

A summary of workforce analyses relating to two key occupations in the aviation workforce

October 2024

This document provides a summary of findings from the Aviation Workforce Insights Platform project undertaken by Scarlatti for the Aviation Industry Association of New Zealand (AIANZ) and Ringa Hora. This summary complements a full report and an interactive dashboard, both of which will be available through the AIANZ and Ringa Hora.

The aviation sector in New Zealand

The aviation sector in New Zealand forms a crucial part of the national economy, serving as a key connector to the global markets. Although, historically, New Zealand has been considered as a global leader in the aviation industry, recent years have been challenging for the sector. There are many factors at play, with external events such as COVID-19 impacting both supply and demand of the aviation workforce; and the rigidity and high costs of training, and slow career progression adding further challenges. As the sector moves through its recovery, demand for workers in the aviation sector, both domestically and internationally, is expected to grow, which may amplify the supply-shortages in New Zealand.

The Aviation Workforce Insights Platform project sets out to examine the supply and demand of pilots and aviation maintenance engineers through stocks and flows modelling, and to provide a snapshot of the characteristics of other important occupations such as flight attendants and baggage handlers/ground crew. For pilots and aviation engineers, the workforce insights platform project is also undertaking scenario analyses, to provide the sector with a view of the impact that a range of interventions may have on resolving the shortages. It is intended that platform will provide an evidence-base to support decision making around responses to meeting projected workforce needs.

Pilots

A key challenge faced by New Zealand's aviation sector is a shortage of pilots. Although it has become more evident recently, partly due to external shocks such as COVID-19, the shortage is the result of a mismatch of long-term trends in the demand and supply of pilots.

Fixed-wing pilot demand

Our pilot model initially considers the demand of pilots over time. Combining key data points; including fleet size, pilots required per aircraft and aircraft utilisation; with assumptions on workforce exit and progression; reveals a long-run historic growth in demand for new pilots of about 2-3% per year. Available projections suggest that pilot demand in New Zealand will likely continue to rise at a similar rate, or perhaps slightly faster, for the next 10 years. The increase in demand for pilots is being driven across all operator types, including flight schools, general aviation, other commercial operators and Air New Zealand. The demand model estimates that the workforce currently requires around 200 new pilots per year, rising to approximately 250 new pilots per year over the next decade.

The project also explored modelling short-term factors that influence demand, such as changes to hiring policies at airlines, or the impacts of COVID-19. However, this approach was eventually dropped

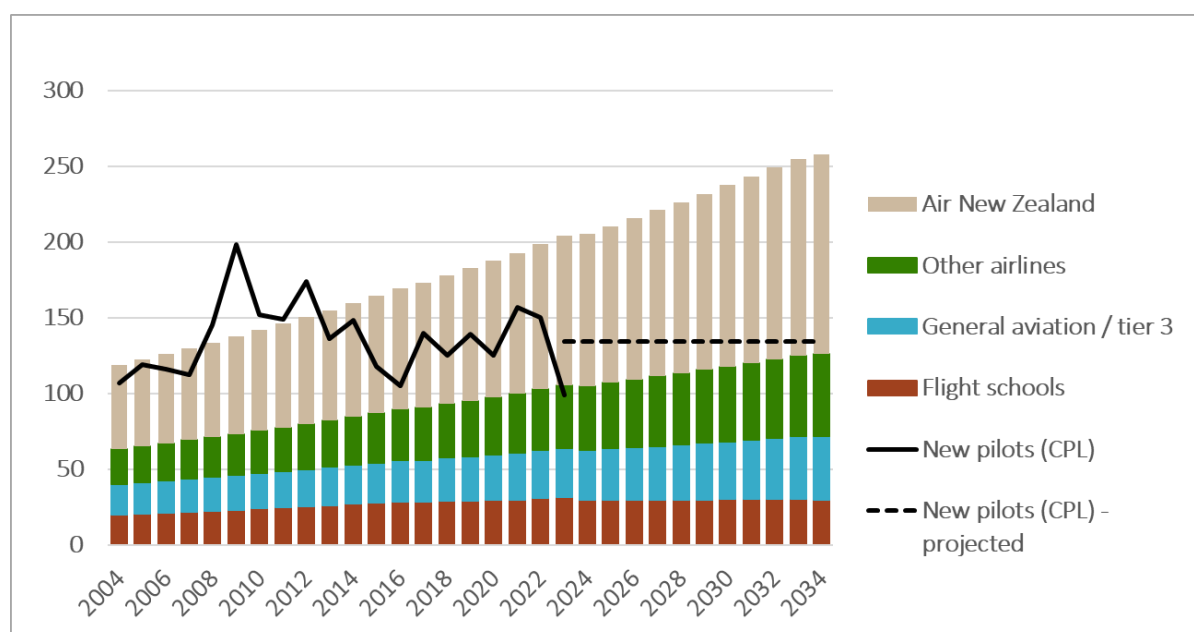
as it added ‘noise’ to the findings without adding much additional insight about what is essentially a medium to long-term problem.

Fixed-wing pilot supply

Our analysis of the supply of pilots focuses on the counts of CAA commercial pilot licenses (CPLs) issued to New Zealanders. Not all New Zealanders newly graduated with a CPL will enter the New Zealand pilot workforce. However, until recently, approximately 75-80% of them did so, albeit not all immediately upon completing their training. Offsetting the 20-25% of New Zealand CPLs holders that do not enter the workforce, some of the international students that train in New Zealand do go on to enter the local workforce. While data on their numbers are scant, our best estimate is that they roughly offset the New Zealanders that do not enter the workforce.

The supply model reveals a relatively flat supply of new pilots, around 140 each year, who are available to enter the workforce each year. This falls short of current requirements and will contribute to an increasing supply-demand gap in the future unless a larger number of new pilots become available each year. Perhaps more telling than the absolute size of the gap between supply and demand is the difference in trends – while demand is rising steadily, pilot supply is flat. The number of new fixed-wing pilots required and available are presented in Figure 1.

Figure 1: New commercial fixed-wing pilots needed, and new CPLs, over time



Fixed-wing pilot shortages

The underlying cause of the current pilot shortage is clear from Figure 1. It seems likely that the shortage started to build around a decade ago, albeit there may have been some cushioning from a period of oversupply that finished when student loan caps were introduced for students undertaking flight training in 2013. At present, we estimate annual pilot shortages to be around 100 pilots, which will be increasing by approximately 50 pilots each year without intervention.

Flight schools bear the brunt of the shortage. Typical career pathways start with work as flight instructors, then progress into general aviation and then into airlines. This means that airlines can recruit general aviation pilots, and general aviation operators can recruit from flight schools, leaving

flight schools with the worst of the shortage. While that is a simplification, we think that it is right to be focussing on flight schools as the ‘canary in the mine’ to monitor workforce shortages. This highlights a further risk. If flight schools are unable to employ the flight instructors they need, they will not be able to maintain even the current supply of new pilots.

Scenarios to address pilot shortages

There are a variety of ways that to respond to the shortage. In our modelling work we consider some of these.

If the only approach to eliminate the shortage was to increase student numbers going through New Zealand flight schools, we find that student numbers would need to increase by approximately 65% over a 5-year period, and then continue to increase at the long-run industry growth of 2-3% per year. Even then though, the current shortage is likely to continue to worsen for the next 2-3 years before it starts to abate.

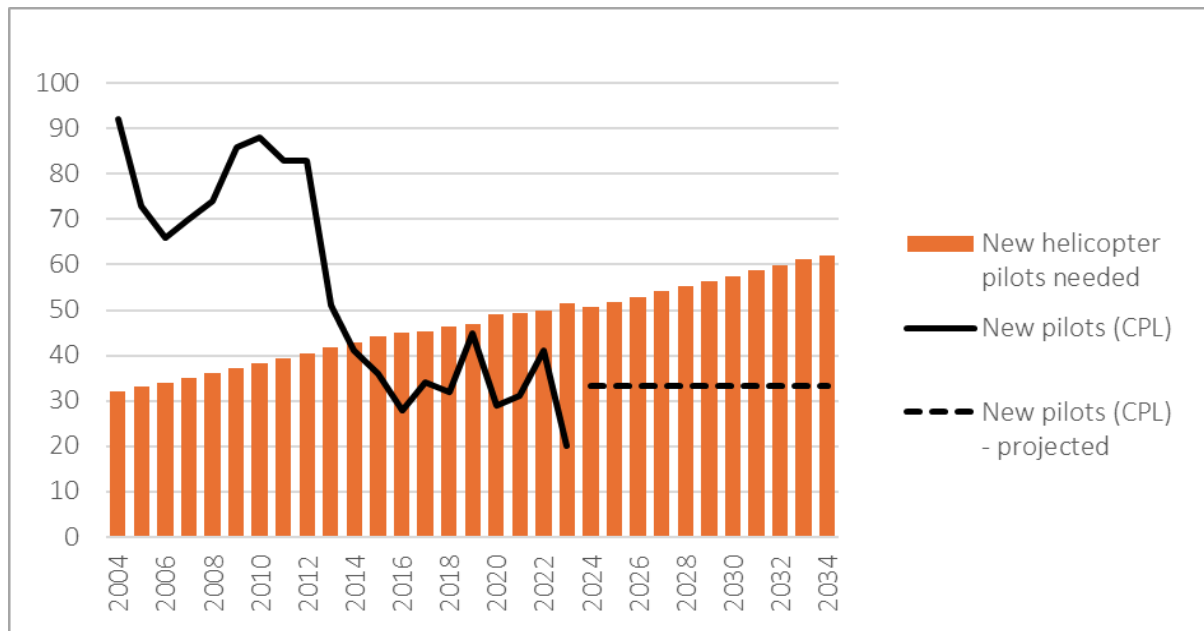
A variation of the scenario above would be to allow international students that have been awarded their CPLs to stay in New Zealand for a period and work as flight instructors. This approach could increase supply relatively quickly to reduce the acute shortfall at flight schools.

The recently announced Air New Zealand cadet scheme may also contribute to reducing the pilot shortage. However, it is not a complete solution. If the cadet scheme continued indefinitely at the proposed numbers of 30 cadets per year, we find that the 5-year increase in student numbers through flight schools noted above, could drop from 65% to 50%.

Helicopter pilots

The situation for helicopter pilots is qualitatively like that for fixed-wing pilots although, if anything, the gap between supply and demand is relatively greater – see Figure 2. Again, the growing underlying shortage may have been obscured for some years by a period of over-supply up to 2013.

Figure 2: New commercial helicopter pilots needed, and new CPLs, over time



Aviation engineer model

Aviation engineering in New Zealand encompasses a diverse range of occupations, each making a specialised contribution to the aviation sector. Our work focusses on a sub-set of engineers, namely maintenance engineers who are responsible for the maintenance, inspection and repair of aircraft, and component overhaul engineers who ensure aircraft components continually meet aviation safety standards.

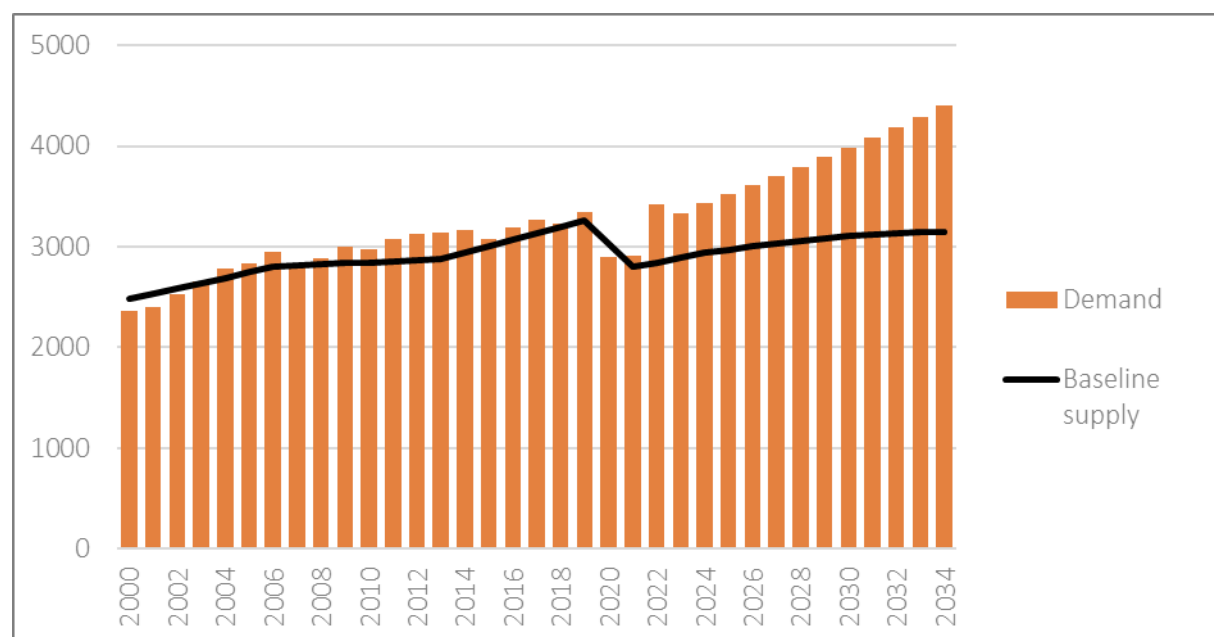
As with pilots, a current pain point is shortages in the aviation engineering workforce. However, addressing this shortage is likely to need different approaches to those for pilots.

Demand and supply of aviation maintenance engineers

Our modelling indicates that demand for aviation maintenance engineers has grown steadily over the past 20 years, with a significant dip during COVID-19, due to a drop in aircraft utilisation.

The COVID-19 period is where our model simulates the emergence of the current shortage, which grows over the next decade – see Figure 3. However, data about the supply and demand of aviation maintenance engineers are scarcer than for pilots meaning the timing of the shortage should be treated as indicative rather than a firm estimate.

Figure 3: Supply and demand of aviation maintenance engineers over time



Scenarios to address workforce shortages

While the growing the supply of training places for new aviation maintenance engineers is an important issue for employers and training providers to collaborate on, the constraints on growing training places are less severe than those for pilots.

Unlike the situation for pilots however, a likely challenge over the medium to long-term will be attracting enough people into the profession. The long-term industry growth of 2-3% is likely to translate into similar growth in demand for new aviation maintenance engineers. However, the New Zealand workforce is only projected to grow at a rate of about 1% over the next decade. While the

difference seems small, talent shortages are felt at the margins, and many other industries are similarly projected to grow at a faster rate than the wider workforce. Employers of aviation maintenance engineers are likely to need to compete harder to attract the talent they need.

Our model estimates the impact of various interventions to close the workforce gap. The workforce draws new aviation maintenance engineers from a range of sources including school leavers, career changes, migrants and tertiary graduates. While this diversity is a strength, it also means that interventions to grow the supply of new talent also need to be diverse.

One scenario that we model considers the impact of introducing 50 additional migrants into the workforce annually from 2025 for five years, alongside efforts to increase the number entering the field from all local talent pools by 50% from 2027 and reducing the exit rate by 20%. Such comprehensive targeting of diverse talent pools, along with efforts to improve retention, is projected to remove workforce shortages by 2034.

End.