

Māori economic participation in the infrastructure sector

Elevating enterprise ownership and labour market outcomes

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Ka nui te mihi ki a koutou katoa!

Executive summary

Ko au te whenua, ko te whenua, ko au

I am the land and the land is me

The connection to the land is physical and spiritual, and integral to the survival and wellbeing of Māori.

Industry-specific insights facilitate focused policy, strategy, and programme formulation

The Māori economy has grown in significance, complexity, and depth. It has entrenched itself as a crucial component of the wider New Zealand economy. Yet its present position and growth lag well behind the remainder of the economy. A series of high-level reports have accounted for Māori economic shortfalls, largely on a national, or economy-wide scale, but few have focused on economic participation in specific industries. This means variances and nuances of Māori participation in different domains of the economy are not being adequately captured. The development of effective policy, strategies, and sector-specific programmes relies on such crucial industry insights.

The purpose of this report is to understand the present state of Māori participation in the horizontal infrastructure industry (hereafter referred to as simply infrastructure) and subsequently develop a strategy that includes policy recommendations and directions-setting initiatives aimed at enhancing Māori participation. Our mahi is driven by four key questions:

- Where are Māori employed in the infrastructure industry?
- What is the present state of Māori business ownership in the industry?
- What challenges are facing Māori employment and business ownership in infrastructure?
- How can Māori economic participation in infrastructure be elevated?

Given these guiding questions, our mahi is explorative in nature. It draws upon and combines quantitative data as well as qualitative insights from comprehensive stakeholder engagement. We do not claim that this report is the final word on Māori participation and progress in employment and enterprise formation in infrastructure. Rather, the report serves as a conversation starter, with a view to expansion and extension mahi in future to bring about the kind of paradigm shift being sought.

Key findings from our mahi

Several key findings emerged from our analysis, some of which reflect broader economic issues, while others are germane to Māori participation in the infrastructure industry.

- **There are significant economic opportunities in infrastructure.** Almost \$60 billion will be spent on infrastructure projects in Aotearoa over the next five years. This comes at a time when the industry is experiencing significant skills and labour shortages. From an economic perspective, this is a highly opportune time to become involved in infrastructure mahi.
- **Social procurement levers could be improved.** Māori business owners in the infrastructure industry report negative experiences of social procurement. In its present form, social procurement can be easily undermined and neglected. The intended benefits of social procurement are not being fully realised on the ground.
- **Social procurement alternatives are already being utilised, though not widely.** Some organisations take an innovative and focussed approach to social procurement in which contracts are tailored to the skills and capabilities of Māori firms. This approach can circumvent the barriers and shortfalls associated with established procurement practices.
- **Lack of coordination is constraining Māori participation.** Coordinated efforts between government agencies, private companies, and iwi/Māori groups are needed to create economic opportunities for Māori in infrastructure. Unfortunately, relatively few instances of this coordination occurring were identified, suggesting economic outcomes are being missed.
- **There is a dearth of data concerning Māori economic participation.** Data that comprehensively details numbers, levels, and locations of Māori employees or businesses, operating exclusively in the infrastructure sector, could not be located for this mahi. Our stakeholder kōrero indicated that this data does not currently exist. However, we also acknowledge that some insights could be inferred about infrastructure from the IDI.
- **Government agencies struggle to effectively engage mana whenua and Māori SMEs.** Meaningful engagements between mana whenua, Māori SMEs and government agencies can create significant economic opportunities for Māori. Cultural and language deficiencies on the part of government agencies prohibit meaningful engagement and, therefore, economic outcomes for Māori. Moreover, the commitment within agencies to meaningfully engage with Māori is patchy and somewhat inconsistent.
- **Potential exists for iwi participation in infrastructure planning and investment.** A number of iwi respondents raised the idea that, as Treaty partners, Māori could and should have a role in planning and investing in infrastructure in New Zealand. Government could explore different planning and funding models that will allow Māori and iwi to co-plan, co-invest and co-own.
- **Capacity building support for Māori enterprise is still lacking.** Māori SMEs raised a range of capacity building constraints which limit their ability to grow and compete in the infrastructure sector.

Recommendations

Using the research presented in this report as a foundation, we have designed a strategy aimed at elevating Māori economic participation in the infrastructure sector. It is guided by six key focus areas:



Contracting – covering contract structure, form, requirements, and process. The goal is an improved environment for Māori, to rationalise contracting, and improve the allocation and management of risk.



Coordination – as between and amongst Iwi, industry, Government agencies, and advisors. The purpose is better coordination, which involves action in terms of streamlining interactions and promotion of beneficial opportunities and results.



Commitment – to embed useful practices and demonstrate a sustained level of commitment that shows the importance of Māori in the sector on a relational rather than transactional basis. The goal is to demonstrate credible commitment and ensure actions follow words, including a monitoring function.



Coaching – in essence, supporting the provision of mentoring and other advice from current participants, including business advice, navigating the terrain, and perseverance. The goal of such a coaching focus is to shine a light on valuable pathways to ongoing prosperity, and mana-enhancing growth.



Collection – of both information/data and experiences to illustrate the state of play and what changes might be needed or coming in the future. The goal of greater collection activity is to provide necessary insight and guidance for Māori (and others) to make efficient and rewarding decisions from a base of mutual understanding.



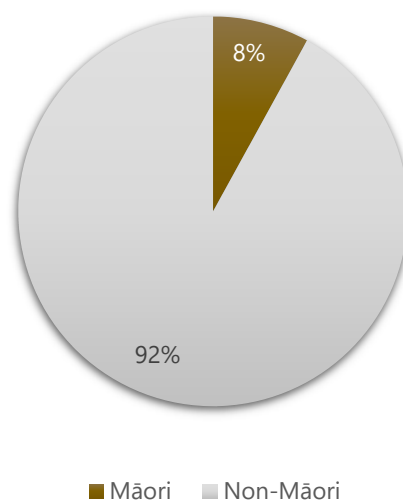
Culture – which covers education and the pipeline of opportunities and resources (enterprises and individuals). The goal is to ensure that there is sufficient capability and resources available to exploit available economic prospects.

1. Purpose of this report

The development of a Māori infrastructure sector strategy follows from the innovative *Te Matapaeroa 2020* report, the setting of Māori Economic Development as a Te Puni Kōkiri Strategic Priority in 2021, and the Māori Economic Resilience Strategy (MERS) workstream within Te Puni Kōkiri. Several pertinent insights into the Māori economy were contained within *Te Matapaeroa 2020*, but perhaps the most striking finding was that, proportionally, Aotearoa is approximately 20,000 Māori businesses short of equitable representation. Regrettably, there has been limited Māori business growth over the past decade.

Recent reporting (Te Puni Kōkiri, 2022) finds that approximately 8 per cent of businesses in Aotearoa are Māori-owned, significantly contrasting with the 17 per cent of Māori representing the population at large.

Figure 1: Enterprise ownership proportions (Te Puni Kōkiri, 2022)



Nominally, to achieve population equity in enterprise ownership, roughly 23,000 new Māori enterprises would be required, assuming no growth in non-Māori business ownership. Expanding Māori enterprise in infrastructure would, therefore, help bridge the considerable gap in business ownership between Māori and non-Māori.

With a goal of elevating Māori business ownership, a series of Māori industry and sector strategies are being developed. Our Māori infrastructure strategy is a key component in the overall suite of relevant mahi, for both economic and cultural reasons.

Prior approaches to Māori economic development have taken a national or economy-wide view of building Māori enterprise. This approach is limited in its ability to capture variances and nuance of Māori participation in different domains of the economy. A sectoral approach to Māori enterprise

development, however, enables the identification of sector-specific characteristics and issues. Thereby, we can develop more focused policies, strategies, and programmes that can target Māori enterprise development in a concentrated manner.

This report aims to provide a baseline stocktake of the state of play for Māori enterprises in the infrastructure sector. Our stocktake includes:

- an examination of Māori employment in the infrastructure sector
- an examination of Māori enterprise ownership in the infrastructure sector
- an examination of Māori enrolment in relevant tertiary education programmes, such as civil engineering
- an examination of the financial opportunity for Māori enterprises in the infrastructure sector
- the identification of key barriers and opportunities for elevating Māori economic participation in the infrastructure sector.

Our stocktake is used as a blueprint for industry-specific action, policies, and programmes for government agencies and other key stakeholders. Specifically, it aims to provide a starting point for policy pilots that can be progressed by Te Puni Kōkiri and other government agencies in partnership with others. We intend that this will lead to industry engagement bringing together government and key industry groups, such as industry peak bodies, professional and career associations, Māori collectives, SMEs, and large corporates.

1.1 We adopt a mixed methods approach

The main objectives of our mahi are to understand the:

- landscape of Māori participation in the infrastructure sector
- challenges to, and opportunities for, elevating Māori participation in the infrastructure sector.

These objectives demand different yet complementary approaches from qualitative and quantitative domains.

We conducted a quantitative analysis of infrastructure expenditure in Aotearoa over the next five years. We did this to assess the landscape of economic opportunity for Māori infrastructure businesses. We applied quantitative techniques in the analysis of higher education enrolment data to gain an understanding of the pipeline of Māori studying relevant courses, such as civil engineering.

To gain insights into the challenges and opportunities facing Māori in the infrastructure sector, we conducted in-depth, semi-structured interviews with a range of infrastructure sector stakeholders, including public officials and Māori business owners. These varied data enable us to illustrate the complex landscape of Māori participation in the infrastructure sector.

1.2 Our definition of a 'Māori business' is based on self-identification

For the purposes of enabling better consistency across government in the measurement and reporting of Māori business activity, Stats NZ has made considerable progress in developing a standardised

definition of a 'Māori business'. Following a series of hui and Māori engagements, Stats NZ identified three primary components that can define a Māori business:

- whakapapa and self-identification
- a minimum Māori ownership level (50 per cent)
- a demonstration of Māori values and cultural connection.

Stats NZ's hui and engagements did not arrive at a consensus of what precisely constitutes a Māori business. In public sector procurement, at the time of writing, a Māori business is defined as either a Māori authority or an enterprise with at least 50 per cent Māori ownership (Te Puni Kōkiri, 2022). However, for the purposes of clarity and ease of identification, we follow a self-identification methodology for sampling Māori businesses included in this report.

1.3 We focus on labour market outcomes as a factor in eventual enterprise ownership

We acknowledge that elevating enterprise ownership is the primary aim of this strategy. Nevertheless, a focus on labour market outcomes is required as enterprise ownership and labour market outcomes are intrinsically linked. By progressing in labour markets, employees can accumulate knowledge and experience, as well as form network connections that support business formation (Amaral & Baptista, 2007).

The requirement to build a base of knowledge and experience before embarking on business ownership is pertinent in highly technical fields, such as engineering. Therefore, as part of developing a strategy to increase the number of Māori businesses in the infrastructure sector, it is important to consider the pipeline of potential Māori infrastructure entrepreneurs in the labour market.

In subsequent sections below, we highlight why this is especially relevant to infrastructure.

1.4 What do we mean by 'infrastructure'?

Throughout this report, we use the term 'infrastructure' to refer to horizontal or lateral projects. We do this to distinguish it from vertical infrastructure projects, such as the construction of schools and hospitals. Specifically, horizontal infrastructure projects, for the purposes of this report, include:

- new road developments
- land development
- water transmission
- water treatment
- stormwater
- rail
- road maintenance
- airports
- ports
- energy transmission
- energy production.

These project types guide our data sampling techniques and selection of stakeholders to be interviewed. We understand that a separate strategy that focuses on Māori participation in vertical infrastructure and construction projects is under consideration.

Part A: Context and strategy

2. Māori thriving in the infrastructure sector

2.1 Vision

Māori enjoying the fruits of their labour and enterprise in the infrastructure sector.

2.2 Goal

For Māori businesses and individuals to engage in the infrastructure sector in an economically rewarding, culturally appropriate, and equitable manner.

2.3 Purpose

To identify the policy work areas that would lead to achieving the vision for Māori in infrastructure.

2.4 Opportunities

This strategy looks to maximise opportunities to:

- unlock the economic potential in the infrastructure sector for the equitable benefit of Māori
- change the paradigm in the letting of contracts and nature of relationships in the infrastructure sector
- exploit the obvious synergy between te ao Māori and elements of the infrastructure sector
- provide iwi with another path to foster the mana of their people across generations
- set a new direction for Māori enterprise development and achievement
- showcase Māori successes in a high-profile and critical part of the economy
- raise income levels, employment opportunities and standards of living across the country, encouraging new entrants and those who have previously left to return to the sector
- highlight possibilities to apply a new model for use in other sectors
- build the next cohort of Māori entrepreneurs and leaders.

2.5 The scope of infrastructure has alignment with some aspects of a te ao Māori perspective...

Te ao Māori, the Māori worldview, recognises the interrelationship and interconnectedness of all things, living and non-living. It is a holistic approach that seeks to understand the totality of a system, not just its constituent parts. It is at the heart of the challenges facing land and water. It is, therefore, a fundamental and central component of infrastructure in Aotearoa. Several interview participants articulated how they enlivened te ao Māori via infrastructure projects.

- **Infrastructure projects can be a vehicle for improving the environment.** An environmentalist view is often viewed analogously with kaitiakitanga – although it is more accurately represented by the te reo Pākehā terms *guardianship* and *protection*.

“With our worldview and our values, we de-emphasise the relative materialistic, financial, and other imperatives, and instead we have a stronger focus on the environment. We are concerned about the environmental impact of things; we have a duty to look after the land and the water.”

- **Social change can be engendered via infrastructure projects.** Reorienting away from profitability, it was advised that Māori view infrastructure projects as levers for enacting social change, by creating jobs and creating opportunities for local communities.

“We focus on the human impact of everything we do in infrastructure. Where can opportunities be created for communities, how can we get people into work? Those are the material things that we can deliver as part of being involved in infrastructure projects.”

- **Intergenerational growth, resilience, and opportunity can be facilitated by infrastructure projects.** Infrastructure can represent long-term investments for Māori and iwi groups. These investments can support future generations, ensuring prosperity and longevity.

“Infrastructure can be a long-term investment for us, something to help us secure the future of our iwi. We are intergenerationally focused, so we’ll try to participate in infrastructure that facilitates that.”

The congregation of Māori values and infrastructure are perhaps the most pertinent in the case of water, especially fresh water. From a Māori perspective, water is considered ‘toto’, the blood, the blood of Papatūānuku. Without blood, Papatūānuku, the Earth, cannot live. Within the politics of the Three Waters reforms, a relatively new concept has emerged: *Te Mana of te Wai* – which refers to the vital importance of water. Involvement in water-based infrastructure projects, or infrastructure projects that affect freshwater, is, therefore, an imperative for Māori.

2.6 However, some features present barriers to both entry and progression

At present, the infrastructure sector presents barriers to advancing Māori achievement.

A 'closed-shop' operating environment, based largely on scale

Smaller businesses, of which Māori firms account for a significant share, do not have the time and/or expertise to participate in the tender process for most infrastructure works. The tender documents tend to be too long and unwieldy for smaller firms, who, unlike larger firms, do not have the resources needed to dedicate time to understanding the documents and formulating a credible response. A vicious cycle ensues as larger firms who do draw on dedicated resources are able to use material from previous responses to reduce the effort needed for subsequent tenders. That is, there are 'threshold effects' at play, which restrict the pool of possible participants on a tender to only a limited pool. The widely understood struggles Māori SMEs have accessing capital has a particularly strong bearing on infrastructure where companies carry large capital – mostly heavy equipment – loadings compared to other industries.

Risk aversion and inertia

Related to the issue of scale, the major players in the sector tend to have limited knowledge of Māori participants and lack of strong incentives to include such Māori firms in their alliances. There appears to be a strong propensity of larger firms to stick to what and who they know already. In addition, such firms and the procurement teams on the 'buy side' look to transfer risk to smaller firms through contract terms (e.g., penalty clauses or other performance-related conditions) rather than managing risks in a more relational sense. Finally, there are reports of a perception issue in relation to smaller and Māori firms from those in a position to partner with such business or provide work to them. The perception is that Māori firms would struggle to deliver to the necessary quality standards or time constraints.

Relatively narrow skillsets contained within, and limited reach of, Māori entities

We note that currently those Māori that are participants in the sector are at different stages of readiness in terms of the required capability to actively participate in a meaningful way. This is the case across iwi and non-iwi groups and is perhaps not surprising given the limited role that Māori have played in the wider sector to date. Where Māori are currently operating in the sector, it can often be the case that they specialise in only a limited sphere (e.g., earthmoving or traffic management), without broadening their service offering. Furthermore, Māori business or iwi entities face some constraints around ease of operating in areas outside traditional rohe. Finally, some Māori firms have reported issues around accessing capital to undertake larger jobs or to expand their offerings, though this was not a widespread issue.

The infrastructure labour market is highly fluid and non-linear

In many parts of the infrastructure labour market, there is a large proportion of the workforce at any one time that has entered from other industries, particularly manufacturing but also construction. This phenomenon is not straightforward to explain but might relate to the cyclical nature of work in those other sectors, or the project-related aspect of infrastructure. Nevertheless, the pattern of work does

make workforce planning difficult. In addition, the path to progression or business ownership is not necessarily a linear one. For instance, a recent news article highlighted a female Māori business owner in the roading sub-sector who went from holding a stop/go sign to business ownership (and 15 employees), after initially working in the administrative side of road contracting firms.¹ Again, such an unpredictable business formation path is not readily amenable to planning or fixed development interventions.

2.7 On balance, infrastructure is too good to ignore

Notwithstanding the issues identified immediately above, infrastructure is a sector that has much appeal for Māori and potentially could provide a stream of work and enterprise opportunity for generations. In simple terms, the benefits far outweigh the costs associated with a greater Māori presence in the sector. There are few sectors that would offer the promise of enhanced prosperity that also have an alignment with Māori worldviews, and the prospect of paradigm shift.

¹ <https://www.nzherald.co.nz/business/life-is-a-highway-mums-journey-from-stop-go-sign-operator-to-roading-boss/2A4PGTQXN2WJ2IECHDJIZ34GIA/>

3. Guiding principles of this strategy

The following principles underpin the strategy:

- The strategy is New Zealand-wide (notwithstanding differences in regional opportunities). The strategy identifies and supports actions that are best for Māori across New Zealand, regardless of locality.
- Collective action is the key to a successful strategy. There is no one specific audience or sector group that the strategy is specifically aimed at – all stakeholders have a role to play and need to be engaged, particularly in relation to implementation.
- The strategy is efficient. This strategy is being developed within a wider context for infrastructure. While having its own flavour, it should avoid duplication and be well aligned with other strategies such as Rautaki Hanganga o Aotearoa, New Zealand’s infrastructure strategy, as well as any local government and other investment plans. It also means working off existing strengths rather than trying to create them.
- Economic growth and employment are the main objectives of the strategy, but not the only ones. While growth is the main goal, it should not come at the cost of tikanga Māori business operations, sustainability or environmental best practice.
- Flexibility is a necessary but not sufficient condition. Flexibility of approach promotes innovation, investment and supports high-quality, strong relationships. It is fundamental to growth, but other aspects are also important.
- The strategy is pragmatic. While being aspirational, the strategy is also pragmatic in the sense of being aware of constraints and other aspects over which the region has no control. In addition, the strategy recognises the need for further information and knowledge to be discovered, but also highlights the need to achieve progress in such an environment.

4. Focus areas

There are six key focus areas for the strategy. The focus areas provide some direction around possible policy pilots, though not all the suggested actions are fully amenable to policy interventions. The focus areas, in no particular order or priority, are:

	<p>Contracting – covering contract structure, form, requirements, and process. The goal is an improved environment for Māori, to rationalise contracting, and improve the allocation and management of risk.</p>
	<p>Coordination – as between and amongst Iwi, industry, Government agencies, and advisors. The purpose is better coordination, which involves action in terms of streamlining interactions and promotion of beneficial opportunities and results.</p>
	<p>Commitment – to embed useful practices and demonstrate a sustained level of commitment that shows the importance of Māori in the sector on a relational rather than transactional basis. The goal is to demonstrate credible commitment and ensure actions follow words, including a monitoring function.</p>
	<p>Coaching – in essence, supporting the provision of mentoring and other advice from current participants, including business advice, navigating the terrain, and perseverance. The goal of such a coaching focus is to shine a light on valuable pathways to ongoing prosperity, and mana-enhancing growth.</p>
	<p>Collection – of both information/data and experiences to illustrate the state of play and what changes might be needed or coming in the future. The goal of greater collection activity is to provide necessary insight and guidance for Māori (and others) to make efficient and rewarding decisions from a base of mutual understanding.</p>
	<p>Culture – which covers education and the pipeline of opportunities and resources (enterprises and individuals). The goal is to ensure that there is sufficient capability and resources available to exploit available economic prospects.</p>

4.1 Improving the contracting environment

4.1.1 Explanation

Māori infrastructure enterprises have poor experiences of social procurement and the broader contracting environment in Aotearoa. Māori enterprises are challenged by:

- time and resource requirements for developing a competitive tender
- disengagement with the tender process
- gaining traction in a sector that favours existing connections and social relationships
- misconceptions of skills and capability
- misunderstanding and undermining of social procurement levers.

Combined, these factors appear to render social procurement, in its present form, an ineffective means of providing opportunity to Māori infrastructure enterprises.

4.1.2 Relevance

From a government agency perspective, social procurement is viewed as a lever to provide opportunities for Māori infrastructure enterprises. Through these opportunities, it is anticipated that Māori enterprises accumulate the skills, knowledge, experience, and contacts required to thrive in the sector. The ineffectiveness of social procurement is, therefore, a significant obstruction to Māori enterprises seeking to engage in the infrastructure sector in an economically rewarding, culturally appropriate, and equitable manner. A reimagining or reorientation of social procurement may minimise present obstructions. However, a policy change in this domain is limited in its ability to tackle issues such as time and resource constraints or misconceptions of the skills and capabilities of Māori firms. The former reflects an issue internal to Māori firms and the latter represents a mindset shift from industry actors.

4.1.3 Priority actions

In resolving the social procurement issue, we propose that awareness-raising is the first logical step

Our kōrero with government agency stakeholders informed our view that government agencies are unaware that social procurement levers are ineffective and being undermined on the ground. Drawing attention to the experiences of Māori infrastructure enterprises can raise awareness of the realities of social procurement.

Understanding challenges and obstructions to social procurement

Our mahi has outlined a series of challenges associated with social procurement from a Māori enterprise perspective. The possibility that additional challenges and obstructions exist should not be discounted. Further research into social procurement experiences will ensure sufficient breadth of insight.

Re-balancing cost-only focus to effectively incorporate broader outcome expectations

Major infrastructure projects in New Zealand are large, multi-year, and often involve a head contract with a large multi-national company that has to capacity to wear contract risk. There are therefore greater difficulties associated with balancing potential risks associated with incorporating broader outcomes under a social procurement regime. There are examples of recent projects where this re-balancing has been explored – beginning with early planning at the business case phase and strong budget holder commitments.

Workshopping alternative social procurement modalities

Social procurement levers are present in a range of central government agencies. Therefore, we propose workshopping social procurement alternatives with representatives from these different agencies. We envisage that TPK could play a central role in organising and managing these workshops. As direction-setters we identified alternatives to social procurement:

- *Direct contracting* – Forgoing a conventional procurement process, we recognise the value in a direct contracting approach for Māori infrastructure enterprises. Practically, this would

involve identifying Māori infrastructure businesses with relevant skills and capabilities and awarding them work without submitting a tender. This method of contracting would be especially relevant where projects involve working on culturally significant sites. Given this, we propose that Māori firms within the rohe of the infrastructure project are prioritised for direct contracting opportunities.

- *Bespoke contracting opportunities* – Broadly, conventional tendering involves a buyer going to market with an RfP which details the skills and capabilities required for a job. A supplier then tenders for said job. Following what we describe as the *Amotai philosophy*, we note opportunities for Māori enterprises can be created by rethinking this process. Bespoke contracting is a two-stage process that (1) involves the identification of Māori infrastructure enterprises in a given rohe, and (2) involves tailoring a contract based on the skills and capabilities of those enterprises. This ensures a good fit between required and available skills and capabilities, while simultaneously providing opportunities for Māori enterprises seeking to break established social barriers in the infrastructure sector. We recognise that quasi-Crown entities, such as Watercare, subscribe to a similar approach and may, therefore, represent something of a blueprint for wider use in different government agencies.
- *Acknowledging risk versus cost of using Māori (often new) companies as sub-contractors* – Large infrastructure projects often default to placing all risk with the contractor and, in many instances, this means only large, overseas-owned companies can secure the master contract which often comes with large bonds held by government. These companies have longstanding, well-established relationships with preferred sub-contractors. They are able to incorporate new Māori-owned companies, but often push the risk they perceive with that approach back to the project owner. Government and others need to be prepared with clear strategies to assess that risk and potential cost, and have Māori companies they have already identified as potential partners to include in the mix.

4.2 Better coordinating actions and interests

4.2.1 Explanation

Improved coordination and transitioning away from siloed thinking and operation is hardly a novel or exclusive finding of this mahi. Nevertheless, we recognise the need for streamlined interactions and the promotion of mutually beneficial opportunities and results. Simply put, capitalising on the opportunities and promoting Māori outcomes in the infrastructure sector requires a collective effort from iwi, industry, government agencies and advisors. Insights from our mahi indicate that opportunities for coordination, cooperation and collaboration are being missed.

4.2.2 Relevance

Authentic partnerships between Māori and the Crown are central to Te Tiriti. Yet effective and authentic partnership opportunities in the infrastructure domain are being challenged by a series of obstructions, including:

- iwi time and resource constraints
- insufficient cultural competencies
- inability on the part of government agencies to effectively engage iwi
- difficulty in identifying opportunities.

We recognise that policy is unlikely to tackle time and resource constraints, but it can be used to develop an environment that is more conducive to coordination between different groups.

4.2.3 Priority actions

Here we present priority actions that build an environment conducive to coordination and cooperation.

Early project planning to incorporate social procurement outcomes

There are now useful working examples of how forward-thinking budget holders and contract managers have re-allocated contracting opportunities to ensure greater take-up of Māori enterprise across the life of a large project. Other significant projects planned by government and others should learn from these examples and make similar commitments to effectively address social outcome targets as set by government.

Development of iwi engagement strategies

Largely, government agencies have difficulty communicating and effectively engaging with iwi. Issues range from a lack of cultural awareness to uncertainty surrounding whom to contact and when. Therefore, we suggest that government agencies develop iwi strategies designed to limit obstructions to effective engagement. Cultural competency training should be a core component of these strategies. We also note that there are inter-iwi variances, particularly between those in different stages of settlement, meaning we do not suggest a 'one-size-fits-all' approach to the development of these strategies. A tailored approach to each iwi would be ideal. However, if that is not practicable, the development of separate strategies for pre- and post-settlement iwi should be considered.

Different government agencies engage with iwi for different reasons. Therefore, we anticipate that each government agency develops an individual strategy that authentically reflects the organisation. In our view, Te Puni Kōkiri has the requisite knowledge and connections to oversee and coordinate the development of these engagement strategies.

Development of Māori business engagement strategies

Our research indicated that engaging with Māori infrastructure businesses, as opposed to solely engaging with iwi, may yield greater economic benefits. There are a large number of Māori SMEs working in the Infrastructure industry but almost no iwi or PSGEs. In addition to iwi engagement strategies, we therefore suggest that government agencies consider the strategies they use for engaging Māori infrastructure businesses. This would likely require access to a routinely updated dataset of Māori businesses, which includes geographic location, skills, and capabilities. We have made a separate recommendation for the establishment of this dataset. We envisage that engagement with Māori businesses will be the responsibility of any and all agencies that initiate infrastructure projects. However, given the lack of an open database of Māori businesses that agencies can use, it may be challenging to initiate engagements.

Māori infrastructure business forums and events

By collaborating, Māori entrepreneurs anticipate that they can access skills, capabilities, and scale they lack independently, and thereby bid for larger infrastructure projects. Initiating an effective collaboration between Māori firms requires an opportunity for entrepreneurs to meet in person. As such, we recognise the value in establishing an annualised business forum or networking event for Māori infrastructure businesses. To encourage engagement, this event could take the form of a Māori business competition, similar to that of Ngā Taumata Rau Aotearoa Māori. Te Waihanga could play an important role in organising such an event.

Inter-iwi collaboration

Reflecting a commonly espoused narrative heard during our stakeholder kōrero, we agree that there is likely an opportunity for iwi to collaborate in the establishment of a contractor that can tender for large-scale infrastructure projects in Aotearoa. It is not obvious that iwi have yet recognised this opportunity or are aware of the financial gains to be had in the infrastructure sector. Therefore, we expect a key component of this priority action will involve communicating the extent of infrastructure opportunities to various iwi. Armed with our research, Te Puni Kōkiri can play a central role in disseminating this information. We expect that this initiative will ultimately be iwi-led, although Te Puni Kōkiri could assume an additional role in coordinating iwi interactions and kōrero.

4.3 Establishing credible commitments

4.3.1 Explanation

In order to embed priorities around advancement of Māori enterprise and labour market outcomes in the sector, credible commitment by agencies is required. By credible we mean:

- **Enduring** – commitment for a period beyond the short term (12-18 months) and into agency Statements of Intent and long-term output plans. In addition, commitment should be to a role or function rather than a person (i.e., the commitment is not person-specific).
- **Meaningful** – there should be contractual conditions attached to performance metrics and the agency should be evaluated on the extent to which objectives are achieved.
- **Specific** – dedicated resource should be assigned to the task of supporting and growing Māori enterprises and higher-level worker positions for workers. The task of fostering Māori participation and performance (e.g., in terms of supplier diversity, and within the 'Broader Outcomes' rubric) in infrastructure should not form part of the duties of a person with other responsibilities; the person should only wear one hat.

In the absence of a credible commitment, it is too easy for the status quo to remain, when significant change is needed to ensure an equitable representation of Māori firms and workers in highly paid positions.

4.3.2 Relevance

As major purchasers of works and related services, government agencies have a major role in bringing about the changes necessary to achieve this strategy's vision and objective. Furthermore, by virtue of

size, government is able to signal the importance of actions to promote Māori enterprise and labour market outcomes to the wider private sector and to Māori entities and individuals. Such demonstration effects support the move to normalise Māori participation and achievement in the infrastructure sector for mutual benefit, rather than being seen as a compliance-type requirement.

There is no single policy lever able to be pulled. Rather than developing a particular policy, it is more about fostering an innovative and brave contracting and procurement environment across government. To create such an environment, buy-in of senior managers and the identification of 'champions' would assist greatly. A quick fix is infeasible.

4.3.3 Priority actions

Establish a pool of skilled resources

At present, the efforts around positive procurement in government appear patchy and uncoordinated. Te Puni Kōkiri could look at bringing together a 'flying squad' (outside of the existing hapori) that would be able to assist in the development of relevant capability across government. The pool of resources would provide guidance around key lessons learned, share experiences of practical actions to match suppliers and procurers, and second resource as required. In essence, Te Puni Kōkiri would create a cross-agency function, drawing on perspectives from other agencies such as Waka Kotahi, the Ministry of Education, and possibly council-controlled organisations such as Watercare.

Promote relevant role creation

Te Puni Kōkiri could develop a case for including specific roles/positions within government agencies that focus solely on finding opportunities for Māori businesses, potentially across a number of given sectors but using infrastructure as a form of pilot. A priority list could be developed that ranks agencies in terms of their suitability and readiness for such functions, with activity focussed on those most ready at the outset.

Create a centre of excellence with a range of functions

Te Puni Kōkiri could create a government centre of excellence with responsibility for promoting Māori enterprise and labour market outcomes in infrastructure (and other sectors, as the case is made). The 'centre of excellence', which could be modelled on the Government Centre for Dispute Resolution within the Ministry of Business, Innovation and Employment, would provide leadership and stewardship across government. It would have monitoring and reporting oversight, as well as designing a system-wide approach to Māori enterprise and labour market outcomes in infrastructure by aligning procurement teams and enterprise support and labour market outcomes functions within agencies to deliver a unified view of ways to enact opportunities for Māori enterprises. The centre of excellence would also provide advice on appropriate changes to contractual terms and conditions of people in existing positions across government to create incentives to meet the objectives of this strategy.

4.4 Fostering the right coaching and support

4.4.1 Explanation

Our mahi revealed that Māori infrastructure enterprises are challenged by business literacy limitations and, to a lesser extent, access to capital. Business literacy, or lack thereof, is reflected in company branding, marketing, financial skills, accounting, human resources, planning, and business growth. Limited business literacy skills also render it difficult to produce successful tenders in procurement. In its present form, the ability to produce an effective tender is essential in infrastructure. Moreover, difficulties experienced by Māori businesses in accessing capital may also be explained, at least in part, by business literacy issues.

4.4.2 Relevance

Competent business management is essential for the success of any enterprise. Infrastructure is no different, and extracting the most from infrastructure opportunities requires enhanced business literacy skills. This is especially relevant given the present mechanism through which work is won in the infrastructure domain. Likewise, access to capital is essential for the formation, growth, and development of Māori infrastructure enterprise. Again, it is essential if Māori enterprise are going to maximise financial opportunities in the infrastructure sector.

4.4.3 Priority actions

Business mentoring and coaching

We identify the provision of business mentoring and coaching as part of a suite of education options to support business literacy. We anticipate that coaching and mentoring can be delivered in tandem with industry and iwi programmes, as well as programmes from dedicated educational providers. In our view, the practical and theoretical components of mentoring and coaching-based education are consistent with the needs and operating models of infrastructure businesses. Business literacy issues are not necessarily exclusive to infrastructure, meaning skills and experience can be drawn from other areas of the economy. Ideally, in the long term, mentoring and coaching can become cyclical, meaning infrastructure business owners who have received coaching may go on to deliver it themselves to other business owners. Additionally, we anticipate mentoring and coaching being ideally delivered by Māori wherever possible. Accordingly, TPK could play a central role in organising and co-ordinating such a programme.

Tender writing support

Given the centrality of tendering, we suggest that a dedicated tender writing programme would be invaluable in ensuring that Māori can capitalise on opportunities in the infrastructure sector. At present, well-established Māori infrastructure firms write tenders on behalf of other Māori firms. These firms are, therefore, in a good position to deliver a tender writing programme. This would also mean the programme could operate in a 'for Māori, by Māori' modality, which we understand is the preference of Māori entrepreneurs.

Capital access initiatives

Capital access issues were not a prominent finding of our mahi, although they were identified as a constraint by some participants. Despite this, we acknowledge, based on mahi from Te Pūtea Matua, that access to capital is an important issue that may be constraining the Māori economy. Without encroaching on the mahi currently taking place in other domains, we suggest a two-pronged approach to the issue:

- *Banking and financial literacy* – Within a package of financial literacy programmes, we suggest the inclusion of an educational component that focuses on the processes of navigating and applying to mainstream financial institutions. However, we also stress that lending is not the sole source of finance available to Māori businesses. Financial literacy programmes should emphasise the roles of other sources of capital, such as equity, partnerships, and collective funding.
- *The provision of Māori lending* – We are aware that various kōrero are presently underway surrounding ideas of an indigenous lending institution. We take the view that indigenous lending would support the participation of Māori in the infrastructure sector. We also suggest that lending is not the only mechanism through which access to capital can be achieved. We propose that iwi and urban Māori groups can have an influential role in providing capital to Māori businesses in their rohe in the form of investments. We envisage this as a Māori-led endeavour whereby Te Puni Kōkiri assumes a facilitatory and co-ordination role.

4.5 Gaining insight from greater information collection and dissemination

4.5.1 Explanation

A barrier to and a central finding of our mahi was the striking lack of data concerning Māori participation in the infrastructure sector. We were unable to identify numbers of Māori businesses and Māori employees in the sector, nor were we able to map out where Māori businesses and employees were located both geographically and in the hierarchies of the sector.

4.5.2 Relevance

Insufficient data and insights constrain informed decision-making. It makes it exceptionally difficult to strategize and develop long-term plans for Māori participation in the infrastructure sector. The goal of greater collection activity is to provide necessary insight and guidance for Māori (and others) to make efficient and rewarding decisions from a base of mutual understanding.

4.5.3 Priority actions

Data collection and data management projects

A routinely updated dataset would be an asset for generating insights and offering guidance for policymakers and Māori enterprises. Therefore, we propose the development of a dataset that

comprehensively accounts for the participation of Māori in both employment and business ownership in the infrastructure sector. That said, we acknowledge mahi currently being conducted by Waihanga Ara Rau that aims to map out ethnic trends of employment and business ownership, in infrastructure and construction, over time. We anticipate that, once completed, this mahi will provide critical insights into the position and distribution of Māori businesses and employees in the sector. We also note that Te Puni Kōkiri has some experience in the domain of data and insight generation with the development of *Te Matapaeroa*. However, we suggest that the development and maintenance of this dataset has a wider buy-in that includes Te Waihanga and other industry bodies such as Amotai.

4.6 Ensuring that sufficient resources and associated capability are available to exploit opportunities

4.6.1 Explanation

Realising opportunities in the infrastructure sector is contingent on the availability of capability and resource. Our mahi suggests that the pipeline of Māori capability is not optimised for forthcoming infrastructure projects. Specifically, there are opportunities to expand Māori participation in infrastructure apprenticeship programmes and tertiary education courses, especially those in engineering disciplines.

4.6.2 Relevance

To fully exploit economic opportunities in infrastructure, there needs to be a sufficient supply of capability and resource. The focus should be across the school-training-work cycle and should be cognisant of the multi-directional nature of learning and applying knowledge across the infrastructure sector. That is, unlike other sectors with a linear, one-directional and well-established pathway from education to a profession or vocation, infrastructure often involves non-standard pathways and multi-directional considerations (e.g. around re-skilling and learning-by-doing) that mean a wider purview is needed.

4.6.3 Priority actions

Apprenticeship and/or cadetship scheme

Our mahi indicated that apprenticeships in the infrastructure sector, unlike vertical construction, have never featured strongly. We propose the establishment of infrastructure dedicated apprenticeship schemes. Apprenticeships can be a powerful vehicle of inducting rangatahi into the sector and setting them on a trajectory of upskilling and career progression. It should also be noted that approximately 50 per cent of new entrants joining the infrastructure sector are career changers. This indicates there is value in tailoring apprenticeship or cadetship schemes beyond a young 'school leaver' demographic, to include individuals experienced in other sectors – effectively easing their transition into infrastructure. This could simultaneously create economic opportunities for Māori while also curbing long-term labour shortages.

To ensure that Māori benefit from an apprenticeship scheme, we propose that it is operationalised using a partnership model between the employer, central government, and iwi/Māori groups, as well as education providers. In essence, we envisage iwi/Māori groups providing an apprenticeship workforce comprising of rangatahi from their respective rohe. Apprentice salaries will be covered by contributions from the iwi/Māori group, the employer, and central government. Apprentice salaries, while historically low, need to consider the present state of the labour market and financial opportunities in other sectors, such as manufacturing, where rangatahi may find work. Simply put, an apprenticeship scheme needs to be economically competitive in the short term as well as the long term.

Te Puni Kōkiri and the Ministry of Education could also look at a modified form of cadetships, where school-aged children are identified for a possible future role in infrastructure in the future. Advice on appropriate courses to take, skills and attitudes to acquire and outlining the potential that exists in the sector could be developed. The success of such a programme would likely require a broader range of agency buy-in, which would include the Ministry of Social Development, Te Waihanga, Waka Kotahi, and Waihanga Ara Rau.

Role modelling for engineering programmes

Historical injustices and traumas have led to a fractious relationship between Māori and the engineering profession. Consequently, Māori, especially rangatahi, have been discouraged from studying engineering programmes at tertiary level. Engineering qualifications are invaluable in the infrastructure sector, especially at the highly paid and high-responsibility end of the employment spectrum. Healing these relationships and historical traumas is not within the purview of this strategy. However, we suggest role modelling the success of Māori engineers represents an important lever for encouraging rangatahi into the field of study. By its nature, role modelling is an individually led endeavour, but we imagine the Tertiary Education Commission (TEC) could play a central role in coordinating and arranging speaking events for role models to present to rangatahi.

Early education intervention

Gaining entry to engineering programmes through conventional routes requires the study of mathematics and sciences at secondary level. Our mahi indicated there is lower uptake of these subjects at secondary level by Māori. We propose further research that understands why the uptake of these subjects by Māori is relatively low. Once understood, initiatives can be developed to encourage more Māori into these domains of secondary education. The Ministry of Education is well-positioned to conduct this research, and the development of initiatives could be conducted in conjunction with the TEC.

5. Next steps

Implementing this strategy requires further consideration of the nature, form and required participants. Without buy-in from other agencies involved in the sector, the chances of bringing about meaningful change are diminished. Therefore, the next logical step would be a hui to introduce the possibility of policy pilots or other actions to interested agencies, from which an implementation plan could be developed.

Prior to that, we would suggest that a 'filtering process' is undertaken to fully assess the merits of the suggested priority actions/directions. We suggest that not all the actions would survive such a process and combining some actions might be more efficient.

Part B: Supporting research

6. Economic opportunities in infrastructure total around \$60 billion in the next five years

Upwards of \$58 billion will be spent on horizontal infrastructure projects in Aotearoa over the next five years. By interrogating this projected expenditure, we identify the nature of infrastructure projects and the regions in which they will be completed. In so doing, we gain an understanding of where the most significant opportunities for Māori infrastructure businesses reside.

Table 1: Infrastructure expenditure

Infrastructure domain	Value over five years
New roading	\$23,146,394,638
Land development	\$15,164,566,569
Energy production*	\$9,192,000,000
Water transmission	\$5,095,768,505
Water treatment	\$2,576,588,913
Stormwater	\$1,363,710,116
Rail	\$1,190,148,345
Road maintenance	\$388,473,465
Airports	\$122,896,352
Ports	\$95,122,554
Energy transmission	\$8,154,691
Total	\$58,343,824,149

Source: <https://wip.org.nz/>

*Energy production expenditure is based on granted consents data. Unfortunately, a breakdown per region or project initiator is not available for this infrastructure domain.

6.1 Infrastructure investments will be made by central and local government, as well as the private sector

Nationally, new roading and land development represent the most significant financial opportunity

Of the approximate \$58 billion in forthcoming infrastructure expenditure, roughly \$23 billion will be spent on developing new roads around Aotearoa. Approximately \$15 billion will be spent on land development. The aggregate of water-based projects (including transmission, treatment, and

stormwater) also represents a significant opportunity, with approximately \$9 billion being spent over the next five years.

Approximately \$15 billion in infrastructure spending will be initiated by central government

Central government infrastructure expenditure over the next five years totals slightly above \$15 billion. Almost \$12 billion of this expenditure is represented by new roading projects. Land development and rail projects represent the second and third largest components of central government expenditure, respectively. Approximately \$1.5 billion will be spent on land development and approximately \$1 billion will be spent on rail development projects.

Local government will spend approximately \$25.5 billion on infrastructure projects over the next five years

Like central government expenditure, new roading and land development represent the largest proportion of forecast local government expenditure. However, the aggregation of water-based projects (\$8,340,567,572), also represents a significant proportion of local government infrastructure expenditure.

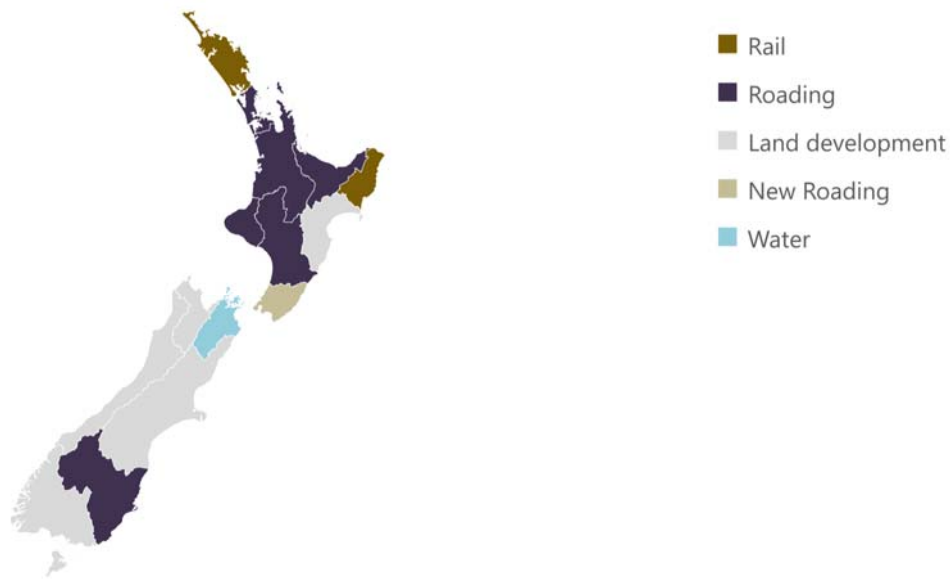
Private sector expenditure is almost entirely on land development projects

Private sector infrastructure expenditure represents roughly \$8.2 billion of forecast infrastructure expenditure over the next five years, approximately \$7.7 billion of which is dedicated to land development projects. This means consideration must be given as to how Māori businesses in land development can penetrate the private sector, given that government procurement policies will have limited to no impact here.

6.2 The most significant opportunities are subject to regional variation

A project-based breakdown of national expenditure paints an approximate image of the forthcoming infrastructure landscape. However, we acknowledge that the complexion of infrastructure spending is regionally variable. This means the most significant opportunities for Māori businesses may differ region by region. As such, we provide a regional breakdown of forecast infrastructure spending in Aotearoa.

Figure 2: Regional breakdown of most significant infrastructure opportunities



Rail and land development represent the most significant financial opportunities in Northland

Significant spends on rail reflect the Northland rail rejuvenation project with KiwiRail. These rail works are expected to begin as early as March 2023. Land development represents the next most significant financial opportunity in Northland. However, as with national spending, the aggregation of water projects also depicts a substantial financial opportunity for Māori businesses.

In Auckland, the most significant expenditure will occur on roading and land development

Approximately \$12.5 billion will be spent on Auckland infrastructure projects over the next five years. Auckland similarly reflects the national infrastructure landscape, in that the majority of spending is on new roads and land development projects. Over \$6 billion of that expenditure is dedicated to new roads and almost \$4 billion is dedicated to land development projects. Again, however, the aggregation of water projects represents a substantial financial opportunity.

New roading and land development are the most significant opportunities in the Waikato

Roughly reflecting the proportions of national expenditure, the most significant opportunities for Māori infrastructure firms in the Waikato are in roading and land development. Similar to Auckland, the aggregation of water projects also represents a significant opportunity.

In Taranaki, new roads represent the most significant domain of infrastructure expenditure

Almost \$420 million will be spent on new roading projects in Taranaki over the next five years. Following the national trend, land development is the next most financially lucrative opportunity. Total water-based infrastructure projects represent the third most significant opportunity.

Substantial investment in new roading over the next five years represents an opportunity for Māori businesses in the Bay of Plenty

Over \$1.5 billion will be spent on new road development over the next five years in the Bay of Plenty. New roads, therefore, represent a significant opportunity for Māori businesses in the region.

Moreover, almost \$1 billion will be spent on land development projects in the region over the same period. Again, water projects, as an aggregate, also represent a lucrative financial opportunity.

Rail outpaces new roading as the most significant financial opportunity in Gisborne

Significant workforce opportunities are represented by the scale of rail maintenance projects to take place in Gisborne over the next five years. These projects are expected to begin in early 2024. As with other regions, new roading and aggregated water projects also represent a significant financial opportunity.

Land development represents the most significant financial opportunity in Hawke's Bay

Over the next five years, roughly \$1 billion will be spent in the Hawke's Bay region on land development. This is, by a considerable margin, the greatest single area of infrastructure expenditure. Like other regions, expenditure on new roading and water-based projects also represents a considerable financial opportunity.

Opportunities in Manawatū-Whanganui broadly reflect national proportional expenditure

New roading developments in Manawatu-Whanganui will total \$2.4 billion over the next five years. Therefore, they represent a substantial opportunity for Māori infrastructure businesses in the region.

New roading, land development, and water represent a significant financial opportunity in Wellington

Reflecting the national landscape, the most significant financial opportunities in Wellington are represented by roading, land development, and aggregated water projects.

Land development, followed by water infrastructure projects, represents the most significant financial opportunity in Nelson

Around \$270 million in land development projects are planned for the Nelson region. This is followed by a spend of almost \$50 million in water-based infrastructure projects. Ports also represent an interesting opportunity in Nelson. It is worth noting that our data pre-dates the flooding in Nelson that occurred in August 2022. Restoration projects will likely influence the eventual breakdown of infrastructure projects.

Land development and water represent the most significant opportunities in the Tasman region

Following land development, there are significant financial opportunities in the development of water transmission, water treatment, and stormwater in Tasman. Ports and new roads also represent a financial opportunity in this region.

Water infrastructure projects, in aggregate, are the most significant financial opportunity in Marlborough

In Marlborough, land development represents the single most significant stream of infrastructure projects. However, an aggregation of water projects in the region represents the most significant financial opportunity for Māori businesses.

In Canterbury, there are significant financial opportunities across the spectrum of infrastructure projects

Reflecting national proportions, land development and new roads are the most significant domains of infrastructure expenditure in Canterbury. Aggregate water projects similarly reflect a substantial domain of opportunity.

Land development projects represent the most significant financial opportunity in the West Coast region

Following the national trend, land development represents the most significant financial opportunity in the West Coast region. New roading projects are comparatively less significant, but aggregate water projects represent a substantial opportunity.

In Otago, new roading represents the most significant financial opportunity

In the same vein as the national trend, land development and new roading represent the greatest proportion of expenditure in Otago.

Land development and water represent the greatest proportional spend in the Southland region

Southland reflects the national trend in that land development represents the most significant financial opportunity. However, water projects, especially water treatment projects, also reflect considerable financial opportunity.

6.3 Opportunities to capitalise on different domains of infrastructure are varied

Opportunities for Māori businesses and workforces vary across infrastructure domains. Some domains feature extensive opportunities, while others reflect nuanced and specialised opportunities.

In roading, we assess that there are significant economic opportunities for Māori businesses and a Māori workforce. Roding projects comprise a broad range of activities, and correspondingly require a range of skills and capabilities. Roding projects are organised into four main categories:

- **Routine and minor works** include: pavement maintenance; traffic control services; establishment of carriageway lighting, such as streetlamps; vegetation control; safety maintenance; traffic management; and minor safety operations.
- **Surfacing** includes sealing and resealing roads, which involves conventional resealing, texturing seals, and asphaltic surfacing.
- **Bridge construction** includes bridge maintenance and repairs, which involves the repair of retaining walls, replacement of timber decks, sandblasting and painting, and foundation protection.
- **Construction** includes rehabilitation and pavement treatment, which involves chemical treatments, reshaping, and removal of paving materials. Construction also includes drainage improvements, which involve the replacement of kerbs and drainage channels, stream clearing, and routine maintenance of surface water channels. Finally, construction also includes the development of new road alignments, widening existing roads, intersection improvements, and tunnelling.

Roding is a labour-intensive endeavour, meaning barriers to entry are lower than infrastructure domains that require heavy investment in specialist equipment. Businesses seeking to operate in this domain should be aware that Waka Kotahi has a prequalification criteria before procurement contracts on physical works can be given. Its qualification criteria cover a range of issues, including meeting specific health and safety standards.

Land development consists primarily of earthworks and earthmoving. These are important starting points for virtually all construction and infrastructure projects and, therefore, represent a significant long-term opportunity for Māori businesses. A key consideration is that earthworks and earthmoving require extensive use of machinery and equipment and are consequently capital-intensive. However, there appears to be something of an opportunity for natural progression in this space from machine operator, to machine owner, to business owner. The provision of capital may, therefore, be an important mechanism for mobilising Māori operators into business ownership in this domain.

Road maintenance works, especially in Northland, are carried out by iwi-owned and iwi-backed businesses. There is, therefore, an existing blueprint for Māori participation in this domain. Road maintenance businesses are somewhat capital-intensive, with specialist equipment being needed to clear tree falls in particular. Traffic management is also a key component of this business type, meaning investment in specialist training is required. A Māori owner of a road maintenance business mentioned being constrained by health and safety regulations and the availability of capital.

Supporting businesses in this domain may come in the form of financial investment and health and safety literacy training.

Water is a moving target in Aotearoa at the time of this mahi. The exact complexion of Three Waters reforms and the extent of implementation is unclear. However, based on the current situation, we identify significant workforce opportunities for Māori in the professions of (1) drinking water treatment operators, (2) drinking water distribution operators, (3) wastewater network operators, and (4) wastewater treatment operators. We are aware that some rural iwi have established themselves as water suppliers. There are similar opportunities for other rural iwi to follow suit, but regulation surrounding water supply is, understandably, quite extensive. Assuming Three Waters reforms are implemented, we forecast significantly more opportunities for Māori in the domain of freshwater infrastructure.

In energy production, we recognise that Māori are heavily involved in the management of geothermal energy production assets. There may be an opportunity to expand Māori interests in this important area of renewable energy production. Other energy production assets such as wind turbines are designed and constructed overseas. The maintenance of these assets is often highly specialist and carried out by the manufacturer. However, there are some opportunities for Māori businesses to establish energy generation assets. For example, Māori businesses may be able to capitalise on erecting wind turbines or solar panels.

In energy transmission, contracts are managed by large energy companies. We assess that there are numerous workforce opportunities in this domain, but relatively few opportunities for Māori businesses to capitalise on forthcoming expenditures.

In rail, KiwiRail conducts the design of its infrastructure project internally. Likewise, track maintenance is also managed internally. The opportunity for Māori here primarily extends to employment in the sector. However, KiwiRail goes to market to procure the construction of railway lines. There is, therefore, an opportunity for Māori businesses to capitalise on rail construction. Rail construction is labour-intensive work with few capital requirements for a contractor or sub-contractor to wear.

In airports and ports, we acknowledge that some iwi have heavy involvement in inland ports in Aotearoa. Beyond those existing enterprises, however, we do not identify a strong opportunity for Māori enterprises in this domain. Airport and port contracts are typically held by large organisations. There may be workforce opportunities for Māori in this space.

6.4 Recovery from extreme weather events

While conducting the research for this report, Aotearoa New Zealand was subject to two extreme weather events: the Auckland anniversary flooding and Cyclone Gabrielle. The New Zealand Treasury has estimated the cost of asset damage from these two events to be between \$9 billion and \$14.5 billion (National Emergency Management Agency, 2023). To date, the following package of financial supports have been announced, with several more due to follow:

- initial \$250 million for Waka Kotahi and local council to repair roads
- \$74 million for affected farmers
- \$75 million for businesses immediate clean-up costs

- \$5 million to Mayoral Relief Funds
- \$65.8 million in Civil Defence Payments
- \$15 million short-term relief funding for Māori communities
- \$17.5 million to support communities and community providers
- \$3.25 million to support the immediate wellbeing needs of people impacted by the cyclone
- \$15 million for council to remove rubbish.

\$941 million has been allocated from Budget 2023 for the “basics” (Dexter, 2023), which includes repairing damage and providing funds for protection against future extreme weather events. From this tranche of spending, and future tranches, there will be a significant economic opportunity for Māori infrastructure businesses to be involved in the rebuild and resiliency of communities. There is also a strong cultural argument to be made for Māori infrastructure businesses to lead or at least be heavily involved in the rebuild and resiliency of affected Māori communities in Tūranga-nui-a-Kiwa and Te Matau-a-Māui.

7. Factors constraining Māori SME engagement in the infrastructure sector

Via observation, literature, and anecdote, there appear to be a large number of Māori SMEs working in the horizontal infrastructure sector. Interviewing owners of these SMEs, we identified a series of factors that inhibit their ability to engage with the infrastructure sector. These factors are wide-ranging and include issues with business literacy, capital, social procurement, the project-based nature of infrastructure, the financial costs of enacting Māori values, labour market shortfalls, and a complex regulatory environment.

7.1 Business literacy and access to capital

Some interview participants noted that Māori-owned infrastructure and construction businesses have “pretty low” business literacy skills. The absence of these skills is apparent in the areas of:

- branding
- marketing
- financial skills and accounting
- human resources
- planning
- expansion.

“Māori infrastructure and construction SMEs, these guys are often small and don’t have much time, and that’s reflected in their business skills. I notice it mostly in branding and how they market themselves, but from what I have experienced there’s a bit of a deficit across the board holding these businesses back.”

Improving business literacy skills may, therefore, represent a lever for streamlining their business operation and attracting new trade. The effectiveness of improving business literacy skills, however, will likely depend on the time and resources available to the SME.

Some interview participants recounted having difficulty accessing capital to establish and grow their businesses. An inability to access capital prohibits Māori firms from re-investing in equipment and resources. Some Māori firms reported being able to access some capital from iwi, but not at volumes significant enough for growth.

“We had a hard time getting the money for some the equipment we needed to win contracts from Waka Kotahi. We struggled with the banks. We ended up with some money from the iwi. It helped but wasn’t everything we really needed.”

There are likely mechanisms from the supply side to enhance access to capital for Māori firms. However, on the demand side, improving business literacy would likely have a positive effect on access to capital.

7.2 Changes to the regulatory environment can be burdensome for smaller Māori firms

Māori firms advised that adhering to health and safety regulations can be excessively onerous and costly for them. From the perspective of a Māori road maintenance firm:

“Changes in road safety rules have been difficult – you used to be able to have someone do a quick course then work on the job to become an STMS (road safety supervisor). Now they must go on a much longer course that costs thousands more, and the on-the-job experience does not count as much. It makes it hard for us to ensure we have enough STMS to oversee the traffic control when we must deal with a tree fall.”

The financial costs associated with bringing human capital up to health and safety standards can be excessive for Māori firms. However, the time and resource costs associated with losing labour during the training period are also burdensome for the day-to-day operations of the business.

7.3 Local and national labour markets constrain Māori business operations and growth

Māori SMEs advised that shortages of skilled labour, especially in regional Aotearoa, constrain business operation and prohibit enterprise growth.

Labour shortages prohibit Māori firms from operating

A lack of suitable labour was reported as an issue constraining the day-to-day operations of Māori firms. Shortages are a prominent feature of the New Zealand labour market, at the time of writing. Nevertheless, the effect of labour shortages can be costly for Māori firms, especially when specialised labour is in short supply. A Māori-owned road maintenance firm experienced this issue:

“At the moment we only have one STMS – so when he’s sick or off, we are quite vulnerable. We have to hire one from Fulton Hogan if our guy is off sick.”

Issues associated with labour shortages are not exclusive to Māori firms; they are, however, amplified when Māori firms are operating in the regions.

Local infrastructure in regional New Zealand amplifies labour shortages

Māori firms operating in regional New Zealand pointed to a lack of available labour in their respective localities. Attracting talented labour to the regions has proven difficult due to the lack of local infrastructure, amenities, and services.

“We have been down the pathway of trying to attract people back up North again. It’s a problem though – people want to come for the lifestyle, but there is not enough housing or local infrastructure to have a certain level of skilled people to come up here to stay – we really need to develop that up if we are going to get people back up to the rohe.”

An inability to attract labour from other localities means that regionalised Māori firms face even worse labour shortage issues.

7.4 Enacting Māori values can be a strain on enterprise growth

Culturally-driven Māori firms reported re-investing their profits into local communities, and into the internal development of labour. Paying for driving lessons and licences were examples of re-investment identified by Māori firms. Such actions are congruent with tikanga Māori values and reflect a sentiment that neither ‘volume nor profitability’ are the central focus of a Māori business. However, these culturally-driven expenditures constrain the capacity of Māori firms to reinvest and grow their businesses.

“We do a few different things like paying for our guys’ driver’s licences, hiring people so they can get experience, and making sure our kaimahi are suitably paid. We do these things because they sit with our values, but they do also make it harder for us to invest in different things and maybe expand the business.”

7.5 The project-based nature of infrastructure can be challenging for Māori firms

The iterative and project-based nature of infrastructure contracting can be prohibitive to the long-term growth and development of Māori firms.

“We leave ourselves exposed at times. When a project is done and we don’t have another to go to, what do we do next? We can’t expect people to hang around waiting for another project, and we have costs to cover too.”

This issue is not exclusive to Māori infrastructure firms, but it raises an issue of longevity and resilience of infrastructure SMEs.

7.6 Social procurement mechanisms are useful, but can be improved

While interviewing government agencies, social procurement was frequently identified as creating opportunities for Māori infrastructure SMEs. Māori SME experience of social procurement, however, suggests that it is not an effective lever in its present form:

- Even in social procurement, the tender process is challenging for Māori firms.
- Social procurement imperatives are easily undermined.
- There is limited comprehension of social procurement.
- Social procurement imperatives can conflict with budgetary considerations, which can impede the delivery of social outcomes.
- Preferential treatment between project managers and certain sub-contractors can constrain opportunities for smaller, lesser-known businesses.

These issues are identified and expanded upon in a case study of Māori businesses’ experiences of social procurement.

A case study on Māori experiences with social procurement

Our extensive kōrero with stakeholders from government agencies offered a detailed but single-sided account of social procurement. During a kōrero with a Māori business owner operating in infrastructure, we obtained a series of insights as to how enterprises experience social procurement. Broadly, the experiences of the Māori business owner indicate that social procurement aspirations are not being realised 'on the ground'.

Small businesses have a hard time producing a competitive tender

Social procurement does not eliminate the requirement for Māori businesses to produce a tender if they wish to win work on their own merits. The participant advised that investing the time and resources into producing a "decent" tender was often problematic:

"We are always quite constrained on time and resources, so can't always spend a lot of time developing a nice tender. But, even when I have the time, writing a tender can be pretty hard. There's a lot of information being asked for, and it's not always clear to me why they are being asked."

Additionally, the participant reported a poor experience of the procurement process, which involved getting little support from government agencies, feedback on rejected tenders, or even acknowledgement of submitted tenders.

"Our experiences with the likes of **[government agency]** have been poor. **[Local government agency]** put together a project and talked a big game about engaging Māori business – we didn't even get a reply to our tender."

In sum, tendering, and management of the tendering process, appear to prohibit the realisation of social procurement aspirations.

Social procurement objectives are being obstructed

The participant noted that "a lot of the infrastructure industry is an old boys' network". Consequently, project managers will seek to sub-contract to firms with whom they are already familiar. This makes it difficult for other firms to break into the industry. Accounting for this, the participant provided a recent example of work his firm did not win:

"The **[project]** job – it's quite specialist work, but we've done it before. We have good experience there, but it looks like the project manager is going to bring in a team from Australia to do the work. That's annoying, because we have the ability to do it, and it also means money will be leaving our rohe. It's a missed opportunity for our people."

Reflecting on other obstructions to the realisation of social procurement aspirations, the participant advised social procurement is often viewed as unfavourable to project budgets. Consequently:

"People who are concerned about the project budget, social procurement is not a priority for them. In my experience, some of those people try to obstruct social procurement if it means they can save a few dollars on the project."

Social procurement and budgetary management can be conflicting imperatives. Adhering to one can be detrimental to the other. Achieving harmony between these two imperatives could be accomplished via financial incentives for adhering to social procurement objectives. However, the participant accounts for further obstructions to social procurement ambitions being realised, one of which is a lack of awareness:

“I spoke to a project manager the other idea – he had no idea what social procurement was. Feels like there is a big disconnect between the top and mid-level. If they don’t know about social procurement, how can they care about it?”

As the participant notes, if people throughout a project are not aware of social procurement and imperatives, they cannot be reflected in the delivery of the infrastructure project. There appears, therefore, to be an opportunity for communicating social procurement and its importance throughout all levels of project management. However, a communicative measure is unlikely to tackle the issue of preferential treatment. For example, the participant provided an account of a project manager seeking to unfairly remove him from a project:

“We had a project manager come into a job who told us that what we had already done was sub-par. He tried to replace us with a different crew that he already knew. Turns out one of his mates was on the crews. We had to bring in engineers to explain to the project manager that he was wrong, and our work was good quality.”

Preferential treatment on the part of project managers can undermine social procurement imperatives. The participants suggest that a greater degree of transparency surrounding social procurement, and infrastructure more broadly, is required. Interestingly, the participant went on to make a suggestion for enabling such a degree of transparency:

“I would like to see the establishment of a procurement person. Someone impartial who can review the procurement process. That way it can be a bit more transparent. I’m sure we would see some uncomfortable trends emerging.”

Other Māori SME owners we interviewed identified further issues constraining the effectiveness of social procurement, which included:

Overseas firms disregard social procurement imperatives

When overseas contractors win large procurement contracts, Māori firms reported a disregard, or lack of understanding, of social procurement.

“When work goes to overseas firms, they have no idea about social procurement, nor do they really care about it. It does not register for them.”

A disregard for social procurement on the part of overseas firms diminishes the likelihood that social procurement imperatives will transcend the project and be realised by Māori firms.

There are no penalties for suppliers that fail to realise their social procurement targets

When tendering for work, large suppliers detail how they will achieve social procurement imperatives, such as utilising Māori subcontractors for certain aspects of the project. However, if the supplier fails

to realise social procurement objectives outlined in their tender, there are no penalties or repercussions.

“There are no consequences really for firms that fail to deliver their social procurement promises. If they said they were going to hire 10 Māori firms, then only hire two, some people might be unhappy, but it is not like the contractor is going to be banned from winning future work. After all, price is the most important part of procurement.”

This creates a dynamic where large suppliers can effectively pay ‘lip service’ to social procurement imperatives. Moreover, this dynamic is made possible because, in procurement, price considerations are weighted significantly more than social procurement.

Risk aversion prohibits the inclusion of ‘unknown’ Māori firms on projects

When identifying subcontractors to fulfil project roles, Māori firms reported that project managers are typically risk-averse. This manifests as project managers seeking to employ subcontractors that are known to them. In some cases, the project manager may own a stake in the subcontractor, meaning they have a vested interest in employing them.

“Speaking about some of the projects I have been across, the focus has previously been on finding subbies who you have worked with before. Price and prior experience are everything. People have long-standing relationships – they may even own part of a subcontractor business – so they will typically gravitate towards using them as subcontractors.”

Moreover, employing a subcontractor that is ‘unknown’, or seen as an outsider, is viewed as risky by project managers. If an ‘unknown’ Māori firm becomes a nominated subcontractor, the project manager must wear the responsibility of the associated risk. In other words, a project manager has no incentive to give an ‘unknown’ subcontractor an opportunity.

8. What levers can create opportunities for Māori infrastructure SMEs?

Māori SME owners provided a series of suggestions for policy and behavioural changes that can support the delivery of opportunities for Māori in infrastructure, including:

Contracts can be tailored to support the capabilities of Māori businesses

A Māori contractor we interviewed advised that there is an opportunity to divide contracts based on the skills and capabilities of Māori businesses. Practically, this involves identifying a Māori business, then developing a contract based on the elements of a project they have the capacity to deliver.

While this is an unconventional approach to contracting, it does provide an opportunity for Māori firms to develop their skills and experience, while also increasing their exposure in the industry. These bespoke contracts can, therefore, represent a stepping-stone for Māori businesses to more complex, higher-value jobs.

“Right size contracts proportional to the size of the firm. Size is important – Māori might not be able to do the \$100m contract but could do the toilet block.”

Engagement with tier-one contractors to encourage the design of bespoke contracts for Māori businesses

Engaging with tier-one contractors to design bespoke subcontracts for Māori businesses was identified as an opportunity for Māori firms. This involves having contracts specifically designed in accordance with the skills and capabilities of Māori firms. Large contractors would likely be reluctant to take such an approach, given the time and costs associated with designed bespoke contracts. However, this could be made a condition of government procurement contracts, essentially obliging large contractors to take this approach.

Direct contracting creates work opportunities for Māori firms

As an alternative to conventional procurement processes, direct contracting to Māori firms was identified as an opportunity for elevating the experience and exposure of Māori firms. Direct contracting to Māori firms would be appropriate for projects that involve culturally significant sites, such as marae or urupā.

Focusing on the labour market can eventuate in enterprise ownership

Māori firms reported training and staircasing their employees to businesses ownership. Good employers, in construction and infrastructure, often support employees into business ownership as they can build a network of companies of expansive skills and capacity. By way of contrast, Māori firms advised that supporting employees into business ownership was congruent with their

“Our apprentices in the academy, we want them to move through the stages of career progression. They start as apprentices, but then hopefully become business owners. That is my vision.”

values. One participant advised that his employees follow a clear trajectory to business ownership from apprentice to employee, to manager, to business owner.

Following this model, inducting Māori into the infrastructure labour market, under the employ of Māori firms, can act as a lever for new business formation.

Māori firms can share skills and capabilities to compete for larger procurement projects

By collaborating, Māori firms can access the skills, capabilities, and scale they lack independently. Collaboration, therefore, represents an opportunity for Māori firms to become more competitive when attempting to win large procurement projects.

Exposure to large-scale projects via collaboration may help develop the skills, experience, and exposure of Māori firms, which in turn can enhance their preparedness for further work. There is, however, a question of how and with whom such a collaboration could be facilitated and managed.

“From what I have seen, the greatest opportunity for Māori in the long term is to do a bit of collaboration so that they can compete for jobs together. They really need the scale to get into the bigger jobs.”

Inter-iwi collaboration could be leveraged in the establishment of a tier-one contractor

Prevailing sentiment from Māori firms suggested that there is an opportunity for multiple iwi to collaborate to either establish or heavily invest in a tier-one contracting firm. An iwi interest in a tier-one firm may help ensure that social procurement imperatives are realised by subcontractors at a project level.

Organising a substantial inter-iwi investment, however, would likely present a series of challenges related to trust, co-ordination, and management.

“There is potential for iwi to work together at national level to support the establishment of a big procurement firm. That way they can tackle bigger projects and make sure there is a trickle down to Māori businesses.”

Inter-iwi relationships can facilitate skill- and capability-sharing between Māori firms

Iwi-backed Māori infrastructure firms, operating in remote and regional New Zealand, reported routinely sharing resources, skills, and capabilities. Sharing between iwi-backed firms is required where an iwi individually lacks the requisite skills or capabilities for a project. This reciprocal model aims to ensure that work in a rohe is conducted by Māori firms. Moreover, this helps establish a consistent pipeline of work for regionalised Māori firms, which supports upskilling and capability development in the long term.

Māori SMEs also discussed **various changes to the social procurement process** which would render it more effective in delivering social outcomes. These suggestions are contained within a case study of alternative approaches to social procurement:

Can social outcomes be achieved differently?

In a kōrero with an infrastructure expert and engineering consultant, the issue of government-mandated social procurement was raised. The participant, who has been heavily involved in various tunnelling projects in New Zealand, advised that social procurement is “too heavily decreed” and often a “box-ticking exercise to satisfy KPIs”. In this case study, we discuss the participant's experience with social procurement and highlight different approaches to the issue.

Mandated social procurement can be ineffective in creating opportunities for Māori

On the effectiveness of social procurement, the participant argued that social procurement targets are weighted too low and often poorly executed:

“The weighting of social procurement (in a tender) is seriously low, I think maybe 5 per cent, and maybe there will be some incentive payments for it, but it’s not much in the grand scheme of things. The motivation to do it can be pretty low.”

The relative insignificance of social procurement elements in the tender process frames it as a low priority. Materially, contextualised within government settings, economic outcomes for Māori and other groups are therefore also a low priority in the delivery of infrastructure projects.

Social outcomes are delivered when project leaders are personally invested

The participant reflected on his experience, and advised social outcomes are achieved when project leaders are personally invested in notions of enhancing social outcomes:

“When you see social outcomes done well, it’s usually because the project leader wants it to be part of the project. There is a certain amount of personal buy-in, where the project leader cares about the social outcomes.”

This insight is similarly reflected in accounts from other stakeholders who noted that personal investment, rather than structurally embedded protocols, tends to drive tangible social outcomes.

Social outcomes could be integrated into the early stages of a project

Reflecting on when social outcome imperatives should be woven into a project, the participant explained:

“I think it could be promoted at the business case stage or commercial case stage. The important thing is to introduce it early and then make sure that it is reflected at each stage of the project.”

In other words, the significance of social outcomes can be elevated if they are considered early and integrated into different stages of the project. That said, the participant went on to advise that a balance needs to be struck to ensure that “you are not digging holes for the sake of digging holes”. This means social outcomes need to be conducive to the delivery of the infrastructure project. Work should not be carried out solely for the sake of achieving social outcomes.

“There is a danger with social outcomes where you can lose sight of the project and how you are delivering it. Social outcomes are important, but you’ve got to maintain focus on the job.”

Social outcomes extend beyond labouring jobs

Reflecting on mandated social procurement, the participant intimated that there is a tendency to focus on labouring roles when aiming at social outcomes. He suggested that not only is this a “lazy” interpretation of social outcomes but it also cannot be sustained in the long term:

“A lot of infrastructure projects these days, they are not particularly labour-intensive. If you’re meeting your social outcome targets by bringing in Māori labourers, (1) you’re being kind of lazy, but (2) you’re not going to be able to do that forever, not with the pace of change in infrastructure.”

Alternatively, according to the participant, social outcomes should be reflected in various employment domains, including highly skilled and high-value roles, such as:

- professional services
- engineering
- accounting
- management
- design
- environmental management.

Altogether, the participant expressed a view that social outcomes should transcend employment domains. Put differently, rather than focusing solely on the number of Māori represented on a project, there should be a concurrent focus on achieving Māori representation at all levels.

Key lessons from social outcome alternatives

- Current social procurement levers can be ineffective on delivering social outcomes for Māori.
- Social outcomes are achieved via personal investment from project leaders and managers.
- Integrating social outcomes into the early stages of a project can ensure imperatives are reflected at all stages of a project.
- Social outcomes can result in Māori participation in low-skilled, low-responsibility roles.
- There is an opportunity to have social outcomes transcend all levels of employment in an infrastructure project.

8.1 There are alternatives to mainstream social procurement levers

Using non-procurement elements more prominently, such as agreements and contracting, social procurement can be reimagined. Specifically, procurement may be operationalised as a demand-led exercise in which buyers alter the paradigm by supporting suppliers. Practically speaking, this involves tailoring contracts in such a way that they match the skills and capabilities of Māori firms. This provides immediate economic opportunities for Māori firms, but also long-term opportunities in the form of experience and skills development. Ultimately, having obtained experience, skills, and industry connections, Māori firms may eventually become less dependent on non-procurement elements.

A model similar to this is promoted by the supplier diversity organisation, Amotai, and is utilised in some quasi-government agencies, particularly those operating dually as limited liability companies and local government organisations. Their status permits the implementation of contracting and procurement models distinct from those in government agencies.

The wider implementation of a demand-led procurement/contracting model is constrained by a few factors:

- Mainstream procurement regulations, followed by government agencies, which require going to the market for tenders.
- Fixed attitudes and viewpoints mean buyers have misconceptions and negative perceptions in respect of smaller, younger suppliers.
- Issues of familiarity, in that buyers prefer to contract to suppliers with whom they are already familiar.

Altering mindsets and viewpoints is unlikely to occur because of this mahi alone. However, canvassing for changes toward this model in the mainstream may yield positive results for Māori infrastructure firms.

9. Government agency perspectives of Māori participation in infrastructure

Several of our stakeholder interviews consisted of kōrero with government agency representatives. They discussed issues, from their end, that they perceive to be prohibiting greater levels of Māori participation in the infrastructure sector. Mostly, these issues reflect an unawareness or inability to engage with iwi and a lack of sufficient cultural competency.

9.1 Government agencies struggle to effectively engage with Māori

Government agency stakeholders recognised that engagement with iwi is an essential part of delivering civil infrastructure projects, not least of all because consent from mana whenua is required for a range of infrastructure projects. Stakeholders, however, recognised and expressed an interest in engaging mana whenua in a more deep and meaningful way, but simultaneously acknowledged they lacked the ability to effectively engage iwi.

"That would be good for mana whenua, that would enable engagement at the governance level, and can be involved with reform and help guide that. And that can cascade into contracting etc."

"If we can get mana whenua more involved in the strategy, that means their influence can cascade down to the delivery."

Government agencies recognise their iwi engagement strategies are dated

Some stakeholders acknowledged that the long-established method of engaging iwi, through land and resource consents, was dated and was being used as an alternative to good relationships.

"We rely on consenting as being a proxy for relationships with iwi – I think iwi fall back on that as well. My feeling is that it has run its course – and we need to be stepping it up into broader partnerships. Consent is great because iwi will always have a say – but it would be better to have iwi engagement from the top."

Stakeholders described engaging with iwi through consenting to be a transactional and sometimes "clinical", process which is incongruent with how Māori typically develop meaningful relationships. Consequently, some government agency stakeholders appreciated the need to transition away from consenting towards a more authentic form of relationship building.

Government agencies find it easier to engage with 'corporate' iwi

Government agency stakeholders noted that their experience of iwi engagement is variable, depending on the structure of certain iwi.

Broadly speaking, government agencies find it easier to deal with iwi that reflect a typical Pākehā corporate structure. Pointedly, this distinction often comes down to whether the iwi in question has been through their Treaty settlement.

Iwi groups that have yet to reach a settlement face time and resource constraints not faced by others. This means they find it more difficult to commit to engagement with government agencies. Citing an example, one participant noted that the ease of engagement with post-settlement iwi creates opportunities for their people.

Altogether, this suggests that current modalities of government agency engagement heavily favour post-settlement iwi.

"The relationships with three of the iwi are quite different – different iwi structures require a different approach from us when trying to establish and maintain relationships."

"Some of it comes down to which iwi and whether they have settled – may not have financial compensation, land acquisitions. So, they are already economically on the back foot."

"[Post-settlement iwi] have gone all the way up through a corporate model – and they are talking to us about crews that might do maintenance and that sort of thing. So, they are identifying opportunity through engagement."

Navigating disparities in organisational culture constrains government agency engagement

Even when dealing with the more corporatised, post-settlement iwi, government agency stakeholders noted that cultural disparities often make effective engagement difficult.

"Struggle as a Pākehā organisation with that mentality have with liaising with the te ao Māori kind of organisation. They are different languages – and there is not a common language for joining those different worlds, that we have discovered yet."

The common language, or lack thereof, pointed to by the stakeholder in question points to a need for enhancing cultural competency in government agencies. When asked about the issue, another stakeholder explained that cultural competency skills are fundamental to iwi engagement.

"If you are trying to insert hapū, iwi, or whoever in the evaluation stage, but you don't have the cultural competency, or your procurement plan doesn't permit it. Not just about how we chop our contracts, also have to know how to work in the space."

Striving towards the improvement of cultural competency, therefore, represents an interesting avenue for improving relations between government agencies and Māori groups.

Government agencies are not always clear on who they should speak to when engaging iwi

Stakeholders representing government agencies advised that it is not always clear who they should be approaching when they wish to initiate iwi engagement.

On one hand, being unable to identify the 'right' person or people with whom to initiate contact is an obvious obstruction to effective iwi engagement. However, an inability to identify relevant people is indicative of poor

relations between government agencies and iwi groups. Improved relationships would, by their own virtue, likely streamline the identification process and, by extension, iwi engagement.

"Being able to work with the right people. It is not always that simple to put your finger on the person to be in the room – who we can build the relationships with."

High demands on iwi time can constrain engagement with government agencies

Government agency stakeholders expressed their awareness that in the current political climate there are considerable demands on iwi time.

"Making sure iwi are involved can be a challenge with capacity – iwi may not have capacity to deal with multiple entities at once to be meaningfully involved."

The main implication of this environment is that iwi, even those in a post-settlement phase, may lack sufficient time and resources to meaningfully engage with all groups seeking to occupy their time.

While we recognise that a 'blueprint' is counterintuitive to authentic mana whenua engagement, we developed a case study of what we identified as best practice in iwi engagement.

Focusing solely or excessively on iwi engagement may be misguided

Our kōrero with government agency stakeholders suggested heavy focus towards iwi engagement as a mechanism for creating economic opportunities for Māori in infrastructure and construction sectors. However, discussions with other stakeholder groups indicated, with few exceptions, iwi do not have significant investments or economic representations in either sector. Focusing on iwi engagement may, therefore, not represent the most effective vehicle for creating opportunities for Māori infrastructure businesses.

Manawatū Gorge and Ōtaki to Levin North projects are cases of best practice in iwi engagement

As part of our stakeholder kōrero, we spoke with a project manager involved in the Manawatū Gorge and Ōtaki to Levin North roading projects. The participant advised that iwi were engaged early in both projects and, consequently, opportunities were created for Māori businesses and the local Māori labour force. We had previously heard that government agencies found effective iwi engagement difficult, so we sought to understand the dynamics of these relationships.

Effective iwi engagement is bespoke and begins early

The participant explained that, from the inception of each project, he identified four questions that reflected his key objectives:

- How do we effectively partner with iwi?
- How do we obtain resources for these projects?
- How do we capitalise on engagement opportunities?
- How do we catalyse social change?

The pursuit of these four objectives rationalised the participant's strategy to engage with iwi early in the development project development phase. This is in contrast to the iwi engagement strategy delineated by some other government agency stakeholders, which involved approaching iwi in the late stages of project planning and development.

The participant also recognised that iwi have variance in structure, "environmental wings", priorities, and available resources. He advised that a bespoke approach to iwi engagement was required to navigate inter-iwi variances.

"We knew going in that different iwi have different structures, imperatives, and resources. You know, like those in a pre-settlement phase are usually less resourced than post-settlement iwi. Some iwi had environmental wings, for example, and others didn't. It meant taking a slightly different approach to engaging each iwi. There isn't a blueprint approach that can be used."

Authenticity and humbleness are a good starting points for iwi engagement

Given the extent to which stakeholders had expressed uncertainty and confusion surrounding iwi engagement, we sought to understand how the participant had successfully engaged iwi. He explained:

"Look, not every project manager or director takes this view. This is just my approach. I take the time to visit the marae and talk to people. I'll take some biscuits and talk with the kuia. That way, I can hear their concerns, talk about their wishes, what has been going well, what hasn't."

Broadly, the participant's approach to iwi engagement can be described as authentic and humble. It represents something of a departure from the "box ticking" forms of engagement highlighted by some other government agency stakeholders.

Government agency and iwi partnerships created business and workforce opportunities

The participant noted that he took a series of practical steps to support iwi seeking to capitalise on the opportunities. These included:

- helping to identify local Māori businesses capable of fulfilling elements of the projects
- attending local marae to help Māori entrepreneurs develop business plans
- supporting Māori businesses in navigating the tender process
- identifying and discussing opportunities for iwi to provide a workforce.

"I attended a few local marae. I wanted to help identify opportunities for Māori business and a local workforce. I later realised it would be helpful to support some businesses with the tender process and developing business plans. There was some more support needed for these guys to capitalise on these opportunities."

The participant describes collaborative behaviours that go beyond the typical purview of a project manager role, yet, through his efforts, achieved significant outcomes for Māori. According to the participant, effective iwi engagement was reflected in their employment outcomes across both projects:

*"60% local
employment"*

*"30% Māori
employment"*

Interestingly, the participant explained that he dispensed with the notion of quotas and percentages used in some government agencies.

"I didn't want to go into the project following the 5 per cent target, or whatever it is. I think that's a bit reductive. Instead, I wanted it to be about real engagement, and from that the numbers would come."

Effective iwi engagement was individually led

The participant explained that his desire to engage iwi and thereby identify opportunities for Māori businesses and a Māori workforce was not driven by the structures of his organisation. Instead, it came from a place of personal motivation:

"I'm not required to engage iwi in the way that I did. It's not part of my job description, but I want to see government agencies and iwi move towards a place of more authentic

engagement. There were clearly opportunities there for Māori business and a local workforce – so why not jump on those opportunities?”

On reflection, the opportunities identified and subsequently capitalised on through an effective iwi engagement strategy may not have happened under a different project manager. In other words, opportunities for Māori businesses and workforces are contingent upon the personal motivations of a project manager.

Key lessons from Manawatū Gorge and Ōtaki to Levin North projects

- It is beneficial to engage iwi at the very early stages of project development. This helps to ensure iwi concerns are heard and considered throughout the project development phase.
- There is not a 'blueprint' for effective iwi engagement. Each iwi has different priorities, resources, and capabilities, which may alter the process of engagement.
- Authenticity and humbleness are solid foundations for iwi engagement.
- Effective iwi engagement can produce material economic outcomes for Māori businesses and Māori workforces.
- Effective iwi engagement strategies do not appear to be structurally led.

10. The complexion and complexity of the infrastructure workforce

In this section, we discuss the nature of the infrastructure workforce and the position of Māori within that workforce. We begin by explaining why drawing clear parameters around the infrastructure workforce is challenging. Subsequently, we discuss the present state and influences of Māori workforce participation in the infrastructure sector.

10.1 The infrastructure workforce is fluid and challenging to define

Both in domestic and overseas contexts, infrastructure sectors comprise a large number of rather small firms (Karmel, 2006). These firms draw upon labour from a wide range of sources, including career changers, school leavers, tertiary graduates, beneficiaries, and migrants. Career changers represent the most significant source of this labour. More specifically, the most common source of career changers comes from the vertical

construction sector. In part, this can be explained by the similarities in skills and capabilities required to deliver construction and civil infrastructure projects. A welder, for example, may find themselves working in both construction and civil infrastructure. Put differently, labourers, including skilled tradespeople, may routinely traverse the parameters of the construction and infrastructure workforce.

“There has always been something of a back and forth between construction and infrastructure for SMEs and labour in New Zealand.”

Additionally, the project-based nature of the infrastructure sector means that workforce requirements are dynamic and subject to intermittent change. In between projects, parts of the infrastructure workforce may transition to other job market domains, such as manufacturing, agriculture, and construction, then return to infrastructure when new projects are initiated.

For example, according to data from Waihanga Ara Rau (Construction and Infrastructure Workforce Development Council), in 2020, career changers represented the greatest source of workers for the infrastructure industry. Tertiary graduates, school leavers, returning Kiwis, and beneficiaries also represented an important, albeit less significant, source of infrastructure labour.

Table 2: Career changer data (2020)

Source of labour	Total workforce transition (nominal)	Total transition to infrastructure (nominal)	Workforce transition to infrastructure (%)
Career changers	2,729,900	12,668	0.5%
Tertiary graduates	100,302	3,450	3.4%
School leavers	56,754	2,003	3.5%
Returning Kiwis	21,955	1,228	5.6%
Beneficiaries	131,600	1,130	0.9%

Source: <https://wip.org.nz/>

Infrastructure appears to attract a small proportion of all labour sources. However, the proportion of career changers transitioning to the infrastructure sector appears particularly low. Recruitment strategies targeted at each labour source may assist in the mobilisation of a Māori workforce.

Altogether, these factors make it intensely difficult to draw clear boundaries around the infrastructure workforce in New Zealand. By extension, it is even more difficult to quantify the present state of Māori participation in the infrastructure workforce. Despite these data limitations, indicators of Māori participation in the infrastructure workforce were provided by various stakeholders interviewed for this project.

10.2 Labour force data tells a mixed story of Māori representation

Here we attempt to map out the representation of Māori in infrastructure employment. In lieu of data germane to the infrastructure sector, we have extracted a sample of professions, from economic consultancy Infometrics, that appear most pertinent to the horizontal infrastructure sector. As alluded to earlier in the report, precise definition of the infrastructure workforce and its associated occupations is not straightforward.

10.2.1 Māori representation in infrastructure professions has held steady

Taking an average of our sample of infrastructure professions suggests that Māori representation in the infrastructure sector has remained steady over the past decade. In 2012, Māori accounted for 17.1 per cent of infrastructure professions, and in 2022 representation increased slightly to 17.7 per cent.

Table 3: Average Māori representation across infrastructure professions

	2012	2022
Average representation in infrastructure professions	17.1%	17.7%

Source: Infometrics modelling

Superficially, one might conclude that Māori are well-represented in the sector, with the average representation more or less reflecting Māori proportions of the population at large. However, further digging indicates that the distribution of Māori in infrastructure shows that they are underrepresented in highly paid roles and overrepresented in lower-paid professions.

10.2.2 With a few exceptions, Māori are underrepresented in the highest paying professions

A sample of the top 10 most highly paid professions (2019) indicates that Māori are largely underrepresented, with a few exceptions. Māori in professions with a strong tertiary education component, such as those in engineering and geology, have experienced marginal increases in representation since 2012, with some of the most significant gains in representation being found in

the domain of structural engineering, moving from 4.4 per cent in 2012 to 8.4 per cent in 2022. Despite these marginal gains, Māori remain considerably underrepresented from a population perspective (17 per cent). Interestingly, Māori are well-represented in other skilled professions, such as structural steel erector driller, and driller's assistant. However, representation in the highest paid of these professions (structural steel erector) has declined over the past decade.

Table 4: Māori representation in highly paid roles

Occupation	Average earnings 2019	2012 proportion	2022 proportion
Engineering Manager	\$133,832	4.1%	6.0%
Geologist	\$126,669	3.6%	5.1%
Structural Steel Erector	\$118,463	37.9%	24.4%
Driller's Assistant	\$116,098	26.9%	28.3%
Structural Engineer	\$113,511	4.4%	8.4%
Construction Project Manager	\$113,395	7.8%	8.9%
Geotechnical Engineer	\$113,108	2.7%	5.8%
Civil Engineer	\$109,075	5.9%	8.4%
Telecommunications Engineer	\$107,648	6.1%	3.9%
Driller	\$107,219	24.3%	25.2%

Source: Infometrics modelling

10.2.3 Māori are overrepresented in some of the lowest paid professions

A sample of the lowest paid professions indicates that Māori tend to be overrepresented. The progression of representation over the last decade tells a mixed story. In some cases, representation in lower paid professions has increased significantly, while proportional representation has declined slightly.

Table 5: Māori representation in lowest paid professions

Occupation	Average earnings 2019	2012 proportion	2022 proportion
Streetsweeper Operator	\$41,176	29.5%	26.8%
Road Roller Operator	\$42,815	36.5%	40.3%
Clay, Concrete, Glass and Stone Processing Machine Operators	\$43,559	11.7%	39.5%

Occupation	Average earnings 2019	2012 proportion	2022 proportion
Nurseryperson	\$43,570	8.7%	11.8%
Stone Processing Machine Operator	\$46,875	19.5%	14.2%
Grader Operator	\$47,535	34.0%	24.5%
Fencer	\$48,706	20.2%	22.5%
Forklift Driver	\$49,317	33.0%	30.0%
Landscape Gardener	\$49,877	12.8%	13.7%
Concrete Products Machine Operator	\$52,447	24.3%	23.1%

Source: Infometrics modelling

10.3 Infrastructure is experiencing significant labour shortfalls

In New Zealand, but in other international contexts too, the infrastructure sector is experiencing significant labour shortages. Such shortages are broadly reflected across the spectrum of the New Zealand economy, including vertical construction. Labour shortages have been attributed to low population growth, buttressed by low levels of immigration. However, infrastructure shortages could be compounded by better wages and career progression opportunities. For example, an infrastructure expert advised:

“Manufacturing, as another sector that offers entry-level opportunities, often pays better wages than parts of infrastructure. It also has clearer career progression pathways for people looking to upskill. So, it could be that the infrastructure sector is losing out to others that can offer more.”

10.4 Mobilising an infrastructure workforce requires time and resources

According to infrastructure experts and engineering consultants interviewed for this mahi, developing an infrastructure workforce is a time- and resource-heavy process. In part, this is because new infrastructure workers “tend to need a series of skills before they can ‘hit the ground’ and effectively do the work”. In other words, entrants to the infrastructure workforce typically require skills developed from prior experience or qualifications before they can meaningfully carry out work. While bringing unskilled workers into the infrastructure domain is possible, it may place constraints on the delivery of projects, as an engineering consultant advised:

"Kids cannot be dropped into an infrastructure job. Not like in some parts of construction or manufacturing. They need to be monitored and buddied up with. Bringing in new labour is in itself a very labour-intensive task. Often, the timeline of the project doesn't lend itself to bringing in new labour."

Similarly, opportunities for upskilling and career progression in infrastructure are contingent upon the availability of time and resources, which is often scarce:

"Progression in the role and upskilling can only really occur if an employer chooses to dedicate the time and resources into you. In the long-term, that's beneficial for the employer, but in the short-term, it can impede the delivery of a project, and in most cases the project will take priority over upskilling staff."

Altogether, these issues make quickly mobilising and upskilling an infrastructure workforce difficult and may partially explain some of the current shortages reflected in the labour market.

10.5 Māori appear to occupy the 'base of the pyramid' in infrastructure

Tangible data that accurately illustrates the distribution of Māori participation in the infrastructure sector is absent. Māori engineers interviewed for this mahi argued that the general absence of this data "reflects a broader problem in construction and infrastructure where we know Māori are underrepresented, but we don't know precisely where". In lieu of sufficient metrics, we asked a spectrum of participants to describe the state of Māori participation in the infrastructure sector. An infrastructure employment expert working in government explained:

"Māori are heavily overrepresented at the base of the pyramid."

This remark reflects a broader sentiment captured from our participants that suggests Māori typically occupy the lower-skilled and lower-paid areas of the infrastructure sector. Moreover, it was observed that Māori tend to remain at the "base of the pyramid", and do not experience career progression to the same degree as their non-Māori colleagues.

10.6 Tertiary education is an enduring barrier for Māori in engineering professions

While not the sole avenue, studying engineering in tertiary education is an established means to obtaining a highly paid and high-responsibility role in the infrastructure sector. A combination of early education issues and historical relationships with engineers have impacted Māori enrolments in engineering programmes.

10.6.1 History and racism have deterred Māori from pursuing engineering qualifications

Several participants highlighted that a tertiary engineering education is often required for highly paid and high-responsibility roles in the infrastructure sector. Māori, however, have been discouraged from studying these disciplines due to historic land confiscations being facilitated by engineers, coupled with racism in the engineering educational domain.

- From 1864, the first Public Works Act enabled the confiscation of Māori land for the purposes of government projects such as roads, and eventually, railways and airports. Engineers were viewed by Māori as the facilitators and enactors of this legislation, which informed a negative perception of the profession. A Māori engineer advised us that “engineering is not widely promoted in the Māori community due to some historical traumas, like the Public Works Act”.
- Negative perceptions of engineers have been compounded by exhibits of racism in the tertiary education context. Specifically, in the years between 1955 and 1979, Pākehā engineering students conducted mock haka while dressed in crude interpretations of Māori dress. This annual event continued despite protests from Māori groups, and only ended in 1979 following a violent incident between engineering students and Māori.

A Māori engineer interviewed for this mahi stated:

“There is trauma there, from events like the Public Works Act and the Haka Party. That had an effect where older Māori would tell us younger ones not to study engineering. Engineers were viewed really negatively through the eyes of older Māori. We would often be encouraged to study law instead.”

Altogether, historical and racial traumas have created friction between Māori and the engineering profession, and this has a negative impact on Māori engineering enrolments and subsequent employment in the infrastructure sector.

10.6.2 Māori early education does not support entry to tertiary engineering courses

Historical and racial trauma aside, pathways to tertiary engineering programmes typically involve the study of science and mathematics at secondary level. However, Māori participation in science and mathematics at secondary level is low. In a nutshell, according to one participant:

“Māori kids, rangatahi, are not studying the kinds of qualifications at high school that are needed for engineering disciplines at tertiary level. There needs to be more input earlier in education if we want to see Māori studying engineering.”

This suggests that early intervention in education may support the mobilisation of Māori into relevant domains that are required for science and engineering programmes. In doing so, Māori may qualify for highly paid and high-responsibility roles in the infrastructure sector.

10.6.3 Māori enrolment data tells a mixed story

Over the past 10 years, Māori enrolment in tertiary engineering programmes has increased nominally, and as a proportion of total enrolments.

- In 2012, 9 per cent of civil engineering enrolments were Māori. In 2021, Māori accounted for 13 per cent of total enrolments.
- Similarly, in geomatic engineering, Māori accounted for 8 per cent of enrolments in 2012, and 10 per cent in 2021.
- Electrical engineering enrolments reveal similar modest increases in proportional representation, moving from 10 per cent in 2012 to 12 per cent in 2021.
- Process and resources engineers, conversely, have seen a slight decline in proportional enrolment from 15 per cent in 2012 to 13 per cent in 2021.

Purely in nominal terms, Māori enrolments across these four disciplines have increased in the last decade. However, accounting for the 18-25-year-old (the age range for most tertiary education enrolments) Māori population share, proportional representation of Māori in these programmes has decreased. In other words, based on the population share of Māori 18-25-year-olds (22 per cent), Māori enrolment in these courses should be significantly higher.

10.7 Various mechanisms can mobilise Māori into the infrastructure workforce

Our stakeholder participants offered a series of options for mobilising Māori into the infrastructure workforce. Here, we present a discussion of these options.

10.7.1 Role modelling Māori success in infrastructure

Several participants identified a benefit in role modelling Māori successes in the infrastructure sector. Practically, this may involve Māori infrastructure professionals speaking and presenting to rangatahi in schools and careers events. According to participants working in government employment, role models should communicate the following information:

- the types of work available in infrastructure
- pathways to entering the sector
- vertical and horizontal progression opportunities
- impact of career on personal life, such as having disposable income
- how infrastructure projects support communities
- how infrastructure mahi can facilitate the enlivening of Māori values, such as kaitiakitanga.

The communication of these factors was informed by a view that financial incentives alone are insufficient for attracting young Māori to the infrastructure sector:

"We can try to attract people to infrastructure with money, and it works, but only to an extent. Getting rangatahi interested in infrastructure, or any career, means we have to be better at communicating the direct and peripheral benefits of the job. Things like Māori values, impact on lifestyle, progression opportunities, and how they can support communities, are the things that get rangatahi interested."

Practically, role modelling is contingent on being able to identify an appropriate Māori 'candidate' who is both experienced in the infrastructure sector and willing to expend their time presenting to rangatahi.

10.7.2 Non-linear pathways are better suited to Māori learning styles

Participants noted that, at present, pathways into the infrastructure are linear, which can make progressing in the sector challenging:

"If you want to get a highly paid role in the infrastructure space, the pathways in are quite linear. Usually, you'll be coming in with a good qualification, like an engineering degree or something. Without a qualification, you can come in low, but it's hard to progress upwards internally."

This issue may be amplified for Māori, who, as participants suggested, "typically do better via non-linear career pathways". In other words, to upskill and progress Māori in infrastructure, consideration

must be given to internal progression pathways, such as on-the-job training, that equip Māori for roles of higher responsibility and pay. Unfortunately, participants noted that internal training and upskilling are costly and can interfere with the delivery of a project. Many employers and project managers are, therefore, reluctant to engage in internal training and upskilling.

10.7.3 Opportunities for rangatahi can be created through the restoration of civil infrastructure apprenticeships

An infrastructure employment expert advised that apprenticeship schemes have been “largely absent from the civil infrastructure space for some time”, which has meant the sector has effectively lost out on young apprentices to other sectors:

“We haven’t had many available apprenticeships in infrastructure for a while. It’s a shame because we are missing out on young people who go off to other industries where they can be trained and upskilled.”

Infrastructure apprenticeships represent an opportunity to mobilise rangatahi into the sector, where they can be trained and upskilled while receiving an income. Our infrastructure employment expert advised that apprenticeships have been coming back “in a small way”, but “full restoration” of apprenticeships would create a great deal of opportunity for young Māori.

11. A way forward

Having identified barriers to and opportunities for Māori, our next steps involve developing a series of recommendations geared toward elevating Māori economic participation in the infrastructure industry. Our strategy is comprehensively detailed in the document titled “*Māori thriving in the infrastructure sector: an enabling strategy for economic prosperity*”. It is guided by six key focus areas:

- 

Contracting – covering contract structure, form, requirements, and process. The goal is an improved environment for Māori, to rationalise contracting, and improve the allocation and management of risk.
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Coordination – as between and amongst Iwi, industry, Government agencies, and advisors. The purpose is better coordination, which involves action in terms of streamlining interactions and promotion of beneficial opportunities and results.
- 

Commitment – to embed useful practices and demonstrate a sustained level of commitment that shows the importance of Māori in the sector on a relational rather than transactional basis. The goal is to demonstrate credible commitment and ensure actions follow words, including a monitoring function.
- 

Coaching – in essence, supporting the provision of mentoring and other advice from current participants, including business advice, navigating the terrain, and perseverance. The goal of such a coaching focus is to shine a light on valuable pathways to ongoing prosperity, and mana-enhancing growth.
- 

Collection – of both information/data and experiences to illustrate the state of play and what changes might be needed or coming in the future. The goal of greater collection activity is to provide necessary insight and guidance for Māori (and others) to make efficient and rewarding decisions from a base of mutual understanding.
- 

Culture – which covers education and the pipeline of opportunities and resources (enterprises and individuals). The goal is to ensure that there is sufficient capability and resources available to exploit available economic prospects.

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Appendix A Infrastructure expenditure data

Project initiator breakdown

Central government

Table 6: Central government-initiated infrastructure expenditure

Infrastructure domain	Value over five years
New roading	\$11,899,386,661
Land development	\$1,533,443,292
Water transmission	\$211,992,884
Water treatment	\$110,205,913
Stormwater	\$95,178,874
Rail	\$1,052,210,253
Road maintenance	\$270,598,482
Airports	\$26,396,023
Ports	\$534,180
Energy transmission	\$2,448,242
Total	\$15,202,394,802

Source: <https://wip.org.nz>

Local government

Table 7: Local government-initiated infrastructure expenditure

Infrastructure domain	Value over five years
New roading	\$10,931,645,364
Land development	\$5,734,427,943
Water transmission	\$5,158,860,242
Water treatment	\$1,923,171,439
Stormwater	\$1,258,535,891
Rail	\$107,023,764
Road maintenance	\$224,731,205
Airports	\$24,457,736
Ports	\$40,273,167
Energy transmission	\$5,971,758
Total	\$25,409,098,509

Source: <https://wip.org.nz>

Private sector

Table 8: Private sector-initiated infrastructure expenditure

Infrastructure domain	Value over five years
New roading	\$24,685,273
Land development	\$7,752,974,581
Water transmission	\$60,250,503
Water treatment	\$225,777,878
Stormwater	\$5,770,446
Rail	\$38,560,482
Airports	\$71,046,499
Ports	\$36,766,771
Total	\$8,215,832,434

Source: <https://wip.org.nz>

Regional breakdown

Northland

Table 9: Northland infrastructure spending over five years

Infrastructure domain	Value over five years
Rail	\$737,301,290
Land development	\$466,213,027
New roading	\$170,235,082
Water transmission	\$93,123,850
Water treatment	\$14,675,802
Ports	\$4,875,138
Stormwater	\$2,140,032

Source: <https://wip.org.nz>

Auckland

Table 10: Auckland infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$6,055,231,058
Land development	\$3,738,890,515
Water transmission	\$1,175,836,977
Stormwater	\$671,777,569
Water treatment	\$478,565,434
Road maintenance	\$311,407,061
Rail	\$27,503,111
Ports	\$16,186,855
Energy Transmission	\$2,448,242

Source: <https://wip.org.nz>

Waikato

Table 11: Waikato infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$1,695,606,468
Land development	\$1,005,461,079
Water treatment	\$508,961,317
Water transmission	\$417,521,758
Stormwater	\$166,048,335
Airports	\$29,218,749
Energy transmission	\$5,603,027
Rail	\$3,536,133
Ports	\$1,677,539
Road maintenance	\$1,267,411

Source: <https://wip.org.nz>

Bay of Plenty

Table 12: Bay of Plenty infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$1,556,831,368
Land development	\$969,182,976
Water transmission	\$368,300,631
Water treatment	\$46,898,343
Stormwater	\$39,767,638
Rail	\$6,358,397
Ports	\$1,099,688
Airports	\$398,438

Source: <https://wip.org.nz>

Gisborne

Table 13: Gisborne infrastructure expenditure over five years

Infrastructure domain	Value over five years
Rail	\$91,026,782
New roading	\$90,339,821
Water treatment	\$49,411,659
Land development	\$43,636,866
Ports	\$24,413,084
Water transmission	\$7,630,275
Stormwater	\$4,142,578

Source: <https://wip.org.nz>

Hawke's Bay

Table 14: Hawke's Bay infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$998,661,014
New roading	\$208,551,506
Water transmission	\$104,946,070
Water treatment	\$68,418,050
Stormwater	\$6,108,983
Airports	\$3,426,106

Source: <https://wip.org.nz>

Manawatū-Whanganui

Table 15: Manawatū-Whanganui infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$2,397,837,385
Land development	\$545,098,879
Water treatment	\$431,479,863
Water transmission	\$173,172,858
Stormwater	\$47,105,889
Rail	\$13,504,387
Airports	\$577,141

Source: <https://wip.org.nz>

Wellington

Table 16: Wellington infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$6,669,975,187
Land development	\$1,956,974,802
Water transmission	\$741,899,359
Water treatment	\$177,884,398
Road maintenance	\$73,243,068
Rail	\$66,484,517
Stormwater	\$27,608,662
Ports	\$12,665,039
Airports	\$1,866,211

Source: <https://wip.org.nz>

Nelson

Table 17: Nelson infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$263,419,185
Water transmission	\$24,309,393
New roading	\$20,143,996
Stormwater	\$18,875,026

Infrastructure domain	Value over five years
Ports	\$12,152,344
Water treatment	\$5,501,671
Road maintenance	\$1,995,658
Airports	\$111,328

Source: <https://wip.org.nz>

Tasman

Table 18: Tasman infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$244,401,339
Water transmission	\$51,881,521
Stormwater	\$19,155,262
New roading	\$14,465,588
Water treatment	\$12,509,964
Ports	\$3,984,375

Source: <https://wip.org.nz>

Marlborough

Table 19: Marlborough infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$156,725,865
Water transmission	\$126,232,458
Water treatment	\$116,731,273
New roading	\$49,537,242
Rail	\$25,708,048
Stormwater	\$19,640,366
Airports	\$3,984,375

Source: <https://wip.org.nz>

Canterbury

Table 20: Canterbury infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$2,734,497,157
New roading	\$1,436,366,768
Water transmission	\$671,073,603
Water treatment	\$213,482,085
Stormwater	\$176,874,009
Airports	\$49,519,855
Rail	\$11,360,629
Ports	\$10,089,023

Source: <https://wip.org.nz>

West Coast

Table 21: West Coast infrastructure expenditure over five years

Infrastructure domain	Value over five years
Land development	\$210,996,034
Water transmission	\$73,455,060
Stormwater	\$26,014,821
New roading	\$22,279,485
Water treatment	\$19,076,035
Ports	\$4,542,188
Rail	\$2,738,281

Source: <https://wip.org.nz>

Otago

Table 22: Otago infrastructure expenditure over five years

Infrastructure domain	Value over five years
New roading	\$1,342,232,250
Land development	\$960,918,050
Water transmission	\$379,340,093
Water treatment	\$214,588,928
Rail	\$104,565,432

Infrastructure domain	Value over five years
Stormwater	\$83,579,103
Airports	\$5,910,820
Ports	\$1,062,501

Source: <https://wip.org.nz>

Southland

Table 23: Southland infrastructure expenditure over five years

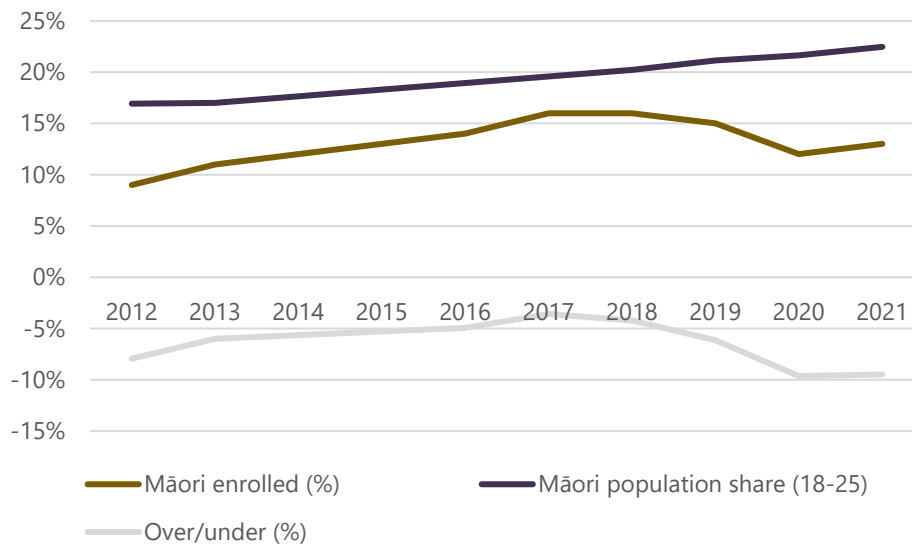
Infrastructure domain	Value over five years
Land development	\$161,831,975
Water treatment	\$131,832,273
Water transmission	\$94,877,386
New roading	\$23,122,107
Stormwater	\$10,666,193
Rail	\$9,939,048
Airports	\$2,357,423
Ports	\$435,719

Source: <https://wip.org.nz>

Appendix B Māori representation in tertiary engineering programmes

Civil engineering

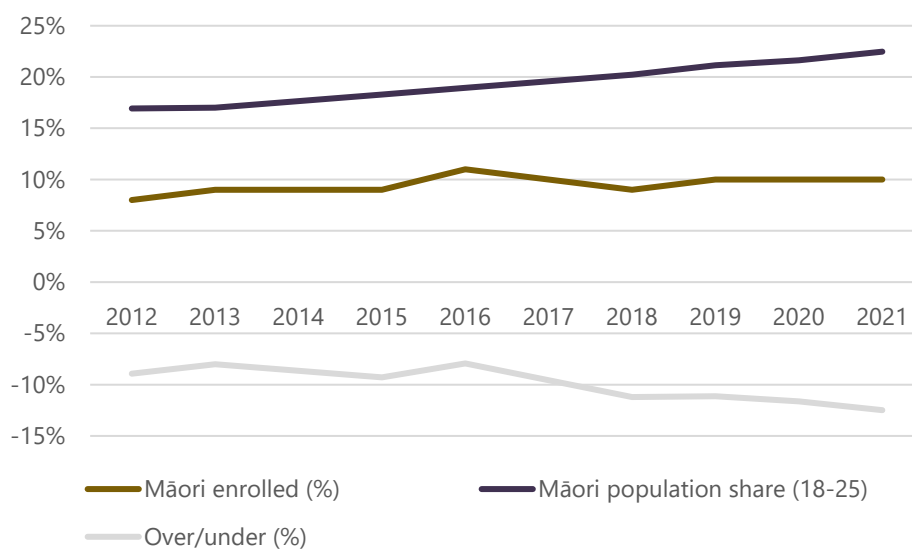
Figure 3: Māori representation in civil engineering programmes



Source: Tertiary Education Commission

Geomatic engineering

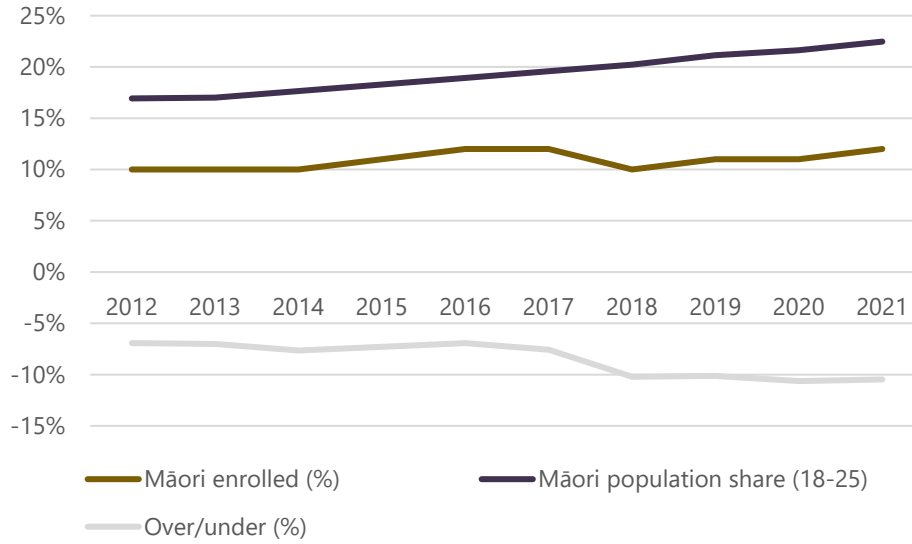
Figure 4: Māori representation in geomatic engineering programmes



Source: Tertiary Education Commission

Electrical engineering

Figure 5: Māori representation in electrical engineering programmes



Source: Tertiary Education Commission

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