


TE HIRINGA O TE TAI AO OUR RESOURCE EFFICIENCY STRATEGY

JUNE 2021



Tuia ki te rangi,
Tuia ki te whenua,
Tuia ki te moana,
Tuia ki te here tangata,
Ka rongo te pō,
Ka rongo te ao,
Tihei mauri ora!

Bind the domain of the sky,
Bind the domain of the land,
Bind the domain of the ocean,
Interlaced by threads of human love
and compassion,
Let peace abound throughout the night,
And the light of day,
Behold the **breath** of life!

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OUR VISION FOR RESOURCE EFFICIENCY

Tūngia te ururoa kia tupu whakaritorito te tutu o te harakeke.

Set the overgrown bush alight, and the new flax shoots will spring up.

Waka Kotahi NZ Transport Agency (Waka Kotahi) has a vision for a 'low carbon, safe and healthy land transport system' as set out within *Toitū te Taiao: our Sustainability Action Plan*.

Our vision for resource efficiency¹ is:

We use resources sustainably with minimal environmental impact.

*Te Hiringa o te Taiao*² sets out what Waka Kotahi will do to achieve this Vision and the steps we will take to deliver on our commitment to environmental sustainability within *Toitū te Taiao* as it relates to resource efficiency and waste minimisation.

Te Hiringa o te Taiao describes what we need to do to enable changes in behaviour, innovation and ways of doing business that drive sustainable sourcing and use of materials, waste minimisation and emissions reductions, while providing the same service benefit.

Te Hiringa o te Taiao responds to the challenges we face in relation to resource efficiency, with a land transport system that is heavily resource dependent, with virgin materials and energy being consumed in large quantities and large amounts of waste being sent to landfills and cleanfills. There is a big opportunity to pursue innovation in resource efficiency and waste minimisation by adopting a circular economy approach.

This strategy will assist Waka Kotahi in delivering the long-term outcomes to 2050 in *Toitū te Taiao* to achieve net zero land transport greenhouse gas emissions and use resources and energy sustainably.

Waka Kotahi will work together with our partners and contractors to deliver our vision for resource efficiency through levers within our control and influence. The intent is for *Te Hiringa o te Taiao* to be adopted by Waka Kotahi, our partners and contractors.

¹ Waka Kotahi has defined resource efficiency as: Achieving the best possible output for the least volume of materials and energy consumed during the construction, operation and maintenance of the land transport system, while providing relevant levels of service for safety, speed, environment and amenity.

² Literally translated *Te Hiringa o te Taiao* means 'The vitality and energy of the natural environment'.

TE HIRINGA O TE TAIAO OVERVIEW

The purpose of *Te Hiringa o te Taiao* is to set out how we will deliver on our resource efficiency and waste minimisation objectives to achieve our long-term outcomes. This is consistent with our statutory obligations, the direction of *Toitū te Taiao*, and the environment and sustainability focus areas under the Waka Kotahi broader outcomes strategy.

The approach outlined in *Te Hiringa o te Taiao* can be summarised as:

Challenges

Large consumption of virgin materials.

Regional shortages of premium aggregate materials

Low levels of recycling

Large production of waste materials from construction and demolition

Significant carbon footprint and energy use

Focus areas

Sustainable sourcing and use of resources

Waste minimisation

Reduced energy and carbon

Headline actions

1. Facilitate a national conversation on resource efficiency for the wider infrastructure sector.
2. Support the increased uptake of recycled and alternative materials while optimising our use of virgin resources.
3. Empower our contractors to move to a zero waste to landfill mind-set on our projects.
4. Empower our contractors to deliver low carbon projects.
5. Initiate and support a behaviour change across Waka Kotahi and industry.
6. Incentivise and champion innovation.

Monitor progress

Annual monitoring and reporting (eg through contract specifications/principal requirements/minimum requirements and KPIs).

OUR COMMITMENTS, STATUTORY OBLIGATIONS AND PARTNERSHIP WITH MĀORI

Waka Kotahi is committed to building strong, meaningful and enduring relationships with our stakeholders to achieve mutually beneficial outcomes. We actively explore opportunities to work with Māori in our land transport projects and celebrate our partnerships and work with Iwi.

When making decisions about resource efficiency, Waka Kotahi proactively respects Māori interest and the principles of Te Tiriti o Waitangi. We recognise Te Ao Māori, a Māori world view, has a wider lens that we are incorporating into what we do. *Te Ara Kotahi - our Māori Strategy* articulates Mātauranga Māori (Māori Knowledge) as a priority for Waka Kotahi where we recognise and provide for cultural heritage, identity, values and Mātauranga Māori in our work, enhancing the land transport system. Managing resources efficiently is consistent with the principle of kaitiakitanga (guardianship and conservation) of the natural environment.

Toitū Te Taiao: our Sustainability Action Plan sets out our commitment to environmental sustainability and public health in the land transport system and the principles we will follow. *Toitū Te Taiao* identifies four key challenges for Waka Kotahi. Improving resource efficiency and waste minimisation is included within the challenge 'Reducing Environmental Harm'. Underpinning these key challenges are six workstreams, supported by headline actions and sub-actions.

Toitū Te Taiao, Workstream 3 '*Protect and enhance the natural and built environment*', includes a headline action (with four key sub-actions) to:

Toitū Te Taiao headline action	Sub-actions
Develop and embed a resource efficiency and waste minimisation policy	Develop and implement a resource efficiency and waste minimisation strategy and supporting policy, measures and targets.
	Identify quick wins and form a prioritised set of actions to support Waka Kotahi, local councils and our contractors to embed resource efficiency and waste management practices into core practice.
	Facilitate a national conversation on resource efficiency for the wider infrastructure sector (e.g. addressing sustainability of aggregate supply).
	Incentivise and champion innovation.

Te Hiringa o te Taiao has been developed to support this headline action and sub-actions in line with our statutory obligations, and commitments within *Te Ara Kotahi, Toitū Te Taiao* and the broader outcomes strategy.

Waka Kotahi functions include managing funding of the land transport system and managing the state highway system. In undertaking these activities, Waka Kotahi must respond to statutory obligations and government priorities that require us to consider a broad range of outcomes, including progress towards a Net Zero emissions low-carbon economy, the sustainable sourcing and use of resources and the minimisation of waste and environmental impacts. Resource efficiency has a key role in delivering these sustainable outcomes.

Resource efficiency and waste minimisation is embedded in legislative requirements that affect the land transport activities that are undertaken by, or on behalf of Waka Kotahi and our partners. This includes:

- Our responsibilities under Section 96 (1)(a) of the Land Transport Management Act 2003 that require that Waka Kotahi exhibit a sense of social and environmental responsibility.
- Our duty under the Resource Management Act 1991 to avoid, remedy or mitigate adverse effects on the environment from Waka Kotahi activities.
- The Land Transport Management Act and the Resource Management Act also specify our requirements to consider the principles of the Treaty of Waitangi and our obligations to consult and engage with Māori.
- The Government Policy Statement on land transport that we must give effect to that prioritises a reduction in greenhouse gases emitted by transport to achieve the Government's emissions reduction targets and protect public health.
- The Waste Minimisation Act 2008 Act that encourages a reduction in the amount of waste we generate and dispose of in New Zealand.
- The Climate Change Response (Zero Carbon) Amendment Act that has set a greenhouse gas emissions reduction target for New Zealand to reduce net emissions of all greenhouse gases (except biogenic methane) to zero by 2050.

Government has also released a number of policies, rules and guidelines outlining the government's direction with regards to sustainable outcomes.

- The government procurement rules require each government agency to consider broader outcomes when purchasing goods, services or works.
- The government sustainable construction procurement guidelines require us to consider sustainable construction practices in the business case stage.
- The forthcoming carbon emission reduction plans and budgets will introduce further requirements to transition New Zealand to a low carbon future.
- The Carbon Neutral Government Programme (CNGP) which requires the public sector to be carbon neutral by 2025, and measure and publicly report on their emissions.
- The Waka Kotahi *Statement of performance expectations 2020/21* sets out its environmental position as: 'we will responsibly manage the land transport system's interaction with people, places and the environment.'

OUR CHALLENGES

While resource efficiency is considered at Waka Kotahi, there is currently no strategic approach to achieve a tangible reduction in resource consumption, waste sent to landfill or reduction in energy use and emissions. Taking a strategic approach presents a very real opportunity to achieve cost savings, realise environmental benefits and to embed a culture of resource efficiency in the delivery of land transport functions.

Targeted policies can strongly influence the initial design specification, expectations and criteria for its tendering and contractual obligations. They can firmly set the scene for the adoption of a resource efficient approach from the outset and promote a culture of acceptance, willingness and commitment to working together towards a successful outcome, while encouraging wider thinking, problem solving and collaboration.

Waka Kotahi has established policies and specifications that support resource efficiency and are in line with government aspirations. These are not yet fully integrated into the decision-making processes and contracts of Waka Kotahi.

Further challenges include:

- Large consumption of virgin materials (aggregate represents the largest raw material used by volume for highways construction. In 2018 New Zealand generated approximately 33.7 million tonnes of aggregates, of which 22 million tonnes were used for road construction³).
- Regional shortages of premium aggregate materials, leading to longer transport distances and associated impacts.
- Significant contribution of haulage and distribution of quarried aggregates to the number of heavy vehicles using the road network and associated impacts (representing 15% of total freight movements in 2017/18)⁴.
- Low levels of recycling (recycled materials made up about 2.2 % of the pavement materials used in Waka Kotahi maintenance contracts in 2019⁵).
- Large production of waste materials from construction and demolition which is putting pressure on already constrained landfill and cleanfill sites. Many of these materials have suitable properties as roading materials.
- Significant carbon footprint (a 2020 study showed carbon emission estimates from eight construction projects ranged between 102 to 209,264 tonnes of carbon dioxide equivalent (CO₂e) and from two maintenance projects annual emissions were 137 and 388 tonnes CO₂e per annum)⁶.
- Construction, operation and maintenance of our land transport network requires large amounts of energy, relying heavily on fossil fuels.
- Lack of baseline data to measure resource efficiency and waste and develop targets.
- Knowledge and capability gaps within industry to drive a step change.

3 New Zealand petroleum and minerals: aggregate production 1993-2018

4 MoT National freight demand study 2017/18, October 2019

5 Data extracted from Waka Kotahi RAMM database

6 AECOM (2020). Carbon footprint stocktake - transport projects/assets

OUR OBJECTIVES

SHORT-TERM

(1-3 years)

Baseline/
integration

- Waka Kotahi has an established baseline for resources, waste, energy, emissions and have established realistic targets to reduce our impact.
- We take into account the whole of life environmental impacts and cost in our decision-making.
- Resource efficiency, energy efficiency and waste minimisation are integrated into our investment, procurement, project management and delivery processes.

MEDIUM-TERM

(4-10 years)

Embedding/
sustainable use

- Waka Kotahi is using resources and energy sustainably and implementing opportunities to drive low waste outcomes.
- Waka Kotahi is working with our partners and contractors to embed resource efficiency and waste management practices into core practice.
- The use of recycled and alternative materials is significantly increasing throughout the supply chain; waste generation and disposal to land is significantly reducing throughout the supply chain.

LONG-TERM

(10 years+)

Adopt circular
economy approach

- Waka Kotahi has adopted a circular economy approach.
- We design out waste & pollution. We keep materials in use. We regenerate natural systems. We adaptively reuse structures and heritage assets where appropriate.
- Our projects have net zero emissions by 2050.

Achieving our resource efficiency objectives will:

- reduce environmental impacts, including reducing energy use and emissions and reducing waste sent to landfill
- deliver long-term cost benefits through whole-of-life considerations
- achieve improvements in broader sustainable outcomes including social, cultural and environmental
- improve service life of assets and reduce the need for materials and energy
- preserve resources for the use of future generations.



OUR FOCUS AREAS

Four focus areas have been identified to respond to the challenges and deliver on our objectives.

Focus area		Long-term goals
Sustainable sourcing and use of resources	<ul style="list-style-type: none"> Use local materials where possible. Optimise the use of virgin materials and resources. Use risk assessed designs to increase the use of recycled and alternative materials. National aggregate resources are managed to preserve for future generations. 	<ul style="list-style-type: none"> Waka Kotahi, our contractors and partners are using local materials, optimising the use of virgin materials and maximising the use of recycled and alternative materials. Our infrastructure design incorporates whole-of-life considerations (ie long-life pavements, low embodied carbon options, etc). We have a (nationally coordinated) strategic approach to resource use that ensures there is planned, long-term sustainability of local material supply and transport of materials is minimised.
Waste minimisation	<ul style="list-style-type: none"> Drive low-waste outcomes from design through to implementation. Increase reuse and recycling uptake throughout our supply chain. Reuse structures and heritage assets where appropriate. 	<ul style="list-style-type: none"> We are driving low-waste outcomes through option development and design. We are minimising waste sent to landfill/cleanfill by maximising reuse or recycling opportunities throughout our supply chain. We are working with our partners and contractors to transition to a low/zero-waste future.
Reduced energy and emissions	<ul style="list-style-type: none"> Reduce energy use and emissions from our projects and activities and using renewable energy sources. Reduce embodied emissions through planning and design solutions. 	<ul style="list-style-type: none"> We are reducing emissions from our activities and using renewable energy sources and minimising energy use associated with transport, plant and machinery use. We are reducing embodied emissions through planning and design solutions. Incorporating climate change and adaptation assessments into business case planning and decision-making processes. We are working with our partners and contractors to transition to a low carbon future.

Focus area	Long-term goals	
Cross-cutting enablers	<ul style="list-style-type: none"> ▪ Use of sustainability rating tools drive better environmental and sustainability outcomes from the earliest planning stage. ▪ Incorporate whole-of-life cost and life cycle impact considerations into our investment and business case phase decision making. ▪ Consider broader environmental outcomes in decision making to optimise win-win opportunities, eg epoxy open-graded porous asphalt (OGPA) long-life pavement with materials, carbon, noise and long-term cost benefits. ▪ Develop good baseline data and systems for ongoing monitoring and reporting. ▪ Specify resource efficiency KPIs and targets in contracts. ▪ Incentivise and champion innovation, and target research to support innovation in resource efficiency. ▪ Build capability and share knowledge with the wider industry sector. 	<ul style="list-style-type: none"> ▪ We use sustainability rating tools to drive resource efficiency and low waste outcomes and to measure our success. ▪ Waka Kotahi measures and reports its achievements in resource efficiency. ▪ We optimise win-win opportunities to achieve broader environmental outcomes, incorporating whole of life considerations. ▪ We drive innovation and enable resource efficiency outcomes across the land transport system.

OUR HEADLINE ACTIONS

The headline actions outline how we will achieve the long-term goals for each of the four focus areas. These are set out in the table below.

Focus area	Headline actions	Sub-actions	Milestones
Sustainable sourcing and use of resources	1. Facilitate a national conversation on resource efficiency for the wider infrastructure sector (eg addressing sustainability of aggregate supply).	1a. Research national aggregate demand, supply and sourcing issues. 1b. Work with government partners to develop a (nationally coordinated) strategic approach to resource use.	1a. Complete by June 2021 1b. From July 2021
	2. Support the increased uptake of recycled and alternative materials while optimising our use of virgin resources.	2a. Review and update (as needed) technical specifications to support increased use of recycled and alternative materials that meet sustainable sourcing and low carbon objectives. 2b. Review and update internal ranking for different pavement technology options (balancing risks and sustainability outcomes).	Commence review of technical specifications from June 2021 Draft recycled and alternative material guideline/ specifications June 2022
Waste minimisation	3. Empower our contractors to move to a zero waste to landfill mind-set on our projects.	3a. Establish a baseline, measures and targets for waste generated across our construction, maintenance and operation activities to drive reduction in waste sent to landfill. 3b. Require resource efficiency and waste minimisation plans for our contracts. 3c. Develop guidance to support our suppliers to drive low waste outcomes.	3a. Set up system to establish baseline, measures and targets from June 2021 3b Require plans from June 2021 3c Draft guidance by June 2021
Reduced energy and emissions	4. Empower our contractors to deliver low carbon projects.	4a. Establish a baseline, measures and targets for energy use and embodied emissions across our construction, maintenance and operation activities that drive a reduction in energy use and embodied carbon. 4b. Develop guidance and tools to support energy and embodied carbon assessment requirements for our contracts.	4a. Set up system to establish baseline, measures and targets from June 2021 4b Draft guidance by June 2021 and tools by September 2021

Focus area	Headline actions	Sub-actions	Milestones
Cross-cutting enablers	5. Initiate and support a behaviour change across Waka Kotahi and industry.	<p>5a. Develop and embed a resource efficiency and waste minimisation policy and measures and targets.</p> <p>5b. Embed resource efficiency into Waka Kotahi processes (including whole of life assessment in investment and business case phases) and support the change required by providing resources and training.</p> <p>5c. Work with government partners and industry groups to enable a step change in resource efficiency across the land transport system.</p> <p>5d. Develop specifications and guidelines to enable successful implementation of our sustainability rating scheme policy and resource efficiency and waste minimisation policy.</p> <p>5e. Develop guidance and tools for internal processes to assess resource efficiency requirements (define what risks and costs are acceptable to ensure better outcomes).</p>	<p>5a. Develop policy by June 2021</p> <p>5b-e Roll out from June 2021</p>
	6. Incentivise and champion innovation.	<p>6a. Develop and fund a prioritised research work programme which supports innovation in resource efficiency.</p> <p>6b. Host innovation workshops to identify and rate potential sustainable and low carbon roading, maintenance and design options.</p>	<p>6a Investigate research priorities and funding options by December 2021</p> <p>6b Commence from December 2021</p>

A detailed action plan will be prepared to support the strategy and delivery of headline actions.

OUR MONITORING APPROACH

The establishment of a baseline and measures for resource efficiency is essential to be able to monitor the progress and performance of Waka Kotahi in delivering the strategy objectives and long-term outcomes as outlined above.

Tiakina Te Taiao, our sustainability monitoring report (a companion document to Toitū Te Taiao) includes a variety of environmental, cultural and public health measures, including resource efficiency and is reported on annually. The 2020 report includes a measure on recycled materials used in resurfacing and rehabilitation maintenance projects. Moving forward as data becomes available it will include a range of measures for resource efficiency, including total materials (and embodied carbon), energy used (and CO₂ emissions) and total waste generated from construction, maintenance and operations.

Resource efficiency measures will include:

- Total materials (tonnes) from construction, maintenance and operations: based on the top 4-5 materials used, including materials that are recycled or virgin materials.
- Embodied GHG emissions from materials.
- Total energy (kWh) from construction, maintenance and operations and GHG emissions from energy use.
- Total waste (tonnes) to landfill/cleanfill from construction, maintenance and operations.
- Total waste (tonnes) diverted from landfill/cleanfill from construction, maintenance and operations.

APPENDIX A - RELATED DOCUMENTS

Toitū te Taiao - Our Sustainability Action Plan - Overview. Prepared by Waka Kotahi dated April 2020.

Te Ara Kotahi - Our Māori Strategy. Prepared by Waka Kotahi, undated. Ref 18-401.

Environment and social responsibility documents. <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility>





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