

The 2030 Big Picture Series:

Perspectives on the economic opportunities for Toowoomba in Southern Queensland





THE REGION BENEFITS FROM MANY ASPECTS OF TRADE INCLUDING AGRICULTURE, RESOURCES, RETAIL, TOURISM, EDUCATION AND HEALTH, PROVIDING ITS DIVERSIFIED ECONOMY WITH THE STRENGTH TO RIDE THROUGH ANY MACROECONOMIC DIFFICULTIES.



EXECUTIVE SUMMARY

Toowoomba is one of Australia's most vibrant regions with rich, fertile soil, lending itself to thriving agriculture production coupled with significant infrastructure development connecting it to the city of Brisbane and well beyond.

Toowoomba is benefiting enormously from multi-billion dollar investment from the Commonwealth, state and private firms and individuals that has recently led to the completion of a 41 kilometre bypass to increase freight efficiency for road transport, the impending construction of a railway line through to Acacia Ridge and a fully operational private airport.

This has enabled Toowoomba businesses to sell produce and complete trade with other parts of the country on a daily basis, as well as conduct international trade, thanks to international carrier Cathay Pacific flying to Hong Kong once a week from the Wellcamp Airport.

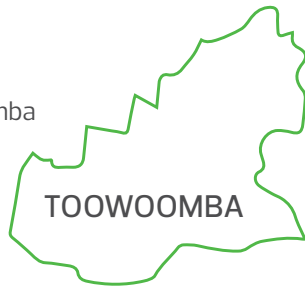
The creation of a sophisticated Tier III data centre, the proposed construction of a premium milk factory and the continuing expansion of the health sector using innovative technology such as robotic surgery, further enhances the region as a destination for effective business.

The region benefits from many aspects of trade including agriculture, resources, retail, tourism, education and health, providing its diversified economy with the strength to ride through any macroeconomic difficulties.

At the release of this report, there have been no reported cases of COVID-19 in the Toowoomba community. It is however still early days to assess the real impact of the pandemic on Toowoomba's economy and community. Local businesses are reeling and particularly industries such as tourism and transportation have been hard-hit. Whilst the 10-year outlook for Toowoomba remains positive, it is still early days in quantifying the economic costs of this crisis which has no immediate end in sight.

THE REGION

Toowoomba was first declared a municipality in 1860. The Toowoomba region is a local government area located in the Darling Downs part of Queensland. A regional centre for business and government services, it is 125 kilometres west of Brisbane. The region covers a total area of around 2,258 square kilometres, or less than 0.5% of Queensland's total area.



Agriculture takes up the vast majority of land in Toowoomba at 1,697 square kilometres, which is approximately 75%. The most common land use by area is grazing native vegetation, which occupies 761 square kilometres or 34% of the Toowoomba region.¹

THE POPULATION

The 2016 Australian Bureau of Statistics survey (ABS)² revealed that Toowoomba had a population of 160,770, which comprised a median age of 38, with more females (51.4%) than males (48.6%). There were 41,659 families averaging 1.9 children.

A report titled, 'Queensland Government population projections to 2031' predicts Toowoomba's population to reach 199,247 in the next 10 years.³

The ABS has supported this forecast. This growth of almost 40,000 people represents a 25 % increase in population over a 15-year-period.

"Toowoomba offers stability and diversity and people are attracted to that," says RSM's director and adviser to privately-owned businesses, William Laird, who is also based in Toowoomba. "We don't have the ocean, but we have a very fertile landscape. There is significant infrastructure development happening in and around Toowoomba and that will give us fast access to Brisbane. We already have direct flights to Melbourne and Sydney from the Wellcamp Airport. We also have good schools, hospitals and a retail sector so there is a lot to like about the region," adds Mr Laird.

In the last five years, Toowoomba has become of the fastest growing towns in the country, with low unemployment and an increase in infrastructure leading to job creation.

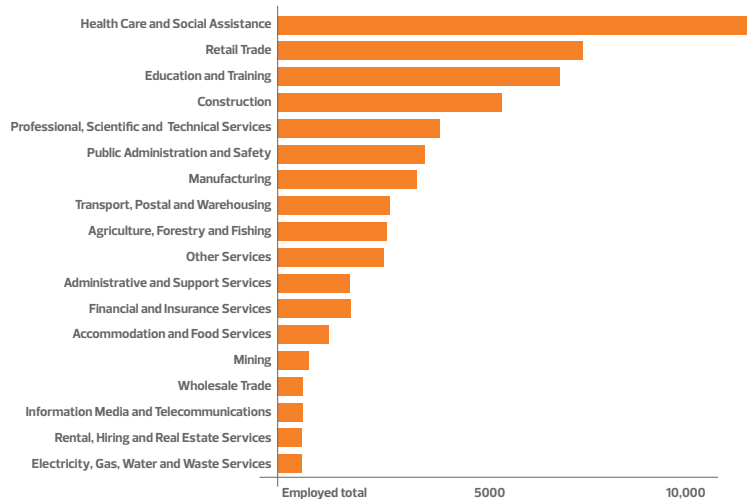
EMPLOYMENT PROFILE

ABS employment data released October 2019 indicates that around 67,400 people are employed in the Toowoomba region.⁴ The Toowoomba region accounts for 3% of total employment in Queensland and 8% of all people are employed in the Queensland agriculture, forestry and fishing sector.

Health care and social assistance is the largest employment sector providing jobs to 14,200, followed by construction with 8,900 people, and accommodation and food services employing 7,000 people.

Significant other employment sectors in the region are construction, professional, scientific and technical services, and public administration and safety. The agriculture, forestry and fishing sector employs 2,900 people representing 5% of the region's workforce.⁵

Employment profile by industry



Source: Australian Bureau of Statistics, November 2019

"Toowoomba is a very liveable city where employment prospects look to be growing as the city develops," says Paul Antonio, Mayor of Toowoomba.

"We have had GDP growth of 3.6% per year and this means more opportunities across many sectors such as agriculture, health, retail, tourism and IT, thanks to the construction of the data centre, which will enable job growth.

"Without a doubt, I see healthcare as the major area of employment growth. We have two private hospitals and a public hospital, along with universities working closely with health services, meaning our facilities are excellent.

"Plus, there are more children attending private schools than public schools in Toowoomba so they see a bright future here. The Catholic Church has invested heavily in the region and that is reflected in the standard of education and health care too."⁶

^{1,5} Australian Government Department of Agriculture and Water Resources (ABARES) www.agriculture.gov.au/abares/research-topics/aboutmyregion/qld-toowoomba#employment

² quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA36910?opendocument

³ www.qgso.qld.gov.au/products/reports/qld-govt-pop-proj-lga/qld-govt-pop-proj-lga-2011-edn.pdf

⁴ www.qgso.qld.gov.au/issues/3426/regional-labour-force-201909-toowoomba-sa4.pdf

⁶ www.abs.gov.au/AUSSTATS/abs%40.nsf/allprimarymainfeatures/5F60A449AE6DE5F6CA258090000ED52A?opendocument

AGRICULTURAL SECTOR

In 2016–17, the gross value of agricultural production in the Toowoomba region was \$276 million, which was 2% of the total in Queensland, which totalled \$14 billion. This has been steadily rising. In 2017–18, the gross value of agricultural production in the Toowoomba region was \$348 million, which was 3% of the total in Queensland.⁷

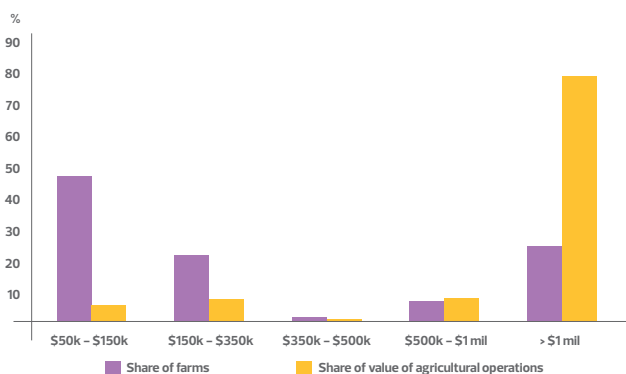
The most important commodities in the Toowoomba region based on the gross value of agricultural production are beef cattle farming, followed by vegetable growing, grains and dairy cattle farming, in that order. These commodities together contributed 85% of the total value of agricultural production in the region.

Number of farms, by industry classification, 2016–17

Industry classification	Toowoomba region		Queensland	
	Number of farms	% of region	Number of farms	Contribution of region to state total %
Beef cattle farming (specialised)	66	32.4	8,528	0.8
Vegetable growing (outdoors)	39	19.0	671	5.8
Other grain growing	26	12.7	1,153	2.3
Dairy cattle farming	21	10.3	509	4.2
Horse farming	10	4.9	460	2.2
Grain–sheep or grain–beef cattle farming	10	4.7	927	1.0
Other	33	15.9	6,153	0.5
Total agriculture	205	100	18,401	1.1

Note: Estimated value of agricultural operations \$40,000 or more. Industries that constitute less than 1% of the region's industry are not shown. Source: Australian Bureau of Statistics

Value of agricultural production, Toowoomba region, 2016–17⁸

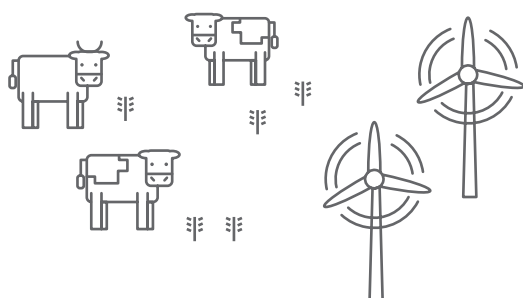


Note: Only farms with an EVAO of \$50,000 or more in 2016–17 are included in this data. The scope of ABS Rural Environment and Agricultural Collections changed in 2015–16 to include only agricultural businesses with an EVAO of \$40,000 or greater. Source: Australian Bureau of Statistics

“Agriculture is a major employer in the region,” Mr Laird says. “Recent statistics show that we produce 82% of Queensland’s eggs. We also have significant other intensive agriculture as well as beef and grain.”

“With the increased food needs of growing populations in Australia and Asia–Pacific, I can only see these levels of production increasing. With the airport, rail and new bypass, fresh food can be delivered daily to interstate and international destinations, a superior advantage to our food producers. Delivering food right off the farm means buyers are receiving fresher produce,” added Mr Laird.

With growth in agricultural business happening quickly, it has led to the establishment of a body to link related businesses, in and out of the region.



⁷ www.agriculture.gov.au/abares/research-topics/aboutmyregion/qld-toowoomba#agricultural-sector

⁸ www.abs.gov.au/ausstats/abs%40.nsf/mf/7503.0



FOOD LEADERS AUSTRALIA

The Toowoomba and Surat Basin Enterprise's (TSBE) Food Leaders Australia (FLA) is a collaborative membership-based group created specifically to assist the food and agricultural sector.

"FLA is a sister entity of the TSBE, and we exist to support the growth of food and agricultural business in the region to allow them to capitalise on new market opportunities, innovations and exports," says Bruce McConnell, general manager, FLA. "We need agricultural and economic opportunities to bloom here and we believe we have the capacity and capability to do that."

FLA has already started hosting industry events and 2019 was the second year it ran the Emerging Exporters program, an initiative to help connect the food and hospitality sector with the local supply chain.

Emerging Exporters is a three-year program funded by Shell's QGC Project where each year 10 food businesses are given advice and guidance to become export-ready.

"We are committed to holding events connecting the local and business community to investment opportunities that include areas such as natural resources along with agriculture, as well as new areas of innovation," Mr McConnell says.

FLA will be hosting regional events to achieve these goals. Some of these

initiatives include the '400M Ag & Food Innovation Forum' in 2019. With 400 million middle-income wage earners in Asia and just 400 million hectares of land available to feed them, this forum was held to introduce business leaders and innovators to new types of innovation, to promote and attract investment in the area.

[The Ag in the Asian Century National Export and Innovation Conference](#) organised by the TSBE was also held in 2019 to look at a number of related themes including capitalising on Asia's need for Australian meats.

Asia's demand for food is expected to double as consumer preferences evolve to desire high quality, safe and reliable food from trusted sources.

[Brookings Institution's Global Economy and Development paper](#) which looked at the unprecedented expansion of the global middle class reveals that out of the next one billion people to reach middle-class status, 88% will live in Asia.

This report also states that by 2030, global middle-class consumption could be \$US29 trillion more than in 2015, and in 2030, Asia will account for well over half the total middle-class consumption market.⁹

The desire and need for the Asian population to consume fresh dairy, fruit and vegetables, beef, grain and wine will increase substantially, which will drive food production, manufacturing and value-added businesses to deliver these products with enhanced nutritional benefits.

"We understand the strategic goals of agribusiness and we are ideally placed to capitalise on it," says Mr McConnell. "With cheap land prices, fertile soil, ideal climate conditions, rail links being established, freeways enabling direct transport to Brisbane and now a private airport, perishable goods can be easily transported. We are big producers of eggs, beef, grain, and avocados amongst other produce which can be easily transported by rail, ship or plane either interstate or internationally. The reality is in the next 20 years the world will have to produce more food now than ever before in its history. Asia, with its rapid growth of the burgeoning middle class, will undoubtedly look to Australia to help fulfil their growing food needs."

Even though the outlook is bright, Mr McConnell believes that further investment is needed to grow the region to handle increased capacity and ensure that transportation is not impeded.

"There is no doubt we need a combination of private and government investment to continue into Toowoomba," he says. "We need to invest in infrastructure so investors know that Toowoomba is a reliable and easy place to do business and that freight can be regularly and easily transported."

⁹ www.brookings.edu/wp-content/uploads/2017/02/global_20170228_global-middle-class.pdf



ASTERION'S MEDICINAL CANNABIS PROJECT¹⁰

The medicinal cannabis facility by Asterion Cannabis Inc is a \$1.0b investment in protected horticulture in the region. The project, which was granted Major Project Status by the Federal Government in April 2019, seeks to develop and establish 'one of the world's largest, fully automated, purpose-built glasshouses for the cultivation and processing of medicinal cannabis'. The project at Wellcamp in Toowoomba, which will position Australia as a major exporter of medicinal cannabis, is expected to create more than 1,000 jobs including roles for scientists undertaking advanced research in medicine and horticulture. Medicinal cannabis is used to treat a range of conditions including epilepsy, arthritis, multiple sclerosis and chronic pain.

Founded in 2018, Asterion is a Canadian medical cannabis company with a wholly owned Australian subsidiary. Some of these advances in science and research are anticipated to attract further investment into the state.

In another related development, Asterion has entered into a research contract with the Queensland Alliance for Agriculture and Food Innovation at the University of Queensland. This 18-month program aims to clone highly productive and elite strains of cannabis for cannabis-based medicines.

ECONOMICS OF THE REGION

Toowoomba has been a growing region for some time and basic economics reveal that over a 10-year period, the Toowoomba Local Government Area (LGA) is performing well with key figures below:

- Gross regional product (GRP) of \$10.8 billion in 2017/18 – seventh largest local economy by LGA in Queensland
- Real economic growth of \$1.5 billion between 2008/09 and 2017/18, with an average annual change of 1.7%

Industry contribution to GRP and real growth since 2008/09 is below:

GRP by industry¹¹

	Level (\$M)	Real annual change, 2008/09–2017/18
Agriculture, forestry & fishing	1,085	8.4%
Mining	560	7.7%
Manufacturing	607	-4.4%
Electricity, gas, water & waste services	349	-5.2%
Construction	827	-0.6%
Wholesale trade	591	6.3%
Retail trade	428	-3.0%
Accommodation & food services	323	10.8%
Transport, postal & warehousing	546	3.1%
Information media & telecommunications	40	-7.7%
Financial & insurance services	361	-6.7%
Rental, hiring & real estate services	266	5.8%
Professional, scientific & technical services	552	11.6%
Administrative & support services	326	7.0%
Public administration & safety	618	6.4%
Education & training	550	-2.2%
Health care & social assistance	1,004	5.0%
Arts & recreation services	40	-6.9%
Other services	228	-0.3%

¹⁰ www.minister.industry.gov.au/ministers/karenandrews/media-releases/maximising-medical-research-and-exports
www.asterioncannabis.com
www.proactiveinvestors.com.au/companies/news/224943/asterion-cannabis--queensland-project-gets-big-boost-after-government-ruling-224943.html

¹¹ Lawrence Consulting

"We have had significant investment in and around Toowoomba," says Jo Sheppard, past CEO, Toowoomba Chamber of Commerce. "There has been a good mixture of government, corporate and private money. QIC invested \$500 million into a retail shopping centre in the CBD, the Wagner family have invested hundreds of millions of dollars into the region as has Clive Berghofer."

Clive Berghofer has developed more than 10,000 blocks of land throughout the Toowoomba region including hotels, shopping centres and retirement villages. He still continues to invest heavily today, 55 years on from his purchase of property in the area.

"We are lucky that there are many pillars to the Toowoomba economy," Ms Sheppard says. "These include resources, food and agriculture, tourism, health and education and the digital economy, which is aided by the development of the Pulse Data Centre. By having so many viable streams of income it enables a good balance should one area start to dip whilst another area grows in revenue. The economy isn't overly reliant on just one sector."

TOOWOOMBA AND SURAT BASIN ENTERPRISE

The Toowoomba and Surat Basin Enterprise (TSBE) is funded by the Toowoomba Regional Council but also attracts revenue from businesses in the form of membership. The aim of the TSBE is to link business with opportunities to create growth in the region.

"We recently received a grant of \$840,000 from the Commonwealth Government to support the Southern Queensland Innovation in Export Hub, centred in Toowoomba," says Ali Davenport, CEO, TSBE.

"The aim of this grant is to better help Toowoomba export its excellent products to international markets."

The TSBE was originally formed with the resources sector in mind but has since grown to support other areas particularly ones where small and medium sized businesses need help networking.

"We provide assistance with advice on marketing, partnership building, exporting and most other aspects of business. We also work closely with Austrade. If we see a gap in the market where our businesses could be doing trade and we need assistance in the form of investment, we will pursue avenues to try and find the investment needed. There are so many possibilities opening up here that I believe that the region and economy will continue to grow."

But of course, as businesses grow they need more data and the creation of the Pulse Data Centre couldn't have come at a better time.

PULSE DATA CENTRE

"There is a lot of excitement regarding the future prospects of Toowoomba including the state-of-the-art Pulse Data Centre, which is the first Tier III data centre to be built outside of a capital city in Australia," Ms Sheppard says.

Located at Toowoomba Technology Park, the FKG Group built the data centre in 2018, and is tipped to create in excess of 5000 new jobs across IT, media, telecommunications and agricultural technology.

It is also 500 metres above sea level and is within 100 kilometres of 46 power stations while being on the same power loop that feeds the Brisbane CBD.

IDC predicts that the IT services market in Australia will grow to \$23.4 billion in 2023, up from \$19.5 billion in 2018.¹²

"The data centre is significant and will enable future professional services investment in the region because of the IT capabilities here now," Ms Sheppard says. "Outside of that, we have significant education investment here

ranging from primary and secondary schools through to TAFE and the university sector, which has received a mix of government and private investment, including from religious institutions. A healthy education sector has enormous benefits.

"Toowoomba is unique in that it is built on an array of industries including agriculture, resources, education, health, and tourism empowering the region to continue to develop no matter what the macro or micro economic circumstances are.

"If your economy is based on one or two industries, then your economy can go bust, but we are fortunate in that we have diversity.

"The advent of the airport has had a significant impact with direct flights to Melbourne and Sydney and with a steadily growing population, the demand to do business both interstate and internationally will only increase."

Toowoomba also have a \$500 million retail shopping centre in the heart of the town thanks to QIC. The 90,000 square metre building hosts an array of shops, thereby stopping locals from needing to visit capital cities.

It was estimated by QIC that the Toowoomba region was losing up to \$800 million per year of local retail shopping through escaped expenditure to Brisbane, the Sunshine Coast and the Gold Coast.

The shopping centre has not only addressed that leakage but attracted residents outside the region to Toowoomba.¹³

With so much development happening within Toowoomba it was with foresight that lobbying to the Commonwealth and the state governments resulted in billions of dollars being invested in the region.

¹² www.idc.com/getdoc.jsp?containerId=prAP44723619

¹³ www.idc.com/getdoc.jsp?containerId=prAP44723619



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The 41 kilometre bypass route runs from the Warrego Highway at Helidon Spa in the east to the Gore Highway at Athol in the west, via Charlton.

INFRASTRUCTURE DEVELOPMENT

1. BYPASS

Under a Public Private Partnership (PPP) arrangement, approximately \$1.6 billion was spent on the development of a second range crossing to take heavy vehicle highway traffic around north of Toowoomba rather than through it.

The 41 kilometre bypass route runs from the Warrego Highway at Helidon Spa in the east to the Gore Highway at Athol in the west, via Charlton.

Almost half of all exports from the Port of Brisbane originate from regions accessed via the existing Warrego Highway Toowoomba Range section. This route requires almost 22,000 vehicles (including 2900 heavy vehicles) to pass through the city's CBD each day.

The second range crossing avoids the need to drive through the Toowoomba CBD and means freight carriers can avoid up to 18 sets of traffic lights.

"The bypass will improve freight efficiencies and will enhance liveability," Mr Laird says.

"Movement in the CBD will be easier and will therefore encourage businesses and shoppers to spend more time there."

Nexus Infrastructure Pty Ltd completed the project in early 2019.¹⁴

2. RAIL LINK TO BRISBANE PORT

The Commonwealth Government announced an \$8.4 billion infrastructure rail project in the 2017 Federal Budget, which included a PPP for the 126-kilometre section tunnelling through Toowoomba Ranges to Acacia Ridge in Brisbane's west.

While this pleases many parties, the reality is that it leaves a shortfall of 38 kilometres from the Port of Brisbane. Estimates have ranged as high as \$2.5 billion to complete this transition.

"The Port of Brisbane has long advocated for better rail infrastructure connecting South West Queensland to the port," says Roy Cummins, chief executive, Port of Brisbane Pty Ltd.

Rail infrastructure would provide agricultural producers and exporters with a more efficient, cost-competitive, and reliable route to market.

"The Federal Government's Inland Rail project provides a once-in-a-generation opportunity to address this imbalance, however, the proposed alignment stops about 38 kilometres short from the Port of Brisbane, at the existing Acacia Ridge intermodal terminal.

"It is our view, and a view held by many local government and industry stakeholders we have spoken with, that freight requires its own dedicated rail line to connect Inland Rail – and,

by default, South West Queensland exporters – with the Port of Brisbane.

"Not to do so limits the potential of the Inland Rail project and the opportunities for south-west Queensland exporters."

According to Mr Cummins, the Port of Brisbane handles more than 450 commodities valued in excess of \$50 billion in international trade every year, with 60% of agricultural products originating from within a 200-kilometre radius of Toowoomba, destined for international markets.

"The region supplies some of the world's most populous countries with high-quality Australian produce including cereals, grains, vegetables and meat products, as well as cotton and cottonseed," he says.

"In our view, South West Queensland and the Darling Downs are home to some of the state's most innovative and resourceful agricultural producers and exporters. An agricultural industry that, while subjected to the unpredictability of weather, capitalised on a unique opportunity to export record volumes of chickpeas to countries including India, Pakistan and Bangladesh during 2016–17.

¹⁴ www.tmr.qld.gov.au/Projects/Name/T/Toowoomba-Second-Range-Crossing.aspx

If the project runs on schedule, it is expected to be fully operational by 2025 at the latest, however, there is hope that both state and federal governments may bow to lobbyists to connect the final 38 kilometres to Brisbane Port.

3. AIRPORT

The Wagner family purchased 3000 acres of land in the Toowoomba region in 1994 for approximately \$3 million. Today, the value of that land is closer to \$1 billion.

On that land they built a privately funded airport at a cost of approximately \$200 million.¹⁵ The Wellcamp Airport is the only regional airport to have a dedicated freight service with an international carrier, Cathy Pacific, running flights at least once a week, with more to come.

Using their own money, construction materials and hiring their own workers, enabled the Wagners to build the airport in 19 months and it was opened to the public in 2014.

"I grew up in Toowoomba and it is a great place to do business," says John Wagner, co-founder, Wagners.

"We thought a regional airport would enable business to flow a lot easier in and out of the region and we are seeing that so far. There is now no impediment to doing business throughout Australia or with Asia.

"Toowoomba is one of the most liveable areas in Australia. There is significant infrastructure development happening in and around the region to help connect Toowoomba to major cities and ports and we will continue to develop land for commercial use."

The Wellcamp Airport currently has in excess of 80 flights a week and that figure is expected to continue to grow.

"It has also helped bring tourism to the forefront of our community," says Sara Hales, general manager, Wellcamp Airport.

"There is a strong correlation between the growth of business and the increase in airport services. Being able

to fly to capital cities from Toowoomba enables people to feel confident that they can do business anywhere.

"I believe that the airport is the single most positive infrastructure development to happen in Toowoomba and as the flight services grow both in frequency and new locations, it will further boost confidence.

"From 2007–2017 we have had growth from \$166 million to \$451 million in terms of exports and that again will be significantly boosted in the future by the advent of Inland Rail and the completion of the bypass."

The airport led to Qantas choosing Toowoomba as its first regional destination for its training academy.

QANTAS ACADEMY

In 2019 Qantas opened its first regional training academy in Toowoomba, situated at Wellcamp Airport, with purpose-built facilities including a new hanger, classroom facilities and student accommodation.

There is capacity to train up 250 pilots a year and research estimates show that more than 790,000 pilots will be needed globally in the next 20 years, with one third of that number needed in the Asia Pacific.

"Toowoomba will be an amazing place to learn to fly," says Alan Joyce, CEO, Qantas. "It's home to Australia's newest airport and offers over 300 days of Queensland sunshine each year and an environment that is textbook for pilot training.

"The region itself is a great place to live, work and study. We've already had many students express their interest in moving to Toowoomba for this pilot training."

Qantas built the state-of-the-art training facilities and student accommodation in partnership with the Queensland Government and the Wagner Corporation, who own the airport. Mr Joyce added that what Qantas has ultimately created is a world-class pilot school for students from Australia and around the globe.

It is expected that the facilities at Toowoomba will create more than 100 direct jobs and around 300 indirect jobs in the local construction industry. The Academy site will create ongoing employment for up to 160 people in training and support roles, plus significant flow on opportunities for local businesses.

EDUCATION

The University of Southern Queensland (USQ) has a modern and well-equipped campus in Toowoomba, which claims to be the number one university in Queensland for graduate employability. Out of USQ's total student population of close to 28,000, the Toowoomba campus has 3,608 students.¹⁶

SPACE

The Mt Kent Observatory is Queensland's only professional astronomical research facility and is located at a dark-sky site outside Toowoomba in southern Queensland.

"We are partnering with NASA, MIT, and Harvard University amongst other significant associations," says John Dornbusch, Chancellor, University of Southern Queensland.

"We see significant potential to develop space programs of varying degrees and we are working with the Commonwealth and Queensland Government to find ways of undertaking innovative space science services."

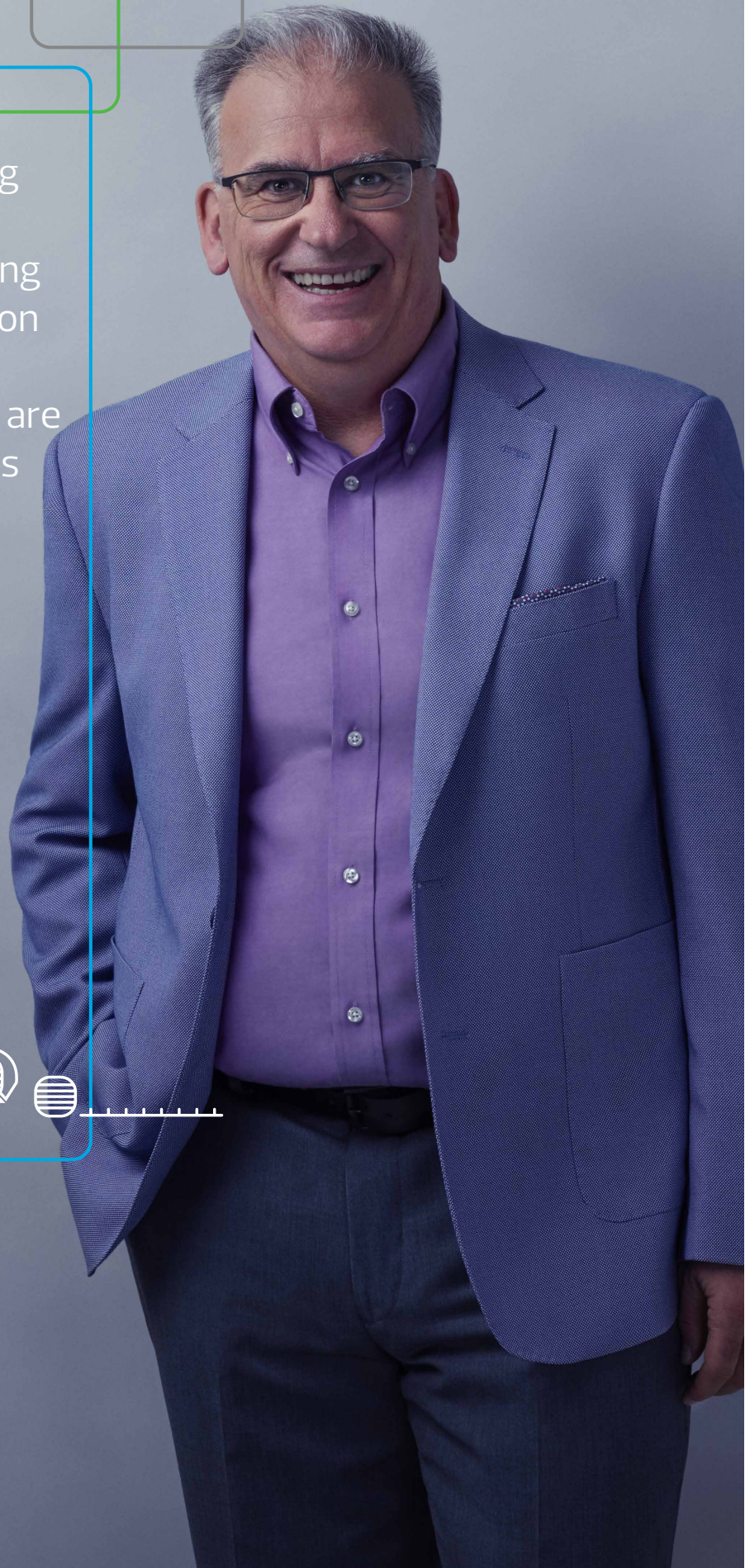
On July 1, 2018, the Commonwealth Government established the Australian Space Agency. Internationally the space industry is worth US\$345 billion each year, but only 0.8% is contributed by the Australian space sector.¹⁷

¹⁵ asia.nikkei.com/Life-Arts/Life/One-Aussie-family-s-runway-success2

¹⁶ www.usq.edu.au/about-usq

¹⁷ www.industry.gov.au/data-and-publications/welcome-to-the-australian-space-agency

We are researching agricultural technology including machine automation and driverless tractors. What we are aiming to achieve is to deliver real value to farmers to make their lands more efficient and to find ways to optimise their time and agricultural production.



The Commonwealth Government committed \$300 million to the Australian Space Agency in the 2018–19 Federal Budget alone. Space is crucial for our communications including the 70% of Earth's land mass that does not have mobile phone coverage, as well as in the marine jurisdiction and airspace.¹⁸

"We are in the perfect location to work with both the Australian Space Agency and international partners because you have to launch rockets from the east of Australia due to the rotation of the Earth," Mr Dornbusch says.

"Rockets have to be launched across the ocean in case anything goes wrong. We are investing heavily in our space programs because we believe it will play a very big part in the future of many industries."

Currently, astronomical research projects operating at Mt Kent include the MINERVA–Australis project, which is a dedicated exoplanet observatory. This is ground-based observational follow-up for the NASA space telescope Transiting Exoplanet Survey Satellite (TESS). Mt Kent observations thus contribute to the discovery and characterisation of nearby exoplanetary systems.

There is also the Shared Skies partnership, where the University of Southern Queensland is collaborating with the University of Louisville to provide live remote observing using 0.5m and 0.7m aperture telescopes, and wide-field cameras.

The partnership is used for research, training, education and outreach, which enables access to northern skies via Moore Observatory in Kentucky.¹⁹

INNOVATION IN ENGINEERING

The Toowoomba region is home to the National Centre for Engineering in Agriculture (NCEA), also based at the USQ's Toowoomba campus, where researchers are developing adaptive systems that sense, control and monitor farming inputs such as water, fertiliser and chemicals by using variable rate technology, unmanned aerial vehicles (ie drones) and proximal sensors (ie in soils and crops) which function in real time.

"We also formed a partnership with USA-based machinery manufacturing company John Deere in 2018, which is very exciting," Mr Dornbusch says. "We are looking at precision agriculture across the whole Darling Downs area, which is the most productive agricultural area in the country."

"We are researching agricultural technology including machine automation and driverless tractors. What we are aiming to achieve is to deliver real value to farmers to make their lands more efficient and to find ways to optimise their time and agricultural production."

NCEA has an ongoing partnership with John Deere to explore methods to lift farm productivity, developing the next generation of agricultural technology – including machine automation and control, such as driverless tractors. This relationship will also lead to training opportunities for researchers and offer postgraduates research opportunities to work with a world leader in machinery manufacturing.

"In the future we will see more drones that will help increase productivity as it will enable farmers to see problem areas on their land and make decisions in real time," Mr Dornbusch says. "This will allow them to monitor situations from closer afield, which will enable them to work on other areas of the property at the same time."

Other areas of research will include commercialisation of technologies and intelligence for applications such as automated weed management.

HEALTH

Toowoomba has two private hospitals, St Vincent's Private Hospital Toowoomba and St Andrew's Toowoomba Hospital, plus a public Toowoomba Hospital. For its population size, Toowoomba's residents are well looked after.

"Residents of Toowoomba and its immediate surrounds have two private hospitals and a public hospital to choose from with an impressive array of specialists combined with placements for university graduates in their respective medical fields," says Ray Fairweather, CEO, St Andrew's Hospital. "We are aligned with the University of Queensland and Griffith University faculties when it comes to the training of doctors and nurses."

St Andrew's Hospital has capacity for 155 overnight beds and has 11 operating theatres but Mr Fairweather points out that the almost half of the patients are discharged within a day.

"Half of our patients don't require beds," says Mr Fairweather. "They are discharged from a chair."

The most exciting and innovative technological advancement is the use of robotics to perform surgery. "The robotic procedures mimic human movements but are more flexible and less intrusive," Mr Fairweather says. "They are expensive and they basically need to be replaced every four to five years at double the cost, but the upside is that they can perform more operations and can get into quite delicate areas of the human body. Robotic surgery is less invasive, reducing the risk of complications resulting in a quicker recovery time for the patient. The facts are that robots can be more precise thereby radical surgeries can be reduced and we are finding that more and more surgeons are keen on these new procedures."

Toowoomba born-and-bred property developer, politician and philanthropist Clive Berghofer has been a longstanding supporter of medical research in the region. In 2013, he made a generous donation of \$50.1 million to the Queensland Institute of Medical Research (QIMR) which was subsequently renamed the QIMR Berghofer Medical Research Institute.²⁰

¹⁸ www.industry.gov.au/sites/g/files/net3906/f/welcome-to-the-australian-space-agency.pdf

¹⁹ www.usq.edu.au/hes/school-of-agricultural-computation-and-environmental-sciences/mt-kent-observatory

²⁰ www.abc.net.au/news/2015-10-29/philanthropist-businessman-clive-berghofer-toowoombas-richest/6894342



CONCLUSION

Toowoomba offers many opportunities to anyone who wants to live there. For families, there is relatively cheap land, great schools, a vibrant economy and ease of movement from one location to the next.

For those in business, you have a world-class data centre, fertile soil ripe for a myriad of agricultural produce, great business enablers in TSBE and the Chamber of Commerce, a private airport with regular flights to Sydney and Melbourne, plus growing retail and tourism sectors.

Education and health are two important sectors in Toowoomba where significant private investment has seen them thrive, driving economic growth even further.

Toowoomba is still in its early days, in relation to its potential. Come 2030, it promises to be an area that capitalises on its role as a regional capital city, knowledge and research centre, freight and logistics hub and agricultural hub – a compelling home for the 50,000 new residents expected to call the region their home by 2031.

A compelling home for the 50,000 new residents expected to call the region their home by 2031.



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