

Christchurch Aerospace Sector Plan

Prepared for the Ministry of Business, Innovation and
Employment

26 November 2019


Project overview

A plan for action

Overview of our work

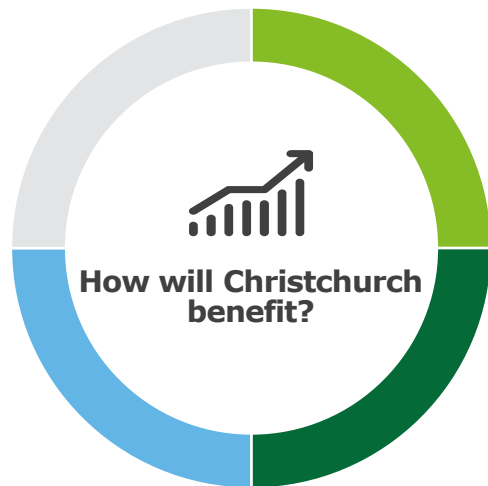
- Aerospace occupies a deep and broad value chain spanning the entire economy, from advanced manufacturing, and fabrication, design, and engineering services all the way through to technical consulting and professional services.
- Aerospace for the purposes of this report excludes commercial airline services, aircraft maintenance activities, and armaments. This includes projectiles, explosives and other technologies with exclusive military applications. In saying that, we recognise that the demarcation of some aerospace applications may overly cumbersome.
- Christchurch has an opportunity to capitalise on its growth potential in aerospace, but the question remains – what are the key strategic choices Christchurch faces in order to successfully advance aerospace as a local sector?
- In this context, the Ministry of Business, Innovation and Employment (MBIE) commissioned Deloitte Access Economics (the “Study Group”) to develop a five-year Sector Plan (the “Sector Plan”) for Christchurch’s aerospace sector.
- A Steering Group was also appointed as part of this project; comprising New Zealand Trade and Enterprise (NZTE), TE Connectivity, Kea Aerospace, ChristchurchNZ and MBIE.
- Additional information was collected by means of a sector snapshot survey, stakeholder workshops and stakeholder consultations.

Objective of this project

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- 1.** Identifying Christchurch’s existing strengths in aerospace
 - 2.** Developing a capability map of the Christchurch aerospace sector
 - 3.** Defining a set of clearly defined goals aligned to key themes
 - 4.** Developing key action points needed to achieve these goals
 - 5.** Providing recommendations on additional initiatives needed to help develop the sector
 - 6.** Identifying potential regional economic benefits arising from implementation of the Sector Plan

Why aerospace?

Increased economic activity from productivity gains and innovation in aerospace is likely to benefit other sectors of the Christchurch economy



Employment

The development of an aerospace sector could support employment growth in both Christchurch and the wider Canterbury Region. Labour demand directly from the aerospace sector will be driven up as existing businesses expand and new organisations locate to Christchurch, and induced employment in other sectors through inter-industry linkages is likely to occur.

Knowledge spillovers

As large aerospace companies locate to or grow organically in Christchurch, knowledge spill overs and economies of agglomeration in the form of technology sharing, adjacent patenting activity, technical talent and commercial expertise are likely to benefit other sectors. Furthermore, large aerospace companies often act as a magnet for small suppliers and contractors.

Productivity

International evidence suggests that aerospace-related businesses punch well above their weight in terms of productivity. Labour productivity rates in aerospace sectors overseas are far higher than other sectors and this is reflected in higher wages, with aerospace workers earning some of the highest annual salaries in the USA. Contributing to the increase in productivity is the application of data. For example primary sector applications of aerospace data in pasture management and water monitoring

Other effects

The reputational effects associated with Rocket Lab's presence in New Zealand are widely documented. For example, engineering firms in New Zealand tended to receive more business opportunities as a result of supplying Rocket Lab. International collaboration resulting from a more vibrant aerospace sector may also stimulate additional research and development, investment, and encourage better commercialisation of research.

Why Christchurch?

Christchurch's strengths lie at the nexus of its competitive advantage, physical attributes, existing business capabilities, and deep collaboration across private sector, industry, tertiary and government.



Physical attributes

Christchurch's low air traffic allows for the development and counter-seasonal testing of aerospace technologies, including sub-orbital rocket launch, drones and satellites. This is supported by excellent air infrastructure provided by Christchurch Airport and seaport infrastructure at Lyttelton. Low rainfall and cloud cover also means that it is well placed accommodate emerging aerospace technologies that rely on favourable atmospheric conditions.



Manufacturing capability

Christchurch is home to a strong electronic manufacturing cluster, with 18% of the country's electronics and electrical manufacturing businesses and one third of the country's manufacturing employees. Close proximity to strong manufacturing bases throughout the wider Canterbury region also allows efficient access to New Zealand's aerospace-adjacent value chains for international companies wishing to do business in Christchurch.



Test-bed facilities

Christchurch offers a wide range of public and private environmental testing facilities located at the University of Canterbury, Ara Institute of Canterbury, Callaghan Innovation, Holmes Solutions and SGS New Zealand. Christchurch's close proximity to Birdlings flat and Kaitorete Spit also make it an ideal location for aerial testing, allowing for incidental cost reduction and a faster iteration process.



Deep collaboration

Christchurch has a highly connected and willing aerospace community, which is due in part to the city's small size. A strong network of space lawyers, space entrepreneurs, aerospace companies, and government organisations means there is a convergence of thinking that spans tertiary institutions, private sector companies, subject matter experts, entrepreneurs and investors.

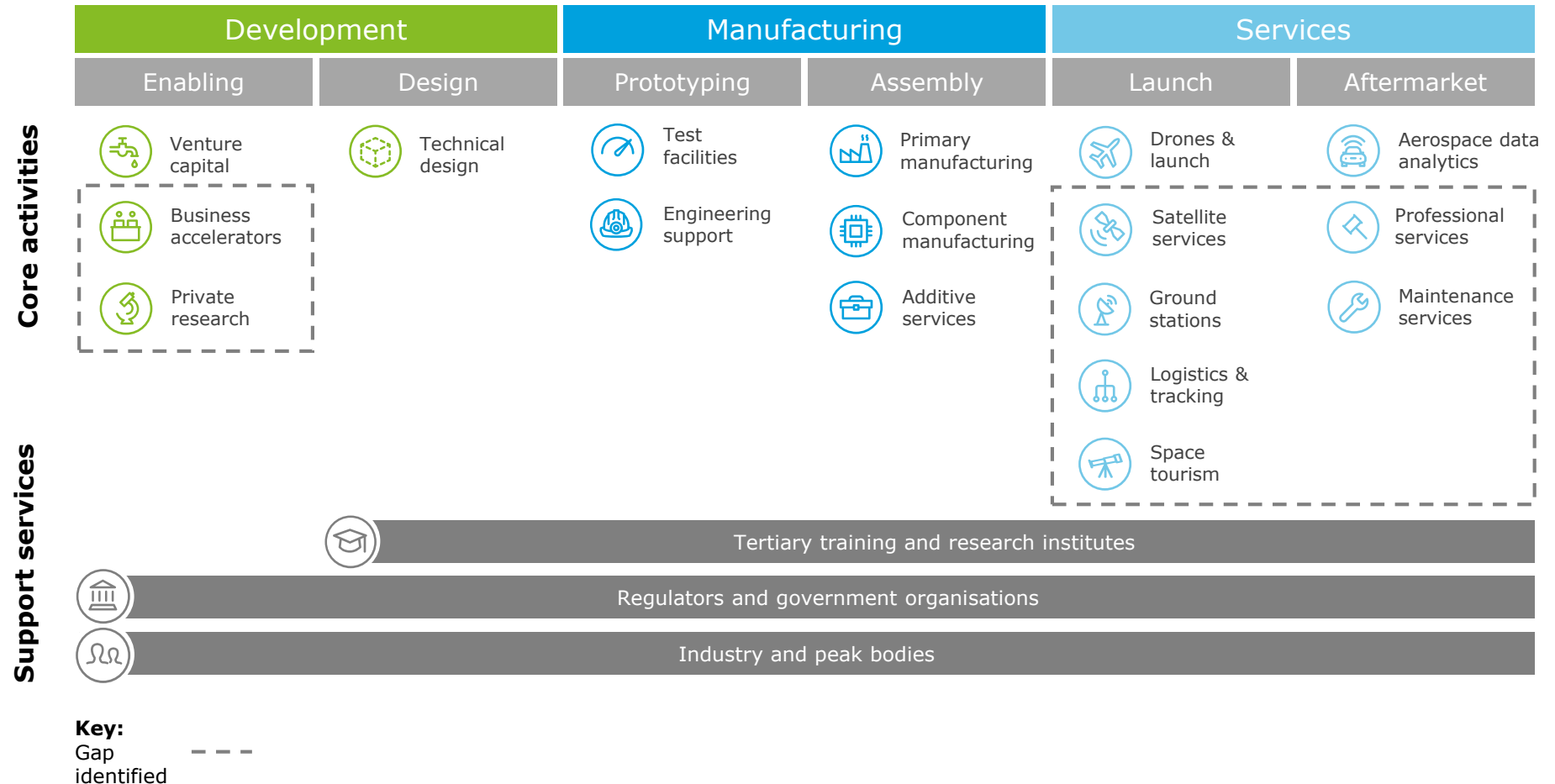


Cost of doing business

One of the key advantages Christchurch offers to the sector is cost, as inputs in the form of the labour, materials, and components are generally cheaper in Christchurch compared to New Zealand's other main economic centres. This is demonstrated through the relative cost of commercial rental space and inflation growth. Labour costs are lower than most other urban centres across New Zealand despite a highly educated workforce with deep engineering capability.

Christchurch aerospace value chain

Pockets of aerospace excellence and deep capability have put Christchurch on the map.



Enabling factors

Christchurch aspires to be at the centre of an energetic national aerospace sector by 2025, with a network of aerospace companies employing hundreds of people across the city.

Where will Christchurch play?

Christchurch specific ambitions include:

1. To become a globally distinctive centre for aerospace
 - i. World renowned in the application of aerospace data
 - ii. A world recognised test site for emerging aerospace technologies
 2. To be a self-contained aerospace ecosystem, with hardware design, manufacturing, launch and data capabilities
- Aerospace is a global opportunity and, as such, Christchurch has a view to maximise the sector's potential. Building a resilient aerospace workforce, a robust research and innovation pipeline and strong commercialisation capability will ensure that aerospace remains an economically attractive opportunity by granting access to rapidly growing export markets.
 - Positioning Christchurch on the world stage as a leader in aerospace data analysis, in particular, will facilitate business transition, business attraction and allow local start-ups to compete internationally through the provision of novel applications for existing aerospace data.

Key enabling factors



Strengthening capability and workforce to ensure that the aerospace sector is positioned for growth.



Creating a business environment to attract new business and encouraging existing businesses to expand into the aerospace sector.



Experimenting through niche expertise and innovation.

While Christchurch is well placed to harness a growing global opportunity, key risks also include:

- A lack of dedicated funding streams for aerospace companies
- Management of intellectual property
- Supply-demand mismatches between aerospace data generation and downstream business applications

Christchurch aerospace Sector Plan

Goals

Sector Plan goals

Goals for Christchurch aerospace, as identified through sector consultations and workshops with a number of key sector participants.

Knowledge sharing



Goal #1

Establish an Aerospace Advisory Group to facilitate information sharing, and to link together upstream and downstream aerospace technologies in a coherent way to assist with market validation, demand determination, and giving a clear line of sight to entrants.

Education and training



Goal #1

To build and retain a workforce of the appropriate size, scope, and depth to accommodate the labour demands of a growing aerospace industry.



Goal #2

To ensure that emerging aerospace industry demands are met by continuous training and broad education programmes.



Goal #3

To build the eminence of the sector and position aerospace as an attractive career pathway for a broad cross-section of young people.



Goal #4

To position Christchurch as an internationally recognised and globally distinctive centre of excellence for industry-integrated research and development for aerospace.

Sector Plan goals

Goals for Christchurch aerospace, as identified through sector consultations and workshops with a number of key sector participants.

Innovation and test-bed capabilities



Goal #1

Develop world-class test capabilities to become a one stop shop for launch, mission control, and monitoring.

Pathways to attract and expand businesses



Goal #1

To attract twenty aerospace companies to Christchurch by 2025.



Goal #2

To develop Christchurch into an interconnected, collaborative aerospace start-up hub.



Goal #3

To encourage diversification of existing Christchurch businesses toward aerospace-related activities.

Key initiatives

The following initiatives, if enacted, may assist in accelerating the growth of Christchurch's aerospace sector.



	Establishing an Aerospace Advisory Group	Establishing an Aerospace Advisory Group to share knowledge and engage in eminence building activities across New Zealand.
	Establishing an end-to-end aerospace incubator	Providing hardware, machining, and software development facilities in one place through an aerospace-specific incubator in Christchurch.
	Establishing testing facilities	Establishing full-service environmental testing facilities in Christchurch and offering designated land sites for small- to medium-scale aerial testing.
	Establishing a Data Cube	Establish a Data Cube to act as a central repository for ready-to-use Geographic Information Systems (GIS) and Earth Observation (EO) data.
	Establishing a workstream to proactively identify demand	Demand identification to link downstream, upstream segments of the aerospace sector.
	Establishing dedicated funding streams and an annual prize for Christchurch aerospace companies	Establishing an aerospace-specific venture investment fund and a sizeable annual aerospace prize.

Appendix

Appendix | Action items

Knowledge sharing

	Action items	Key stakeholders
1	Quick win Develop a capability directory to map the Christchurch aerospace value chain, from precision manufacturers and engineers to authorised resellers of satellite data.	Aerospace Advisory Group
2	Quick win Creating local and international awareness of aerospace in Christchurch to assist in prioritising this sector.	MBIE, ChristchurchNZ and local Iwi
3	Long-term Establish an open source space data platform, or 'data cube', to enable data-centric entrepreneurship and AI research.	MBIE, ChristchurchNZ

Appendix | Action items

Education and training

Action items	Key stakeholders
<p>1</p> <p>Quick win Investigate the establishment of a Space Research Centre to provide R&D focus and expertise, as well as participating in key space events and conferences.</p>	<p>University of Canterbury</p>
<p>2</p> <p>Quick win Identify and develop 'cornerstone projects' supported by both government and industry designed to encourage commercialisation in operational environments.</p>	<p>MBIE</p>
<p>3</p> <p>Quick win Establish undergraduate and postgraduate programmes to support both aerospace or aeronautical engineering and aerospace science.</p>	<p>University of Canterbury</p>
<p>4</p> <p>Quick win Continue to strengthen the relationship between industry and the tertiary sector by establishing aerospace internships and work experience programmes.</p>	<p>ChristchurchNZ, Industry, University of Canterbury</p>

Appendix | Action items

Education and training

Action items	Key stakeholders
<p>5</p> <p>Quick win Establish a regional fees-free and/or scholarship programme for young students wishing to pursue a career in aerospace, with pro-active support for diversity.</p>	<p>MBIE, Christchurch City Council</p>
<p>6</p> <p>Long-term Assess the demand for skills required now and in the future, and assess which training programmes are needed to ensure a robust talent pipeline.</p>	<p>ChristchurchNZ, Ara Institute of Canterbury</p>
<p>7</p> <p>Long-term Continue to drive perception change from the bottom-up by actively promoting and funding Aerospace education programmes in schools.</p>	<p>MBIE, ChristchurchNZ, aerospace industry body</p>

Appendix | Action items

Innovation and test-bed facilities

Action items	Key stakeholders
<p>1</p> <p>Quick win Develop a compelling test bed facility and package testing iteration option to assist with test positioning.</p>	<p>MBIE, ChristchurchNZ, University of Canterbury and Industry</p>
<p>2</p> <p>Quick win Development of a start-up prospectus for fast realisation of testing capabilities and launch ranges.</p>	<p>Aerospace Advisory Group, NZSA, government, ChristchurchNZ and University of Canterbury</p>
<p>3</p> <p>Quick win Establishing regulatory pre-approved locations and zones for test bed development.</p>	<p>ChristchurchNZ, MBIE, and local Iwi.</p>

Appendix | Action items

Pathways to attract and expand businesses

	Action items	Key stakeholders
1	Quick win Communicate examples of Christchurch aerospace excellence with the world and engage in "why Christchurch" storytelling.	All
2	Quick win Develop lessons learned from success factors for start-ups in aerospace, reasons for start-up failures in aerospace, and communicate what Christchurch can offer.	Aerospace Advisory Group
3	Quick win Continue to develop aerospace research partner programmes with international universities and 'sister cities' to increase international exposure.	University of Canterbury, ChristchurchNZ, Aerospace Advisory Group
4	Long-term Introduce financial incentives for aerospace companies.	ChristchurchNZ, Christchurch City Council

Appendix | Action items

Pathways to attract and expand businesses

Action items	Key stakeholders
<p>5</p> <p>Long-term Fund the development of an aerospace-specific start-up incubator to accelerate businesses.</p>	<p>Industry, MBIE, New Zealand Venture Investment Fund, Canterbury Angels, Angel Association of New Zealand</p>
<p>6</p> <p>Long-term Improve access to capital by establishing government joint ventures and/or co-investment arrangements with domestic and international capital providers.</p>	<p>Industry and MBIE</p>



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