mechanical)</td>
<td></td>
<td></td>
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<tr>
<td>323113</td>
<td>Aircraft Maintenance Engineer (Structures)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>312312</td>
<td>Electrical Engineering Technician, CNC Setter and Programmer</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>342314</td>
<td>Electronic Instrument Trades Worker (general)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>342315</td>
<td>Electronic Instrument Trades Worker (special class)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>312412</td>
<td>Electronic Engineering Technician, CNC Setter and Programmer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>233911</td>
<td>Aeronautical Engineer</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>239914</td>
<td>Aircraft through-life logistics (including maintenance management) skills</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>312512</td>
<td>Process Control Technician, Engineering Designer including 3D CAD, Engineering Technical Officer, CNC Setter and Programmers</td>
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</tbody>
</table>

- **High**
- **Critical**
SKILLS IN DEMAND

Figure 2.5 provides an overview of the extent of skill needs reported by aviation employers during the industry consultation phase of this study.

**Figure 2.5**

**EMPLOYER-REPORTED SKILL DEVELOPMENT NEEDS**

*Source: Aviation Workforce Skills Study Industry Survey (TLISC 2015)*

The impact of technology change on the aviation workforce is visible, with skill areas related to digital technologies consistently reported by more than half of respondents as needing to be further developed at least to some extent. These include analytical skills (70.6 per cent of respondents), which have grown in importance and prevalence along with the recent growth in the use of real-time data analytics and ‘Big Data’ analytics. Closely related to this are problem-solving skills, or the ability to interpret the available information and react adequately, which is cited by more than 60 per cent of employers.

Risk and safety management and modelling is the second skill area that most needs developing (68.1 per cent), with a particular focus on the computerisation and business integration of risk models. Maintaining data security (51.2 per cent) and systems compliance (57.5 per cent) also require skills in high demand across the industry, with implications for most occupations at all levels.

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>To a great extent</th>
<th>To some extent</th>
<th>To very little extent</th>
<th>Not at all</th>
<th>Unsure</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical</td>
<td></td>
<td></td>
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<tr>
<td>Risk &amp; safety management/modelling</td>
<td></td>
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<tr>
<td>Technical - engineering/maintenance</td>
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<tr>
<td>Customer service</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Problem solving</td>
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<tr>
<td>Systems compliance</td>
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<tr>
<td>Digital literacy/readiness</td>
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<tr>
<td>Data security</td>
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<tr>
<td>Occupational Health and safety (OHS)</td>
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<tr>
<td>Teaching and training (incl. flight simulation)</td>
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<tr>
<td>Financial / commercial</td>
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<tr>
<td>Technical - advanced flying</td>
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<tr>
<td>Language, Literacy and Numeracy</td>
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<td></td>
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<tr>
<td>Security</td>
<td></td>
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<tr>
<td>STEM (Science, Technology, Engineering, Maths)</td>
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<tr>
<td>Supply chain</td>
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<tr>
<td>Design</td>
<td></td>
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<tr>
<td>Technical - manufacturing</td>
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</tbody>
</table>

The bar charts show the percentage of respondents indicating the extent to which each skill area needs development.
Digital literacy and digital readiness are an issue for around 55 per cent of employers. This is significant, as low levels of digital literacy are a barrier to workforce upskilling and the full realisation of the benefits of training. The same is true of low levels of language, literacy and numeracy (LLN), which affect at least to some extent 40 per cent of our survey respondents.

The need to develop knowledge and the job-specific implications of ‘human factors’ theory within the Aviation workforce was also cited by several employers. This skill area is closely related to occupational health and safety (OHS) matters, and risk and safety management. The need is particularly great in the aircraft engineering and maintenance sector, where regulatory changes mean that training existing staff in human factors will become compulsory.
2. SCENARIOS FOR FUTURE LABOUR DEMAND

MARKET GROWTH FORECASTS

Australia’s economic outlook is strong, with rapidly transforming economies such as China, India and Indonesia offering significant opportunities for increased commercial activity. There will be more than three billion middle-class consumers at Australia’s doorstep by 2020.

Globally, air cargo transport has consistently outperformed world trade figures in the past decade, and this trend is expected to continue in the short to medium term.

The strong growth in air passenger and cargo traffic observed in the Asia-Pacific region in the past decade is expected to continue, with world air cargo expected to double in the next 20 years. Asia’s rapidly expanding middle class and the tremendous increase in international online shopping are stretching the capacity of regional airlines and airport infrastructure.

The scale and rate of the aviation sector’s growth in the region in Figure 2.6 shows the actual and projected growth of the region’s air passenger and cargo fleet from 2004 through to 2034. The passenger and cargo fleet will nearly triple in the 20 years to 2034, with 10,330 planes forecast to be added to the region’s traffic.

To operate this number of planes, Boeing estimates that around 216,000 new Pilots will need to be trained in the Asia-Pacific in the next 20 years – the most of any region in the world. This will put significant pressure on Australian airlines to attract and retain workers as the domestic and international competition for skilled Pilots will be fierce. In addition, the strong demand for Aircraft Maintenance Engineers that has been observed in previous years will be maintained.
Overall, activity in the general aviation (GA) side of the industry is on track to recover, after three years of relative downturn between 2010 and 2013. The increased growth in the fly-in-fly-out (FIFO) workforces has led to increased labour demand in some regional areas, resulting in a particularly strong demand for Aircraft Maintenance Engineers and Light Aircraft Maintenance Engineers with the appropriate licences. However, there is substantial year-on-year variability in activity in some GA sectors, which may impede the industry’s ability to attract and durably retain suitably skilled workers (Figure 2.7) (see also Appendix 2 for data on other GA sectors).

**Figure 2.7**

Change in hours flown in general and regional aviation compared with the previous year, years ended December 2006–13.

*Source: BITRE, 2013*
Figure 2.8 gives estimates of employment in four sub-sectors of the aviation industry and a short-term forecast of the labour trend to 2020. Employment in scheduled passenger transport is projected to fall slightly, while in aerodrome operations, air freight and non-scheduled passenger transport are likely to rise slightly or remain stable.
Table 2.2 shows a forecast for steady demand in key occupations. Aircraft Maintenance Engineers will be in high demand, with at least an additional 2,000 needed by 2017.

**Table 2.2**

**FORECASTS OF JOB OPENINGS FOR NEW ENTRANTS, 2015 - 17.**

*Source: TLISC/CEET(2013)*

<table>
<thead>
<tr>
<th>Position</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Aviation occupations</strong></td>
<td>1,600</td>
<td>1,600</td>
<td>1,600</td>
<td>4,800</td>
</tr>
<tr>
<td>Aeroplane/Helicopter Pilot/Flying Instructor</td>
<td>300</td>
<td>400</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>Flight Attendant</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>600</td>
</tr>
<tr>
<td>Air Traffic Controller</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Aircraft Maintenance Engineer (Avionics/Mechanical/Structures)</td>
<td>700</td>
<td>600</td>
<td>700</td>
<td>2,000</td>
</tr>
<tr>
<td>Baggage Handler/Aircraft Refueller/Other Ground Crew</td>
<td>300</td>
<td>300</td>
<td>400</td>
<td>1,000</td>
</tr>
</tbody>
</table>
IMPACT OF SKILL SHORTAGES

The shortage of Flight Instructors and Flight Examiners is expected to continue in the short to medium term because of the time it takes to develop the skills required. The remuneration discrepancy between Commercial Pilot roles and Instructor/Examiner positions will continue to further compound this shortage.

The ongoing strong demand for Australian-trained Aeroplane Pilots and, to a lesser extent, Helicopter Pilots, may lead to localised shortages in the longer term in the absence of greater industry commitment to the training and development of pilots.

For Aircraft Maintenance Engineers, the low vacancy levels observed since 2012 pose a significant risk of operational disruption, given the specific nature of the skill sets held by engineers (including aircraft and company-specific skills and knowledge), and the small number of qualified engineers and engineering trainees in Australia.

As engineers and prospective entrants with limited employment or advancement prospects in Australia decide to change careers or move overseas, the pool of qualified candidates will be rapidly depleted when demand increases again. The shortage of Aircraft Maintenance Engineering Trainers and Assessors across engineering specialties in particular is expected to at least continue, and may deepen further in the coming years, with grave implications for the viability of aircraft maintenance training programs.

Vacancies may remain unfilled in rural and remote areas, where local demand associated with general aviation (particularly agricultural aviation services and FIFO transport) might not be sufficient to allow for full-time work throughout the year.

These findings are corroborated by an extensive three-year research project into ‘The Future of Aircraft Maintenance in Australia: Aviation Safety, Workforce Capability and Industry Development’, undertaken by the University of NSW through an Australian Research Council grant. The study found “a significant projected medium to longer-term impact of skill shortages on aircraft maintenance”, with the report noting that a reduction in aircraft engineering training capacity poses a long-term risk to the industry’s ability to access skilled workers.

Work Safety Officers will remain in very high demand at airports in the short to medium term, due to the many large-scale construction projects underway or scheduled at capital city and regional airports. The specialist skill sets required for this occupation may result in localised shortages, and regional airports are likely to experience greater difficulties in attracting and retaining skilled staff.
EMERGING SKILLS

The ability to adapt quickly to new technology, as well as the ability to autonomously interpret and react adequately to data analytics, are necessary skills for new entrants, as well as the existing workforce. Knowledge of automated and unmanned systems and safety management systems was consistently identified as critical emerging skills for the industry.

These baseline skills will need to be supplemented by thorough, efficient on-the-job training. This is particularly true in the areas of customer relationship management and sales, where the reshaping of airlines’ customer growth and retention strategy and channels to market approaches will require the full participation of all directly and indirectly affected workers in order to be successful.

The increased integration of information technology (IT) systems in aviation businesses leads to the emergence of specialist integrative roles at the intersection of the various systems. For example, risk modelling systems are increasingly integrated with other business systems, including flight simulation training and workforce performance and development tracking. In addition, operational staff increasingly need to receive training on the systems' implications for their role.

Non-technical, targeted training modules are consequently increasingly being developed in partnership with training providers or within organisations to ensure data security, systems compliance, and an appropriate approach to problem solving at the level required by the role.

In the field of flight training, the rise in demand for specialised Commercial Pilot training has led to the emergence of multi-crew instruction specialist instructors and assessors. Concurrently, the increased use of flight simulators for flying training, and the increased sophistication of the scenarios that can be simulated, mean that flight simulation training is emerging as a specialty of its own, requiring a complex set of skills that is difficult to acquire.

In a context of volatile fuel prices, highly developed energy and fuel management skills are becoming a mandatory part of the skill set expected of pilots, managers, and maintenance workers.
PART III
IMPACT OF AVIATION TRAINING IN AUSTRALIA
1. Training Needs

2. Publicly Funded VET Enrolments
   » Age Profile of Publicly Funded Enrolled Students

3. Cost of Training

4. Industry Views of the Australian Aviation Training System
   » Drivers of Training Investment
   » Training Outcomes in the Workplace
   » Quality of Training Delivery and Assessment
   » Impact of the Costs of Training

5. Challenges for Training Providers
   » Adjusting to Regulatory Changes
   » Trainers/Assessors Recruitment Difficulties
1. TRAINING NEEDS

Table 3.1 provides five-year estimates of the minimum training needs (ie: the minimum number of qualifications that need to be completed) identified by TLISC in 2013 to ensure the Aviation Industry’s demand for skilled workers is met. These estimates only include the needs for formally qualified workers. The qualification profile of a given occupation may change over time. In many instances, existing workers who hold a qualification at a certain level may be required to upskill, while others who do not hold a qualification may move to acquire their first qualification.

Table 3.1

<table>
<thead>
<tr>
<th>All aviation occupations</th>
<th>Total</th>
<th>Higher education</th>
<th>Adv. Diploma or Diploma</th>
<th>Certificate III/IV</th>
<th>Certificate I/II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8,800</td>
<td>1,800 20.5%</td>
<td>2,500 28.4%</td>
<td>4,100 46.6%</td>
<td>400 4.5%</td>
</tr>
<tr>
<td>Aeroplane/Helicopter Pilot/Flying Instructor</td>
<td>2,100</td>
<td>800 38.1%</td>
<td>1,300 61.9%</td>
<td>100 4.8%</td>
<td>0 0.0%</td>
</tr>
<tr>
<td>Flight Attendant</td>
<td>1,500</td>
<td>500 33.3%</td>
<td>700 46.7%</td>
<td>300 20.0%</td>
<td>0 0.0%</td>
</tr>
<tr>
<td>Air Traffic Controller</td>
<td>700</td>
<td>300 42.9%</td>
<td>400 57.1%</td>
<td>0 0.0%</td>
<td>0 0.0%</td>
</tr>
<tr>
<td>Aircraft Maintenance Engineer (Avionics/Mechanical/Structures)</td>
<td>3,800</td>
<td>100 2.6%</td>
<td>100 2.6%</td>
<td>3,200 84.2%</td>
<td>300 7.9%</td>
</tr>
<tr>
<td>Baggage Handler/Aircraft Refueller/Other Ground Crew</td>
<td>800</td>
<td>200 25.0%</td>
<td>0 0.0%</td>
<td>500 62.5%</td>
<td>100 12.5%</td>
</tr>
</tbody>
</table>

Additional demand for training may arise as a result of workers undertaking qualifications at the same level as, or lower than, the highest qualification held, typically with the purpose of broadening their skill set. These are not included in the estimates. Therefore, as many workers will complete multiple qualifications, these figures underestimate the total demand for aviation-related qualifications. Non-accredited training (eg: company-specific training that does not result in a recognised qualification being delivered) is not included in these estimates.
Training needs are projected to be for about 9,000 people to acquire aviation-related qualifications between 2013 and 2017. Nearly half of these are for Aircraft Maintenance Engineers, with the vast majority of training required at the Certificate III and IV level (84.2 per cent). This is consistent with the qualification profile of this occupational group.

The second largest occupation group in terms of training needs is Pilots and Flying Instructors, representing just under a quarter of all training needs. The majority of the training required is at the Diploma and Advanced Diploma level (61.9 per cent), with higher education degrees amounting to 38.1 per cent of the qualifications that need to be acquired. This is a significant shift upwards from the current qualification profile of this occupational group, highlighting the need for higher-level skills in these professions. A similar upward shift in qualification profile is expected for Flight Attendants, who represent 17 per cent of all training needs.
2. PUBLICLY FUNDED VET ENROLMENTS

An overview of publicly funded student enrolments in aviation-related vocational education and training (VET) qualifications since 2004 is provided in Figure 3. Data are sourced from the National Centre for Vocational Education Research (NCVER) VOCSTATS dataset, which includes data collected on government-funded training (privately funded training is excluded). Enrolment levels are shown by job category: Maintenance/Manufacturing (corresponding to the MEA Training Package), Ground Operations and Flight Operations (both part of the AVI/TDA Training Package).

Enrolments in aircraft maintenance and manufacturing-related qualifications constitute the majority of publicly funded enrolments into VET aviation qualifications. While maintenance and manufacturing enrolments rose steadily between 2004 and 2010, enrolments in engineering specialties became more volatile from 2011 onwards. This mirrors the volatility of the aircraft maintenance labour market and the scarcity of work placements and apprenticeships available to aspiring trainees.

Publicly funded enrolments in ground operations-related VET qualifications have experienced a remarkably strong and consistent growth in the past decade, with enrolment levels increasing sixfold since 2002. This is a direct reflection of the rapid growth of the aviation industry in Australia. It shows that the industry, its workforce and candidates wanting to get into the industry have been able to benefit from the expansion of government mechanisms for training funding.

However, there has been a sharp decrease in publicly funded enrolments in flight operations-related qualifications since 2009. It is expected that enrolments will start increasing from 2015 onwards as the extension of government funding into flight operations qualifications comes into effect.
VET STUDENTS COMMENCING PUBLICLY FUNDED AVIATION QUALIFICATIONS SINCE 2004.
Detailed figures for publicly funded enrolments in aviation-related qualifications since 2010 are provided in Table 3.2, split by qualification level.

**Table 3.2**

PUBLICLY FUNDED ENROLMENTS IN AVIATION QUALIFICATIONS BY AQF LEVEL, 2010–14.

<table>
<thead>
<tr>
<th>Ground Operations</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate II</td>
<td>5</td>
<td>18</td>
<td>15</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Certificate III</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Flight Operations</td>
<td>220</td>
<td>295</td>
<td>323</td>
<td>299</td>
<td>358</td>
</tr>
<tr>
<td>Certificate II</td>
<td>44</td>
<td>70</td>
<td>114</td>
<td>133</td>
<td>149</td>
</tr>
<tr>
<td>Certificate III</td>
<td>64</td>
<td>67</td>
<td>66</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>92</td>
<td>115</td>
<td>84</td>
<td>37</td>
<td>74</td>
</tr>
<tr>
<td>Maintenance</td>
<td>1,348</td>
<td>752</td>
<td>1,059</td>
<td>1,555</td>
<td>905</td>
</tr>
<tr>
<td>Certificate II</td>
<td>212</td>
<td>93</td>
<td>198</td>
<td>129</td>
<td>132</td>
</tr>
<tr>
<td>Certificate III</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>1,076</td>
<td>598</td>
<td>646</td>
<td>1,061</td>
<td>574</td>
</tr>
<tr>
<td>Diploma</td>
<td>43</td>
<td>41</td>
<td>214</td>
<td>361</td>
<td>192</td>
</tr>
<tr>
<td>Advanced Diploma</td>
<td>16</td>
<td>9</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

For aviation maintenance qualifications, publicly funded student enrolments rose in the three years from 2011 at the Certificate IV and diploma level. The increase in diploma-level enrolments can be largely attributed to the need for Aircraft Maintenance Engineers to be upskilled to meet new licensing requirements. However, in the meantime fewer apprenticeships have significantly reduced opportunities for new entrants and these are expected to decline further, given significant contributors to training such as Qantas are gearing down their apprenticeship programs.
AGE PROFILE OF PUBLICLY FUNDED ENROLLED STUDENTS

Figure 3.2 compares the age distribution of VET students enrolled in government-funded aviation-related qualifications in 2006, 2011, and 2013.

The share of students in the lowest age bracket (15-24 years) has markedly increased in the past decade, standing at close to 80 per cent in 2013. This correlates with the expansion of government funding mechanisms for aviation students (such as the availability of VET-FEE HELP), and demonstrates that training funding policies have the ability to draw young entrants into the industry. Such support mechanisms can help mitigate the risks associated with a fast ageing workforce and their targets should be regularly reviewed in light of industry-specific workforce issues.

FIGURE 3.2


TOTAL VET ACTIVITY

Total VET activity (TVA) data provides an estimate of the extent and nature of the vocational education and training (VET) delivered in 2014 and 2015 by Australian training providers. It is referred to as ‘total VET activity’, to reflect that the information is collected from all types of providers and not only those in receipt of Commonwealth or State/Territory funding. Prior to 2014, the available information was restricted to those training providers in receipt of Commonwealth or State/Territory funding.

Information is provided on the number of training providers, students, enrolments in programs, enrolments in subjects, hours of delivery and program completions.

FIGURE 3.3

SOURCE: VOCSTATS

Figure 3.3 above shows that Total VET activity enrolments in the Aviation Training Package are more than four times larger than previously measured. This indicates that a significant proportion of VET training delivery is not subsidised by Commonwealth or State/Territory funding. This is explored further in Figure 3.4.

The Aviation Industry attracts as much Government funding (15 per cent) as International fees for service, with the remaining 70 per cent funded by industry (employers and students).
In 2015 the Aeroskills Training package attracted a significant amount of government funding (Figure 3.6), with 66 per cent of training delivery involved Commonwealth and/or State and Territory funding, with the remainder funded by industry.
The availability of more complete VET data is of significant benefit for industry and government stakeholders as it gives a far clearer picture of the extent and nature of the use of individual Training Packages. Effective workforce planning requires access to data about skills supply and demand that is as accurate and contemporary as possible.

FIGURE 3.5
SOURCE: VOCSTATS

FIGURE 3.6
AEROSKILLS TRAINING PACKAGE TVA BY FUNDING SOURCE 2015.
SOURCE: TVA SUBJECT ENROLMENTS

34% 66%
Commonwealth and state funding Domestic fee for service
As the graphs below illustrate, training supply was significantly underreported before the introduction of TVA. Enrolment figures for government funded training relating to the Aviation Training Package completely are completely dwarfed by overlaying the same metrics, funded directly by industry (Figure 3.7).

The outcome for the Aeroskills Training Package is somewhat different, with the reported enrolments for government funded training somewhat similar across both of the datasets. However, of interest in Figure 3.8, is that where government funding for Aeroskills Training Package training reduces from 2011, there is a consequent upswing in industry-funded training delivery. In practical terms, industry have increased their financial investment in skilling the workforce, following a reduction in available government funding. The trend continues into 2015.

**FIGURE 3.7**

AVIATION TRAINING PACKAGE – GOVERNMENT FUNDING AND FEE-FOR-SERVICE COMPARISON.

SOURCE: VOCSTATS
AEROSKILLS TRAINING PACKAGE – GOVERNMENT FUNDING AND FEE-FOR-SERVICE COMPARISON.

SOURCE: VOCSTATS
3. COST OF TRAINING

The cost of training in aviation is considerable. Vocational aviation students bear four times the fees of the average student, with costs located in the 99th percentile of the student population. As Figure 3.9 shows, this disparity cannot be explained by a qualification composition that skews markedly towards higher level and therefore more-costly training.

![Figure 3.9](Image)

**VOCATIONAL VET FEE-HELP PER STUDENT COSTS 2014.**

The greater part of the expense can be expressed as the cost of an airplane per hour, plus the cost of an instructor per hour, times the number of hours required to become proficient. Unfortunately for students, access to airplanes is expensive, instructors are highly specialised and learning to fly takes time. Such expense is a surmountable barrier for only the most dedicated students. This is reflected in unit completion rates at 98 per cent, nearly 35 per cent higher than the average.

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1. Eligible and VET FEE-HELP assisted course enrolments and loans by fee type and VET provider, 2014 – comparing per student costs of flying schools against the population of all other school students.

Notes to table:

* Student licence totals are likely to include considerable double-counting as students who have completed their General Flying Progress Test (GFPT) or not are counted separately but do not sum.

** Data from 2014 was not included because student licences were replaced by recreational licences and cannot be disaggregated. 2014 also saw a drop in licence issues more generally due to transitional licensing arrangements at CASA.

Since the introduction of VET FEE-HELP in 2009, the number of students using government loans has risen each year, but the number of licences issued has not (Figure 3.10). The drop in licences issued suggests that the favourable interest conditions of government loans aren’t a sufficient incentive for students. The difference between the licences issued and Government support can be explained by the composition of domestic and international fee-for-service students (Figure 3.11), with this cohort making up more than 70 per cent of the total at VET level.
If we examine tertiary aviation qualifications (Figure 3.12), we can see that the average post-subsidy debt per student has steadily increased along with the popularity of the qualifications while upfront payments have fallen slightly.

This dataset does not include: Commonwealth Government subsidies for bachelor degrees (and occasionally other qualifications such as graduate diplomas, i.e. post-graduate courses), and higher education courses (amounting to about 60 per cent of the costs of production) or State government subsidies – the extent of which depends on both (a) the state of residence of the student; and (b) the type of course enrolled in.

Students receive a 10 per cent discount (known as the HECS-HELP discount) on upfront payments of $500 or more.
Higher-level qualifications in aviation are certainly diversifying (Figure 3.13), but so it seems are the costs. Aviation degrees in particular are heavily subsidised at a Commonwealth and state level but advanced diplomas (in flight instruction) have apparently reduced figures due to a small number (17 students) that all attracted Commonwealth or state funding drawing down the average.⁹

⁹ TVA VET subject enrolments 2014.

SOURCE: DEPARTMENT OF EDUCATION AND TRAINING, STUDENT LOAN DATA SERIES
The data paints a picture of aviation students as dedicated, in debt, with new entrants in modest decline despite increases in the provision of government loans. Future workforce requirements are depending on a static yield of passionate students and an incentive structure that is not enticing enough (Figure 3.14).

**FIGURE 3.14**

POST-SUBSIDY DEBT PER AVIATION QUALIFICATION TYPE (2014).

**SOURCE:** DEPARTMENT OF EDUCATION AND TRAINING, STUDENT LOAN DATA SERIES
4. INDUSTRY VIEWS OF THE AUSTRALIAN AVIATION TRAINING SYSTEM

The new model for developing and maintaining Training Packages began on 1 January 2016. Under these arrangements Industry Reference Committees (IRCs) drive the process of Training Package development. IRCs are comprised of people with experience, skills and knowledge of their particular industry sector and their role is to ensure that Training Packages meet the needs of employers. IRCs have a direct relationship with the Australian Industry and Skills Committee (AISC) and are supported by independent Service Skills Organisations (SSOs) to develop and review Training Packages, and to inform Training Package development priorities through engaging with industry stakeholders and providing feedback to the AISC.

Under the new arrangements, Australian Industry Standards (AIS) is the appointed SSO for the Aviation Training Package, with an SSO for the Aeroskills Training Package yet to be appointed. AIS was formerly the Transport and Logistics Industry Skills Council (TLISC), which operated for more than 20 years engaging with industry, identifying relevant workplace standards and developing Training Packages.

AIS supports the Aviation IRC in their development of the Four-Year Workplan for the Aviation Training Package. The Four-Year Workplan focuses on the prioritisation of the skill needs of the Aviation industry, and it is developed and reviewed annually in consultation with industry stakeholders, and submitted on behalf of the IRC to the AISC for approval.

The AISC approves activity from the Workplans, which means the Aviation IRC and AIS work together to develop a Business Case which details the work required, industry support, benefits and impacts of any proposed changes on industry and training providers, and anticipated timelines. Business Cases are developed in consultation with industry stakeholders and submitted on behalf of the IRC to the AISC for approval.

Business Cases that are approved result in the commissioning of project work to develop or review Training Packages by AIS with direction and oversight by the IRC.

DRIVERS OF TRAINING INVESTMENT

Retention of skilled employees is the most often cited driver of investment in training, reported as a major factor by 75 per cent of aviation employers (Figure 3.15). Regulatory compliance and succession planning concerns are a close second at 69 per cent.

EMPLOYER-REPORTED DRIVERS OF TRAINING INVESTMENT

TRAINING OUTCOMES IN THE WORKPLACE

Industry responses to the survey undertaken during the research phase of this study indicated that new entrants to flight operations and aviation maintenance roles were often ill-prepared for immediate employment. This is despite all aviation-related qualifications including units of competency and packaging rules that are validated through industry consultation before endorsement and release for use by industry training organisations.

Recent releases of the MEA Aeroskills Training Package and AVI Aviation Training Package include qualifications and skill sets that are designed to achieve aviation maintenance and flight crew licensing requirements. Skills transferability is based on the use of nationally endorsed qualifications across the aviation industry.

Despite problems with new entrants not always being job-ready, employers overall reported significant improvements in their employees after undertaking training, with the biggest benefits being improved occupational health and safety outcomes and improved technical skills (Figure 3.16).

Releases of the AVI Aviation Training Package during 2016 included clear vocational qualification pathways that seek to address the issue of industry professionalisation and competence of those working within aerodrome operations supervisory and management roles.
The International Civil Aviation Organization (ICAO) now requires member nations to produce a State Safety Program. Australia’s State Safety Program sets out how aviation safety in Australia is managed, with a focus on safety systems. It provides a framework for the continuous improvement of aviation safety by clearly establishing how the various elements of Australia’s safety system work together. There are four key components: policy and objectives, risk management, safety assurance and safety promotion. The program describes each of these components’ functions and sets out the legislative and organisational framework of aviation safety.

CASA provides guidance materials and resource kits to industry for the implementation of Safety Management Systems through an online delivery model. The AVI Aviation Training Package Release 2.0 incorporates units of competency and skill sets that are aligned to the requirements of Australia’s State Safety Program and provide a means through which industry can achieve the required levels of skills and knowledge.
QUALITY OF TRAINING DELIVERY AND ASSESSMENT

The Australian Qualifications Framework11 (AQF) provides a guide to the volume of learning, describing how long a learner who does not hold any of the competencies identified in the relevant units of competency would take to develop all the required skills and knowledge. The amount of training provided by an RTO is part of the overall volume of learning. The amount of training required for an online delivery mode comprises the formal, guided learning as well as any workplace learning. To ensure learners are able to obtain and absorb the required knowledge and skills before assessment, training organisations must choose and plan the resources used to guide them.

When designing a course for online delivery, a training organisation would analyse the nature of a learner cohort, consider any specific requirements of the training product (the qualification and each unit of competency), and then use the analysis to determine how it will schedule training and assessment activities to ensure learners are able to fully develop the required skills and knowledge before being assessed. Significant costs are involved with designing, developing and implementing training and assessment strategies that incorporate online delivery methods that contribute to competency outcomes, and are likely to be a key factor in the implementation of aviation maintenance and flight training programs.

Training organisations that deliver ground operations and aviation transport security qualifications are not required to train and assess learners within an operational environment if acceptable means of simulation assessment are available. Units of competency included within these qualifications have been recently modified to include an enhanced range of assessment conditions. The revised conditions mandate that assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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IMPACT OF THE COSTS OF TRAINING

For Pilots, the expenditure required to obtain a commercial licence are consistently cited as a major barrier to entry into the industry, particularly for young candidates. This compounds the high demand for experienced, commercially qualified pilots. Cadet programs that incorporate flying time requirements have proven to be successful in encouraging and supporting new entrants, ensuring they are able to gain the required qualifications and develop the company-specific skills desired by employers.

In past years, some employers have called for cadetship schemes to be expanded on an industry-wide scale, as a commitment to meeting the industry’s long-term demand for pilots.

Figure 3.17 provides a summary of survey results of employers’ assessment of aviation training in Australia. The data was gathered from industry responses to the survey undertaken during the research phase of this study.

During the extensive industry consultation exercise conducted as part of this study, the role of government training funding and support was consistently highlighted as critical to the long-term survivability of the industry. The recently endorsed AVI Aviation Training Package Release 2.0 includes VET qualifications that will allow federal training funding to become available for all commercial pilot licence types, thus minimising the upfront costs to entrants.
FIGURE 3.17

INDUSTRY ASSESSMENT OF TRAINING IN AUSTRALIA
AVIATION WORKFORCE SKILLS STUDY INDUSTRY SURVEY (TLS/C 2015)

<table>
<thead>
<tr>
<th>Training Outcomes</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>State and/or Federal government support is used to offset part of training costs</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Training courses provide good value for money</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Available training courses represent value for money</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>External recruits: qualified trainees have the required skills and knowledge to adapt quickly</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Internal upskilling: qualified trainees have acquired the skills and knowledge needed</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Benefits of training match/exceed expectations (e.g. productivity, safety, staff retention)</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Trainers and assessors have current knowledge and keep up with best practices</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Flexible/tailored training modules are available and adequate to meet company or site-specific needs</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Training is reasonably accessible (location, flexibility, availability of online learning)</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Training budget is adequate/is spent within acceptable contingency limit</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>No concerns on the legitimacy of the qualifications/certifications delivered (assessment is rigorous)</td>
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<td>40%</td>
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5. CHALLENGES FOR TRAINING PROVIDERS

There is some evidence that the contraction in the aircraft maintenance engineering labour market, has resulted in a significant reduction of training commencements. This has, in turn, affected the activity levels, and in some cases the long-term viability, of established specialised RTOs across the country.

Industry stakeholders who participated in the intelligence-gathering phase of this study indicated that some of the major training providers in the field have decided to no longer deliver qualifications in this sector or have cut back on services.

The implementation of current Aviation regulatory reforms, coupled with the dual costs of maintaining separate RTO and Flying School accreditation, continues to be raised as a concern by Aviation RTOs, with many questioning the cost/benefit ratio of continued operations. High compliance costs drive up training costs, which flow on to employers.

Training facilities for aircraft maintenance require significant financial investment and may be hard to replace once lost. Respondents expressed concern that further reduction in training capacity would compromise the industry’s ability to access skilled workers in the future. Respondents noted that an inability to readily access qualified labour would gravely impede the industry’s ability to pursue predicted growth opportunities in the Asia-Pacific.

Figure 3.18 shows the key business challenges nominated by training organisations during the survey conducted for this report.

FIGURE 3.18
WHAT ARE THE KEY CHALLENGES FOR YOUR TRAINING BUSINESS IN THE NEXT 12 MONTHS?
SOURCE: AVIATION WORKFORCE SKILLS STUDY TRAINING INDUSTRY SURVEY (TLISC 2015)
ADJUSTING TO REGULATORY CHANGES

CASA is undertaking a regulatory reform program to modernise existing legislation and to harmonise it with Standards and Recommended Practices (SARPs) published by ICAO. The new legislation for flight crew licensing is formally known as Civil Aviation Safety Regulation (CASR) Part 61. It became legally effective on 1 September 2014, after which time a four-year transition period began. New legislation for training organisations also became effective on 1 September 2014 with the introduction of CASRs Parts 141 and 142. All training for the grant of a Part 61 licence, rating or endorsement must be conducted by the holder of a Part 141 or Part 142 certificate.

CASR Part 147 Continuing Airworthiness (Maintenance Training Organisations) sets out matters relating to maintenance training organisations, including requirements for approval as a maintenance training organisation and requirements that apply to maintenance training organisations. It empowers CASA to issue a Manual of Standards (MOS) for the regulation. A person (the applicant) may apply to CASA for approval as a maintenance training organisation. Only a person who is a registered training organisation (RTO) may apply for approval as a maintenance training organisation to provide category training or carry out assessment of units of competency.

To support the harmonisation of the regulations with international practices, competency-based standards have been introduced for all CASA flight crew and aviation maintenance qualifications. Detailed competencies for the granting of a licence, rating or endorsement have been published by CASA in the MOS for CASR Part 61/147. These competency standards are consistent with Australian Government policy that requires VET to be structured and competency-based, delivered by qualified and competent instructors, and assessed against clearly defined competency standards.12

The new CASRs are designed to improve aviation safety, address known risks, and maintain Australia’s reputation of the aviation industry being one of the safest in the world. They align Australia with international standards, and incorporate lessons learned from aviation accidents around the world.

CASA has released a new timetable for its regulation reform program through 2016-2020, which has been developed using industry feedback following months of extensive consultation with the aviation community. The new program establishes a revised timetable for finalising, making and commencing the outstanding new Parts of the Civil Aviation Safety Regulations 1998, updating recently made CASR Parts and other major regulatory initiatives.13

The regulatory reform timetable outlines legislative changes that will have effects on the following aspects of the Aviation industry:

- Fatigue Management
- Flight Crew Licensing
- Flight Training and Checking
- Aerodromes
- Air Transport Operators
- Aerial Work
- Unmanned Aircraft

TRAINERS/ASSESSORS RECRUITMENT DIFFICULTIES

Aviation training providers experience significant challenges in acquiring the skilled workforce necessary to their operations, with close to half of all training providers surveyed reporting they experienced difficulty in recruiting new trainers, assessors or instructors in 2015.

Both flying schools and aircraft maintenance training organisations reported significant difficulties in recruiting new personnel. Respondents overwhelmingly attributed their recruitment difficulties to a shortage of skilled and qualified personnel, further evidencing the chronic shortage of trainers and assessors described in Part II. Insufficient remuneration and unattractive employment conditions were also perceived as a leading cause for these recruitment difficulties, particularly for flying schools.
PART IV

INTERNATIONAL BENCHMARK AND REGIONAL INTEGRATION OPPORTUNITIES
1 ASSESSMENT OF THE AUSTRALIAN AVIATION TRAINING BRAND
   » ABILITY OF THE AUSTRALIAN AVIATION TRAINING MARKET TO MEET DEMAND FROM INTERNATIONAL STUDENTS

2 STATUS OF REGIONAL SKILLS INTEGRATION AND LABOUR MOBILITY
   » INDUSTRY AND RTO EXPERIENCE WITH RECOGNITION OF PRIOR LEARNING AND EXPERIENCE AND LICENCE CONVERSIONS
   » INDUSTRY EXPERIENCE WITH RECRUITING OVERSEAS-TRAINED CANDIDATES
1. ASSESSMENT OF THE AUSTRALIAN AVIATION TRAINING BRAND

Figure 4.1 shows the self-assessment by Australian training providers of the aviation training system in Australia compared with other countries. Training providers overwhelmingly estimate that while aviation training in Australia is widely recognised as being high quality compared with other countries, this quality comes at a high financial cost.

The high costs of aviation training (particularly Pilot training) and the scarcity of training facilities (particularly for aircraft maintenance training) mean that Australian training programs may not be as easy to access as programs in other countries. These findings were corroborated during the industry consultation undertaken for this study.

Several industry submissions pointed to the US flying training market as being more competitive in terms of program costs and access to employment opportunities for newly licensed pilots. The Australian aviation training market is also relatively sensitive to currency fluctuations, with Australian flying training schools reporting a marked drop in international student enrolments after the Australian dollar reached parity with the US dollar in 2010.

The quality of the Australian aviation training system overall is well recognised overseas, with experienced Australian-trained pilots being highly sought after by high-profile, expanding airlines such as Emirates, Etihad, Cathay Pacific and China Southern.

AVIATION TRAINING PROVIDERS’ ASSESSMENT OF THE AVIATION TRAINING SYSTEM IN AUSTRALIA COMPARED WITH OTHER COUNTRIES.

SOURCE: AVIATION WORKFORCE SKILLS STUDY TRAINING INDUSTRY SURVEY (TLISC 2015)
In the field of aircraft manufacturing and engineering, Australia is considered a leader in the provision of through-life services, particularly applied to military aircraft. In addition, there are several engineering and engineering training areas in which Australia possesses significant, internationally recognised expertise that holds sizeable potential for international growth. These include advanced fibre composites; integrated componentry; advanced avionics diagnostics systems; prefabricated materials and offsite manufacture; steel framed multi-storey buildings; and unmanned aerial systems (UASs).

**ABILITY OF THE AUSTRALIAN AVIATION TRAINING MARKET TO MEET DEMAND FROM INTERNATIONAL STUDENTS**

While Australian aviation training providers generally consider they possess the right in-house skills and experience to work with international students (72 per cent), they are less confident about their experience with recognition of prior learning and experience assessments (60 per cent) (Figure 4.2).

The chronic shortage of trainers and assessors is also noted to have a negative impact on training providers’ ability to respond to demand from international students, with just 55 per cent of respondents believing that their current staffing levels are sufficient to meet demand.

However, the major sticking point is the ability for training providers to provide international students with access to workplace experience, thought as possible for just over a quarter of all respondents. The difficulty for international students to access workplace training is likely to affect the competitiveness of the Australian aviation training industry, restricting its ability to take advantage of the strong growth opportunities that are being created with the rapid growth of the industry in mainland Asia and South-East Asia.

**Figure 4.2**

**AVIATION TRAINING PROVIDERS’ ASSESSMENT OF THEIR ORGANISATION’S ABILITY TO RESPOND TO DEMAND FROM INTERNATIONAL STUDENTS.**

*Source: Aviation Workforce Skills Study Training Industry Survey (TLISC 2015)*
2. STATUS OF REGIONAL SKILLS INTEGRATION AND LABOUR MOBILITY

INDUSTRY AND RTO EXPERIENCE WITH RECOGNITION OF PRIOR LEARNING AND EXPERIENCE AND LICENCE CONVERSIONS

Overall, aviation employers in Australia have limited visibility of overseas qualifications, with only 7 per cent of industry recruiters being ‘satisfied’ with the breadth and depth of information available to them about overseas qualifications (Figure 4.3).

Fewer than 10 per cent of recruiters were satisfied by their experience with obtaining formal recognition of prior learning or experience. Some respondents pointed to a perceived poor supporting documentation of Pilot qualifications from certain countries that negatively affected their views of the quality of the training delivered and of the legitimacy of the qualification delivered.

FIGURE 4.3

EMPLOYER VIEWS OF THE VISIBILITY OF QUALIFICATION STANDARDISATION.

SOURCE: AVIATION WORKFORCE SKILLS STUDY TRAINING INDUSTRY SURVEY (TLISC 2015)
INDUSTRY EXPERIENCE WITH RECRUITING OVERSEAS-TRAINED CANDIDATES

One-third of Australian employers surveyed for this study who had recruited overseas-trained candidates reported encountering knowledge and skills gaps compared with Australian standards that caused moderate or serious problems for business operations (Figure 4.4).

Low levels of language, literacy and numeracy (LLN) and digital literacy had been a problem for just over 20 per cent of employers, a relatively positive result. To put this in perspective, 75 per cent of Australian employers across all transport and logistics sectors reported their business’s operations were significantly affected by low LLN levels in their workforce – including Australian-trained and born staff.

A commonly cited knowledge gap across occupations relates to Australian regulations, whose impact on job responsibilities often requires additional training. For Pilots, several employers estimated that Australia had “very high standards compared to the rest of the world”, and that international recruits faced a significant burden (both in terms of time and money) to convert their qualifications into Australian licences and commercial employability.

The gaps cited by employers also included a different approach to safety systems and the need for overseas-trained staff to absorb the “safety culture” peculiar to Australian companies, particularly in aircraft maintenance functions.

FIGURE 4.4

EMPLOYER-REPORTED OPERATIONAL IMPACT OF RECRUITING CANDIDATES WITH OVERSEAS QUALIFICATIONS.

SOURCE: AVIATION WORKFORCE SKILLS STUDY TRAINING INDUSTRY SURVEY (TLISC 2015)
APPENDICES

IMPACT OF AVIATION TRAINING IN AUSTRALIA
METHODOLOGY

APPENDIX 2
» GENDER BREAKDOWN OF INITIAL AVIATION LICENCES

APPENDIX 3
» YEAR-ON-YEAR VARIATION IN HOURS FLOWN IN GENERAL AND REGIONAL AVIATION, YEARS ENDED DECEMBER, 2006–13

ACKNOWLEDGEMENTS

LIST OF TABLES AND FIGURES
METHODOLOGY

The Aviation Workforce Skills Study builds on the methodology used to develop TLISC’s annual Environmental Scan (E-Scan). It draws on the extensive data collected by various government agencies on the aviation industry, as well on other publicly available data and AIS/TLISC’s own research.

The aviation occupations included in the study are: Pilot, Cabin Crew, Baggage Handler, Airport Operations, Aircraft Maintenance and Engineering, and engineering occupations associated with avionics manufacture and repair. Aviation occupations in the Australian Defence Force are considered where there is evidence of job sharing affecting the Aviation Industry’s workforce situation (mainly Pilots). These are covered by the following ANZSCO occupations:

- 231111 Aeroplane Pilot
- 231112 Air Traffic Controller
- 231113 Flying Instructor
- 231114 Helicopter Pilot
- 231199 Air Transport Professionals nec
- 323100 Aircraft Maintenance Engineers nfd
- 323111 Aircraft Maintenance Engineer (Avionics)
- 323112 Aircraft Maintenance Engineer (Mechanical)
- 323113 Aircraft Maintenance Engineer (Structures)
- 451711 Flight Attendant
- 721911 Aircraft Baggage Handler and Airline Ground Crew
- 733112 Aircraft Refueller

The project comprised an extensive data-gathering phase, during which data was collected from government agencies (primarily CASA records, ABS Census data, NCVER VET enrolment data, and BITRE statistics) and other sources (IBISWorld industry reports, Boeing and Airbus forecasts, industry analysis reports published by consultancies, company annual reports, TLISC’s own industry intelligence and research, and other relevant sources). The data collected was consolidated and analysed in detail to identify skills shortages and other key workforce and training issues.

These data were supplemented by findings from two extensive surveys conducted with industry and training stakeholders during the research phase. A call for submissions was sent out, seeking detailed observation on skills and training issues across the industry. In total, more than 200 stakeholders in the Aviation Industry provided input into this study.

A discussion paper with preliminary findings was released to gather stakeholder input and ensure industry views were accurately represented in this final report.
## APPENDIX 2: GENDER BREAKDOWN OF INITIAL AVIATION LICENCES

**INITIAL FCL LICENCE ISSUES BY GENDER, FINANCIAL YEARS 2010-11 TO 2014-15, BY AIRCRAFT AND LICENCE TYPE**

<table>
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<tr>
<th>Aircraft Type</th>
<th>2010-11</th>
<th>2011-12</th>
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<tr>
<td><strong>Total FCL Licences</strong></td>
<td>7.9%</td>
<td>92.1%</td>
<td>7.3%</td>
<td>92.7%</td>
<td>7.8%</td>
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<tr>
<td><strong>Aeroplane</strong></td>
<td>7.5%</td>
<td>92.5%</td>
<td>6.6%</td>
<td>93.4%</td>
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<tr>
<td>Air Transport</td>
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<td>95.0%</td>
<td>6.2%</td>
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<tr>
<td>Commercial</td>
<td>6.9%</td>
<td>93.1%</td>
<td>6.4%</td>
<td>93.6%</td>
<td>6.8%</td>
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<tr>
<td>Private</td>
<td>8.3%</td>
<td>91.7%</td>
<td>6.8%</td>
<td>93.2%</td>
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<tr>
<td>Student (GFPT)</td>
<td>7.6%</td>
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<td>7.2%</td>
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<td>7.2%</td>
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<tr>
<td><strong>Helicopter</strong></td>
<td>4.7%</td>
<td>95.3%</td>
<td>4.9%</td>
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<tr>
<td>Air Transport</td>
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<td>Student (GFPT)</td>
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### CAR 5 / PART 61 INSTRUMENT RATING INITIAL ISSUES, FINANCIAL YEARS 2010-2011 TO 2014-15, BY TYPE

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### MPL LICENCE AND MAINTENANCE AUTHORITY INITIAL ISSUES, FINANCIAL YEARS 2010-2011 TO 2014-15

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APPENDIX 3: YEAR-ON-YEAR VARIATION IN HOURS FLOWN IN GENERAL AND REGIONAL AVIATION, YEARS ENDED DECEMBER, 2006–13

Private

Business

Training

Test & Ferry

Charter

Agriculture

Regional Airlines

Aerial Work
ACKNOWLEDGEMENTS

This list details those organisations that elected to be recognised as contributing to the Aviation Workforce Skills Study.

Advance Aviation Group Pty Ltd
Aerial Application Association of Australia (AAAA)
Aero Enterprise Aust Pty Ltd
AgustaWestland Australia Pty Ltd
Airborne Aviation
Arkaroola Air Services Pty Ltd
ASSET Aviation Institute
Asset Training Australia
Australian Airports Association (AAA)
Australian Federation of Air Pilots (AFAP)
Australian Helicopter Industry Association
Australian Helicopters P/L
Aviation Australia
Aviation Maintenance Repair and Overhaul Business Association Inc. (AMROBA)
Aviation Training Services Victoria (ATSV)
Ballistic Training Solutions
Boeing Aerostructures Australia
Bowman Studio
Civil Aviation Safety Authority (CASA)
Flight Training Adelaide
Goldfields Air Services WA
Helibiz
Hillsboro Aero Academy
Historical Aircraft Restoration Society
John Cameron Aviation
K&M Harris Pty Ltd Trading as Specialised Career Solutions
Mahindra Aerospace – Australia
Multi-crew Airline Training Systems Pty Ltd (MATS)
Partec Institute and the Composites Training Centre
PlaneTorque Australia Pty Ltd
Riverina Air Motive Pty Ltd
Ronald Dickens
Rotor-Lift Aviation
Safeskies Australia
Sport Aircraft Association of Australia
The Transport Workers' Union (TWU)
Tristar Aviation Company Pty Ltd
William Angliss Institute
# LIST OF TABLES AND FIGURES

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<th>Section</th>
<th>Name of Chart</th>
<th>Source</th>
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<td>ABS</td>
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<td>Executive Summary</td>
<td>Figure E.1: Aviation workforce by sector (occupation based), 1985 - 2015.</td>
<td>ABS 6291.0.55.003 - Labour Force, Australia</td>
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<td>Figure E.2: Aviation workforce by sector (employer based), 2007 - 2021.</td>
<td>IBISWorld Reports</td>
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<td>Part I – Statistical Analysis of the Aviation Workforce in Australia</td>
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<td>1. Size of Aviation employment in Australia</td>
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<td>Aviation employment by job type</td>
<td>Table 1.1: Aviation employment by job category, 2013.</td>
<td>(CASA) Air Operator Certificate (AOC) Holders Safety Questionnaire (2015)</td>
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<td>Figure 1.1: Share of employment in Australian airlines by occupation type, 2002-10</td>
<td>International Civil Aviation Organization (ICAO) Statistic Data Series Collection</td>
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<td>Australian airlines’ expenditure on staff</td>
<td>Figure 1.2: Staff expenditure as a percentage of total operational expenditure in major Australian airlines, 2009-15.</td>
<td>TLISC (2015). Compiled from various sources</td>
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<td>2. Industry demographics</td>
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<td>Workforce age profile</td>
<td>Figure 1.3: Age profile of the Air and Space Transport subdivision, 2006 and 2011</td>
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Australian Industry Standards Ltd (AIS) was established in early 2016 as an independent, government-funded Skills Service Organisation. It is a major component of the Australian Government's reform of vocational education and training across Australian industry sectors. Australian Industry Standards is a government-funded not-for-profit organisation that develops skills standards across a range of Australian industries.

As an organisation, we have a deep-seated passion for skills development and its power to set our industries apart from their international competitors and to transform the lives of individuals.

Our standards are high. Always. We hire the best minds, who bring with them deep technical skills, proven expertise in workforce development, and who have an inbuilt commitment to servicing industry. Our reputation is one of delivering high-quality, future-focused qualifications through transparent and open engagement.

Our proven capability and intense focus on service is why we are one of only a handful of organisations selected by government to do the job of a Skills Service Organisation. We work under the direction of 11 Industry Reference Committees that represent the following sectors: aviation, transport and logistics, maritime, energy, water and utilities, public safety, police, fire, defence and corrections.

Together, these industries keep Australia productive, powered and secure. The industry challenge is to be the best they can possibly be. Ours is to ensure their workforce is skilled to world-class standards.

AIS supports these important industry sectors by using our own world-class, in-house capability and capacity in industry engagement, quality assurance, and project management to produce training packages and other support services.

AIS takes over this important activity from its predecessor, the Transport and Logistics Industry Skills Council (TLISC), which operated for more than 20 years engaging with industry, identifying relevant workplace standards and developing Training Packages.

At Australian Industry Standards, our focus is on helping industry to develop world-class qualifications for their workforce.

ABOUT US

• AIS supports industry growth and productivity through our modern innovative approach to establishing skills standards.
• AIS provide high-quality, professional secretariat services to help our allocated Industry Reference Committees develop the skills that industry needs.
• AIS partners with industry to shape the workforce of the future.