NEW ZEALAND
INFRASTRUCTURE
COMMISSION
Te Waihanga

Testing our thinking

Te whakapātaritari i ō mātou whakaaro

Developing an enduring National Infrastructure Plan

He whakawhanake i tētahi Mahere Tūāhua ā-Motu auroa

Discussion Document

Tuhinga Matapaki

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New Zealand Infrastructure Commission | Te Waihanga

Te Waihanga seeks to transform infrastructure for all New Zealanders. By doing so our goal is to lift the economic performance of Aotearoa and improve the wellbeing of all New Zealanders.

We are an autonomous Crown entity, listed under the Crown Entities Act 2004, with an independent board. We were established by the New Zealand Infrastructure Commission/Te Waihanga Act 2019 on 25 September 2019.

Information on the Commission is available at www.**tewaihanga**.govt.nz

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About this document

This document sets out our thinking as we begin work to develop a National Infrastructure Plan. It describes 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.

You'll find questions in each section of this document and you can share your views through our feedback form. **https://inform.tewaihanga.govt.nz/make/b70ca024-cbad-4770-a076-b21e0099aca3**

We'll use your comments as we continue to develop the Plan, but it won't be the only opportunity to share views. We'll be holding webinars and workshops, sharing updates, and will also be consulting on a draft Plan before we develop the final Plan.

To hear more please sign up to our newsletter. **https://tewaihanga.govt.nz/newsletter**

He kōrero mō tēnei tuhinga

E whakatakoto ana tēnei tuhinga i ō mātou whakaaro i a mātou e tahuri ana ki te whakawhanake i te Mahere Tūāhanga ā-Motu. Kei te whakaahuatia ngā mea e manakotia ana ka kapi i te Mahere me te raruraru e whakamātau ana ia ki te whakaoti, me te huarahi e marohitia ana e mātou hei whai ki te whakawhanake.

E whakaaturia ana tēnei e mātou i tēnei wā hei whakapātaritari i ō mātou whakaaro me te whakarato ara wātea ki a koe ki te tuhi mai i ō whakaaro. Whakamōhio mai mēnā kei te tika tā mātou, mēnā rānei he take anō i mahue i a mātou, ki tō titiro.

Ka kitea e koe ngā pātai i ia wāhanga o tēnei tuhinga, ā, ka taea e koe te whakapuaki i ō whakaaro mā tā mātou puka urupare. **https://inform.tewaihanga.govt.nz/make/b70ca024-cbad-4770-a076-b21e0099aca3**

Ka whakamahia e mātou ō whakahokinga kōrero i a mātou e hoahoa ana i te Mahere. Ka tohaina e mātou ō mātou whakaaro mā te whakaatu ki ngā taiopenga huri noa i te motu, me te whakahaere awheawhe me ngā kauwhaurangi, me te tuku kōrero hōu mā tā tātou paetukutuku, pānui me ngā pae pāhopori. Ka kimi urupare hoki mātou mō tetahi Mahere tauira i mua i tā mātou whakaputa i te Mahere ngao matariki hei te Hakihea 2025.

Mō te roanga atu o ngā kōrero, tēnā, rēhita mai ki tā mātou pānui. **https://tewaihanga.govt.nz/newsletter**

About the National Infrastructure Plan

New Zealanders have different expectations for what we want and need from our infrastructure – our roads, schools, hospitals, water networks and more. We also need to make some big decisions about getting the infrastructure we need in the right places at the right time, and in a way that's affordable. To do this we need to develop a shared, long-term view of our infrastructure expectations and priorities.

A National Infrastructure Plan can give us this long-term view, and answer some key questions:

- What's needed and what should we be spending over the next 30 years?
- What's our planned investment over the next 10 years?
- What's the gap between the long-term infrastructure need and planned investment? How do we address that gap?

The Minister for Infrastructure has asked the New Zealand Infrastructure Commission, Te Waihanga, to lead this work, but we'll be working across central and local government, the sector and industry, and with the public to ensure the Plan is enduring.

The National Infrastructure Plan isn't about identifying a multi-decade list of projects. Instead, it's an opportunity to give us greater certainty about what we should build.

It will build on the work that Te Waihanga did on Rautaki Hanganga o Aotearoa, the New Zealand Infrastructure Strategy, which made recommendations and set objectives for improving New Zealand's infrastructure system.

The National Infrastructure Plan will be delivered to the Minister for Infrastructure in 2025, and the Government will then respond.

National Infrastructure Plan

August to December 2024:

Testing our thinking

January to April 2025:

Building our knowledge

Mid - 2025:

Sharing our findings

December 2025:

Final National Infrastructure Plan presented to the Government

He kōrero mō te Mahere Tūāhanga ā-Motu

He huhua noa ngā tūmanako o ngāi Aotearoa ki ngā mea e hiahiatia ana e tātou i ō tātou tūāhanga - ō tātou ara, kura, hōhipera, whatunga wai me te maha noa atu. He nui anō ngā kōwhiringa hei whakatau mā mātou mō te whakatū i ngā tūāhanga e matea ana e tātou i ngā wāhi tika, me ngā wā tika, i runga i tētahi huarahi he māmā te utu. Hei whakatutuki i tēnei me whakawhanake e tātou he tirohanga pātahi, pae tawhiti ki ō tātou kawatau tūāhanga, whakaarotau anō hoki.

Ka taea e te Mahere Tūāhanga ā-Motu te whakarato i tēnei tirohanga pae tawhiti, me te whakautu hoki i ētahi pātai mātuatua:

- He aha ngā mea e matea ana, e hia te pūtea me whakapau e tātou i roto i te 30 tau e tū ake nei?
- He aha tā tātou haumi kua whakaritea mō te 10 tau e haere ake nei?
- He aha te āputa i waenga i te matea tūāhanga pae tawhiti me te haumi kua whakaritea? Me pēhea tā tātou whakakī i te āputa?

Kua tono te Minita mō ngā take Tūāhanga ki Te Waihanga ki te ārahi i ēnei mahi. Nō reira, e tūroa ai te Mahere, ka mahi tahi mātou ki te kāwanatanga me ngā kaunihera, ki te rāngai me te ahumahi, me ngāi tūmatanui.

Ehara te whai a te Mahere Tūāhanga ā-Motu i te tautohu i tētahi rārangi pūtere tekau tau matarau te roa. Engari, he ara wātea kē tēnei ki te whakaū i ngā whakaritenga me te māramatanga whānui mō ngā ratonga ka matea pea kia haumitia e tātou, tae ana ki ngā wā me ngā papa.

Ka whai mātou i ngā mahi i mahia e Te Waihanga mō te Rautaki Hanganga o Aotearoa. I whakatakotoria i roto i taua rautaki he tūtohunga, i whakaritea hoki he whāinga mō te whakapakari ake i te pūnaha tūāhanga o Aotearoa.

Ka tukuna te Mahere Tūāhanga ā-Motu ki te Minita mō ngā take Tūāhanga i 2025, kātahi ka whakahoki te Kāwanatanga ki te mahere.

National Infrastucture Plan

August to December 2024:

Testing our thinking

January to April 2025:

Building our knowledge

Mid - 2025:

Sharing our findings

December 2025:

Final National Infrastucture Plan presented to the Government

What we're doing to develop the Plan

Te Waihanga has work underway that will contribute to the National Infrastructure Plan. This includes the following:

Infrastructure needs analysis: We are identifying long-term needs, factors that will affect the demand for infrastructure over the next 5-30 years, and the possible costs. This will help to show the changes we need to make to deliver New Zealand's infrastructure well. This work will include forecast modelling and analysing future scenarios to understand the nature of the uncertainties we face and how they will affect infrastructure. This can help us prepare for the future, whatever it may bring.

Current investment intentions: We are forming a comprehensive view of the infrastructure investment that's currently planned. This draws on sources that include the National Infrastructure Pipeline that Te Waihanga manages, the Treasury's Quarterly Investment Reporting, local government plans and significant private sector investment intentions.

Further information about the National Infrastructure Pipeline can be found at **https://www.tewaihanga.govt.nz/the-pipeline**

Infrastructure Priorities Programme (IPP): Through the IPP, we are independently reviewing unfunded infrastructure proposals to give decision-makers a menu of high-quality vetted proposals. The assessment will provide confidence to decision-makers that these proposals are nationally important, offer value for money, and can be delivered.

A list of proposals that have been through the IPP will be published alongside the Plan and updated on a regular basis. We are currently inviting applications to the IPP up until 20 December 2024 and successfully assessed proposals will be published post-Budget 2025. A second round will begin in February 2025 and the results will be published in September 2025. Proposals will still need to meet relevant business case requirements, and we are working with the Treasury to integrate the IPP with their processes to make sure that there is no duplication.

Further information about the IPP and how you can contribute can be found at **https://www.tewaihanga.govt.nz/our-work/infrastructure-priorities-programme**

Gap analysis and proposed approach for infrastructure investment: We will bring together the infrastructure needs analysis, current investment intentions, and analysis from the Infrastructure Priorities Programme to identify:

- how infrastructure investment could be better prioritised and sequenced to improve outcomes
- funding constraints and the trade-offs required between areas of infrastructure need to support how infrastructure investment decisions are made.

This analysis will give us a recommended approach to infrastructure investment for meeting New Zealand's needs. It will show what's already planned over the next 5-10 years, as well as areas where we need to invest over the longer term.

Policy and system reforms: We will identify some of the main challenges in New Zealand's infrastructure system and the changes needed to overcome these.

What will the Plan look like?

While we'll publish a document that summarises our key findings and recommendations, the National Infrastructure Plan will have a number of parts that we'll also be sharing. These include:

- the National Infrastructure Pipeline and the Infrastructure Priorities Programme which provide regularly updated insights into planned and potential future investments
- workforce capacity and demand modelling
- past and ongoing research to inform the Plan
- the underlying models, data and tools used to develop the Plan.

He aha ā mātou mahi ki te whakawhanake i te Mahere

E whakahaere mahi ana Te Waihanga hei takoha atu ki te Mahere Tūāhanga ā-Motu. Arā, koia ko ēnei:

Te tātari matea tūāhanga: Kei te tautohu mātou i ngā matea pae tawhiti, me ngā āhuatanga ka pā ki te popono ki ngā tūāhanga i roto i te 5-30 tau e whai ake nei, me ngā utu pitomata. Ka āwhina tēnei ki te whakaatu i ngā panoni e tika ana kia mahia e whaihua ai te whakatūnga o ngā tūāhanga o Aotearoa. Kei roto i ēnei mahi ko te whakatauira matapae me te tātari i ngā āhuatanga anamata e mōhio ai tātou ki te āhua o ngā āhuatanga pāhekeheke kei mua i a tātou, me te āhua o tā rātou pā mai ki ngā tūāhanga. Mā konei tātou e āwhinatia ai ki te whakarite mō te anamata, ahakoa pēhea ngā āhuatanga ka tōia e ia.

Ngā koronga haumi o nāianei: E waihanga ana mātou i tētahi tirohanga matawhānui mō te haumi tūāhanga i whakaritea o te wā nei. Ka whakawhirinaki tēnei ki ngā puna kōrero pēnei i te Rārangi Tūāhanga ā-Motu e whakahaeretia ana e Te Waihanga i ia hauwhā, me te Pūrongo Haumi i ia hauwhā a te Tai Ōhanga, me ngā mahere a ngā kaunihera me ngā koronga haumi tāpua o te rāngai tūmataiti.

Ka kitea te roanga atu o ngā kōrero e pā ana ki te Rārangi Mahi Tūāhanga ā-Motu i **https://www.tewaihanga.govt.nz/the-pipeline**

Hōtaka Whakaarotau Tūāhanga (IPP): Mā roto i te IPP, kei te arotake motuhake mātou i ngā tono tūāhanga kāore e whai haumi hei tuku atu ki te hunga whakatau i tētahi tahua o ngā tono tino kounga i oti ai te arotake. Mā te arotake e whakamanawatia ai te hunga whakatau he mea whai tikanga ā-motu ēnei tono, he nui te wāriu engari he pāpaku te utu ā, e taea ana te whakatutuki.

Ka tāia te rārangi o ngā tono i tukatukahia mā te IPP i te taha tonu o te Mahere, ā, ka rite tonu tōna whakahōungia. I tēnei wā e tango ana mātou i ngā tono ki te IPP tae noa ki te marama o Hakihea 2024. Ka tāia ngā tono i angitu te arotake i muri atu i te Tahua Pūtea 2025. Ka tīmata te rauna tuarua i te marama o Hui-tanguru 2025, ā, ka whakaputaina ngā hua i te marama o Mahuru 2025. Me tutuki tonu i ngā tono ngā matea take pakihi whai hāngai. Ka mahi tahi mātou me te Tai Ōhanga ki te whakauru i te IPP ki ā rātou tukanga hei whakaū kāore he tāruatanga.

Ka kitea te roanga atu o ngā kōrero mō te IPP me te huarahi e taea ai e koe te takoha i **https://www.tewaihanga.govt.nz/our-work/infrastructure-priorities-programme**

Te tātari āputa me te huarahi e tūtohungia ana mō te haumi tūāhanga: Ka whakatōpūhia e mātou te tātari matea tūāhanga, ngā koronga haumi o te wā, me te tātari mai i te Hōtaka Whakaarotau Tūāhanga hei tautohu i:

- te āhua e pai ake ai te whakamātāmuatia o te haumi tūāhanga, me tōna whakaraupapatanga e whaihua ake ai ngā putanga
- i ngā herenga pūtea me ngā āhuatanga tuku e matea ana i waenga i ngā wāhanga matea ā-tūāhanga hei whakaatu i te tukanga whakatau take tūāhanga.

Mā tēnei tātaritanga ka whakakitea mai ki a mātou tētahi huarahi whai tautoko ki te haumi tūāhanga hei whakatutuki i ngā matea haumi tūāhanga o Aotearoa. Ka whakakite mai ia i ngā mea ka oti te whakamahere i roto i te rima ki te tekau tau e heke mai nei, waihoki ngā wāhanga e tika ana kia haumitia e tātou i roto i te wā roa.

Ngā hanganga hōu i ngā kaupapa here me te pūnaha: Ka tautohua e mātou ētahi o ngā tino raruraru i te pūnaha tūāhanga o Aotearoa me ngā panonitanga e matea ana ki te whakatika i ēnei.

Ka pēhea te āhua o te Mahere?

Ahakoa ka tāia e mātou he tuhinga e whakarāpopoto ana i ā mātou kitenga matua me ā mātou tūtohunga, he maha ngā wāhanga o te Mahere Tūāhanga ā-Motu ka tohaina e mātou. Ko ēnei ko:

- te Rārangi Mahi Tūāhanga ā-Motu me te Hōtaka Whakaaro Tūāhanga. He rite tonu te tuku a ēnei i ngā māramatanga o te wā ki ngā haumi i oti ai te whakamahere, me ngā haumi pitomata hoki
- te kaha o te ohumahi me te whakatauira popono
- ngā rangahau o mua, rangahau haere tonu hoki hei whakaawe i te Mahere
- ngā tauira tūāpapa, ngā raraunga me ngā taputapu i whakamahia hei hoahoa i te Mahere.

What do we want to know from you?

This document sets out our thinking as we begin work to develop a National Infrastructure Plan. Below is a complete list of the questions that we're asking in this document. You'll also find questions in each section of this document. You can share your views through our feedback form. **https://inform.tewaihanga.govt.nz/make/b70ca024-cbad-4770-a076-b21e0099aca3**

Section one: Why we need a National Infrastructure Plan

1. What are the most critical infrastructure challenges that the National Infrastructure Plan needs to address over the next 30 years?
2. How can te ao Māori perspectives and principles be used to strengthen the National Infrastructure Plan's approach to long-term infrastructure planning?

Section two: Long-term expectations

3. What are the main sources of uncertainty in infrastructure planning, and how could they be addressed when considering new capital investments?

Section three: Existing investment intentions

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

Section four: Changing the approach

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

Theme one: Capability to plan and build

Investment management: Stability, consistency and future focus

6. What changes would enable better infrastructure investment decisions by central and local government?
7. How should we think about balancing competing investment needs when there is not enough money to build everything?

Workforce and project leadership: Building capability is essential

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?
9. How can we build a more capable and diverse infrastructure workforce that draws on all of New Zealand's talent?

Project costs: Escalation means less infrastructure services

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

Theme 2: Taking care of what we've got

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

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?

Resilience: Preparing for greater disruption

12. How can we improve the way we understand and manage risks to infrastructure? What's stopping us from doing this?

Decarbonisation: A different kind of challenge

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

Theme 3: Getting the settings right

Institutions: Setting the rules of the game

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

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

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

Regulation: Charting a more enabling path

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

Section five: What happens next?

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

He aha tā mātou e hiahia nei hei whakamōhio mai māu?

E whakatakoto ana tēnei tuhinga i ō mātou whakaaro i a mātou e tahuri ana ki te whakawhanake i te Mahere Tūāhanga ā-Motu. Kei raro nei ngā pātai e ui ana mātou i tēnei tuhinga. Ka kitea hoki e koe ngā pātai i ia wāhanga o tēnei tuhinga. Ka taea e koe te tuhi mai i ō whakaaro i roto i tā mātou puka whakahokinga kōrero. **https://inform.tewaihanga.govt.nz/make/b70ca024-cbad-4770-a076-b21e0099aca3**

Wāhanga tuatahi: He aha tātou e mate nei ki tētahi Mahere Tūāhanga ā-Motu

1. He aha ngā wero tūāhanga taumaha me whakatau e te Mahere Tūāhanga ā-Motu i roto i te 30 tau e haere ake nei?
2. Pēhea te whakamahi i ngā tirohanga nō te ao Māori me ngā mātāpono hei whakakaha ake i te huarahi o te Mahere Tūāhanga ā-Motu ki te whakamahere tūāhanga?

Wāhanga tuarua: Ngā kawatau pae tawhiti

3. What are the main sources of uncertainty in infrastructure planning, and how could they be addressed when considering new capital investments?

Wāhanga tuatoru: Ngā koronga haumi o te wā

4. Me pēhea te Rārangi Mahi Tūāhanga ā-Motu e whakamahia ai kia whaihua ake te tautoko i te whakamahere tūāhanga, me tōna tukunga huri noa i Aotearoa?

Wāhanga tuawhā: Te huri i te huarahi

5. Kei te arotahi mātou ki ngā raruraru tika, he aha ētahi hei whakaaro mā mātou?

Kaupapa tuatahi: Te kaha ki te whakamahere me te hanga

Whakahaere haumi: Te pūmau, te ōrite, me te arotahi ki te anamata

6. He aha ngā panonitanga hei whakaahei i te kāwanatanga me ngā kaunihera kia whaihua ake ai ā rātou whakatau haumi tūāhanga?
7. Me pēhea te āhua o ō mātou whakaaro ki te whakataurite i ngā matea haumi whakataetae ina kore rawa he pūtea hei hanga i ngā mea katoa?

Te ohumahi me te ārahi pūtere: He mea nui te kaha ki te hanga whare

8. Me pēhea tā mātou whakapakari ake i te ārahitanga i ngā pūtere tūāhanga tūmatanui hei whakaū kua nui te whakaritea o ērā, ā, ka tukua hoki? He aha ngā āhuatanga e aukati ana i a tātou i te mahi i tēnei?
9. Me pēhea tā mātou waihanga ake i tētahi ohumahi kaha ake, kanorau ake hoki, e tō mai ana i ngā pūkenga katoa o Aotearoa?

Utu pūtere: Ki te piki ake te utu ko te tukunga iho ko te heke iho i ngā ratonga tūāhanga wātea

10. He aha nga huarahi ka taea te whakamahi kia nui ake ai te wāriu mai i ā tātou tāra tūāhanga? He aha ngā āhuatanga e aukati ana i a mātou ki te mahi i tēnei?

Kaupapa tuarua: Te tiaki i ngā rawa kei a tātou i tēnei wā

Whakahaere rawa: Ko te whakahaere i ngā rawa kei a tātou i te wā nei tā tātou tūmahi nui rawa atu

11. He aha ētahi rautaki hei whakamanawa i tētahi tirohanga pae tawhiti whaihua ake ki te whakahaere rawa, ā, mā te aha hoki e pai ake ai te whakamahere whakahaere rawa. He aha ngā āhuatanga e aukati ana i a mātou ki te mahi i tēnei?

Manawaroa: Te whakarite mō ngā tauwhatinga nui ake

12. Me pēhea tā mātou whakapakari ake i te āhua o tō mātou mārama, me tā mātou whakahaere i ngā tūraru ki ngā tūāhanga? He aha ngā āhuatanga e aukati ana i a mātou ki te mahi i tēnei?

Whakakore whakawaro He momo wero rerekē

13. Me pēhea e taea ai e mātou te whakaheke i ngā tuku waro mai i te tuku me te whakamahi tūāhanga? He aha ngā āhuatanga e aukati ana i a mātou ki te mahi i tēnei?

Kaupapa tuatoru: Kia tika ngā tautuhinga

Ngā whakanōhanga: Te whakarite i ngā ture o te kēmu

14. E matea ana he panonitanga ki ō tātou whakanōhanga tūāhanga me ō tātou pūnaha, ā, mehemea āe, he aha ngā panonitanga ka tino whaihua?

Utu whatunga: Ka whakaaweawetia ō tātou whakaaro ki ō tātou matea e te āhua o tā tātou whakarite i te utu mō ngā ratonga tūāhanga

15. Ka pēhea te utu whatunga e taea ai te whakamahi hei whakarato i ngā putanga tūāhanga pai ake?

Waeture: Te whakamahere i tētahi huarahi whakaahei

16. Ko ēhea tautuhinga ā-waeture me panoni hei whakaahei i ngā putanga tūāhanga whaihua ake?

Wāhanga tuarima: Ka aha i muri mai?

17. He kōrero, he tūtohunga anō rānei āu e hiahia ana koe kia whakaarongia e mātou i a mātou e hoahoa ana i te Mahere Tūāhanga ā-Motu?

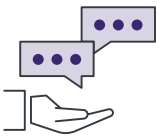
Section one:

1

Why we need a National Infrastructure Plan

He aha tātou e mate nei ki tētahi Mahere Tūāhanga ā-Motu

Gettyimage_SCM Jeans



Discussion questions
- what do you think?

Discussion Questions

Question 1

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

Question 2

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

Laying a foundation for the people, places, and businesses of New Zealand to thrive

Our infrastructure delivers services we depend on like power, water, transport, healthcare and education. It allows us to share resources so that we can be more connected, healthier, sustainable, wealthier and smarter.

In many cases, this infrastructure was built and paid for by prior generations. We need to ensure we leave future generations with just as strong a legacy, while making sure we don't overly burden them with the costs.

This will mean making careful choices about where we spend our infrastructure dollar, understanding what our needs are, while also allowing flexibility for the needs we can't foresee. A National Infrastructure Plan can give us the information we need to do this, while helping to tackle some of our greatest infrastructure challenges.

We need greater certainty, but also flexibility

New Zealand needs greater certainty about what is important to us and where we should be choosing to invest. An increased level of certainty helps us to better understand what skills and people we'll need to build our infrastructure, and what projects we should be prioritising to ensure New Zealand continues to thrive.

At the same time, it's also important to allow for flexibility.

If we lock in projects years in advance, we risk building the wrong projects, in the wrong places, at the wrong times as circumstances or needs change.

Looking back 30 years highlights just how much can change. We built infrastructure over this time that would not have been imagined in 1995, like fibre broadband or large solar farms. Our expectations for infrastructure have also changed. We want our roads to be safer than we did 30 years ago, and we want sewage to be more thoroughly treated before it goes into the sea.

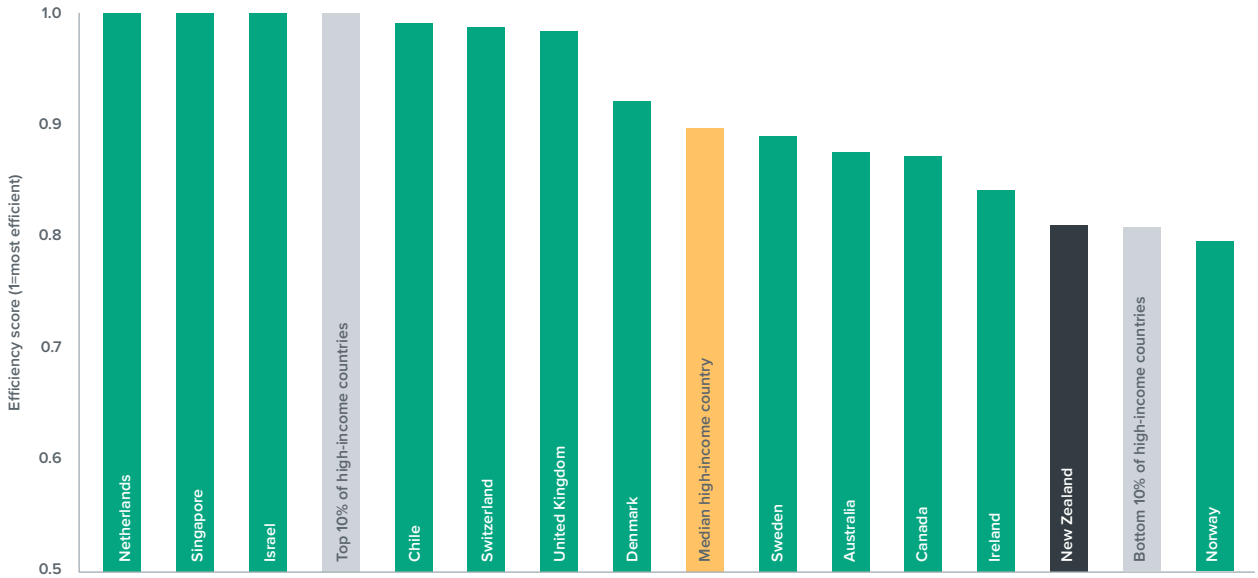
Unforeseen events also affect our infrastructure needs. These could be natural disasters, technology change, or shifts in people's behaviour.

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.

We don't get enough for our infrastructure spend

One of New Zealand's biggest infrastructure challenges is investment efficiency. New Zealand spends an average of 5.8% of GDP on public and private infrastructure. International comparisons show that our infrastructure investment levels as a percentage of GDP are higher than Australia and the median OECD country. However, New Zealand ranks near the bottom 10% of high-income countries for the efficiency of that spend (Figure 1).

Figure 1: The ranking of efficiency of public infrastructure spend



Source: New Zealand Infrastructure Commission, 2021.

We face challenges in turning our resources into infrastructure services. We can see this in the costs of the labour and materials needed to build infrastructure, where prices have risen one-third faster than prices elsewhere in the economy. It can also be seen in productivity, where infrastructure construction productivity has grown at only one-third of the rate of the overall economy. New Zealand also ranks poorly against other high-income countries on many of the measures used to assess infrastructure governance practices.

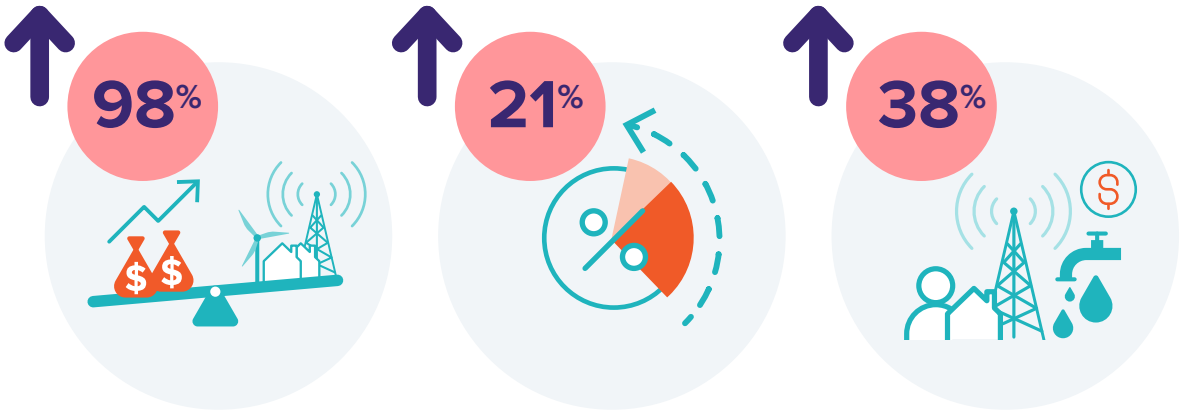
A National Infrastructure Plan can help in charting a path through these challenges and by providing information on where investment can have the greatest impact.

We can't build our way out of all our challenges

We've previously commissioned research that looked at New Zealand's infrastructure needs. It showed that if we were to build all the infrastructure we need, it would cost 9.6% of our GDP – almost twice what we are currently spending and more than we've spent in the past.

This would require significant increases in debt, taxes paid, or user charges (Figure 2), and it's unclear New Zealanders would be willing to or could afford to pay this.

Figure 2: What would be required if we were to double our spending on public infrastructure



increase in debt-to-GDP ratio by 2051, or

increase in the average income tax paid per taxpayer, or

increase in household spending on infrastructure services (about $5,200 extra per household per year)

Source: Briefing to the Incoming Minister for Infrastructure, New Zealand Infrastructure Commission, 2023.

Instead, a National Infrastructure Plan can take a realistic view of how much money we've got for looking after and improving our infrastructure in the long term to help build a better collective understanding of the choices we have. It can also look at options for paying for infrastructure that better reflect people's needs while also helping reduce the demand for infrastructure. A good example of this is volumetric charging for water, which can help spread the cost while encouraging people to conserve water.

We need to improve the way we govern our infrastructure

We have policies, frameworks, processes and tools that guide the way we govern our infrastructure. This governance is how we make sure that the government's infrastructure investments meet New Zealand's long-term objectives and aspirations.

This isn't just about making decisions on what to invest in, it's also about understanding how investments are being delivered, and how infrastructure is being operated and maintained throughout its useful life.

However, New Zealand ranks poorly against other high-income countries on many of the measures used to assess governance practices (Figure 3).

Figure 3: Benchmarking infrastructure governance in New Zealand

Source: OECD

We can get better at working together

The infrastructure system is large, decentralised and complex. There are many players, numerous priorities, trade-offs and options for potential projects that are all competing for limited funding, resources, workforce and attention. We also tend to plan and make decisions in the silos we have built to manage and deliver our infrastructure services.

This complexity can make it hard for infrastructure organisations to coordinate and work together. Each has their own priorities and pressures. But there's a clear need for better coordination, as our infrastructure networks do not operate in isolation. Our roads carry powerlines and water pipes, and connect with our homes, hospitals and schools.

The benefits of coordination are most obvious during challenges like natural disasters, where providers have worked together to get effective results quickly. But to work together, organisations need good information about what's needed and planned – something that a National Infrastructure Plan can help provide.

The National Infrastructure Plan provides an opportunity to coordinate infrastructure planning, delivery and operations, in a more efficient and timely way. This enables infrastructure investment to be focused on the right things at the right times, reduced project costs, and delivery of more affordable services.

Where you can find out more

Discover the Strategy:

Rautaki Hanganga o Aotearoa (May 2022)

How is our infrastructure tracking?

Monitoring progress against New Zealand's first Infrastructure Strategy (May 2024)

2

Our long-term needs

Ngā kawatau pae tawhiti

Gettyimage_Wirestock

Discussion questions
- what do you think?

Discussion Question

Question 3

What are the main sources of uncertainty in infrastructure planning, and how could they be addressed when considering new capital investments?

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.

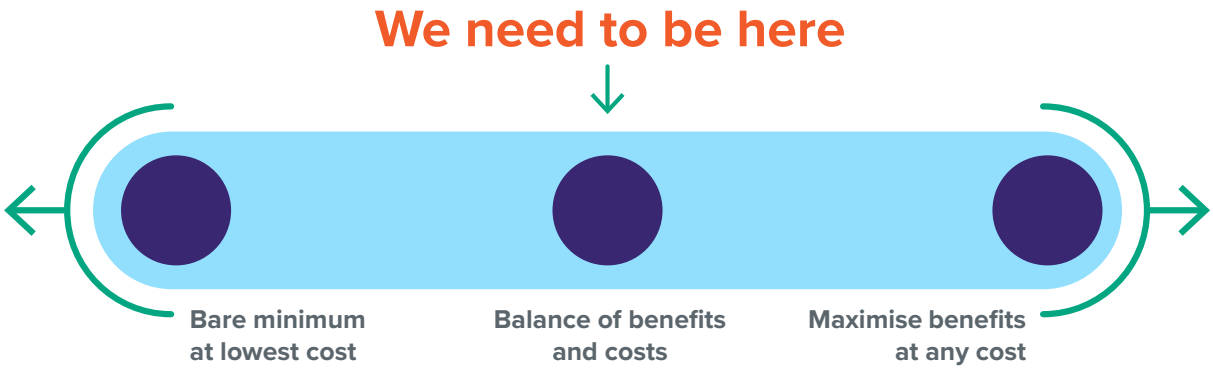
Our current work

How are we considering our long-term infrastructure needs?

We all have different expectations of what we'll get from our infrastructure

This affects how we plan for and invest in infrastructure. These expectations could, at one extreme, be limited to the bare minimum infrastructure we need to survive, such as drinking water supply, or at the other extreme, the best quality of service possible (Figure 4). However, infrastructure is not free. The cost of providing infrastructure must be weighed against the benefit it provides and our willingness as a society to pay for it. That means there's a balance to be struck when determining our long-term expectations for future infrastructure investment.

Figure 4: The spectrum of infrastructure needs



Source: Paying it forward, New Zealand Infrastructure Commission, 2024.

We are taking a system-wide approach to assessing the need for infrastructure [1]

We could assess long-term infrastructure investment in two ways: either by adding up projects and investment plans across all infrastructure sectors, or by taking a system-wide view on how much infrastructure is needed and considering the factors that drive investment in different sectors and regions.

We are planning to take a system-wide approach to assessing needs. This allows us to put different investment needs in context and see how they may fit together over time. For this approach, we will start with the infrastructure that we already have and consider how factors like a changing population may increase or decrease the need for investment in the future.

We will also consider the constraints we can expect to face when investing in infrastructure

Any increase in investment will need to be paid for by society in some way, such as through increased user charges or taxes. We will take a realistic view on what financial resources we are likely to have for infrastructure investment.

[1] This approach draws upon lessons from our previous work and from other infrastructure bodies' approaches to define and measure investment needs, such as Infrastructure Australia's 2019 Australian Infrastructure Audit, the UK National Infrastructure Commission's 2023 National Infrastructure Assessment, and the Global Infrastructure Hub's 2017 Infrastructure Outlook.

How will we determine the long-term need for infrastructure?

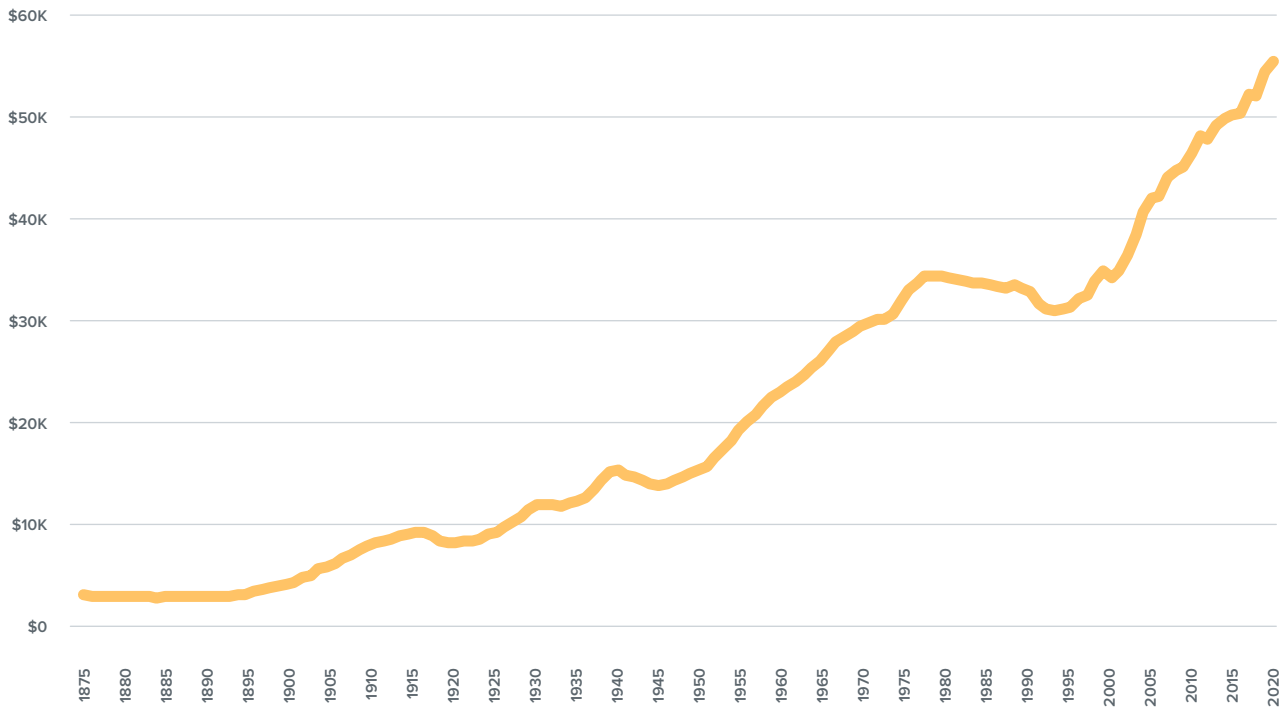
We have been investing in infrastructure at a consistent rate for recent decades

This investment allows us to build new and improved infrastructure faster than existing infrastructure is wearing out. New Zealand invests in infrastructure at a comparable rate to other high-income countries. If anything, we invest a bit more than the OECD average.

We've got more infrastructure than ever before

The amount of infrastructure we have has increased significantly over time, and particularly over the past 30 years (Figure 5).

Figure 5: Per capita infrastructure stock in New Zealand, 1875 to 2022



Source: New Zealand Infrastructure Commission's analysis of various historical sources including the New Zealand Official Yearbook, Stats NZ's Long-Term Data Series, and Stats NZ National Accounts.

But New Zealand is among the least efficient high-income countries in terms of what we get for that spend

One reason for this is our geography – larger, more densely populated countries tend to be more efficient at providing infrastructure. Another reason is that we are not always making investment decisions that result in the best value for society.

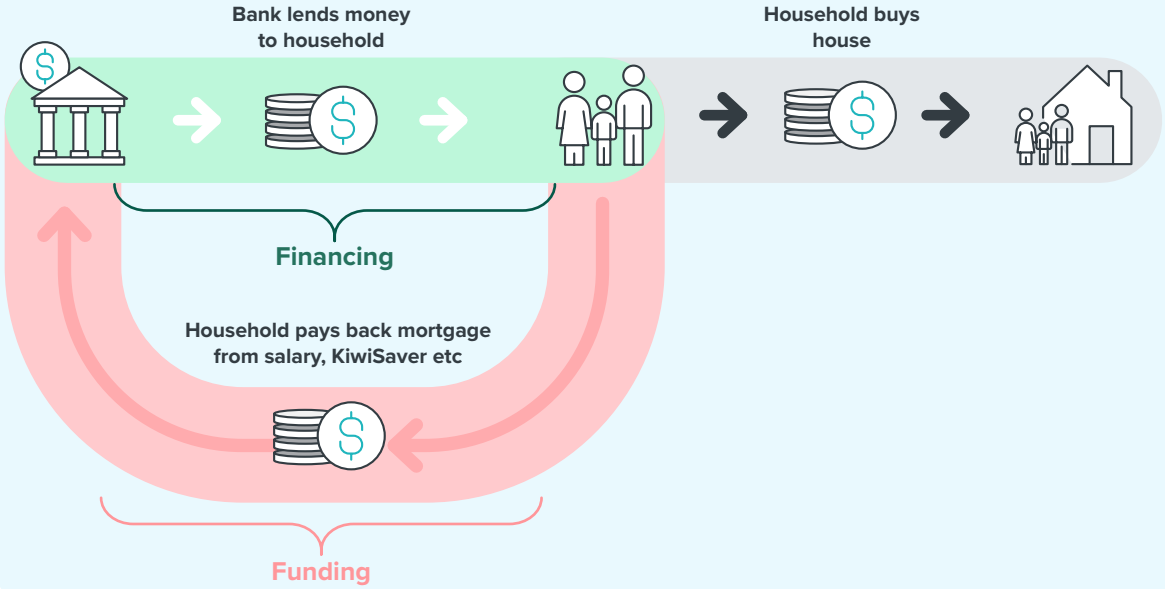
We need to consider what we are willing to pay for infrastructure

The amount of money we have available to invest in infrastructure, and our expectations for the services we'll get from it, are limited by our willingness and ability as a society to pay for it.

Box 1: The financial sector won't fund our infrastructure

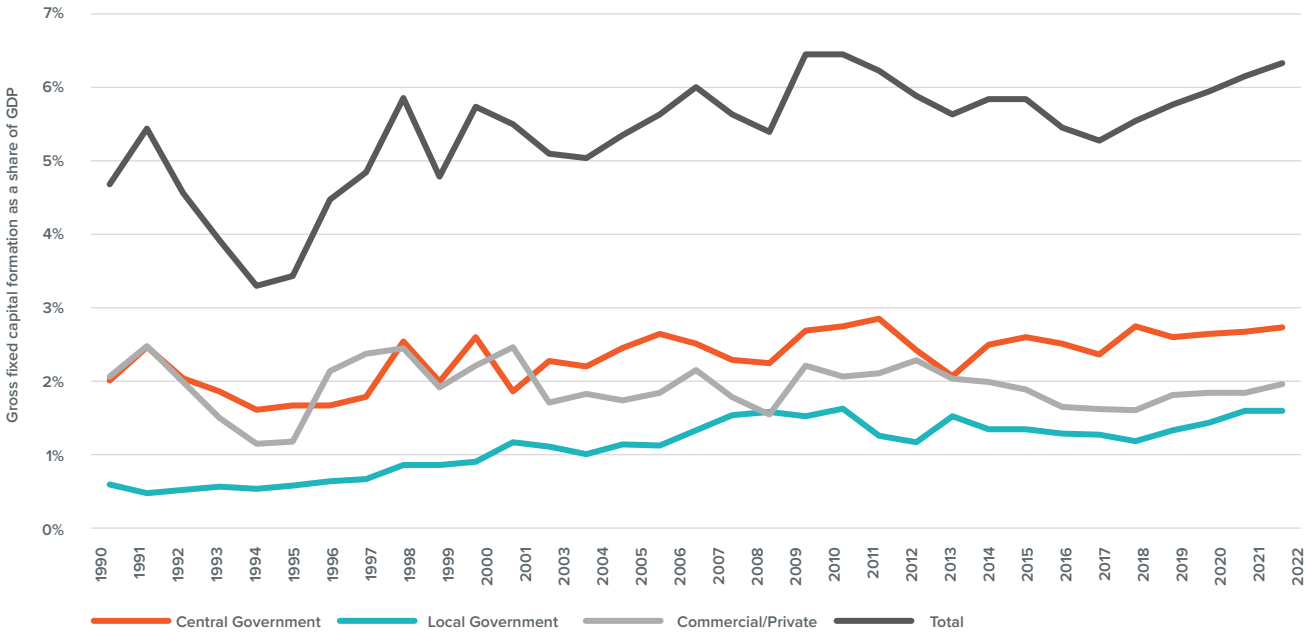
It is common for the terms 'funding' and 'financing' to be used interchangeably, but they are not the same thing. Funding represents all the money needed to pay for infrastructure. It comes from the community through users, taxpayers, or ratepayers. Financing is about when we pay for our infrastructure. It could mean using cash surpluses now or borrowing from sources we need to service and repay later.

For example, when you buy a house, you finance the purchase through a mortgage from the bank. They lend you the money to buy the house. However, ultimately, you fund the purchase of the house, by paying the mortgage back using your income.



Over the last 20 years, we've spent around 5.0% to 6.5% of our GDP on infrastructure. Based on the average expenditure since 2003, we can expect to spend around $24 billion on infrastructure in 2024 (Figure 6).

Figure 6: New Zealand infrastructure investment as a share of GDP, 1990 to 2022



Source: New Zealand Infrastructure Commission's analysis of Stats NZ data.

Not all of this money is available for new infrastructure

Over the last few decades, for every $10 of new or improved infrastructure we built, around $6 of existing infrastructure wore out or reached the end of its usable life. This suggests that in the long term, almost 60% of investment is needed to renew and replace existing infrastructure.

We also need to consider whether there are infrastructure investments that can be made to improve economic growth or productivity at a national or regional level, or both. If infrastructure investment can generate economic growth, it could lead to increased revenue that can then fund more infrastructure. If investment can generate benefits and value for people and businesses, they may also be willing to pay extra for it, creating another source of funding for infrastructure.

It is critical that we choose and prioritise the right projects. While new infrastructure can yield new revenue streams, the 'bang for our buck' can vary significantly by project and can depend on whether it is built in an area where it is most needed. [2] If we don't, future infrastructure renewal and maintenance costs will result in long-term liabilities and financial strain for its owners.

Considering where or how we should invest in the future

The National Infrastructure Plan will aim to give decision-makers information and advice about what will drive infrastructure spending over the next 30 years and how this could change over that time.

[2] Pedro R.D. Bom & Jenny E. Ligthart, 2014. 'What Have We Learned From Three Decades Of Research On The Productivity Of Public Capital?', Journal of Economic Surveys, Wiley Blackwell, vol. 28(5), pages 889-916, December.

Valerie A. Ramey, 2020. 'The Macroeconomic Consequences of Infrastructure Investment', NBER Chapters, in: Economic Analysis and Infrastructure Investment, pages 219-268, National Bureau of Economic Research, Inc.

What do we think will drive our need for infrastructure over the next 30 years?

Our infrastructure requirements and expectations will change over the next 30 years, in ways we can't always predict

They will shift over time in response to many factors. One example of this will be changes to the size, age and make up of our population.

For example, we can already see that over the last 60 years, changes to our population account for more than 60% of the growth in the value of our infrastructure.

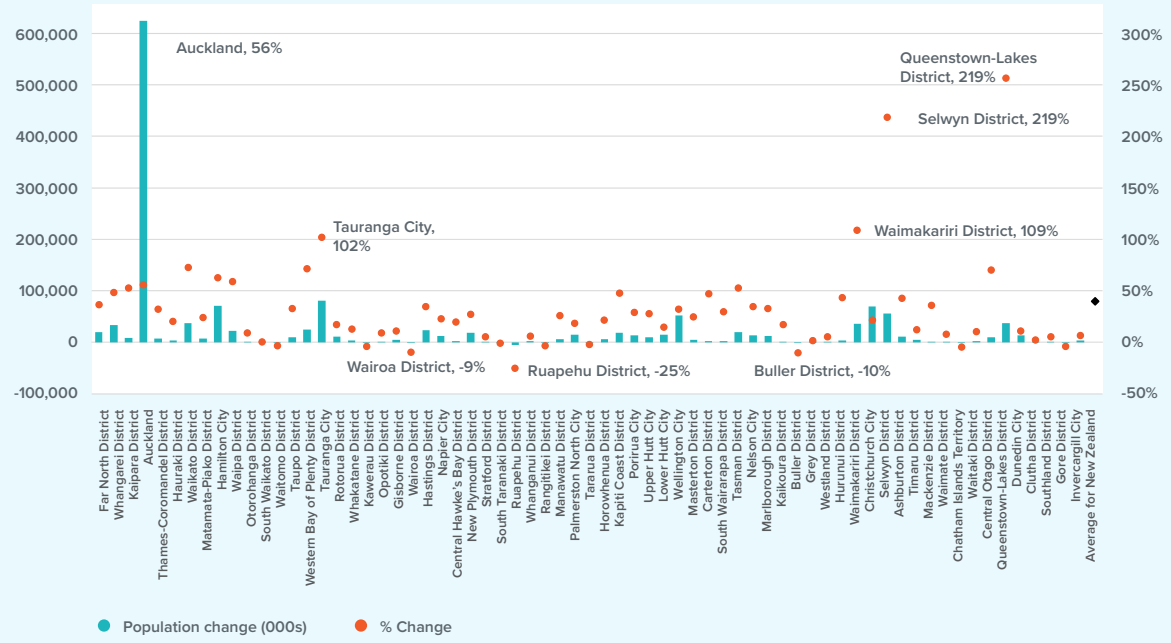
The future is different and uncertain

Some areas are more predictable than others. We can carefully plan for those areas where we have a reasonable idea of the future, while making sure we also have institutions and settings that are flexible enough to adapt and keep options open for changes we can't predict.

In the case of population change, growth is expected to slow both in New Zealand and worldwide. What population growth we will have will increasingly be driven by migration, which is less predictable than birth and death rates. While we know that population growth tends to drive a greater need for infrastructure, it will be difficult to predict how much infrastructure we may need or where it may be needed (See Box 2 on uneven population growth).

Box 2: Population growth is not even and so neither is the infrastructure that is needed

Between 1996 and 2023 the population of New Zealand grew by 1.5 million, or 40%. This growth did not occur evenly across the country. Auckland grew by 56% but accounted for 42% of all the growth in New Zealand's population. Although smaller in absolute terms, four areas more than doubled in size – Tauranga City (102%), Waimakariri District (109%), Selwyn District (219%) and Queenstown-Lakes District (257%). Some areas' population actually shrank, such as Wairoa (-9%), Ruapehu (-25%) and Buller District (-10%). Infrastructure investment needs to respond to these shifts.

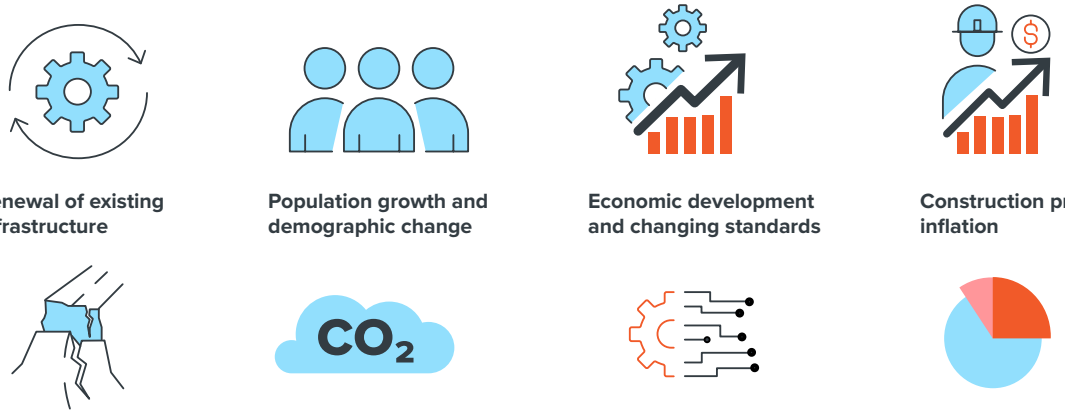


Source: 2023 Census population counts, Stats NZ (https://www.stats.govt.nz/information-releases/2023-census-population-counts-by-ethnic-group-age-and-maori-descent-and-dwelling-counts/)

We have identified eight drivers of infrastructure spending to explore

While population change is important, it is not the only factor that matters. We've identified eight broad drivers of demand for infrastructure spending that we plan to explore (Figure 7).

Figure 7: Potential drivers of demand for infrastructure spend

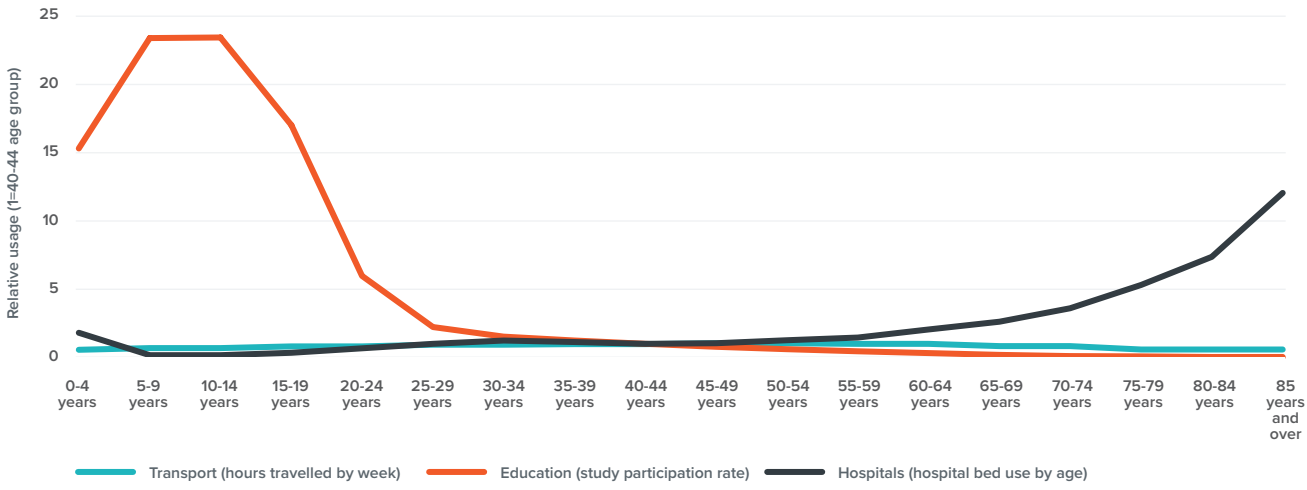


Source: Pay it forward, New Zealand Infrastructure Commission, 2024.

In some cases, we can make reasonable guesses about the future based on past trends. We can forecast investment to renew and replace infrastructure based on how much infrastructure we currently have and what condition it is in. Similarly, we can make reasonable predictions about how future construction prices might rise based on long-term trends. How we respond to these needs can be straightforward. For instance, after identifying our renewal needs, we can adequately fund the costs of depreciation and asset renewal.

Another example is population ageing, we can predict with reasonable certainty that our population will continue to age. The share of New Zealanders aged 65 years or over is forecast to rise from one in six to over one in four over the next three decades (Figure 8). This could mean a greater demand for hospital infrastructure and less demand for schools.

Figure 8: We use different types of infrastructure at different stages of our life

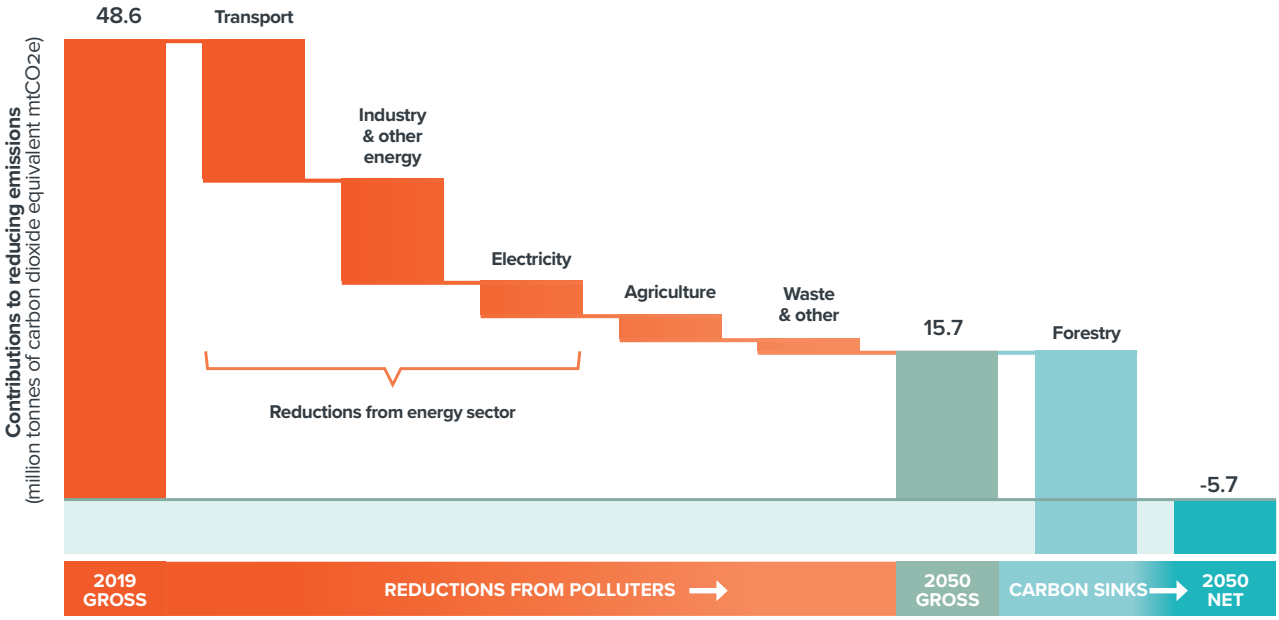


Source: New Zealand Infrastructure Commission analysis of Household Travel Survey data, Census study participation rate data, Education Counts data, and NZIER hospital usage estimates.

We won't always have experience or historical trends to guide us. For example, we've only just started to reduce our carbon emissions, and will need to do so much more quickly if we're going to meet our greenhouse gas emissions targets. In cases like this, how we respond might mean less focus on identifying the scale of funding need, and instead focus on ensuring our policy and system settings allow flexibility for responding to unknown futures.

Factors like these will have different impacts on different sectors. We will need to understand how these impacts vary across sectors and recognise this in forecasting future infrastructure demand. Modelling from the Climate Change Commission highlights that decarbonising our economy will drive change in the transport and energy sectors in particular (Figure 9). The government and other investors can then focus their efforts where infrastructure is most likely to be needed.

Figure 9: Contributions to reducing emissions (million tonnes of carbon dioxide equivalent)



Source: Rautaki Hanganga o Aotearoa, New Zealand Infrastructure Strategy, 2022–2052, New Zealand Infrastructure Commission, 2022. The Strategy used 2021 data and modelling from the Climate Change Commission.

Some of the drivers of future infrastructure demand, such the need to build resilience to natural hazards, and our changing population, could impact upon Māori disproportionately. Many iwi are already investors in a range of infrastructure projects, through the corporate iwi entities established as a result of Te Tiriti settlements and as part of their longer-term, intergenerational investment strategies.

Finally, our forecast of infrastructure needs will include a combination of scenarios and sensitivity-testing to account for the many forms the future can take. Rather than be prescriptive about a specific scenario, our goal is to share insights about what's going to drive infrastructure demand and how these could push investment trends over the next 30 years.

Section three:

3

What investment is already planned

Ngā koronga haumi o te wā

Gettyimage_Don Wu

Discussion questions
- what do you think?

Discussion Question

Question 4

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

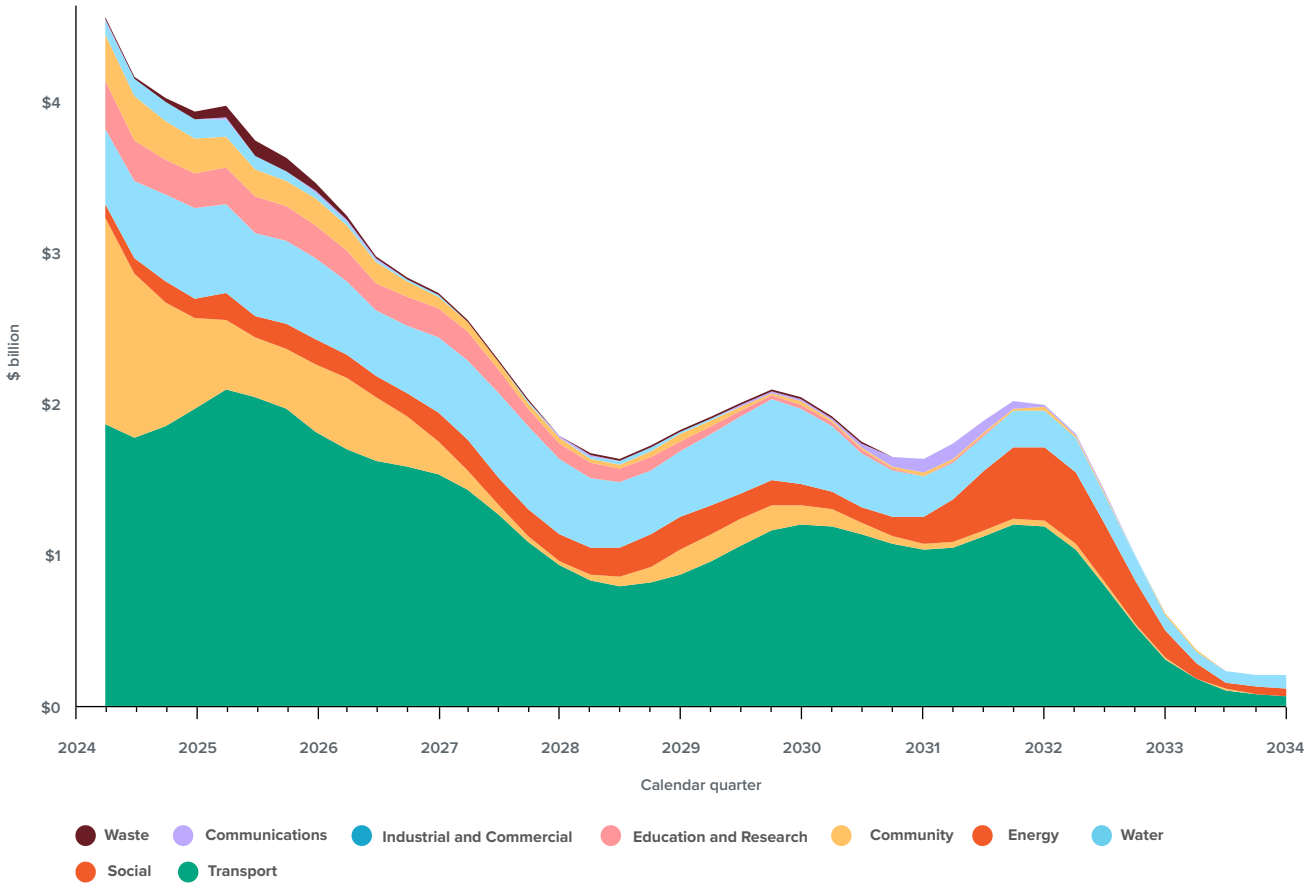
The information we need to develop a National Infrastructure Plan

Te Waihanga already gathers and shares 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.

Our current work

The Pipeline shows infrastructure projects that are funded and currently being delivered, are committed, or are anticipated but do not yet have funding. We've worked to grow the data it contains, but not all projects are included. We're currently capturing around two-thirds of total public infrastructure investment and what we can show about the ongoing plans for projects is limited. It also includes more data about projects in the next three years than the years beyond. This is because New Zealand tends to plan and fund infrastructure projects on a relatively short time horizon (Figure 10).

Figure 10: Forward visibility of work in the Pipeline



Source: Pipeline snapshot (August 2024), New Zealand Infrastructure Commission, 2024.

While public discussions of infrastructure investment often focus on a small number of 'megaprojects' costing more than $1 billion, most projects are much smaller. At present, there are 17 megaprojects in the Pipeline, 6 of which do not yet have a funding source confirmed. By comparison, there are over 6741 projects with a value of less than $100 million.

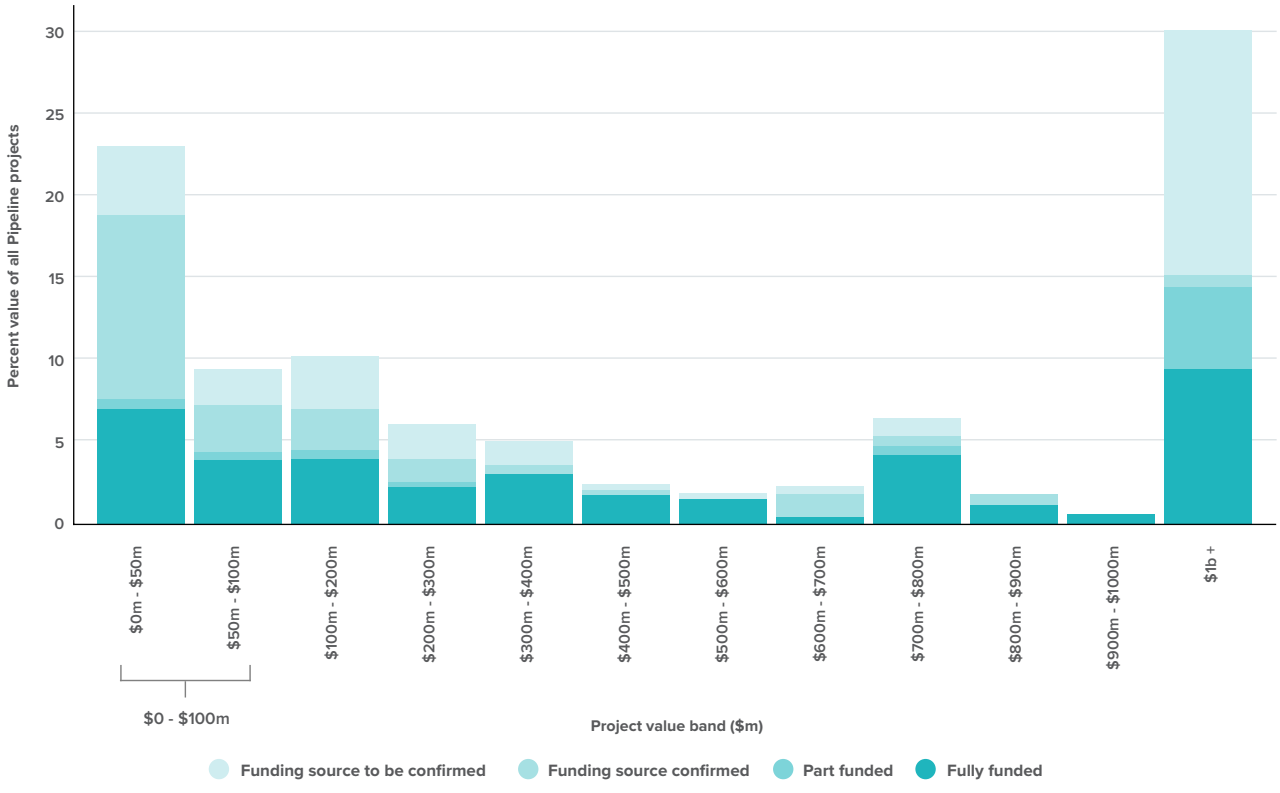
Megaprojects make up an estimated 30% of the total value in the Pipeline as at 30 September 2024. Projects under $100 million make up an estimated 34% of the total value in the Pipeline as at 30 September 20.

Smaller projects can make a big difference overall. While megaprojects can have large benefits for our infrastructure networks, they only affect a small part of a network at a time, e.g., a large bridge can mean a big change to a particular point on our road network. But programmes of small projects can deliver incremental improvements to many parts of a network, e.g., a series of intersection improvements might speed up travel for a long section of the country. Meeting our infrastructure needs will mean building a mix of small and large projects (Figure 11).

'Small is good... For one thing, small projects can be simple.'

Bent Flyvbjerg and Dan Gardner,
How Big Things Get Done

Figure 11: Small projects and programmes account for most infrastructure investment



Source: Based on published National Infrastructure Pipeline data, New Zealand Infrastructure Commission, 2024.

Understanding the gap between what's already planned and what's needed

Our current investment in infrastructure may not be aligned with our long-term needs. We may be spending too little on some types of infrastructure or too much on others. We may also have to adjust the mix of investment to meet changes in needs in different sectors or regions.

In developing the National Infrastructure Plan, we aim to shine a light on this by bringing together the data we're gathering about long-term trends from our infrastructure needs analysis, with the more immediate-term information we're gathering on current investment intentions and through our Infrastructure Priorities Programme. By comparing these, we can see where New Zealand may be over- or under-investing in infrastructure, where there are trade-offs between different investment paths, and where we still have gaps in our knowledge.

We'll use this analysis to identify an approach to infrastructure investment that will best achieve New Zealand's infrastructure needs. We will though, be relying on existing information about needs and current investment. As a result, we will have less certainty or confidence in those areas where information gaps exist.

We expect to discover gaps

Our work to date has identified several areas where we are likely to find gaps between what's planned and what's needed, and several areas where we may discover more. We outline these areas in more detail in the following sections and summarise key challenges here.

New Zealand's currently planning more infrastructure investment than can be funded. This means that we will need to prioritise and balance needs, while also making sure we get good value for money from any investment. Simply put, we can't afford to 'build our way out' of every challenge, so we will have to approach investment in a smarter way.

We often invest less in looking after our infrastructure than we need to. This seems to be common in many areas of publicly owned infrastructure. Where this is the case, we may need to lift maintenance and renewal spending to catch up and avoid future gaps.

We may also find gaps in those areas where we expect changing demands will drive infrastructure needs, such as population change, an increasing need for resilience to natural hazards, and the need to reduce carbon emissions.

We'll find ways to close the gaps

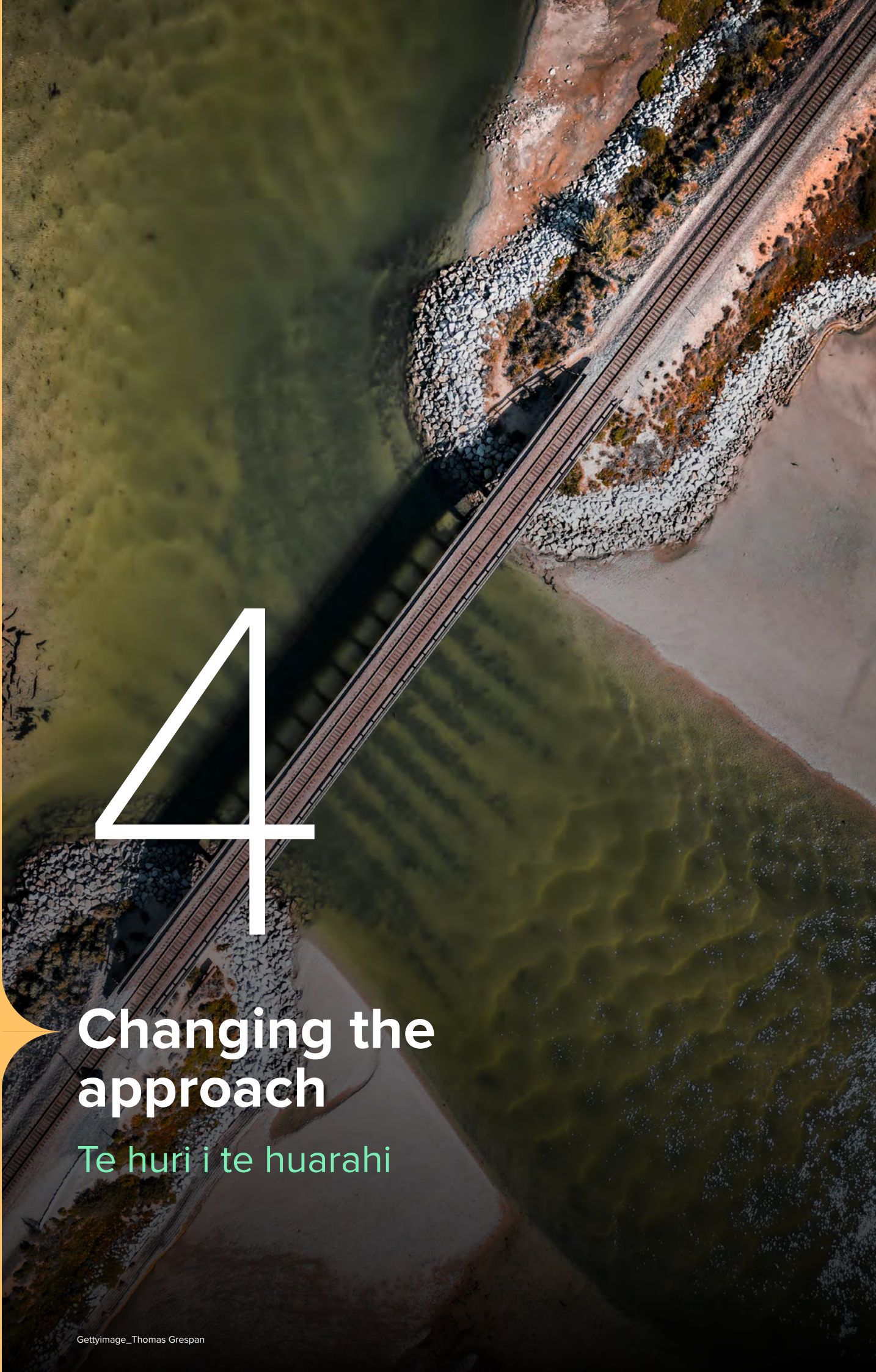
The National Infrastructure Plan will provide independent information and advice on ways of closing the gaps between the infrastructure investment that's already planned and our long-term needs. This will consider existing infrastructure system settings and the opportunities to improve them to get better results from our infrastructure investment.

Section four:

4

Changing the approach

Te huri i te huarahi



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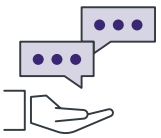


Discussion questions
- what do you think?

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

Three areas where changes to our infrastructure system would get us better results

We have used our research and publicly available information on infrastructure investment challenges to identify key areas for change. Within each of the three areas, 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.

Table 1: Three areas where change may be needed

Theme one: **Capability to plan and build**	Theme two: **Taking care of what we have**	Theme three: **Getting the settings right**
Investment management: Stability, consistency, and future focus **Case study 1:** Land transport's funding sustainability challenges	**Asset management:** Managing what we already have is the biggest task **Case study 2:** Health infrastructure's asset management investment challenges	**Institutions:** Setting the rules of the game
Workforce and project leadership: Building capability is essential	**Resilience:** Preparing for greater disruption	**Network pricing:** How we price infrastructure services impacts what we think we need **Case study 3:** Paying for housing infrastructure
Project costs: Escalation means less infrastructure services	**Decarbonisation:** A different kind of challenge	**Regulation:** Charting a more enabling path

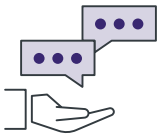
Theme one:

Capability to plan and build

Source: Gettyimages_ georgeclerk

Being successful at building and maintaining our infrastructure relies on good systems and processes for planning and managing investment, as well as a capable workforce and strong project leadership. When these are in place, the cost of building infrastructure is lower and more predictable.

Investment management:
Stability, consistency, and future focus



Discussion questions
- what do you think?

Discussion Questions

Question 6

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

Question 7

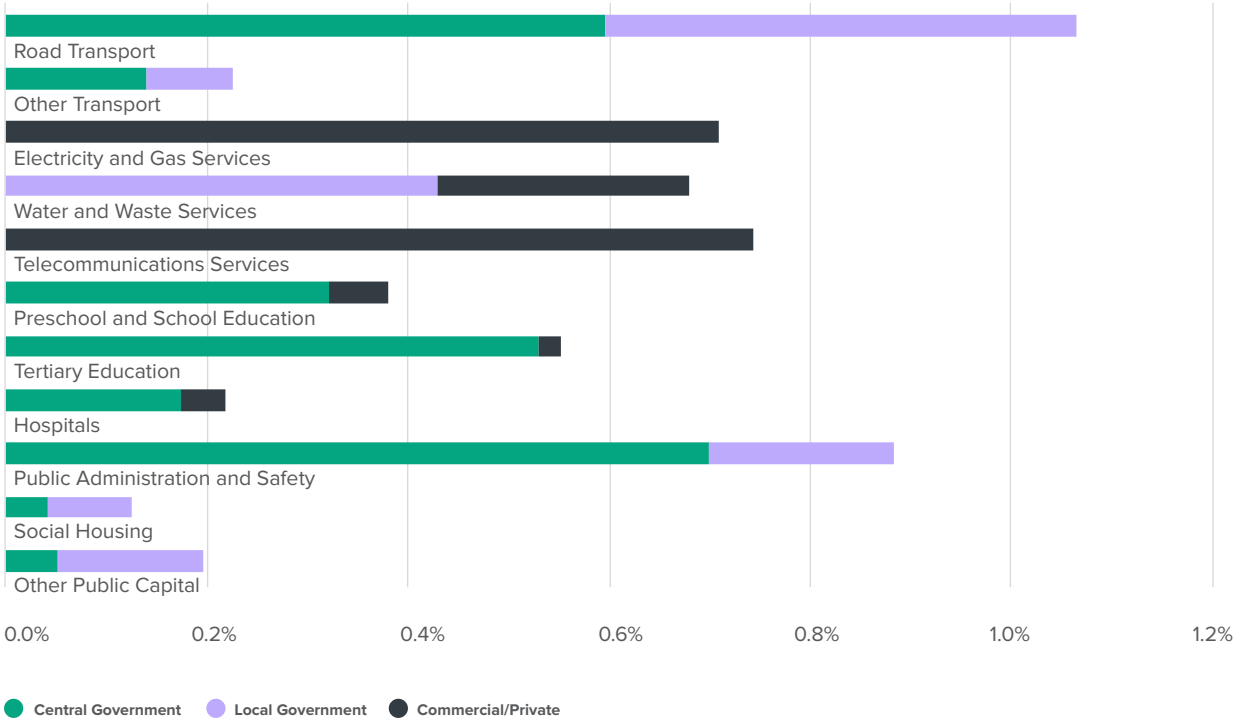
How should we think about balancing competing investment needs when there is not enough money to build everything?

Context

Central government accounts for almost half of our total infrastructure investment

Central government plays a key role in infrastructure investment, especially in land transport, education, health, and public administration and safety (Figure 12). Local government is an important investor in land transport, water and waste services, and other public services like libraries and parks. In the electricity, gas and telecommunications sectors, investments are mainly run on a commercial basis, although some providers are fully or partly owned by central and local government.

Figure 12: Average annual capital investment as a share of GDP, by infrastructure sector, 2013–2022



Source: New Zealand Infrastructure Commission's analysis of Stats NZ data. Note: * Social housing GFKF data not available for the years 2020–2022.

The Treasury's Investment Management System (IMS) governs infrastructure planning, decision-making, delivery and monitoring for most central government funded infrastructure

The IMS is part of the government's broader public finance system. It is managed by the Treasury, and it sets out policies, processes and requirements for government agencies to plan and successfully deliver investments. The IMS helps Ministers to govern the government's investment portfolio and drives a focus on making sure that we are investing carefully and in projects that represent value for money.

Our evidence base

What do we know?

Better governance practices are needed for infrastructure investment

We have policies, frameworks, norms, processes and tools that guide the way we govern our infrastructure.

New Zealand ranks poorly against other high-income countries on many of the measures used to assess governance practices (see Figure 3 in Section one). Our performance is ranked as especially poor in the areas of long-term strategic vision for infrastructure, efficient and effective public procurement, evidence-informed decision-making, and use of cost benefit analysis to guide investment decisions.

These governance issues can limit our ability to get the most value for money from our infrastructure spend.

Long-term investment planning practices need to be lifted

New Zealand has varied requirements and processes for organisations involved in long-term infrastructure investment.

This makes it difficult to understand how and where New Zealand's infrastructure providers are intending to invest, and to coordinate across sectors. Poor long-term planning also makes it difficult to understand whether we're investing in the right infrastructure projects at the right time.

Some infrastructure providers, including many involved in electricity distribution, are subject to price-quality regulation under the Commerce Act, and are required to have five-year revenue allowances. Local governments are required to develop and publish ten-year Long Term Plans, while the New Zealand Transport Agency (NZTA) operates on three-year planning and investment cycles. Other central government infrastructure providers don't have specific legislative requirements, but face Cabinet-mandated expectations for developing ten-year investment intentions.

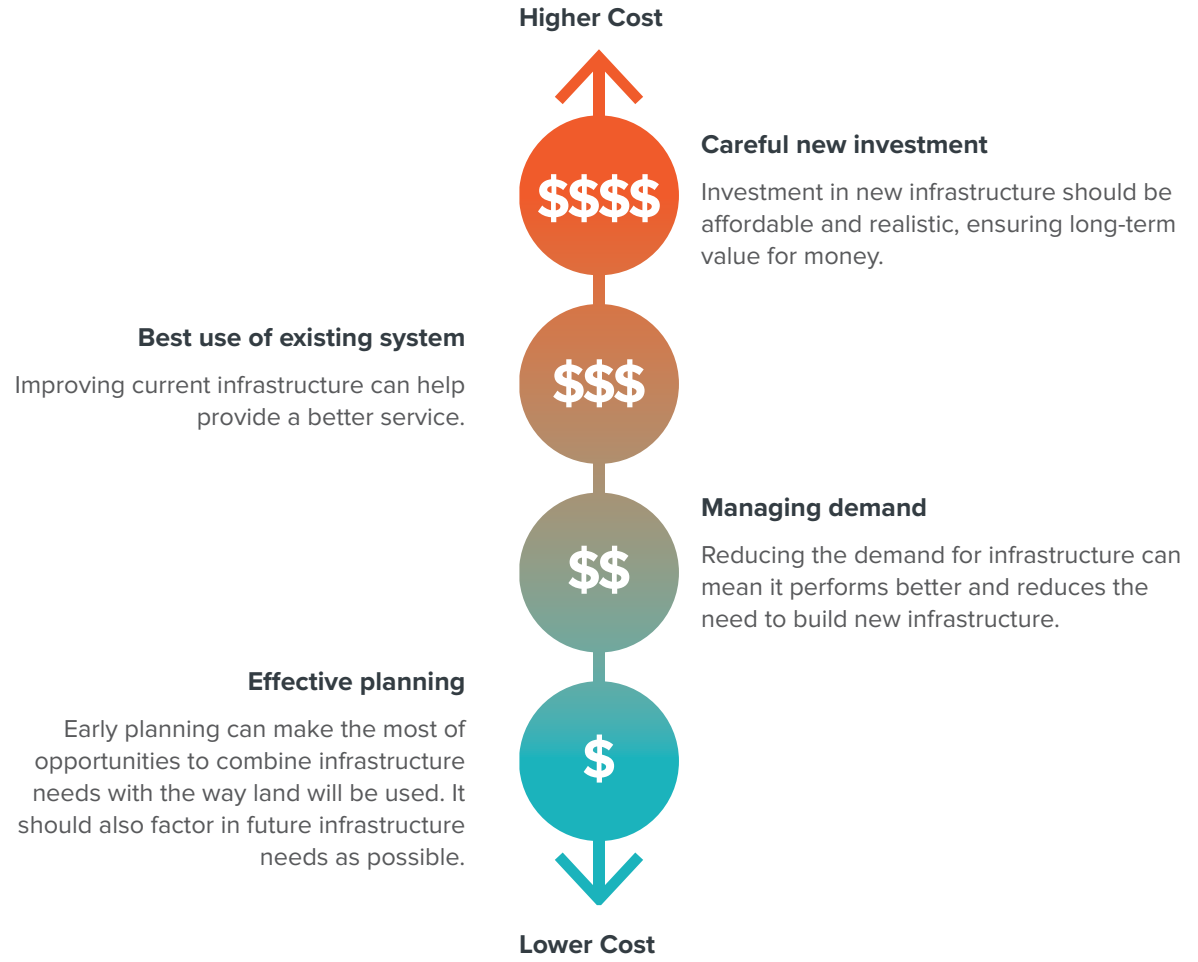
We are collating information from local government Long Term Plans and ten-year investment intentions reported to the Treasury by central government agencies. Together with the data in the National Infrastructure Pipeline, this information paints a picture of what public infrastructure providers say they are planning beyond the current project funding cycle. However, this is likely to be an incomplete picture given agencies vary in how well they report on their planning and there are gaps in the data about their investment intentions.

Best practice investment decision-making principles are not always followed

Infrastructure decision-making should follow best practice principles. This starts with identifying a problem, followed by investigating the options to solve the problem, and understanding the costs and benefits of these options before deciding which to fund. It also means considering when there are options to solve problems without building new things (Figure 13).

But in practice, we often don't follow this approach. Te Waihanga looked at 44 capital initiatives that were being considered for funding in Budget 2024. We found that only 18 of these initiatives had a business case attached. Many more did not follow core business case guidance. For example, we found that only three proposals for funding included a cost benefit analysis.

Figure 13: Intervention hierarchy for addressing problems



Source: Rautaki Hanganga o Aotearoa, New Zealand Infrastructure Strategy, 2022–2052, New Zealand Infrastructure Commission, 2022.

Poor up-front planning leads to time, cost and quality challenges

When an organisation starts to talk about an infrastructure project, they may lack many details about it. In most cases, they've identified a problem, such as a need to reduce traffic or to improve water supply, but have only just started to understand options for solving it. As they consider these options in more detail, and work though the business case process, they can make decisions and become more confident in understanding the details about the project. Their estimates of the time and cost to build the project then become more certain.

When organisations don't take the time to plan and understand project options and details upfront, there is a greater risk of it costing more or taking longer to build than expected.

While a few high-profile projects can get the most attention, there are less visible challenges across many areas of public infrastructure investment. For example, in the June 2024 quarter Treasury has reported over 50 investments that will take at least 20% longer to deliver than was originally expected. Treasury also reported that overall, projects are going to cost $1.2 billion more than was originally planned. This is equal to over 10% of what the government planned to spend on infrastructure in the year.

Investment monitoring and assurance processes can be improved

Some investments don't complete risk assessments and submit them to the Treasury, which may mean that these investments don't have the right plans to make sure they are delivered successfully. There are also gaps and errors in the way investments are reported to Cabinet, which can limit its ability to govern the portfolio of infrastructure investment.

To help improve this, Treasury is reviewing its approach to business cases and Gateway assurance reviews to update them to better align with international best practices.

Greater transparency of large public sector projects is needed

The more New Zealanders know about the plans and decisions on infrastructure projects, the better they can hold government and delivery agencies to account. This can help get better results.

Infrastructure providers that are subject to regulation under the Commerce Act, such as electricity lines and broadband fibre providers, must prepare and share plans for how they'll look after their infrastructure and can face penalties for failing to meet quality standards. This level of transparency makes it possible for the public to understand what is being spent and what they get for their money.

By contrast, central and local government infrastructure providers have fewer or more varied requirements for transparency. We looked at 27 large infrastructure projects across central and local government and found that around half of all their key planning documents were not accessible. We also found that post-implementation reviews for completed projects were not accessible either.

Treasury now publishes quarterly investment reporting for central government investments.

Government capital funding is facing cost pressures that significantly exceed the available funding

Information from the Treasury's quarterly investment reporting shows that government agencies plan to spend more than we can currently afford, even over a medium-term period. We can also expect further costs due to issues like the need to maintain and renew ageing infrastructure.

For these reasons, we will need to make trade-offs and prioritise some investment opportunities over others.

In Case Study 1 (below), we show some of the funding and investment challenges in just one sector, land transport. Similar funding pressures can also be found in areas like education, health, and public administration and safety infrastructure.

Case study 1:

Land transport's funding sustainability challenges

Context

We rely on our land transport networks to move goods to market and to travel for work and recreation. We spend a lot on land transport, almost 20% of our total infrastructure investment. The costs don't stop there. New Zealand households spend even more on fuel, public transport operation, and vehicle ownership.

Our expectations of land transport investment are increasing, but the money received from transport users to pay for that investment is not increasing at the same rate. This is leading to pressure to pay for investment out of general tax revenues, and to make trade-offs with investments in other sectors. This raises questions about how we should fund transport, what level of investment we need as a country, and how to prioritise this alongside our other needs.

The Government is taking some measures to improve financial sustainability by allowing time-of-use charging, making changes to laws about toll roads, exploring new funding tools like development levies and moving the light vehicle fleet to a road user charges system.

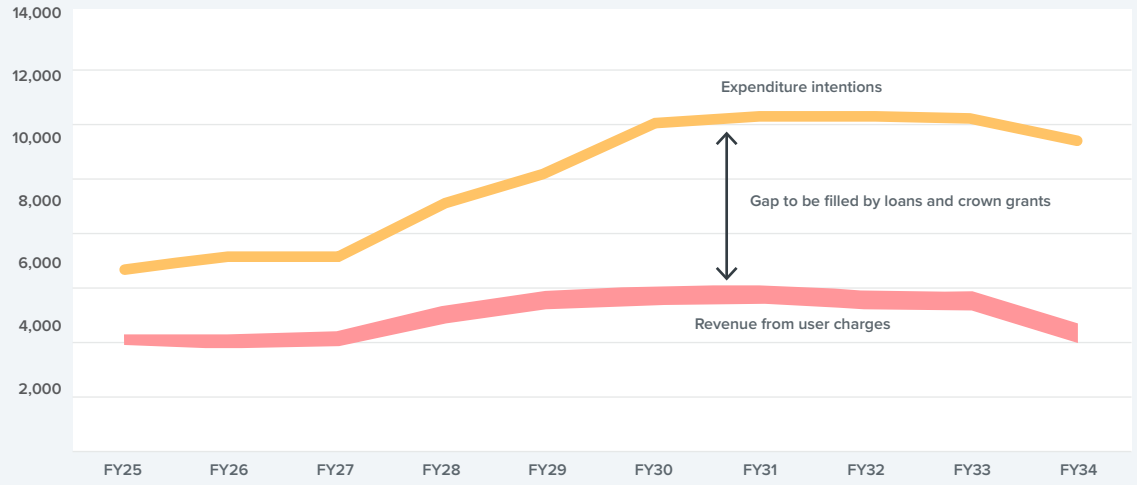
What do we know?

There is a growing gap between how much road users pay and what we spend on land transport projects

The land transport system, including roads, urban public transport, and rail, was designed to run on a cost-recovery, user-pays model. Under this model, the money transport users pay through fuel taxes and other fees is ring-fenced and expected to cover the full cost to the Crown of providing transport infrastructure and services. If we adhere to this model, we could only invest as much as we collect from transport users and ratepayers.

However, we're currently spending or planning to spend more than we're collecting from transport users. This funding gap is topped up with loans and grants from the government. We've been doing this since the 2010s, but it is expected to increase even more acutely in the future. The New Zealand Transport Agency's recent projections suggest that, if nothing changes, we'll be spending around $6 billion more than we collect from transport users each year from the late 2020s onwards (Figure 14).

Figure 14: New Zealand plans to spend much more on land transport than it collects from users



Source: NZTA National Land Transport Programme 2024-2027.

Land transport investment faces value for money pressures

New Zealand's land transport system should first look after the existing road network, and then improve it through projects that come with benefits that outweigh the cost to deliver them. However, it's not clear that is happening despite big increases in investment over recent decades.

Since the early 2010s, funding for maintenance and renewal hasn't kept up with need. As a result, we've seen the surface of our roads get worse. At the same time, there's been a lot of investment in more or wider roads, but this hasn't reduced road congestion in our major cities. New Zealanders also have increasing expectations for what we get from our transport system, making the job of funding the system even harder.

Closing the funding gap would mean a big increase in what we pay for transport

Land transport prices would need a big increase to cover the full cost of the investment planned for transport. In land transport, user charges currently only cover about half of the costs of personal transport.[3] This means that prices would have to roughly double to fully cover costs.

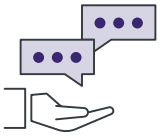
Measures such as time-of-use charging and tolling of new roads can help, but they are unlikely to fully close the gap. For instance, the most extensive time-of-use pricing option for Auckland would raise around $260 million per annum – less than 5% of the $6 billion annual funding gap outlined by the NZTA. Our research together with recent project experience, suggests that tolling new roads may pay for 10% to 25% of the cost to build those roads, leaving a need to find most of the funding elsewhere.

Other measures, such as replacing Fuel Excise Duty for petrol vehicles with Road User Charges, will help by making sure we don't collect less money as cars become more efficient. But this will not raise substantially more money unless user charges are increased from current levels.

If it's not possible to raise more money from transport users, then there will need to be trade-offs between what we spend on transport and other types of public infrastructure.

[3] Ian Wallis Associates Ltd (2023). Domestic Transport Costs and Charges Study.

Workforce and project leadership: Building capability is essential



Discussion questions - what do you think?

We are interested in your views on how we can build capability in the infrastructure workforce, including on the following questions:

Discussion Questions

Question 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?

Question 9

How can we build a more capable and diverse infrastructure workforce that draws on all of New Zealand's talent?

Context

Building and looking after the infrastructure we need depends on a workforce that is productive, efficient, and right sized and skilled for the job. However, New Zealand's infrastructure sector is facing a range of workforce and leadership challenges that limit its ability to work as well as it could.

Our evidence base

What do we know?

Over 100,000 people work in planning, building, and maintaining infrastructure

The infrastructure workforce is large and complex. In 2018, we estimated that there were around 108,000 full-time equivalent workers spread across more than 200 infrastructure roles. That's a bit under 5% of the overall New Zealand workforce.

These workers are split evenly between 'horizontal' infrastructure like roads, water pipes and electricity transmission, and 'vertical' infrastructure like schools and hospitals.

People sometimes assume that those working in infrastructure are mainly focused on building new projects. However, around 14% of infrastructure workers are engaged in planning and design, 46% are building new infrastructure, and a further 40% work at managing and maintaining infrastructure.

The infrastructure workforce grows by recruiting from other sectors and through immigration

Our infrastructure workers move between sectors and countries. This means that the workforce can scale up to deliver more work when needed, but on the flip side, the industry can lose skilled workers quickly in a downturn. We need to ensure that the sector can attract, develop, and retain the skills that it needs.

Four in ten people working in infrastructure jobs in 2018 had moved from another industry in the last two years. People are more likely to move between industries when they are in 'blue collar' occupations and are less likely to move when they're in specialised trades and professions.

Migration also plays an important role in the infrastructure industry. One in four people working in infrastructure roles in 2018 were on a visa. Most of these people are on residence visas, although temporary work visas have played a larger role in recent years. Migration plays a more important role in filling specialised trades and 'white collar' professional roles.

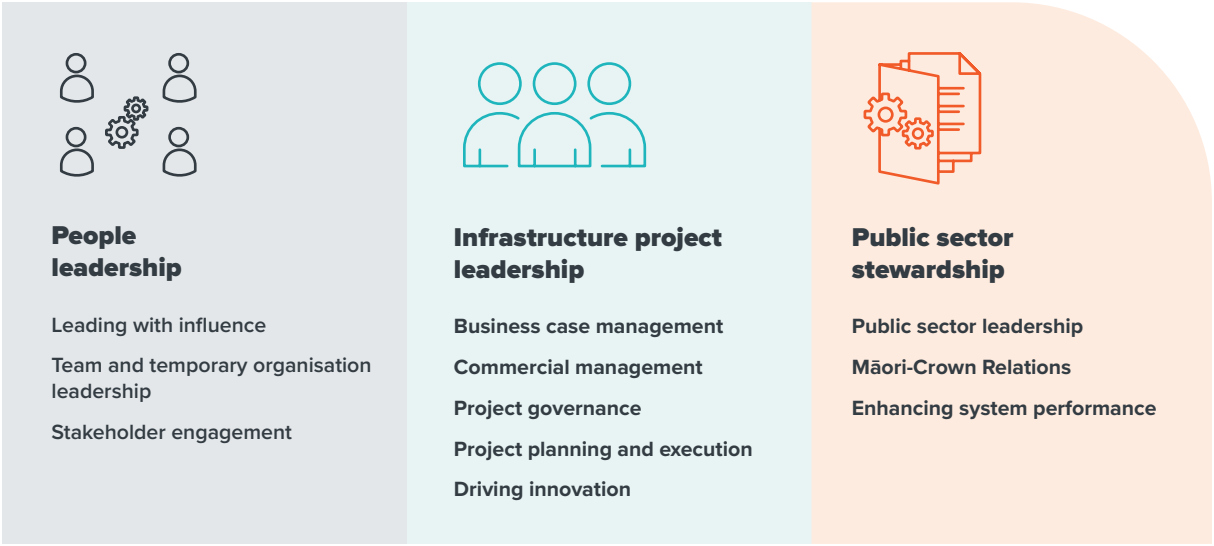
Project leadership is key for delivering complex projects in the public sector

New Zealand needs good project leadership to make sure our infrastructure projects are planned, designed, and delivered well. But currently both central and local government don't have enough project leaders with the depth of experience needed to successfully deliver complex projects. For instance, many agencies lack experienced project directors and senior responsible owners with good commercial and construction knowledge.

Our reviews of recent infrastructure projects such as Transmission Gully, the City Rail Link, and the Mental Health Infrastructure Programme highlight these challenges. Infrastructure project leaders in any sector must be able to effectively lead teams, organisations and infrastructure projects. They need a range of capabilities to do this successfully (Figure 15).

Managing infrastructure projects in the public sector can be more complex than in the private sector. Project leaders must navigate shifting political agendas that can alter project priorities and cause delays. They need to work within government funding cycles and engage with a diverse range of stakeholders, all of which add complexity.

Figure 15: Core capabilities that are essential for successful infrastructure project delivery in the NZ Public Sector



Source: From the Project Leadership Capability Framework, New Zealand Infrastructure Commission, 2024.

More work is needed to grow project leadership capability

Without a formal capability framework or development pathway for infrastructure project leaders, the public sector has been slow to professionalise infrastructure project leadership roles. There are no formal frameworks or pathways for skills or development. Those recruiting project leaders can have inconsistent expectations, while those investing in infrastructure projects have no assurance of the skills and capabilities of the leaders driving them. This gap contributes to inefficiencies and increases the risk of project delays and cost overruns.

Te Waihanga has recognised this gap and has developed a Project Leadership Capability framework and leadership network to support infrastructure leaders to connect and learn from each other. These measures can help the sector learn and improve, but more work is needed to build capability and embed it in the public sector.

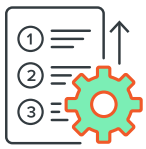
Increasing the diversity of the workforce is a key opportunity to build capacity and capability

While the infrastructure workforce is large, it only draws upon the skills and talents of a small share of New Zealand's population. There is an opportunity to fill skill gaps and lift the sector's capacity and capability by recruiting from a wider talent pool than it does at present.

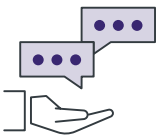
Women play a large role in the overall New Zealand workforce (47% of all workers are women) but a small role in the infrastructure workforce (only 11% of infrastructure workers are women). In 18 of the 30 largest infrastructure occupations, women make up less than 5% of total workers. Women in infrastructure tend to be working in clerical and administrative roles and are rare in other roles.

This tends to be the case among both older and younger workers, which means that female participation in the workforce is unlikely to change much as older workers retire. Instead, system-wide changes would be needed to recruit, support, and retain more women in infrastructure roles. Workplace cultures and opportunities for women to advance in their occupations and industries may be a barrier. For example, women are more likely than men to leave roles in the engineering sector, particularly in the early- to mid-stages of their career.

Growing ethnic diversity among infrastructure workers is another opportunity to build the workforce and use the talents of all New Zealanders. The infrastructure workforce has a similar mix of ethnicities as the overall New Zealand population. However, all ethnicities are not evenly represented in each role. For instance, labourer occupations tend to have more Māori and Pacific workers, while professional occupations have more European and Asian workers.



Project costs:
Escalation means less infrastructure services



Discussion questions
- what do you think?

We are interested in your views on further opportunities to improve our ability to deliver good infrastructure at an affordable cost, including on the following question:

Discussion Question

Question 10

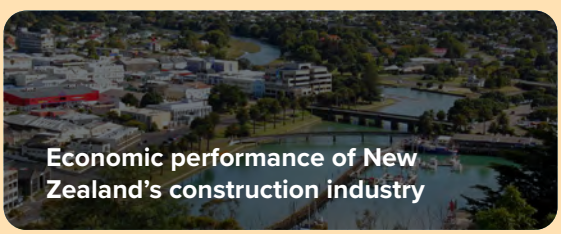
What approaches could be used to get better value from our infrastructure dollar? What's stopping us from doing this?

Context

Building high-quality infrastructure requires good bang for our buck

New Zealand faces significant infrastructure challenges. The costs of meeting demographic changes, responding to climate change and natural disasters, and maintaining and improving our existing infrastructure are large. To meet these challenges, we'll need to get as much value as we can for our money.

Our evidence base



What do we know?

Growing costs and uncertainty mean we get less for our infrastructure spending

The cost of building and maintaining infrastructure has tended to rise faster than prices elsewhere in the economy. As a result, we are getting less for our infrastructure dollar.

Changing and uncertain costs are just as big a problem. Since 2010, the prices of key construction materials have gone up or down more than 2% in any given quarter (in other words +/- 8% change in a year) almost half the time. For infrastructure projects in the procurement or delivery phases, these changing prices can impact on time and cost. We also know that big cost increases can be damaging to construction firms.

Table 2: Average annual growth rates in output prices for construction sectors

	Construction overall	Residential building construction	Non-residential building construction	Heavy and civil engineering construction	Construction services	Economy wide
1995 through 1999	1.0%	1.7%	0.8%	0.6%	0.8%	1.0%
2000 through 2008	4.4%	4.2%	3.7%	4.7%	4.3%	3.7%
2009 through 2019	2.5%	3.1%	2.4%	2.4%	2.2%	1.7%
2020 through 2023Q1	7.6%	9.3%	7.3%	7.8%	6.5%	5.0%

Source: Stats NZ Producer Price Indices and Te Waihanga analysis.

New Zealand has higher construction costs for large and complex projects, but we can deliver other projects efficiently

Rising construction prices are not unique to New Zealand – most high-income countries face similar challenges. However, we stand out in having higher costs for delivering large and complex infrastructure projects.

Our research has found that we face a cost premium for projects like motorways, road tunnels, and underground rail projects. However, we seem to be able to build some projects, like surface rail stations, electricity transmission lines and wind farms, as cost effectively as other countries.

In some areas, such as hospital construction, we seem to have gone from having average construction costs to having above-average construction costs.

Likewise, on average, we face higher prices for equipment, land, and some construction materials like concrete, but have lower wages than Australia.

The cost of building infrastructure changes as input costs, construction productivity, and project scope changes

Input costs are things like wages, construction material prices, and the cost of buying land. These costs can change a lot in the short term, and we have limited control over them as they're often influenced by worldwide factors. An exception is the cost of buying land, where there are opportunities to save by planning in advance.

Productivity is about how efficiently we use workers, materials, and equipment to build things. We can lift productivity growth through things like consistent regulatory frameworks, use of standardised designs, and promoting competition among firms, but the benefits come slowly over time.

Project scope is about what we choose to build and where we choose to build it. Seemingly minor scope choices can have a major impact on the cost to build projects. For instance, four-lane highway projects in Europe cost an average of 76% more if they are

built to higher design speeds, because they need new alignments and more earthworks. Sometimes, New Zealand's challenging geology means we have no choice but to build something expensive, but in many other cases, we can get better value through good project planning and design (Figure 16).

Figure 16: Drivers of infrastructure delivery costs

Source: Why do construction input costs change, New Zealand Infrastructure Commission, 2023.

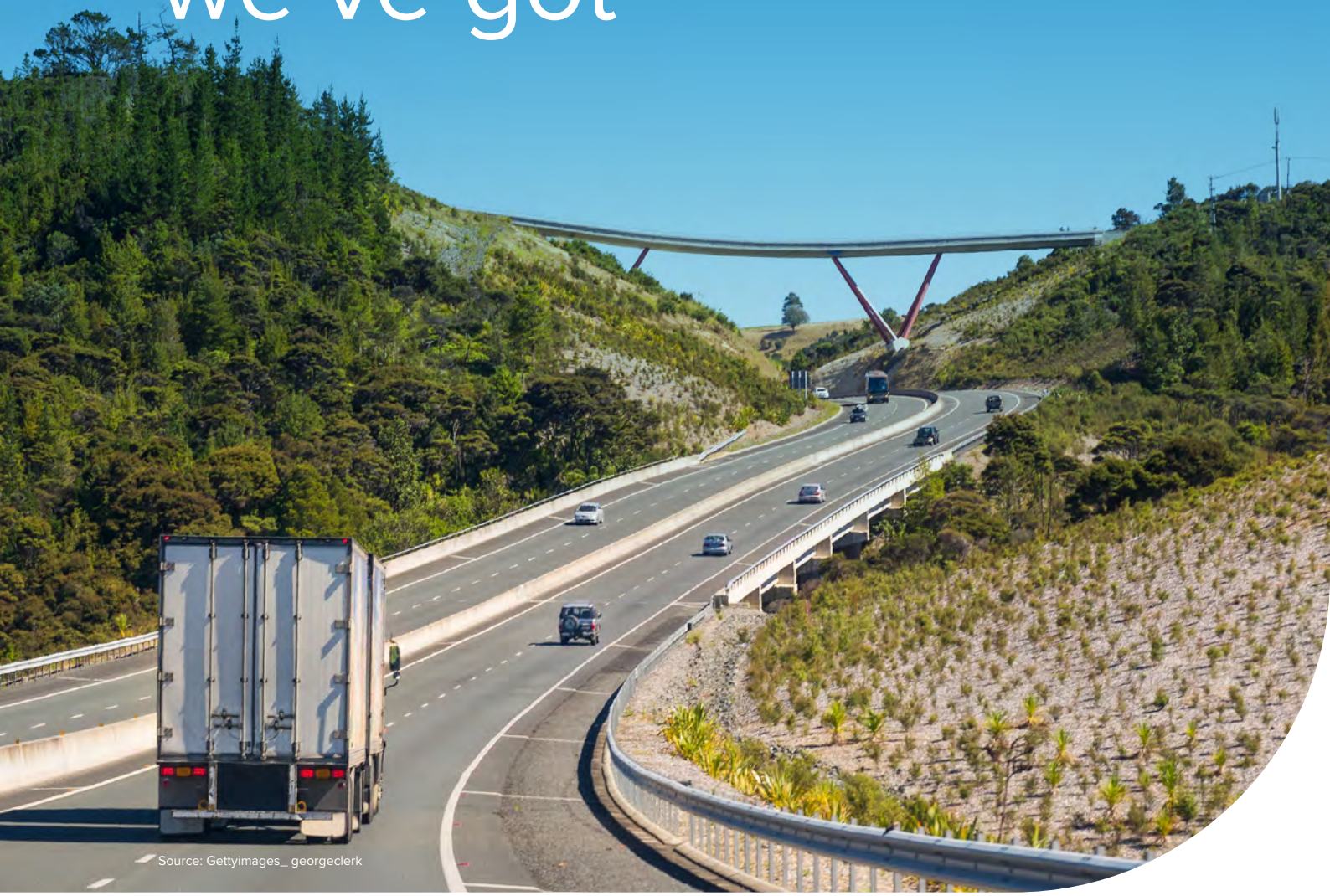
If we want to get better value from our infrastructure dollar, we need to understand and manage project scope

This means taking the time to understand what we are building before we set out to build it, as well as setting up good processes and planning for making decisions about project scope and design. It also means investing in the right capability for planning, procuring, and managing infrastructure.

There are opportunities to build more efficiently by, for example, using standardised designs for repeatable projects, being open to new technologies and methods, and protecting the land that we may need for future projects. We also need to use information on past projects to set realistic cost expectations for new projects.

Theme two:

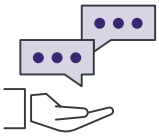
Taking care of what we've got



Source: Gettyimages_ georgeclerk

Good planning is important so we understand our infrastructure and what it will take to keep it in working order. We also increasingly need to think about the resilience of our infrastructure against natural disasters and other risks, and how we decarbonise our economy, which will mean repurposing or replacing infrastructure.

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



Discussion questions
- what do you think?

Asset management means looking after our infrastructure. We are interested in your views on how we can improve planning for this, including on the following question:

Discussion Question

Question 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?

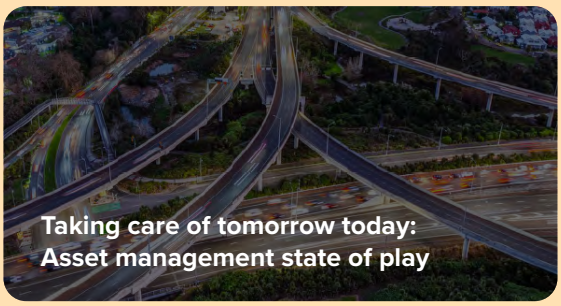
Context

As long as we have infrastructure, we will need to spend money on keeping it going. If we don't, people will no longer be able to use it or won't get as much use out of it.

The more infrastructure we have, the more we will have to spend to maintain and renew it. The types of infrastructure that we have also matters. Some types, like roads and bridges, last longer than others, like school buildings.

To do this work efficiently, we need to invest in good asset management planning. This means that we need to know what we already have, where it is, what condition it is in, what services it supports, and what future pressures it will face. We need to use this information to understand what future investment is needed to maintain services from infrastructure.

Our evidence base



What do we know?

In the long run, much of our infrastructure investment will need to go towards renewing and replacing infrastructure

Over the last decade, for every $10 we spent on new infrastructure, almost $6 of existing infrastructure wore out. If we want to maintain our existing infrastructure for future generations, that's roughly how much we need to spend on renewing it in the long term.

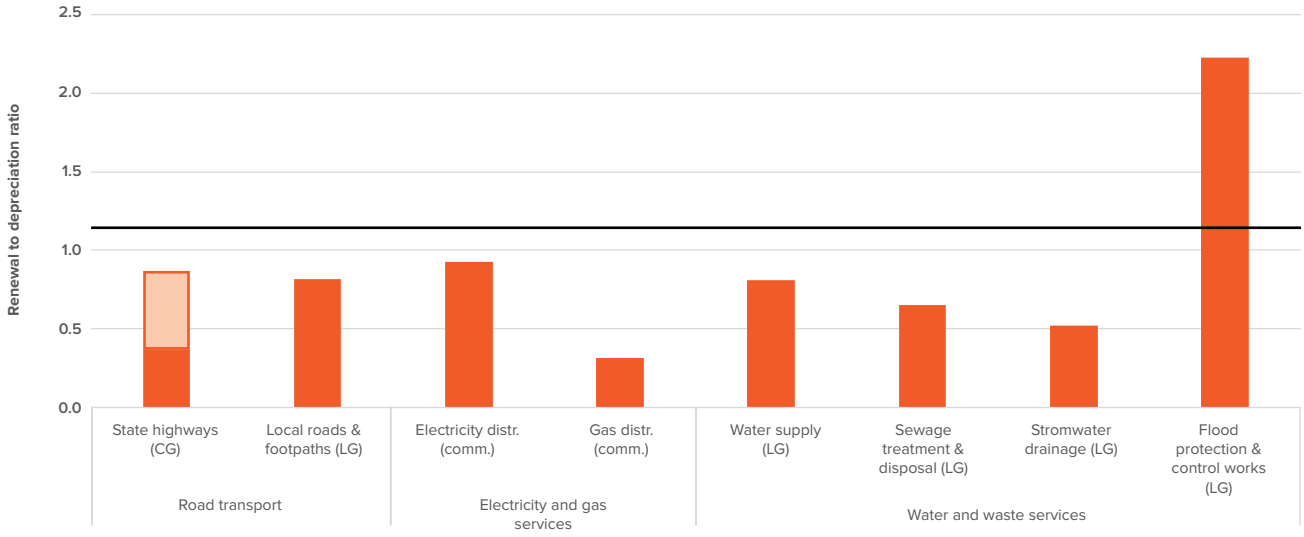
This doesn't necessarily mean that we need to renew everything on a 'like for like' basis. We can replace worn out infrastructure with something better so that it can serve more people, or so it can meet rising quality expectations. Sometimes technology changes make it possible to replace obsolete infrastructure with new technologies that are cheaper to build or operate.

We may not be spending enough to renew our infrastructure

Data suggests that for electricity distribution infrastructure and existing flood protection infrastructure we're spending enough or even more than we need on covering depreciation. However, for state highways, local roads, water supply, wastewater and stormwater infrastructure, and gas distribution infrastructure we don't spend enough on covering depreciation (Figure 17). The condition of our state highways and local roads has gotten worse as a result.

We couldn't find comparable data on vertical infrastructure like health and education. Central government, which owns most of this infrastructure, does not compile and publicly report this data. This absence of information is more likely to mean there are problems with renewal investment. In Case Study 2 (below), we discuss central government asset management challenges using the health sector as an example.

Figure 17: Ratio of renewal investment to depreciation costs by sector



Source: Te Waihanga analysis of data published by infrastructure providers and regulators.

Notes: Ratios below 1 indicate that infrastructure is wearing out faster than it is being renewed or replaced.
The dashed bar for State highways indicates alternative assumptions about the classification of renewal vs maintenance spending.

Renewal backlogs are more expensive in the long term

While we can 'sweat assets' for a while, we can't do this forever. At some point it will be necessary to catch up on renewals, and the cost of catching up is likely to be higher. This is because intermittent or delayed maintenance is more expensive in the long run than doing it through a continuous and planned programme. It also increases the risk that infrastructure will fail.

Poor asset management planning practices lead to insufficient maintenance and renewal work

If we want to get on top of our maintenance and renewal challenges, we need to improve asset management planning and invest in the capability to put it in place. Asset management maturity isn't the only factor that matters – funding rules, governance decisions, and workforce capacity all make a difference – but it is foundational to success.

At present, we often lack good information on the state of our existing infrastructure and how best to invest in maintaining and renewing it. This makes it difficult to accurately forecast how much we'll need to invest in future maintenance and renewal.

Systems for looking after infrastructure can be complex, and can involve a range of models for management, governance and organisational structure. There are opportunities to make use of best practice approaches from sectors that already perform well to lift practices across the board.

There are areas of good practice in some sectors

Sectors where infrastructure is critical to providing services, such as the energy sector, tend to have stronger approaches to asset management.

Regulation and scrutiny of asset management has helped ensure it's done well in some sectors, but not in others. For instance, sectors that are regulated under the Commerce Act are more effective and active in regulating their asset management. Sectors with governance bodies like boards, that know how important the infrastructure is for the service they provide, are also likely to do better at looking after it.

However, there are pockets of asset management excellence in all sectors. A key feature of almost all these success stories is getting the right people together with a passion for infrastructure, including champions at the top levels of an organisation.

Some sectors have very little asset management regulation and low maturity

Central government tends to have lower maturity for looking after its infrastructure assets compared to other sectors. Government agencies are generally not required to have long-term plans for looking after their infrastructure. While they do need to have asset management plans, many do not have comprehensive plans in place.

The health sector, which we discuss further below, is an area where asset management planning has been poor. This sector relies on hospital infrastructure to deliver life-saving services, but has consistently under-invested in asset management planning and as a result, hasn't invested enough in maintenance and renewals.

There is a strong immediate need within central and local government to lift understanding of the importance and practice of asset management. This includes making sure that we resource it properly and that we have people with the right capabilities doing this work. Maintaining our infrastructure is not something that we can do once and move on – it is an ongoing job that requires ongoing funding, resourcing, and commitment by infrastructure owners.

Case study 2:

Health infrastructure's asset management investment challenges

Context

We depend on our health infrastructure, our hospitals and healthcare facilities, to play a part in supporting and improving our quality of life. But we spend much less on this infrastructure than we do on operational spending like nurse and doctor wages and medicines.

Less than 5% of our total infrastructure spend goes to health infrastructure, including both public and private hospitals and other health services. However, this is likely to rise in the future as our population grows and ages, needing more hospital care. As a result, we will need to look at how we prioritise investment in health infrastructure alongside other needs, and to make sure we get the balance right when it comes to deciding when to spend to maintain and improve our hospitals against the other ongoing costs to provide healthcare.

What do we know?

We need to improve information on the condition of existing hospitals and what is needed to maintain, renew, and expand them

We don't have good information about our planning and approach to looking after our public hospitals, which has made it hard to know how much we should be investing.

Improving this can help us understand what services we will need to provide.

The need is only going to increase as our people and our hospitals get older

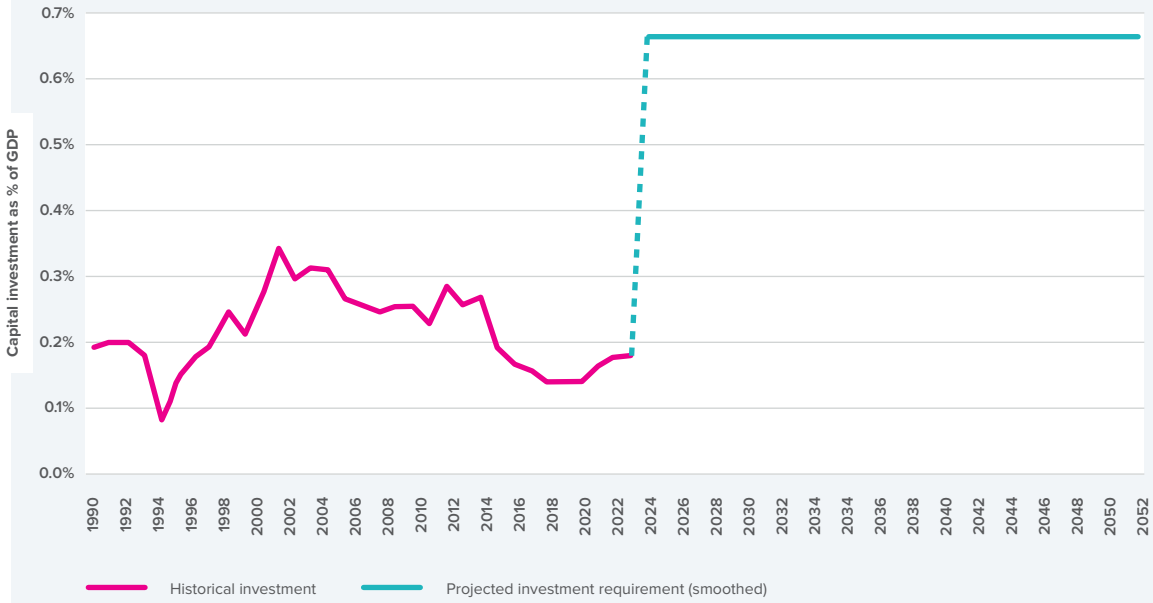
To help fill the information gap about the state of our hospitals, we commissioned research on their long-term investment needs. This looked at different scenarios based on the health services we currently provide, projections for how our population might change over time, and the cost to build and maintain public hospitals (Figure 18).

Under all scenarios, a big increase in investment is expected to be needed. This is because:

- We need to renew or replace a large amount of hospital space that will reach the end of its usable life within the next 30 years.
- We need to make sure our hospitals can serve the needs of an ageing population. Older people use hospital services at a much higher rate than younger people.

We can reduce some of these costs by improving or changing the way we provide health services, such as using tools like telehealth, but one of the best opportunities to reduce our investment need is to get better at asset management and infrastructure delivery.

Figure 18: Public hospital infrastructure spending as a percentage of GDP, based on a 'business as usual' scenario for meeting our long-term needs



Source: Building a healthy future, NZIER report to the New Zealand Infrastructure Commission, 2023.

Health investment faces challenges to successful delivery

While we need to invest in our health infrastructure, we face some challenges in getting good value for our spend. Our hospital projects cost more to build than they used to, adding to our costs.

Recent reviews of health projects show some of the issues causing these high costs. Overcoming these will mean getting better at planning and delivering infrastructure projects.

Paying for health infrastructure requires us to consider several trade-offs

Public health services are funded out of general tax revenues. There is a need to consider and balance several trade-offs when investing in health infrastructure.

On one hand, we need to make decisions about how much to spend on health infrastructure over other types of infrastructure. On the other hand, we need to make choices about when to prioritise spending on renewing, repurposing or replacing health infrastructure over other types of investment.

In the short term, it can feel like there are benefits in 'sweating assets' to pay for operating the health system. In the long term, this can lead to our infrastructure failing and preventing us from delivering good healthcare services to all New Zealanders.

Resilience:
Preparing for greater disruption

Discussion questions
- what do you think?

We are interested in your views on how we can better understand the risks that natural hazards pose for our infrastructure, including on the following question:

Discussion Question

Question 12

How can we improve the way we understand and manage risks to infrastructure? What's stopping us from doing this?

Context

Natural hazards like earthquakes, floods and storms can damage our infrastructure. But unlike the need to renew worn out infrastructure, the costs of natural hazards are hard to forecast.

We are looking at how we can lift our understanding of this issue and how it may affect our future investment needs. But we are not alone in looking at this. For example, the Department of Prime Minister and Cabinet is looking at the resilience of our critical infrastructure, and the Ministry for the Environment is working to understand how we need to adapt to the impacts of climate change.

Our evidence base

What do we know?

Risk reduction, resilience, and disaster preparedness are required to prepare for risks to infrastructure

Infrastructure owners play an important role in preparing for and responding to natural hazards and other risks. They provide infrastructure that supports critical services like water supply and healthcare, and need to make sure these services are available after a disaster.

Central government also plays a critical role in this area. In addition to its role in providing infrastructure, it also:

- provides leadership in responding to and recovering from emergencies
- manages our country's risk exposure though rules and legislative settings
- acts as the insurer of last resort, ensuring that we can recover after an event occurs.

It is critical that each of these roles is performed well. If we can't restore services quickly enough, it can have major consequences for our health, wellbeing and economy. If we don't plan and build to the right standards, we could be taking on greater risks than we can handle. If the government and other infrastructure providers can't pay for the damage caused by events, we will be unable to recover.

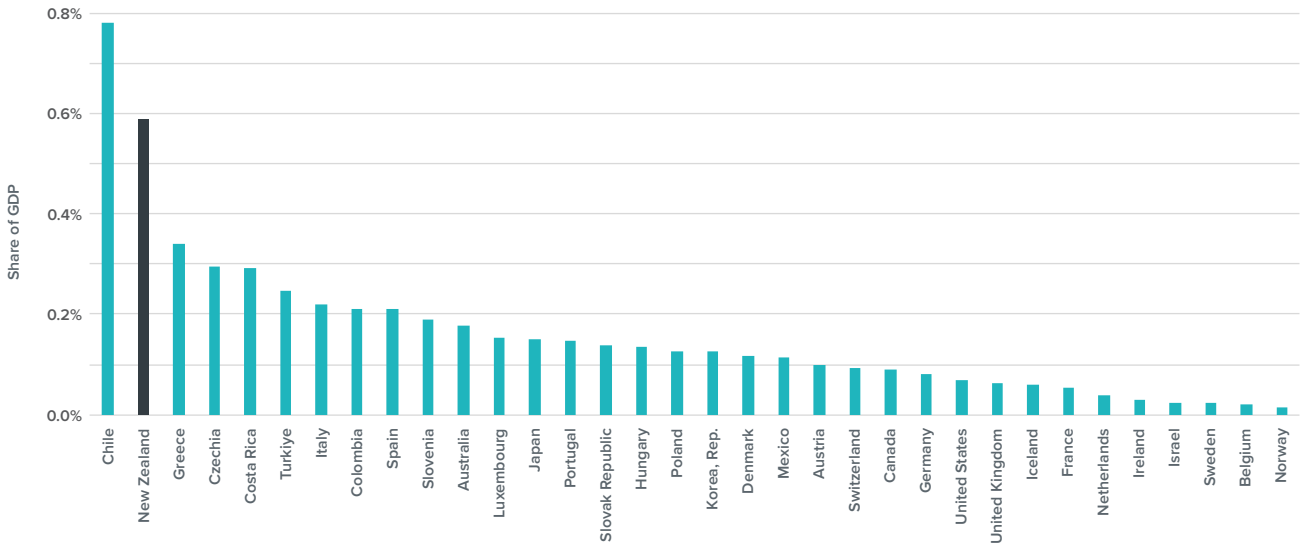
New Zealand is highly exposed to natural hazards, and risks will rise due to climate change

New Zealand faces a high level of risk from a range of natural hazards, including earthquakes, flooding, volcanic eruptions, and tsunami. Our people and infrastructure are often near hazards such as fault lines, rivers, and coastlines.

In recent decades, New Zealand has experienced some of the highest reported damage caused by natural hazards across OECD countries (Figure 19). But costs reported to insurers may not fully count damage to our public infrastructure, as it is often uninsured against natural disasters.

Climate change will make severe weather events both more frequent and severe, increasing the risk to our people and infrastructure.

Figure 19: Reported annual damages from natural hazard events



Source: Te Waihanga analysis of EM-DAT database (Centre for Research on the Epidemiology of Disasters, 2024) and the World Bank GDP data, using Lloyd's approach (Centre for Economics and Business Research, 2012). As reporting of natural damage disaster damage costs is variable even among high-income countries, these figures should be treated with some caution (Jones et al., 2022).

We lack a comprehensive understanding of natural hazard risks, and our process to analyse risks is ad hoc

To manage risks, we must understand them first. This requires a good scientific understanding of our natural landscape and infrastructure that is regularly updated.

Without this, we may be exposed to risks that we do not yet understand. For instance, the 2022 update of the National Seismic Hazards Model resulted in large increases in estimates of the likelihood and severity of ground shaking throughout New Zealand.

New Zealand does not currently have a national flood hazard map, although a research programme is underway, and the country's first national level flood maps are expected to be released in 2025. This is a first step towards understanding our long-term risks, as climate change will increase the risks of floods and sea level rise.

Natural hazard risk research is currently funded through one-off research grants such as the Strategic Science Investment Fund and the Endeavor Fund. Funding for these grants is time limited, and there is no framework or requirement for them to be updated as scientific understanding evolves. Similarly, there is no clear framework for how improved understanding of risk should flow through into government decisions, such as changes to planning rules or building standards.

In the absence of this information, we lack a good accounting of the potential costs of natural hazards

The cost of responding to natural hazards poses big financial risks for government. While New Zealand is highly exposed to natural disasters, central government currently lacks:

- an understanding of the costs that natural hazards can create for infrastructure
- an understanding of how we're currently managing these financial risks
- a proactive approach to managing the financial risks of natural hazards.

There are no system-wide requirements in place for infrastructure providers to assess or disclose their natural hazard risks or proactively manage these risks. The last assessment of insurance coverage for infrastructure providers was completed by the Office of the Auditor-General in 2013.

We also face other threats to our infrastructure, such as cybersecurity and supply chain risk

Although natural hazards are important for New Zealand, we also need to identify and manage other risks to infrastructure. The Ministry of Foreign Affairs and Trade has highlighted that, after a period of stability, the global political and economic environment is changing and becoming riskier. In recent years, we have experienced disruptive events, such as 'the global recovery from the COVID-19 pandemic; Russia's illegal invasion of Ukraine; difficult economic conditions that affect international cooperation and global growth; the rapid advances in emerging technology; and the increasingly devastating impacts of climate change.'[4]

Our infrastructure is also increasingly affected by cybersecurity threats and supply chain risks. These risks come at a time when our infrastructure networks are more connected to each other and to the world than ever before. We use information technology systems for managing water and electricity networks, and rely on global supply chains for the materials we need to build our infrastructure. We need to plan to make sure we can respond to these challenges.

[4] https://www.mfat.govt.nz/assets/About-us-Corporate/MFAT-strategies-and-frameworks/MFATs-2023-Strategic-Foreign-Policy-Assessment-Navigating-a-shifting-world-June-2023.pdf

Decarbonisation:
A different kind of challenge

Discussion questions
- what do you think?

We are interested in your views on how we can improve understanding of the decarbonisation challenge facing infrastructure, including on the following question:

Discussion Question

Question 13

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

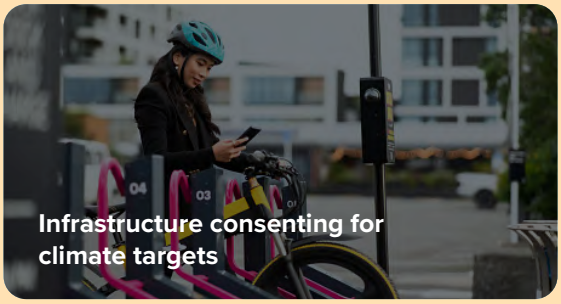
Context

We need to reduce net greenhouse gas emissions by 2050 to play our part in global efforts to avoid the worst effects of climate change. Our 2050 target requires New Zealand to reach and maintain net zero emissions of all greenhouse gases other than biogenic methane and to reduce biogenic methane emissions by 24-47% from 2017 levels.

We will need to consider how we tackle this challenge through our infrastructure. The way we build, maintain, operate, and use infrastructure can either generate or reduce greenhouse gas emissions. To meet this challenge, we will need to operate and maintain our existing infrastructure differently. We will need to build more low-carbon infrastructure, such as renewable energy generation and shift away from investment in infrastructure that causes higher emissions.

Te Waihanga is focused on lifting understanding of this issue and how it may affect future investment needs.

Our evidence base



Infrastructure consenting for climate targets

Paying it forward: Understanding our long-term infrastructure needs

What do we know?

New Zealand has high per-capita emissions relative to most other high-income countries

Our emissions have fallen slightly since their 2006 peak, but not as rapidly as in our peer countries. Since 2005, greenhouse gas emissions created by electricity generation and waste infrastructure have declined but land transport emissions have risen.

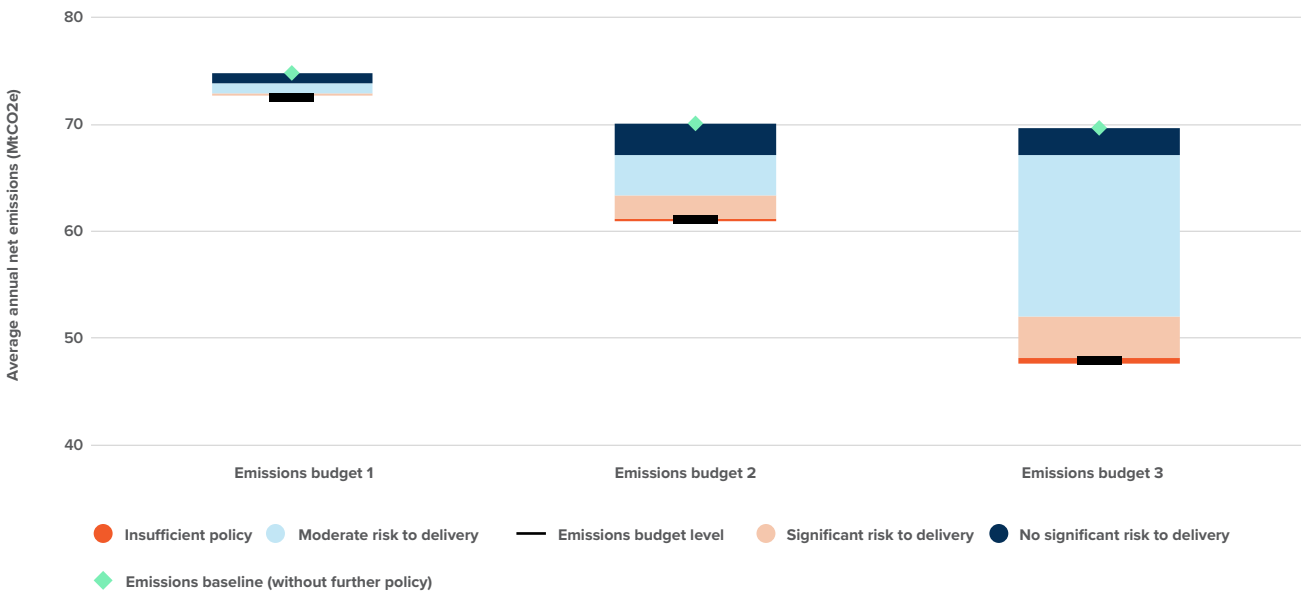
Meeting emissions targets requires changes

New Zealand's approach to emissions reduction includes pricing of carbon emissions through New Zealand's Emissions Trading Scheme (ETS), as well as policy measures like regulation to encourage emission reduction and investment in low-emission alternatives. The Government's Climate Change Strategy and Emissions Reduction Plan outlines its current approach to meeting these targets.

There's a risk that current policies won't be enough to achieve our goals. A recent Climate Change Commission report highlighted moderate to significant risks to achieving emissions budgets in the 2030s (Figure 20). [5]

Addressing these risks may require us to increase our ambition on emissions reduction measures, which could have implications for infrastructure.

Figure 20: Assessed risks to achieving future emissions budget



Source: Climate Change Commission (2024).

[5] This is consistent with the Ministry for the Environment's (2024a) assessment of current emissions reduction plans. Moreover, if the price of overseas emissions offsets is higher than expected, then further domestic emissions reductions may be needed.

Decarbonising our economy will increase demand for low-emission infrastructure, such as renewable energy generation and urban public transport

No matter what approach we take to decarbonising our economy, we know it will lead to changes for our infrastructure. It will increase demand for low-emission infrastructure, reduce demand for high-emission infrastructure, and increase the need to repurpose existing infrastructure to serve new purposes.

For instance, we are likely to need more electricity infrastructure so we can electrify land transport and industrial process heating. We'll need low-emission electricity generation options, like solar farms and wind farms, rather than high-emission options, like coal-fired power stations.

We also need to reduce the emissions we generate when we build and maintain infrastructure. This is challenging as infrastructure construction materials, like concrete and steel, are often carbon intensive and there aren't many alternatives. Our best chance for reducing the emissions created during the life of our infrastructure is often to get more use out of the infrastructure we've already got so we don't need to build more.

We need to get quicker at building low-emission infrastructure

To meet our net zero carbon emission goals, we need to build low-emission infrastructure more quickly than we do now. We'll spend less on meeting our emissions reductions targets if we have an enabling planning and consenting framework for low-emission infrastructure. We address this issue in a following section of this document ('Regulation: Charting a more enabling path').

Theme three:

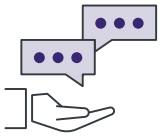
Getting the settings right

Source: Gettyimages_ Don Wu

We need institutions, or broader ‘rules of the game’, that adapt over time so we can meet our infrastructure needs in a changing world. This means charging for infrastructure in a way that ensures we can afford to improve and maintain it where needed. It also means ensuring that regulations, such as resource management consenting requirements, are efficient and fit for purpose.

From December 2024 the National Infrastructure Agency will be focusing on the administration of infrastructure funds and working with agencies to deliver projects involving private finance.

Institutions:
Setting the rules of the game



Discussion questions
- what do you think?

We are interested in your views on what changes are needed to our infrastructure institutions, including on the following question:

Discussion Question

Question 14

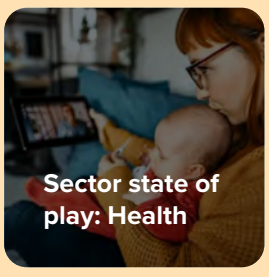
Are any changes needed to our infrastructure institutions and systems and, if so, what would make the biggest difference?

Context

Broadly defined, institutions are 'the rules of the game' that structure how our infrastructure system works. These include the laws, settings and practices that guide what to do.

Getting these institutions right is important for getting the best from our infrastructure. In previous sections, we've discussed the challenges facing some of the institutions around infrastructure investment planning, decision-making, and delivery.

Over a longer period, we may see institutions come under pressure from demands and expectations that we can't anticipate. Systems and processes that work well today may cause problems in the future. We will need to review and reform our infrastructure institutions over time to ensure that they continue to be fit for purpose.



What do we know?

New Zealand's infrastructure sectors are owned, run, funded and regulated in different ways, and these have changed over time

For instance, water services are owned and run by local authorities, funded through user charges and rates, and regulated by Taumata Arowai. In contrast, electricity services are owned and run by a combination of private companies, state-owned enterprises, trusts and customer-owned co-operatives, are funded through user charges, and are regulated by the Electricity Authority and the Commerce Commission.

The institutions governing infrastructure have changed over time. In some cases, these changes have led to improvements in the quality, choice and affordability of services. The telecommunications sector is a good example of how this change has given New Zealanders better services (Box 3).

Box 3: Cutting the cable: a recent history of telecommunications

Until the 1980s, telecommunications in New Zealand were delivered by a government monopoly, which also offered postal and savings bank services. While most New Zealanders could access their services, there were long waiting lists to have a phone installed, and the monopoly was slow to respond to demand.

In the 1980s, the government made large-scale reforms in the sector. The Post Office was broken up into three state-owned enterprises, with Telecom taking over the telecommunications network. Telecom's legal monopoly was abolished, and the company was sold in 1990, with some regulation put in place around local calling services and price increases. A number of competitors entered the market in the 1990s.

The impacts of these reforms were dramatic. Toll call prices fell by 60% between 1987 and 1992. New Zealanders got new services like 0800/0900 numbers and voicemail. By the turn of the century, we had one of the world's highest percentage of people using the internet.

At the same time, there were concerns about the need for competition in the sector, and about investment in and uptake of fast broadband services. As a result, the government introduced greater regulation in 2001, and in 2006 a law was passed requiring Telecom to prepare separate accounts for its wholesale business, and to lease part of its network to its competitors.

In 2011, Telecom split into two separate companies, the wholesale network provider Chorus and a retailer (now known as Spark). Chorus became the largest partner in the government's Ultrafast Broadband (UFB) programme, delivering fibre to around 1.3 million homes and businesses. From 2022, Chorus' UFB network was subject to price-quality and information disclosure regulation administered by the Commerce Commission.

As with the earlier reform programme, this set of changes led to benefits for New Zealanders. Average broadband download speeds in New Zealand are the 13th fastest in the OECD. Broadband prices in our cities are in line with or lower than OECD averages. New Zealand also has the highest per-capita rate of satellite broadband subscriptions, showing an openness to new technologies.

Sources: Statistics New Zealand, 1983; Howell & Obren, 2003; Wilson, 2022; Commerce Commission, 2024.

Some of New Zealand's infrastructure institutions have not kept pace with change

Some of our institutions haven't changed quickly enough. For example, New Zealand's model of providing and funding water services through local government bodies has struggled to deliver and maintain healthy, reliable, and affordable water services. This has led to pressure to reform these institutions, such as the Government's Local Water Done Well policy.

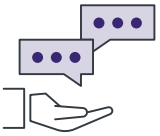
Other infrastructure institutions will face challenges in the future

Change has affected our infrastructure in different ways over the last 30 years, and the next 30 years will bring further change. While the future is uncertain, we need our institutions to be as resilient and adaptable as possible to best position us for the future.

There are some areas where we can foresee the need for change, such as the need to increase the supply of low-emission electricity. Significant investment is needed with PwC estimating that more than $50 billion could be required by 2035. Changes may be needed to ensure this investment can be funded and delivered efficiently. In other areas we will need to keep an eye on the horizon as we do not yet know what may be coming.

Source: NZstories

Network pricing:
How we charge for infrastructure services impacts what we think we need



Discussion questions
- what do you think?

We are interested in your views on further opportunities to improve network infrastructure pricing, including on the following question:

Discussion Question

Question 15

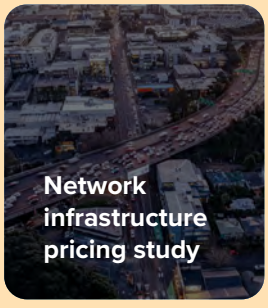
How can best practice network pricing be used to provide better infrastructure outcomes?

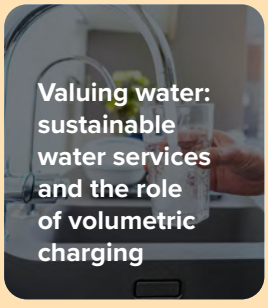
Context

We raise the money we need to pay for our infrastructure services in a range of ways – including infrastructure pricing for efficient and sustainable infrastructure investment

Sometimes the way we fund infrastructure services is obvious and closely connected to how we use them, like monthly electricity bills and mobile phone bills. But other times they are far less visible, like rates, taxes or the fuel excise we pay in petrol prices, all of which pay for infrastructure services.

Our evidence base





What do we know?

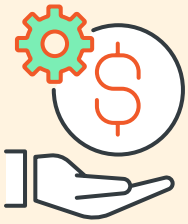
Improving the way we charge for network infrastructure can give us better infrastructure outcomes

It can do this by both increasing the amount of money we have available to invest, and by reducing or deferring the need to invest. An example of this is time-of-use charges on busy roads. These charges can gather money for transport infrastructure, while also encouraging people to rethink their car use and help reduce congestion. Other examples are water metering to support water conservation and leak detection, and steps for incentivising energy efficiency and decarbonisation.

There are some common pricing principles that can help guide the way all sectors charge for infrastructure

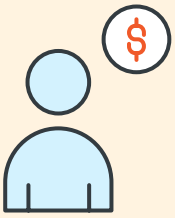
We have best practice goals and principles for pricing of network infrastructure. Pricing approaches should achieve the following three goals as described in Box 4.

Box 4: Best practices for pricing network infrastructure



Goal 1:

Pricing **guides infrastructure investment** to ensure that we can provide and maintain the infrastructure we need. This is the most important thing to get right as network infrastructure is long-lived and can impact our future choices.



Goal 2:

Pricing **sends signals to users** about when, where, and how they should use infrastructure networks to maximise the overall benefits of those networks. Service levels and investment needs are highly influenced by user behaviour.

Goal 3:

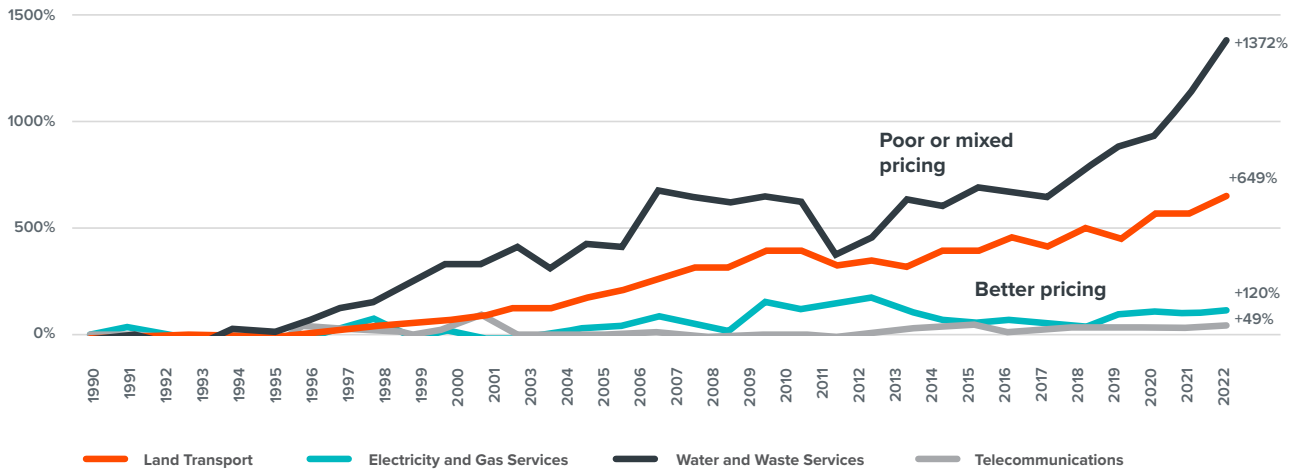
Pricing is used to **share the benefits** of providing networks widely through society. This can be addressed through adjustments to pricing once the first two goals above are achieved.

Sectors that follow better pricing practices have an easier time raising the right amount of money to maintain and improve their assets and identifying the highest-value areas for investment. These networks also tend to operate more efficiently.

There are differences in pricing practices

Since 1990, our investment has grown rapidly in sectors where the way we charge is less aligned with pricing principles. This includes land transport, water and waste infrastructure (Figure 21). By contrast, in sectors like electricity, gas and telecommunications, where pricing is better aligned with best practice, investment has been more modest.

Figure 21: The way we invest reflects the way we charge



Source: Adapted from New Zealand Infrastructure Commission (2024).

Improvements to the way we charge for water and land transport can help us get more from our existing networks and our investments in new infrastructure

We are seeing progress against three key opportunities to improve pricing in water and land transport:

- Charging for metered water can reduce a community's water needs. It helps encourage people to use less water and makes it easier to detect leaks, and this can reduce the need for expensive upgrades. More councils, such as New Plymouth District, are rolling out water metering and getting benefits in terms of leak detection and improved water conservation.
- Time-of-use charging, for busy urban roads at peak times can help spread demand to different times of the day so we get more use from these roads, while helping to keep traffic moving. The Government intends to progress legislation to enable time-of-use charging schemes.
- Tolling new roads can raise money to help pay for new infrastructure. If tolls can cover the cost of a new road, this shows it may be a good investment decision – people value it enough to pay for the cost of building it. The Government intends to toll newly constructed roads and to amend tolling legislation to enable broader applicability.

If we don't make changes, pricing challenges for transport and water infrastructure can result in broader costs for society. We highlight this in Case Study 3, which focuses on how we pay for housing infrastructure.

We can make sure that changes to infrastructure prices are managed fairly

How we charge for infrastructure can affect the way costs are spread between high-income and low-income households. In general, charges based on use put more of the cost of funding infrastructure onto high-income households, as they tend to use more infrastructure, relative to fixed charges.

However, low-income households end up paying a greater share of their income when we increase infrastructure charges, regardless of whether they are usage-based charges or fixed charges.

New Zealanders tend to see usage-based charges as a fairer way to pay for infrastructure. For instance, we surveyed New Zealanders and found that 72% of us see volumetric charging as the fairest way to pay for mains water services.

Case study 3:

Paying for housing infrastructure

Context

Population growth is concentrated in our cities, leading to shortfalls in housing and infrastructure

New Zealand's population has grown by 1.5 million since 1996, and this growth has tended to be concentrated in our larger cities. Our growing population creates demand for housing, and house prices rise when we don't build fast enough to keep up with demand. This is why, over the last 15 years, house prices have risen faster than ever in our fastest growing cities.

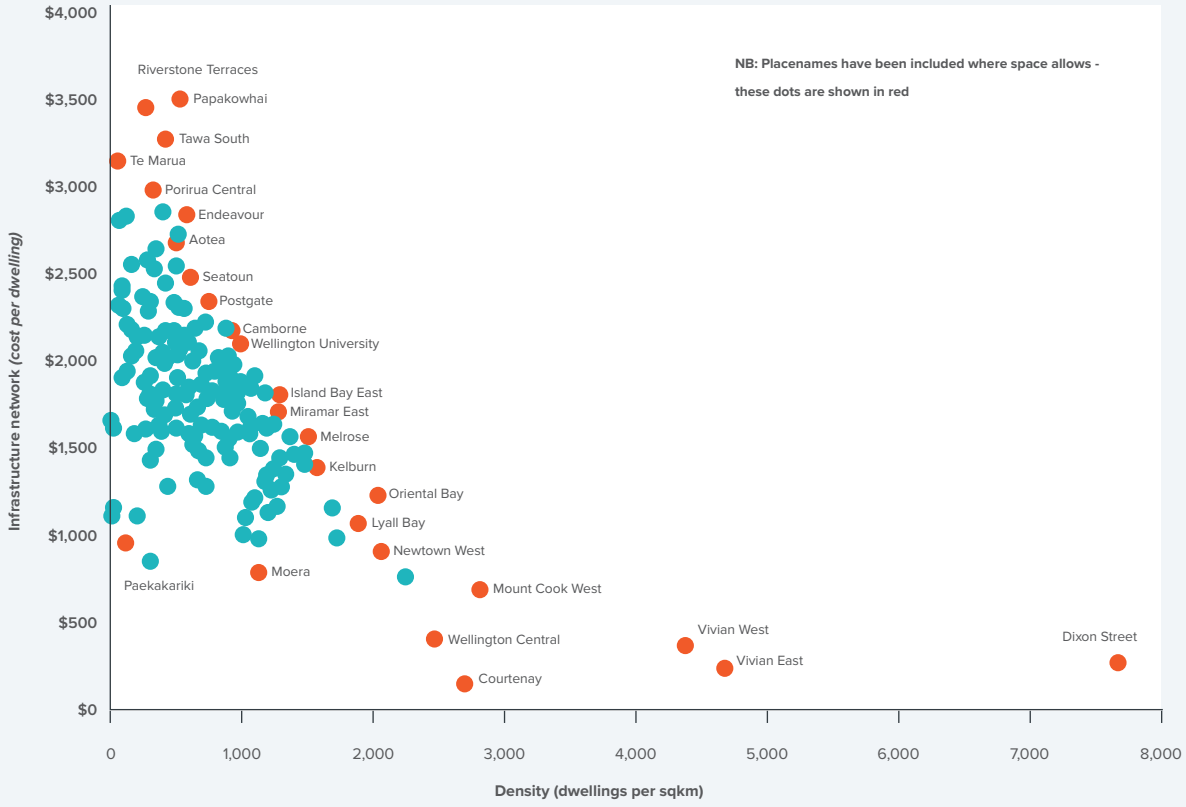
Changes to planning rules to enable more homes to be built can help address this. However, increased population and more new homes require infrastructure, much of which is provided by local governments. They need access to local roads, public transport, water and wastewater networks, and community facilities like parks and libraries. If we can't pay for this infrastructure, it can limit the number of houses that can be built.

What do we know?

New housing tends to be cheaper to service in areas where there's already infrastructure

The cost of the infrastructure needed to support new housing can vary significantly by location. It tends to be cheaper to build infrastructure in areas where there is already infrastructure nearby, and it is cheaper to provide infrastructure for higher-density housing (Figure 22). [6] As a result, decisions about where to build new homes can make a big difference to infrastructure costs. However, councils don't all collect the same data on the capacity of their infrastructure.

Figure 22: Population density and local government infrastructure costs per dwelling in the Wellington region



Source: Sense Partners, 2024.

[6] See also evidence from Auckland (https://knowledgeauckland.org.nz/publications/cost-of-residential-servicing/), Melbourne (https://assets.infrastructurevictoria.com.au/assets/Resources/Infrastructure-Victoria-Choosing-Victorias-future-Five-urban-development-scenarios-_2.pdf) and Sydney (https://www.productivity.nsw.gov.au/sites/default/files/2023-08/202308_NSW-Productivity-Commission_Building-more-homes-where-infrastructure-costs-less_accessible-v2.pdf).

We need better tools to pay for growing communities

Since 2002, local governments have spent an average of about $3.8 billion per year renewing and improving their networks. [7] Councils rely mainly on rates to fund council services and infrastructure, but they are increasingly turning to development contributions and targeted rates to help pay for growth infrastructure.

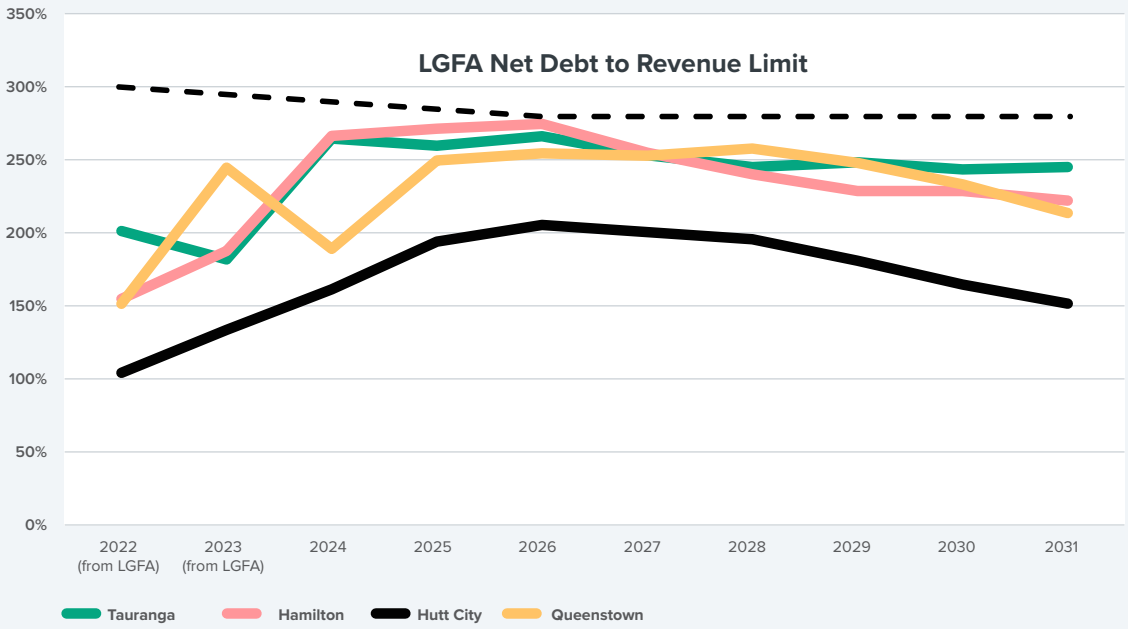
These tools don't always recover the full cost of housing infrastructure. For instance, from 2014 through 2021, Tauranga spent over $481 million providing infrastructure to support growth, but only collected $225 million in developer contributions over that same period. [8] Slower-than-expected development can also pose financial risks for councils. For instance, our analysis of the development contributions policy planned for Drury showed that if there was 15% less development than expected by 2060, ratepayers would need to pay an extra $530 million in costs over this period.

Financing infrastructure for housing growth is increasingly challenging for councils

Most councils borrow money to build new infrastructure and repay that debt over time using user charges and rates. However, they are facing some financing constraints.

Councils use the Local Government Funding Agency (LGFA) as their main financing tool because it has low borrowing and administrative costs. Councils in the LGFA must comply with financial rules, including a limit on debt-to-revenue ratios, and many fast-growing councils are nearing their debt limits (Figure 23). It is possible to work around these limits to a degree, but councils will not be able to pay for all investment with increased debt unless they also have a way to raise new revenues.

Figure 23: Estimated debt to revenue ratios in 2021 LTPs for selected high-growth councils



Sources: Councils' 2021–2031 LTPs, LGFA, and Te Waihanga analysis. Note: Where possible, Te Waihanga used net debt to revenue ratios in LTPs. In cases where councils reported gross debt, Te Waihanga calculated net debt as borrowings plus financial derivatives minus cash and investments. Revenue was calculated as total revenue minus development and financial contributions and vested assets.

[7] https://media.umbraco.io/te-waihanga-30-year-strategy/djkmtwj4/build-or-maintain.pdf

[8] Source: Tauranga Annual Reports and StatsNZ Local Authority Financial Statistics.

Regulation:
Charting a more enabling path

Discussion questions
- what do you think?

We are interested in your views on further opportunities to improve regulation affecting infrastructure delivery, including on the following question:

Discussion Question

Question 16

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

Context

New Zealand will need to build and replace a lot of infrastructure if we want to enjoy quality, reliable services into the future. But consenting processes for infrastructure projects can be too slow or too costly, and they don't always give us the economic, social, or environmental benefits they were designed to promote.

This system has become more complex and slower over time. We won't be able to meet our infrastructure goals unless this trend is reversed, but we also need to consider how to address the needs that this system represents.

The Government is currently planning to reform several Acts that can affect infrastructure: the Resource Management Act 1991, the Public Works Act 1981 and the Overseas Investment Act 2005. This reform work is under way and may be well advanced by the time this Plan is finalised.

Our evidence base

What do we know?

Our regulatory approach requires projects to seek permission on a case-by-case basis

Our consenting legislation, like the Resource Management Act, requires approval for new infrastructure on a case-by-case basis and evidence that it won't have a negative impact on surrounding activities and the environment. But the standards that infrastructure projects face are not always clear, and in some cases may not have kept up with technological changes that require projects to be designed in different ways. Sometimes, national direction under the Resource Management Act clarifies what can be built and where, but it is often absent.

Another challenge is that our urban areas and wider environment has already been altered from its natural state. Change, including building new infrastructure, is sometimes needed to improve our natural and built environment.

Gaining permission for infrastructure projects can be costly, slow and uncertain

Our research has found that from 2028, consent processing times would need to be 50% quicker than they are projected to be if New Zealand is to approve the infrastructure needed to support our climate change goals.

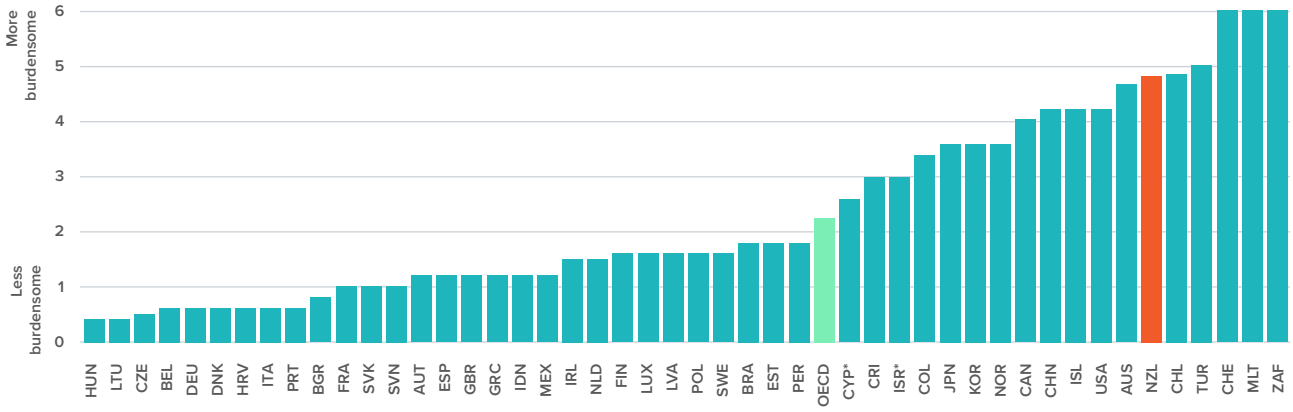
The cost of consenting infrastructure projects can be significant. These costs place the heaviest burden on smaller projects. For example, we find that projects costing under $200,000 spend an average of 15.9% of their budgets on consenting, compared with an average of 0.7% for projects costing between $100 million and $1 billion.

Consenting costs appear to be growing over time. The cost of consenting infrastructure projects increased by 70% from 2014 to 2019, and consent processing times increased by 50%.

Regulation tends to grow and gain complexity over time

In the late 1990s and early 2000s New Zealand performed strongly in OECD's rankings of how much burden our regulations create. Since then, our performance has deteriorated. According to the most recent OECD review, New Zealand now has a higher-than-average regulatory burden for market entry and competition (rather than consenting). Our overall regulatory burden is similar to countries like the US and Australia, but considerably higher than most European Union countries (Figure 24).

Figure 24: NZ has a high regulatory burden relative to other OECD countries



Source: OECD (2024). OECD Product Market Regulation (PMR) indicators: How does New Zealand compare? https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/product-market-regulation/New%20Zealand_PMR%20country%20note.pdf.

We can expect the amount of regulation we have to grow as people expect more clarity and as new challenges emerge. However, there is a need to check that the changes in regulation are delivering benefits that justify the added cost of complying with them.

A further issue is that the ways we enforce regulation can overlap. For example, infrastructure projects involving foreign investors often have their environmental impacts separately assessed through both the Resource Management Act and the Overseas Investment Act, using different criteria. This means that people building infrastructure need to rework the same information twice so that it is suitable for both applications. This adds to their costs without necessarily increasing benefits.

Getting regulation right can mean better results from infrastructure

Regulation can also ensure that infrastructure services are provided in a cost-effective and reliable way. As an example, infrastructure like electricity transmission and distribution, and fixed-line broadband is regulated under the Commerce Act. In an earlier section, we highlighted how this regulation helps with better asset management planning, because it encourages infrastructure owners to focus on providing reliable services with consistent funding levels.

Section five:

5

What happens next?

Ka aha i muri mai?

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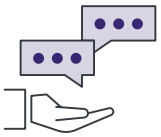

Discussion questions
- what do you think?

Discussion Question

Question 17

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

This document sets out our thinking as we begin work to develop a National Infrastructure Plan. It describes 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.

You'll find 17 questions that cover the topics found in the Discussion Document. You can answer as many questions as you like. You can also provide any other comments or suggestions that you would like us to consider as we develop the National Infrastructure Plan.

You can share your views through our feedback form between 6 November and 5.00pm 10 December. **https://inform.tewaihanga.govt.nz/make/b70ca024-cbad-4770-a076-b21e0099aca3**

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 commercial sensitive information will be removed.

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 on social media. We'll also be seeking feedback on a draft Plan before we publish the final Plan in December 2025.

Email **info@tewaihanga.govt.nz** if you have any questions or would like more information.

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