Regulatory Impact Statement (RIS): Outer Space and High Altitude Activities Bill

Agency Disclosure Statement

This RIS has been prepared by the Ministry of Business Innovation and Employment. It summarises the analysis of options to provide a legal regime for space and certain high altitude activities taking place from New Zealand.

The need for this legislation has been precipitated by the intention of a company, Rocket Lab, to commence space launches from New Zealand; and the negotiation of a Technology Safeguards Agreement (TSA) with the US Government to enable the transfer of sensitive technologies from the US to New Zealand. s 9(2)(h) legislation should follow on quickly to provide certainty and alleviate risk.

Normally this paper would follow the advice to the Government on the TSA (as the legislation is required for New Zealand to ensure full compliance with the TSA) but because of the critical path to facilitate the first rocket launch, legislative drafting needs to commence in advance of the conclusion of the TSA. The broader cost benefit analysis associated with a rocket industry in New Zealand will be contained in the advice to Ministers on the TSA and in the National Interest Analysis. This paper focuses on the cost benefit analysis associated with the enabling legislation (assuming that the TSA will be concluded). Legislation is also required to give effect to other international Space Treaty obligations that New Zealand is party to but has not previously had to ensure compliance with because we have not had a space launch industry.

The requirement for domestic law to enable New Zealand to ensure it can fully comply with its TSA and other international obligations means there is limited discretion. Given this, the proposals have been informed by established best practice with respect to national legislation for space activities, in particular the UK Outer Space Act 1986 and the United Nations General Assembly resolution 68/74 on recommendations on national legislation relevant to the peaceful exploration and use of outer space (November 2014). While it is possible to deviate from international best practice legislation for space activities, conforming means that we can be confident that we can meet our international obligations.

During the development of the space regulatory regime, we became aware of a range of technologies being developed to operate at very high altitudes (near space) and performing similar functions to satellites, including Earth observation, internet connectivity and surveillance activities. In order to future proof the space activities regime for developments in technology, and to ensure that different technologies providing similar applications and services are treated consistently, it is proposed that certain high altitude activities be brought within the scope of the space regime. With one exception (relating to the need to meet certain international obligations such as the TSA), the problem definition, policy objectives, key choices and conclusions are the same for the high altitude regime as the space regime. Given this, the inclusion of high altitude activities is an extension of scope at the margin and it does not justify a separate RIS. Instead the RIS has been updated to include the regulatory impact analysis produced on the high altitude regime.

The Minister for Science and Innovation has requested that legislation be introduced into the House prior to Rocket Lab's first test launch. This has constrained the time available to undertake the RIA. We have identified the key legal obligations and policy considerations that the regulatory

regime needs to provide for. However, within the time available we have not fully worked through all of the matters associated with implementing the regime.

A further report back to Cabinet in April 2016 provided further advice on the scope of space policy and space agencies. The decisions in this paper did not require a RIS to be produced.

We have consulted with relevant government agencies and their comments have been incorporated into the Cabinet papers and RIS. We have also consulted with Rocket Lab who is the only private entity (that we know of) with plans to undertake space launches from New Zealand within the next 12 months. Consultation with the wider public will take place when the Bill is before the Select Committee.

Simon Rae
Manager, Innovation Policy

20 May 2016

Executive summary

1. The key issue is how best to provide a fit-for-purpose legal framework for space and certain high altitude activities from New Zealand that enables New Zealand to fully implement our international obligations, facilitate the development of safe, secure and responsible space activities, and manage liability to the Crown that arises from our international obligations.
2. The analysis concludes that a new law is required. Internationally, space launch legislation is based on a licensing regime (an overarching licence to launch a space object with specific requirements implemented through licence conditions) that provides the necessary controls over participation in space launches, including powers to veto launches and/or payloads (i.e. cargos). Given this, we propose that a licensing regime is put in place.
3. Choices around the content of the regulatory regime are largely constrained by what is necessary in order to comply with international obligations, including the draft TSA which contains obligations of an absolute nature. However there are choices around: How prescriptive or permissive the regime is; and Whether or not the government transfers all liability associated with space launches, or chooses a risk-sharing approach.
4. On the first matter, we propose to adopt a permissive regime that will provide the minimum necessary to meet our international obligations and manage risks and not impose unnecessary compliance on space launch operators. A permissive approach involves giving the decision on the conditions of the licence to a decision-maker, rather than providing the detailed conditions in the primary legislation. The case for recommending this approach is largely based on the evolving nature of space activities and, in particular, the shift from large and very expensive satellites to micro and relatively low cost satellites, and relatively low cost and frequent launches. A fit-for-purpose legal framework needs to meet New Zealand's international obligations and provide basic protections, but not stifle the development of a domestic space industry by imposing excessive costs. In an environment of rapidly changing space technologies and related market demand, our judgment is that this is best achieved through tailored licence conditions that take into account the particular circumstances and risks.
5. Under the Outer Space Treaty and the Liability Convention (two of the main international space treaties) the State assumes liability for space objects. These include launch vehicles

and satellites, but the State does not create the risks nor is best placed to manage them. These are matters for the owners/operators of space objects. In light of this other governments pass off liability to owners/operators, both through stating in legislation that they have liability, and through the requirement for insurance. However some governments, such as the US, take a risk-sharing approach with the objective of encouraging the development of the space industry.

6. For the New Zealand legal framework we have considered two options. The first is to include a provision in primary legislation that the Government will seek an indemnity for liability, with the level of insurance to be set in licence conditions. This makes it cear that licence holders will have liability, but allows the Government to cap that liability through setting insurance requirements that reflect its assessment of risk and consequences. The alternative is for the primary legislation to stay silent on liability and include a provision for the Government to transfer liability through insurance requirements (but stay silent on the policy position thus providing maximum flexibility for future governments).

7. Space and certain high altitude activities create risks for national security, safety and for the environment. New legislation is required to manage national security risks. For the most part safety will be dealt with under existing domestic law (the Health and Safety in Employment Act 1992, which is to be replaced by the Health and Safety at Work Act 2015 from April 4, 2016) which creates general obligations on space launch operators. There may, howver, be particular safety concerns that arise from high-frequency launches or particular payloads which over time may require a more proactive approach to safety. Hence, it is proposed that the primary legislation make provision for safety related licence provisions. Similarly the Resource Management Act will largely address environmental risks. However, there may be environmental impacts in space that we don't yet know about or that fall outside of the scope of the RMA. Hence, it is proposed that the primary legislation make provision for environmental protection related licence provisions.

Outer Space regime

Status quo

8. Rocket Lab (a US company with a New Zealand subsidiary) is proposing to commence space launches from New Zealand in early 2016 offering a dedicated launch service for small satellites.

9. The initial test-launch and any subsequent launches are contingent upon New Zealand concluding and implementing a treaty-level Technology Safeguards Agreement (TSA) with the United States (US) Government. The TSA enables the transfer of sensitive US technologies from the US to New Zealand and imposes obligations on New Zealand in relation to the use and secure management of the technologies. The majority of the obligations are to ensure compliance by Rocket Lab and third parties such as Rocket Lab's contractors with the provisions of the TSA. Negotiations between New Zealand and the US on the TSA are underway and a separate Cabinet paper will be prepared seeking approval to sign, implement and bring into force the TSA.

10. Although rockets are to some extent regulated by Civil Aviation Rule part 101, New Zealand has no comprehensive regulatory regime designed for space launches and the operation of payloads (e.g. satellites) in space, s 6(a)

11. New Zealand could choose to meet its proposed TSA obligations through a contract with Rocket Lab. However, legal advice supports the view that the TSA obligations will require domestic legislation within a reasonable time of concluding the TSA so that New Zealand can

ensure full compliance with our TSA obligations. Legislation is also required to give effect to other international Space Treaty obligations that New Zealand is party to but has not previously had to ensure compliance with because we have not had a space launch industry.

12. For the purposes of the RIA we have defined **the status quo** as:

- Rocket Lab wishes to launch space objects in New Zealand;
- the New Zealand Government is negotiating a TSA with the US Government to enable Rocket Lab to access the necessary US technology. Once the TSA is concluded, signed and brought into force it will create obligations on the New Zealand Government to protect and ensure the secure use and management of sensitive US technology;
- once rocket launches commence from New Zealand (either by Rocket Lab or any other launch operation that might establish in New Zealand) we will need to discharge our other existing international obligations that we have previously signed up to and manage the liabilities that arise from those agreements; and
- without a regulatory regime for space launches there is no way we can ensure full compliance with those obligations or manage the liabilities.

Problem definition

13. The problem with the status quo is that New Zealand cannot:

- ensure full compliance with the proposed TSA and other international obligations;
- adequately manage the liability to the Crown that arises from our international obligations;
- manage national security risks related to space objects (launch vehicles and satellites); and
- be assured that safety and environmental risks arising out of space launches can be managed.

Compliance with the TSA and other international obligations

14. Legislation is required to fully meet obligations proposed in the TSA, as well as obligations arising from a number of international outer space treaties. There are five international treaties on outer space law, three of which New Zealand is already party to, and two to which we will need to accede.

Technology Safeguards Agreement (TSA)

15. The draft TSA imposes a number of obligations on New Zealand relating to the use and secure management of sensitive US technologies. For example Article VI (2) requires that the New Zealand Government must ensure that only people authorised by the US Government access launch sites, equipment, and data in segregated areas. s 9(2)(h) [redacted]

Outer Space Treaty

16. The Outer Space Treaty on principles governing the activities of states in the exploration and use of outer space including the moon and other celestial bodies. New Zealand is party to this Treaty). The Outer Space Treaty creates a number of obligations. For example, each country that is party to the agreement bears international responsibility for its national activities in outer space. Countries must ensure that the activities of private entities in outer

space require authorisation by the State and are subject to ongoing supervision. **We can't meet this obligation under the status quo.**

Rescue Agreement

17. The Rescue Agreement relates to the rescue of astronauts, the return of astronauts and the return of objects launched into outer space. New Zealand is a party to this Treaty and is able to meet its international obligations under the status quo through existing law and protocols put in place by the New Zealand Police to guide their operational response to an incident.

Registration Convention

18. The Registration Convention requires registration of objects launched into outer space. New Zealand is not currently a party but should accede as registration of space objects is integral to a New Zealand-based space launch programme. Cabinet approval will be sought separately.

Moon Agreement

19. The Moon Agreement governs the activities of states on the moon and other celestial bodies. New Zealand is not currently party. So far only a small number of countries (13) have signed and ratified the Moon Treaty since it came into force in 1984. We consider that more analysis is required to understand the obligations that arise from the Moon Treaty and to determine if New Zealand should accede to the Treaty. This is not a priority relative to putting in place a regulatory framework for space launch activities.

New Zealand's liability

20. The Convention on International Liability for Damage Caused by Space Objects is the main international Treaty relating to liability associated with space objects. New Zealand is a party to this Treaty. In general the States participating in a launch (which includes a State from whose territory a space object is launched) are jointly and severally liable to pay compensation for any damage their space objects cause to other parties, or to third States, on the surface of the Earth, to aircraft in flight, in the air, or in outer space.

21. In some circumstances liability is absolute, unless it can be shown that a claimant State was grossly negligent or intended damage to be caused. In other circumstances, liability is apportioned on the basis of fault. A State that has paid compensation following an incident causing damage may seek indemnification from other parties involved in the launching.

s 9(2)(h), s 9(2)(f)(iv)

National security risks

s 6(a)

s 6(a)

Safety Risks

24. Rocket launches and satellites create safety risks. For the most part safety will be dealt with under existing domestic law (e.g. the Health and Safety at Work Act 2015 from 4 April 2016) which creates general obligations on space launch operators. In additional, there are specific obligations, such as the requirement for secure and segregrated areas and accident areas, that arise out of the TSA relating to safety and therefall fall within the scope of New Zealand's international obligations. Legal advice is that regulation is needed so that New Zealand can ensure full compliance with these TSA obligations.

25. There may also be particular safety concerns that arise from high-frequency launches or particular payloads which over time may require a more proactive approach to safety. Given the relative novelty of rocket launches in New Zealand knowledge of where these risks might arise cannot be anticipated and hence we cannot be assured that the status quo, which in this case is reliance on existing law, will be sufficient.

Environmental Risks

26. Local authorities have responsibility and powers under the Resource Management Act to authorise and manage the land use activities associated with, and effects on the environment arising from, rocket launches. While for the most part it can be expected that the RMA is adequate to address environmental risks, some risks might arise that are beyond the jurisdiction of the RMA. These could include risks to the environment in space. As with safety risks, the relative novelty of rocket launches in New Zealand and indeed the development of knowledge internationally of environmental risks in space, means that we cannot be assured that reliance on existing law will be sufficient.

Policy Objectives

27. Based on the problem definition, the following policy objectives describe the outcomes that we are seeking to achieve with respect to a legal framework for space launches. These have been agreed with the Minister of Economic Development:

- The development of safe, secure and responsible space activities (this includes addressing national security, safety and environmental risks but in a way that allows the development of a space industry in New Zealand).
- Meet our obligations arising from the TSA related to the use and secure management of sensitive US technologies.
- Meet our obligations arising from international outer space treaties that New Zealand is party to or will need to accede to once space launches commence.
- Manage New Zealand's liability that arises out of our existing international obligations.

28. It is essential the legal framework does not inhibit the development of a space launch industry. As part of the policy development process, an assessment of the economic benefits of the development of a space launch industry in New Zealand was undertaken by Sapere Research Group. This estimates the benefits to New Zealand from the development of a space launch industry to be in the order of $750m to $1.550bn over 20 years. The potential for further upside benefits is great. The benefits identified by Sapere include:

- significant economic development opportunities from the growth in scale and critical mass of Rocket Lab's supply industries, including 3D printing, carbon composites and engineering;
- increased employment and salaries in Rocket Lab's supply industries and Rocket Lab as it scales up its launch activities;
- increased numbers of international visitors to watch rocket launches leading to increased demand for accommodation and other services particularly in the Mahia region;
- construction activity and infrastructure improvements in the Mahia Peninsula related to the development of the space launch facility; and
- significant but unquantified benefits from the reputational effects of being a first mover in the development of low-cost high-frequency space launches.

Options and impact analysis

29. The following options have been assessed in terms of whether they wholly or partly meet the policy objectives:
    - Option 1: Do nothing (status quo);
    - Option 2: Non-regulatory option, specifically a contract with Rocket Lab or any other space launch or satellite operator;
    - Option 3: Develop a regulatory regime for space launches (Option 3A is to develop a standalone regime; Option 3B is to modify existing law).
30. Doing nothing is not an option as it would mean that New Zealand is in breach of its international obligations, cannot shift liability to those who create the risks and are best placed to manage them, does not alow New Zealand to protect national security, and may not be adequate to address safety and environmental risk. We have not undertaken further analysis of this option as it does not achieve any of the policy objectives.

Assessment of how each feasible option meets the policy objectives

31. The analysis of how each option meets the policy objectives is set out below.

	Does it meet our international obligations?	Does it enable safe and secure launches from New Zealand?	Does it manage liability risks?
Non-legislative option (contract)	s 6(a), s 9(2)(h) [redacted]	**No.** National security issues cannot be adequately addressed without an ability to prevent those who present a security risk from participating in a rocket launch industry. At the moment in the absence of a licencing regime there is limited ability to stop the launch of a space object. Safety risks can largely be managed under the Workplace Health and Safety Act, but frequent launches may also present features (likelihood of risk and consequences), which require additional obligations on the operator. Environmental risks can largely be managed under the RMA but novel environmental risk may arise (such as pollution in space) that are outside the jurisdiction of the RMA)	**No.** There needs to be a legislative basis to transfer liability arising out of New Zealand's international obligations to those who own/operate space objects.
Legislative option (A)	**Yes.** A new law will enable us to develop a regulatory regime that addresses our international obligations	**Yes**. A new law will enable us to meet national security objectives. A new law will enable any emerging safety and environmental risks to be addressed through imposing licence conditions on the operator.	**Yes.** A new law will contain provisions to transfer liability to those conducting rocket launches.

Legislative option (B)	While it is feasible to modify existing law, there are no advantages over standalone legislation and significant disadvantages. Significant amendments would be required to the scope, purpose and powers of these Acts before they could apply to rocket launches. For example, the Civil Aviation Act deals with a different context (although there are some minimum requirements for rocket launches in Part 101) and it is largely focused on safety not national security. The Defence Act also has a different purpose and would require significant amendments before it could apply to a commercial rocket launching area. Given the specific strategic role of the Defence Force, it is unlikely that the Defence Act is a suitable vehicle to regulate a commercial industry.

32. Our conclusion is that neither the status quo nor the non-regulatory option addresses all the problems that we need to address in order to enable space launches from New Zealand. Therefore legislation is required to meet our obligations and manage risks.

Detailed content and design choices

33. The design of the legislation needs to address the problems that have been identified and the policy objectives set out in paragraph 27.

34. A set of principles to guide these decisions has been developed and agreed with the Minister for Economic Development. The principles are as follows:

    Minimum necessary, i.e. the legislation will contain the core elements required to achieve New Zealand's policy objectives, and the rules and their enforcement will be proportionate to the benefits and risks expected to arise from the development of a New Zealand rocket industry.

    Certain and predictable, i.e. regulated entities have certainty as to their legal obligations and the regulatory regime provides, as far as possible, predictability over time. This is particularly relevant in a situation where Rocket Lab will transition from a contract with the Government to a regulatory regime for rocket launches.

    Flexible, i.e. a regime that is flexible enough to accommodate changes to the number of industry participants, launch locations and international obligations.

    Consistent with existing domestic law, i.e. there is a presumption that wherever possible the regulatory regime developed for rocket launch activities in New Zealand will maintain domestic law, including safety and environmental legislation, rather than seek to modify it.

35. We've also had regard to international practice. Specifically, the UN General Assembly Resolution 68/74 on recommendations relevant to the peaceful exploration and use of outer space. While we can deviate from that we could not then be sure that we were effectively meeting our international obligations.

36. Internationally, space launch legislation is based on a licensing or permitting regime that provides the necessary controls over participation in space launches including powers to prevent or stop launches. Licensing or permitting also enables liability to be transferred to where it can best be managed.

37. We've considered two approaches: A prescriptive approach with detailed provisions relating to the matters that we have identified above contained in the primary legislation, or a more permissive approach where the legislation sets up a decision- making framework that enables the decision-maker to address these decisions on a case-by-case basis. We've assessed these options against the principles as follows:

Description of prescriptive approach

38. An example of a more prescriptive approach to space law is provided by Australia's Space Activities Act 1998. While it provides for a decision-maker to issue a licence based on certain legislative criteria, it also contains in the primary legislation detailed provisions relating to liability, safety and accidents.

39. However, it is relevant to the consideration of the definition and consideration of this option that the Australian Government has just announced that the Act will be reviewed. The rationale for the review included the fact that space technologies have advanced significantly since the Act was introduced, and the need to ensure Australia's civil space regulation effectively stimulates innovation and investment in this growing industry sector while effectively meet Australia's international obligations in managing the space environment.

40. In commenting on the review, the chief executive of the Space Industries Association of Australia noted that the Space Activities Act was based on the outdated assumption that the Australian space sector would involve launch vehicles sending large satellites into space but satellites are becoming increasingly miniature, and that "The risk and liability assumptions that underpin the Act in its current form are acting as a brake on the development of a viable Australian space industry,"

Description of permissive approach

41. The permissive approach is based on giving a decision-maker (the responsible Minister) discretion to make the decision on whether or not to issue a licence and the conditions of such a licence, but balanced against and informed by specific objectives which are aligned with problems and objectives identified in this regulatory impact analysis.

42. There will need to be some prescription, as certain requirements in the TSA around safe and secure areas and accident zones are quite specific. There will also be regulation-making powers, as some matters may be more appropriate for Cabinet to decide, or there may be conditions that are common to all licencees or classes of licencee, and these could usefull be set out in regulation to provide certainty to licence applicants.

43. The key features of the permissive approach are as follows:

Requirement for licence

44. All persons who launch or operate space objects will be required to have a licence which the responsible Minister may grant if the activities proposed to be undertaken are consistent with the purpose of the regime. A licence will authorise the launching of one or more space objects.

45. The Minister must not grant such a licence if:

- The grant of a licence would be inconsistent with New Zealand's international obligations, or
- The Minister responsible for the New Zealand Security Intelligence Service certifies the grant of a licence would pose an undue risk to national security, or
- The Minister is not satisfied that the applicant is a 'fit and proper' person; or
- The grant of a licence would be contrary to New Zealand's national interests.

46. Before granting a licence, the responsible Minister will be required to consult with other interested Ministers to take into account other national interests.

47. To avoid duplication and unnecessary cost, it is proposed that the responsible Minister would have power to recognise non-New Zealand licences or parts thereof and, if the Minister is

satisfied, to exempt an applicant from any requirement that has been fulfilled by obtaining that non-New Zealand licence or part of that licence.

Licence conditions

48. The licence may specify certain conditions which may include conditions designed to prevent the contamination of outer space or adverse effects on the environment of the Earth, avoid interference with the activities of others in outer space, avoid any breach of New Zealand's international obligations, preserve national security, ensure the safety and security of launch sites and related areas, and govern the disposal of payloads in outer space on the termination of operations under the licence and related licence requirements.

49. Regulations may prescribe minimum standard conditions which are to be included in every licence.

Revocations

50. There will be a power to revoke licences if concerns, particularly national security concerns, arise in relation to the licence. Other grounds for revoking licences will include matters such as making false statements, or providing false information in relation to licences, breach of licence conditions, committing serious offences, or concerns about health and safety.

51. The responsible Minister will have the power to revoke the licence if the Minister responsible for the New Zealand Security Intelligence Service issues a certificate that continuation of the licence poses a risk to national security, or for breach of licence conditions, or for other grounds including matters such as making false statements, providing false information in relation to licenses, committing serious offences, or concerns about health and safety.

Liability

Risk sharing versus risk transfer

52. The international liability to pay compensation reflects that at the time the international treaties were negotiated, in the late 1960s and early 1970s, space launches were still largely government activities. Technology advances in the development of small satellites has changed this and a greater number of public and private entities are now participating in space activities.

53. States don't tend to take responsibility for risks caused by private entities as the State does not create the risks, nor is best placed to manage them. These are matters for the owners/operators of space objects. In light of this many states pass off liability to the owners/operators of space objects, both through stating in legislation that they have liability, and through the requirement for insurance. However some states, such as the US, take a risk-sharing approach with the objective of encouraging the development of the space industry.

54. The US (and the Netherlands), have developed regulatory regimes based on risk-sharing i.e. the US government will require the licensee to carry insurance for part of the risk and will itself carry the rest of the risk. The assessment in these countries is that risk sharing is necessary to foster the development of the space industry[1].

55. In response to the international liability to pay compensation, other jurisdictions such as Australia take the approach of requiring the licensee to have insurance to reimburse the government for the cost of international claims for damage up to a certain amount. It has been claimed that the financial burden resulting from the liability rules is one of the factors that has made the Australian regime too costly and inhibited the development of a space launch industry.[2]

1 The conversation.com/space treaties are a challenge to launching small satellites in orbit.

2 Shooting for the stars: Turnball government aims to stimulate space industry

s 9(2)(j), s 9(2)(f)(iv)

60. Our advice on this is to include a provision in the primary legislation to authorise the responsible Minister to require an indemnity against the Crown's liability in whole or in part and to set licence conditions requiring insurance for a specified amount.

Regulation-making powers

61. There will need to be broad regulation-making powers including: powers to make regulations prescribing fees, information and standard terms and conditions to be included in licence applications, any procedural requirements including time limits and extensions relating to applications, security requirements (e.g. adherence to the Protective Security Requirements) and security enhanced areas, procedures and processes for launch safety investigations and launch recovery operations, and other matters as necessary for the proper administration of the Act.

Assessment of prescriptive vs permissive approach

62. We've assessed these two approaches against the regulatory design principles in the following table

Design principles	**Prescriptive regime**	**Permissive regime**
Minimum necessary	✖	

	What constitutes the 'minimum' will change over time, as international space law evolves to deal with new technologies and new markets. It is not possible to precisely predict the direction of these developments and attempts to do are likely to be based on incorrect assumptions which could undermine the efficacy of the law over time. In addition, what is the 'minimum' in relation objectives such as national security is highly dependent on a case-by-case risk assessment.	A permissive approach allows judgements on what is the minimum necessary to be reflected in the decision to licence and in the licence conditions. A permissive approach provides flexibility for the conditions to evolve as information becomes available on what the "minimum necessary.
Certain and predictable	□ Prescriptive approaches can provide more certainty, but in relation to space law this should not be overstated as there is always going to be a discretional element (to licence or not having regard to a range of objectives). Prescriptive approaches may inadvertently result in scenarios where there is greater uncertainty over the long-term than a permissive regime because the particular circumstances around a new market or technology were not contemplated which may result in a need to review and amend the law more frequently.	✖ The margin of discretion is higher for the discretionary approach which on the face of it would tend to reduce certainty, particularly over the short-term until practice leads to the development of case law. However, this should also not be overstated relative to the prescriptive approach as the objectives that the decision-maker needs to balance will be clearly set out in the primary legislation.
Flexible	✖ A prescriptive approach in the primary legislation will limit the scope for the law to adapt to deal with new technologies or new markets.	□ The permissive approach is more amenable to tailoring decisions to the particular case.
Consistent with domestic law	Both options are intended to be consistent with domestic law.	

63. We conclude that a permissive approach is the best way to achieve the policy objectives and to address the problems that have been identified. While a permissive regime provides for less certainty and predictability than a prescriptive regime in the short-term until practice and case-law has been established, a prescriptive regime carries a greater risk that the law will become outdated more quickly as the assumptions on which it is based no longer hold in the face of changes to technology and the market. As the permissive regime meets the other design criteria better than the prescriptive regime, our advice is that this approach is more suitable to the challenges of designing a legal framework for an industry undergoing fast-paced technological change.

High altitude activities regime

Background

64. A key objective of the proposed space activities regime is to facilitate the development of a safe, secure and responsible New Zealand space industry. To 'future proof' the legislation for ongoing developments in technology and to ensure that different technologies providing similar services are treated consistently, it is proposed that certain high altitude activities are brought within scope of the legislation.

65. In many cases, these technologies are dual purpose (military and civil). By including certain high altitude activities within the scope of the legislation, the New Zealand government will have the ability to control near space activities that originate from New Zealand territory and ensure that they are consistent with our national interests. This approach is consistent with the proposition that New Zealand's space policy and space law should encompass all of New Zealand's interests in space.

The problem

66. The Civil Aviation Act 1990 governs the civil aviation system in New Zealand (international and domestic). It provides for the economic regulation of licensing and international air services competition for foreign and New Zealand international airlines. It also establishes the safety and security framework for civil aviation. Security in this context is read as aviation security. This is relatively narrow in scope – only covering risks to safety from the carriage of dangerous goods and the risk to aviation security by unlawful interference with an aircraft. The CA Act has no powers to control activities or operations that may pose a threat to national security or are not in the national interest.

67. The current review of the CA Act may address this gap. Aircraft as defined in the CA Act includes balloons and remotely piloted aerial systems (RSPAs, sometimes known as drones). Rockets are not captured by this definition, and are therefore not covered by the regime, except for air traffic control purposes to ensure any rocket launch does not interfere with aircraft operations. The regulation of aircraft operations (including balloons and RSPAs) operating in near space is therefore unsatisfactory from a national security / national interest perspective.

68. The lack of a regulatory framework for high altitude activities creates the following problems:

- Lack of certainty for commercial operators about what rules apply to their activities in New Zealand. This may inhibit investment in research and development activities and new business ventures.

- Inconsistent treatment of different technologies that perform similar functions (which would create an uneven playing field for commercial operators).

- New Zealand cannot adequately control certain high altitude activities which originate from New Zealand's territory. (The Department of the Prime Minister and Cabinet is in the process of briefing relevant Ministers on the national security issues for New Zealand arising from very high altitude activities. This information is classified and cannot be included here.)

69. We wish to make the most of the economic development opportunities associated with near space activities. To do that we need to ensure that New Zealand's ability to regulate where necessary to protect and advance interests including national security, safety, and environmental impacts is established. The question is which regime is best placed to regulate near space – the Civil Aviation regime or the proposed Space Activities Act?

Options

70. The policy objective is to ensure that New Zealand has an enabling regulatory regime that encompasses all of our interests in space, including near space activities.

71. The options we have considered are:

- Option 1: Status quo (and wait for international consensus as to the best approach to regulate certain very high altitude activities).

- Option 2: Include very high altitude activities as part of the Civil Aviation Act review. Under this option, very high altitude activities could be regulated through an extension of the Civil Aviation regime to include regulation on national security and national interest grounds.

- Option 3: Clarify that the proposed Space Activities Act covers activities carried out in near space. Under this option the responsible Minister would have a power to regulate and permit aircraft activities (in particular those of balloons and drones) in near space on the same basis as similar activities carried out by satellites in outer space. Those regulatory functions relating to safety where the Civil Aviation Authority (CAA) has jurisdiction would continue to be conducted by the CAA.

- Option 4: Develop a standalone national security bill to address the national security issues.

72. The advice from the Department of the Prime Minister and Cabinet is that Option 1 (the status quo) is not a viable option as it exposes New Zealand to immediate national security risks. While other countries are facing similar challenges, there is not yet any international consensus on how they should be addressed, nor any prospect of such consensus in the short term. Based on recent discussions we have had with international space policy experts,

it appears that other countries are at a very early stage in their exploration of potential solutions to this problem.

73. We have ruled out option 4 on the basis that protecting New Zealand's national security is just one of a suite of objectives that are relevant to space activities and it is not efficient from a regulatory perspective to design a standalone regulatory tool to achieve this objective.

74. This leaves options 2 and 3. The Ministry of Transport is undertaking a review of the Civil Aviation Act. The Civil Aviation Amendment Bill has a priority 3 to be passed in 2016. Regardless of which of these options is preferred, it is desirable to ensure consistency and harmonisation between the (new) space activities regime and the (soon to be revised) civil aviation regime.

75. We have assessed options 2 and 3 using the following criteria:

- Territorial jurisdiction: the option should be neutral as to the extent to which New Zealand asserts territorial jurisdiction within near space;
- Regulatory efficiency: the option is the minimum necessary to achieve the objectives;
- International alignment: consistency with evolving international approaches;
- Regulatory effectiveness: well defined regulatory objectives carried out by a fit for purpose mechanism;
- Technology neutral: different technologies offering similar services should be regulated consistently.

A summary of this assessment is presented in the table below:

	Extend the Civil Aviation regime to include regulation of aircraft on national security and national interest grounds	**Extend the scope of the proposed space activities regime to include certain high altitude activities. Existing regulatory functions where the CAA has jurisdiction (e.g. safety assessments of balloons and drones and pilot qualifications) will continue to be conducted under the Civil Aviation regime**
Should be neutral as to the extent to which New Zealand asserts territorial jurisdiction	0 The CAA regime already applies to all aircraft regardless of altitude, but it does not currently enable regulation on national security and national interest grounds.	0 International treaties establish that all nations have free access to outer space. The proposal is to regulate certain high altitude activities because they start from New Zealand (and so we have jurisdiction over the activities). We are not seeking to define where space and airspace begin and end.
Regulatory efficiency	0 0 Both options appear equal in terms of regulatory efficiency.	
International alignment	There has been a suggestion that the International Civil Aviation Organisation's jurisdiction over international aviation could be extended to include near space activities. However, discussions are at a very early stage and there is no prospect of an international consensus on the best approach emerging in a timeframe useful for our purposes.	
Regulatory effectiveness	**X** The review of the Civil Aviation Act will propose to regulate aircraft from a national security perspective in lower altitudes (i.e. from the ground up to whatever level we set as the lower limit of the space regime). Cabinet decisions on this proposal will be sought in June. If timing is a critical factor in the decision of where to locate a higher altitude regime then the Space Bill has a slight advantage.	0 The economic and commercial objectives of the proposed Space Activities Act are as relevant to near space as they are to outer space. Cabinet has agreed that space policy should include all of New Zealand's interests in space. There is a strong case for keeping the policy and regulatory dimensions of near and outer space activities together. To avoid the perception that New Zealand is seeking to define the limits of outer space to include (part of) what we regard as near space, the high altitude regime will be a separate part of the Space Act.
Technology neutral	**X** The CAA regime is predominantly focused on safety of New Zealand's air transport services.	0 Including higher altitude activities in the space regime will ensure that different technologies providing similar functions are regulated consistently regardless of which altitude they operate at. **This is the most compelling argument.**

76. Th

e above assessment supports the option of extending the proposed Space Activities Act to include certain activities operating at very high altitudes. Specifically, this means that:

- payloads that New Zealand authorities deem capable of being operated at very high altitudes (i.e. near space) are within the scope of the Space Activities Act; and
- high-altitude vehicles (i.e. the carrier systems that New Zealand authorities deem capable of taking payloads up into the high altitude region) are also within the scope of the proposed legislation, but (if they are aircraft), the safety aspects of their operation will still be addressed through established Civil Aviation Authority procedures.

77. However, there is as yet no international consensus on the best approach to regulating near space. This means that in this particular area the Space Activities Bill will have to anticipate the evolution of international law in these areas, and we are seeking to do this in a way that is in harmony with international law, not contrary to it.

78. To help manage these risks, the high altitude provisions will be drafted as a separate part of the Space Activities Bill so that they operate as a set of standalone requirements and definitions. This also means that, if necessary, they can be decoupled from the main outer space provisions without impacting on the integrity of those parts of the Bill.

Defining the lower limit at which the high altitude regime will apply

79. There are three options for defining the limit at which the high altitude regime will apply:

- ***Option 1: Define the limit by reference to flight level 999 (approximately 30km above ground)***

  This is the limit of New Zealand's flight information region. The advantage of using this limit is that it effectively represents the upper limit of airspace likely to be subject to air traffic control / used by 'ordinary' civil aircraft providing air services. The disadvantage of this option is that it will not capture many of the activities that New Zealand security agencies are concerned about.

- ***Option 2 - Define the limit by reference to an altitude of 20km above ground***

  This is a height at which some scientists believe 'near space 'begins. This limit would pick up more of the activity that security agencies are concerned about. Its disadvantage is that it may appear arbitrary.

- ***Option 3 - Define the limit by reference to flight level 600, the current altitude that is the limit of controlled airspace in New Zealand. This is about 18km above ground***

  This option would pick up more of the activities about which the security agencies are concerned. As the limits of controlled airspace are made by a designation under the Civil Aviation Act, this option also has a practical connection with the civil aviation regime which is helpful given the need to harmonise certain criteria for authorising activities under the two regimes.

80. A concern with flight level 600 (option 3) is that it would capture aircraft such as weather balloons which are not intended to be in scope. However, this could be dealt with by including a power for the responsible Minister to make regulations that exempt or exclude (as may be appropriate) specified vehicles or aircraft or classes of vehicles or aircraft which undertake certain activities that are not intended to be subject to the high altitude regulatory regime and are otherwise regulated as appropriate under aviation legislation and regulations.

81. On balance we consider that option 3 is the preferred option as it strikes a balance between:

- The risks of setting the limit of near space too high and thereby failing to regulate activities occurring between this limit and the lower options;
- The risks of setting the limit too low and thereby inadvertently bringing within the scope of the regulatory regime a whole lot of activity that we do not want to capture. It is possible that flight level 600 will capture some these things but that is why we are proposing that there be the ability to exempt or exclude (as appropriate) specified high altitude vehicles; and
- The need to ensure an efficient alignment between the Space Activities Act and the Civil Aviation Act, and to reduce any uncertainty and complexity in relation to the interface between the two regimes.

82. There will also be a review of the Space Activities Act three years after its enactment which will provide an opportunity to ensure harmonisation between the two regulatory regimes.

Conclusions and recommendations

83. A regulatory regime for space activities and certain high altitude activities is necessary for New Zealand to make the most of the economic development and innovation opportunities arising from these technologies while managing security, safety and environmental risks. For space activities, a regulatory regime is also required to ensure that New Zealand can implement the proposed TSA and to meet our other international obligations arising from UN space treaties that we are or intend to become a Party to. The regime needs to be proportionate to the risks and therefore a permissive regime is warranted.

Consultation

84. The following government agencies have been consulted: the Ministry of Foreign Affairs and Trade, the Ministry of Transport, the Ministry of Defence, the Ministry for the Environment, the New Zealand Customs Service, the Ministry of Primary Industries, the New Zealand Police, the Treasury, the State Services Commission, the Civil Aviation Authority, and Worksafe New Zealand. The Department of the Prime Minister and Cabinet (DPMC) has been informed. DPMC has led consultation with and coordinated input from the relevant New Zealand security agencies. All agencies are in broad agreement with the need for a licencing regime and the specific design option that is being proposed.

85. Rocket Lab has been informed about the options and consulted on the design of the regulatory regime and implementation options. Rocket Lab has emphasised that the regime needs to accommodate relatively low cost and frequent launches of very small satellites, and onerous liability provisions will act as significant deterrent to the development of the industry in New Zealand. We consider that the proposed design can address these concerns through the flexibility to tailor licence requirements to specific circumstances, including an assessment of risks and consequences.

86. We have not publicly consulted on the proposed options while the Government has been in negotiations with the US Government on the proposed TSA Treaty. However, once the TSA negotiations are completed, the Government will make a public announcement that it is developing a regulatory regime for outer space and high altitude activities so that people are aware of the proposals. The public will also have an opportunity to submit on the Bill at Select Committee.

Implementation plan

87. The Government will implement its TSA obligations through a contract with Rocket Lab until legislation is enacted. Draft legislation will be in the public domain before Rocket Lab's first test launch.

88. Key implementation risks relate to building domestic capability to administer a space activities licencing regime and to monitor and enforce the regulatory requirements. However, for the first two years, at least, Rocket Lab will mainly be launching US rockets with US payloads which will be subject to the US commercial space launch and payload licences.

89. In April 2016, Cabinet agreed that MBIE will be the lead agency for space policy for an initial period. MBIE is in the process of developing an implementation plan which will cover the initial period until legislation is enacted and implementation once the new Act enters into force.

90. Compliance costs for the regulated entities will be minimised through flexibility in the legislation to ensure that requirements are proportionate to the perceived level of risk. It is also proposed that the set up costs associated with establishing the new regulatory systems and processes will be met by the Crown. Once the legislation is enacted, a cost recovery fees and levies regime will be established.

Monitoring, evaluation and review

91. Rocket Lab is the only private entity (that we are currently aware of) seeking to develop a space launch industry in New Zealand. Hence, the number of parties directly affected by the space activities regime is small (limited to Rocket Lab and its suppliers). Given this, we propose to keep in regular contact with Rocket Lab to ensure that the legislation is achieving its purpose. We do not expect large numbers of players to be affected by the high altitude activities part of the regime and there will be a power for the responsible Minister to make regulations that exempt or exclude, as may be appropriate, specified vehicles or classes of vehicles or aircraft which undertake activities that are not intended to be subject to the high altitude regulatory regime and that are otherwise regulated as appropriate under civil aviation law.

92. In light of the speed with which this regulatory regime is being developed (though for good and understandable reasons), combined with the exponential changes in space industry technologies and the space industry overall globally, we propose that there be a review of the regime in two to three years to ensure that the legislation is achieving its purpose. It is also proposed that this review be a legislative requirement in the new Act.