Space Policy Review
Ministry of Business, Innovation and Employment,
PO Box 1473, Wellington 6140
spacepolicyreview@mbie.govt.nz
[by email]

3 November 2022

Re: AWS comments on the New Zealand Space Policy Review Consultation

Dear Sir/Madam,

Amazon Web Services (AWS) is pleased to make a submission on the *New Zealand Space Policy Review Consultation*.

Introduction

AWS is the cloud computing arm of Amazon Inc. AWS has been operating in New Zealand for the past 9 years. We have offices in Auckland and Wellington including a dedicated public sector-focused team. In September 2021, AWS announced that it would establish an AWS Region in Auckland in 2024, which will bring world-class cloud computing infrastructure onshore to New Zealand. The Economic Impact Study[1] that accompanied the AWS infrastructure announcement estimated that this investment of NZD$7.5 billion will create around 1,000 new jobs and contribute approximately NZD$10.8 billion to New Zealand's GDP over the next 15 years.

AWS allows customers to innovate and scale in a highly secure cloud environment. The forthcoming AWS infrastructure in Auckland will enable our thousands of New Zealand customers – from large enterprises to government to small businesses and individuals – to leverage our advanced cloud services using infrastructure located in New Zealand. Some of our most inspiring New Zealand customer success stories can be found in our Economic Impact Study.[2]

AWS in Space

In July 2020, AWS launched a new business segment dedicated to accelerating innovation in the global aerospace and satellite industry.[3] Then in March 2021, AWS launched the AWS Space Accelerator to catalyse additional innovation and support some of the most innovative startups that are helping shape the future of aerospace. AWS' interest in space is wide, ranging from solutions in smart design and manufacturing, ground services[4], geospatial analysis, satellite operations, and research and exploration. AWS has helped commercial and government customers build satellites, conduct space and launch operations, and reimagine space exploration. Our reliable global infrastructure and portfolio of cloud services position AWS to equip organisations in the private and public sector to process and transform

[1] AWS Economic Impact Study, New Zealand Region

[2] Ibid. see p.5

[3] We are driving innovation in space with the world's leading cloud, Terresa Carlson, July 2020

[4] Ground services are deployable command & control infrastructure with a direct downlink to the cloud. AWS Ground Station is the only fully managed cloud service that lets you control satellite communications, process data, and scale your operations without having to worry about building or managing your own ground station infrastructure.

space collections into data, make that data actionable and accessible to customers around the globe, and redefine how organisations transform the space market segment. With the AWS Cloud, customers are accelerating space missions, removing barriers to innovation on Earth, and inspiring future generations.[5] To read about some of our customer's stories in the public sector, we have published a number of blogs here.

Customers across virtually every industry and of every size, including start-ups, enterprises, and public sector organisations, are running every imaginable use case on AWS. With AWS, customers can leverage the latest technologies to experiment and innovate more quickly. We are continually accelerating our pace of innovation to invent entirely new technologies to transform business. AWS is architected to be the most flexible and secure cloud computing environment available today. Our core infrastructure is built to satisfy the security requirements for the military, global banks, and other high-sensitivity organisations. This is backed by a deep set of cloud security tools, with 230 security, compliance, and governance services and features. Within New Zealand's emerging commercial space industry, where it's feasible for even small start-ups to make a big impact by introducing innovative new space technologies, the cloud will be critical to accelerating experimentation, expanding automation, and delivering deeper insights.

Comments on the consultation document

The attached submission (Appendix A) contains AWS views on the ***New Zealand Space Policy Review Consultation***. Thank you for the opportunity to provide comments. We would be pleased to elaborate further on our submission and look forward to remaining engaged in supporting New Zealand's space policies.

Yours sincerely,

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Amazon Web Services

[5] AWS for Aerospace and Satellite

Appendix A

AWS Submission to the New Zealand Government on
New Zealand Space Policy Review Consultation

AWS is pleased to submit the following comments in response to the New Zealand (NZ) Space Policy Review Consultation paper.

Submitter information

About you

Name: privacy of natural persons

Email address: privacy of natural persons

Are you making this submission on behalf of a business or organisation?

☒ Yes ☐ No

If yes, please tell us the title of your company/organisation.

Amazon Web Services New Zealand Ltd.

Would you like to be kept informed of the outcome of the Space Policy Review?

☒ Yes ☐ No

Are you happy for MBIE to contact you if we have questions about your submission?

☒ Yes ☐ No

Release of information

☒ Please tick this box if you do not wish your name and contact details above to be included in any information about submissions that MBIE may publish.

☐ Please tick this box if there is other information within your submission that you want to be kept confidential. If you have ticked this box, please state your reasons and grounds under the Official Information Act 1982 below, for consideration by MBIE.

Section 1: New Zealand interests in space

Question 1. What are your interests and relationship to space? (Pick as many as apply below)

General interest in space	Work in the New Zealand space sector	Cultural connections to space	Academic involvement on space issues	Other (please explain in box below)
☐	☒	☐	☐	☐

Please note any other interests and relationship to space below that you would like to share.

AWS is actively involved in the space sector. Our key interests in New Zealand are: enable local and export growth, support utilisation of space[6], and further enhance New Zealand's space innovation capacity.

AWS is a local and global enabler for space activities. Locally, AWS supports New Zealand's growing commercial space industry and government programs working directly with some of our customers including LeoLabs who has operations in New Zealand.[7] Globally, AWS supports many nations and companies with space launch, communications, remote sensing, space situational awareness, science, exploration, agriculture, navigation, national security, data integration, data security, and many more areas. AWS is committed to supporting local growth, as evidenced by our investment to build a new Auckland Region, representing a NZD$7.5bn investment over 15 years.

A key goal for AWS is to help grow domestic space capabilities. AWS aims to support students and researchers and academics. To facilitate domestic capabilities, AWS provides a number of services and datasets for free; ranging from our 500+ online free cloud courses, to our global Earth imaging Open Data repository – the Registry of Open Data. The Registry exists to help people discover and share datasets that are available via AWS resources. See recent additions and learn more about sharing data on AWS. GNS Science is the first New Zealand organisation to use the Registry to publish research datasets from GeoNet at no cost for cloud storage (see the online case study). This means data is free to researchers and innovators.

AWS also offers Cloud Credits for Research, which are available for researchers to conduct research using Earth Observation data on AWS. Students, educators, and researchers are key drivers of technological innovation and we want to support new advances in the space research field.

Through all of these initiatives, AWS seeks to bring the benefits of space to everyone. By partnering with others, leveraging AWS' cloud capabilities, we have been able to work with governments and companies to utilise space data to enhance the quality of life for people around the world through

[6] This includes reimagining space system architectures; transform space enterprises; launch new services that process space data on Earth and in orbit; provide cloud solutions to support public sector missions and companies advancing space around the world.

[7] To read further about LeoLabs work with AWS please find out how they've used AWS to accelerate space traffic management through cloud here.

activities such as agriculture, transportation/logistics, education, disaster response/recovery, fishing, etc.

Section 2: New Zealand values in space

Question 2. To what extent do you agree or disagree that these values should apply to New Zealand's space activities and engagements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
Innovation	☐	☐	☐	☐	☐	☐
Responsibility	☐	☐	☐	☐	☐	☐
Stewardship	☐	☐	☐	☐	☐	☐
Partnership	☐	☐	☐	☐	☐	☐

Question 3. Are there any other values, or aspects of kaitiakitanga (guardianship), that you think should apply to New Zealand's space activities and engagements (for example, cultural values regarding space).

New Zealand's values in space should be nationally-determined and continually evolve over time around some consistent themes. These values identified in the policy review will likely provide a good foundation from which to build a space program. Further differentiation between "responsibility" and "stewardship" may be helpful in guiding those tasked with implementing the policy to understand these distinctions in policy approaches. We would also encourage the government to consider how partnerships in the areas of open data sharing can help better leverage opportunities in space for New Zealand.

On kaitiakitanga, there is an importance of guardianship of the information and data we can collect and share from space to address sustainability issues. For example, there are currently 54 Essential Climate Variables (ECVs), outlined by the Global Climate Observing System (GCOS)[8], which are used to characterise observations and provide a clear message on historical and future climate change. These variables include atmospheric, terrestrial and ocean observations and a majority of them are only visible from space.[9]

AWS already supports governments and industry in areas that fully align with these values. For example, our customers are: using AWS capabilities to quickly design, produce, and sell space cutting edge technologies (Innovation case study here); collecting, analysing, and disseminating space situational awareness information (Responsibility case study here); helping farmers with crop productivity and sustainable fishing through maritime domain awareness (Responsibility case study here); utilising space data for managing mangroves, to fight deforestation, and detect and combat wildfires and monitor climate change (Stewardship); and we are working with these customers, government and industry, to work around the world to bring space capabilities to those that need it (Partnership case study here).

[8] "Essential Climate Variables", The Global Climate Observing System, website accessed 24 October 2022, 10:48am.
[9] "The Paris agreement might draw the limelight but another collaborative global effort is bringing crucial understanding to our planet's changing climate. And much of its focus is on space", EUMETSAT, 1 December 2017.

On "partnership", AWS has signed statements of intent with a variety of space organisations including Singapore, Brazil and Greece, UAE Mars Mission: Hope Probe, and AWS has worked with Argentina-based Satellogic as well as the European Space Agency. We would be happy to share further details about how we support "inclusion" and "diversity" in space programs.

Section 3: New Zealand's space policy objectives

Question 4. Are any of these key policy objectives of particular importance to you?

These objectives are mutually reinforcing and therefore are equally important. Removing one of them would come at the detriment of the other objectives. For example, a strong work force and innovative industrial base is critical to achieving the other four objectives.

Section 3a: Growing an innovative and inclusive space sector

Question 5. To what extent do you agree or disagree that these policy objectives will help the New Zealand government to grow an innovative and inclusive space sector?

a. Promoting New Zealand's natural advantage for conducting space activities, and research and development expertise across the space value chain

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

b. Partnering within New Zealand and internationally to increase research and development capabilities

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

c. Identifying opportunities to increase diversity in the space sector

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

d. Using cutting-edge space technology and space sourced data to support New Zealand's values and interests.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

Comment: The top-level policy objectives (in contrast to the subordinate policy objectives tied to each of the individual top-level policy objectives) may have greater effect if the space objectives are tied to national-level goals. For example, the "Cross-Cutting Government Interests in Space" section provides the national-level goals; economic and national security, and sustainability and responsibility. The space objectives would derive from those national goals. Our global experience in national space policies has shown countries have a higher degree of success in prioritising, implementing, budgeting, and executing their national space programs if those programs are tied to broad, high-level national interests.

Question 6. Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed)? Is there anything missing?)

With respect to "using cutting-edge space technology and space sourced data to support New Zealand's values and interests" – Innovation in the space domain is enabled by technological innovation and information and data management. Special attention should be given to enabling foundational technology capabilities that will spur an innovative space community. These foundational capabilities include cloud services, computing, AI/ML, cybersecurity, digital twins, and data infrastructure. Specific reference to these technologies in the policy review would be a way MBIE could develop a strategy to guide industry and government decisions toward appropriately adopting the right technology solutions to grow the sector.

We would also suggest adding as a priority in this section, "growing access to open and available space and geospatial data" as supporting New Zealand's values and interests. Since 2010, natural disasters have impacted thousands of citizens and cost New Zealand close to $27 billion in insured losses[10]. Freely and easily accessible data on earthquakes, tsunamis, and other natural hazards can help accelerate global research. It also enables governments and communities to better understand and prepare for natural hazards, reduce risks to prevent disasters when events occur, and even forecast future events. GNS Science Te Pū Ao (GNS Science) and its GeoNet programme, New Zealand's leading geoscience and data provider, is the country's first organisation to use the Amazon Web Services (AWS) Open Data Sponsorship Program to achieve this.[11] Making data freely available to researchers has been an underpinning philosophy of the GeoNet programme since its inception in 2001. Now, its datasets are faster to download, especially for large dataset requests, and more accessible to researchers, learning institutions, and the general public globally via the Registry of Open Data on AWS, which exists to help people discover and share data.

Within "partnerships" (p.10), we would suggest the government consider more continuous grant distribution for start-ups, helping companies at the earlier stages of development commercialise. This also could include commercialising some of the publicly-funded research and development, partnering with industry to leverage that research to grow New Zealand's space industry. The RMIT Space Industry Hub, for which AWS is a core partner, would be one example of facilitating these industry partnerships with research organisations. We note there has been already the space-related funding that the MBIE Catalyst Fund provided to the space sector, and we would encourage similar initiatives to continue. We would also suggest including an objective on committing to attracting and enhancing investment. For example, clearly articulated and steady investment by the government and attraction of private capital.

[10] "New Zealand's costliest natural disasters in the past decade", Business Insider, accessed 2 November 2022
[11] First organisation in Aotearoa New Zealand to release their research datasets on the Registry of Open Data on AWS, August 2022, AWS

On process, Objectives 3, 4, and 5 all appear to have overlap in their desired outcomes. For example, achieving the objective of responsible use of space (Objective 4) requires a domestic regulatory regime (Objective 3) that determines what safe, responsible, and sustainable utilisation of space is. Likewise, having a sustainable space program (Objective 5) is one end-state that Objective 3 and Objective 4 are trying to accomplish. Elements of Objectives 3, 4, and 5 can all be combined into one objective regarding the long-term sustainable utilisation of space.

Question 7. Are there any other policy objectives that you think would help the New Zealand government to grow an innovative and inclusive space sector?

A space sector that is innovative and inclusive should seek to achieve specific objectives. "Innovative and Inclusive" are worthy qualities and attributes of a space sector that the nation of New Zealand needs to accomplish major strategic goals.

Specific objectives about utilising space development to enhance the quality of life for citizens could be useful. This could be part of an objective about using space to help all New Zealanders through applied education, employment, and use of space to help with education, agriculture, disaster response/recovery, scientific discovery, etc. An objective about what space can directly do for New Zealand's citizens should be an important element of this policy.

As per our separate suggestions to the MBIE Aerospace Strategy, the space sector will develop in an innovative and inclusive way if there is focused attention from the government to global outreach, collaboration, and market development. New Zealand can be innovative at home and create new space technologies and uses for space capabilities, but a self-sustaining New Zealand space industry will need to be globally competitive. AWS can help governments and industry develop cutting edge space technologies for use at home whilst also using our extensive partner network and customer relationships to give space companies access to the rest of the world. AWS has deep experience and capabilities to help entrepreneurs, academics, and companies innovate quickly, securely, affordably, and globally.

Question 8. Do you have any questions or comments about what these objectives would mean in practice?

In general, how will the government prioritise between the objectives and the "sub-objectives" and what are the top-level, strategic goals that New Zealand are trying to achieve through these objectives?

Specifically, we would like to know more about how the government will pursue the objective related to its "natural advantage" (p.9 of the Space Policy Review document)?

AWS has a number of customer stories and use cases on our website should this prove to be useful in helping New Zealand understand how these activities are implemented in practice.

There are several important initiatives – e.g., exports, technology development, workforce, education, infrastructure investment – that will help support and spur innovation. For example, identification of which areas to target for development and investment would be useful. We recommend that this policy review identify specific initiatives, relevant regulations and legislations, and which agencies will be responsible for implementing these elements of the policy.

Section 3b: Modelling sustainable space and Earth environments

Question 9. To what extent do you agree or disagree that these policy objectives will help the New Zealand government to model sustainable space and Earth environments?

d. Encouraging inclusive, sustainable space collaborations within New Zealand

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

b. Assessing the cumulative impact of space activities on the Earth environment

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

c. Assisting with solving sustainability challenges through space data, including to better monitor or understand the Earth's environment

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

d. Investing in New Zealand's capability to retain, grow, access and use sustainable space technologies

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

Question 10. Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed)? Is there anything missing?)

What is missing in the policy is what the strategic goals are and how the objectives fulfil those goals. For example, there is the objective of an innovative and inclusive space sector. As stated in our previous response, this is worthy objective, but the policy should explain "why" it is a needed objective. Said another way, "innovative and inclusive" are a means to an end, but what is the end-state that New Zealand is seeking? The strategic goals are listed in this policy review but they are listed as "interests" rather than goals/end-states. For example, you would need a space sector that is innovative and inclusive to support New Zealand's national security goals.

More broadly, the listing of Objectives and then "sub-Objectives" under each objective is somewhat confusing. Instead, listing the goals and corresponding actions along with the end, ways, or means would be helpful.

Question 11. Are there any other policy objectives that you think would help the New Zealand government to model sustainable space and Earth environments?

An objective regarding government support for the research, development, and fielding of both industry and government space-based Earth and space environmental monitoring capabilities would help create domestic technologies and capacities that have global utility and marketability. New Zealand should consider how to become a critical partner and provider of both Earth and space data to support these space policy objectives.

Question 12. Do you have any questions or comments about what these objectives would mean in practice?

The "sustainable" objectives provide a good understanding of the government's belief of the importance of environmental stewardship. The objectives raise some questions as to what specific actions the government will take and what government will need from industry to accomplish the objectives. Government ministries will look for guidance on which programs to undertake and how/where to prioritise their budget. Likewise, industry will look for specific objectives to make informed decisions on their investment in technology/capability development.

AWS, has experience in space sustainability and space situational awareness. In practice, space sustainability and situational awareness require the integration of massive amounts of disparate sources of data and analytical models to provide a true and effective understanding of the space domain. AWS works with a variety of companies and governments to develop and operate space sustainability and situational awareness capabilities (some examples outlined in Question 3 above). AWS also has a platform called Project ARGUS which will be used to integrate massive amounts of data and models to create a single knowledge base for what has happened, what is happening, and what is likely to happen in space.[12] New Zealand, as part of its space policy, may consider how it can develop its own data sets and analytical models and how those capabilities will integrate with the global systems. AWS can assist with this.

Section 3c: Promoting the responsible uses of space internationally

Question 13. To what extent do you agree or disagree that these policy objectives will help the New Zealand government to promote the responsible uses of space internationally?

a. Advocating for effective international rules, norms and standards in space

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

b. Partnering with like-minded launch states to adopt peaceful, responsible and sustainable space practices

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

[12] How Argus Works, AWS

c. Collaborating internationally to increase New Zealand's influence and capabilities in the global space sector

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

Question 14. Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed)? Is there anything missing?)

We agree that these policy objectives will help New Zealand promote the responsible use of space. New Zealand needs both a message and presence in the international community to promote the responsible use of space. This policy gives clear priority to promoting the responsible use of space both domestically and internationally and for New Zealand to be present at these global discussions.

Question 15. Are there any other policy objectives that you think would help the New Zealand government to promote the responsible uses of space internationally?

New Zealand should consider not just promoting the responsible use of space but also developing the capabilities and services that provide the data and capabilities to identify and respond to opportunities and challenges in space. For example, LeoLabs – a company active in New Zealand and an AWS customer - uses AWS to power its space traffic management platform, which tracks all active satellites and debris in LEO and warns satellite operators of potential collisions. LeoLabs' radar tracking facility in New Zealand is the first of its kind in the southern hemisphere. LeoLabs has integrated AWS high performance computing (HPC), Amazon EC2, containers, and serverless computing into their end-to-end solution architecture to help space, scientific, defense, and intelligence agencies monitor and protect their most valuable space assets.

Question 16. Do you have any questions or comments about what these objectives would mean in practice?

Refer to response to Question 12.

Section 3d: Protecting and advancing our national security and economic interests

Question 17. To what extent do you agree or disagree that these policy objectives will help the New Zealand government to protect and advance our national security and economic interests?

a. Use space assets to protect and advance New Zealand's national security and economic interests

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

b. Manage the broad range of security risks in space to protect New Zealand's space industry

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

c. Collaborate with international space and security partners to pursue New Zealand's national security and economic interests

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

Question 18. Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed)? Is there anything missing?)

Protecting and advancing national security and economic interests will involve New Zealand continuing to develop its space capabilities. Space capabilities can be expensive and take time for a nation to develop which requires consistent funding and investment and collaboration with a range of stakeholders. AWS has demonstrated that it can support cloud-based solutions to provide to the traditionally Capital expenditure (CapEx) heavy investments of satellite ground infrastructure: this downloadable report from Northern Sky Research (NSR) on cloud computing in the satellite world named AWS Ground Station as one of the solutions available to satellite operators looking to run a fully managed cloud-based ground station service. The report highlights the measurability and flexibility that cloud-based solutions provide to the traditionally CapEx heavy investments of satellite ground infrastructure. AWS is touted as offering flexible per-minute access to antennas for self-service scheduling, alleviating the need to buy, lease, build, or manage a fully owned ground segment.

On process, whilst we can see that these policy objectives reflect current context for space policy, as written, these policy objectives do not appear to outline New Zealand's objectives for helping to meet the nation's national security goals, economic interests, or its international security obligations. These could perhaps be reframed as objectives that provide more direction and specific guidance that conveys to New Zealand's space companies which sectors or missions are priorities and, therefore, help the sector make informed investment decisions.

For example, stating an objective such as, "*The free access to and utilisation of space data is critical to New Zealand's national security and economic growth. New Zealand, in collaboration with industry, will develop, acquire, and operate both ground-based and space-based capabilities to collect, analyse, and distribute space domain awareness information*," delivers an actionable message to government and industry as opposed to the existing language, "*Space technologies can help us advance our national security and economic interests, like using satellite imagery to track illegal fishing, or GPS to support our maritime supply chains. Space capabilities can also help New Zealand in responding to wider regional challenges, including the conduct of humanitarian assistance and disaster relief.*"

This section could benefit from looking at the relationship between space and security as bidirectional. There is "security *for* space" and there is "space *for* security". This section, as written, identifies the challenges in "security *for* space" and could benefit from emphasising where "space *for* security" is critical to achieving national-level security goals. For example, space capabilities are critical for maritime domain awareness and monitoring activity across the Pacific.

AWS works closely with its customers – commercial and government – to support both parts of this relationship. For example, AWS provides cybersecurity capabilities to our customers and AWS supports space situational awareness missions. AWS enables "security for space". Likewise, AWS helps many different types of users use "space for security" by bringing together space information for missions such as disaster response and recovery or maritime domain awareness.

Question 19. Are there any other policy objectives that you think would help the New Zealand government to protect and advance our national security and economic interests?

See answer to Question 18. This section could benefit from goals and objectives.

Question 20. Do you have any questions or comments about what these objectives would mean in practice?

How would the statements in this section be implemented and what specific activities would be undertaken by the responsible ministries and agencies? What support from industry is the government seeking?

Section 3e: Regulating to ensure space activities are safe and secure

Question 21. To what extent do you agree or disagree that these policy objectives will help the New Zealand government to ensure space activities are safe and secure through regulation?

a. Facilitating the safe and secure use of emerging space technologies from New Zealand

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

b. Clarifying what New Zealand space activities are inconsistent with the national interest

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

c. Promoting and protecting New Zealand's interests through permitting space technologies

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	Don't know
☐	☐	☐	☐	☐	☐

Question 22. Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed)? Is there anything missing?)

The examples and themes in this section provide good information on how New Zealand currently regulates certain space activities. The comments in this section do not provide clear guidance nor are specific goals listed or described. The infographic on page 21 provides useful information on the

principles New Zealand will utilise when making regulatory decisions. This section could also benefit from identifying which critical industries and capabilities are necessary for the economic growth, enhancement of quality of life, and national security of New Zealand.

Question 23. Are there any other policy objectives that you think would help the New Zealand government with regulating to ensure space activities are safe and secure?

One significant consideration for the development space regulation is balancing a regulatory regime that protects public interests while allowing industry to develop space technologies. New Zealand could benefit from a policy statement that its space regulatory regime will strive to balance the needs of public interest with creating a regulatory environment that; attracts business to New Zealand, encourages domestic entrepreneurship, supports innovation, and provides clarity and stability to space industry and investments.

Question 24. Do you have any questions or comments about what these objectives would mean in practice?

How would the statements in this section be implemented and what specific activities would be undertaken by the responsible ministries and agencies? What support from industry is the government seeking?

Section 3e(i): Regulating in line with our national interests

Question 25. Are there any comments you would like to make about these criteria that inform consideration of the national interest?

Regulatory regimes are a competitive advantage in the global space market. The US Government's United States Space Priorities Framework 2021 highlights a similar commitment – "The United States will foster a policy and regulatory environment that enables a competitive and burgeoning US commercial space sector".[13] A nation that adopts a principled and rules-based space regulatory strategy will attract foreign business to its shores and it will grow domestic space industries. These criteria provide a clear message to the space industry that New Zealand has a responsive regulatory regime and the regulation will meet international standards. New Zealand should consider such statements for its space policy as it will not only enable new companies to grow in New Zealand but it will also attract partnerships and investment.

Question 26. What questions do you have about how the national interest is considered in practice?

How would the Minister receive input from other ministries about what is considered to be a violation or adherence to these principles? For example, in some nations a defense ministry may have a different opinion than an industry ministry as to what appropriate behaviour is in space. What is the process by which MBIE will generate regulations and make decisions regarding specific licenses? This is not something that needs to be answered in the space policy review, but would be of interest to those in the sector.

[13] The United States Space Priorities Framework, December 2021, p.5