

A series of five grey spheres of varying sizes, arranged in a diagonal line from the top right towards the bottom left. Each sphere has a soft shadow beneath it.

Understanding Value in the New Zealand Aviation Sector

Report to New Zealand Trade and Enterprise

April 2011

Why Locate an Aviation Manufacturing or Services Business in New Zealand?



New Zealand offers strong potential for growth in aviation, building on a sector that is vibrant, innovative and internationally competitive

From small beginnings, the aviation sector in New Zealand has grown into a mature and valuable contributor to the New Zealand economy. New Zealand's world class infrastructure and regulatory environment supports an internationally competitive aviation industry. New Zealand is also well-known as a great place to live and work.

The aviation manufacturing sector in New Zealand is poised for significant growth in the coming years, primarily driven by growth in nearby Asian markets. As a result, investment in infrastructure is scaling up: passenger terminals, planned improvements to runways, commercial and industrial developments are inspiring entrepreneurs and established businesses to take advantage of new opportunities.

In terms of specific opportunities for investment, four areas appear particularly attractive:

- **Pilot training.** New Zealand's

uncluttered and safe skies attract cadets looking to secure internationally recognised qualifications

- **Aircraft maintenance and completions.** New Zealand delivers a strong brand position for firms that demand high-quality output
- **Light aircraft manufacturing.** Firms based in New Zealand are well placed to develop niche aircraft used to cost-effectively meet commercial and public needs
- **Aviation technology.** New Zealand firms are able to quickly and efficiently develop world-beating technologies, with considerable speed to market.

Aviation businesses that are focussed on high-quality outputs have proven to be successful from a New Zealand base. The growth forecast for the sector means that a New Zealand location will make sense for a growing number of aviation businesses.

The aviation sector in New Zealand is integral to the economy and its development

Aviation and the New Zealand economy have developed together

New Zealand was quick to recognise the importance of aviation to the nation's economic development. In 1916, Boeing sold its first plane (known as a B&W Seaplane) to the New Zealand Flying School, making New Zealand Boeing's first customer.

Soon after, New Zealand adopted passenger flights. To support the growing use of aircraft for domestic travel, flight training schools were established in 1916, and three years later New Zealand's first airmail service became operational. New Zealand has quickly adopted the use of aircraft in the tourism, forestry and agriculture sectors.

Today New Zealand continues its love affair with aviation, and aviation plays a key role in the New Zealand economy. Aviation connects New Zealand to the world, both in terms of passenger and freight:

- Aviation allows New Zealand to be readily accessible to tourists. In 2010, 2.5 million International tourists visited New Zealand, spending almost \$10 billion (18% of total exports). Almost all of these tourists arrived by air
- Aviation enables New Zealand to efficiently export high-value products. While air-freight accounts for only 8% of exports, it represents more than 16% of exports by value.

The importance of aviation to New Zealand has significant impacts for aviation sector businesses. As illustrated in Figure 1 (following page, source: CAA) New Zealand's aviation infrastructure exceeds the level expected from a

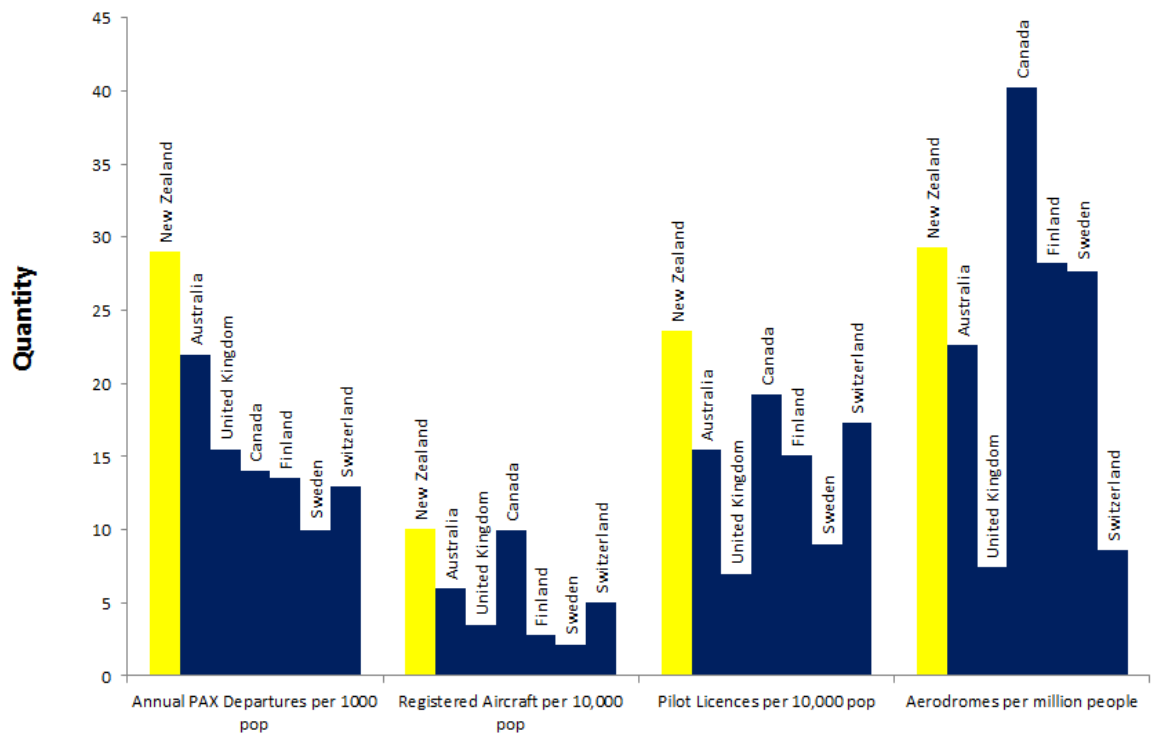
country of its size, and there is a high level of public awareness of the sector. On a per capita basis nowhere else in the world records more annual passenger departures than New Zealand. This demand for aviation services means that New Zealand has more aircraft operating per capita than any other country, which translates further into New Zealand having the highest number of registered pilots per capita. Infrastructure is needed to sustain New Zealand's thirst for aviation, which is evident in the number of aerodromes in operation—where New Zealand has among the highest number of operational aerodromes in the world (per capita).

Aviation will continue to be strongly linked with New Zealand's economic development

In 2009, there were 25 businesses involved in the design and manufacture of aircraft; 85 in aircraft parts; 105 in airport operations and infrastructure; 153 in aviation services; 15 in aviation fuel; 61 in aviation logistics; and 93 in aircraft maintenance repair and overhaul. Today the New Zealand aviation sector has grown into a considerable physical and economic presence. More than 1,000 businesses operate within the New Zealand aviation sector, these businesses employ more than 23,000 people and boast an average revenue per employee of greater than \$400,000.

The New Zealand aviation sector in 2009 was estimated at \$9.7 billion in revenue, with 40% derived from export earnings. This is expected to grow by between 5-9% per annum to 2015, meaning revenue from the aviation sector could amount to \$15 billion in 2015.

Figure 1
International comparison of New Zealand's aviation industry (relative size)



(Source: CAA 2010)

This report which describes New Zealand's environment for aviation businesses has been prepared for New Zealand Trade & Enterprise (NZTE) – New Zealand's economic development agency – which has a strong interest in supporting growth in the aviation sector.

- First we review the current capability of the sector, both in terms of airport infrastructure and the increasing focus on commercial development of adjoining property (pages 4-5)
- We then review labour market characteristics that are essential to the sector's vibrancy – highlighting its ability to attract highly skilled personnel while paying less than comparable wage rates overseas (pages 6-7)

- We evaluate the regulatory environment for aviation businesses, both in terms of general regulation and industry specific regulation (pages 8-9)
- Finally we highlight some specific areas where New Zealand is particularly well positioned for growth—aviation technology, pilot training, aviation maintenance and completions, light aircraft manufacturing and aviation technology (pages 10-16).

Throughout this value proposition we use real-life case studies to illustrate successful examples of aviation sector firms that choose to locate in New Zealand.

Aviation Sector Capability

New Zealand has the physical infrastructure needed to support a growing aviation sector

New Zealand has an extensive infrastructure base that will be used to support further growth in the aviation sector.

Commercial airports in Auckland, Hamilton, Christchurch, and Invercargill all have runways capable of handling large passenger jets, and Hamilton Airport has plans to extend its runway further.

Auckland Airport handles 13 million passenger arrivals and departures each year, making it the second busiest airport in Australasia. 65,000 vehicles pass through Auckland Airport each day, and 19 million people each year. Auckland Airport has a commercial property strategy that aims to take advantage of this demand.

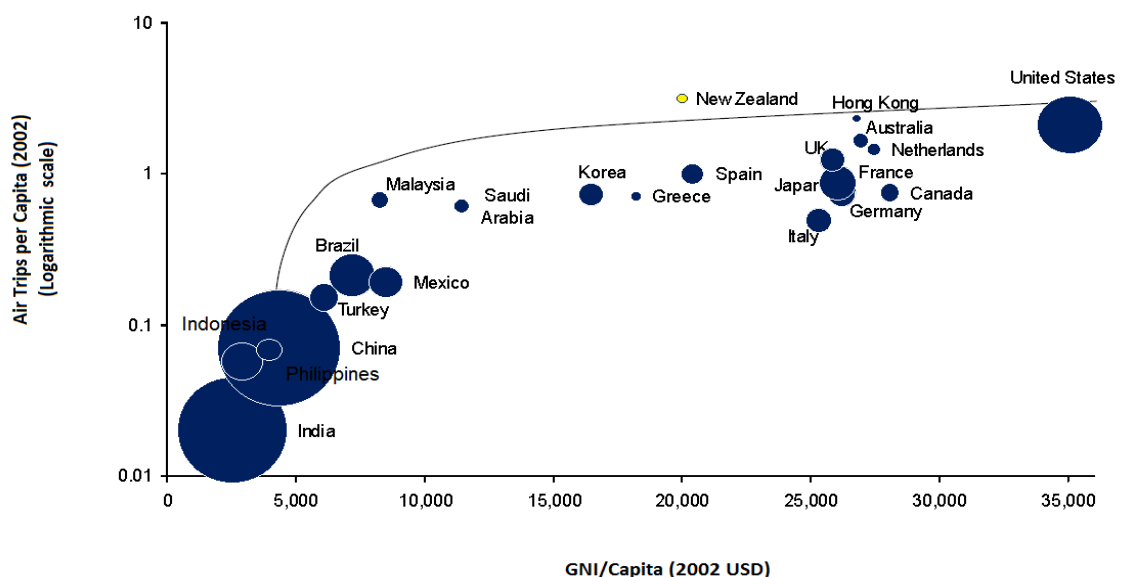
Other airports have improved their infrastructure in recent years, and New Zealand now boasts a nationwide network of modern airport facilities:

- In 2007 Hamilton Airport opened its new upgraded terminal—with more check-in counters and internal baggage carousels to increase efficiency
- Christchurch airport has spent more than \$200 million on a new terminal opening in 2011—that will improve passenger flows and enhanced retail and cafe areas
- In expectation of the Boeing 787 and Airbus A350 soon entering service, Wellington Airport recently completed a \$40 million upgrade of its international terminal which will double passenger throughput.

New Zealand's infrastructure has been built to respond to market conditions—New Zealanders are frequent travellers, and prioritise spending in this area. The chart below shows that New Zealanders take more air trips per capita than any other nation, at a rate well above that predicted by income levels.

Figure 2

Relationship between income and air travel



(Source: Zinnov 2007)

The New Zealand aviation sector is poised for growth

Growth in the New Zealand aviation sector is driven by exports

In New Zealand growth in the aviation sector has primarily been driven through the expansion of exports, creation of products from intellectual property, and addition of new products and services to existing businesses. Aviation infrastructure in New Zealand creates a good environment for exporting goods, and New Zealand's major and secondary airports all have comprehensive strategies for developing commercial activities on site, including activities such as aircraft design and manufacture, engine testing, and pilot training.

Investment in infrastructure related to aviation will contribute to continued growth

Auckland Airport's *The Landing* is a world-class warehouse and logistics location situated to the north of the airport. Christchurch Airport is developing an area called *Dakota Park*, which will house a range of aviation-focused businesses. In Hamilton, *Titanium Park* is a joint venture property development that is home to the Waikato Aviation Cluster. All of these commercial developments have airside access, and all have the advantages that come with being located close to major air transport facilities.

New Zealand also has an expanding network of infrastructure to support intermodal freight movements. The country's major airports are all relatively close to container seaports, keeping the costs of freight movements relatively low. Recent investments in inland ports at South Auckland (MetroPort and Wiri) and a proposed inland port outside

Hamilton will help to further reduce freight costs.

MetroPort is a strategic inland port located in the heart of Auckland's industrial belt. Its location, ease of access and fast turnaround are key features of the terminal's success. The shipping lines that use MetroPort call at the Port of Tauranga where import cargo destined for Auckland is offloaded at the Tauranga Container Terminal. Cargo is then railed to MetroPort before distribution to its final destination. The same process is applied in reverse for Auckland sourced export cargo.

MetroPort is fully Customs bonded and MAF approved. There is an on-site fresh produce quarantine inspection facility along with fumigation and door inspection areas. Currently there are 1,000 ground slots including 60 reefer points. Its own dedicated twin rail sidings can cater for unit trains of 100 TEU.

Ports of Auckland also operates an inland port at Wiri, South Auckland. Like MetroPort, Wiri offers flexibility and the ability for shipping lines and cargo owners to drop off and pick up their cargo at Wiri instead of trucking it through central Auckland, allowing them to tailor their supply chain options. Wiri has reduced truck movements through the Auckland CBD by an estimated 100,000 movements per annum, increasing efficiency, and providing community and environmental benefits.

The commercial developments and logistics investments being made in New Zealand will ensure that the country continues to provide an efficient base for aviation sector businesses for many years to come.



Labour Market Conditions



New Zealand has access to a highly skilled workforce at comparatively low wage rates

Businesses in New Zealand have access to a world-class labour force

Employers in New Zealand have access to a highly-skilled workforce. Four out of five residents in New Zealand have some form of school qualification, and New Zealand’s tertiary education providers produce around 30,000 graduates each year. In New Zealand there are 5 established tertiary institutions and 4 private operators that provide accredited qualifications in various aeronautical related fields.

More than 40% of these graduates earn their degrees in information technology, engineering, and commerce—disciplines that are all important to a dynamic aviation sector. New Zealand’s engineering programmes in particular are world renowned, supplying high-quality engineering graduates at a rate that grew by more than 5% per year

from 2002-2007. As of 2008, there were more than 50,000 people employed in engineering-related roles in New Zealand.

Labour costs in New Zealand are lower than competitor countries

Engineering salaries in New Zealand are lower than other developed countries, with a median base salary comparable to that of the Philippines or Malaysia (source: New Zealand Department of Labour). This is consistent with trends in other industries, where New Zealand salaries are 20-33% lower than the average salaries paid in Australia, the US, UK and France (see Table 1). For example, the New Zealand Institute of Chartered Accountants (NZICA) identified that Chief Financial Officers/GM Finance working in New Zealand on average earn 40% less than their overseas counterparts.

Table 1

Comparison of salaries in New Zealand and comparable countries

Employer Type	Average Salary per Employer Type (USD)					Average Discount in NZ
	New Zealand	Australia	United States	Great Britain	France	
Senior professional	40,604	50,158	60,516	49,707	60,802	27%
Private Practice/Firm	37,402	47,341	55,491	47,334	61,735	29%
College / University	39,700	54,638	51,005	50,625	45,959	21%
Other Organization	37,179	43,924	53,305	44,916	56,920	25%
Self-Employed	35,530	40,209	49,438	39,926	73,699	30%
Contract	34,715	46,276	60,448	41,905	53,315	31%
Junior professional/assistant	33,304	36,846	41,238	39,083	50,233	20%
Average	37,221	46,830	51,519	43,549	53,718	

(Note: International salary data is converted to USD using a 5 year average exchange rate)



New Zealand is a great place to work and live

New Zealand has international appeal as a destination for highly-skilled labour

New Zealand businesses are able to attract both domestic and overseas labour despite a comparatively lower wage rate because New Zealand is a great place to live and work. Mercer releases a Quality of Living Survey annually, comparing 221 cities based on 39 criteria. In 2010 Mercer ranked Auckland (5th) and Wellington (12th) as having among the best quality of life of all cities considered.

New Zealand has an active skilled migrant programme, which helps to ensure that any shortages in local capacity are filled through international recruitment and facilitated immigration. New Zealand Immigration facilitates both short-term and long-term immigration to New Zealand under a system where points are awarded for skilled employment; qualifications; relevant work experience; age; and family ties. Since the skilled migrant programme began in December 2003, more than 250,000 people have been assessed for residency.

New Zealand has a cost-effective and uncomplicated tax system

The taxation regime in New Zealand has long been recognised as one of the most simple and efficient regimes of

any OECD member state (OECD 2001 and 2007). Departure from a 'broad base, low tax' principle increases arbitrage behaviour and administration costs. The New Zealand system has attempted to minimise these distortions through taxing a broad base and minimising tax rates. The 2007 OECD report notes that New Zealand is well placed to respond to long-term pressures highlighting that a reduction in tax rates, flattening of the tax schedule and the alignment of tax rates should further enhance the efficiency and simplicity of the New Zealand tax system. New Zealand does not enforce any form of capital gains tax.

New Zealand has lower than average wages rates and a labour force with higher than average skills. New Zealand's workforce is very productive, and despite the lower than average wages, high proportions of New Zealand's population participate in the labour market. To some extent the quality of life on offer in New Zealand is a type of non-financial remuneration and it allows New Zealand to attract overseas talent when needed. Employers gain competitively priced and highly-skilled labour and employees gain a career in a country ranked among the highest in the world in which to live - a compelling offering.

New Zealand has a stable regulatory environment that promotes business confidence

Doing business in New Zealand is unparalleled in its simplicity

The World Bank *Doing Business* report presents quantitative indicators on business regulation and the protection of property rights. *Doing Business* assesses regulations that affect 9 stages of the business cycle across 183 economies. New Zealand ranks exceptionally well in the following areas critical to a high quality business environment:

- Protecting investors (1st)
- Getting credit (2nd)
- Registering property (3rd), and
- Enforcing contracts (9th)

Overall New Zealand is ranked 3rd out of 183 economies for its ease of doing business. Transparency International produces a *Corruption Perception Index* on an annual basis and, in their 2010 report, New Zealand is ranked the least corrupt economy out of all 178 countries surveyed.

New Zealand has an efficient regulatory environment

New Zealand is recognised as having an efficient regulatory system, and has adopted progressive reforms that give confidence to the private sector. Much of this efficiency is driven by the need for local businesses to compete on an international scale. New Zealand has

been a leader in liberalising international trade since the 1980s. As a result, New Zealand has successfully negotiated trade agreements with most of its major trading partners (including China).

Regulatory stability is also important to business confidence, and New Zealand has a steady and effective regulatory environment. This is reflected in the World Bank indicator that rates cumulatively change in business regulation. New Zealand ranks as one of the economies with the least regulatory change between 2006 and 2011. This makes sense as the effectiveness of the business environment suggests that there is no longer a need for major regulatory reform.

New Zealand is party to international agreements that protect intellectual property and its legal system actively protects such rights. Among others New Zealand is party to The Agreement on the Trade-Related Aspects of Intellectual Property Rights (the TRIPS Agreement) and The Universal Copyright Convention 1952. Participation in these Agreements means that when an original work is created in New Zealand, it is not only protected by copyright in New Zealand, but also automatically protected under the copyright laws in other countries that are members of the World Trade Organisation.



The New Zealand aviation sector operates within a world-class regulatory environment

New Zealand has an internationally respected aviation regulator

Regulation of the aviation sector in New Zealand is the responsibility of the Civil Aviation Authority (CAA). The primary mandate of the CAA is to monitor safety and security in the aviation sector. The CAA's duties include incident reporting, monitoring compliance with safety standards, conducting inspections, and taking enforcement action.

The CAA requires appropriate levels of engineering and maintenance, which are monitored through regular audits of maintenance schedules. The quality and skill of these audits is recognised by the US Federal Aviation Authority, which accepts CAA certification of New Zealand-designed and certified aircraft repairs and modifications. This is a clear endorsement of the technical competence of New Zealand trained engineers, and saves costs for New Zealand aviation businesses.

Increased safety does not mean high compliance costs

Industry participants in New Zealand also express positive views on the work of the CAA. In 2004, an industry survey found that stakeholders regard regulation of the New Zealand aviation sector as

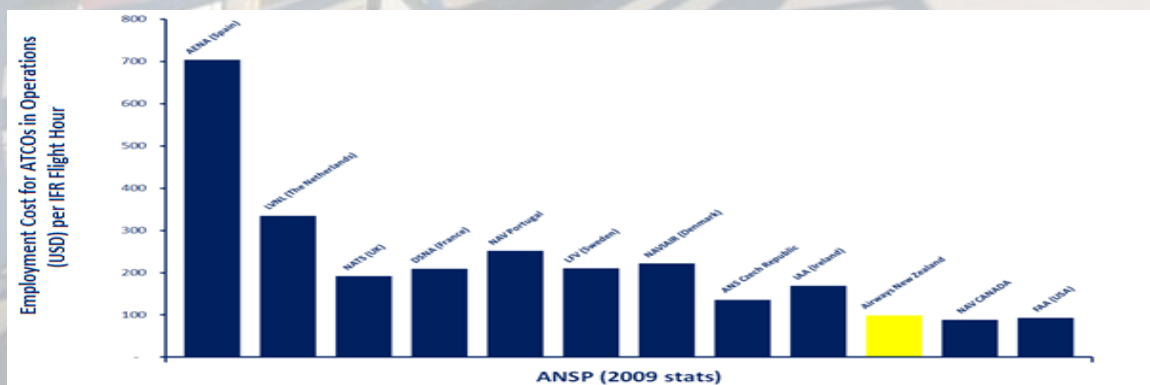
striking the right balance between robust oversight and minimising compliance costs (source: CAA 2004).

In Airways New Zealand, New Zealand has one of the most cost-effective Air Navigation Service Providers (ANSPs) in the world. This is partly due to technology choices resulting in lower than average employment costs (see Figure 3 below). For example, Airways New Zealand was the world's first ATC provider to adopt an Oceanic Control System (OCS), this increased navigational capacity and formed the basis of the system now used in the United States. In a progressive reform, the New Zealand Government instituted Airways New Zealand as the world's first fully commercial ANSP. The corporatisation of this former government department enhanced operational efficiencies and ensured that flight movement costs in New Zealand remained comparable with much larger countries, such as Canada and the US.

The general and sector-specific regulatory environment in New Zealand supports future growth in aviation. Safety and maintenance requirements ensure that New Zealand maintains its exceptional reputation, but compliance costs are kept as low as possible.

Figure 3

International comparison of ANSP costs



(Source: CANSO ANSP Performance report)

Opportunities: Pilot Training

Airlines demand quality pilots, and New Zealand is uniquely placed to deliver this training

What is driving the growth in demand for well-trained pilots?

Global passenger growth is expected to increase 5% per annum from 2009 to 2028. Emerging markets like China, India and the Middle East hold the greatest opportunities for delivering this growth. China is expected to be the fourth largest international market for leisure travellers by 2020, with about 100 million outbound Chinese tourists (source: Zinnov).

In 2007, the International Air Transport Association (IATA) warned that more than 17,000 pilots will need training per year to 2018. In its 2010 'Current Market Outlook' Boeing suggests demand for pilots could be far more significant. In their forecasts, Boeing predicts that more than 23,000 new pilots will be required each year to 2029. Economic growth in Asia has increased demand for air travel and consequently Asia will require almost 10,000 new pilots each year to 2029. Asia will therefore account for 40% of global demand, primarily driven by China (China will represent 40% of total demand from Asia). Currently global capacity to train pilots is estimated at approximately 15,000. The number of retiring pilots contributes to this shortfall, and while raising the mandatory retirement age may help address this issue, IATA says there is an imminent need to increase pilot training capacity.

Forecast growth in air travel, combined with an ageing population of pilots, presents considerable opportunity for well-trained pilot cadets. Airlines are looking for graduates with world-class

training, and companies in New Zealand have established a reputation for producing pilots of the highest quality.

What makes New Zealand a good place to train pilots?

New Zealand pilot licenses are well regarded internationally, and are accepted automatically in the United Kingdom and other European countries.

New Zealand has a diverse landscape; glaciers, fiords, rugged mountains, vast plains, rolling hillsides, subtropical forest, and a volcanic plateau. The weather is just as diverse. Though New Zealand does not experience great variation in temperature, its location in the southern latitudes and the prevailing westerly winds results in changeable weather. Visibility is also favourable at most airports, with few flight interruptions as a result.

New Zealand's airspace, as a proportion of global airspace, is the seventh largest in the world (7%) and comparable to Australia's (11%). This means relatively uncluttered skies—ideal for training pilots. The low density of aircraft within New Zealand airspace also helps to control air traffic control costs (as shown on the previous page). This is because the complexity of controlling airspace increases sharply when more planes are in the sky.



Case Study: CTC Aviation Training Ltd (CTC)

CTC has experienced increased demand for its New Zealand-trained pilots, and has needed to increase capacity. CTC chose to locate its second aviation training in New Zealand—beating Australia, the United States and South Africa as CTC’s preferred location.

Ian Calvert (CEO of CTC) believes that New Zealand offers some unique benefits for locating pilot training facilities. At the forefront of Ian’s mind is the cost of doing business in New Zealand. Labour makes up a large proportion of CTC’s costs —engineers and pilot trainers do not come cheap. A New Zealand location allows CTC to access highly skilled pilot trainers and engineers at a cost that is lower than the other locations evaluated by CTC. Ian says that despite lower than average salaries, attracting skilled workers to New Zealand is not difficult, as the relative cost of living more than compensates for this.

A New Zealand base also positions CTC to take advantage of growth markets in Asia - “Airlines want to be close to their cadets”. CTC has recently signed a pilot training contract with Spice Jet from India, and is exploring other opportunities in the region.

Ian says that Hamilton, New Zealand is a place CTC “wants to be”. The company believes New Zealand’s weather and compact yet diverse geography makes for an ideal training environment:

“Our climate is ideal - enough good weather to get the training done, but also enough bad weather to create a good training environment”.

The capacity at Hamilton Airport to handle CTC’s operations, and the willingness of the airport management and local councils to facilitate the arrival of CTC, was also a major plus. This reflects the positive attitude of infrastructure providers and officials to businesses like CTC.

New Zealand’s international reputation for producing high-quality products and services strongly aligns with the brand position of CTC— making New Zealand a smart choice to locate.

Opportunities: Aircraft Maintenance and Completions

New Zealand's exceptional MRO capability improves asset utilisation and safety

More aircraft, more engines, more MRO

The expected growth in passenger air-travel to 2028 means that airlines will need to use more planes to meet demand. In its influential Market Outlook for 2010, Boeing estimates that the airline industry will require 30,900 new jets by 2028, which translates into US\$3.6 trillion in capital investment.

Growth in Gross Domestic Product (GDP) is considered the most powerful predictor of growth in commercial air services. Asia, led by China, is experiencing considerable GDP growth, and a resulting increase in demand for airplanes. Over the next 20 years demand for aircraft from Asia will rise to 34% of total global demand making Asia the number one importer of aircraft by value.

New Zealand has a reputation for MRO of the highest quality, with exceptional turnaround times

The MRO sector in New Zealand is well placed to take advantage of the

forecast growth in aircraft in the Asia/Pacific region. In addition to being located near these growth markets, New Zealand companies have earned a reputation for exceeding airlines' expectations on engine turnaround times, the quality of workmanship (complemented by robust regulatory and safety checks), and honest service.

New Zealand also has a competitive aircraft interior completions industry. New Zealand firms have specific capabilities in the design, engineering, certification, manufacture and installation of high-value aircraft interior design.

There is considerable opportunity for New Zealand to take advantage of growth in MRO of engines of small to medium sized aircraft (forecast growth of 30,180 planes to 2028) and interior completions of all aircraft (forecast growth 30,900 planes to 2028) as the global demand for aircraft continues to rise.

Figures used for aircraft growth are outlined in Table 3 (below).

Table 3

Demand forecast and projected value for aircraft out to 2028

Aircraft type	Example	Quantity	Value (billions USD)
Large Aircraft	Boeing 747 and Airbus A380	720	220
Twin-Aisle	Boeing 777, 787 and Airbus A330-340	7,100	1,600
Single-Aisle	Boeing 737 and Airbus A320	21,160	1,700
Regional	Planes under 90 seats	1,920	60
		30,900	3,580

(Source: Boeing 2010)



Case Study: Christchurch Engine Centre (CHCEC)

In 2001 Pratt & Whitney (P&W) (51%) and Air New Zealand Ltd (49%) formed a joint venture trading as the Christchurch Engine Centre (CHCEC). Various forms of this company have been operating since 1948, providing more than 50 years of experience undertaking Maintenance, Repair and Overhaul (MRO) at the Christchurch Airport site. CHCEC provides full engine overhaul and test services for the Rolls-Royce Dart and JT8D engines.

The flagship engine of CHCEC is now the V2500 of which more than 70 engines pass through the centre every year. Newer more fuel efficient engines have been serviced at CHCEC since, in 2004 considerable capital was invested—reaffirming the shareholders' view that their New Zealand location remains internationally competitive. Having an operation in New Zealand makes perfect sense for the shareholders of CHCEC. Customer Satisfaction is key to CHCEC's value, and P&W Market Feedback Analysis indicates that across many indicators (including business honesty and overall customer service) its New Zealand business consistently outperforms its other locations—this is reflected by a near 100% resign on all MRO contracts.

Access to highly skilled labour is another compelling reason for CHCEC's New Zealand base. In New Zealand CHCEC can access top-tier engineers for a fraction of the cost of other locations. When supply of domestic skilled labour is low, it is relatively easy to attract skilled labour from places such as South Africa, Norway, Britain and Sweden, due in part to the attractiveness of living and working in New Zealand. Locating in New Zealand also allows CHCEC to secure high-quality apprentices—which is a cost-effective way of up-skilling the team.

The company's dedication to in-house training and New Zealand's workplace attitude means that CHCEC has low annual staff turnover (4-5%). The highly-skilled nature of the CHCEC team allows CHCEC to deliver superior MRO and also allows some of the industry's quickest engine turnaround times. Turnaround times are also helped by advantages arising from New Zealand's time zone, which allow CHCEC to minimise disruption to airline operations in key growth markets.

Opportunities: Light Aircraft Manufacturing

Aircraft manufacturing in New Zealand can cost effectively supply innovative niche aircraft

Unique environments call for the niche aircraft already being supplied by New Zealand businesses

New Zealand has a well established capability in light aircraft manufacturing, particularly for specialised niche aircraft. While New Zealand is unlikely to manufacture larger aircraft in the near-term, the light aircraft sector presents significant opportunities for growth.

Economic growth throughout Asia is placing increasing pressure to connect Asia's provincial regions to its major cities. Increased connectivity allows greater movement of people and opens businesses to new markets, further fuelling regional growth. Light aircraft are ideally suited to servicing more remote airfields. Indeed, specialist high-performing light aircraft manufactured in New Zealand, are already operating in challenging conditions throughout Africa, Papua New Guinea, Nepal, Canada, and New Zealand.

These aircraft are manufactured by Pacific Aerospace Limited (PAL) (described in the case study on the following page). These New Zealand-designed and manufactured aircraft provide an ability to perform freight movements, passenger movements, skydiving, surveying, medevac, agricultural top-dressing and fire-fighting, in environments that require specialist light-aircraft.

The supply chains and infrastructure for building niche aircraft exist in New Zealand

New Zealand has established supply

chains that allow companies to manufacturer light aircraft. The New Zealand business environment is conducive to development of innovative ideas, and the New Zealand Aviation Cluster has helped to foster more than 25 such light aircraft designs. Some of these are currently progressing through the various stages of the commercialisation process.

The innovative thinking and ingenuity of aircraft engineers at PAL has allowed the company to outcompete the much larger Cessna Caravan in certain niche applications. Viking Air, a Canadian aircraft manufacturer, has also recognised the market potential in Asia, and is aggressively targeting its Twin Otter plane in those markets.

Companies like PAL and Viking Air are scaling up their operations to meet demand for specialist aircraft in the Asia Pacific region. At the same time, market entrants with new aircraft designs are also trying to gain a foothold in this market. Whichever suppliers ultimately prevail, there is a clear opportunity in New Zealand aviation sector companies to take advantage of growth in the light aircraft manufacturing supply chain.



Case Study: Pacific Aerospace

Damien Camp (CEO of Pacific Aerospace) sees great value in manufacturing light aircraft from New Zealand. Pacific Aerospace is the largest light aircraft manufacturer in the Southern Hemisphere, and recently built its 644th aircraft.

In the 1950s, the predecessor company to Pacific Aerospace designed the Fletcher Aircraft, known as the agricultural workhorse. The design of the Fletcher drew on the ingenuity of New Zealand's farming sector, and Damien believes this value is as strong today as it has ever been. Responding to natural conditions is a feature of Pacific Aerospace's flagship aircraft the P-750 XTOL (pictured)—no other aircraft can climb as fast, or land at higher altitudes or on a shorter runway.

The ground-breaking design of the P-750 poses unique engineering challenges to the leanest of manufacturing operations—and Damien believes the mentality and ethic of the New Zealand workforce is integral to the success of Pacific Aerospace. Accessing these talents at lower costs than Australia is also important.

Pacific Aerospace implements lean manufacturing initiatives, such as PACE (Pacific Aerospace Competitive Edge), that aim to increase manufacturing productivity. As a result, production capacity has increased from one aircraft every 5 weeks to two aircraft every 4. Such initiatives show that with the right focus, New Zealand aviation manufacturers can be world beaters on both quality and cost. Pacific Aerospace exports more than 90% of its aircraft, and Damien does not view New Zealand's distance to market as a major barrier. Pacific Aerospace links into New Zealand's domestic supply chains, and takes advantage of well developed international freight infrastructure where needed. The flexible nature of New Zealand's aviation SMEs also allows Pacific Aerospace to adjust its market offering to consolidate its niche position.

Damien believes that the regulatory environment in New Zealand supports the value of Pacific Aerospace's offering. The Civil Aviation Authority (CAA) has a solid international reputation for safety and robust regulatory processes—which makes supplying aircraft to other countries much easier.

Opportunities: Aviation Technology

New Zealand provides aviation technology businesses a place to innovate, develop and export their ideas

New Zealand is a place of innovation and significant technological capability

Development and commercialisation of aviation technology within New Zealand is rapidly growing. New Zealand is home to leaders in aviation componentry, software, aviation design and advanced materials.. The aviation technology developed in New Zealand has a reputation for high-quality and innovation, and the speed and cost to which solutions are brought to market is a hallmark of doing business in New Zealand.

Market demand trends mean aviation technology businesses located in New Zealand have an advantage

The global aviation sector is forecast to experience continued growth over the next 20 years. Though conventional aircraft will provide the bulk of passenger movement capabilities, new aircraft and non-conventional technologies will be needed to meet demand in a changing market. The American Institute of Aeronautics and Astronautics (AIAA) believes the aviation sector is already undergoing such transformation as a

direct response to a more competitive environment. According to the AIAA, market forces are shaping the development of aviation technology, which will lead to new categories of aircraft operators, new markets, and new services to more airports. The AIAA states that future air transportation systems will “*need to meet the challenge of efficiently integrating complex operations comprising new categories of aircraft including Uninhabited Air Vehicles (UAV), Very Light Jets (VLJ), and Vertical Short Takeoff and Landing (VSTOL) aircraft*”.

To meet these future demands, aviation businesses will need to develop new technologies at the least possible cost and highest possible quality. New Zealand is an ideal location for aviation technology businesses due to the high demands placed on product quality. The ability of New Zealand businesses to meet the unique challenges of product development is demonstrated by the range of New Zealand products and services in use around the world (See Table 2 below), with many more products and aircraft designs awaiting commercialisation.

Table 2

Examples of New Zealand products in use around the world

Company	Product	Countries in use
Airport 20/20	Flight Display System	America
Cavotec	Pop-up pit system (under tarmac solution)	Oman
SpiderTracks	Web –based flight tracking systems	Australia
BCS	Baggage and freight handling systems	Global
Glidepath	Baggage and freight handling systems	Global
Right Hemisphere	Visual communication solutions	America, Germany
Flight Structures	Aeronautical design and certification consultancy	New Zealand
Superstructure Group	Integrated Safety and risk management solution	Global
Radiola	RealTrack – intelligent transport systems	Global
FlightCell	Aviation communication products	Global
UFL Group	Airport fit-out services	Global

(Source: Castalia research)



Case Study: Metrology Group of Companies

The Metrology group of companies represents the very essence of doing business in New Zealand. Metrology was started in 1960 by a diesel mechanic who had an idea about how to improve fuel injection componentry.

Since then Metrology has grown into a multi-million dollar company, employing 22 specialist staff. As demand for its services grows, Metrology has increased its service offering and now supplies value added high-precision componentry and measurement services for the aerospace industry.

Gerald Kapoor, major shareholder and Chief Executive of Metrology, sees great value in locating his business in New Zealand. Mr. Kapoor believes that New Zealand has huge potential in “special niche, high-value manufacturing” and in terms of aircraft componentry “this is where the growth in New Zealand is”.

Metrology offers value to its customers through its unique ability to engineer high-precision aircraft componentry, and to certify these components within its own onsite laboratory. Metrology is often asked to solve difficult problems that larger manufacturers are too inflexible to deal with— this requires highly skilled metrologists and support staff.

Metrology also benefits from International Accreditation New Zealand (IANZ) accreditation. IANZ has a mutual agreement with the National Association of Testing Authorities (NATA), Australia, such that both organisations recognise accreditations by IANZ and NATA as being equivalent—this improves access to the Australian market. Engineering completed by Metrology is AS9100 and AS/NZS ISO 9001:2000 accredited and its laboratory certifications are NZS/ISO/IEC 17025:2005 accredited. Future demand for the products and services provided by Metrology appears promising. Customers require an ever increasing level of sophistication and traceability in the components used in modern aircraft, which Metrology is well-placed to deliver.

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