Developing the Aotearoa New Zealand Aerospace Strategy

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31 October 2022

Submission on developing the Aotearoa New Zealand Aerospace Strategy

Your name and organisation

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About the Submitter	I am Chief Executive of the drone training school run by Aviation Safety Management Systems Ltd (ASMS), one of the largest drone training schools in New Zealand. In addition to our public courses, our drone pilot training programmes include specialised course for NZ Police, the NZ Defence Course, and for participants in the Airspace Integration Trials. Collectively Aviation Safety Management Systems Ltd and Fenix UAS Ltd are responsible for a significant proportion of the expositions submitted to the Civil Aviation Authority for Part 102 certification. Our clients include both private sector and public sector organisations. Our clients have had a number of applications approved for very low risk / no risk Beyond Visual Line of Sight (BVLOS) operations. I have also written Specific Operations Risk Assessment (SORA) applications for multiple operators seeking to operate outside the narrow constraints of Civil Aviation Rules Part 101. I have seen first-hand how the lengthy delays in the current system carry a significant risk of destroying innovation. I am an expert in matters related to the regulation of unmanned aircraft. I June 2020 I was awarded a PhD from the Victoria University of Wellington for my thesis *Essays in the Regulation of UAS and Counter-UAS Systems.* I have also recently completed a Master of International Security degree with research focussed on the threats that drones may pose to New Zealand. My publications include: "A Counter-Drone Strategy for New Zealand", *National Security Journal*, Vol 4, 18 May 2022. https://doi.org/10.36878/nsj20220518.02 "Ground Risk Buffer for Large Helicopter UAVs", working paper, 29 January 2022. https://www.academia.edu/71738438/Ground_Risk_Buffer_for_Large_Helicopter_UAVs "Quantifying the Cost of Drone-Related Threats in New Zealand", *National Security Journal*, Vol 3(3), 8 November 2021. https://doi.org/10.36878/nsj20211108.03 "Ground Risk Buffer for Large Multirotor UAVs", working paper, 28 September 2021. https://www.academia.edu/53282063/Ground_Risk_Buffer_for_Large_Multirotor_UAVs "Addressing Security Concerns with Chinese Drones and DJI Products", Working Paper, 29 July 2020. https://www.academia.edu/43142234/Addressing_Security_Concerns_with_Chinese_Drones_and_DJI_Products *Essays in the Regulation of Drones and Counter-Drone Systems*, PhD Thesis, Victoria University of Wellington, May 2020. http://hdl.handle.net/10063/8900 "A Framework for Counter-Unmanned Aircraft System Regulation in New Zealand", *Policy Quarterly*, Vol 14(3):74-80, August 2018. https://ssrn.com/abstract=3241310

	"Proposals to Address Privacy Violations and Surveillance by Unmanned Aerial Systems", *Waikato Law Review*, Vol 24(1), 2016. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3074728 "A Model of Human Harm from a Falling Unmanned Aircraft: Implications for UAS Regulation", *International Journal of Aviation, Aeronautics, and Aerospace*, Vol 3(3). http://dx.doi.org/10.15394/ijaaa.2016.1120 "Application of New Zealand Privacy Law to Drones", *Policy Quarterly*, Vol 12(2), May 2016. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2707883

Overview of the Aerospace Strategy

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

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

Question 1: Page 7 of the consultation document sets out the four areas for the Aerospace Strategy:
1. A strategy for building our aerospace sector;

2. Building strong foundations (Three Pillars);

3. Goals for 2030;

4. Pathway to the 2030 Future State.

The four areas are what they are; for the most part they are neither right nor wrong – that is determined entirely by the content in each area. And, unfortunately, the content is lacking.

The first area, titled "A strategy for building our aerospace sector" has the description "Details what the current New Zealand aerospace sector looks like, and the 2030 Future State the Aerospace Strategy aims to achieve". It is appropriate to include this in the aerospace strategy, but no part of the consultation document actually details what the current New Zealand aerospace sector looks like. There is no mention of: the domestic passenger air transport sector, air freight, the General Aviation sector, the agricultural aviation sector, the emerging uses of unmanned aircraft. There is also no mention of the failing nature of the regulatory system – policy makers and senior leadership in CAA believe that sweeping conflicts of interest under the carpet is the same as effectively addressing those conflicts in an open and transparent manner,[1] industry doesn't particularly trust the CAA,[2] and the MoT is incapable of actually listening to the unmanned aircraft sector.[3] There should be no doubt that the regulatory system is failing the people and companies that could deliver innovation: a person or organisation with an innovative idea for advancing unmanned aviation into beyond visual line of sight (BVLOS) operations or developing a heavy unmanned aircraft is faced with a 12-14 month delay before the Civil Aviation Authority will even start looking at their application. The current system is

[1] See the discussion in Sections 4 and 5 of Dr Andrew Shelley, *Submission on the Civil Aviation Bill*, 2 December 2021. https://www.academia.edu/64649752/Submission_on_the_Civil_Aviation_Bill
[2] See the discussion in Section 4 of Dr Andrew Shelley, *Submission on the Civil Aviation Bill*, 2 December 2021.
[3] See answer to Question 2 below.

killing innovation; that fact needs to be acknowledged up front if this strategy is to achieve anything other than rearranging the deck chairs.

The second area "Building strong foundations" proposes three pillars which are largely irrelevant. As I discuss in the answer to question 2 below, the critical problems facing the sector are regulatory and education. It follows that the two most important "pillars" are 'a responsive regulatory system' and 'a technologically skilled and scientifically educated workforce'.

Question 2: The critical factors for development of the aerospace sector are regulatory and education.

On the regulatory front there are problems with:

a) Wellington bureaucrats ignoring submissions on consultations which do not support their pre-determined outcomes;

b) Government employees failing to monitor and effectively implement regulatory regimes and then the policy-making Ministry imposes vastly more onerous regimes when a significant adverse event occurs;

c) The Ministry of Transport's (MoT's) lack of knowledge and expertise, coupled with a lack of genuine engagement with industry;

d) The Civil Aviation Authority (CAA) likewise refuses to engage with industry, is inwardly-focussed, refuses to document decisions or issue determinations; and the Director refuses to exercise powers that would vastly increase the effectiveness of resources currently allocated to the authority;

e) Civil Aviation Rules that are not fit for purpose, but due to the MoT's lack of expertise will not be changed any time soon; and

f) A general framework of legislation and regulation that raises the risk (and therefore cost) of doing business in New Zealand.

<u>Ignoring Submissions that do not support pre-determined outcomes</u>

The MoT's consultations on Enabling Drone Integration provide a case study in submissions being ignored that do not provide support for the pre-determined outcomes of the government organisation conducting the consultation. A number of industry submissions asked for a formal remotely piloted aircraft licence to be incorporated into Civil Aviation Rules Part 61, with that licence providing the holder with certain privileges that would no longer require a Part 102 certificate. This would reduce the certification burden on both industry and the CAA, but was rejected because it wasn't part of the pre-determined package of measures that the bureaucrats had determined were required.

The issue of consultation outcomes being pre-determined was raised by me in my submission on Enabling Drone Integration.[4] However, notwithstanding any of the arguments raised in my submission, or any other submission, the MoT continued on with its preferred policy prescription – almost as if the outcome had been pre-determined.

The problem with submissions being ignored is so great that some people who have provided responses to previous consultations conducted by organisations such as the MoT will not have bothered to provide responses to the current consultation. One person that I have discussed the present consultation with indicated that he wasn't going to prepare a submission, stating "*many other people wouldn't have taken the time to put together a submission as previous attempts at pointing out flaws and errors have continually been set aside in favour of [more sycophantic] submissions*." Not to

[4] Dr Andrew Shelley, *Submission in Response to the Enabling Drone Integration discussion paper*, 4 June 2021. A public version of this submission is available at https://www.academia.edu/55370193/Submission_in_response_to_the_Enabling_Drone_Integration_discussion_paper. An unredacted version is available on request.

put too fine a point on it, but at times it seems like the policy-making bureaucracy considers industry to be a bunch of imbeciles unable to appreciate the nuance of policy making and the weighty issues considered by government. As a result, policy relating to unmanned aircraft has become increasingly divorced from what is actually required. A great start was made in 2015 when Part 102 was introduced, but since then the philosophy that the mandarins in government know best has led to the current situation where there are significant impediments to innovation.

Government Failure to Effective Monitor and Implement Regulatory Regimes

The Civil Aviation Authority does little to monitor the compliance of unmanned aircraft operators with existing regulatory requirements. At most it responds to some complaints, but it has dedicated no resource to proactive monitoring ('surveillance') of the industry. While the lack of any serious events may suggest that all is well, the reality is that CAA's lack of action creates significant risk for all members of industry who are compliant. The failure to monitor compliance with existing regulatory regimes – or to implement them properly – has resulted in three mass casualty events in New Zealand. Pike River was enabled by a Department of Labour that failed to ensure the existing regulatory regime was complied with – and after the event legislation was changed to introduce an altogether more onerous health and safety regime for all of New Zealand industry, a regime that requires cost to outweigh benefit, and which allows for speculative prosecutions that are undefendable. The March 15 Attacks were enabled by the NZ Police who failed to properly vet the licence application by Brenton Tarrant – and after the event regulations were changed to punish firearms owners who had absolutely nothing to do with the attack. And White Island was enabled by WorkSafe failing to enforce the Adventure Activities regulations – and now operators who were compliant with the existing regulations will have to meet even more stringent requirements. In New Zealand we have a system where failure of the bureaucracy results in more onerous requirements on industry – not something that can be cast as any sort of comparative advantage.

MoT Lack of Knowledge and Expertise

The MoT's lack of serious knowledge and expertise is illustrated by its fixation on the widely-discredited Gatwick event as a justification for new regulatory interventions. The MoT also refused to engage with industry members on why it relied on Gatwick, which led to a perception in industry that the MoT was simply intent on ramming through its proposals without considering the evidence. I provided extensive material on Gatwick in my submission on the Civil Aviation Bill to the Transport & Infrastructure Select Committee.[5]

The MoT also refuses to listen to industry: in the Enabling Drone Integration consultation a number of organisations submitted in favour of a Remote Pilot Licence being included in Part 61 of the Civil Aviation Rules. As proposed the licence would include privileges such as unshielded operation at night (subject to a night rating), agricultural operations (subject to an appropriate 'rating'), operations within 4km of an uncontrolled aerodrome, etc. This proposal was voiced by Massey University's representative at a 'Drone Forum' held in Wellington by the MoT on 21 November 2019. Attendees at the forum were overwhelmingly in favour of the proposal. Organisations supporting this proposal in submissions on the Enabling Drone Integration paper included (but were not limited to) ASMS,[6] Massey University School of Aviation, and UAVNZ. Apparently the MoT understands the needs of the industry more acutely than does the representative body UAVNZ, and rejected this suggestion in favour of an online multi-guess test for all drone pilots. The MoT's approach will entrench inefficiency, doing nothing to relieve the road blocks to innovation that currently exist.

Civil Aviation Authority

In terms of sector-specific regulation, the Civil Aviation Authority is not fit for purpose. In particular, there are clear problems at the management and executive level. For example, in the UAV regulatory

[5] See the discussion in paras 7.27-7.33 (pp. 22-24) of Dr Andrew Shelley, *Submission on the Civil Aviation Bill*, 2 December 2021. https://www.academia.edu/64649752/Submission_on_the_Civil_Aviation_Bill

[6] For the ASMS submission and a summary of the Part 61 licence proposal see Dr Andrew Shelley and Heather Andrews, *Submission – Enabling Drone Integration*, 4 June 2021.

space, many policy decisions have been made that my organisation is aware of because of the dozens of repeated interactions that we have with CAA every year. When we convey those decisions to clients (people who want to use drones for some beneficial purpose) they will often ask where these decision are written down. Unfortunately, the answer is almost always “they aren’t, you’ll just have to trust us”. I know of multiple times that CAA staff have drafted guidance documents, intended to be uploaded to the CAA website, only to have their efforts blocked by elsewhere in CAA. My experience in other regulatory sectors is that regulators will prepare determinations with detailed ‘reasons’ documents for all major decisions. This approach aids transparency and accountability. It is difficult not to conclude that CAA seeks to avoid placing guidance material or determinations on their website precisely to avoid accountability, and it can only be the senior levels within CAA that are making these decisions.

Furthermore, the Director refuses to exercise the power specified in s72E of the Civil Aviation Act 1990 to:

> *in the course of performing its functions and powers, consider whether it could most efficiently and effectively perform those functions and powers by means of its own operations or by delegating or contracting out those operations to appropriate persons selected after an appropriate competitive process.*

There is absolutely no doubt that with a 12-14 month wait before new Part 102 applications begin to be processed by an Inspector that ***the CAA is neither efficiently nor effectively performing its functions and powers***. Furthermore, having resource dedicated to processing new Part 102 applications, renewals, and amendments means that the CAA is not able to allocate that resource to proactively monitor the unmanned aircraft sector, so again the CAA is not efficiently or effectively carrying out its functions. Even if budget was significantly increased for the CAA so that it could both (a) process Part 102 applications in a timely manner, and (b) effectively monitor the unmanned aircraft sector, the processing of low risk applications could be more efficiently performed by the private sector.

[**C-IN-C**] I have previously proposed a number of measures to CAA that would enable them to more efficiently and effectively carry out their functions and powers. [redacted]. The risk does not lie in procedures that have been approved dozens of times already. The risk lies in assessing the person who is to have primary responsibility for the operation. We could immediately reduce CAA Inspector workload by adopting the process that I have suggested, which would translate into reduced waiting times for people wanting to progress innovative new applications.

[**C-IN-C**] Another option available to CAA is to adopt the approach utilised by CASA in Australia. CASA has determined a range of operations that are low risk (UAV < 25kg, Visual Line of Sight) and has issued delegations to three private sector organisations to provide the complete certification service for organisations that meet those restrictions. [redacted]
Making this change would eliminate most of CAA’s Part 102 certification workload, freeing up CAA Inspectors to work on the more complex Part 102 applications associated with some of the more innovative UAV applications. This proposal might even mean that CAA could engage in some monitoring and surveillance of the unmanned aircraft sector.

Although the above two proposals would both mean that CAA could make better use of its existing resource, I expect there to be strong opposition from within CAA. Such a decision needs to be taken away from the CAA and made by a higher level Ministry that has the scope to consider the trade-off between CAA maintaining control and the current environment that is destroying incentives for innovation.

Civil Aviation Rules

Several of the Civil Aviation Rules are not fit for purpose for unmanned aircraft operations. In particular, Part 61 needs to be amended so that there is a Remote Pilot Licence, and Part 101 should be amended so that the licence holder has certain privileges that are not otherwise available for operations under Part 101. Two examples of the types of privileges that should be available to the holder of the Remote Pilot Licence are unshielded operations at night and operations within 4km of an uncontrolled aerodrome not requiring the agreement of the aerodrome operator. Currently a person must be operating under the authority of a Part 102 certificate to have these two privileges; but shifting those privileges to a licence would reduce CAA's workload as well as providing for a more logical system of licencing and certification. As noted above, these changes have previously been suggested to the MoT, but apparently an online multi-guess test for all drone pilots is a higher priority than something that would improve the functioning of the industry and indirectly enable innovation (by freeing up CAA resource).

General Regulatory Framework

Finally, New Zealand has a general framework of legislation and regulation that increasingly makes doing business in New Zealand difficult and costly. As a high-tech employer taking risks I need to be able to get rid of employees who are not performing, without the risk and cost of long drawn-out PIPs, potential PGs when the employee doesn't respond to the PIP, or worse being accused of bullying and sparking a WorkSafe investigation. All of these are a huge drain on time that is better spent managing and growing the business. The Health and Safety at Work Act 2015 creates huge risks for businesses of being second-guessed after the fact by a bureaucrat who alleges that something more could have been done, even if there wasn't actually an accident that caused harm. As soon as the allegation is made the onus of proof falls on the business. Time, money, and resources that could be better spent developing technology and the sector are then spent defending against the allegations. This doesn't happen to every business every day, but it is a factor that increases the risk (and therefore the cost) of doing business in New Zealand.

Education

On the education front, New Zealand's education sector fails to deliver people that have the relevant knowledge and skills. There must be a focus on mathematics and science in high schools. There must be support for individuals who choose to pursue an academic career in mathematics, physics, and technology. There should also be support for students to study at academic institutions: the current approach of denying student allowances to students under 24 from middle class households does nothing to promote university education as a viable option for those students.

There must also be a focus on excellence and achievement. Accepting falling standards is not acceptable. As a small technology-focussed business I don't have the people resource to be able to dedicate time to training unskilled staff. I need people who can immediately be productive. Note that this is not just technology jobs – I also need skilled and trained technical writers, and skilled and trained administrators. Through experience I have found that the best administrators are those that were trained by the Royal New Zealand Air Force (RNZAF), which previously had a training programme to train people to effectively perform administrative roles. Unfortunately, the administrative trade was disestablished some years ago. Most businesses have to hope that the person they hire has absorbed sufficient skills in their previous roles to be able to perform effectively.

Question 3: *If* the government takes on board the issues I have raised in this submission, and takes substantive steps to resolve those problems, *then* the strategy would be very helpful. My client base

would grow, there would be new opportunities for our core business, and there would be new activities to engage in. More could be said, but that is part of our confidential business strategy.

Area One - A strategy for building our aerospace sector

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

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

Question 4: The Draft 2030 Future State is fanciful in the extreme. First, though, what "existing advantages"? New Zealand seems to be doing everything it can to stifle development of the sector. There is nothing in the Draft 2030 Future State that speaks to an efficient and responsive regulatory system, but as I noted in my answer to Question 1, the existing performance of the civil aviation regulatory system is killing innovation.

"Diverse and inclusive" is entirely irrelevant to the development of a thriving aerospace sector. Inclusion of these words is just another example of the disconnect between the bureaucracy and business. I literally don't care about the make up of my work force, I want to hire them for their skills, not because they tick the box for a quota.

"The sector is safe, innovative, and productive" – government would do well to reflect on the time-honoured saying that "you can't make an omelette without breaking eggs". Safety is good, but perfect safety will stop development in its tracks. Lives have been lost in space exploration, and other lives been put at risk, but that has nonetheless been a worthwhile endeavour.

"hundreds of research and development intensive firms" – this suggests to me that the bureaucracy has no idea of the realities of the cost and risk of research and development. Hundreds of firms is a large number, all of which will be small or medium sized enterprises. Each firm must have a reasonable expectation of super profits to justify the risk of R&D.

In relation to greenhouse gas emissions, it's a real shame that the NZ government bureaucracy is not evidence-led. There is no need to target a sector to actively contribute to reducing GHG emissions. Rather, the evidence is that pricing GHG emissions appropriately will allow the most efficient response across sectors. Maybe there will be a major role for air transport, maybe there won't. Maybe the Zeppelin airship will make a comeback, maybe it won't. Let the energy strategy play out and we can see what happens to aviation.

Question 5: The proposed 2030 Future State is great. Setting aside the issue that the proposed strategy won't get New Zealand to that State, that State would certainly allow my firm to grow and develop.

Question 6: The barriers to optimising sector growth are as described in the answer to Question 2.

Question 7: The most immediate thing that the government could do to help achieve the 2030 Future State is to direct the Director of Civil Aviation to give effect to s72E of the Civil Aviation Act 1990 by delegating low-risk Part 102 certifications to one or more private sector organisations. This would

immediately free up existing CAA resource to focus on more complex and high-risk certifications, as well as providing resource for the surveillance of existing operators in the sector.

Question 8: The best way to enable the ambitions of any racial or cultural group is to (a) ensure that the education and training sector has provided them with the relevant skills, and (b) that's it. Providing overt preference to a racial group will generate backlash against that group and lead to questioning of competence.

Area Two - Building strong foundations (Three Pillars)

Question 9:	What do you think of the Three Pillars and do you think they will support the 2030 Future State?
Question 10:	What else would you like to see in the Three Pillars?
Question 11:	What actions and initiatives could the sector focus on to support the Three Pillars?

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

Question 9: There are a number of actions buried in there, but the Pillars themselves are actually irrelevant to the strategy. The irrelevance is unsurprising, as 'pillars' are a feature of popularised approaches to strategy that avoid the genuine hard work of making a real strategy. Pillars give the appearance of substance without actually requiring real substance.

A strategy first requires an end state to be defined, which is the Draft 2030 Future State. A strategy then requires an assessment of the problem to be overcome in achieving the end state – however, as discussed in the answer to Question 1, the consultation document fails to do this. The problem assessment may result in the setting of goals or policy objectives. It is only then that an action plan can be developed. The actions buried in the three pillars could form the start of part of that action plan, but logically they should occur *after* the setting of goals.

The actions buried within the pillars include actions such as:

- actively support economic and regional development, encouraging new start-up activity and attracting innovators and investors
- effectively aligning policy across government
- balance opportunities for the sector alongside identified risks, considerations of safety, and New Zealand's national security and national interests
- build government skills and capability in essential areas, such as data management and cyber security
- encourage broader participation in aerospace education, trades training and the workforce

Many of these are good actions, but they should be steps logically required to meet the goals, not something that occurs before setting those goals.

I also have a few questions and observations on three action areas included within the Three Pillars:

1. Why is there a need to "build government skills and capability in essential areas, such as data management and cyber security"? Do you want a thriving commercial sector that has these skills, or do you want an ever-growing government sector?
2. It is not necessary to "build a positive narrative that demonstrates the everyday relevance of the sector and clearly communicates the benefits of aerospace technologies" – no one cares, they really don't. And they also don't need to care: no one cares about how their TV signals get to them, no one cares how the Google maps aerial images are obtained.
3. The action to "encourage broader participation in aerospace education, trades training and the workforce" is incredibly important and needs to be significantly elevated. If implemented effectively this will assist with solving the "education" problem in my answer to Question 2.

Question 10: I would like to see the Three Pillars deleted entirely. If they are not going to be deleted, then replace them with two pillars of 'a responsive regulatory system' and 'a technologically skilled and scientifically educated workforce' as discussed in my answer to Question 1.

Question 11: This is a government strategy, not a strategy for the sector or individual sector participants. I see opportunities for employing more people as lobbyists to extract the economic rents available from government agencies, but I'm not sure that's what you had in mind.

Area Three - Goals for 2030

Question 12:	What do you think of the Goals for 2030?
Question 13:	Are the goals framed in a way that will enable New Zealand to build on its strengths and comparative advantages to achieve the 2030 Future State?
Question 14:	What activities and milestones can help us achieve these Goals?
Question 15:	Where do you see yourself in realising these Goals?

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

Question 12: The Goals for 2030 are laudable but seem to have a considerable amount of virtue signalling and wishful thinking embedded.

"GOAL ONE – Build a sustainable air passenger journey" is completely irrelevant if we are focussed on evidence-based policy, but incredibly important if we are virtue signalling for the air transport industry. As noted in the answer to Question 4, the evidence is that pricing GHG emissions appropriately will allow the most efficient response across sectors. Maybe there will be a major role for air transport, maybe there won't. One thing that is absolutely certain is that the energy density of current battery technologies is not conducive to long-range high volume air transport. There are also considerable issues to address around environmental degradation and human exploitation with batteries. Perhaps this should be deleted entirely from the aerospace strategy, and rely instead on the energy strategy's support for the development and use of hydrogen.

"GOAL TWO – Safely integrate all forms of autonomous aerial vehicles" – this is a very important goal. But the challenge is not as significant as made out. In the 8 years since 2014 there have been only 2 recorded incidents of small drones colliding with airliners, neither incident resulting in anything other than minor scuff marks. Yet we have a system that is premised on the idea that a small drone will bring down an airliner and kill hundreds of people – this is a fantasy scenario that is completely divorced from reality.

The MoT has steadfastly advocated following the rest of the world and mandating registration and Remote ID of small drones, notwithstanding the complete absence of evidence that this will ever work, or that it achieves any safety benefits. From outside of government this looks very much like a strategy of bureaucratic risk aversion – if something goes wrong then all responsibility can be disclaimed with the pronouncement that "best practice" was being followed. But when that practice is not supported by evidence of effectiveness it becomes more a case of "the blind leading the blind" rather than best practice.

What has never been considered is mandating the use of transponders on all General Aviation aircraft, and the economic basis for such a decision has also not been considered. In 2017 a Cost Benefit Analysis was conducted on the implementation of ADS-B below Flight Level 245 (24,500ft). Unsurprisingly, the quantitative analysis found that there was a net cost to General Aviation from mandating ADS-B, and that the safety benefits did not outweigh those costs. What has never been assessed is whether the cost of mandating ADS-B for all General Aviation would be outweighed by the economic benefits that would be derived from enabling many of the higher value forms of BVLOS with unmanned aircraft. These are the big questions that will allow the development of a technology that can provide significant economic benefit to New Zealand.

There is also a very strong culture of bureaucratic risk aversion, apparent even in the Airspace Integration Trials. How is it that flying BVLOS in uncontrolled airspace is less risky than flying BVLOS in controlled airspace where all the manned aircraft have a transponder so are electronically visible,

and can be told what to do by Air Traffic Control? The logic appears to be based on the fallacy that a small drone will result in the deaths of hundreds of airline passengers.

"GOAL THREE – At the forefront of global sustainable space activities" – this is laudable, but just complying with international agreements. There's nothing special or new here.

"GOAL FOUR – Actively support a permanent human presence in space" – this is probably laudable, but hard to see how or why it is particularly important to New Zealand.

"GOAL FIVE – Critical decision-making made easy through aerospace-enabled data, tools and applications" – this isn't a goal for the aerospace sector, this is a goal for transforming various government agencies into organisations that use up-to-date data to make decisions.

There is also at least one missing goal. A very important goal is "**World class science and technology education and trade training**". We have an opportunity to raise our standard of achievement in mathematics and the sciences so that we objectively amongst the best in the world. We will support high quality science and technology education in schools and universities."

Question 13: I'm still at a loss to understand what these "comparative advantages" are that NZ actually has. When I look across the Tasman Sea I see a country that has some much greater natural comparative advantages. Perhaps the greatest comparative advantage that NZ *could* have is that we are small enough that we could actually get everyone who actually knows what they are talking about in one room and solve a number of the outstanding problems. But the MoT and CAA don't seem particularly interested in this, and I don't see how the goals build on this comparative advantage that we could have if we chose to make use of it.

Question 15: In relation to Goal ONE, I will continue to advocate for an evidence-based, science-based, and economics-based approach to climate policy.

In relation to Goal TWO, I will probably start lobbying to see if I can capture a share of the AITP slush fund. Other than that, my company will continue to provide education support for companies involved in the programme, as well as developing procedures and expositions where appropriate. I will also continue to lobby for a more rational (evidence-based, science-based, risk-based) approach to airspace integration. I may also look to actively start an operating company that would require integration into airspace to deliver particular services of relevance to NZ economic and national security.

Goal THREE and FOUR – Probably N/A, although my company may assist with developing regulatory documentation.

Goal FIVE – there is a potential investment opportunity to support this pillar, but anything more than that is part of a confidential business strategy.

Area Four - Pathway to the 2030 Future State

Question 16: [redacted]

Question 17: [redacted]

Question 18: [redacted]

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

Question 16: I would like to see the Action Plan focus on actions that will give effect to building 'a responsive regulatory system' and developing 'a technologically skilled and scientifically educated workforce'.

Building a responsive regulatory system should include the following actions, in order:

1. Direct the Director of Civil Aviation to contract low risk Part 102 certifications to private sector organisations.
2. Direct the Civil Aviation Authority to write Determinations for policy decisions affecting Part 102 certification, and to publicise those Determinations on its website.
3. Amend the Civil Aviation Rules Part 61 to include a Remote Pilot Licence. The Rule and accompanying advisory materials must be prepared and implemented within 12 months, no excuses.
4. Direct the MoT to provide proper justification, with reasons, when it chooses to ignore industry.
5. Clearly identify the technical skills that are required in CAA to understand and process complex Part 102 applications (because the non-complex ones will have gone to the private sector.
6. Establish a project with industry to develop better frameworks for managing risk within the SORA process.

Developing a technologically skilled and scientifically educated workforce should include the following actions

1. Provide increased financial support for students seeking to studying mathematics, computer science, physics, and technology at university level.
2. Provide increased financial support for high school teachers with qualifications in the above.
3. Provide increased focus in excellence against international benchmarks.
4. Consider increased use of the New Zealand Defence Force as a training institution for New Zealand industry – this will of course require increased funding for the NZDF to ensure that it is an attractive option for school leavers, and to ensure that there are sufficient trained personnel available to fully utilise all capital equipment owned by the NZDF.

Question 17: The above actions would help ensure that there is a responsive regulatory system to enable innovation, and would help ensure that there is a workforce that has the right knowledge and skills to be able to effectively contribute to innovation.

Question 18: [redacted]

[redacted]

In addition to the above, I would like to be involved in the formulation of the strategy, to ensure that it is a strategy that has a chance of delivering a system that is capable of fostering innovation, rather than being a feel good document that sits on a government website and achieves little.