



A long haul partnership



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Message from the President

Having worked closely with our Boeing Australia team for many years, I've witnessed firsthand that Boeing Australia is a company that is committed to Australia: to bringing the best of Boeing to Australia and sharing the best of Australia with the wider Boeing enterprise.

I believe today Boeing has never been a more invigorating place to work, and Australia is among the most dynamic places in the world to operate an aerospace business.

After almost 90 years in Australia, Boeing continues to evolve and develop its business, investing in talent, technology, innovation, sustainability, and communities.

I know the strong Australian dollar has been challenging in recent years for exporters like us and our many Australian suppliers, but these challenges are not insurmountable. While we operate in a high cost environment, Australia is building a reputation for productivity and innovation.

Our people work hard at this internally to find ways to work more efficiently while improving quality and meeting our cost and schedule targets. We do this by taking a collaborative approach and leveraging the



strength and diversity of The Boeing Company both here and around the world to identify ways of doing things better.

I am particularly proud of the partnerships we have with our small-to-medium sized enterprise suppliers (SMEs) through our Office of Australian Industry Capability (OAIC). This organisation has achieved exceptional results for Australian SMEs by providing the right training and resources to ensure they can compete efficiently on the global market. This also means identifying opportunities across the breadth and depth of The Boeing Company and its international tier one suppliers. To date the OAIC has delivered some 320 bidding opportunities for Australian SMEs and facilitated more than \$336 million worth of export contracts for Australian suppliers.

Innovation does not come without significant investment in research and development, and this includes our own Boeing Research & Technology-Australia arm (which goes from strength to strength) as well as investment in Australian universities and also our people.

The CSIRO is a legendary Australian research organisation and one with which Boeing has had an enduring and valuable partnership. Over more than 25 years together we have invested more than \$130 million across a wide range of projects including airspace and airport congestion simulation tools and 'topcoat reactivation technology' that allows aircraft to be re-coated with a simple and cost efficient sprayon technology and saves millions of dollars. Most significantly, with CSIRO, we developed the world's first comprehensive blueprint for the development of sustainable aviation fuels – a major achievement.

We must continue to develop the capabilities of our Australian workforce and ensure we have a strong pipeline of talent both within Boeing Australia and across our universities and our schools.

Today we have more than 3,100 employees at 27 sites around the country. Every day, nearly 120,000 people fly on Boeing aircraft in Australia, and Boeing products and services form a key part of Australia's world-class defence capability. Australian companies contribute to Boeing products sold all over the world. It is a tremendously valuable and enduring partnership and one of which I am proud to be a part.

Maureen Dougherty

President Boeing Australia & South Pacific



Boeing Australia: An overview

For a company with a heritage stretching back almost 90 years, Boeing has its sights fixed firmly on the future.

No company becomes an integral part of the fabric of any country, like Boeing has in Australia, without taking a serious and considered approach to the long run.

Advances in technology are rapidly driving innovation across a range of design, management and manufacturing practices around the world. While no one knows precisely what the future holds, what the team at Boeing has always recognised is that in order to play a part in that future, it must continually invest in its people, its partners and its research and development, to ensure it stays innovative, creative, and world-class across its operations.

It is an ongoing process for the company and is one of the reasons that today Boeing Australia represents the company's largest operational footprint outside the United States.

With more than 3,100 employees at 27 sites, Boeing is an integral part of the aerospace and defence industry in Australia, with long term relationships based on trust and performance.

Over the past three years, strong operating results have helped drive revenues from Australian customers totaling some US\$8.7 billion, with around US\$12.5 billion in orders from both commercial and defence customers. The company has seven wholly-owned Australian subsidiaries:

- **Boeing Australia Holdings Pty Ltd.** Established in 2002 and headquartered in Sydney.
- **Boeing Aerostructures Australia.** Australia's only manufacturer of complex aerostructure components, including rudders for the Boeing 777 and the moveable trailing edge control surfaces for the 787 Dreamliner.
- **Boeing Defence Australia.** One of Australia's leading defence companies, specialising in the support, maintenance, modification and upgrade of defence platforms, and in communications, training and logistics.
- **Boeing Flight Services Australia.** A world-class provider of commercial flight and technical training to domestic and international airlines.
- Aviall Australia. A leading supply-chain management provider of new aviation parts and aftermarket services that distributes products to aerospace, defence and maritime customers.
- Insitu Pacific. A provider of unmanned aerial systems for commercial and military applications. Its Brisbane office acts as the regional headquarters for the Asia-Pacific and Middle East regions.

• Jeppesen Australia. A supplier of aviation and marine charting, navigation and scheduling services for rail, air and logistics customers.

The company is also represented in Australia by:

- **Boeing Commercial Airplanes.** Its Sales Support and Field Services offices have been operating in Australia since 1959.
- Boeing Defense, Space & Security. Its Business Development and Product Support organisations work closely with the Australian Defence Force to provide leading-edge platforms, services and solutions.
- Boeing Research & Technology-Australia. Since 2008, this organisation has operated as the focal point for Boeing's research and development collaboration with Australian industry, government and academia, building on partnerships that go back decades.







Boeing products including F/A-18 Super Hornet, 777-300ER, Wedgetail and 737-800 are in service with defence and commercial customers in Australia.



Boeing Defense, Space & Security



With 58,000 employees worldwide and revenues of US\$33 billion, Boeing Defense, Space & Security (BDS) (including the Australian subsidiaries – Boeing Defence Australia and Insitu Pacific) combines manned and unmanned airborne capabilities, intelligence and security systems, communications architectures and extensive large-scale integration expertise across several diverse business areas.

Its relationship with Australia is built on a strong and enduring partnership and a long term understanding of the country's aircraft capabilities, weapons, intelligence and surveillance systems, and satellite needs. It is a partnership built upon decades of responsiveness and innovation to deliver the capabilities needed.

Almost all parts of the business are represented in Australia including Boeing Military Aircraft, Global Services and Support and Network and Space Systems, bringing the full breadth and scope of Boeing's defence space and security portfolio. Key capabilities in Australia include strike, mobility, vertical lift and surveillance aircraft, precision weapons and full range of support capabilities from logistics, training, maintenance and modifications to upgrades for multiple platforms and systems. Of increasing importance is Boeing's diverse capability in network and space systems that provides the Australian government with command and control, communications, intelligence, surveillance and reconnaissance and space systems, enabling the full spectrum of C4ISR functionality and interoperability with key coalition partners.

Current BDS products in or destined for Australia include:

- 12 Super Hornet EA-18G Growler electronic attack aircraft (delivery in 2015)
- 24 F/A-18F Super Hornets
- 71 F/A-18 Classic Hornets
- Five CH-47D Chinook helicopters, with seven additional CH-47Fs on order

- Eight Poseidon P-8A aircraft
- Six C-17 Globemaster III military transport aircraft
- Six Wedgetail E-7 737 Airborne Early Warning and Control aircraft
- Vigilare ground based defence command and control system
- Jeppesen Mobile FliteDeck
- Modernised High Frequency Communications system
- Harpoon missiles
- Joint Direct Attack Munitions
- ScanEagle Unmanned Aircraft System
- Wideband Global SATCOM satellite program sixth satellite
- Ships Signals Exploitation Equipment signals intelligence systems
- Torpedo defense capabilities
- Shipboard Gigabit Ethernet Data Multiplex systems
- Ultra High Frequency communications payload on Intelsat Ltd's IA-22 satellite

Partnerships with Defence

Boeing Defense, Space & Security (BDS) is an essential part of the company's operation in Australia, and has an office in Canberra. The organisation works alongside other Boeing defence businesses in Australia including **Insitu Pacific** and **Boeing Defence Australia** to ensure there is a responsive, engaged and well-coordinated solution in place.

Insitu Pacific, established in Australia in June 2009 as the first office outside the United States, provides services, sales and through-life support for a range of unmanned systems to both military and commercial customers. Based in Brisbane, it has around 70 employees and serves customer needs in the wider Asia-Pacific region and the Middle East. Insitu Pacific's ScanEagle was deployed in support of Australian troops for more than six years, flying more than 41,000 combat hours, including in Afghanistan and Iraq. The company is also involved in a worldleading effort to expand unmanned aerial system (UAV,) applications into the commercial arena, including a recent trial funded by the oil and gas industry for marine mammal monitoring off the coast of Australia and a collaboration in Queensland to look at the viability of UAVs in emergency search and rescue operations.

With a world-class team of more than 1,300 employees at 15 locations around the country, including product support teams in Amberley and Oakey in Queensland and Williamtown in New South Wales, Boeing Defence Australia (BDA) is Australia's leading defence aerospace enterprise and supports some of the largest and most complex programs for the Commonwealth of Australia, the Australian Defence Force and international customers.

Boeing's partnerships with Defence in Australia cross the breadth of the company's sphere of activity with a number of world firsts.

The Royal Australian Air Force was the first international customer for the **F/A-18 Super Hornet** and has taken delivery of 24 of this high performance strike fighter, with a further 12 **EA-18 Growler** aircraft to be delivered from 2015.

The Wedgetail Airborne Early Warning and Control

aircraft has entered service with the Royal Australian Air Force. Based on the Boeing Next-Generation 737-700 commercial aircraft, the 737 AEW&C aircraft provides airborne battle management capability with an advanced multirole electronically scanned radar and 10 state-ofthe-art mission crew consoles able to track airborne and maritime targets simultaneously. The mission crew can direct offensive and defensive forces while maintaining continuous surveillance of the operational area. Boeing Australia has also taken over prime responsibility for supporting Wedgetail from Boeing in the US to ensure a continued high level of readiness for Australia's command and control aircraft fleet.







Australia was the first international customer for the Joint Direct Attack Munition Extended Range (JDAM ER). Underscoring Boeing's commitment to Australian industry, Australian-based Ferra Engineering won the worldwide contract to build wing kits that triples the effective range of the JDAM-ER, allowing aircrews to deploy the weapon from beyond the range of an enemy's air defence system.

Deliveries of seven new **Chinook CH-47** aircraft begin in 2015.

With the launch by Boeing and the US Air Force of the sixth **Wideband Global SATCOM satellite**, the advanced WGS communications network that serves the US Department of Defense, Australia has become the first international partner for this secure communications network, providing significant satellite communications capabilities as well as full interoperability with collation communication systems.

Since becoming operational in mid-2010, the Boeingbuilt **Vigilare** has become the core of the Royal Australian Air Force's (RAAF) air defence surveillance network, providing a component of battlespace management that supports operations at a tactical and strategic level, as well as training. The system facilitates interaction between assets including the RAAF's Wedgetail, Hornet and Super Hornet aircraft and Royal Australian Navy vessels. More recently, Boeing secured a five year \$66.7 million contract to provide enhanced support services for Vigilare including engineering, maintenance, supply and training services, and system updates.

A number of RAAF squadrons are using **Jeppesen Mobile FliteDeck** – electronic charts with a complete system of high quality and standardised aeronautical charts and procedures. This can be used on a number of tablet devices and provides the industry's first interactive data-driven Enroute application that can be used as a true paper replacement solution for RNAV equipped aircraft.

Boeing Defence Australia has three business units:

 Integrated Logistics provides total weapon system management services including maintenance, engineering and upgrades, component maintenance solutions and technical support for Australian government, defence and commercial customers. Services delivered to the Royal Australian Air Force include weapon system management of the Super Hornet fleet, Classic Hornet deeper maintenance and modification, logistics support to the C-17 Globemaster III, technical support and rotary wing training and training support to the Australian Defence Force.





This is in addition to the Boeing Australia Component Repair facility in Melbourne which delivers maintenance, repair and overhaul of aircraft structural components for both commercial and military platforms.

- Information and Operational Services develops and delivers complex command, control and communications systems while operating and maintaining mission critical Defence infrastructure and providing specialist engineering services as well as information assurance solutions to customers. Key projects include support services to the Boeing developed Vigilare Defence Battlespace Command and Control system, network operations and support services to the Defence High Frequency Communications System, software engineering and Tactical Data Link Engineering Services.
- Tactical Derivative Aircraft provides integrated logistics support and maintenance, modification and upgrade services for Boeing commercial aircraft converted for military applications in the Intelligence, Surveillance and Reconnaissance domains. Key projects include the E-7A Wedgetail Airborne Early Warning & Control (AEW&C) In Service Support contract with the Commonwealth of Australia, plus Turkey Peace Eagle AEW&C and Korea Peace

Eye AEW&C subcontracts with Boeing Seattle for the provision of integrated logistics support services to those customers.

It also operates a Systems Analysis Laboratory (SAL) in Brisbane that offers customers the opportunity for analysis and experimentation of advanced concepts and military operations. It is run by a team of highly skilled software engineers and tri-service ex-military operations analysts to provide decision support services to defence projects, and enables outreach and liaison with Boeing's laboratories in the United States, United Kingdom and in other parts of the world. Further, Boeing plans to add an additional SAL node in Canberra to better facilitate direct customer interaction and multi-national engagement within the Australian Capital Territory.

Strengthening industrial links

Within an organisation the size of The Boeing Company – more than 170,000 employees, across 71 countries around the world – there are incredible prospects for work. Yet making the right approach to the right people in the right way can be daunting.

That's where Boeing's Office of Australian Industry Capability (OAIC) comes in. Since 2007, this Seattlebased organisation has worked hard to establish partnerships with Australian industry. With a deep knowledge across all parts of The Boeing Company from the commercial airplanes business to space, defence, cybersecurity and research and development, the team at OAIC identifies immediate and long term opportunities for Australian small to medium sized enterprises (SMEs) within Boeing's global supply chain.

The OAIC is a perfect example of how Boeing's long term view of business in Australia can deliver tangible benefits – like industry intelligence, training, introductions and partnerships – that deliver both immediate and sustained long term returns.

The OAIC has a network and depth of relationships across The Boeing Company that is second-to-none. Over the past seven years, it has built strong relationships across the Boeing business and around Australia that go beyond traditional aerospace and into new areas including cybersecurity, capital equipment, resources and provision of satellite services.

Despite the high Australian dollar and widely reported challenges of the local manufacturing industry, Boeing has been able to identify areas where Australian business can offer valuable products and services to the world by positioning them as globally competitive offering the best products, best value for money and the best lead times.

Today, Australian contractors are involved in every Boeing commercial program and every defence platform.

While it is true that part of the work involves making introductions to Boeing on behalf of local industry, the OAIC goes much further than this by actively seeking out Australian business with the technical know-how and competency to add value in the global marketplace.

Initially much of the work conducted by the OAIC involved training Australian SMEs to ensure they have the skills and knowledge to deliver internationally. This has included program management, business development and communications training as well as hands-on classes on subjects including LEAN manufacturing and Quality Assurance. Additionally more than 25 Australian defence manufacturing industry senior executives have completed the leadership program at the Boeing Leadership Center in St Louis, Missouri.

There are a great number of success stories from this partnership. For example, Marand Precision Engineering has a longstanding and trusted relationship with Boeing, so that when the F15 program in the US was looking for a supplier of world class tooling, the OAIC was able to recommend and successfully introduce Marand.

Ferra Engineering is another success story and its achievements bring benefits for other smaller Australian contractors. Of the US\$60 million contract won by Ferra for the Joint Direct Attack Munition Extended Range (JDAM ER), US\$20 million is being subcontracted to other local SMEs.

The Brisbane-based company also does work for the Boeing P-8A Poseidon maritime patrol aircraft, F/A-18E/F Super Hornet fighter and Commercial Aviation Services group. Since working with Boeing, the company has set up a production arm in Los Angeles to enable fast assembly to take place, as well as a forward stocking operation in Oklahoma.



In Melbourne, Electromold Australia - a company of less than 25 employees – is today part of the supply chain for some of Boeing's most advanced aircraft. Boeing discovered a significant inefficiency in its supply chain - aircraft parts were being shipped from Australia to the United States for chemical surface treatment and then back to Australia because there was no certified supplier in the country. Electromold had the capability to do the work but was not Boeing-certified. By working closely with the Office of Australian Industry Capability, Electromold worked hard to streamline its operations before passing the approval process. Today the company has multiple contracts from Boeing's direct suppliers and is processing commercial and defence parts that go into Boeing products including the 787 Dreamliner, V-22 Osprey and the F/A-18 Super Hornet.

Similarly, Lovitt Technologies Australia in Melbourne has found enormous benefits through its partnership with the OAIC and recently added a new contract to supply subassemblies for the Bell Boeing V-22 Osprey tiltrotor aircraft. Managing director Marcus Ramsey says the company is seeing more opportunities and winning more work through its partnership with the Global Supply Chain Program and Boeing. But the work of the OAIC is not limited to products and services needed by Boeing. One Perth-based company benefitted from the assistance of the Global Supply Chain and OAIC for products Boeing uses rarely. Western Australian Specialty Alloys (WASA) sought Boeing approval for its alloys which, while widely used in aerospace applications, are less frequently used by Boeing. WASA has built on its collaboration with Boeing to help drive sales worth millions of dollars for the Australian company around the world.

The influence of the OAIC also goes well beyond the United States, with targeted introductions of Australian business to companies in Canada, Switzerland, Japan, Italy and The Netherlands.

It is a partnership that is truly working for Australia, for The Boeing Company and for many of its tier one suppliers around the world.

Boeing Commercial Airplanes

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More efficient, more environmentally friendly and a superior flying experience

The Australian, New Zealand and South Pacific markets make up a dynamic region of roughly 40 million people. Total air traffic is forecast to continue to grow at the current annual rate of 4.8 percent over the next 20 years as connections to the neighboring Asia Pacific region and other world regions improve.

This growing region has been a critical market for Boeing Commercial Airplanes. The company opened its Australian office in 1959, and today continues to have a strong regional presence. Boeing Commercial Airplanes works closely with all airlines in the region including Air New Zealand, Air Niugini, Air Vanuatu, Fiji Airways, Our Airline, Qantas and Virgin Australia. More than 50 years ago, Qantas became the first international customer for the Boeing 707, the world's first jet aircraft and today the Qantas Group, including Jetstar, is the first Australian operator of the Boeing 787 Dreamliner. Back in 1959, the entrance of Australia to the jet age halved flying times to the rest of the world; today the 787 is improving the efficiency and environmental performance for the Qantas Group and Jetstar, and delivering a superior flying experience for its passengers.

Since that first order for the 707, the Qantas Group has purchased more than 250 Boeing aircraft including 747, 767, 717, the popular single aisle 737 classic and Next-Generation and the newest, most fuel efficient 787. Over the years Boeing has worked and continues to work closely with Qantas to deliver the aircraft to meet not only performance, financial and technical demands, but also the best possible inflight experience for its passengers.

In fact most air travellers in Australia and the South Pacific would have flown on a Boeing 737 at least once in their life, if not countless times, as the aircraft has proven a tremendous workhorse for many airlines in the region including Air New Zealand, Air Vanuatu, Fiji Airways (formerly Air Pacific), Our Airline (formerly Air Nauru), Qantas and Virgin Australia.

In 2000, under the Virgin Blue brand, Virgin Australia domestic services were launched with two 737-400









aircraft. Today the airline operates more than 75 Boeing Next-Generation 737 aircraft and is the first Australian airline to order the 737 MAX the new fuel-efficient single aisle aircraft.

The 737 MAX incorporates the best of future engine technologies for unprecedented levels of efficiency and reliability, as well as the superb Boeing Sky Interior which is much-loved by passengers. The 737 MAX will bring great efficiency including operating costs eight per cent lower than its main competitors, and greater environmental performance. The superior fuel efficiency of the 737 MAX also reduces carbon emissions as well as a noise footprint which is 40 per cent smaller than today's single-aisle airplanes. Virgin Australia has ordered 23 737 MAX-8 aircraft.

Virgin Australia also operates the popular and fuel efficient 777-300ER for its long haul international flights.



Across the Tasman, Air New Zealand is the worldwide launch customer for the Boeing 787-9, the slightly larger version of the -8 Dreamliner. The airline also deploys both 777-200ER and 777-300ER aircraft on its international routes, along with the 767-300ER. Known for its innovative approach to product development, Boeing works closely with Air New Zealand to deliver both an exceptional experience for its passengers and exceptional flight economics for its business.

Both the Australian and New Zealand governments have Boeing commercial aircraft in their fleet. The Royal New Zealand Air Force uses two 757-200 aircraft in a variety of roles, while the Australian Government chose two Boeing Business Jets (BBJs), a version of the 737, for its ability to fly anywhere in the world with just one stop. With headquarters in Seattle in the United States, Boeing Commercial Airplanes manufactures



and assembles its aircraft at three sites at Renton and Everett in Washington State, as well as the 787 line at Charleston, North Carolina and has a workforce of more than 80,000 people.

More than 12,000 Boeing commercial jetliners are in service (including those manufactured by McDonnell Douglas) and today, Boeing Commercial Airplanes offers a family of technologically advanced aircraft.

With deliveries of new aircraft for this part of the world set to reach 1,010 new jets by 2032, Boeing Commercial Airplanes believes the future for airlines in Australia, New Zealand and the South Pacific looks very positive and with the 737-MAX, 787 and the new generation 777X, the company has plenty to offer its airline customers as the market continues to grow.



Innovative design and manufacture in Australia

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Nowhere is Boeing's story of innovation and technological advances in Australia quite as obvious as at Boeing Aerostructures Australia (BAA), the country's only designer and manufacturer of high-end complex composite aerostructure components for commercial aircraft.

Based at Melbourne's Fishermans Bend, the company has a long heritage in Australian aviation that began with its legacy companies in 1927. It may be imagined that a company that manufactured, among other things, iconic Australian aircraft like the Wirraways, may have faded into history and yet nothing could be farther from the truth.

Today the business designs, tests, certifies and produces world class advanced structures including part of the wing of the most technically advanced commercial aircraft in the world – the Boeing 787 Dreamliner.

BAA manufactures the 'moveable trailing edge' control surfaces of the 787 using a unique carbon fibre production technology developed in Victoria called Controlled Atmospheric Pressure Resin Infusion.

This is Australia's largest aerospace contract valued at \$4 billion over 20 years and it would not be possible without the resin-based infusion system that enables the components to be cured without the need for an autoclave. These types of innovations in technology are due to Boeing's long term view of its business in Australia; its investment in the training and development of its people; and its deep belief in research and development.

BAA worked hand-in-hand with Boeing Research & Technology-Australia to develop this highly valued intellectual property. It requires less infrastructure, labour and energy to produce a composite part and the weight and efficiency savings created using resin-infused composite materials also contribute to increased fuel savings on the aircraft.

In addition to work on the 787 moveable trailing edge, BAA's 1300-strong workforce produces 737 ailerons, 747 moveable leading edges and 777 cove lip doors, elevators and rudders. LEAN manufacturing systems have long played an important part in manufacturing efficiencies at Fishermans Bend and BAA sees this as an ongoing process of continuous improvement. The company is also strongly committed to Boeing's global Go For Zero campaign, focused on achieving an injury free workforce, one day at a time.

From Melbourne, all aircraft components are shipped to the United States for final assembly at Boeing's factories in Charleston, South Carolina, and Everett and Renton in Washington State.





Leading edge services



With more Boeing aircraft flying in this part of the world, it is important to ensure Boeing customers are supported with a range of services from spare parts to flight training, technical support to flight planning and fleet scheduling. This is where Boeing's Commercial Aviation Services (CAS) comes in. CAS business units provide customers with lifecycle solutions, training, materials and engineering services, and 24x7 global customer support. In addition to aviation customers, CAS also works with and supports a number of transport and marine customers in Australia.

Aviall Australia is a major parts supplier to the aviation industry. Aviall represents more original equipment manufacturers for more types of aircraft than any other aviation parts distributor. Worldwide Aviall currently stocks more than US\$2bn in available inventory and lists more than two million part numbers within its parts system.

Aviall has six customer service centres in Australia located in Melbourne (Tullamarine and Moorabbin), Sydney, Brisbane, Cairns and Perth. The service centres are strategically placed so that Aviall is able to provide parts on the shelves as close as possible to where the customer needs them, thereby minimising the customer's inventory carrying costs.

Aviall has also invested heavily in technology to manage its inventory. Aviall.com is an example of how technology has made it easier for customers to check inventory, place orders, check order status and more at their convenience 24/7.

Boeing Field Service operates in Australia as part of CAS. Field Service provides Boeing customers with timely on-site technical advice and the ability to call upon any Boeing Commercial Airplane technical resource to resolve operator problems. Dedicated Field Service representatives are located in Brisbane, Sydney, Melbourne and Auckland.

Boeing Flight Services Australia offers flight and technical training to airlines across the region and around the world. In Brisbane, Boeing operates five full-flight simulators and one fixed-base training device at a \$45 million training centre in partnership with Virgin Australia and provides training for Boeing 717, 737 Next Generation and Airbus A320 aircraft. In Sydney, a Boeing training centre in partnership with Virgin Australia supports Boeing 777 training, and in Melbourne a centre partners with Ansett Aviation Training and focuses on Boeing Next-Generation 737 and Airbus A320 training.

Jeppesen Australia provides today's most advanced flight information solutions and computerised flight planning and optimisation solutions, as well as crew and fleet scheduling. Jeppesen Marine supplies maritime navigational data and operational information to customers with its highly acclaimed digital cartography and software.

Jeppesen's procedure design business provides increased efficiency, particularly to the resources and maritime industries, by creating procedures allowing aircraft to fly into remote locations even under instrument meteorological conditions.

In Melbourne, Jeppesen's research and development team develops the Total Airport and Airspace Modeler, the industry leading tool which simulates air traffic operations to facilitate planning, analysis and decision making by the aviation industry through the world.





Sustainability and the Environment

Around the world, the aviation industry is keenly aware of the issues of environmental sustainability and climate change, and both here and internationally The Boeing Company has been at the forefront of much of the work to develop new ideas and technologies that drive better environmental performance.

This work goes across all aspects of the company's operations in Australia – from operations and manufacturing to involvement in the community and also research and development.

As the founding member of the Defence Industry Sustainability Forum, established in late 2009, Boeing has taken a leadership role. The group acts as a single point of contact for defence contractors and regulators, and partners on environmental projects such as recycling and energy reduction on defence bases.

Boeing Defence Australia set a goal of certifying all its operations to the international environmental management standard ISO 14001 and excellent progress is being made. Sites at Amberley, Oakey and Williamtown as well as Brisbane Boeing House, Network Operations & Security Centres (NOSC) in Townsville, Riverina and Darwin are all certified, with NOSC Exmouth to be included in certification in 2014.

Additionally Boeing Aerostructures Australia in Melbourne is certified to ISO 14001.

Boeing Australia has produced four annual submissions under the National Greenhouse and Energy Reporting Act since 2009. Over this period, Boeing Aerostructures Australia has seen a 40 per cent drop in the amount of greenhouse gas emitted for each aircraft part produced and indeed while production rates have more than doubled, greenhouse gas emissions rose by just 10 per cent.

Across Australia, many Boeing sites have environmental action plans, created with input from employees to identify energy and waste reduction opportunities. Initiatives have included separating and recycling materials, installing sensor lights and water efficiency devices, reducing water consumption, reducing the amount of chemicals used and eliminating waste, and over the past four years energy consumption and greenhouse gas emissions have reduced by six percent.

Boeing's work goes beyond its own operations and people to support education in environmental issues. Its partnership with the Centre for Sustainability Leadership sponsors a number of study fellowships aimed at developing the skills, knowledge and networks of emerging leaders in the field of sustainability. The sevenmonth course is based on an award-winning curriculum and approach and includes subjects on how to use economics and sustainability to create growth. Importantly, Boeing also plays a role in driving this critical discussion and encouraging action on aviation environmental issues. A key part of this is the annual Boeing-hosted Aero Environment Summit. This event aims to inspire the industry through collaboration and joint action and brings together representatives from airlines, airports, manufacturers, government agencies, environmental organisations, universities and research bodies. At the Summit a broad range of presenters deliver the latest findings in their fields, update partners on programs, share ideas, answer questions, move the debate forward and work towards the aim of creating a carbon-neutral aviation industry by 2020.

Together with the CSIRO, Boeing has led the development of the world's first comprehensive blueprint for the development of sustainable aviation fuels that made a compelling case for the development of a new Australian bio-based aviation fuel industry generating some 12,000 clean energy jobs over the next 20 years, especially in regional areas, cutting greenhouse emissions and reducing Australia's reliance on aviation fuels imports by \$2 billion per annum. The two organisations have subsequently invested in a comprehensive study to evaluate the potential for growing new feedstocks in northern Australia and turning them into sustainable aviation biofuels.



Boeing's contribution to Australia

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Investing in Australia's economy: suppliers in all states



Boeing Research & Technology-Australia

Providing innovative technologies



Innovation is at the heart of Boeing's businesses here and around the world, but Boeing knows sustained innovation does not happen without significant and well-directed investment.

It is why, six years ago, Boeing established an Australian branch of Boeing Research & Technology (BR&T), its advanced research and development unit, to better support the local Australian business units and the broader enterprise. BR&T-Australia provides a focal point for collaboration with research and development organisations across the Australian innovation system including universities, private sector providers, the Commonwealth Scientific and Industrial Research Organisation and the Defence Science and Technology Organisation.

Its mission is to conduct research that fuels the growth and profitability of Boeing businesses, engage in highly collaborative and leveraged research investments in focussed areas, and invest in development of the next generation of in-country aerospace scientists and engineers. BR&T-Australia is a highly collaborative organisation that brings the best of Australian technology to Boeing. The work BR&T-Australia performs today transcends numerous parts of Boeing's businesses in Australia including:

- the development of highly integrated large scale composite structures;
- platform maintenance technologies;
- light robotics and automation for aircraft manufacturing;
- autonomous systems supporting the commercial deployment of Unmanned Aircraft Systems (UAS);
- wide area communications and human factors for enhancing aircrew training and performance; and
- leading the implementation of Boeing's environment strategy around sustainable aviation fuels in Australia and the South Pacific region.

Research investments in Australia

Boeing Research & Technology's priorities in Australia include:

- BR&T-Australia is recognised as a world leader in developing out-of-autoclave resin infusion technology for aerospace composite structures. Working with the research and development community, both within Boeing and across the globe, the focus is on producing new and improved resin systems and manufacturing approaches to achieve highly integrated large scale composite aero-structures.
- BR&T-Australia's expertise in light robotics supports the continued competitiveness of Boeing Aerostructures Australia's manufacturing operations locally, as well as achieving productivity breakthroughs through automation across the broader domains of aerospace assembly, maintenance, repairs and overhaul across the globe.
- Unmanned Aerial Systems (UAS) research exploring future technologies that enhance the safe and efficient utilisation of airspace by both manned and, in future, unmanned aircraft is a priority for BR&T-Australia. The program brings together specialist researchers from BR&T-Australia, Insitu Pacific Ltd and leading universities in this space. Collaborative research is also underway into bio-inspired technologies for autonomous systems including novel guidance, navigation, and control techniques used by insects in the natural environment.
- In the Human Factors (HF) research space, BR&T-Australia is developing a suite of technologies that provide insight into the visual scan behaviour of pilots in various phases of flight. This approach utilises next generation commercial eye tracking and data handling technologies. The tool's database will be continually expanded and contains baseline aircraft instrument thresholds and characteristics of expected pilot visual attention. Real time behaviour is then evaluated against the baseline data and displayed along with related performance metrics to flight instructors via a wireless Android tablet device. Ultimately, the same data could be streamed in to 'black box' recorders to assist in safety investigations and provide further feedback for pilot training.
- BR&T-Australia provides coordination for Boeing's aviation biofuel strategy across Australia and the South Pacific region. Boeing is working with a range of industry partners, universities, and governments at both state and federal level to prioritise research and development investments for a viable and sustainable aviation biofuels industry in future. BR&T-Australia's work includes investigation of a range of possible biofeedstocks that can be used for the production of biofuels that do not compete with food stocks.
- Development of an international Virtual Testbed to enable Boeing's international centres to realise the

benefits of using a standard, disciplined process and reusable tool suite for designing, integrating, executing, and monitoring distributed System Of Systems tests in a relevant live, virtual, and constructive environment.

Incremental Sheet Forming (ISF) is a manufacturing technology which is ideally suited to small production runs of sheet metal parts, such as prototype part production and ageing aircraft replacement parts, where the original die is no longer available. This project collaborates with the University of Queensland and the Queensland Manufacturing Institute (QMI) Solutions. The aims are to better understand the broad applicability and utility of the ISF process, and to develop a common software framework where ISF design and analysis tools can interact.

One of the hallmarks of Boeing's technology partnerships in Australia is the 25-year relationship with the CSIRO. Over the course of the partnership Boeing and CSIRO have jointly invested more than \$110 million. In 2011, CSIRO was recognised with a Leader's Choice award in the academia category of the Boeing Supplier of the Year Awards. Also in 2011, Boeing was awarded a CSIRO Gold Medal for Research Excellence.









Supporting education, training and skills transfer initiatives

Manufacturing today is a highly-skilled, high-tech operation. It is as much about engineering as it is about knowledge and software and is moving away from the traditional image of workers in overalls bashing metal to a smart design-led industry that sits at the heart of innovation.

In order to compete and win in this new century, Boeing believes that investing in a pipeline of talent is crucial to the success of a growing and increasingly integrated global enterprise. This means ensuring ongoing education, training and skills of its people, its Australian suppliers and the wider community.

Boeing has a highly skilled and educated workforce and employees are encouraged on a path of continuous learning including acquiring knowledge, achieving certification in particular skills and further education including masters degrees and doctorates from Australian universities.

In 2010, Boeing Aerostructures Australia (BAA) established its own on-site Skills Training Centre that provides comprehensive skills training in specific competencies needed for resin infusion fabrication and composite aerostructure assembly. To date more than 800 new employees have been trained, as well providing ongoing training of current employees. Working with composite materials is such a new area for industry that BAA has worked with Federal and State governments and educational bodies to establish a new accredited qualification – a Certificate III Engineering Composites Trade – to secure the future skills needed in the local aerospace manufacturing industry.

Boeing knows the future of the cutting-edge aerospace industry is through the development of smart, talented and enthusiastic people. In Australia, the company is passionate about encouraging young people through education to inspire their interest in science, particularly aerospace and aviation-related projects, which is why it has supported the Gateway Schools Program for a number of years. This initiative between Queensland Government and industry bodies creates pathways for high school students in years 11 and 12 to enter the industry.

Last year more than 3,000 high school students were exposed to aviation and engineering careers through Boeing-sponsored outreach programs and more than 100 students visited Boeing sites.

Boeing also works closely with selected Australian universities to enhance undergraduate curricula, support continuing education of Boeing employees, recruit candidates for employment and collaborate on research that benefits the company's long-term business needs. Since 2008, Boeing has contributed more than \$475,000 to Australian universities and is currently supporting University of Queensland, Queensland University of Technology and Royal Melbourne Institute of Technology University. Funds are used for a variety of student projects, travel bursaries, scholarships, awards and student outreach programs including scholarships which include valuable work placement, 24-day study tours of the US and co-supervision of fourth year thesis projects. In-kind support is also provided through Boeing attendance at university events, and more directly via mentoring and internship programs.

During National Science and Engineering Week Boeing sponsored the TedxQUT event that included a showcase of new technologies developed by science and engineering students, and brought together a diverse community inspired by speakers who shared their ideas on building a stronger future through science, technology, engineering, art and mathematics.

In addition to educating high school and university students, Boeing is dedicated to life-long learning for its employees. The company encourages local and international study, and each year across the business a number of Australian employees undertake professional assignments and gain exposure to programs from a global operations perspective.

The skills transfer aspect also extends to Australian small to medium enterprises working with Boeing. A number of Australian businesses have benefited from assistance in the implementation of initiatives like quality assurance and the lean manufacturing principles of the Boeing production system, which has led to development and expansion of their manufacturing skills and the knowledge and expertise to bid for further work in the aircraft and aerospace industries.





Boeing – a real partner in the community



With more than 3,400 employees in Australia, being a genuine part of the community is incredibly important to Boeing, its people and its culture. Wherever possible, the company wants to do more than simply donate to a cause; it wants to get involved and get its hands dirty.

Nowhere is this more apparent than at the Greening Australia tree planting days where employees have been volunteering to plant trees and undertake other duties. Dirty (and clean) hands also play a key part in the Stephanie Alexander Kitchen Garden Foundation which supports sustainability by encouraging schoolage children to learn about healthy food production and preparation.

Being part of a community also means being there when the times get tough and Boeing has donated more than \$3 million to support a number of community groups, including recovery efforts following the Queensland floods and cyclone in 2010, the Christchurch earthquake in early 2011, and the Victorian bushfires in 2009.

In Melbourne BAA employees have participated in the Red Cross blood donation scheme for the past five years.

For Boeing, working with community groups means not only choosing organisations where the need for financial support is great, but also identifying thoughtful and appropriate partnerships that offer opportunities to inspire, inform and engage others, including its employees.

This approach can be seen in the relationship Boeing has with the Great Barrier Reef Foundation. Its program works with 'citizen science' groups, made up mostly of volunteers, who help contribute to knowledge about the reef by actively collecting information about the health of the coral. These groups are spread along the 2,300km coastline bordering the Reef.

The partnership with the Australian War Memorial too fits perfectly with this ethos. The iconic Australian museum has as one of its mandates "to encourage others to remember, interpret and understand the Australian experience of war and its enduring impact on Australian society." Boeing has been a long term supporter of this Australian institution.

At all parts of its business in Australia, at all 27 sites, across all 3,000 plus employees, Boeing people see themselves as active participants in the community whether it is disaster recovery or volunteering, supporting the environment or encouraging children to read or major donations to cultural institutions or community events.



Dr Brendan Nelson, Director of the Australian War Memorial (AWM) with Maureen Dougherty and AWM Chair Rear Admiral Ken Doolan AO RAN (Ret'd); Boeing volunteers.





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