

Submission on developing the Aotearoa
New Zealand Aerospace Strategy

Your name and organisation

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Overview of the Aerospace Strategy

- Question 1:** Do the four areas above provide the right basis for the Aerospace Strategy?
- Question 2:** What are the critical factors that you see for aerospace sector development?
- Question 3:** How would an Aerospace Strategy help you?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Thank you for the opportunity to comment on the Aerospace Strategy. This submission constitutes an institutional response from The University of Auckland Waipapa Taumata Rau, which includes feedback from Te Pūnaha Ātea - Space Institute and other colleagues involved in space-related activities across the University. We welcome MBIE's leadership regarding the Aerospace Strategy. The suggestions and recommendations to follow are intended to help strengthen the strategy and go further to addressing sector needs.

High Level Recommendations:

- Provide **certainty of funding**, including a timeline for future opportunities. This would enable the sector to move more quickly to realise the goals and develop an ambitious and targeted programme of research aligned to strategy. This is critical, given the strategic national importance and significant return on investment opportunities for NZ
- Consider the establishment of a **collaborative national research centre** to help/support space technology development and enable collective leadership to make crucial decisions around areas of current and future need
- Introduce **specific calls** for the aerospace sector that focus on predetermined goals aligned to strategy *and* **contestable funding to support new** and emerging ideas
- Create pathways that **reward industry/academia cooperation** and are focussed on the development of technologies with market potential
- As part of the strategy, consider the investment required to **develop and sustain a highly skilled work force**. Without this, institutional experience and capability dissipates as people leave for other countries with greater opportunities.
- Government to **partner and engage** with the University of Auckland to leverage the available **technical expertise**, which would underpin the **regulatory and policy expertise** in the New Zealand Space Agency
- Reconsider **Goal 4 – a permanent human presence in Space**
- Ensure the strategy is targeted enough so that the sector is aware of the **key strategic priorities** and can focus efforts accordingly, but also broad enough to allow for **new opportunities and technologies** to emerge over time
- Ensure the strategy considers both the investment in **space technologies** and investment in the **application of those technologies for benefit to NZ**

Question 1: Do the four areas above provide the right basis for the Aerospace Strategy?

A strategic vision for NZ's Aerospace sector is critical to ensuring NZ continues to develop national capabilities and a high-skill workforce, strengthens and grows collaborative partnerships, and contributes to a more inclusive and sustainable economy. NZ is part of an internationally important space sector and must maintain visibility internationally, which is not currently highlighted in the four areas, or elsewhere in the strategy.

Question 2: What are the critical factors that you see for aerospace sector development?

The critical factors to develop and grow a thriving aerospace sector include:

- A strategy that is specific in the areas to be targeted, but also provides sufficient scope to enable new opportunities to emerge
- Aerospace-targeted investment in R&D (e.g., technologies with clear aerospace market potential) and related education and training
- Investment in space technologies and the application of those technologies for benefit to New Zealand
- Cooperation between complementary entities (e.g., publicly funded research centres and profit driven commercial enterprises) and international partners
- Certainty of funding, including a timeline for future funding, would allow the sector to move more quickly to realise goals and develop an ambitious programme of research aligned to strategy.

Question 3 - How would an Aerospace Strategy help you?

The strategy should help to prioritise and emphasise the relative strategic importance of the aerospace sector and align government activity and investment in targeted areas. This in turn will enable researchers to more closely align research activities with future funding. Attempting to fund a strategy through contestable funding open to all sectors (e.g., the MBIE Endeavour Fund) is futile.

Area One - A strategy for building our aerospace sector

- Question 4:** Is the 2030 Future State set out in a way that enables New Zealand to build on its existing advantages to develop a leading place in the global aerospace economy?
- Question 5:** Will the 2030 Future State support your ambitions for growth and participation in the sector?
- Question 6:** What barriers are there to optimising sector growth?
- Question 7:** How could the government and the sector work together to achieve the 2030 Future State?
- Question 8:** How can the Government enable Māori ambitions for the sector?

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Question 4 – Is the 2030 Future State set out in a way that enables New Zealand to build on its existing advantages to develop a leading place in the global aerospace economy?

The 2030 Future State contains statements that are generic and applicable to many different sectors, and statements that are narrow and clearly building on existing projects. This will make it difficult for people in the sector to see how their work fits with the strategy and how they might contribute. Additionally, the way it is currently written provides little room for opportunities that will emerge in the wider aerospace sector in future.

Question 5 - Will the 2030 Future State support your ambitions for growth and participation in the sector?

The draft 2030 Future State only partially supports our ambitions as it is quite narrow in the themes that are considered. The current strategy focusses on specific “topics” and therefore it does not help to grow a diverse ecosystem with companies aiming to develop different technologies with a variety of applications.

Question 6 - What barriers are there to optimising sector growth?

The lack of a skilled workforce and limited resources to kick-start the sector are significant issues. The draft 2030 Future State references a sector supporting tens of thousands of high paid jobs, however, there is no focus on developing a national education program that produces this highly skilled workforce, the absence of which will mean continued reliance on international hiring. The education sector will need resources to develop and educate NZ aerospace engineers.

The funding mechanisms that are currently available do not always encourage partnership in projects between different types of institutions like academic research centres and industry partners, and therefore we are missing significant opportunities for collaboration.

Question 7: How could the government and the sector work together to achieve the 2030 Future State?

The New Zealand Space Agency is rightly focussed on regulatory frameworks, policy and strategy, however, greater engagement and partnerships with technical experts would be beneficial. The University of Auckland has considerable technical expertise in house and encourages the Space Agency to leverage this, thereby enabling the government and sector to co-design initiatives and collaboratively guide aerospace growth.

Clear and timely communications from the government regarding strategy and aligned funding opportunities would also be beneficial and enable more targeted research activity.

Question 8 - How can the Government enable Māori ambitions for the sector?

The strategy would be further strengthened by partnering with Māori in the co-development of goals and associated pathways. Future iterations of the strategy should provide meaningful opportunities for Māori, as Tiriti partners, to communicate their concerns, interests, and aspirations, and strengthen the interface between mātauranga Māori and the space sector.

We would also encourage the provision of resources to improve primary education as it is at this level that we can make the difference. In parallel, the sector can promote inspiring initiatives leveraging the fact that space is exciting.

Area Two - Building strong foundations (Three Pillars)

Question 9: What do you think of the Three Pillars and do you think they will support the 2030 Future State?

Question 10: What else would you like to see in the Three Pillars?

Question 11: What actions and initiatives could the sector focus on to support the Three Pillars?

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Q9 - What do you think of the Three Pillars, and do you think they will support the 2030 Future State?

Pillar 1 sounds appropriate but there is no indication of how any of this is going to be put into practice.

There is also no clear relationship with the five goals that are also mentioned in the document. Stronger alignment between the goals and Pillars is required.

Q10 - What else would you like to see in the Three Pillars?

The three pillars are very broad and as they are set could include all of what is necessary to grow the sector.

However, it is unclear how the Pillars, the Goals, the four areas, and the 2030 Future State relate to each other. Greater clarity around how these aspects of the Strategy are intended to work together is required.

Q11 - What actions and initiatives could the sector focus on to support the Three Pillars?

Statements like “We seek to actively support economic and regional development, encouraging new start-up activity and attracting innovators” are applicable to nearly every sector. These statements need to be transformed into real and meaningful actions, through which the government can support the entities operating in the sector.

One mechanism would be to create a National Aerospace Technology Programme, to fund projects aiming to develop the technologies of space (hardware or software) or services with good commercial potential/application, and that can show a clear route to market implementation. Consider a call once a year, with a rapid assessment process.

Consider supporting national facility platforms to lower the cost of the development of space technologies and facilitate start ups’ access to the space market.

Area Three - Goals for 2030

Question 12: What do you think of the Goals for 2030?

Question 13: Are the goals framed in a way that will enable New Zealand to build on its strengths and comparative advantages to achieve the 2030 Future State?

Question 14: What activities and milestones can help us achieve these Goals?

Question 15: Where do you see yourself in realising these Goals?

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Q 12. What do you think of the Goals for 2030?

With regards to the identified goals, these tend to either describe broad areas of strategic interest (e.g., Goal 3) or are too narrowly defined (e.g., Goal 4) and could be potentially constraining.

To expand on this, take [Goal 3 - at the forefront of global space activities](#). It must be made clear this is a global challenge that requires international cooperation and collaboration. Does NZ want to contribute to the development of new mitigation guidelines by sitting in relevant international forum like IADC? What are the areas in which we want to grow national excellence: understanding the space environment with new sensors and orbit determination capabilities and contribute to any of the available catalogues? Develop tools to enable safe operations? Contribute to the development of new policies and regulations (e.g., orbital slotting, end-of-life disposal?), Provide support for the development of active debris removal and on-servicing missions? As currently written, there is no specific goal stated here, even at high level. How does NZ want to contribute to this global challenge?

Concerning [Goal 4 – actively supporting a permanent human presence in space](#). We support the intention to collaborate internationally, however, to constrain this to the “permanent human presence in space” is too narrow and may miss other significant international opportunities, e.g., in exploration and science where NZ could benefit even more (planetary defence, small- body missions, in-situ resource utilisation are good examples). We question this goal as it is currently stated, as it will be hugely expensive, and the benefits to NZ are unclear.

Q 13. Are the goals framed in a way that will enable New Zealand to build on its strengths and comparative advantages to achieve the 2030 Future State?

We would recommend a two-pronged approach, which would involve support for strategic areas (as currently identified) plus a mechanism to encourage and support new ideas. Calls for new ideas could unearth significant opportunities beyond those currently considered strategically important.

The strategy could be more ambitious around the development of Earth Observation (EO) technologies (e.g., radar or optical), that are specific to NZ. Currently, this plan reads as an endorsement of the status quo, where data products are procured from overseas. The strategy fails to acknowledge and leverage the skill set and capabilities that exist in NZ and the potential to develop our own dedicated EO satellites and services with strong export potential.

Q 14 - What activities and milestones can help us achieve these Goals?

In each area, an assessment to determine current national expertise would be important before going ahead with any decision. Once strengths and opportunities have been identified, resources should be made available to unlock the potential.

Q 15 - Where do you see yourself in realising these Goals?

The University of Auckland has made significant commitments and investments in this area and will:

- continue to undertake research to support the outcomes targeted by the goals
- train the future aerospace workforce
- build international collaborations, and
- represent NZ on relevant international decision-making bodies.

We are keen to be an enabler of a much larger and more comprehensive aerospace ecosystem.

Area Four - Pathway to the 2030 Future State

Question 16: What policies, ideas, actions, and/or initiatives would you like to see in the Action Plan to help achieve the ambitious 2030 Future State?

Question 17: What would be the benefits of these actions and how would they help grow the New Zealand aerospace sector?

Question 18: How would you like to be involved in the delivery of the Aerospace Strategy?

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Q 16. What policies, ideas, actions, and/or initiatives would you like to see in the Action Plan to help achieve the ambitious 2030 Future State?

- Timely insight (from MBIE) into the budget allocated to the development of the action plan, the upcoming opportunities, and their frequency will be essential in aligning our activities. Clarity and certainty are extremely important.
- An assessment of national expertise and potential in the space sector is required. This will help ascertain the skills and expertise currently available in NZ.
- Establish a National Aerospace Technology Programme, to fund projects aiming to develop algorithms, technologies, and applications with good commercial potential/application.
- Support national facilities/platforms to lower the cost of the development of space technologies and access to the space market.
- Establish schemes to reward collaborations between industry (commercially focused) and research centres (or Universities, possibly including educational elements). The criteria for awards can be tailored toward particular technology areas or applications (e.g., spacecraft subsystems, or technologies for EO, or sustainability of the space environment).
- There is a critical level of activity and investment needed to sustain a capable work force, and the structure and level of funding needs to recognise this. Without such support, institutional experience and capability dissipates as people leave to other countries with greater opportunities. Maintaining capability is crucial if NZ has ambition to have national mission abilities that are distinct from Rocket Lab USA. The current structure of intermittent funding often coupled to very small amounts of seed money makes it very difficult to develop and retain an experienced and highly skilled team, let alone a more resilient structure with multiple teams that allow for succession planning and horizontal peer review.
- A clear statement from government as to whether “New Zealand Satellite Missions” is part of the vision for 2030 would be useful to guide the sector.
- The strategy fails to acknowledge and leverage the skill set and capabilities that exist in NZ and the potential to develop our own dedicated EO satellites and services with strong export potential.

Q.17. What would be the benefits of these actions and how would they help grow the New Zealand aerospace sector?

These actions will help to foster research, establish enterprises (helping R&D) and grow the workforce and the sector. Collaborations across different organisations will create synergy which will benefit the whole ecosystem.

Q18. How would you like to be involved in the delivery of the Aerospace Strategy?

Continue to be involved in helping drive the growth of the aerospace sector by offering services and partnerships to new and existing enterprises to help developing technologies and services, including testing and in-orbit demonstrations.

Continue to contribute as an educational institution establishing Aerospace Engineering courses to create a talent pool for companies to source the employees that are essential to their growth and success. Provision of specialised training for utilising space technologies (e.g., Mission Operations, Earth observation) and their applications to relevant sectors.

Secure the required support to develop capabilities (R&D) that will then be transitioned to the NZ commercial sector.

Thank you for the opportunity to comment on the draft MBIE Aerospace Strategy.