Title: **Testing our thinking - Developing an enduring National Infrastructure Plan**

Organisation: **Islands for the Future of Humanity**

Reference: **NIPC24-0002916** | Submitted: **29/11/2024 12:10 pm** | Submitted by:

Summary of information submitted

Page 1 - Introduction

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We're seeking feedback

Our Discussion Document, Testing our thinking: Developing an enduring National Infrastructure Plan, sets out our thinking as we begin work to develop a National Infrastructure Plan. The Discussion Document sets out what we expect the Plan will cover and the problem it's trying to solve, as well as the approach we're proposing to take to develop it.

We're sharing this now to test our thinking and give you the chance to share your thoughts. Let us know if we've got it right or if there are issues you think we've missed.

We'll use your feedback as we develop the Plan. We'll be sharing our thinking by presenting at events around the country, hosting workshops and webinars, and sharing updates through our website, newsletter, and social media. We'll also seek feedback on a draft Plan before publishing the final Plan in December 2025.

Submission overview

You'll find 17 main questions that cover the topics found in the Discussion Document. You can answer as many questions as you like and can provide links to material within your responses. On the final page (6. Next steps) you can provide any other comments or suggestions that you would like us to consider as we develop the National Infrastructure Plan. Submissions are welcomed from both individuals and organisations.

A few things to note:

- You can save progress using the button at the top right of this form.
- A red asterisk (*) denotes a mandatory field that must be completed before the form can be submitted.
- We expect organisations to provide a single submission reflecting the views of their organisation. Collaboration within your organisation and internal review of your submission (before final submission), is supported through our Information Supply Platform. You'll need to be registered with an Infrastructure Hub account, and be affiliated with your organisation to utilise these advanced features. Many organisations will already have a '*Principal respondent*' who can manage submissions and assign users at your organisation with access to the draft responses.
- Submissions will be published on our website after the closing date. The names and details of organisations that submit will be published, but all personal and any commercial sensitive information will be removed.

Further assistance

Each submission that is started is provided a unique reference identifier. These identifiers are shown in the top right of each application page. Use this identifier when seeking further assistance or communicating with us about this submission by using one of the following methods.

- Use info@tewaihanga.govt.nz to contact us with any questions relating to our Discussion Document and consultation.
- Use inform@tewaihanga.govt.nz for help managing roles and permissions of user accounts affiliated with your organisation in the Information Supply Platform (ISP).

Submission method

Our preferred method is to receive responses through this form. However, we anticipate some submitters will wish to upload a pdf document, especially where their submission is complex or long. If this submission method is necessary, please use this word template and save as a pdf. We ask that you retain the structure and headings provided in the template as this will support our processing of responses.

Select a submission method

To continue, select the method you will be using.

Online form

Page 2 - Context for the Plan

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Testing our thinking

The Discussion Document includes five sections. Below we're seeking feedback on why we need a National Infrastructure Plan. We also want to test our thinking on our long-term needs and make sure we have a clear view of what investment is already planned.

Section one: Why we need a National Infrastructure Plan

A National Infrastructure Plan can provide information that can help improve certainty, while retaining enough flexibility to cancel or amend projects as circumstances or priorities change.

1. What are the most critical infrastructure challenges that the National Infrastructure Plan needs to address over the next 30 years?

We (Islands for the Future of Humanity - an independent non-partisan collective advocating for improved NZ National resilience) are most concerned about NZ's lack of assessment, management and mitigation of global catastrophic risks. These low probability but high consequence hazards include extreme pandemics, nuclear war, super volcano eruptions, massive solar storms, global cyberattacks, asteroid/comet impacts, and potential future AI catastrophes.

NZ should take a vulnerability approach to managing these risks, and consider where and how our infrastructure leaves us vulnerable. International assessment describes these risks, for example RAND Corporation's 2024 report "Global Catastrophic Risk Assessment" for the US Government. Our own research group has identified a number of NZ's infrastructure vulnerabilities in the context of global catastrophe, including but not limited to:

- *Liquid fuel supply*
- *Food security*
- *Interisland and coastal shipping*
- *Essential health security capabilities and capacities*
- *Digital communications*

Since the primary function of government is to protect the wellbeing of citizens, a primary focus of government infrastructure investment needs to be ensuring resilience and redundancy across critical systems. A 2023 report by NZCat (see their separate submission based on this report) "Aotearoa NZ, Global Catastrophe, and Resilience Options: Overcoming Vulnerability to Nuclear War and other Extreme Risks" details a portfolio of possible infrastructure projects to enhance resilience to global catastrophe. Infrastructure priorities need to begin by first ensuring basic needs (food, water, shelter, transportation, communications) can be produced and supplied under whatever circumstances.

To the degree that one thinks the market will supply goods and services optimal in business-as-usual circumstances, then the government should focus on facilitating resilience and redundancy for not-business-as-usual scenarios. Unlikely but extreme tail

risk scenarios are where most of the future harm lies (the inevitable next pandemic as one example), and the core function of government as provider of public goods which lack market incentives is to anticipate and mitigate these harms, in the present case, by investing in appropriate infrastructure that ensures resilience to complement market efficiency.

We note that in places the Discussion Document refers to 'resilience to natural hazards'. Given the above, the Commission should be clear that resilience to all hazards is required, both natural and anthropogenic, both local in NZ, and hazards that originate elsewhere but spread to affect the entire world. The RAND report (mentioned above) was mandated by the US Government Global Catastrophic Risk Management Act 2022 on catastrophic risks and is a good starting point. We note the short subsection in the Discussion Document on p56-58, where other risks including supply chain, cyber, and MFATs geopolitical assessment are mentioned. It is probable that when considering likelihood and consequences, that these risks contain most of the expected future harm to NZ (mediated by hazards such as extreme pandemics, nuclear war, solar storms, supervolcano eruptions, AI catastrophes, etc).

2. How can te ao Māori perspectives and principles be used to strengthen the National Infrastructure Plan's approach to long-term infrastructure planning?
N/A

Section two: Our long-term needs

The National Infrastructure Plan will reflect on what New Zealanders value and expect from infrastructure. To do this, the Plan needs to consider New Zealanders' long-term aspirations and how these could be impacted over the next 30 years.

3. What are the main sources of uncertainty in infrastructure planning, and how could they be addressed when considering new capital investments?
A key challenge is to determine the circumstances that could arise. This requires foresight and horizon scanning, and considering future scenarios that include global catastrophes like those listed above, not just business-as-usual projections. This analysis could be undertaken by an all-of-government committee under the supervision of a Chief Risk Officer or similar. A publicly facing National Risk Register would also be a critical component of this. We note that the just released Royal Commission of Inquiry in Covid-19 Lessons Learned makes basically these recommendations, which should generalise across infrastructures and across risks and hazards.

Another key challenge now and over the next 30 years is to anticipate what goods and services (raw materials, expertise, etc) might be in short supply, especially in the case of any future catastrophe, and prioritise infrastructure the construction of which is dependent on access to these commodities. There may not be an opportunity later on to develop certain kinds of essential infrastructure, for example if global trade collapses due to a

nuclear war, or if critical shortages arise. NZ needs to prioritise securing its basic needs (food, water, shelter, transportation, communications - regardless of future conditions). Several reports have detailed NZ's extreme dependence on trade, and the likelihood of societal collapse in its absence, given current infrastructure.

Infrastructure needs to be resilient, but there also needs to be a Plan B, ie resilience infrastructure.

Section three: What investment is already planned

We already gather and share data on current or planned infrastructure projects through the National Infrastructure Pipeline. This data, alongside other information gathered by the Treasury or published by infrastructure providers, helps to paint a picture of investment intentions.

4. How can the National Infrastructure Pipeline be used to better support infrastructure planning and delivery across New Zealand?

N/A

Section four: Changing the approach

We have used our research and publicly available information on infrastructure investment challenges to identify key areas for change. The next question and the following three pages seek further detail on the three themes in section four of our paper. Within each of the three themes, we explore some topics in more detail, outlining the evidence, discussing the current 'state of play', and asking questions about where more work is needed.

5. Are we focusing on the right problems, and are there others we should consider?

Given the foregoing, it is clear that public resources should prioritise scenarios that deviate from business-as-usual, with a vulnerability focus, and ensure resilience gets as much attention as efficiency. Redundancies and 'Plan B' infrastructure need to ensure NZ has the right suite of affordances and capabilities should it need to pivot how it does things, for example in the context of a nuclear war, extreme pandemic, electrical grid collapse (due to a global cyber attack, electromagnetic pulse, or solar storm). Examples of critical problems (those listed above, namely liquid fuel, food supply & distribution, shipping, health security, communications) could be met with infrastructure such as biofuel production capacity, electrification, government owned shipping assets, public health infrastructure, optimized cropping and land use policy, and so on).

We note the continued dominance of investment in the transport sector (as illustrated on p.31). Transport is a critical resilience function (eg to ensure food produce can be

distributed to populations). However, it would be wise to assume some scenarios where liquid fuel imports are not available for months or years (eg nuclear war), and consider investment priorities in locally produced fuel (eg biofuel), transport assets that run well and most efficiently on that fuel (eg coastal shipping assets), electrification of road transport, etc.

Changing the approach — Capability to plan and build

Section four looks at changes that we can make to our infrastructure system to get us better results. We've broken these changes down into three themes: capability to plan and build, taking care of what we have, and getting the settings right.

For the first theme, we look at three key areas:

- Investment management: Stability, consistency, and future focus
- Workforce and project leadership: Building capability is essential
- Project costs: Escalation means less infrastructure services.

Investment management: Stability, consistency, and future focus

We're interested in your views on how we can address the challenges with government infrastructure planning and decision-making.

6. What changes would enable better infrastructure investment decisions by central and local government?

As mentioned above, the introduction of an all-of-government infrastructure decision-making process grounded upon a National Risk Register and overseen by a Chief Risk Officer (or similar) would go a long way to ensuring public good priorities are met.

7. How should we think about balancing competing investment needs when there is not enough money to build everything?

Government support should ensure that basic needs can be met, regardless of circumstances, and therefore prioritisation should follow a hierarchy of needs (starting with infrastructure ensuring water, food, shelter, transportation, communication, etc). Key resilience infrastructures would then include energy systems, liquid fuel, agricultural machinery, food transportation, including interisland, coastal, and trans-Tasman shipping assets, healthcare surge capacity, and so on.

Workforce and project leadership: Building capability is essential

We're interested in your views on how we can build capability in the infrastructure workforce.

8. How can we improve leadership in public infrastructure projects to make sure they're well planned and delivered? What's stopping us from doing this?
N/A

9. How can we build a more capable and diverse infrastructure workforce that draws on all of New Zealand's talent?
We don't have the solution to this, but we concur that an appropriate infrastructure workforce is critical, and needs to be based onshore, given the potential catastrophes listed above. It may not be possible, for example, to fly in French or German engineers to help fix a ruptured fuel pipeline or interisland ferry gearbox (as has been done in the past), in a context such as nuclear war in Europe, or an Indonesian supervolcano eruption.

Project costs: Escalation means less infrastructure services

We're interested in your views on further opportunities to improve our ability to deliver good infrastructure at an affordable cost.

10. What approaches could be used to get better value from our infrastructure dollar? What's stopping us from doing this?
N/A

Page 4 - Taking care of what we've got

Changing the approach — Taking care of what we've got

The second theme in section four looks at how we can get better at taking care of what we have. It looks at three areas:

- Asset management: Managing what we already have is the biggest task
- Resilience: Preparing for greater disruption

- Decarbonisation: A different kind of challenge.

Asset management: Managing what we already have is the biggest task

Asset management means looking after our infrastructure. We are interested in your views on how we can improve planning for this.

11. What strategies would encourage a better long-term view of asset management and how could asset management planning be improved? What's stopping us from doing this?
N/A

Resilience: Preparing for greater disruption

We are interested in your views on how we can better understand the risks that natural hazards pose for our infrastructure.

12. How can we improve the way we understand and manage risks to infrastructure? What's stopping us from doing this?
At present NZ lacks a comprehensive National Risk Assessment and publicly facing National Risk Register, let alone one that includes global catastrophic risks (such as those detailed in the RAND Corporation report for the US Government as mentioned above). Without a commonly agreed risk framework then infrastructure responses to the risks that harbour most of the expected future harm to NZ remain unaddressed. Overcoming this problem requires formalised government foresight and risk assessment capabilities. The DPMC is currently consulting on the topic of their next long-term insights briefing, which proposes to look at global risks. This briefing and other similar products must be joined up across government so that infrastructure can be prioritised based on an all-of-government assessment of expected return on investment and the need to ensure basic needs first. The expected return needs to account for the expected harms of future global catastrophes and the expected offset in harm afforded by the infrastructure.

Decarbonisation: A different kind of challenge

We're interested in your views on how we can improve understanding of the decarbonisation challenge facing infrastructure.

13. How can we lower carbon emissions from providing and using infrastructure? What's stopping us from doing this?

N/A

Page 5 - Getting the settings right

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Changing the approach — Getting the settings right

The third theme in section four looks at how we can get our settings right to get better results from our infrastructure system. It looks at three areas:

- Institutions: Setting the rules of the game
- Network pricing: How we price infrastructure services impacts what we think we need
- Regulation: Charting a more enabling path.

Institutions: Setting the rules of the game

We're interested in your views on what changes to our infrastructure institutions would make the biggest difference in giving us the infrastructure we need at an affordable cost.

14. Are any changes needed to our infrastructure institutions and systems and if so, what would make the biggest difference?

As above, integrate infrastructure decisions with comprehensive national risk assessment and risk management. Also, require that infrastructure decisions consider resilience to a range of scenarios beyond business-as-usual as a key criteria, rather than mere efficiency, which the market will seek to provide anyway.

Network pricing: How we price infrastructure services impacts what we think we need

We're interested in your views on further opportunities to improve network infrastructure pricing.

15. How can best practice network pricing be used to provide better infrastructure outcomes?

N/A

Regulation: Charting a more enabling path

We're interested in your views on further opportunities to improve regulation affecting infrastructure delivery.

16. What regulatory settings need to change to enable better infrastructure outcomes?

N/A

Page 6 - What happens next?

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Additional information to support our development of the Plan

Section five in the Discussion Document is on the next steps. In this section, we're asking you for any additional comments, suggestions, or supporting documentation that we should consider in our development of the National Infrastructure Plan.

17. Do you have any additional comments or suggestions that you would like us to consider as we develop the National Infrastructure Plan?

Click 'Add another' to add multiple suggestions or comments.

Item 1

Regarding financing, the world is in a state of geopolitical flux, and we cannot assume that supply of international goods and services will remain reliable. As such, the prudent approach is likely to be a 'buy now' one. Where borrowing finances a flurry of investment in critical infrastructure required to ensure resilience and the supply of basic needs under future catastrophe scenarios. The advantage of investing now, is that those people alive today are protected (rather than remaining at risk until resilience infrastructure is constructed), as well as those of future generations (across the lifetime of the infrastructure), and recovery of the costs can be apportioned across time in a way that each individual pays an equitable amount for the benefit of equal resilience across time.

For example, if the government thinks it should act to minimise 'stochastic harm' from unpredictable major events, and the majority of this harm stems from global catastrophes (Covid-19 was more damaging to NZ than any other event this century), then government might invest in biofuel refining capability, interisland or trans-tasman shipping infrastructure, and so on, and lease it to the private sector, with the option to control these assets should catastrophe arise. Ensuring NZ has the affordances it needs in times of catastrophe is important. We note that this is not necessarily the most economical approach, but it appropriately balances resilience and efficiency to ensure public wellbeing across time, and across expected iterated catastrophes.

However, as the Discussion Document states, it is "unclear" whether NZers are willing or could afford any particular financing approach, so they must be asked. There needs to be citizen engagement on proposed financing options, that lay out the benefits and drawbacks of each approach. This 'menu of options' approach could be facilitated through citizen assemblies, or similar participative democracy approaches. The voice of citizens needs to be facilitated and up-weighted appropriately in the face of the voice of organisational entities (businesses and the like) that possess resources that enable them to speak and submit at length on these issues.

Item 2

We have written at length on many of the topics above, including a suite of academic papers on health security, food security, fuel security, and the catastrophic impacts of trade isolation for NZ. We are very happy to make an oral presentation if the Commission is interested in more information.

Our work on global catastrophic risks can be accessed here (and includes papers on how to ensure NZ food and fuel security, improving national risk assessment processes, etc): https://www.islandfutures.earth/repository

The Main Report of the Aotearoa/NZ Catastrophe Resilience Project we cite above is here: https://adaptresearchwriting.com/2023/11/16/main-report-aotearoa-nz-global-catastrophe-and-resilience-options/

***Islands for the Future of Humanity** is comprised of: [redacted]. We declare no conflicts of interest pertaining to NZ Infrastructure.*

18. Attach any documents that support your submission

Click 'Add another' to add multiple attachments in PDF format.

Document 1

No attachment

Thank you for your response

Thank you for providing feedback on our Discussion Document. We'll use your comments as we continue to develop the Plan. This will not be the only opportunity for you to provide feedback, but it is an important way to test our emerging thinking on the development of an enduring National Infrastructure Plan.

If you have prepared a submission on behalf of an organisation, you'll need to be an authorised *respondent* to make the final submission. If you entered a new organisation during sign-up, or your organisation does not already have a *Principal respondent* assigned, you will have been asked to nominate yourself or someone else for this role as you started this submission. Our team will have worked to verify these accounts allowing *Principal respondents* to manage access and assignment of requests for information to people within your organisation.

If you require any assistance please reach out to our team at inform@tewaihanga.govt.nz.