

Arataki

30-year plan

September 2023 v1.1

Waka Kotahi NZ Transport Agency
Published March 2023 (version 1)
Updated September 2023 (version 1.1)

ISBN 978-1-99-106854-5 (online)
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(20-182)

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The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023. This includes a new climate adaptation lens added to the *Lenses* section, as well as updates to the *Strategic Context* and five regional directions: Te Tai Tokerau Northland, Tāmaki Makaurau Auckland, Waikato, Tairāwhiti Gisborne, and Te Matau-a-Māui Hawke's Bay. Minor corrections have also been made.

Arataki

Executive summary

September 2023 v1.1

The journey

A photograph of a person riding a bicycle on a paved path. The path is bordered by a low concrete wall and some greenery. In the foreground, there is a large, light-colored rock. The background shows a road with cars, trees, and a clear sky. A teal curved graphic element is in the top left corner.

Arataki was first published in 2019. It identified the significant shifts, known as step changes, needed to meet the government's short-term priorities and long-term outcomes for the land transport system over a 10-year period. It also considered how Waka Kotahi should focus its efforts in each region.

Arataki version two was published in 2020. This release reflected the initial impact of COVID-19 on the land transport system. This work supported the Waka Kotahi response to the global pandemic.

In 2022, we took our first step towards developing a longer-term view with the *30-year plan: baseline network version*. This release was launched as a prototype on a digital platform to support land transport planning and investment decisions. It focused on the actions Waka Kotahi (in collaboration with others) would need to make to the state highway network to achieve priority outcomes and deliver a fit-for-purpose land transport system.

This current version of *Arataki* replaces all previous versions, including *Arataki: 2021-2031* and the *30-year plan: baseline network version*.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023. This includes a new climate adaptation lens added to the *Lenses* section, as well as updates to the *Strategic Context* and five regional directions: Te Tai Tokerau Northland, Tāmaki Makaurau Auckland, Waikato, Tairāwhiti Gisborne, and Te Matau-a-Māui Hawke's Bay. Minor corrections have also been made.



Arataki: 30-year plan

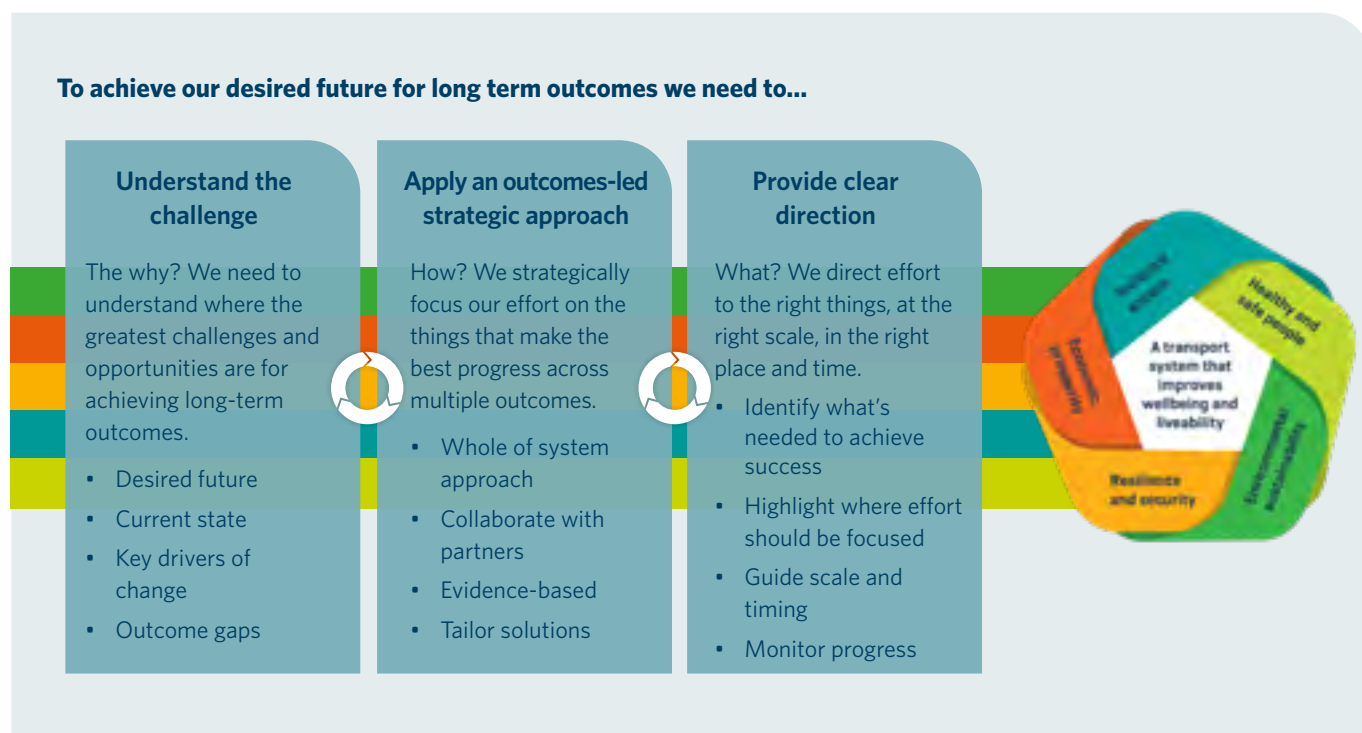
Arataki is being developed as a shared sector view of how we need to plan, develop, and invest in the land transport system during the next 30 years. This version of *Arataki* provides a strong foundation for us to have ongoing conversations with our partners and others to co-create the plan. *Arataki* provides direction that will guide how we'll work together during the next 30 years to deliver the future land transport system needed to keep Aotearoa New Zealand moving.

As a foundation, *Arataki* uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport. This framework sets long-term outcomes for the transport sector to work towards.

Arataki then applies a three-part conceptual framework to:

- understand the challenges the system faces
- apply an outcomes-led strategic approach
- provide clear direction towards a transport system that improves wellbeing and creates great places to live.

Arataki conceptual framework



Understanding our challenge

To support wellbeing and create great places to live in Aotearoa New Zealand, the transport sector needs to focus less on the physical movement of people and goods (mobility), and more on safe, sustainable access and connectivity for all. This shift requires integration with digital, urban development, energy, and other related systems.

To achieve this, we need to:

- adapt to climate change and improve resilience
- better integrate transport and land use in our largest cities, and provide a wider range of options including walking, cycling, and public transport in smaller towns and cities
- improve access to transport for rural communities
- move freight more efficiently and safely
- maximise the benefits of technology, data, and innovation
- shift to an outcomes-based approach.

The greatest level of change needs to happen in the cities of Aotearoa. This is where nearly all future population growth is forecast to take place. Here, the transport system needs to be dramatically different, with better integration between land use and transport to support quality, mixed-use, compact urban form. In our largest cities, rapid transit networks need to enable, support, and shape urban development, while connecting more people to jobs and each other.

The number of people living in smaller, rural, and remote districts outside of urban areas will decline or remain the same. This includes places like Waitomo, Ruapehu, Kawatiri Buller, Māwhera Greymouth, Te Tai o Poutini Westland, and Maruawai Gore. The land transport system will play a critical role in supporting the economic and social wellbeing of these communities. Public transport will also need to play a larger role in smaller cities and towns. New approaches, like on-demand shared services, will become more important.

Freight will be moved with greater efficiency and safety. The share of the freight task moved on rail and coastal shipping will also change, to support the reduction in vehicle kilometres travelled (VKT) and emissions. In towns and cities, increased home and business delivery for things like groceries and online purchases needs to be addressed. Primary producers will be looking to get products to market in faster and more economic ways.

Aotearoa is less productive than comparable countries and needs more efficient ways of doing business, like moving freight faster. The economy is slowly shifting towards service industries and will require primary industries, like farming and forestry, to find new ways to stay productive. There are also equity challenges, like ensuring fair pay, conditions, and opportunities. Businesses are under pressure to tackle these productivity and equity issues while also lowering their carbon emissions, as part of the country's push to reach net zero by 2050.

In Aotearoa we are significantly exposed to natural hazards like floods, erosion, landslides, and coastal inundation. Around 750,000 New Zealanders, and 500,000 buildings worth more than \$145 billion, are near rivers and in coastal areas already exposed to extreme flooding.¹ There are also several major urban centres, taonga, and sites of cultural importance at risk. The impacts of natural hazards are felt by everyone. Climate change is making these events more frequent and severe. Even with aggressive strategies to reduce greenhouse gas emissions, the impacts of a changing climate will be felt for decades.

As we have experienced, climate change and more frequent extreme weather events mean there are significant challenges ahead. We need to respond in different ways to build greater resilience. There will be ongoing impacts on communities and the transport networks that connect them. The transport sector will need to work with communities and infrastructure providers to adapt, including:

- identifying at-risk areas
- making plans to manage impacts
- potentially considering different approaches to rebuilding.

Together, we need to find new solutions and identify long-term options that reflect the diverse requirements for urban and rural communities.

Technological innovations and shifting customer expectations will require and enable us to work in agile ways. The land transport system must be more equitable, so it achieves more for everyone. We'll aim for 'win-win' solutions to grow housing supply in accessible and sustainable ways.

Transport has a strong role in making places better (placemaking) and creating communities where people want to live. It provides access to education and jobs; it connects communities to each other.

1. Ministry for the Environment (2022). Managed retreat: what it is and when it might be useful. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/managed-retreat/>

We want the land transport system to be safer and have less impact on the environment. To achieve these goals, we need to better plan and work out how we'll get there.

We must stop taking a 'predict and provide' approach to planning, where decisions about future transport infrastructure are based on projections from current trends and assumptions. Instead, we need to take a 'decide and provide' approach where we proactively plan the desired future we want to achieve, like improving safety or reducing emissions, then consistently make decisions based on what's needed to achieve these.

Decision-making, especially for infrastructure, must prioritise initiatives that deliver multiple outcomes regardless of the funding source.

We assess when interventions are needed and sequence them to:

- maximise value over the whole-life cycle
- rebuild in smarter ways
- use cross-government funds effectively.

Disruption from climate change should be managed through adaptive and timely responses. The way the land transport system is planned, operated, and managed will increasingly respect and integrate Te Tiriti and Te Ao Māori.

Providing clear direction

Arataki provides direction for the land transport system. The content is set out in various sections to address specific topics and needs across the transport landscape.



Strategic context



Sets the scene by describing what the land transport system could look like in 30 years, what's driving change, plus challenges and opportunities to be addressed.



National directions



Identifies the types of national, system-wide activities Waka Kotahi considers necessary for the land transport system to achieve long-term outcomes, government priorities, and objectives. It includes directions for each of the five transport outcomes from Te Manatū Waka Ministry of Transport.



Regional directions



Provides guidance for 14 regions in Aotearoa New Zealand. Each regional section includes a high-level summary, context, and outlook based on:

- an assessment of the impact of the key drivers, current state, and performance of the land transport system
- the scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years.

These directions indicate where effort should be focused. They direct conversations with partners about priority outcomes in each region.



Transport modes and strategic networks



Outlines our approach to the different transport modes and their roles. This section also covers the most important parts of the land transport system, strategic networks, and our plan for managing them in the future

Strategic networks are the most critical parts of the country's land transport network. They form the backbone of the entire transport system and support the most essential movements of people and freight across all modes.



Lenses



The land transport system can be viewed from multiple perspectives or lenses. This section looks at the transport system through specific perspectives, including Māori, freight, equity, and climate adaptation.

What's next

Waka Kotahi can't, shouldn't and won't plan the land transport system alone. Transport is a shared responsibility across many different players. It must factor in the needs of our communities, cities, and regions. Transport must align, and be part of, wider initiatives, such as providing housing and reducing emissions across the whole economy.

The focus now shifts to developing *Arataki* further with our partners – iwi Māori, local government, central government, and the wider transport sector. This will ensure an accurate and complete view of where effort should be focused. It will also outline a shared and enduring direction of the change required to the land transport system over time.

We want to:

- work in partnership with Māori to better provide for their aspirations for the land transport sector
- work with local government to develop the aspects of *Arataki* that are important to them, including their response to climate change, resilience issues, and system security
- work with a range of partners and stakeholders to build stronger direction about emerging issues, such as biodiversity
- build a shared evidence base with insights located on a collaborative digital platform.
- develop direction about creating transformational change for strategic urban networks.

Arataki

Strategic context

September 2023 v1.1

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Arataki



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This version of *Arataki* provides a strong foundation for us to have ongoing conversations with our partners and others to co-create the plan. *Arataki* provides direction that will guide how we'll work together during the next 30 years to deliver the future land transport system needed to keep Aotearoa New Zealand moving.

As a foundation, *Arataki* uses the *Transport Outcomes Framework* developed by Te Manatū Waka Ministry of Transport. This framework sets a purpose for the transport system centred around the wellbeing of New Zealanders and making places great to live. It outlines five outcome areas to contribute to this purpose:

- inclusive access
- economic prosperity
- resilience and security
- healthy and safe people
- environmental sustainability.

These five outcomes provide certainty and consistency for future planning, but are flexible enough to inform current priorities and policy direction.

Arataki outlines what's needed for Waka Kotahi and the wider transport sector to progress towards achieving the five outcomes by:

- taking a system approach to outline a high-level plan for the land transport system over the 10-, 20-, and 30-years
- providing internal direction for integrated planning and external direction to the sector
- highlighting where effort should be focused to have the greatest benefit
- identifying emerging issues and gaps
- providing guidance on scale and location of the most urgent and high-priority challenges.

Inclusive access

Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare.

Economic prosperity

Supporting economic activity via local, regional, and international connections, with efficient movements of people and products.

Resilience and security

Minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events.

Healthy and safe people

Protecting people from transport-related injuries and harmful pollution, and making active travel an attractive option.

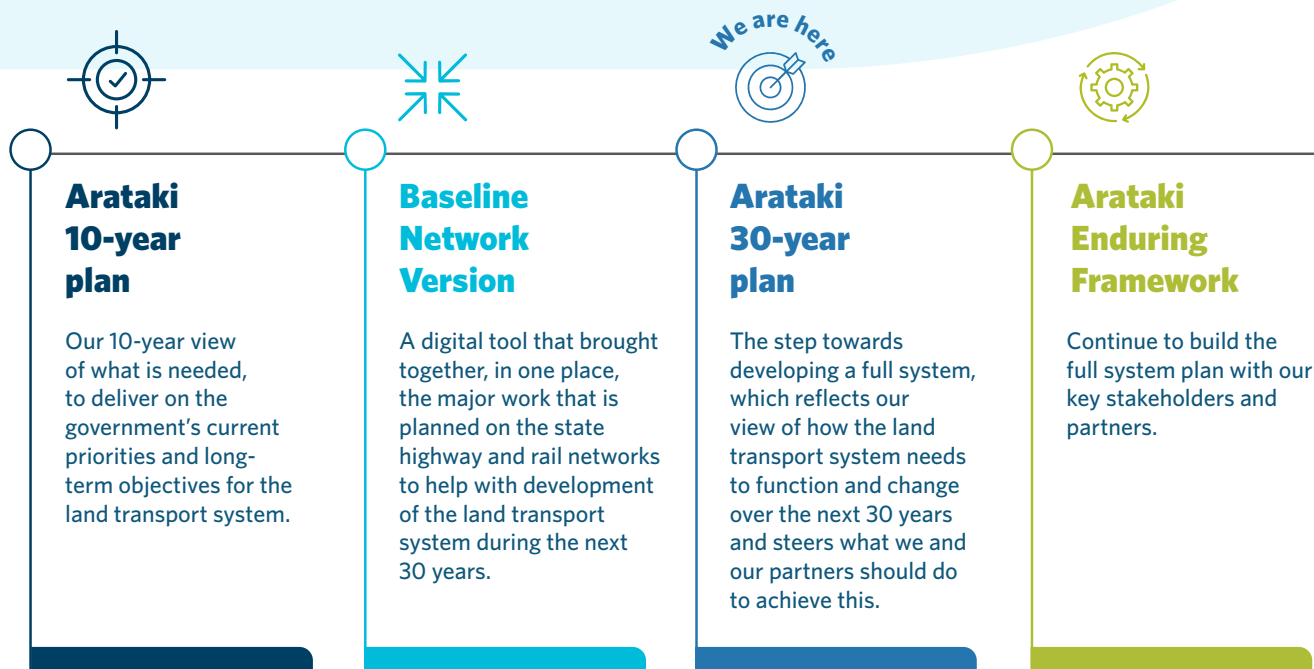
Environmental sustainability

Transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality, and air quality.



Arataki is aligned with the *Strategy for Waka Kotahi – Te Kāpehu*. The strategy informs our work and shapes how we partner with others to implement the full range of levers available – from policy and regulation through to education, engagement, and awareness.

Arataki: The journey



Arataki: 2021-2031 was first published in 2019. It identified the significant shifts, known as step changes, needed to meet the government's short-term priorities and long-term outcomes. It also considered how Waka Kotahi should focus its efforts in each region.

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In 2022, we took our first step towards a longer-term view with the *30-Year Plan: Baseline Network Version*, released as a prototype on a digital platform to support planning and investment decisions. It focused on the actions Waka Kotahi (in collaboration with others) may need to make to the state highway network to achieve priority outcomes and deliver a fit-for-purpose land transport system.

This release

The 2023 *Arataki* releases are the first steps towards developing a 30-year, whole-of-system plan across all Te Manatū Waka Ministry of Transport outcomes. It's a work in progress and will need further development over time with our partners and the wider sector.

For this version, we have prioritised work that will inform the future *Waka Kotahi Investment Plan*, and provide direction to the 2024–27 National Land Transport Programme (NLTP) and other Crown funding.

More specifically, this release:

- integrates *Arataki: 2021–2031* and the *30-Year Plan: Baseline Network Version*
- links outcome challenges (why), strategic approach

Step changes for *Arataki*

Current approaches may not be enough to achieve transport outcomes. Instead, some areas will require significant change, or step changes, to deliver transformational shifts in performance by:

- creating new ways of influencing the system
- broadening our understanding of the parties, behaviours and/or influences in the land transport system
- improving how we target multiple outcomes
- substantially changing the pace (or order) things are done or achieved
- removing historic barriers or limitations
- considering challenges and opportunities from a new perspective, for example iwi Māori.

(how), and direction setting (what)

- provides clearer direction at a national and regional level to progress Te Manatū Waka *Transport Outcomes Framework*, and identifies priority areas for focused effort
- strengthens the evidence base to develop key insights, with an initial focus on reducing vehicle kilometres travelled (VKT)
- outlines the impacts of the transportation system on Māori aspirations and different population groups
- includes climate adaptation responses for our transport outcomes.

In 2019, *Arataki: 2021–2031* identified five step changes:

-  support regional development
-  transform urban mobility
-  improve urban form
-  tackle climate change
-  significantly reduce harm.

These step changes will be reviewed with our partners to provide further direction and identify where new transformations are needed.

Arataki: What's next

Waka Kotahi can't, and shouldn't, plan the land transport system alone.

Work to date has been done with Te Manatū Waka and KiwiRail. The focus now shifts to developing this plan further with our partners, iwi Māori, local government, and the wider transport sector.

Transport is a shared responsibility across many different players. It must factor in the needs of our communities, cities, and regions.

Transport must also align, and be part of, wider initiatives, such as reducing emissions across the whole economy.

Input from the transport sector will ensure an accurate and complete view of where effort should be focused. It will also build a shared and enduring direction of the change required to the land transport system over time.

Our transport challenges - now and in the future

What the land transport system could look like in 30 years

Transport enables us to participate in society, giving us access to whānau, places of learning, and employment.

It contributes to our economic prosperity and connects us with the rest of the world.

It impacts our health and environment, shapes how we use land, and influences how towns and cities grow and function.

The land transport system will evolve substantially over the next 30 years. While predicting the future is impossible, we will use trends and influences to understand how the future may be different from today.

To support positive wellbeing and great places to live in Aotearoa New Zealand, the transport sector will need to focus less on the physical movement of people and goods (mobility), and more on safe, sustainable access and connectivity for all. This shift will require integration with digital, urban development, energy, and other related systems.

A fit-for-purpose land transport system in 30 years will need to:

- provide affordable, convenient, safe, and sustainable access for everyone to social, cultural, health, and economic opportunities
- support efficient, resilient, and reliable connections that support economic activity and move goods to market
- deliver safe, healthy and low-emissions travel that avoids harm to people and the environment
- be multimodal (providing many ways of transportation)
- promote shared modes (like buses and trains) and active modes (like walking and cycling) as the first choice for most daily transport needs
- plan, design, build, maintain, and operate to minimise waste and use resources efficiently
- respond and adapt to disruption and the impacts of climate change
- contribute to the creation of great places
- respect and uphold the mana, taonga, and tikanga of tangata whenua
- minimise environmental impact, protect and enhance biodiversity, and ensure water quality
- enable strong social connections for those who are vulnerable
- ensure communities remain socially, economically, and digitally connected through periods of unplanned disruption.

Aotearoa New Zealand is changing because of many factors

Population

New Zealand's population is growing, ageing, and becoming more diverse. Most growth is expected to happen in urban areas. This will increase travel demand and require new infrastructure and services.

In areas with steady or declining populations, there may be challenges around maintaining existing infrastructure.

Additional transport options will be required to ensure an older, more diverse population can continue to participate fully in society.

Economy

The shift in New Zealand's economy from primary sector (like farming and forestry) to service industries (like health and transport) is expected to continue.

Freight volumes and movements are forecast to increase, with growth driven mostly by the need to service a growing population.

Changes in freight-supply chains, including international shipping and aviation connections, will affect how imports and exports move within the land transport system.

Infrastructure

The cost of maintaining and delivering infrastructure is likely to increase over time. This is because of:

- growing resource scarcity
- increasing network complexity
- growing impacts of climate change.

These challenges will drive innovation in how transport is delivered, but we won't be able to build our way out of every challenge. We'll need to carefully consider where to focus effort and the level of services provided over the long term.

Climate change and carbon reduction

We need to dramatically reduce greenhouse gas emissions and limit climate change as quickly as possible. This will transform our towns and cities, vehicle fleet, freight supply chains, and supporting infrastructure.

Light-vehicle travel in major urban areas will need to be much lower than today. This will fundamentally change how we manage travel demand.

Emission reduction in our economy will mean a shift to a circular economy over the coming decades.¹ A circular economy aims to reduce waste and pollution by using resources for as long as possible. Then materials are recycled or reused at the end of their lifecycle.

This shift could reduce future freight demand because of less primary materials and waste. The land transport system will need to be designed and maintained to support this transition.

We also need to adapt to the impacts of climate change that are already happening. Some communities will need to adjust or move. The location and type of economic activity, particularly primary production like farming, will also likely change.

Severe weather events will occur more often. This will threaten people's safety, disrupt transport services, and affect infrastructure. It will also impact the predictability and reliability of travel routes.

The transport sector will need to work with communities and infrastructure providers to understand the longer-term options for managing climate change impacts. This will mean looking at a different mix of transport options. For example, including more water-based travel as network backup to minimise downtime (redundancy) and system resilience.

Technology

New technology and big data will bring opportunities for land transport users, but also new risks.

Multiple devices, systems, and information will connect customers, operating systems, and physical assets in new ways. This will provide opportunities for new services, business models, and greater integration than ever before.

Technological developments have the potential to improve the efficiency and safety of the transport system.

Digital connectivity will allow customers to choose how they pay for their transportation. This will contribute to a reduced need for ownership of private motor vehicles.

Technological changes will need to be carefully managed to avoid unintended negative effects. For example, if people can't access or afford to connect digitally, they will be at a disadvantage.

Some vehicle technology advances, especially automation and connectivity, have slowed in recent years than previously predicted.

There are also fundamental technological challenges to overcome, like ensuring privacy and security, before we will see more transformational changes to the vehicle fleet.



How we move will be different

Ways of travel

People will be able to tailor transport services to their needs, abilities, and lifestyle.

In towns and cities, people will travel by a range of active and shared ways, or modes, that include:

- micromobility (like walking, cycling, scooters)
- e-mobility (like e-bikes, electric cars)
- public transport (like buses, trains, and ferries)
- shared mobility options (like carsharing, bikesharing).

Rural Aotearoa will also open up to more active and shared modes.

Vehicles

The light and heavy vehicle fleet will change.

Our light vehicle fleet will be smaller, safer, and lower emission. Heavy vehicles, including public transport vehicles, will also be lower in emissions.

Many vehicles will include sophisticated technology to make the system safer and more efficient with greater resilience to disruption.

Inclusivity

The land transport system will be fairer and more inclusive. More affordable and accessible transport options will be available to people of all ages, stages, and abilities.

There will be an emphasis on ensuring rural communities and lower-income households have access to transport options that suit their needs.

As digital and remote access to services increases, the need for physical trips will decrease.

Transport systems

Many parts of the transport system will remain important for moving and connecting people, communities, and freight. These parts include roads, rail, cycleways, footpaths, ports, hubs, and airports. However, the way these transport parts are used and managed will be more efficient.

New Zealand's challenging terrain and relatively long land-based travel times mean aviation (powered by low-emission fuels) will remain critical for longer interregional connections.

Interregional rail can, and will, support shorter passenger trips (one to three hours) between major population centres.

Coastal and rail shipping

Coastal and rail shipping will continue to play a vital role in the movement of goods, with volumes increasing as demand grows (depending on commodity).

Freight ports and hubs will enable swift transfer and integration between transport modes.

Urban freight

Urban freight will be delivered in many ways, like footpath robots, cargo e-bikes, and automated trucks.

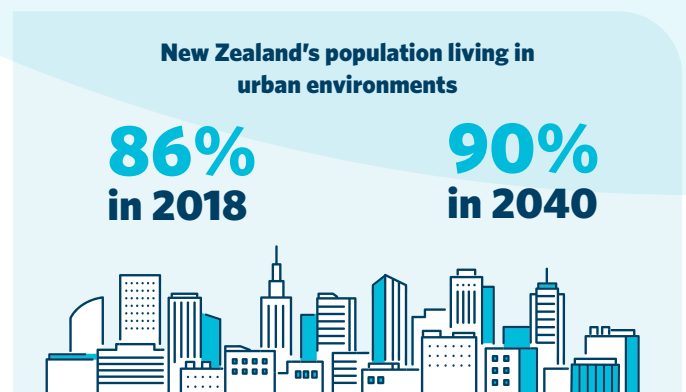
Short-haul air travel, including drones, may be used to transport high-value, time-critical goods. These movements may be overseen by freight hubs using digital connectivity, embedded sensors, and artificial intelligence.

Our towns and cities will continue to evolve

Urban population

The trend towards people moving to cities, known as urbanisation, is projected to continue.

In 2018, 86% of New Zealanders lived in urban centres.² This is projected to increase to over 90% by 2040.³



Mixed-use development

Our towns and cities will be more compact and mixed used. This means people can learn, work, and play closer to where they choose to live. This kind of development will:

- make better use of existing and new transport networks and services
- support more active and shared transport choices
- reduce trip lengths for all modes.

Transport networks

The future transport system will be integrated with land-use and urban form. This will support social, economic, and environmental wellbeing and resilience.

For example, transport networks will be actively managed in real-time. This will keep people safe as well as ensure efficient and reliable movement of people and freight.

How the system is maintained, operated, and developed will be different

Maintenance and operation

Maintenance and operation of the land transport system impacts peoples' level of access and safety. It also affects how efficiently freight is moved, levels of service, and resilience.

The land transport system will include sophisticated vehicle technology, integrated with digital and physical infrastructure. This will provide real-time management and monitoring for:

- efficient supply chains
- safe travel for people and freight
- reduced exposure to disruption.

Transport and electricity systems will be more interconnected with the roll out of charging networks for low-emission vehicles across Aotearoa.

Travel demand management, like pricing for transport use, will play a role in incentivising people and business to make informed choices about travel.

Real-time data and modelling will assess network conditions for greater system efficiency, sequencing, and improvements.

Development

Investment decisions will focus options that deliver the lowest whole-of-life costs. This means we will plan and invest to make networks more resilient and durable, like ensuring footpaths can cope with future users, such as mobility scooters, and weather events.

We'll aim for low emissions in the construction, maintenance, and operation of physical infrastructure.

We'll adopt a circular economy approach to make best use and re-use of resources. Safe-system principles will be embedded into the design and delivery.

The interaction between the land transport system and environment will be managed to protect and enhance biodiversity and water quality. Nature-based solutions will be used to adapt to climate change.

Our ways of working will be different

Collaboration

There will be consideration and collaboration across the transport sector, including spatial planning. This will allow integrated solutions while supporting broader government and community priorities.

Te Ao Māori, and strong enduring relationships with Māori, will be embedded in work practices and be part of all land transport activities. Māori will have a role in guiding strategic decision making for the transport system.

As the nature of climate change is better understood, the transport sector will work with communities to plan when to defend, accommodate, and retreat from the impacts.

Planning, management, and responses

The transport sector will actively manage uncertainty in a rapidly changing world. We monitor trends, plan, and prioritise responses that deliver value in many ways.

Thirty-year system plans are developed, adapted, and maintained collaboratively across the sector. These plans:

- guide where effort is prioritised
- ensure we are focused on the most important issues
- help us apply efficient and effective responses.

The way solutions are developed and assessed will avoid unnecessary work, yet still provide assurance and confidence that public money is being used wisely.

Solutions that cost less and are most effective will be used more often than major investment. This includes planning, demand management, and making the most of existing infrastructure.

Funding

Funding models will be different. A variety of revenue streams and pricing models across a range of funds (user paid, public, and private investment) will pay for the maintenance, operation, and improvement of the transport system in an integrated way.

Information and technology

Business information and practices will be digital and integrated with our partners, supply chains, and service providers. Transport information is clear and informs system governance and public accountability.

Demand for transport modes is captured in real time from many information sources, like data from vehicle systems and smart devices.

Real-time information capture and predictive analytics automate and enhance:

- operations
- planning
- transactional processes
- return on investment.

This data will inform better timing and targeting of maintenance and improvements.

New technology and other innovations are routinely trialled and adopted when beneficial. Performance-based regulation will allow flexibility and innovation, while maintaining safety and environmental standards.

Regulatory oversight of the system will become real-time and preventative.

Artificial Intelligence-assisted monitoring will provide information on traffic, vehicle issues, and unsafe practices. The regulator will be able to respond quickly to emerging risks and prevent harm before it occurs.



Drivers for future change

There are six key external factors, or drivers, that will shape and change the future land transport system: demographic change, changing economic structure, climate change, technology and data, funding and financing challenges, and changing travel patterns.

While we cannot predict the future, we can monitor these drivers and identify emerging trends that will affect the choices and trade-offs we need to make.



Demographic change

Population growth is a fundamental driver of transport challenges and opportunities.

A growing population means more people who need to get to places that matter to them, like work, education, and entertainment. It also means more goods need to be moved to these growing locations.

Business activity will ramp up to serve this rising population, resulting in more business travel.

Between 2006 and 2018, New Zealand's population grew by more than 750,000 people.⁴ This was mostly because of people moving from overseas.

From June 2021, population estimates show a lower growth rate in all regions than the previous year.⁵

International travel restrictions because of COVID-19 are a key reason for this, with lower rates of overseas migration, especially in travel-dependent industries like education.

COVID-19 border closures have slowed immigration.⁶ Despite this, New Zealand's population is still projected to rise from 5 million to 6.2 million by 2048.⁷

The location of population growth has also shifted in recent years. Since 2020, towns close to major cities have gained the most people.

Population growth in many major cities has slowed considerably, and even declined in places like Tāmaki Makaurau Auckland.

These changes seem related to changing work patterns during COVID-19 lockdowns. Remote working has allowed greater flexibility about where people choose to live and work.

It's uncertain if these patterns will continue over the medium- to long-term. We will monitor trends to understand whether the scale and location of population growth returns to pre-COVID-19 levels.

Growth factors

Immigration is projected to be the largest factor for population growth over the next 25 years.

The difference between births and deaths, also known as natural increase, has accounted for most population growth in the past.

However, from 2006 to 2018, there was a shift in population growth, as the difference between arrivals and departures, also known as net migration, rose in all regions except Te Tai o Poutini West Coast. This trend is projected to continue through to 2048.⁸

This means that population growth is largely because of immigration to Aotearoa New Zealand and people living longer.

Population concentration

Populations moving to cities, known as urbanisation, is a long-standing contributor to demographic change.

In 2018, 86% of New Zealand's population lived in urban environments.⁹ This is projected to exceed 90% by 2040.¹⁰

While COVID-19 impacted recent population growth patterns, long-term growth is expected in urban areas, particularly the Upper North Island.

Of the 1.3 million additional people expected to join the New Zealand population by 2048, 74% will be in Te Tai Tokerau Northland, Tāmaki Makaurau Auckland, Waikato, and Te Moana a Toi-te-Huatahi Bay of Plenty.¹¹

This growth will put pressure on transport networks across the Upper North Island, including freight movement around ports in Tauranga and Tāmaki Makaurau.

Projected population trends in smaller rural and remote areas

The number of people living in smaller, rural, and remote districts outside of urban areas will decline or remain the same.¹² This includes places like Waitomo, Ruapehu, Kawatiri Buller, Māwhera Greymouth, Te Waipounamu Westland, and Maruawai Gore.

The land transport system will play a critical role in supporting the economic and social wellbeing of these communities.

The changing age profile

The age of people who live in Aotearoa New Zealand impacts the transport network. Age can impact where people travel and the choices they have to get around.

People aged 25 to 65 years travel the most, about seven and eight and a half hours per week.¹³ Most travel is done by driving a car or van.

People under 15 and over 75 years spend significantly less time travelling. They are more likely to move on foot, or as a passenger in a car or van.

New Zealand's population is growing older and living longer, because of better healthcare and declining birth rates.

By 2048, the percentage of people over 65 years in some areas is projected to exceed 35%.¹⁴ This includes Kaipara, Thames-Coromandel, Hauraki, Horowhenua, Kāpiti, Carterton, South Wairarapa, Te Tai o Aorere Tasman and Central Otago.

Moving around cities and towns will need to be safe and easy for young people, people with children, and seniors.

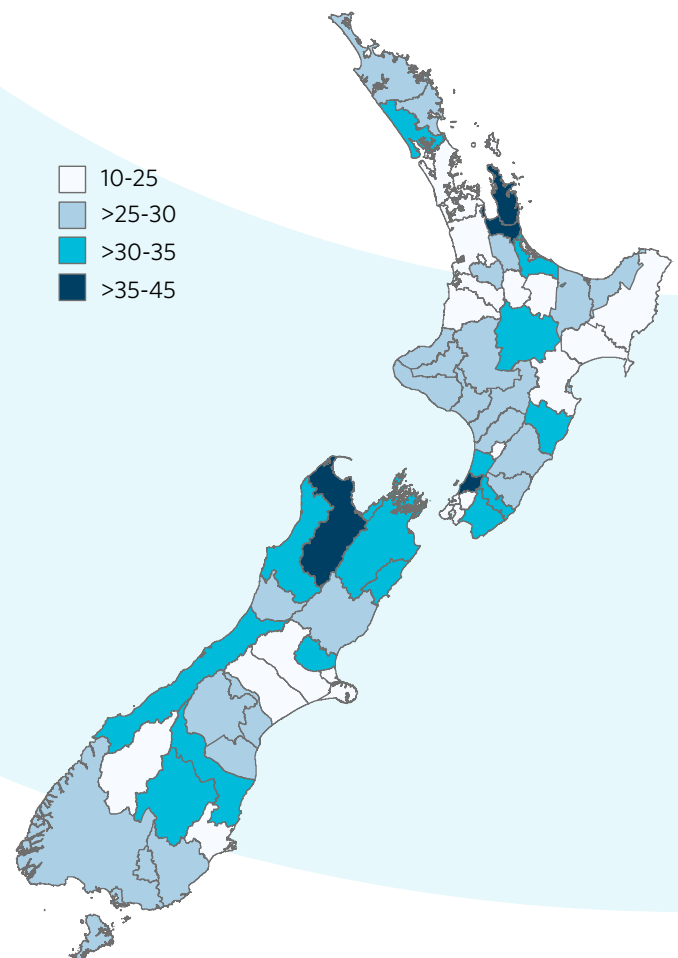
It will be important to ensure reliable and accessible transport options, well-maintained footpaths and road crossings, and safe speeds for vehicles.

New transport options could create both opportunities and risks.

For example, on-demand services could provide increased accessibility and choice for people who don't have a license or access to a vehicle. However, more micromobility options, like scooters and bicycles, could increase risks for people who choose to walk.

Projected percentage of people over 65 in 2043 by territorial authority (Map Data Source: Stats NZ)

Figure 01





Changing economic structure

The economy is shaped by, and shapes, our land transport system. Economic changes impact:

- where and how many people are employed
- wages
- consumer demand
- prices of raw materials
- imports and exports.

Higher income growth often means higher consumer spending. This leads to increased business spending and demand for goods and services.

The performance of the land transport system can affect how easily businesses can deliver goods and services to market. It also affects how consumers access those goods and services.

Tourism directly impacts travel demand because of the movement of people at key entry points (like airports), and between major visitor centres and attractions.

Urban centres in Aotearoa face challenges of social deprivation in certain communities. This includes lower rates of employment, lower incomes, and less access to essential services.

Across Aotearoa, there are opportunities to:

- build a more inclusive economy
- lift productivity
- build economic diversity.

This can be done by identifying and addressing the constraints in each area. Then opportunities for growth can be pursued based on existing, adjacent, or new activities.

Over recent years, service industries have contributed more to New Zealand's economy than primary industries and manufacturing.¹⁵

Economic growth has been focused in large urban areas, especially Tāmaki Makaurau Auckland. More people are moving to cities, many from overseas, and there has been intense city development.

Urban growth and changing industries result in increased business travel and freight movement. This trend is expected to continue over the next 10 to 30 years.

Urban growth and changing industries result in increased travel for business travel and freight movement. This trend is expected to continue over the next 10-30 years.

Border closures because of COVID-19 hit international tourism hard and disrupted freight and industry supply chains.

However, New Zealand's economy has continued to prove resilient, with gross domestic product now exceeding pre-pandemic forecasts.¹⁶

The number of international visitors and workers entering New Zealand is expected to recover as border restrictions ease. Yet there is uncertainty about the timing and scale of recovery, including whether it will return to pre-COVID-19 levels.

Impact of climate change on our economy

Climate change is already being felt across New Zealand's primary industry sectors.¹⁷

All regions have experienced extreme weather events, such as flooding and drought. The severity and frequency of these events are expected to grow.

Over the coming decades, parts of the country will become wetter, or drier and warmer. This may lead to changes in the nature and location of primary production. It may also affect businesses and freight that support the primary sector.

Aotearoa is expected to move to a circular economy over the coming decades.¹⁸

A circular economy would mean:

- lower usage of primary materials
- significantly reduced levels of waste
- less freight movement.

It's important to make sure the transition to a low-emissions economy is just, fair, and inclusive for all New Zealanders.¹⁹



Tangata whenua are especially vulnerable to the effects of climate change.²⁰ There are particular risks and opportunities for the Māori economy, particularly because of asset dominance in natural resource-based sectors.

We know during previous recessions and COVID-19 lockdowns there was a greater impact on Māori.

Significant growth in Te Ōhanga Māori (the Māori economy) is set to continue. This will be seen in the proportion of Māori in the labour force, as well as a diversified asset base of Māori employers, entities, and self-employed Māori.



Climate change

Climate change is already impacting the land transport system and will continue to do so for decades to come.

Transport is one the largest sources of greenhouse gas (GHG) emissions in Aotearoa. Emissions must be reduced to net-zero targets by 2050.

At the same time, the transport system will have to adapt to escalating impacts from climate change. This includes sea level rise as well as increasingly severe and frequent climate-related events like storms, droughts, and wild fires.

Climate change must be part of all decision making, ensuring the infrastructure and services we provide are:

- resilient to climate change
- enable emissions reductions
- continue to support the needs of New Zealanders.

Reducing greenhouse gas (GHG) emissions

Transport is responsible for 17% of New Zealand's gross emissions, and 39% of total domestic CO₂ emissions.²¹

We need to greatly decarbonise transport to reach net-zero emissions by 2050 and support global efforts to limit warming to 1.5°C above pre-industrial levels. Urgent action and system-wide changes are needed to put our transport emissions on the path to a low-emissions future.

The *Emissions Reduction Plan* identifies three focus areas for reducing transport emissions:

- reduce reliance on cars and support people to walk, cycle and use public transport
- rapidly adopt low-emissions vehicles
- begin work to decarbonise heavy transport and freight.²²

Delivering on the emissions and vehicle kilometres travelled (VKT) reduction targets is a huge challenge. It will require a transformation in urban travel choices and the vehicles we travel in.

However, achieving these targets will also have benefits. For example, it will deliver better transport for everyone in Aotearoa New Zealand. It also contributes to more vibrant, resilient, prosperous places to live, work and visit – and will reduce our reliance on unstable global energy markets.

Efforts to reduce emissions and VKT will affect a range of other transport challenges. For example, historical trends of population growth that drive increased transport demand won't be as relevant if we reduce light vehicle VKT. This means other transport modes will play a much greater role. This has implications for urban form, road space allocation, and network prioritisation.

The impacts of climate change on people in New Zealand

Severe weather events in Aotearoa New Zealand are already having significant impacts on the land transport system.²³

In January 2023, flooding, landslips, and storm damage meant road closures in Te Tai Tokerau Northland, Tāmaki Makaurau Auckland, and Waikato.

A month later in February 2023, flooding and landslips caused by Cyclone Gabrielle meant closures to road and railway lines in Te Tai Tokerau Northland, Tāmaki Makaurau, Waikato, Tairāwhiti Gisborne and Te Matau-a-Māui Hawke's Bay.²⁴

The impacts of climate change will continue for decades, even with aggressive strategies to reduce greenhouse gas emissions.

Changing weather patterns will continue to increase the frequency and severity of flood events and landslips. This will affect communities and the transport networks that connect them.

Most people in New Zealand live near water. Many are within a few kilometres of the coast, or next to rivers and lakes.

From 1901 to 2010, global sea levels rose an average of 19cm total.²⁵ Between 1990 to 2016, global sea levels rose an average of 3.4mm per year.²⁶

Rising sea levels won't be felt evenly around Aotearoa. Impacts will vary depending on a range of factors like topography, coastal processes, and vertical-land movement.

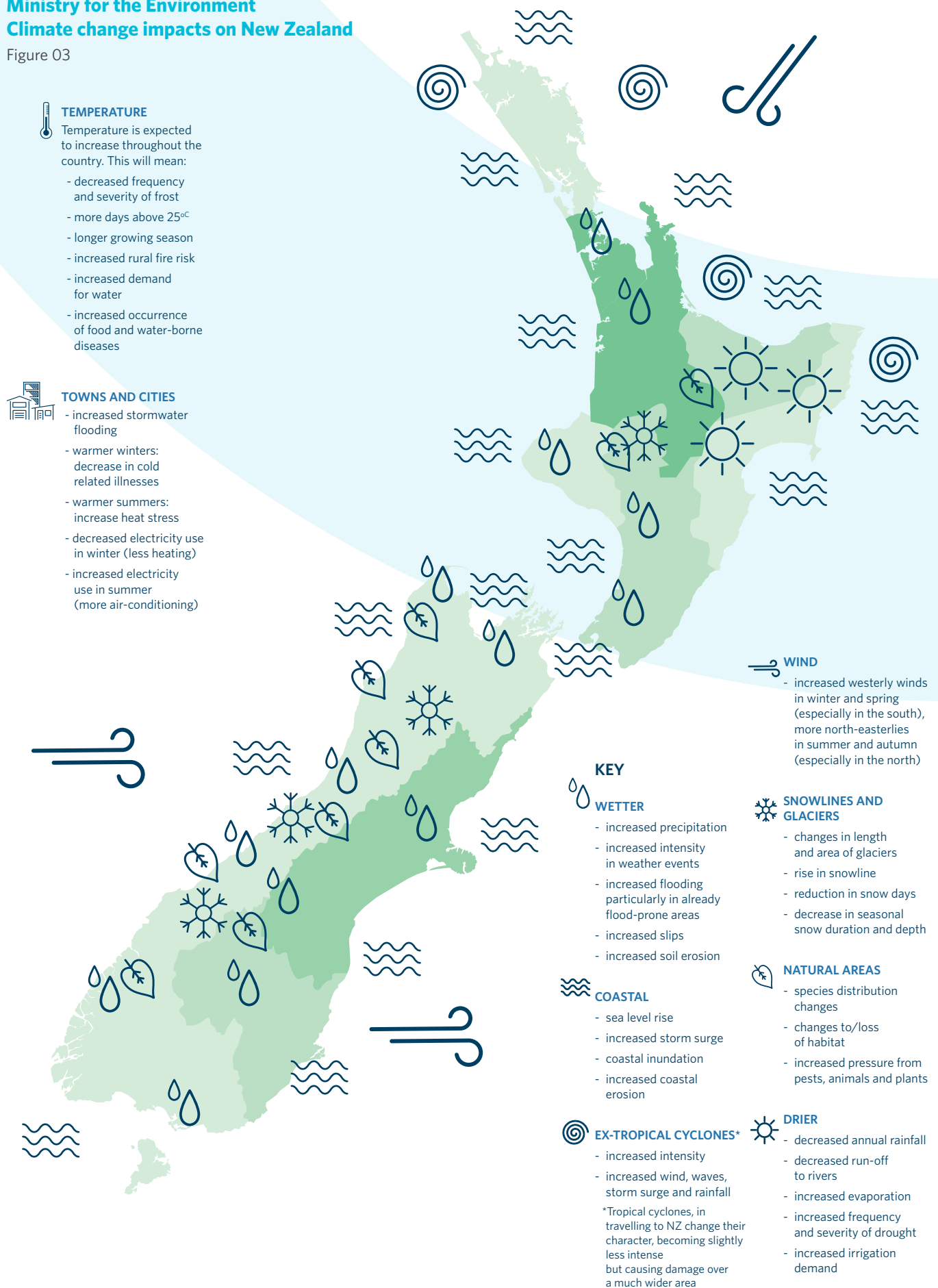
The most affected coastal areas will experience sea level rise of 30cm in 10 to 20 years, and one metre by 2060.

Rising sea levels mean tides, waves, storm surges and elevated groundwater will reach further inland. This will cause more frequent and extensive flooding in many low-lying areas.

Coastal communities and routes will be impacted by increased erosion and receding shorelines.

Ministry for the Environment Climate change impacts on New Zealand

Figure 03



Hotter temperatures and wildfires can damage transport infrastructure, causing buckled railway lines and damaged roads.

Rural and coastal communities may become increasingly isolated as:

- infrastructure damages become more frequent
- service outages last longer
- repair costs increase.

Residents in these communities may have trouble accessing essential services such as health facilities, fuel, groceries, and emergency assistance. It might be difficult for businesses to access freight services as well as cater for tourism and recreational visitors. Many Māori communities in rural and coastal areas will be disproportionately impacted by these changes.²⁷

In urban areas, the impacts of climate change on multi-modal networks can be complex, widespread, and cascade across the land transport system. The closure of main roads because of weather events can lead to delays and congestion, which can spread if traffic shifts to alternative routes. Extreme weather can cause delays and cancellations of public transport, affecting its reliability and comfort for users. Disruption to transport can prevent access to other critical infrastructure in need of repair, such as power, water, or telecommunications.²⁸

On major transport corridors, the need for maintenance and renewal is likely to increase; this may result in further delays and costs diverted from other investments.

The risk of a major disruption will increase for interregional connections, and the economic and social interactions that rely on them. Freight detours and delays will have significant economic impacts, especially if these continue for a long time. Backlogs at airports, seaports, and freight hubs could impact the movement of exports and imports and disrupt supply chains. This could lead to product shortages for consumers or lost income for producers.²⁹

There are many uncertainties regarding the future impacts of climate change. We will monitor international efforts to reduce emissions and limit global warming.

Analysis of the potential impacts of climate change will also need ongoing work and updates for future planning and decision making.

Adapting to the impact of climate change will require refocused effort. This means not just building back what's there now following disruption but having a stronger eye to the future. This will require working with communities to find new ways forward and developing plans for when to defend, accommodate, and/or retreat.



Technology and data

Technological advances are changing how the transport system is used and managed.

New platforms, services and providers are changing how we regulate and manage access to the land transport network.

These are also allowing risk-based and intelligence-led regulation. This may lessen compliance costs for regulators and system users.

An individual's ability to access technology and data is also growing. This offers opportunities to tailor individual solutions and provide high-quality information in real time.

Mobile phone use and technology

A rise in mobile phone use has allowed new transport technology. From 2020–2021, there were 5.8 million mobile phone connections in New Zealand, more than one phone per person.³⁰

However, around 10% of households don't have access to a mobile phone.³¹ These are mostly older and poorer households.³²

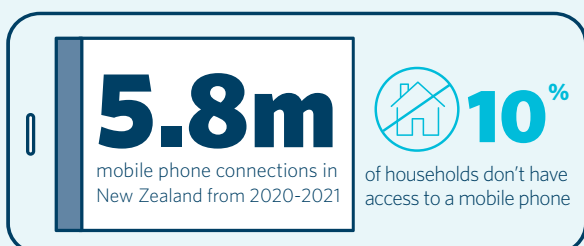
Big data from mobile devices, machine learning (machines that can learn without direct instructions), and artificial intelligence can help:

- make the most of existing networks
- provide real-time travel information
- manage unplanned incidents
- help maintain, operate, and improve the network.

Emerging technologies and transport

Some emerging technologies have the potential to transform our land transport system over the coming decade. These include:

- mobility as a service
- on-demand transport
- connected vehicle technologies
- automated vehicles.



Mobility as a service

Mobility as a service is usually enabled by a phone app. It brings together tailored travel options that allows a person to plan, book, and pay for an end-to-end journey. Options could include one or more types of transport, including:

- public transport
- on-demand transport
- ridesharing
- walking
- cycling
- micromobility (like e-bikes and scooters).

Connected vehicle technologies

Connected vehicle technologies allow vehicles to communicate with:

- other vehicles
- infrastructure
- road users.

As use of this technology increases, there is potential to integrate it with network management. This, in turn, may deliver benefits for both road safety and ensures we get the most from the existing network.

Automated vehicles

Automated vehicles have in-vehicle technologies and sensors that scan and navigate a vehicle's way as it is driving. This includes artificial intelligence and remote sensing methods like cameras and light detection and ranging (LIDAR).

Different levels of automation are possible, from adaptive cruise control to full automation.

Full automation means the vehicle can drive under all road and environmental conditions. Automation has the potential to deliver benefits for road safety.

Other forms of automated vehicles could also have an important role in freight movement and low-cost urban public transport.

The development and release of fully automated vehicle technology in recent years has been much slower than predicted. The timeframe for this technology remains highly uncertain.

Progress in automated freight and passenger services is developing faster because it is simpler to deploy.

More detailed information about technology and data, including in-depth background on the emerging technologies, is contained in *Arataki – Our 10-Year Plan: Technology and Data Background*.³³

Data and transport planning and management

Good data is essential for effective transport planning and management.

Over the coming decade, massive data growth is expected because of the decreasing costs of smartphones, signals, and sensors. The transport sector will not only use data, but it will also generate it.

Advanced analytics will help identify the most efficient travel routes and modes. Remote sensors, including those on vehicles, can reduce crash risk. They do this by analysing complex data to identify what contributes to crashes. They can also identify where preventative maintenance to road networks is needed.

Transport agencies and network operators will need to understand and invest in computing and data management infrastructure. This will allow them to collect, analyse, and gain helpful insights from data.

They will also need to transmit real-time information back to users of the transport networks. Governance and management of data will be important to ensure the security and privacy of individuals.

Using digital models to improve transport efficiency

Through digital engineering, it's possible to create fully detailed, data-rich, virtual models of everything we survey, design, and create across the land transport system. These virtual models are known as digital twins.

Analysing digital twins help the transport and construction sectors become more efficient by enabling:

- real-time asset and network management
- end-to-end digital lifecycle management
- resource optimisation.

Data use and analysis will unlock benefits for:

- construction
- operations and maintenance
- supply chain improvements
- system resilience
- productivity of investment
- network optimisation.

Insights from data analysis tools, like artificial intelligence (AI) and machine learning, will help us make better decisions. They'll improve many areas of transport, from long-term forecasting through to traffic signal operations.

Technology is evolving fast

It's difficult to predict which technologies and business models will emerge beyond the coming decade and how they might impact the land transport system.

It will be important to use foresight techniques and approaches, such as horizon scanning, to identify what might happen and share this information in a timely way.

This will help us:

- understand how the needs of the people who use transport could change
- identify the opportunities or risks for the land transport system
- respond appropriately.

Accessibility to new technologies

The land transport system will need to ensure people with less access to digital technologies are still able to use transport networks to get to education, employment, and essential services.

For example, people who can't access the internet or make electronic payments will need to be considered when designing and implementing transport services.

The land transport system will need to ensure there are enough workers with the right skills to develop, maintain, and operate new technologies.



Funding and financing challenges

It's getting more expensive for central and local government to pay for critical activities like maintaining and renewing infrastructure assets, and managing the impacts of climate change.

The costs of building infrastructure have grown faster than in other sectors because of increasing:

- property values
- costs of material and labour
- complexity of projects and costly consenting processes.³⁴

The level of land transport funding available to central and local government will also come under pressure unless action is taken.

Over time, usual funding sources, like fuel excise duty (FED) and road user charges (RUC), will lose value and be stretched because of competing demands.

Changes to transport funding are already happening.

Government funding for land transport comes from a variety of sources beyond the National Land Transport Fund.

These include:

- previously committed Crown investment in the New Zealand Upgrade Programme
- urban development funds through Kāinga Ora
- the Climate Emergency Response Fund (CERF).

As Aotearoa moves towards emissions-reduction goals, traditional revenue sources, like fuel excise duty, will decrease per vehicle kilometres travelled. Yet demands on the network will remain.

Some districts face funding pressures because of population decline. These areas often have ageing populations on fixed incomes that can't afford significant rates increases.

Local government faces significant challenges that place pressure on available funding. For example, funding for the land transport system may be tight in coming years as the sector faces significant investment in other projects like three waters (drinking water, wastewater, and stormwater).

Some infrastructure dates to historical periods like the 1930's depression, when there was increased public spending to boost the economy.

Funding to replace older infrastructure assets can be challenging because of new cost factors. For example, planners must consider the impacts of climate change.

Many large cities have committed large-sum investment in new infrastructure to accommodate population growth. However, revenue hasn't kept pace with debt. This means many cities have nearly reached their debt ceiling, putting further strain on investment.

In the future, we'll need to look at the full range of funding and financing options to support a sustainable revenue system for local and central government.

As funding sources for the transport system become more varied, it will be important to provide a clear view about the most important issues.

In the future, we'll need to look at the full range of funding and financing options to support a sustainable revenue system for local and central government.



Changing travel patterns and preferences

How people travel is shaped by a wide range of factors like the:

- layout of rural areas, towns, and cities
- quality of options available
- individual needs and circumstances.

While these factors usually take a long time to change, technological development and major disruption can have a surprisingly dramatic effect on travel.

During the COVID-19 pandemic, public transport use decreased significantly as businesses encouraged flexible-working arrangements. As the country recovers from the pandemic, it appears these new patterns are here to stay.

Other shifts in travel patterns are happening and are expected to continue over time.

Major changes to planning controls are underway to support urban intensification around town centres and public transport hubs. As more people live in areas with good travel options and shorter trip lengths, they are likely to use public transport and active modes more often.

Technological advances are creating new transport options, such as e-scooters and e-bikes. Use of these modes is likely to grow as they allow longer faster journeys with less physical effort. E-bikes have the potential to carry more cargo than regular bicycles.

These transport options will need their own infrastructure, networks, and facilities, like secure end-of-trip parking and storage. They also need new legislation, like regulating the power and speed of e-bikes.

Online shopping is on the rise. This means fewer trips by buyers, but increased deliveries. This will continue to change travel patterns and require planning, like development of freight-management strategies.

Electric vehicle ownership is likely to increase, as vehicle range and services improve. This will require development of new fuelling networks across the country.

Impact of future drivers of change on Māori

Demographic change

The proportion of people identifying with Māori ethnicity is projected to grow in all 16 regions between 2018 and 2043.³⁵

In 2018, the Māori population was 17% of New Zealand's population, ranging from 54% of the population in Tairāwhiti Gisborne to 9% in Te Tai o Aorere Tasman and Ōtākou Otago.³⁶ That share is projected to increase to 21% nationally by 2043, ranging from 69% in Tairāwhiti to 12% in Te Tai o Aorere and Ōtākou.³⁷

The Māori population has relatively high proportions of tamariki and rangatahi, and a lower proportion of kaumatua. These different age groups and higher birth rates mean faster growth for the Māori population as compared with the total population.³⁸



Climate change

Māori as tangata whenua are particularly sensitive to climate impacts on the natural environment for social, economic, cultural, and spiritual reasons.³⁹

Many Māori communities are in rural and remote locations. These areas are particularly vulnerable to the effects of climate change on homes and infrastructure.

Changing climate also threatens sites of cultural significance like marae, urupā (burial grounds), wāhi tapu (sacred sites) and mahinga kai (food gathering sites).⁴⁰

Many Māori depend on primary industries for their livelihoods. In some places, climate change may alter patterns of use of mahinga kai (food-gathering sites) or rongoā crops (medicinal plants). Coastal impacts could disrupt access to marae or wāhi tapu.⁴¹

Impacts on Māori and wider economy could limit whānau access to:

- food
- electricity
- housing
- health services.⁴²

These limitations could compound existing inequalities of Māori wealth and wellbeing.⁴³

The socio-economic disparities between Māori and non-Māori communities mean sensitivity to climate change impacts and risks are higher for Māori society.⁴⁴

Many Māori communities are in coastal regions and adjacent to rivers. This means access roads to marae are often exposed to flooding, landslides, and coastal processes, like changing sea levels. Damage to the transport network could cut off marae and wider Māori communities more frequently.⁴⁵

Further evidence is needed to understand the:

- scale of the issue
- locations where impacts could be greater for Māori than other groups
- different possible responses required.

Changing economic structure

Māori are re-emerging to play a prominent role in the economy. Te Ōhanga Māori (the Māori economy) is key to the wellbeing of Māori and is a significant and important contributor to the wider economy of Aotearoa.

There has been significant growth in the Māori population and labour force (currently 300,000), that is projected to continue.⁴⁶ Māori will be a higher proportion of the future workforce, because of the higher proportion of tamariki and rangatahi.⁴⁷

In 2018, the increasingly diverse Māori asset base was estimated at \$68.7 billion.⁴⁸ The previous concentration of Te Ōhanga Māori in the primary sector has dispersed, spreading risk and increasing resilience.⁴⁹

Yet, the primary sectors continue to dominate Te Ōhanga Māori in agriculture, fishing, and forestry. This also includes sheep and beef farming, dairy farming, forestry, fishing and aquaculture, and other agriculture (including horticulture).⁵⁰

Given the dominance in the primary sectors, there are particular risks and opportunities for Te Ōhanga Māori as Aotearoa transitions to a low-emissions economy.



Impact of future drivers of change on freight

Many changes will influence freight and demand over the next 30 years including:

- population growth
- customer desires
- climate
- economic structure.

Funding and financing may be challenged by climate change. Safety concerns may be improved by technology and data. These changes may also affect the different ways for transporting freight.

Demographic change

Urban freight is expected to grow because of increasing:

- population
- demand for mixed-use neighbourhoods
- consumer expectations for more and faster deliveries.

More demand for urban freight may create increased congestion and emissions in cities. It may also present challenges for freight operations around their first-and-last-mile delivery routes.

Changing travel preferences

Increased online shopping and home delivery create a significant amount of traffic in cities.⁵¹ This trend shows no sign of slowing.

Freight vehicles often take up more space than cars and require areas to load and unload.⁵² This creates competition with private passenger vehicles for kerbside parking.

Freight carried along key urban corridors often causes noise or vibration. These could worsen as urban freight demand grows over time.

Increased demand for micro-freight, like low-powered electric vehicles and cargo bikes, might solve some freight challenges in urban areas.

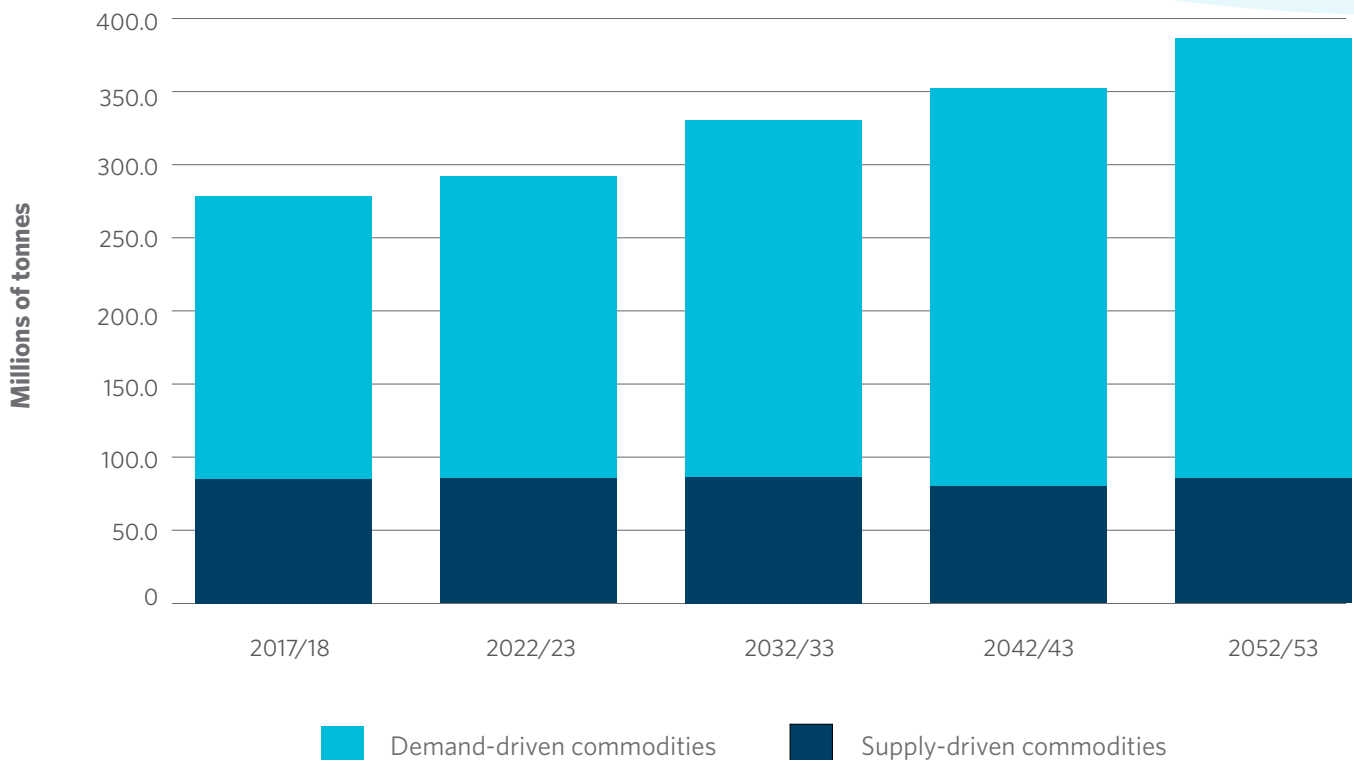
Future freight demand

Total freight volume is expected to increase 18% by 2033 and 39% by 2053.⁵³

Freight will be dominated by demand-driven commodities (like timber and coal), because of economic and population growth.⁵⁴ The volume of these commodities is expected to increase 26% by 2033 and 56% by 2053.⁵⁵

Estimates and forecasts of supply-driven and demand-driven commodities

Figure 04



Climate change

Climate change will reduce production quality and quantity across primary industries like horticulture, viticulture, agriculture, and forestry.⁵⁶

The amount of suitable land for primary industries will decrease as sea levels rise and low-lying coastal areas are affected by inundation and groundwater salinisation.

The volume of freight of supply-driven primary industries, like dairy and meat, is forecast to grow less than 2% by 2033 and 0.4% by 2053.⁵⁷

This will be driven by horticulture and a small cyclical peak in forestry. Other primary industries could face limitations on production or supply.

National freight and supply chain strategy

Government policies that encourage a mode shift from road to rail and coastal shipping could increase the need for intermodal freight terminals in New Zealand. Intermodal freight terminals can:

- provide efficient and effective transfers of freight between different modes
- improve productivity
- reduce negative effects from the movement of freight.

Te Manatū Waka is developing a *National Freight and Supply Chain Strategy*. This 30-year view will outline what government and industry want the freight and supply-chain systems to achieve, pathways and priority actions, and how government and industry will work together.⁵⁸

The strategy will inform investment decisions by central and local government. It will address key drivers for change like decarbonisation, resilience, productivity, innovation, equity, and safety.

Technology and data

New developments in technology and data will help businesses manage safety risks associated with freight movement. These include increasing vehicle automation and connected-vehicle technologies.⁵⁹

Autonomous vehicles scan and navigate their way as they are driving. As human error is involved in 90% of fatal and serious injury crashes, automated vehicles may offer the greatest improvement to road safety.⁶⁰

Connected vehicles can help with safety, like alerting drivers to cyclists or pedestrians, and vice versa. They also provide real-time information about weather and road conditions.⁶¹

Potential relocation of Ports of Auckland Ltd (POAL)

A key uncertainty over the next 10 to 15 years is the potential relocation of New Zealand's primary import gateway, Ports of Auckland Limited (POAL).

POAL's current downtown Auckland location in Tāmaki Makaurau has a capacity of about 30 years. There is a 10- to 15-year window to make a final decision on relocation.⁶²



New developments in technology and data will help businesses manage safety risks associated with freight movement.



Our challenges and opportunities

Inclusive access

The transport system should be accessible by all people in New Zealand, regardless of disability, income, age, gender, sexuality, and ethnicity.

Access describes how easy it is for people to get the things they need and want. This is shaped by personal capabilities, cost, safety, travel options, and time.

Access is high when people can take advantage of many social and economic opportunities within a short amount of time and at an affordable cost.

Access across the land transport system isn't as inclusive as we would like. Some areas aren't tracking in the right direction.

Households are spending a higher proportion of their budgets on transport. Lower-emission transport options are not available for everyone. Public transport services are not a viable alternative for everyone because of coverage or frequency.

There is no agreed strategy or plan to support inclusive access. The land transport system is at the start of the process for delivering on this outcome.

However, government has set clear direction through the *Emissions Reduction Plan* to establish a need for a fair transition. *Arataki* focuses on the parts that support inclusive outcomes.

Why is this important?

The transport system in our towns, cities and regions should help make these great places to live. It should connect people to opportunities, no matter what their circumstances.

Yet, current transport often relies on private vehicle use. This limits the ability of some people to easily access opportunities to employment, education, and social, and cultural activities.

A transformational shift away from private vehicle travel will require offering safe, reliable, appropriate alternatives that are accessible to everyone. These alternatives are not currently in place in most parts of New Zealand.

For example, we need to better understand the travel preferences of women, young people, and certain ethnic groups, who still feel wary about using public transport and active modes, like walking.

Those on low incomes or in rural, isolated areas have fewer transport choices. The current offerings available may be different than what these groups want or need.

Access, timeliness, and affordability are barriers that need to be addressed.

What are we currently doing about this outcome?

Continue to partner with other agencies to deliver good urban form

Waka Kotahi supports, enables, and encourages quality, mixed-use, compact urban development that efficiently uses land, reduces travel distances, and lowers reliance on private vehicles.⁶³

Waka Kotahi partners with other agencies to play our part to deliver good urban form. We do this by:

- leading operational land transport planning with local urban development so decision making supports consistent land use and transport
- working with partner agencies to support ongoing integration between transport and urban development decision making, from long-term strategy through to delivery
- including investment conditions in urban development packages to allow prioritised, sequenced, and integrated activity.

As part of the Urban Growth Agenda, government is partnering on spatial-planning initiatives in the fastest growing urban centres: Tāmaki Makaurau Auckland, Kirikiriroa Hamilton, Tauranga, Te Upoko o te Ika a Māui Greater Wellington, Ōtautahi Christchurch, and Tāhuna Queenstown.

Waka Kotahi has an active role in these spatial-planning partnerships, which include the development of significant transport programmes in our cities.

Through spatial planning, we aim for well-planned and managed urban growth that improves environmental outcomes for existing communities.

Spatial planning should support improved travel choices, more affordable housing, and better access to jobs. This work recognises the importance of integrating land-use and transport planning.

Continue to encourage the use of public transport and active modes

Public transport is a key enabler of inclusive access.

Yet, public transport is not accessible across the country and for different groups.

Offering more public transport options in more places will improve access and affordability.

Active modes, like walking and cycling, help people make short local trips without a vehicle. Longer trips to work and education are also possible with high-quality networks.

The Community Connect Programme makes public transport more affordable and accessible. It offers a 50% concession on public transport services for community services cardholders.

Support access for a range of groups

There are challenges for accessing transport across a range of groups. Inclusive access to transport should be our end goal by providing accessible, affordable, and available transport for everyone.

There are access issues for a range of groups, including low-income people, those with mobility issues, new migrants, and Māori.

Some programmes have been developed, including the Total Mobility Scheme, that support people who can't use public transport to travel all or some of the time.⁶⁴

However, there is still more that can be done. This includes:

- providing more frequent public transport services to areas of need
- improving accessibility for wheelchair users and vision impaired
- ensuring low-emissions options are available for all groups
- supporting people to get driver licences
- improving access to safer vehicles.

Encourage licencing and safer driving

Access to driver licencing training is not consistent across Aotearoa. In many rural areas, there are no options for people to access testing services.

Not being able to legally drive means access to opportunities and jobs is restricted. This encourages people to drive without licences, putting themselves and other road users at risk, and potentially risking fines and infringement notices.

Some programmes encourage rural licensing and driver training.⁶⁵ For example, the Youth Driver Licence Scheme helps young people access free training and tests.⁶⁶



Helping young people become licensed also supports the vision of zero deaths and serious injuries on New Zealand roads.

This is particularly meaningful because young drivers between 15 and 19 who never held a licence were involved in 150 fatal or serious injury crashes from 2013 to 2017.⁶⁷

Access to safer and cleaner vehicles

Aotearoa has an older vehicle fleet compared to many other countries, and it's getting older.

Lower-income people are more likely to have older vehicles and drive further. This means they're at risk from serious harm in crashes.

As the fleet transitions to electric vehicles and other low-emission options, there will be cost barriers for people to access them.

Some programmes that provide access and financial incentives to support people into lower-emissions vehicles include:

- the Clean Car Discount
- social leasing
- Clean Car Upgrade, a scrap-and-replace scheme.

Additionally, providing a range of other transport options, including public transport and cycling, can minimise the need to drive.

Measuring progress

What targets have been set?

There is currently no hard target for inclusive access. However, *Te Manatū Waka Transport Outcomes Framework* indicates the transport system should increasingly enable people to access opportunities.

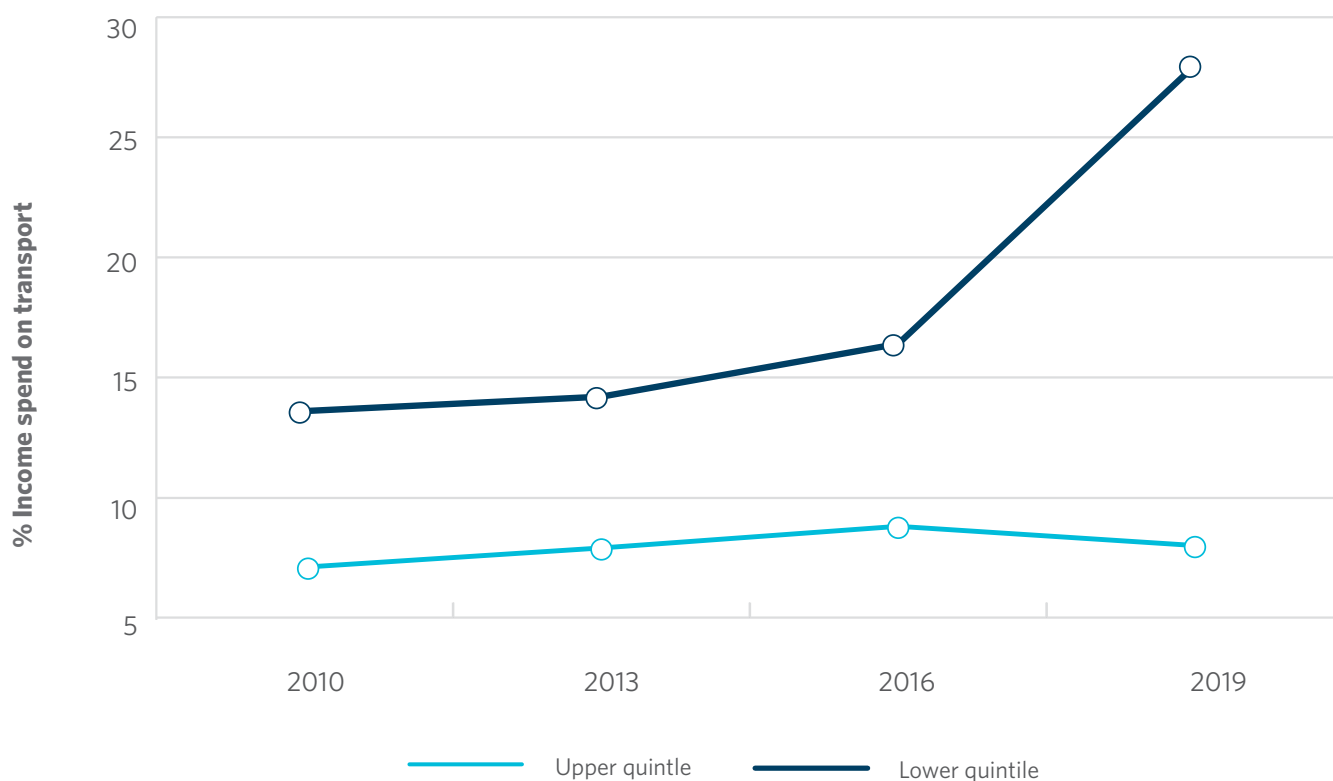
How are we tracking?

The percentage of adults unable to make a beneficial journey because of cost, time pressure, and/or lack of transport choice has reduced from 12% in 2018-2019 to 8% in 2020-2021.⁶⁸

Since 2016, the proportion of household income spent on transport has increased from 16% to 28%.⁶⁹ This means transport is becoming less inclusive for lower-income earners.

System indicator - Household spending on transport (2010-2019) ⁷⁰

Figure 05



Looking ahead, what are the key challenges?

Despite ongoing investment, there are access issues for people living in urban areas. In our largest cities, public transport doesn't reach everywhere and might not work for all trips. Cycling networks are also underdeveloped.

Growth and existing pressure in urban areas puts pressure on the land transport system to keep up. This means access can be reduced because of a lack of new services, even after significant investments are made.

Rural areas have access challenges like network resilience, a lack of alternatives to private vehicle trips, and access to driver licensing.

Those most likely to be affected by transport inequalities include Māori, Pasifika, people with disabilities, lower-income households, carless households, non-licensed individuals, children and young people, older people, women, LGBTQI, and minority ethnic groups.

While differences exist between these groups, many of the barriers we need to overcome to increase diversity are shared.

The four most common barriers to equitable transport in New Zealand are:

- cost
- accessibility
- safety
- practicality.

Access challenges are often greater for lower-income households and those without access to a motor vehicle.

Māori are more likely to experience transport-related social exclusion, like missing out on opportunities or engagements because of lack of transport access.

Improving long-term outcomes can have short-term impacts, especially for vulnerable communities.

What do we still need to work on?

Develop clear focus and targets

Waka Kotahi and Te Manatū Waka don't currently have clear focus areas for how to deliver this outcome.

Developing areas for focus would provide direction about what's needed in the land transport system to support inclusive access in urban, provincial, and rural areas. This should include measures to address the necessary scale of change.

Better integrate land-use and transport to improve urban form and the accessibility of key services

Shaping urban form, and the transport system that supports it, is one of the most lasting impacts on the environment we make.

The way our towns and cities are laid out has a tremendous effect on whether everyone can access opportunities in an easy, safe, and sustainable way.

Agencies shaping cities should ensure urban patterns created across New Zealand support long-term goals and challenges, as well as current lifestyles.

Growth and development over much of the past 75 years has increased pressure on housing supply and affordability. It has also affected the environment and the ability of people and businesses to move around in an easy and affordable way.

Current approaches to urban development have generally resulted in low-density, car-based development. They often don't give enough consideration to where people live, work, study, play, and how people connect to those places.

Central and local government, alongside iwi Māori, must work together to reshape our towns and cities. They must aim to design places that are easy to get around using a range of travel options, which are safe for all users, and are better places to live and work.

We also need to achieve win-win solutions to grow housing supply in a way that also allows wider access and sustainability benefits.

To do this, we'll need to continue playing an active government role in urban development, to shape how our towns and cities grow in the future.

With an enabled land-use planning system now in place, the focus needs to be on taking steps to support and encourage growth into highly accessible locations.

This will require active collaboration across the various parties involved in the urban development process.



Improving long-term outcomes can have short-term impacts, especially for vulnerable communities.

Shift from reliance on single occupancy vehicles to more sustainable transport solutions, particularly in our cities

During the past 75 years, New Zealanders have become reliant on private vehicles to meet their travel and freight needs.

While private vehicles are well suited for many trips, relying on private vehicles to meet so much of our travel needs has created a range of problems like:

- congestion
- poor quality urban environments
- pollution and increased emissions
- poor health
- high travel costs.

For urban areas to thrive, people need to move around easily and have a range of choices about how they get to work, connect with family and friends, and access services.

We need to build a modern transport system with a mix of reliable transport options that helps keep people and products safely moving.

It also means land use and transport need to support and encourage convenient trip options so more people can meet most of their needs locally and are less reliant on private vehicles.

The opportunity to encourage this shift is greatest in larger urban areas, giving us an opportunity to encourage more sustainable options.

Areas of future focus to improve this outcome

There are many ways to improve inclusive access across the transport system. Some areas for future focus are to:

- embed equity and safe-system principles into transport policy and planning processes
- develop more detailed strategic guidance on inclusive access
- enable more licensing and driver-safety schemes
- improve access to compliance requirements like vehicle warrants and vehicle testing, particularly for rural and low-income communities
- work with communities and partners to find an appropriate level and mix of services especially in areas where populations are declining
- expand public and shared transport options for those with few travel choices (for example, shift workers)
- support access for women, ethnic minorities, and LGBTQI people to reflect needs like safety, affordability, and travel with children
- identify ways to improve the long-term affordability of public transport
- support public transport services that provide accessible, affordable access to education and employment

- support services to improve mobility for senior residents
- use transport to improve access to employment, education, essential services, social, and cultural activities in higher-deprivation areas and isolated communities
- identify opportunities for network improvements and demand-management activities with a focus on mode shift
- promote greater-integrated land use and transport planning, including spatial planning for sustainable management of urban growth
- provide greater transport choice in urban and regional areas as an alternative to private car use
- support approaches, like standards for kerbs and intersections, to ensure streets have appropriate space for a range of users, including walkers, people with prams, wheelchair users, and mobility scooters
- improve services and infrastructure so people can get on and off public transport easily
- make sure everyone can access public transport infrastructure, like bus shelters and timetable signs
- manage and improve walking networks to allow safe and accessible trips for people
- continue rolling out cycling networks for a range of trips, and fill network gaps to support access
- support dynamic use of road space that allows flexible use, responding to changes to different modes, access requirements and changing mobility of people
- improve road quality in Māori communities (particularly rural areas) to lessen the burden on vehicles and finances.

Critical dependencies with other outcomes

Activities contributing to other outcomes can influence inclusive access outcomes.

Environmental sustainability:

- Encourage initiatives that reduce emissions and shift to low-emission modes, like public transport, walking, cycling, and electric vehicles, which will benefit public health and safety.
- Ensure our approach to emissions reduction and alternative modes support access for all.
- Support the implementation of the Avoid Shift Improve Framework while supporting access to transport.

Resilience and security: The safety of the transport network will likely be disrupted by extreme weather events, like high temperatures and sea-level rise. Waka Kotahi will need to make sure access is considered as part of our response.

Economic prosperity: Make sure freight and urban growth balance access for people.

Healthy and safe people: Make sure the land transport system takes an inclusive approach to keeping everyone safe.

/G=via Glen Innes /N=via Newmarket /LS=Limited Stops C=Cancelled *=Arrival due/departing



Healthy and safe people

There are four main ways the transport system can achieve the outcome of healthy and safe people:

- improve road safety by reducing the number of deaths and serious injuries on our roads
- improve rail safety by reducing accidents and incidents, particularly at level crossings
- reduce public health harms (such as air and noise pollution) caused by the transport system
- reduce the health impacts of low physical activity and encouraging greater use of active travel modes.

Our road safety focus is guided by the *Road to Zero Strategy and Action Plan*. At the heart of this strategy is a 40% reduction in the number of people killed and seriously injured in road crashes by 2030.

Rail safety can be improved through effective regulation and upgrades to infrastructure, like level-crossing removals and fencing off access to tracks.

Deaths and serious injuries on the rail network are thankfully rare, but critical risks remain and need to be addressed over time.

Reducing air and noise pollution is a considerable ongoing challenge that requires a holistic approach.⁷¹ This includes:

- reducing reliance on fossil-fuelled vehicles (especially diesel)
- improving emissions standards
- reducing exposure to poor air quality and noise through effective planning and investment, like noise walls.

Increasing the role of active modes, like walking and cycling, to boost physical activity levels will require:

- developing compact, mixed-use urban areas
- improving walking and cycling facilities and networks
- ensuring transport regulations enable and encourage these forms of movement.

Why is this important?

Between 2020–2021, there were:

- 333 deaths because of vehicle crashes
- about 2,395 people seriously injured on our roads.⁷²

In addition to this, an estimated social cost of \$4.6 billion was spent on injuries because of motor vehicle crashes.⁷³

As for health and air pollution in New Zealand:

- More than 3,300 adult New Zealanders die prematurely from air pollution, most of which is from diesel motor vehicles.⁷⁴
- Air pollution from motor vehicle emissions has increased by 10% over the 10-year period from 2006 to 2016.⁷⁵
- Each year, air pollution contributes to more than 13,000 hospital admissions, 13,200 cases of childhood asthma, and about 1.7 million restricted-activity days.⁷⁶

Noise is also a factor. About 38,000 people are exposed to elevated levels of noise from state highways and major local roads in New Zealand.⁷⁷

As for physical activity, just over half of New Zealand adults are defined as physically active (30 minutes of exercise, five days a week).⁷⁸

A lack of physical activity, and New Zealand's increasing levels of child and adult obesity, may result in premature deaths and increased pressure on the health system.



What are we currently doing about this outcome?

Improving road safety

We need a holistic approach to reduce the level of harm experienced within our land transport system.

The map across shows fatal and serious road crashes in the past five years. This remains a key challenge for New Zealand.

New Zealand's road strategy for 2020–2030, Road to Zero, starts to address these issues.⁷⁹

Along with a 40% reduction target, it commits to a shared vision of a safe transport system where:

- it's safe to drive, cycle or walk
- transport improves our health and wellbeing, creating great places for our communities.

Delivery is supported by a system-wide response involving Waka Kotahi, Ngā Pirihimana O Aotearoa New Zealand Police, Te Manatū Waka Ministry of Transport, Auckland Transport, Te Kaporeihana Āwhina Hunga Whara Accident Compensation Corporation, and Mahi Haumaru Aotearoa WorkSafe.

Road to Zero is underpinned by the safe system approach. This approach aims for a more forgiving transport system that acknowledges people make mistakes. It emphasises shared responsibility, decision-making, and accountability for those who design, monitor, enforce, and use the transport system.

Road to Zero focuses on a combination of interventions to achieve safety performance outcomes that include:

- improving roads through safety infrastructure (like median barriers and roundabouts)
- safe and appropriate speed limits
- strengthening road policing (like the roll out of roadside drug testing and additional safety cameras)
- encouraging people to buy safer vehicles
- improving vehicle standards
- strengthening road safety penalties
- improving access to driver training.

Road to Zero action plans will be delivered every three years to support the strategy. These plans will direct road safety partners to make progress towards the 40% reduction target.

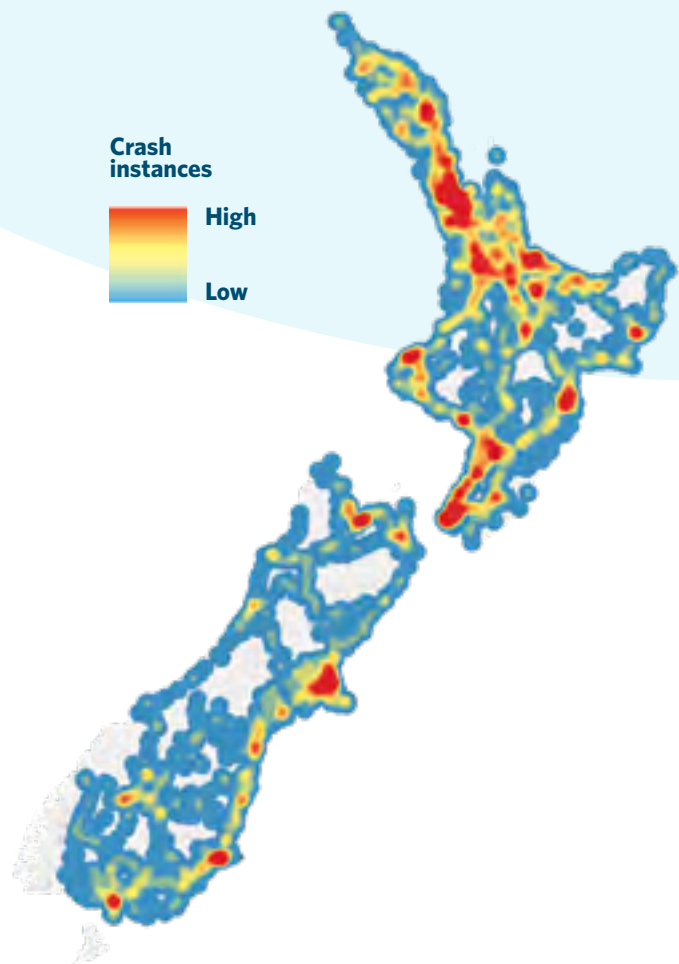
Waka Kotahi currently leads, or partners on, 15 actions across the five key focus areas:

- infrastructure and speed management
- vehicle safety
- work-related road safety
- road-use choices
- system management.

While Waka Kotahi is primarily responsible for delivering many of the actions in the current plan, we can't achieve these targets without our road safety partners.

Fatal and serious road crashes by region

Figure 06



Improving rail safety

For rail safety, Waka Kotahi:

- serves as national rail safety regulator
- monitors rail activities funded through the National Land Transport Fund (NLTF).

Waka Kotahi works with KiwiRail and other rail partners to make New Zealand's railway system safe for everyone.

The *New Zealand Rail Plan* outlines the government's vision and priorities for rail until 2030. It also outlines the investment needed to achieve it. This will happen through the Rail Network Investment Programme (RNIP), approved by the Minister of Transport.

We are developing partnerships to support delivery with the private sector, other government agencies, iwi/Māori, and local government.

Our regulatory strategy, *Tū Ake, Tū Maia*, will also be critical to achieving the 40% reduction.

Improving safety for Māori

We also recognise the need to reduce harm to Māori by the transport system. We are continuing to engage and build relationships with Māori to improve road safety by:

- better understanding context
- doing further research
- supporting Māori to design and implement initiatives.

We will look for opportunities to collaborate with other government agencies that are working with Māori (mana whenua and mataawaka) to use resources and learnings that contribute to road safety and wellbeing.

Improving safety in urban and rural areas

For urban centres, road safety we will focus on implementing the recommendations in the *Emissions Reduction Plan* (ERP). This will reduce emissions created by vehicle kilometres travelled (VKT) and improve safety across all modes.

For rail safety, our focus will be on reducing harm at level crossings nationwide and investing in improvements to urban rail networks.

Our road and rail safety interventions will continue to focus on improving safety in provincial or rural areas.

Improving public health

The current system-wide approach to lessen negative public health impacts from the land transport system is not delivering.

The *Waka Kotahi Environmental Sustainability Plan, Toitū Te Taiao*, outlines three objectives to improve public health by 2050:

- support physically active and healthy travel options
- no harm from land transport air emissions
- no harm from land transport noise.⁸⁰

Activities that aim to reduce greenhouse gas emissions and ease air pollution include:

- programmes like Clean Car Standard and Clean Car Discount
- discounted public transport
- walking and cycling improvements
- working with the sector to reduce freight transport emissions.

Current research is looking into the social costs of land transport noise and has identified priority locations where transport noise can be lessened.

We are also developing national walking and cycling plans that outline what's needed to achieve a dramatic increase in these travel options.

For urban centres, we anticipate the recommendations in the ERP to reduce VKT. This will increase the uptake of low-emission vehicles which will help improve air quality, though it may not be enough.

Noise, air, and water quality issues will be worsened by increased traffic along arterial transport routes, unless measures are put in place to reverse current trends. This matters because most population growth is expected in cities with transit-oriented development that aims to create vibrant, liveable, sustainable communities with accessible transport options.

For rural areas, we'll focus on enabling safe opportunities to access more active and low-emission transport options.

Measuring progress

What targets have been set?

Road to Zero aims for a 40% reduction in people dying or being seriously injured on our roads by 2030.

Targets have also been set for road controlling authorities to reduce speed limits near 40% of schools by 2024 and all schools by 2027.

There are also national standards for air quality set under the Resource Management Act 1991.

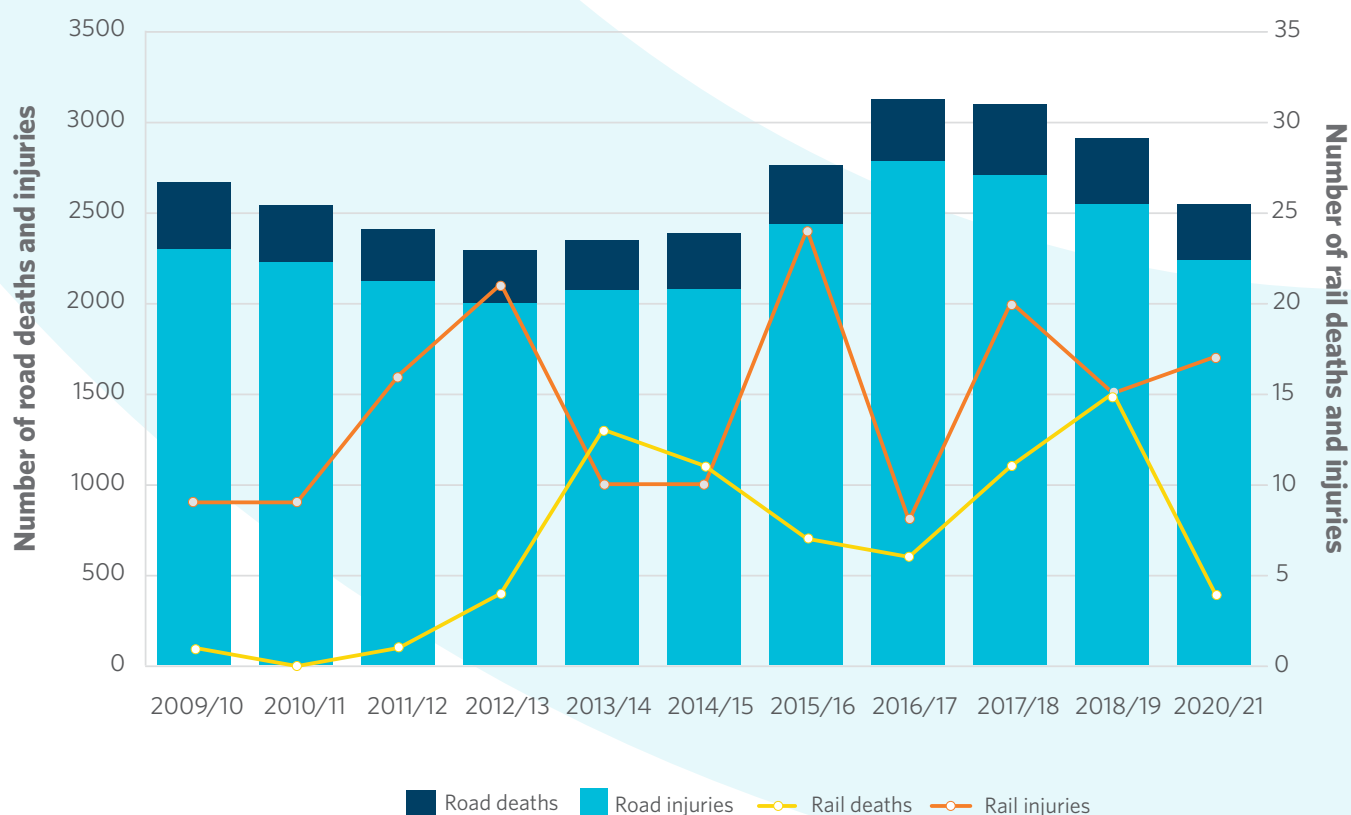
How are we tracking?

Some indicators of health and safety tracking are:

- 11% reduction in deaths and serious injuries between 2018 and 2021
- more people are travelling by active modes (walking and cycling)
- increased harmful effects from road transport emissions.⁸¹

System indicator number of deaths and serious injuries from road and rail transport 2011–2021 ⁸²

Figure 07



Looking ahead, what are the key challenges?

Some challenges to consider going forward:

- Most of New Zealand's roads don't have speed limits that are safe or appropriate for the:
 - design
 - infrastructure
 - adjacent-land use
 - modes of transport
 - types of crashes that could occur on that road.
- While harmful emissions contribute to over 3,000 premature deaths each year, they currently receive less focus than road and rail safety.
- A growing population means more people are using our transport networks – this increases risks and conflicts between different users of the transport system.
- Some people (like elderly, those with a disability and Māori) have difficulty accessing safe, reliable, and healthy transport options.
- Walking and (especially) cycling are often unsafe travel choices with poor facilities and undeveloped networks that discourage their use.

What do we still need to work on?

Considering our current and planned interventions, we still see several areas that can be worked on over the course of this 30-year plan:

- develop a whole-of-system approach to improve public health in transport services, with an increased focus on reducing air pollution
- provide cost-effective incentives that reduce private vehicle use to encourage public transport or active modes
- develop a work programme for rail safety beyond the three-year timeframe of the current Rail Network Investment Programme
- improve understanding of Māori-safety outcomes and programmes that reduce safety and public health risks for Māori
- develop a strategic direction to reach Vision Zero beyond the current strategy.

Areas of future focus to improve this outcome

Some areas of future focus to improve the health and safety outcome include:

- progress a stronger system-wide response to improve poor air quality caused by transport
- identify the barriers to reduce the number of people dying or being seriously injured on roads
- expand current evidence about Māori overrepresentation in death and serious injuries in road crashes
- identify and implement actions, partnerships, and new approaches to reduce the number of people dying or being seriously injured on roads
- develop an approach to lift rail safety beyond the current 10-year time horizon
- work with partners to research and plan for road safety, with a focus on equity and inclusive access
- enable road safety partners to achieve targets for national death and serious injury
- look at ways to reduce transport noise in priority locations
- ensure a multi-outcome approach (that includes equity and safe-system principles) is applied in programme delivery, including those to reduce the kilometres travelled in light vehicles
- enable iwi Māori to participate in transport planning, particularly for road safety
- use risk-based, localised responses to deliver road-safety improvements in high-risk areas
- require high-quality active mode infrastructure is included in new developments
- support initiatives to reduce speeds in urban areas
- support safe behaviour on regional roads
- improve or maintain physical access to marae (communal and sacred meeting grounds), papakāinga (collective residential areas), wāhi tapu (sacred sites), and wāhi taonga (precious sites).

Critical dependencies with other outcomes

Activities contributing to other outcomes can influence health and safety outcomes.

Environmental sustainability:

- Immediate high dependency on planned environmental sustainability initiatives also delivering health, safety, and fairness outcomes.
- Initiatives that reduce emissions and shift to low-emission modes (like public transport, walking, cycling, and electric vehicles) will benefit public health and safety.
- Need to better understand how safety may deliver outcomes such as inclusive access, economic prosperity, and resilience.

Inclusive access:


Negative public health impacts from the transport system are more prevalent:

- in certain places (like South Island urban centres for air quality)
- for certain people (like those on low incomes, for whom it's more difficult to upgrade to cleaner vehicles)

We need a stronger focus on achieving inclusive access outcomes from existing safety and public health interventions. For example, current efforts to improve access to driver licensing services and training in rural or low-income areas.

Resilience and security:

The safety of the transport network could be impacted by cyber-attacks.



Activities contributing to other outcomes can influence health and safety outcomes.

Environmental sustainability

The environmental sustainability outcome seeks to reduce the transport system's negative impacts on the environment. It has three areas of focus:

- reduce greenhouse gas emissions
- improve biodiversity and water quality
- improve resource efficiency and waste management.

Reducing greenhouse gas emissions requires a mix of actions to:

- avoid or reduce the number and length of trips people make
- enable and encourage people to shift to more sustainable transport options
- decarbonise the vehicle fleet.

Traditionally, the focus on biodiversity and water quality has been to avoid, remedy, or mitigate any negative impacts from the transport system. In the future, there will be an increased shift to:

- using transport corridors to support biodiversity
- finding opportunities to improve water quality.

The land transport system must continue to enable behavioural change, innovation, and ways of doing business to drive:

- sustainable sourcing and use of materials
- waste minimisation
- emissions reduction.

Why is this important?

Although Aotearoa is a small emitter by global standards, our per person emissions are amongst the highest in the Organisation for Economic Co-operation and Development (OECD). We're not yet pulling our weight in the global challenge to reduce emissions and reduce the scale of future climate change.

New Zealand has a goal of net zero emissions by 2050.⁸³ The *Emissions Reduction Plan* (ERP) outlines how transport emissions can be reduced by about 41% by 2035.

Efforts to reduce emissions can deliver wider benefits to New Zealand's communities like:

- reducing air pollution
- delivering improved public health and safety outcomes
- providing better transport choice
- reducing congestion
- supporting more vibrant, people-focused towns and cities.

New Zealand's indigenous biodiversity is in decline. Both land and water environments face significant pressures from human activities. This is worsened by climate change.

The land transport system is a substantial presence in the natural environment, crossing many sensitive ecosystems, habitats, and waterways. The transport sector must reduce the ecological effects of its construction, operation, and maintenance activities and protect and enhance biodiversity on road reserve land.

Building, maintaining, and operating the land transport system uses large quantities of fossil fuels, virgin materials such as aggregate, and other resources. This means high levels of carbon in the land transport system.

Construction and demolition waste represent about 50% of all waste going to landfill.⁸⁴ Land transport construction and demolition waste is not often recycled. The use of recycled or alternative materials in new builds is limited.

What are we currently doing about this outcome?


Reducing light vehicle kilometres travelled (VKT)

Reducing light vehicle travel is critical to reducing transport emissions. This is particularly true in our largest and fastest growing urban centres.

Our largest cities combined make up over 64% of the total vehicle kilometres travelled (VKT) on New Zealand's roads.⁸⁵

Reducing reliance on private vehicles requires a three-pronged approach to changing car dependency:

- Shape urban form by encouraging good quality, compact, mixed-use urban development that supports public transport, enables shorter trips, and provides safe, healthy, attractive urban environments where walking and cycling are encouraged.
- Make shared and active modes more attractive by improving the quality, quantity, and performance of public transport, walking, and cycling facilities.
- Influence transport demand and selection with a mix of incentives and disincentives (push and pull factors) to discourage private vehicle use or encourage people to try something new.⁸⁶



Reducing light vehicle travel is critical to reducing transport emissions.

Provincial (towns between 10,000 and 30,000 people) and rural areas (areas with populations <10,000) make up about 36% of New Zealand's vehicle travel. Reducing vehicle travel in these areas is limited because of:

- fewer travel choices
- relatively low levels of population growth
- high reliance on private vehicles.

In provincial centres we'll focus on:

- improving active-mode networks for shorter journeys, including micro- and e-mobility, like e-bikes
- improving public transport, on-demand, or shared services with a focus on accessibility
- supporting a national electric vehicle charging network.

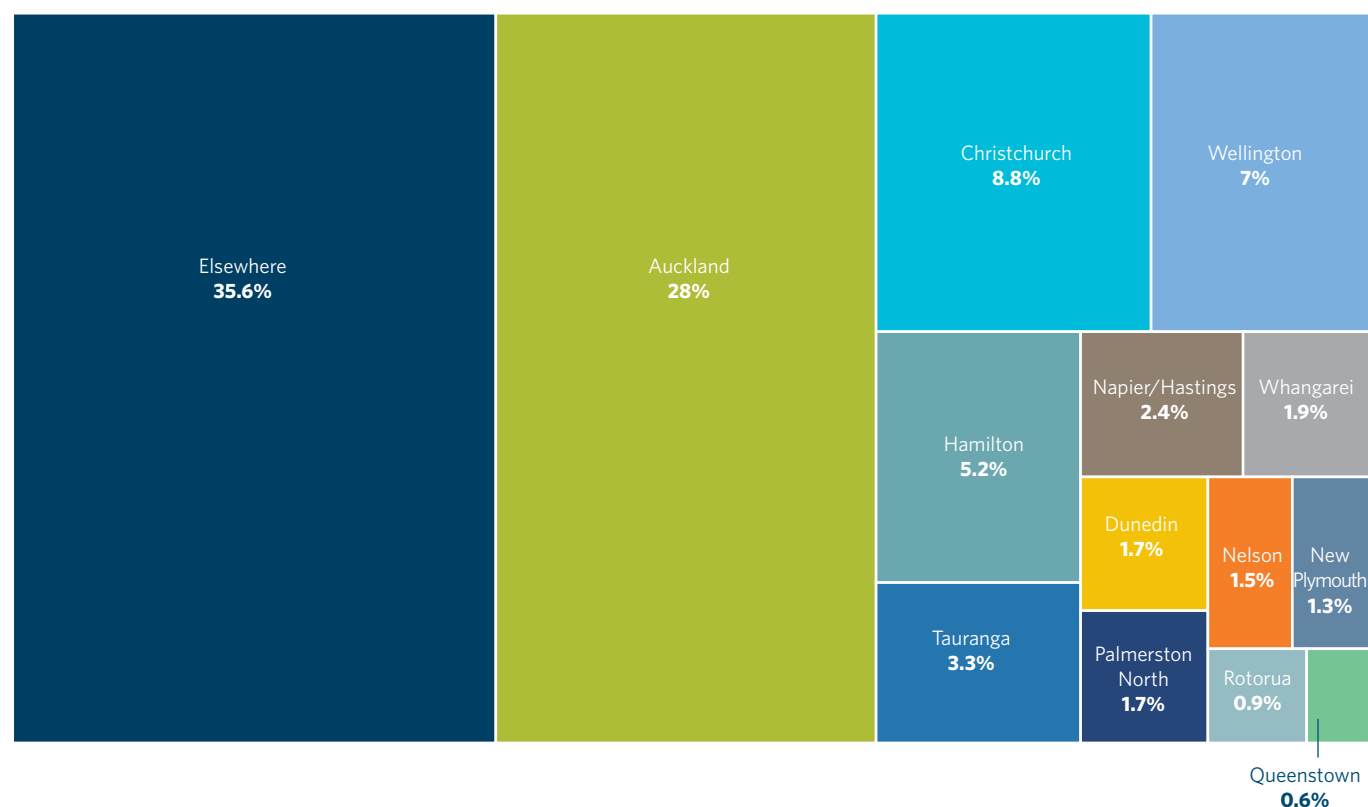
In rural areas, we recognise opportunities to reduce car travel and provide attractive alternatives are more limited.

In rural areas we will focus on:

- supporting use of safe and clean vehicles
- supporting a national electric vehicle charging network
- exploring ways to reduce long-distance travel to essential services, like shared services for hospitals and large employment hubs, or using mobile facilities to deliver services to remote communities.

Share of VKT (million per year) 2020 by functional urban area

Figure 08



Decarbonising freight transport

An integrated and multi-modal freight system is key to delivering on the ERP targets for freight transport. This will:

- enable goods to be transported by the most efficient modes
- support smooth connections between modes (such as inland ports and intermodal terminals)
- provide multiple back-up options for business continuity.

Over time, we need more freight moved by safer and lower emission modes, like rail and coastal shipping.

Emissions from road trucks (light and heavy) has grown steadily. Trucks now contribute to nearly 50% of road emissions.⁸⁷

This growth is because of more freight travelling by road. It also reflects that 'trucks' includes many personal vehicles, like vans and utes.

One of the actions in the *Emissions Reduction Plan* (ERP) is to develop a national freight and supply chain strategy. This strategy will take a long-term, system-wide view of the freight and supply chain. In collaboration with industry, the strategy will identify how to decarbonise the freight transport system to net zero by 2050, while improving the efficiency and competitiveness of the supply chain. The strategy will be delivered in 2023.

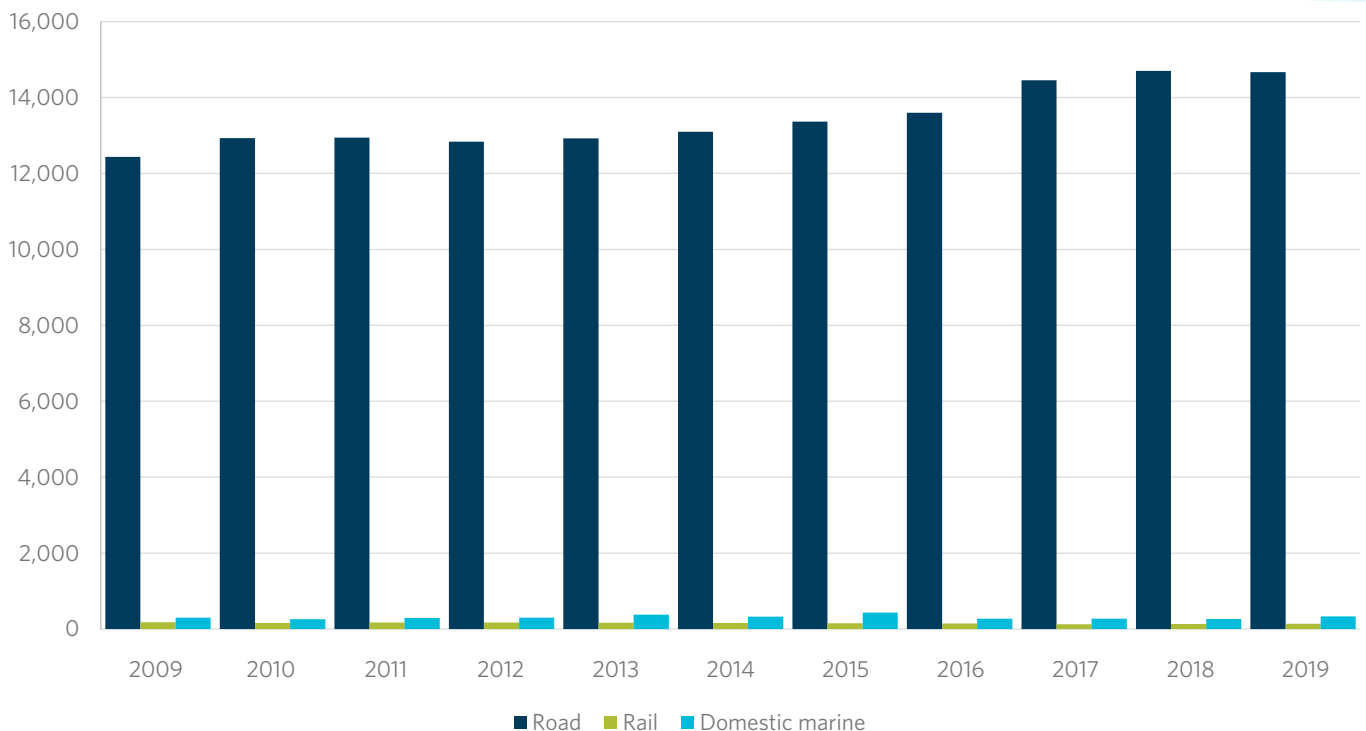
Rapidly adopt low-emissions vehicles

The ERP contains a range of actions to support the adoption of low-emission vehicles including:

- incentivise uptake through the Clean Car Discount Scheme
- implement the Clean Car Standard
- consider further measures (including regulatory, legislative, and tax settings) to improve the fuel efficiency of imported vehicles, and discourage the importation of high-emitting vehicles
- support trialling of social-leasing, and equity-focused Clean Car Upgrade, a vehicle scrap-and-replace scheme.
- develop a cross-agency work programme to deliver the EV charging network.

Percentage share of emissions cars versus trucks (note Ministry for the Environment calls light commercial vehicles 'trucks')

Figure 09



Biodiversity (including water quality)

Land transport's construction, maintenance, and operational activities impact biodiversity in many ways. This includes removing, degrading, and severing ecosystems and wildlife.

Transport corridors can provide important ecological functions and allow changes in land use and development.

Waka Kotahi key organisational directives for biodiversity are *Toitū Te Taiao: Our Sustainability Action Plan* and the *Environment Plan*.

A long-term outcome to 2050 is the land transport network is managed to support and enhance indigenous biodiversity.⁸⁸

Ecology objectives include 'no net loss of native vegetation, wetlands, critical habitat or endangered species.'⁸⁹

These are aligned with national directives around minimising effects and improving biodiversity.

Improving resource efficiency and waste

A strategic approach to improving resource efficiency and waste minimisation presents an opportunity to:

- achieve cost savings
- realise environmental benefits
- create a culture of resource efficiency in the delivery of land transport functions.

There are three focus areas to improve resource efficiency:

- sustainable sourcing and use of resources
- waste minimisation
- energy and carbon reduction.⁹⁰

Achieving our resource efficiency objectives will:

- reduce environmental impacts, including energy use, emissions, and waste sent to landfills
- deliver long-term cost benefits through whole-of-life considerations
- reduce exposure to changes in the supply of materials
- achieve improvements in broader sustainable outcomes including social, cultural, and environmental
- improve the service life of assets
- reduce the need for materials and energy
- preserve resources for future generations
- reduce and minimise embodied carbon in the land transport system.

Measuring progress

What targets have been set?

New Zealand has a goal of net zero emissions by 2050.⁹¹ The *Emissions Reduction Plan* (ERP) outlines how transport emissions can be reduced by about 41% by 2035.

The ERP identifies the following targets for the transport sector by 2035:

- reduce total kilometres travelled by the light fleet by 20% through improved urban form and travel options, particularly in our largest cities
- increase zero-emissions vehicles to 30% of the light fleet
- reduce emissions from freight transport by 35%
- reduce emissions intensity of transport fuel by 10%.


Delivery of the targets will be achieved through a set of over 70 actions for the transport sector. More than half of these actions relate to:

- reducing light vehicle kilometres travelled (VKT)
- improving urban form, public transport, walking, and cycling.

How are we tracking?

A few points about how New Zealand is tracking:

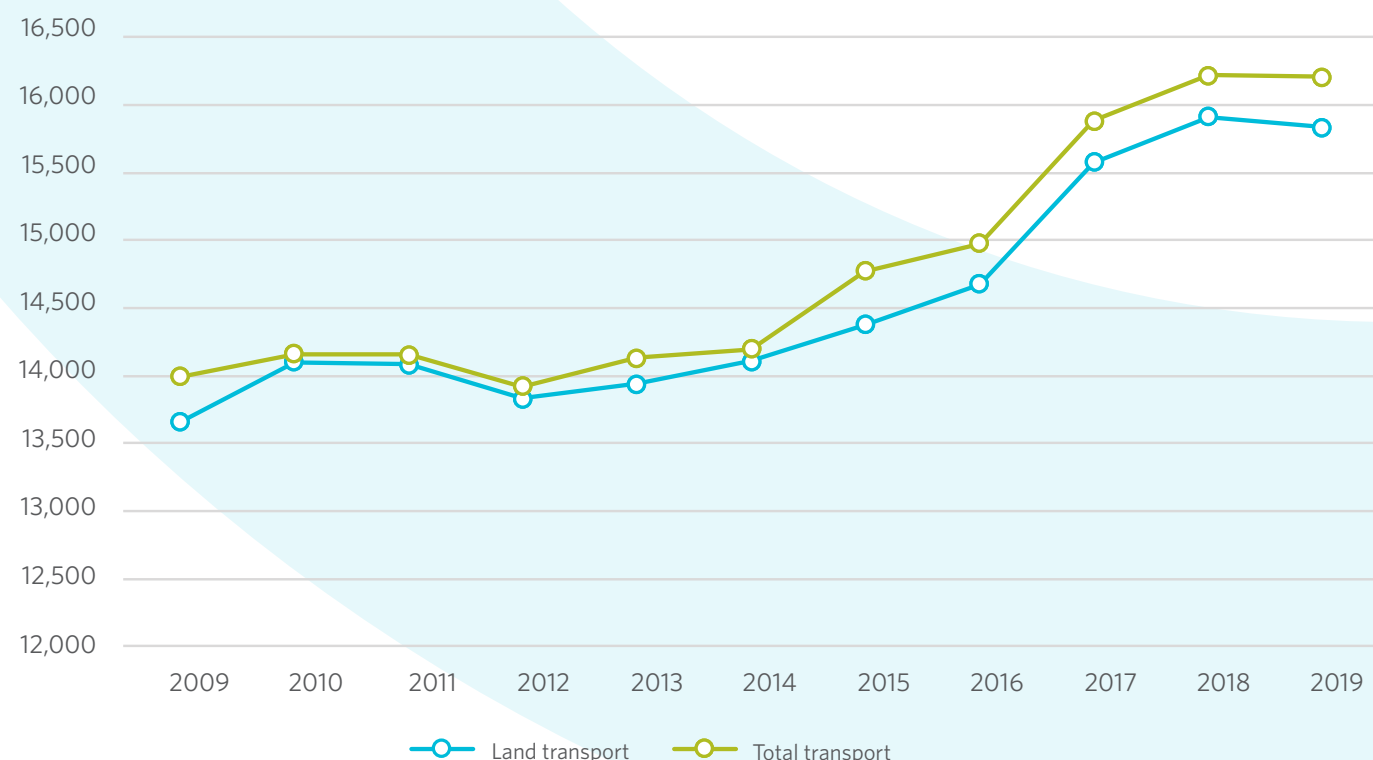
- Transport emissions have been increasing since 2012.
- New Zealand towns and cities have very high levels of car dependence, with low uptake of public transport, walking, and cycling.
- New Zealand's light electric fleet is growing.
- Re-use of materials in roading network improvements is growing (circular economy).⁹²



Reduce total kilometres travelled by the light fleet by 20% through improved urban form and travel options, particularly in our largest cities.

System indicator – Greenhouse gas emissions from the land transport system⁹³

Figure 10



Looking ahead, what are the key challenges?

Some key challenges for the future include:

- delivering emissions reduction at scale and pace given it's an immense task that relies on sustained, integrated effort across multiple sectors and organisations
- delivering emissions and vehicle travel reduction in a way that's equitable and doesn't restrict access to social and economic opportunities
- making the shift from car dependency in urban areas towards public transport, walking and cycling through urban form, transport choice, and demand-management approaches
- transforming the vehicle fleet, given Aotearoa has a relatively old vehicle fleet and we're entirely reliant on imported vehicles
- reducing reliance on road freight for transport without increasing costs or reducing sector efficiency
- building social license for rapid implementation and use of alternate modes without increasing transport inequities
- moving away from compliance-focused approaches to reduce negative effects on biodiversity and water quality, in favour of approaches where transport can make a positive difference
- continuing to refine standards and processes to ensure building, maintaining, and operating the land transport system is resource- and energy- efficient.

What do we still need to work on?

Reducing greenhouse gas emissions

While the current ERP sets targets to 2035, an on-going focus is required to meet government's commitment to achieving net zero carbon emissions by 2050.

Improving biodiversity (including water quality)

Stronger Waka Kotahi direction is needed, likely in the form of biodiversity policy. This would achieve biodiversity outcomes through our core functions of:

- investing in land transport activities
- managing the state highway network
- providing access to land transport.

The requirements of the *National Policy Statement for Freshwater Management* and *National Policy Statement for Indigenous Biodiversity* will affect how biodiversity is considered through Waka Kotahi projects and operations.

Efforts to support and enhance biodiversity by 2050 will likely be implemented in three stages:

- slowing decline
- stabilising
- building.

The first stage (slowing decline) is where foundational work has been and shall continue. This includes:

- incorporating biodiversity into our asset data management standard
- identifying ecological areas
- researching impacts and effects management
- developing guidance and tools.

Improving resource efficiency and waste

The *Waka Kotahi Resource Efficiency Strategy* assumes the adoption of a circular economy approach to the delivery and maintenance of transport system over the next 10+ years.

This circular economy approach means Waka Kotahi will need to:

- design to avoid waste and pollution
- keep materials in use
- regenerate natural systems
- reuse structure and heritage assets where possible.

Reducing embodied carbon

Maintaining and operating the land transport system uses resources and contributes to embodied carbon.

Waka Kotahi will need to reduce carbon emissions when:

- maintaining the network and operations
- choosing materials.

Areas of future focus to improve this outcome

Some areas for future focus to improve the environmental sustainability outcome:

- complete and maintain walking and cycling networks that are safe, convenient, and sustainable
- include resource efficiency and waste minimisation in design standards, procurement processes, and investment decision making
- plan and prepare guidance at the national level to deliver light vehicle VKT reduction targets and support urban VKT reduction planning
- establish an evidence base for significant natural areas and indigenous biodiversity to assist transport planning and delivery
- improve direction and management of biodiversity on the transport network, including use of nature-based solutions, maintaining water quality, and using transport corridors to connect greenspaces

- ensure planning and investment delivers the lowest, whole-of-life costs
- ensure a multi-outcome approach (that includes equity and safe-system principles) is applied to programmes, including those to reduce kilometres travelled by light vehicles
- partner with Māori on the climate response in the land transport system to incorporate Mātauranga Māori (Māori knowledge) and ensure an equitable, Māori-led transition
- promote effective integration of land use and transport planning, including spatial planning for sustainable management of urban growth
- maximise the existing transport system, and identify opportunities for network optimisation and demand-management activities with a focus on supporting mode shift
- implement regulatory change to reduce harmful emissions and encourage low-emission vehicle uptake
- improve public transport infrastructure and services to support mode-shift that is safe, convenient, and sustainable.

Critical dependencies with other outcomes

Activities contributing to other outcomes can influence environmental sustainability outcomes.

Healthy and safe people: Reducing emissions in our main urban centres needs a safe-system approach. To enable safe and convenient trips on foot or bike, mode share shift needs support from things like:

- infrastructure improvements
- speed management
- network prioritisation.

Inclusive access: Efforts to reduce emissions and VKT should seek a fair transition and not restrict access to opportunities or disadvantage communities.

Economic prosperity: Collaboration across the freight sector to understand opportunities to reduce emissions and make the most of supply chains and modes.

Economic prosperity

The land transport system supports economic prosperity in cities, towns, and rural areas by:

- connecting people to local places for work, shopping, education, and services
- connecting businesses to their workers, customers, suppliers, and other domestic businesses
- ensuring transport improves the attractiveness of cities as places to live, work, and visit
- providing trade routes from New Zealand producers to domestic and international markets, and for imports to enter the country
- providing the backbone for safe and low-emission tourist journeys throughout New Zealand on roads, trains, ferries, and cycleways.

Why is this important?

Economic prosperity is for the wellbeing of individuals, whanau, and communities.⁹⁴ A well-performing economy needs to be productive, sustainable, and inclusive.⁹⁵

Achieving higher productivity – producing more with what we have – means there is more to go around. Wages increase faster when productivity growth is strong.

After the Second World War, New Zealand experienced less productivity growth. The country has since gone from being one of the most productive economies to one of the least in the OECD.⁹⁶

Land transport provides access to education and employment opportunities. This is fundamental for people to live prosperous lives.

While many things can be done online, physical travel is still fundamental to a well-run economy where people live fully.

There is a strong relationship between the number of employment opportunities available and economic productivity.⁹⁷ Increased productivity benefits individuals and businesses through higher income.⁹⁸

Timely and reliable freight movement is important for keeping the cost of goods and services down. Delays and inefficiencies lead to extra costs that are ultimately passed on to everyone. Road congestion costs New Zealand's economy \$1.3 billion annually.⁹⁹

Rail has an important role in moving freight to and from ports and inland distribution hubs.

In cities, the transport network can have positive or negative effects on the attractiveness and convenience of a community. Transport can also impact where economic activities are located.

Land transport is necessary, but on its own, not enough to generate significant economic prosperity at both the national and regional level.¹⁰⁰

Roading networks play a critical role in supporting economic prosperity. Yet, our high dependence on private vehicles and low use of public transport means we're missing out on key productivity benefits.

For example, one study shows public transport increases productivity between 3% and 23% over other modes, as it can move more people quickly and reduce congestion.¹⁰¹

In busy urban areas, public transport gives people more convenient and efficient options and allows other traffic, like freight, to travel more freely.¹⁰²

Before the COVID-19 pandemic, tourism was New Zealand's biggest export industry. As New Zealand's border opened only recently, there's a need and opportunity to consider the recovery of the tourism sector and its implications for the land transport system.


What are we currently doing about this outcome?

Waka Kotahi implements and supports economic prosperity locally, regionally, and nationally.

To guide planning and investment for the land transport sector, Waka Kotahi regularly consults with the industry and freight sector to improve our understanding of:

- freight movements
- freight supply
- network constraints
- consumer demand.

Waka Kotahi is supporting Te Manatū Waka with the development of the *Freight and Supply Chain Strategy*.



Land transport provides access to education and employment opportunities. This is fundamental for people to live prosperous lives.



Moving more freight by rail and coastal shipping

The implementation of the Rail Network Investment Programme (RNIP) will support a resilient, reliable network and increase rail freight volumes.

The coastal shipping activity class enables investment in new or enhanced domestic services inter-modal links, and new or enhanced maritime infrastructure.

Waka Kotahi worked with partners in the *Future of Rail Review*, the *New Zealand Rail Programme*, and the legislative framework for heavy rail planning and funding.

Waka Kotahi has responsibility for regulation of the rail transport system, including rail operator licensing, and performance monitoring.

Continuing to improve freight productivity

More than 8,200 kms of New Zealand's 11,000 kms of state highways can be travelled by high productivity motor vehicles (HPMV).

HPMV, including 50MAX, are trucks that can operate above the current 44-tonne weight limit under permit.

50MAX vehicle combinations have one more axle than conventional 44-tonne vehicles combinations. This means overall truck load is spread further with no additional wear on roads per tonne of freight.

This means 50MAX gives operators an option to carry increased payloads on parts of the network that, while economically important to New Zealand, carry lower volumes of freight.¹⁰³

Continuing to support network resilience

Specific programmes support a resilient land transport system through:

- managing and optimising highway networks
- recovering from disruptive events
- providing alternative routes for key journeys
- investing in coastal erosion protection.

Contributing to good planning and urban form

Through joint work programmes on regional and local spatial planning, Waka Kotahi is supporting integrated growth and infrastructure plans, investment, and land-use decision-making.

The *One Network Framework* supports partners with transport network classification. It connects land use and transport together, recognising that streets not only keep people and goods moving, but they're also places for people to live, work, and enjoy. This allows consideration of economic activity and growth for the future.

Continuing to improve safe access to jobs

Driver licensing and education programmes in rural communities across Aotearoa are helping people access jobs and drive safely.

Measuring progress

What targets have been set?

While there are no hard targets, Te Manatū Waka *Transport Outcomes Framework* indicates the transport system should provide reliable, multi-modal options for the movement of people and goods.

How are we tracking?

Te Manatū Waka indicators show travel times for freight got less predictable on urban roads in most cities between 2019–2020 and 2020–2021.¹⁰⁴

Population growth and emissions reduction will increase network pressure. Monitoring predictability and reliability is vital for future planning at the local and regional level.

Travel time predictability for rail freight has been relatively stable for the past decade, but predictability has reduced slightly (from 90 to 88%) in recent years.

Travel time predictability for road freight shows good interpeak predictability on key freight routes. Yet, there are times of the year when predictability lessens.

The predictability of travel times is based on a comparison to the same times and locations as the previous year. In 2020/21, because of COVID-19 lockdowns the road network experienced a decline in demand. This made journeys freer flowing, particularly on state highways near urban centres. With the return to more normal journey times in 2022, we expect higher travel time predictability in 2022–2023.

Te Manatū Waka expects the freight task to increase by 0.86% per year over the next 30 years.¹⁰⁵

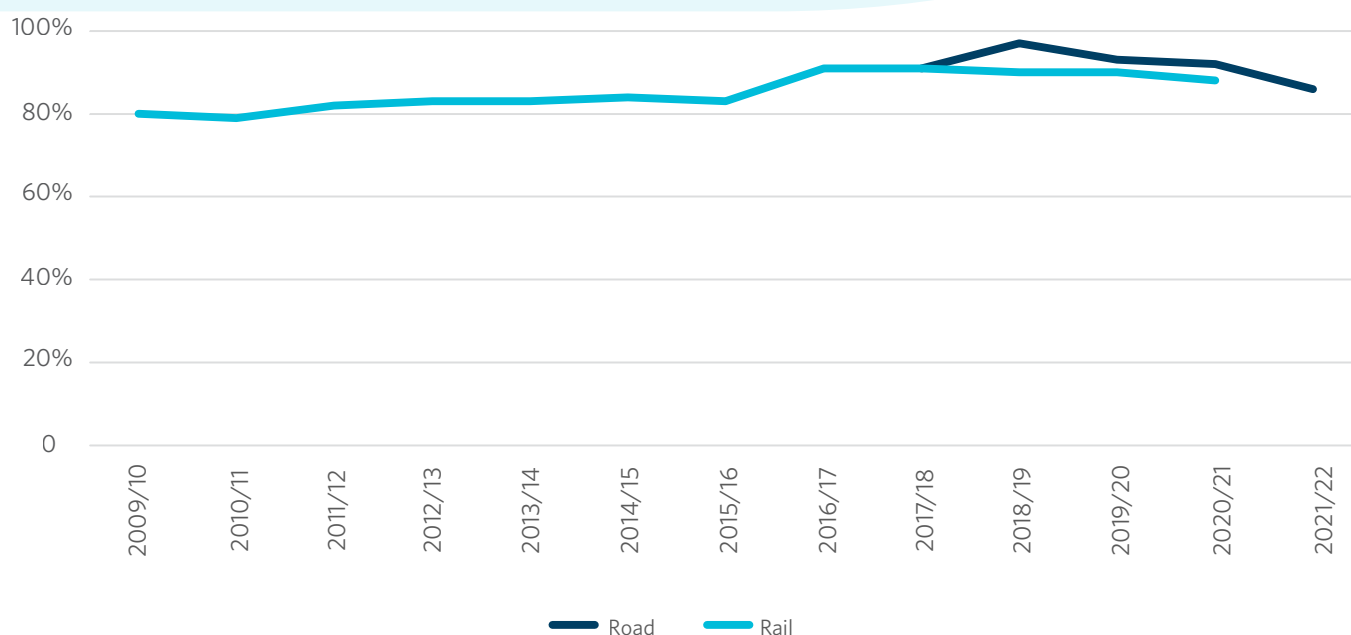
Looking ahead, what are the challenges?

Some key challenges are the lack of:

- travel time reliability/predictability for rail and road freight
- real-time data on the freight system, including the value of goods moving around the network, and data on barriers to achieve greater productivity
- sector-wide collaboration on solutions for freight
- evidence about the opportunities and challenges facing Māori entities, employers, self-employed, and employees in the transport sector.

System indicator - Travel time predictability for freight (rail and road)¹⁰⁶

Figure 11



What do we still need to work on?

New Zealand Freight and Supply Chain Strategy (Waka Kotahi support role)

Te Manatū Waka New Zealand Freight and Supply Chain Strategy will be published in 2023.

The strategy will identify what is needed to improve the system in the coming decades. It will provide direction to the transport industry and government agencies.

Waka Kotahi supports the strategy by providing evidence and insights from collaboration with the sector.

Along with the *Government Policy Statement on Land Transport*, the *New Zealand Freight and Supply Chain Strategy* will provide direction to Waka Kotahi. It will identify how to decarbonise the freight-transport system to be net-zero by 2050, while improving the efficiency and competitiveness of the supply chain.¹⁰⁷

Until the *New Zealand Freight and Supply Chain Strategy* is delivered, Waka Kotahi will continue to:

- progress with the levers identified in *Arataki 2020*
- progress actions identified in the *Emissions Reduction Plan*
- seek direction from the *Freight and Supply Chain Issues* paper.

Decarbonisation of freight (Waka Kotahi support role)

The equitable transition to a low-emissions economy is a significant opportunity to improve our economic prosperity.

The *Emissions Reduction Plan* has a target of reducing emissions by 35% from freight transport (trucks, rail, and ships) by 2035.¹⁰⁸

Targets for reducing the emissions intensity of transport fuel by 10% by 2035 will require increased use of lower emissions fuels, with potential cost implications.

Moving to a low-emissions freight transport system will help avoid the worst impacts of climate change.

Supporting resilience across road, rail, and coastal shipping will help:

- lessen disruptions from climate change
- ensure connectivity and performance of supply chains
- support the wellbeing of New Zealanders.

Densification in urban areas

New Zealand's population is expected to grow and become more concentrated, especially in urban areas.¹⁰⁹

Mixed-use development and increased freight will put pressure on our freight and supply chain system and urban networks. This includes first-and-last-mile freight delivery.

Consumer behaviour and the layout of urban centres determine the:

- distance people need to travel
- distance goods need to be moved between home, workplaces, distribution centres, and ports
- transport options for these movements.

Waka Kotahi will work with industry partners towards getting the right balance for the movement of people and goods through levers (ways of bringing about change).

Data, technology and digital

There are significant gaps in data for tourism, access to services, and interregional travel for people. The *National Freight Demand Study* was last done in 2018.

Going forward we need to improve the detail of available data, including collecting real-time data at a transactional level. We will focus on intelligent systems, like pulse analytics, to collect data and evaluate trends. Investing in digital infrastructure will help support economic prosperity.

Technology is rapidly changing and there is a risk of investing in out-dated technology.

Adopting new digital technologies has the potential to:

- transform the efficiency, safety, and sustainability of our local, regional, and global supply chains
- support tourism and accessibility.

Given the urgency of emission reduction, industry will need to respond faster than ever before.



New Zealand's population is expected to grow and become more concentrated, especially in urban areas.

Sector-wide collaboration

There is a lack of sector-wide collaboration on freight solutions. Work with the freight sector and industry is a focus area for Waka Kotahi. Coordination within the sector will improve efficiency and reliability, as well as reduce consumer costs.

Collaborative effort will help us to better understand:

- freight movements
- freight supply
- network constraints
- consumer demand.

This knowledge will improve planning and investment in the land transport network.

Areas of future focus to improve this outcome

Some areas of focus for this outcome include:

- deepening and broadening our analysis of this outcome
- ensuring the land transport system can use digital networks and tools to improve services, network management, and connectivity
- developing a shared freight evidence base across government and private sector, including collection of and improved access to high-quality data and information for better network management
- improving economic outcomes by collaborating with, and developing direction to, the freight sector
- building the evidence base about transport opportunities and challenges facing Māori entities, employers, self-employed, and employees
- implementing plans to reduce freight carbon emissions to net zero
- developing and implementing a stopping-places strategy
- planning to support amenity and infrastructure improvements
- moving to an integrated and multi-modal freight system where road, rail, and coastal shipping each play to their strengths and contribute to a safe, reliable, and resilient freight system that moves goods effectively with low emissions
- equipping appropriate remaining sections of the state highway network for use by high productivity motor vehicles (HPMV)
- supporting the development of business models and services that match goods and carriers for movement across all modes from origin to destination

- identifying the nature, scale, and location of damage to local roads from heavy freight vehicles, that pose funding challenges for affected local councils
- delivering transport infrastructure and services to maximise benefits
- ensuring regulation supports safe trialling and adoption of technologies, including new forms of mobility
- using transport to improve access to employment, education, essential services, social and cultural activities in higher-deprivation areas and isolated communities
- enabling development of key regional industries through transport investment
- ensuring availability of mobile coverage
- improving operational responses to disruptive events
- investing in metropolitan rail networks
- supporting amenity and infrastructure improvements to service international and domestic visitors
- managing rising transport costs so they don't have a negative impact on economic activity
- supporting resilient, reliable, and efficient freight and business travel
- supporting improvement of interregional passenger rail between cities
- separating freight and people on strategic networks to reduce movement conflicts
- supporting the development of intermodal freight terminals to facilitate transfers
- reducing interpeak congestion on freight networks.

Critical dependencies with other outcomes

Activities contributing to other outcomes can influence economic prosperity outcomes.

Resilience and security: Without climate adaptation to support transport system resilience, there's a risk of increased costs for people and freight. Ultimately, this will impact the economy.

Healthy and safe people: Road to Zero and *Tū Ake Tū Māia* will improve safety for people and freight with positive impacts on the economy.¹¹⁰

Inclusive access: With increased growth in urban centres, Waka Kotahi needs to work with industry and partners to achieve balance and fairness for the movement of people and goods.

Environmental sustainability: There are several focus areas within the *Emissions Reduction Plan* for which Waka Kotahi will lead or co-lead including supporting the decarbonisation of freight.



Resilience and security

New Zealand is a geologically active country. We often experience wild or extreme weather.

We face ongoing natural hazard events, like earthquakes and cyclones, that cause serious damage to infrastructure and communities.

Our transport system must anticipate both natural and human-made risks, and be prepared to recover from disruptive events.

The resilience and security outcome seeks to ensure communities can access economic and social opportunities regardless of unplanned disruptions to the transport system.

This outcome covers a range of issues and interventions for transport.

Resilience and security both deal with hazards and disruptions to the land transport system, whether they are natural (resilience) or human-made (security).

Challenges of resilience and security are vast and growing. Existing hazards such as seismic and volcanic activity remain. The risks and effects of climate change are rising.

New security risks could emerge as the transport system becomes more complex, interconnected, and integrated with digital systems.

There is no hard target for resilience and security. However, there is an expectation transport will support resilient and secure communities that can recover quickly and effectively from disruptive events.

This can be done across multiple activities, from strategies and plans through to delivery and operation.

Why is this important?

A well-functioning transport system is vital for responding to emergencies quickly. It helps communities and businesses resume activity after an emergency.

Planning for climate adaptation is critical to manage current and future vulnerabilities in the transport system.



Planning for climate adaptation is critical to manage current and future vulnerabilities in the transport system.

What are we currently doing about this outcome?

Improving resilience

Resilience risks are always changing.

Factors like a growing population, increasingly interconnected networks, and climate change affect distribution, frequency, and exposure to potential disruptive events.

Waka Kotahi has a range of activities to address resilience.

Waka Kotahi participates in the New Zealand Lifelines Council.¹¹¹ This council is made up of lifeline-utility organisations, like power companies, across government and sector boundaries. They work together to improve infrastructure resilience at a national and regional level.

The *Waka Kotahi Resilience Framework* outlines the strategic approach to land transport resilience.¹¹²

The *Resilience Framework* adheres to four principles:

- reduction of risk
- readiness
- responsiveness
- recovery.

It takes a holistic approach, covering the economic, physical, social, cultural, and impacts of risks and shocks.

One framework outcome is for communities to be less exposed to and better prepared for natural hazards and disruptive events.

The *National Resilience Programme Business Case* is an output from the *Resilience Framework*.¹¹³ It provides an evidence base for future planning and investment decisions. It identifies and rates current and future natural hazard risks to the land transport system.

High-priority risks need a range of responses. They also need a long-term view to consider the changing hazards of climate change.

An integrated-system response doesn't assume infrastructure will be maintained or upgraded to lessen risk – other interventions will be considered.

Response options include:

- **avoid** – avoid placing infrastructure in high-risk locations where possible
- **defend** – develop solutions to lessen the risk of disruption, like flood protection or slope stabilisation
- **accommodate** – plan for periodic disruption, like providing for rapid reinstatement, detour routes, and/or timely information
- **retreat** – re-route journeys away from the impacted area.

Adapting to climate change

Climate change (particularly sea level rise and more extreme/severe weather events) is increasing risks to the transport system.

Managing this risk will require adaptation across local and central government, communities, and iwi.

The *National Climate Change Risk Assessment* identified consequences for the land transport network because of temperature changes, severe weather events, and rising sea levels.¹¹⁴

The *National Adaptation Plan* focuses on:

- reducing vulnerability to climate change impacts
- enhancing adaptive capacity
- considering climate change in all levels of decision making
- strengthening resilience.¹¹⁵

This means infrastructure assets are made less vulnerable. This can be done by using renewal programmes to:

- improve adaptive capacity
- carry out preventative maintenance
- ensure new infrastructure is ready for climate change.

Waka Kotahi has developed *Tiro Rangi - Our Climate Adaptation Plan*. *Tiro Rangi*:

- shapes the Waka Kotahi response to the changing climate
- describes the role of Waka Kotahi in climate adaptation across the land transport system
- picks up the four National Adaptation Plan actions that Waka Kotahi leads or co-leads.

Tiro Rangi identifies priorities that underpin a Waka Kotahi adaptation response including:

- better understanding climate risks
- embedding climate adaptation into planning and decision making
- applying a Te Ao Māori worldview.

Improving security

As a crown entity, Waka Kotahi has adopted the *Protective Security Requirements*.¹¹⁶ These requirements outline expectations for:

- personnel
- information
- physical security
- security governance across public sector organisations.

Concerns about personal security can influence people's use of the land transport system, like active modes (walking and cycling) and public transport.

Some concerns might include being involved in an accident or being the victim of criminal offences, violence, or threats.

Issues can include:

- routes with poor visibility or lighting
- concealment spots
- lack of surveillance.

Early consideration of crime prevention through environmental design can help address these issues.

Waka Kotahi participates in the government's *New Zealand Crowded Places Strategy*.¹¹⁷ This strategy serves as a guide for owners and operators of crowded places. It advises on best practices for protecting people working in, using, or visiting public spaces.

Waka Kotahi has developed the Land Transport Security Programme 2022. The programme provides structure to prioritise, guide, and coordinate ongoing Waka Kotahi activities. It provides a strategic work programme to improve security of the land transport system, including people and assets.

Measuring progress

How are we tracking?

There are a few ways to measure how we're tracking and the progress being made.

The cost of emergency works on state highways is increasing, partly because of the increased number of storm events. This trend is expected to continue.

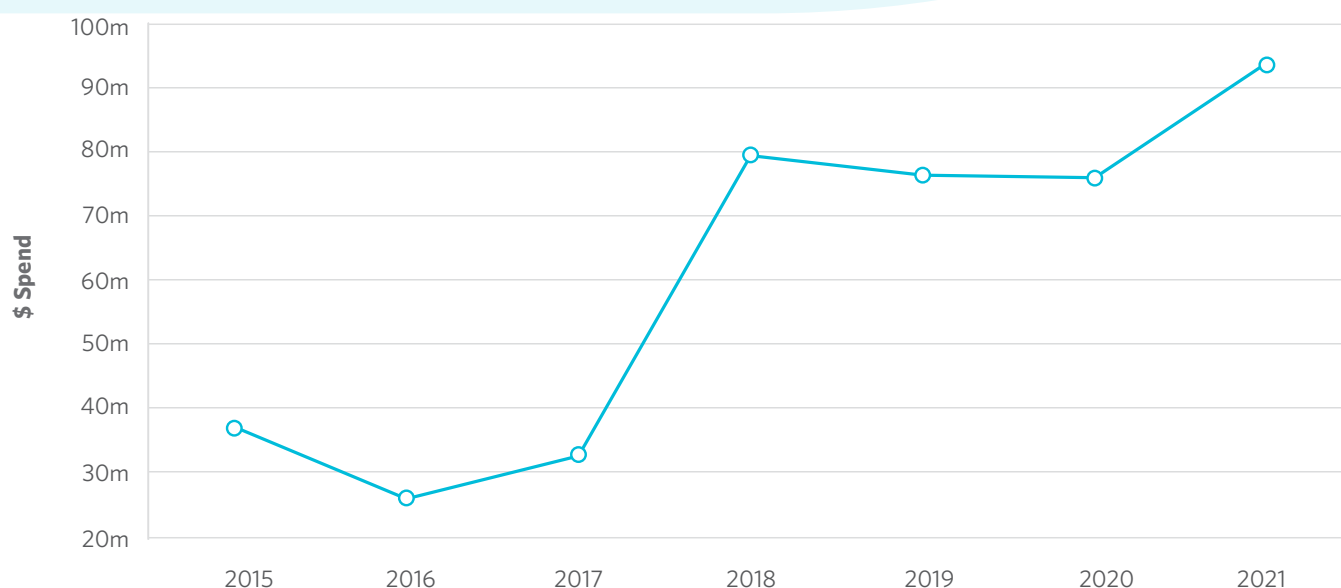
The *National Adaptation Plan* has highlighted the scale of the climate adaptation challenge and improved understanding of climate-related impacts.

Actionable data on climate impacts and resilience risks has improved through the *National Adaptation Plan* and the *National Resilience Programme Business Case*.¹¹⁸ This will inform future decision making.

System-wide action on climate adaptation has grown. This is because of national initiatives funded through the Climate Emergency Response Fund (CERF) and regional adaptation plans through local government.

System indicator – Annual cost of emergency works¹¹⁹

Figure 13



Looking ahead, what are the key challenges?

Some key challenges for this outcome in the future include:

- New Zealand is subject to significant seismic and geological risks.
- There is a lack of redundancy in parts of the land transport system – some regions rely on one or two critical lifelines to stay connected to neighbouring regions.
- Some existing corridors have a high risk of disruption. Climate impacts are expected to increase these risks.
- Climate change is already contributing to extreme and severe weather events resulting in more frequent flooding and bush fires. These events will happen more often.
- The rising costs of maintaining and repairing networks amidst growing disruptive events, like storms, flooding, sea-level rise, and high temperatures.
- Inconsistent and ad hoc approaches have been used across the transport sector to assess and respond to security risks.
- Māori communities in isolated rural and coastal areas will be disproportionately affected by the impacts of climate change.
- Further evidence is required on the locations of marae and their exposure to sea level rise, taking into account land movements from plate tectonics, volcanic activity, soil subsidence and other factors.

What do we still need to work on?

Improving resilience from natural hazards

An update to the *Strategic Resilience Framework* is underway and outlines key shifts for improving resilience:

- **Community-focused** – move away from asset or network availability towards community impacts. Improve understanding of different communities' tolerance and acceptance of risk, and how to maintain access to economic and social activities.
- **Collaborative** – work better with partners to improve transport resilience across the full transport system.
- **Comprehensive** – consider resilience across all hazards and risks and best ways to respond.
- **Pro-active** – be active and pre-emptive across the four principles of reduction of risk, readiness, responsiveness, and recovery. Consider a wide range of approaches to resilience risks.

The *National Resilience Programme Business Case* will aim to act and respond to priority risks. It will use the framework of avoid, defend, accommodate, retreat. It will consider and group risks according to region, corridor, and/or journey.

The programme of improvements in the *National Resilience Programme Business Case* include projects that will:

- reduce risk from natural hazards
- improve readiness of the transport system
- inform investment decision making for resilience.

Some improvements to be delivered include evaluating detour routes for key corridors and support plans for major risks, like seismic events.

We don't have shared data across the system about climate hazards and risk.

The *National Resilience Programme Business Case* does identify existing extreme and major risk sites along the state highway network. However, there's a lack of resource to address all sites. It also doesn't consider the locations of emerging risks.

Waka Kotahi is working on a resilience data platform. This will integrate data on historical risks and potential future impacts. It will help us understand current and future resilience challenges, including climate change.

This will help Waka Kotahi develop land transport resilience strategies, as well as social and economic assessment tools. These can be used to build resilient communities and infrastructure. They will assist land transport investment partners to prioritise effort and make informed decisions.

Adapting to climate change

The *National Adaptation Plan* has several actions across infrastructure and the built environment that will be lead, or supported, by Waka Kotahi.

As part of the development of *Tiro Rangi*, Waka Kotahi investigated nature-based solutions to climate adaptation.

The Climate Emergency Response Fund has funded the Māori Climate Action Platform. This will look into Māori-led responses to climate adaptation and mitigation.

Resource management reforms will inform future planning for resilience and climate change. Waka Kotahi will continue to work with local government on resilience and climate adaptation strategies. Future work will include looking at regional spatial strategies and managed retreat.

Our first *Tiro Rangi* laid the foundations for the next couple of years. Initially, actions build on existing initiatives. Those that unlock future action are prioritised.

Waka Kotahi will develop climate-change risk assessment tools specifically for the state highway network.

Improving security

The Land Transport Security Programme will initially focus on ensuring:

- security needs of land transport assets are met
- future assets are designed with protective security measures that are flexible and responsive to changing needs.

Like resilience, preparedness is a key component of land transport security. To improve our responsiveness and planning for emergencies, Waka Kotahi will create asset response plans to prepare for many security situations. This will take an all-hazards approach across the system and supply chain.

Waka Kotahi will continually update the security outlook for the land transport system. It will do this by ensuring:

- information is timely and effective
- intelligence flows internally for decision makers and partners.



Waka Kotahi is working on a resilience data platform. This will integrate data on historical risks and potential future impacts.

Areas of future focus to improve this outcome

Some areas of focus to improve this outcome:

- include climate adaptation in national and regional transport planning processes as part of a multi-outcome approach to build community resilience
- incorporate physical- and digital- security standards into all stages of building, management, and operations
- collaboratively build spatial tools to assess geological and hydrological risk so the transport sector can understand risk across the network
- make sure cybersecurity risks are safely managed across a connected transport system
- embed Te Ao Māori views into regional and local transport planning to work with communities on adaptation responses
- support the development of a digital resilience platform to understand risk across the transport network
- support planning and design work that prioritises natural hazards in high-risk areas with vulnerable communities and infrastructure
- plan and invest in extreme resilience risks on the state highway network
- use an adaptive planning approach to network disruption
- identify alternate places, routes, and modes to support resumed networks in times of disruption
- use local planning processes to prepare for climate issues
- plan with communities for when to defend, accommodate, and/or retreat
- better understand if access to Māori communities is more sensitive to climate-change impacts and where these impacts could be most felt
- better understand the locations of marae and their exposure to sea-level rise and other land factors like plate tectonics, volcanic activity, and soil subsidence.

Critical dependencies with other outcomes

Activities contributing to other outcomes can influence resilience and security outcomes.

Environmental sustainability: Activities that reduce carbon emissions can influence resilience. Reducing carbon emissions is critical to minimising climate impacts and helping climate adaptation.

Inclusive access: Equitable access to all modes and improved urban form can help communities take advantage of social and economic opportunities. This can help communities recover from disruptive events.

Economic prosperity: Improving the ability to move freight by rail and coastal shipping can:

- increase redundancy of nationally and regionally significant freight connections
- lead to less disruption of the transport system.

References

1. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
2. Statistics New Zealand (2019). Environment Aotearoa 2019. Accessed November 2022. <https://environment.govt.nz/assets/Publications/Files/environment-aotearoa-2019.pdf>
3. Statistics New Zealand (2017). Urban area population projections: 2013(base)-2043 update. Accessed November 2022. <https://www.stats.govt.nz/information-releases/urban-area-unit-population-projections-2013base2043-update-nz-stat-tables>
4. Statistics New Zealand (2019). 2018 Census population and dwelling counts. Accessed March 2022. <https://www.stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts>
5. Statistics New Zealand (2021). Subnational population estimates: At 30 June 2021 (provisional). Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-estimates-at-30-june-2021-provisional>
6. Statistics New Zealand (2022). Net migration loss continues. <https://www.stats.govt.nz/news/net-migration-loss-continues/>
7. Statistics New Zealand (2021). Subnational population projections 2018(base)-2048. Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
8. Statistics New Zealand (2021). Subnational population projections 2018(base)-2048. Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
9. Statistics New Zealand (2019). Environment Aotearoa 2019. Accessed November 2022. <https://environment.govt.nz/assets/Publications/Files/environment-aotearoa-2019.pdf>
10. Statistics New Zealand (2017). Urban area population projections: 2013(base)-2043 update. Accessed November 2022. <https://www.stats.govt.nz/information-releases/urban-area-unit-population-projections-2013base2043-update-nz-stat-tables>
11. Statistics New Zealand (2021). Subnational population projections 2018(base)-2048. Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
12. Statistics New Zealand (2021). Subnational population projections 2018(base)-2048. Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
13. Ministry of Transport (2021). Household travel. Accessed March 2022. <https://www.transport.govt.nz/statistics-and-insights/household-travel/>
14. Statistics New Zealand (2021). Subnational population projections 2018(base)-2048. Accessed March 2022. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
15. Statistics New Zealand (2020). Which industries contributed to New Zealand's GDP? Accessed March 2022. <https://www.stats.govt.nz/tools/which-industries-contributed-to-new-zealands-gdp>
16. The Treasury (2022). Budget economic and fiscal update 2022. Accessed May 2022. <https://www.treasury.govt.nz/sites/default/files/2022-05/befu22.pdf>
17. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
18. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
19. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
20. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
21. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
22. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>

23. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. Accessed July 2023. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
24. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. Accessed July 2023. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
25. NZ SeaRise Te Tai Pair o Aotearoa (2022). Global sea-level rise. Accessed June 2022. <https://www.searise.nz/>
26. NZ SeaRise Te Tai Pair o Aotearoa (2022). Global sea-level rise. Accessed June 2022. <https://www.searise.nz/>
27. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. Accessed July 2023. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
28. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. Accessed July 2023. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
29. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. Accessed July 2023. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
30. Commerce Commission New Zealand (2022). Annual telecommunications monitoring report, 2021 Key facts. Accessed September 2022. https://comcom.govt.nz/_data/assets/pdf_file/0019/279100/2021-Annual-Telecommunications-Monitoring-Report-17-March-2022.pdf
31. Stats NZ (2018). Households with access to a mobile phone in New Zealand. <https://figure.nz/chart/61KWjBRjOeE8rQQk>
32. Stats NZ (2018). Households with access to a mobile phone in New Zealand. <https://figure.nz/chart/61KWjBRjOeE8rQQk>
33. Waka Kotahi NZ Transport Agency (2020). Arataki technology & data background information. p5. <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/arataki-technology-and-data-information-august-2020.pdf>
34. Te Waihanganga, New Zealand Infrastructure Commission (2022). Rautaki Hanganga o Aotearoa, New Zealand Infrastructure Strategy. Accessed June 2022. <https://strategy.tewaihanganga.govt.nz/strategy/3-case-for-change>
35. Stats NZ (2022). Māori population share projected to grow in all regions. <https://www.stats.govt.nz/news/maori-population-share-projected-to-grow-in-all-regions/#:~:text=The%20proportion%20of%20people%20identifying,percent%20in%20Tasman%20and%20Otago.>
36. Stats NZ (2022). Māori population share projected to grow in all regions. <https://www.stats.govt.nz/news/maori-population-share-projected-to-grow-in-all-regions/#:~:text=The%20proportion%20of%20people%20identifying,percent%20in%20Tasman%20and%20Otago.>
37. Stats NZ (2022). Māori population share projected to grow in all regions. <https://www.stats.govt.nz/news/maori-population-share-projected-to-grow-in-all-regions/#:~:text=The%20proportion%20of%20people%20identifying,percent%20in%20Tasman%20and%20Otago.>
38. Stats NZ (2022). Māori population share projected to grow in all regions. <https://www.stats.govt.nz/news/maori-population-share-projected-to-grow-in-all-regions/#:~:text=The%20proportion%20of%20people%20identifying,percent%20in%20Tasman%20and%20Otago.>
39. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
40. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
41. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
42. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
43. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>

44. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Technical report – Pūrongo whaihanga. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-technical-report.pdf>
45. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Technical report – Pūrongo whaihanga. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-technical-report.pdf>
46. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
47. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
48. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
49. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
50. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
51. Waka Kotahi NZ Transport Agency (2020). Arataki. Our plan for the land transport system 2021-31 version 2. p24. <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/key-drivers-step-changes-levers-interventions-august-2020.pdf>
52. Kotler, A. (2021). Tested and effective: Mobility solutions from CIVITAS Living Lab projects. https://civitas.eu/sites/default/files/tested_and_effective_-_mobility_solutions_from_civitas_living_lab_projects_0%281%29.pdf
53. Ministry of Transport (2019). New Zealand transport outlook – Freight model. <https://www.transport.govt.nz/assets/Uploads/Data/Transport-outlook-updated/Freight-Model-Version-2-Documentation-20190423.pdf>
54. Ministry of Transport (2019). National freight demand study 2017/18. Accessed November 2022. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
55. Ministry of Transport (2019). National freight demand study 2017/18. Accessed November 2022. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
56. Ministry for the Environment (2022). National climate change risk assessment for New Zealand – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Main report – Pūrongo Whakatōpū. p76. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-main-report.pdf>
57. Ministry of Transport (2019). National Freight Demand Study 2017/18. Accessed November 2022. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
58. Ministry of Transport (2022). <https://www.transport.govt.nz/>
59. New Zealand Government (2019). Road to Zero: New Zealand's road safety strategy 2020-2030. p48. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
60. AA (2018). Crash causes: What happened? Accessed November 2022. <https://www.aa.co.nz/membership/aa-directions/driver/crash-causes-what-happened/>
61. Waka Kotahi NZ Transport Agency (2020). Arataki technology & data background information. p5. <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/arataki-technology-and-data-information-august-2020.pdf>
62. Ministry of Transport (2020). Upper North Island supply chain strategy. <https://www.transport.govt.nz/area-of-interest/infrastructure-and-investment/upper-north-island-supply-chain-strategy/>
63. Waka Kotahi NZ Transport Agency (2022). Board meeting minutes, March 2022. <https://www.nzta.govt.nz/assets/About-us-2/docs/board-meeting-minutes-2022/minutes-20220302.pdf>
64. Waka Kotahi NZ Transport Agency (2022). Total mobility around New Zealand <https://www.nzta.govt.nz/resources/total-mobility-scheme/total-mobility.html>
65. Beehive (2021). Government backs rural driver licensing support programme. <https://www.beehive.govt.nz/release/government-backs-rural-driver-licensing-support-programme>
66. Partners Porirua (2019). Government funds licence scheme for youth. <https://partnersporirua.org.nz/government-funds-licence-scheme-for-youth/>
67. Ministry of Transport (2019). Road to zero. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf p52
68. Ministry of Transport (2021). Transport indicators inclusive access. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access>

69. Ministry of Transport (2021). Transport indicators inclusive access. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access>
70. Ministry of Transport (2021). System indicator – Household spending on transport (2010–2019). <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access#element-1992>
71. Ministry for the Environment (2016). Health and air pollution in New Zealand 2016. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
72. Ministry of Transport (2021). Transport indicators healthy and safe people. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/healthy-and-safe-people>
73. Ministry of Transport (2019). Social cost of road crashes and injuries. <https://www.transport.govt.nz/assets/Uploads/Report/SocialCostof-RoadCrashesandInjuries2019.pdf>
74. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
75. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
76. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
77. Ministry of Transport (2020). Exposure to elevated levels of noise. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/healthy-and-safe-people#element-1953>
78. Ministry of Health (2022). Annual update of key results 2021/22: New Zealand health survey. <https://www.health.govt.nz/publication/annual-update-key-results-2021-22-new-zealand-health-survey>
79. Ministry of Transport (2019). Road to zero. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
80. Waka Kotahi NZ Transport Agency (2020). Toitū te taiao – Our sustainability action plan. <https://www.nzta.govt.nz/assets/resources/toitu-te-taiao-our-sustainability-action-plan/sustainability-action-plan-april-2020.pdf>
81. Ministry of Transport (2022). Te Ara Ki Te Ora – Te rīpoata Aroturuki ā-tau 2021 | Road to zero annual monitoring report 2021. <https://www.transport.govt.nz/assets/Uploads/Road-to-Zero-Monitoring-Report-2021.pdf>
82. Ministry of Transport (2022). Transport indicators – Healthy and safe people. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/healthy-and-safe-people/>
83. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
84. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
85. Ministry for the Environment (2020). National policy statement on urban development. <https://environment.govt.nz/publications/national-policy-statement-on-urban-development-2020>
86. Waka Kotahi NZ Transport Agency (2019). Keeping cities moving. <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Keeping-cities-moving.pdf>
87. Waka Kotahi NZ Transport Agency (2022). Release of the VKT evidence pack. Accessed November 2022. <https://www.nzta.govt.nz/planning-and-investment/national-land-transport-programme/viewupdate/290> (note: the evidence base requires a login)
88. Waka Kotahi NZ Transport Agency (2020). Toitū te taiao – Our sustainability action plan. <https://www.nzta.govt.nz/assets/resources/toitu-te-taiao-our-sustainability-action-plan/sustainability-action-plan-april-2020.pdf>
89. Waka Kotahi NZ Transport Agency (2008). State highway environmental plan: Improving environmental sustainability and public health in New Zealand. <https://www.nzta.govt.nz/assets/resources/environmental-plan/docs/environmental-plan.pdf>

90. Waka Kotahi NZ Transport Agency (2021). Te hiringa o te taiao – Our resource efficiency strategy. <https://www.nzta.govt.nz/assets/resources/te-hiringa-o-te-taiao-our-resource-efficiency-strategy/te-hiringa-o-te-taiao-our-resource-efficiency-strategy.pdf>
91. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. Accessed November 2022. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
92. Ministry of Transport (2021). Transport indicators – Environmental sustainability. Accessed November 2022. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/environment-sustainability#element-2526>
93. Ministry of Transport (2019). System indicator – Greenhouse gas emissions from the land transport system. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/environment-sustainability#element-2526>
94. Ministry of Business, Innovation and Employment (2019). Economic plan. <https://www.mbie.govt.nz/assets/economic-plan.pdf>
95. Ministry of Business, Innovation and Employment (2019). Economic plan. <https://www.mbie.govt.nz/assets/economic-plan.pdf>
96. New Zealand Productivity Commission (2021). Productivity by the numbers. <https://www.productivity.govt.nz/assets/Documents/productivity-by-the-numbers/Productivity-by-the-numbers.pdf?vid=2>
97. Sage Journals (1999). Size, sprawl, speed and the efficiency of cities. <https://journals.sagepub.com/doi/10.1080/0042098992638>
98. Waka Kotahi NZ Transport Agency (2013). How does public transport benefit New Zealanders. <https://www.nzta.govt.nz/assets/resources/public-transport-information-pack/docs/public-transport-information-pack-no-1.pdf>
99. Auckland Transport Alignment Project. (2018). Auckland transport alignment project. <https://www.transport.govt.nz/assets/Uploads/Report/ATAP2018-v2.pdf>
100. Waka Kotahi NZ Transport Agency (2013). How does public transport benefit New Zealanders. <https://www.nzta.govt.nz/assets/resources/public-transport-information-pack/docs/public-transport-information-pack-no-1.pdf>
101. Waka Kotahi NZ Transport Agency (2013). How does public transport benefit New Zealanders. <https://www.nzta.govt.nz/assets/resources/public-transport-information-pack/docs/public-transport-information-pack-no-1.pdf>
102. Waka Kotahi NZ Transport Agency (2013). How does public transport benefit New Zealanders. <https://www.nzta.govt.nz/assets/resources/public-transport-information-pack/docs/public-transport-information-pack-no-1.pdf>
103. Waka Kotahi NZ Transport Agency. (2021). HPMV permit questions & answers. <https://www.nzta.govt.nz/commercial-driving/high-productivity/hpmv-permit-questions-and-answers/>
104. Ministry of Transport (2021). System indicator – Reliability and predictability: People and freight <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/economic-prosperity#element-2076>
105. Ministry of Transport (2019). Hīkina te Kohupara – Kia mauri ora ai te iwi. Transport emissions: Pathways to net zero by 2050. www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinakeKohuparaDiscussionDoc.pdf
106. Ministry of Transport (2021). System indicator – Travel time reliability for freight (by rail). <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/economic-prosperity#element-2076>
107. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan: Table of actions. <https://environment.govt.nz/assets/publications/Files/Aotearoa-New-Zealands-first-emissions-reduction-plan-Table-of-actions.pdf>
108. Ministry for the Environment (2022). Emissions reduction plan. <https://environment.govt.nz/assets/Emissions-reduction-plan-chapter-10-transport.pdf>
109. Ministry of Housing and Urban Development (2022). Enabling housing density. <https://www.hud.govt.nz/urban-development/enabling-housing-density/>
110. Ministry of Transport (2019). Road to zero. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
111. New Zealand Lifelines Council (2022). <http://www.nzlifelines.org.nz/>

112. Waka Kotahi NZ Transport Agency (2018). 2018 Resilience framework. <https://nzta.govt.nz/assets/Highways-Information-Portal/Technical-disciplines/Resilience/Resilience-response-framework/transport-resilience-framework.pdf>
113. Waka Kotahi NZ Transport Agency (2020). National resilience programme business case. <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/resilience/national-resilience-programme-business-case/>
114. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Main report. <https://environment.govt.nz/publications/national-climate-change-risk-assessment-for-new-zealand-main-report/>
115. Ministry for the Environment (2022). Adapting to climate change. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/>
116. Protective Security Requirements (2022). <https://protectivesecurity.govt.nz/>
117. New Zealand Police (2020). Crowded places strategy. <https://www.police.govt.nz/advice-services/protecting-crowded-places-attack/crowded-places-strategy>
118. Waka Kotahi NZ Transport Agency (2020). National resilience programme business case. <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/resilience/national-resilience-programme-business-case/>
119. Ministry of Transport (2021). System indicator- Annual cost of emergency works. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/resilience-and-security>

Arataki

Lenses

September 2023 v1.1

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The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. This includes the new Climate Change Adaptation Lens added to the *Lenses* section.



Climate change adaptation lens

This section pulls together all available evidence and information on climate change adaptation that was included in the March 2023 release of *Arataki*. Some minor updates have been made.

We need more evidence to support climate change adaptation in the context of the Equity Lens and the outcomes of environmental sustainability, inclusive access, and healthy and safe people. We will address these in future updates of *Arataki*.

This section serves as a foundation for future development of the Climate Change Adaptation Lens for *Arataki*, to be developed collaboratively with partners.

At a glance

To support wellbeing and create great places to live in Aotearoa New Zealand, the transport sector needs to focus less on the physical movement of people and goods (mobility), and more on safe, sustainable access and connectivity for all. This shift requires integration with digital, urban development, energy, and other related systems.

To achieve this, we need to adapt to climate change and improve resilience.

In Aotearoa, we are significantly exposed to natural hazards like floods, erosion, landslides, and coastal inundation. Around 750,000 New Zealanders, and 500,000 buildings worth more than \$145 billion, are located near rivers and in coastal areas already exposed to extreme flooding.¹

Climate change and more frequent extreme weather events mean there are significant challenges ahead. We need to respond in different ways to build greater resilience. There will be ongoing impacts on communities and the transport networks that connect them.

The transport sector will need to work with communities and infrastructure providers to adapt by:

- identifying at-risk areas
- making plans to manage impacts
- considering different approaches to rebuilding or moving away from high-risk locations.

Together we need to find new solutions and identify long-term options that reflect the diverse requirements for urban and rural communities.

Disruption from climate change should be managed through adaptive and timely responses. The way the land transport system is planned, operated, and managed will increasingly respect and integrate Te Tiriti o Waitangi and a Te Ao Māori perspective.

Severe weather events are already affecting the land transport system.² As we move forward, these events will occur more often. This will threaten people's safety, disrupt transport services, and affect infrastructure.

It will also impact the predictability and reliability of travel routes. This will mean looking at a different mix of transport options, like including more water-based travel, to provide network backup to minimise downtime (redundancy) and system resilience.

How the system is maintained, operated, and developed will be different. Nature-based solutions will be used to adapt to climate change.

Our ways of working will be different. As the nature of climate change is better understood, the transport sector will work with communities to plan when to defend, accommodate, and retreat.

The government's first *National Adaptation Plan* sets the direction for how Aotearoa will:

- adapt to the unavoidable impacts of climate change
- address key climate risks up to 2028.

The *National Adaptation Plan* outlines actions about:

- reforming institutions to be fit for a changing climate
- providing accessible data, information, and guidance to reduce climate risks
- embedding climate resilience across government strategies and policies.

Waka Kotahi has committed to the following actions in the *National Adaptation Plan*:

- integrating adaptation into decision making
- progressing the Rail Network Investment Programme with Te Manatū Waka Ministry of Transport
- investing in public transport and active transport with Te Manatū Waka
- developing and implementing a climate adaptation plan, known as *Tiro Rangi*.³

Outlook

Climate change is already impacting the land transport system and will continue to do so for decades to come. The transport system will have to adapt to escalating impacts from climate change. This includes sea level rise as well as increasingly severe and frequent climate-related events, like storms, droughts, floods, and fires.

At the same time, we will need to continue focusing on reducing emissions to meet net-zero targets by 2050.⁴

Climate change must be part of all decision making, to ensure the infrastructure and services we provide:

- are resilient to climate change impacts
- enable emissions reductions
- continue to support the needs of New Zealanders.

To achieve our long-term goals, the *National Adaptation Plan* provided the framework to avoid, protect, accommodate, and retreat. A combination of these strategies should be adapted to each situation, depending on the location and amount of time to act. Nature-based solutions will also help us adapt to and lessen the impacts of climate change. Adaptation strategies should be built into long-term planning.

We can be proactive and choose to:

- avoid building in areas where future climate hazards have been identified
- use transport-oriented development in the right locations.

Infrastructure in urban and rural communities is highly interdependent. Extreme weather has the potential to affect many systems and cause a chain of impacts. For example, disruption to transport can prevent access to critical infrastructure, such as power, water, and telecommunications; these resources are also essential to emergency response and recovery.⁵ This can also lead to cyclical impacts that affect transportation. For example, if an area loses power, then electric vehicles cannot be charged.

Urban communities

Urban transport networks play an important role in moving large numbers of people and freight. Increasing levels of disruption and delay can affect access to essential services on roads, rail lines, bus routes, ferries, and cycle routes.

The impact of severe weather events on multiple modal networks can be complex, widespread, and cascade down the land transport system. The closure of main roads can lead to delays and congestion, which can spread if traffic shifts to alternative routes. Extreme weather can cause delays and cancellations of public transport, affecting reliability and user comfort. Disruption to transport can prevent access to other critical infrastructure such as power, water, or telecommunications, which may need repair.⁶

Urban areas have more alternative routes and modes, but network efficiency may still be impacted when there's additional pressure on areas that are still functioning. Although disruption in urban areas can sometimes be short-lived, it has the potential to affect many people at significant economic cost.⁷

Current approaches to urban development have generally resulted in low-density, car-dependent development without enough consideration of where people live, work, study, and play. These environments are poorly suited to adapting to future drivers of change, such as an ageing population or climate change.

For example, to enable retreat we could relocate transport infrastructure and other assets away from locations exposed to climate-related hazards, such as coastal areas. We could improve system resilience by providing multiple travel modes and alternative routes for more options.⁸

Decisions around how to recover from disruption and provide a more resilient network need to balance cost, access, and equity. In some cases this could mean a reduced level of service.

Future opportunities, particularly around technology, mobility as a service, and connected vehicles, should be leveraged. Integrating transport investment and resourcing decisions within the urban transport, spatial planning, and development system is essential. This will help transform urban mobility from car dependency towards more sustainable, adaptable, and safer forms of transport. Ultimately, transport can play a role in making urban environments great places to live by creating green spaces, providing natural resilience, and connecting communities.

Rural communities

Severe weather events may mean rural and coastal communities grow more isolated as:

- infrastructure is damaged more frequently
- service outages last longer
- repair costs increase.

Some communities rely on road transport for access and economic activity, and often don't have alternative routes or mode options. This means these locations may not be accessible for residents, businesses, tourists, recreational visitors, and essential services.

Decisions around how to recover from disruption and provide a more resilient network will need to balance cost, access, and equity. In some cases this could mean reduced levels of service, use of alternate modes, or support for communities to adapt to intermittent service.

Māori

Māori as tangata whenua are particularly sensitive to the impact of climate on the natural environment for social, economic, cultural, and spiritual reasons.⁹

Many Māori communities are in rural and remote locations. These areas are particularly vulnerable to the effects of climate change on homes and infrastructure.

Of the 191 marae in Aotearoa New Zealand within one kilometre of the coast, about 47 are potentially exposed to a 100-year extreme sea level now and in the future.

Changing climate also threatens sites of cultural significance like marae, urupā (burial grounds), wāhi tapu (sacred sites), and mahinga kai (food gathering sites).¹⁰

Many Māori depend on primary industries for their livelihoods. In some places, climate change may alter ways of using mahinga kai or rongoā crops (medicinal plants). Coastal impacts could disrupt access to marae or wāhi tapu.¹¹

Impacts on Māori and the wider economy could limit whānau access to:

- food
- electricity
- housing
- health services.¹²

These limitations could compound existing inequalities of Māori wealth and wellbeing.¹³

The socio-economic disparities between Māori and non-Māori communities mean sensitivity to climate change impacts and risks are higher for Māori society.¹⁴

Currently nearly all Māori land is Māori freehold land. There are about 1.47 million hectares of Māori freehold land, which makes up roughly 5% of all land in Aotearoa.¹⁵ Large proportions of Māori freehold land are located in low-lying and coastal areas, which results in higher exposure to damage from rising seas. Some land is located by rivers and lakes, while other areas contain fragile environments, such as wetlands. These areas are at risk of erosion, storm surges, and flooding.¹⁶ The primary sector, which includes agriculture, forestry, and fishing, makes up \$23 billion of the total Māori asset base of an estimated \$68.7 billion.¹⁷ This means a large portion of the Māori economy is vulnerable to the impacts of climate change.

There are also particular challenges to responding to climate change impacts and risks for Māori communities. Around 30% of Māori freehold land is believed to be landlocked and remote, which makes it difficult to make infrastructure improvements for resilience.¹⁸ The governance and management activities of Māori freehold land are restricted by Te Ture Whenua Māori Act The Māori Land Act (1993). Multiple and absentee ownership can complicate preparing for climate change.

Many Māori communities are in coastal regions and adjacent to rivers. This means access roads to marae are often exposed to flooding, landslides, and coastal processes, like changing sea levels. Damage to the transport network could cut off marae and wider Māori communities on a more frequent basis.¹⁹

These challenges especially impact young people, Māori, Pasifika, and vulnerable segments of the rural community. If we make poor decisions about how we operate and manage the land transport system, this will only contribute to those existing challenges.

Further evidence is needed to understand the:

- scale of the issue
- availability of mahinga kai and food production on Māori land
- accessibility to marae
- locations where impacts could be greater for Māori than other groups, or if a different response is required.

The first *National Adaptation Plan* notes that establishing a platform for Māori climate action is the most important way government can build a climate-response partnership with Māori. This platform will build:

- Te Tiriti partnership
- greater recognition of Māori rights and interests, including Treaty settlement commitments.

The platform will build on three focus areas:

- embed partnership and representation
- support Māori-led strategy and alignment
- activate kaupapa Māori, tangata Māori solutions.

Impact on the land transport system

There are many uncertainties regarding the future impacts of climate change.

Adapting to the impact of climate change will require refocused effort. This means not just building back what's there now following disruption, but increasing resilience for the future. This will require working with communities to find new ways forward and develop plans for when to defend, accommodate, and retreat.

Analysis of the potential impacts of climate change on the transport system will also need ongoing work and updates for future planning and decision making.

Climate change events

Climate change will increase the frequency and severity of climate-related hazards such as:

- flooding
- coastal inundation and erosion
- landslides
- high winds
- heatwaves
- drought
- wildfires.

The consequences of climate impacts will extend far beyond damage to transport infrastructure. It will also impact the economy and affect the lives and livelihoods of people who rely on our land transport system.²⁰

The land transport system will have to adapt to the escalating impacts from climate change.

Climate change must be part of all decision making, ensuring the infrastructure and services we provide:

- are resilient to climate change
- enable emissions reductions
- continue to support the needs of New Zealanders.

There were two severe weather events at the start of 2023. In January, the Auckland Anniversary Weekend floods caused flooding, landslips, and storm damage, resulting in road closures in Te Tai Tokerau Northland, Tāmaki Makaurau Auckland, and Waikato. In February, Cyclone Gabrielle caused flooding and landslips resulting in closures to roads and railway lines in Te Tai Tokerau, Tāmaki Makaurau, Waikato, Tairāwhiti Gisborne, and Te Matau-a-Māui Hawke's Bay.²¹

The South Island experienced the fifth driest summer on record in 2022 to 2023.²² Despite this, Marlborough is still in recovery mode following the floods of August 2022, when slips and road damage cut off communities in Canvastown and Rai Valley from Te Taihū-o-te-Waka-a Māui Marlborough and Whakatū Nelson.²³

Even with aggressive strategies to reduce greenhouse gas emissions, the impacts of climate change will continue for decades.

Changing weather patterns

Changing weather patterns will continue increasing the frequency and severity of flood events, storm surge, and landslips. These weather events will affect communities and the transport networks that connect them.

Hotter temperatures and wildfires

Hotter temperatures and wildfires can damage transport infrastructure, causing buckled railway lines and damaged roads.

Sea level rise

Most people in Aotearoa New Zealand live near water. Many are within a few kilometres of the coast, or next to rivers and lakes.

From 1901 to 2010, global sea levels rose an average of 19cm total.²⁴ Between 1990 and 2016, global sea levels rose an average of 3.4mm per year.²⁵

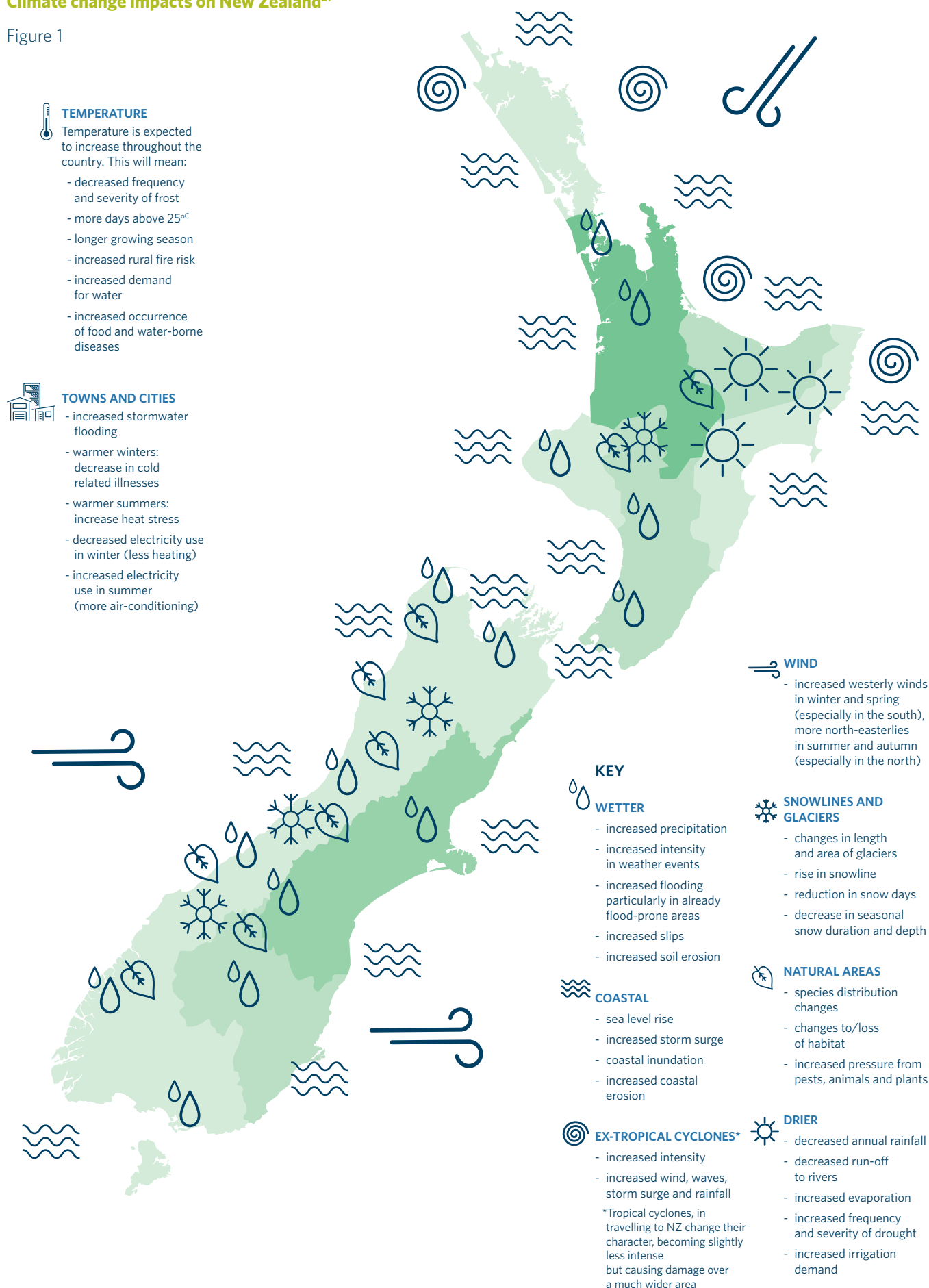
Rising sea levels won't be felt evenly around Aotearoa. Impacts will vary depending on a range of factors like topography, coastal processes, and vertical-land movement.

The most affected coastal areas will experience sea level rise of 30cm in 10 to 20 years, and one metre by 2060.²⁶

Rising sea levels mean tides, waves, storm surges, and elevated groundwater will reach further inland. This will cause more frequent and extensive flooding in low-lying areas. Coastal communities and routes will be impacted by increased erosion and receding shorelines.

Climate change impacts on New Zealand²⁷

Figure 1



Impact on major transport corridors

The need for maintenance and renewal along major transport corridors is likely to increase. This could result in more delays and divert costs from other investments.

The risk of a major disruption will increase for interregional connections and the economic and social interactions that rely on them. Long detours and delays for freight would have significant economic impact.

Disruption to supply chains and the movement of exports and imports could result in backlogs at airports, seaports, and freight hubs. This might lead to product shortages for consumers or lost income for producers.²⁸

Impact on modes

There are several modes in the land transport system. These ways of moving play different roles based on their strengths, locations, networks, levels of service, and user preferences.

Maintaining and building network resilience, like planning for extreme weather events and climate change, is currently an operational challenge for road and rail transport.

In the future, climate change may require a review of the location of some roads because of flooding and landslides. With sea levels forecast to rise, coastal erosion and inundation in low-lying coastal areas will increase the need for repairs, relocation, and preventative measures.

It won't always be practical or affordable to continue providing the same levels of service across the network. Some parts are likely to have reduced levels of service, depending on their importance and access requirements. This could mean more temporary fixes, like one-lane sections or bridges, are needed to maintain access.

Where these approaches aren't possible and there are low-access requirements, tough decisions about retreating from the network, or providing access through other means like coastal shipping, will have to be made in partnership with communities.

Impact on strategic networks

Strategic networks are the most critical parts of the country's land transport network. They form the backbone of the entire transport system, supporting the most essential movements of people and freight across all modes.

There are some key climate challenges and opportunities in achieving resilience and security on strategic networks.

Strategic networks provide lifeline connections between populated areas, ports, and other infrastructure. They need to be resilient to perform their functions effectively.

A well-functioning strategic network is vital for:

- responding to emergencies quickly
- restoring communities and business activity after an emergency.

As climate-related impacts increase, adaptation planning is critical for managing future vulnerabilities in the transport system and the communities served.

There is a lack of redundancy, or ways to minimise downtime, in parts of the strategic network. Some regions depend on one or two critical lifelines to stay connected to neighbouring regions.

Emergency and maintenance costs on strategic networks are rising. This is mostly because of climate change. Areas of the transport network are experiencing more significant climate-related impacts, especially from storms and flooding. This is expected to continue and get worse.

Challenges are likely to remain the same, but grow in:

- magnitude
- frequency
- duration.

To continue as lifeline connections, the strategic network will need to balance resilience, service levels, and maintenance costs.

As we expand or change strategic networks in the future, we'll need to make sure we don't create new resilience challenges.

Some key areas to focus efforts are:

- consider how to maintain lifeline connections and service levels during disruption
- develop a greater understanding of the changing risks of climate-related hazards
- use an adaptive-management approach to climate change when maintaining and operating the transport network.

Our strategic networks plan

Our standard approach across most strategic networks, especially well-developed networks, is a series of programmes that maintain, renew, and make the most of existing infrastructure. Making the most of the existing network and resilience are key.

We will build our understanding and management of the:

- physical risks to assets
- risks that hinder our ability to deliver to expectations, maintain service levels, and fund priorities.²⁹

To ensure critical parts of the strategic networks continue to function, decisions must be made about programme investment standards and timings.

Programmes should avoid rebuilding infrastructure that's not fit for purpose. Instead, the focus should be on improvements to all modes and safety. Programmes will need to adapt to change over time.

One of the key drivers where transformational change may be required on the strategic road network is when significant safety, resilience, or reliability issues with national-scale implications can't be addressed through incremental improvement programmes.

Current and future strategic networks

During the next 30 years, improving climate change resilience along strategic networks will be one of the most significant drivers of change.

For example, transformational change is needed on sections of the strategic network from Kawakawa to Kaitia, especially through Mangamuka Gorge. This route connects many isolated communities, but is extremely vulnerable to ongoing closures from slips, resulting in extended, repeated, and ongoing closures. Because of climate change, these closures are expected to become more frequent.

Previous work on this section of the strategic network has confirmed the:

- entire route is vulnerable to flooding, rockfalls, and slips – some parts have limited redundancy (ability to minimise downtime when disruption occurs)
- topography and geology is challenging
- alternate routes are limited and substandard.

The strategic direction and next steps are:

- fast-track planning work to respond to current closures
- investigate what's required to achieve a long-term solution to current slip vulnerabilities
- investigate potential alternative routes to existing connections.

For wider context relating to the current and future strategic networks, see the *Land Transport Modes and Strategic Networks* section of *Arataki*.

Land Transport Modes and Strategic Networks



Making progress

The land transport system will need to deliver significant change to achieve multiple outcomes over the coming years. We need to shift approaches to find effective and efficient solutions.

Climate change adaptation planning will help improve the resilience of the transport system. It will also help ensure we recover quickly when disruption occurs.

We will engage with system changes already underway, both at a national level, such as the resource management reform, and internally, like the *State Highway Strategy*. We'll then leverage these system changes to influence investment direction, like the *Government Policy Statement on Land Transport*, with the goal of enabling long-term investment in climate adaptation.³⁰

Our transport system needs to:

- prepare for natural and human-made risks
- make plans to recover from disruptive events.

Some parts of the country depend on one or two transport links to stay connected. Maintaining these links during severe weather or natural disasters is a challenge.

Some transport corridors are in areas with extreme and high risk of disruption. Climate change is expected to increase the frequency of these risks.

Adapting to climate change must be a focus for strategic networks so these routes continue to function as important parts of the network. In some places this may mean changing the mode mix or providing lower service levels.

Highly impacted parts of the network are also expensive to maintain and operate, and often have limited funding. This is another reason why new approaches are needed.

We will maximise value from transport infrastructure and services by:

- boosting network resilience by maintaining critical parts of the network
- addressing immediate climate change and extreme weather challenges in high-risk areas.

New Zealand's *National Adaptation Plan* sets objectives to improve resilience of infrastructure by:

- reducing vulnerability of exposed assets
- ensuring all new infrastructure is fit for a changing climate
- using renewal programmes to improve our ability to adapt.

New approaches to recovering from disruption should be considered like:

- using an adaptive-management approach to decision making
- adapting to new conditions
- reducing service levels
- providing access through alternative means like coastal shipping
- using other ways of travel.

Key actions to make progress:

- Build resilient communities by including climate adaptation in national and regional transport planning.
- Build resilience in rural and coastal communities by making adaptation a core and urgent element of transport planning, especially for high-risk areas and connections.
- Ensure climate change is allowed for in physical- and digital-security standards for construction, asset management, and operations.
- Embed Te Ao Māori views into regional and local transport planning to work with communities on adaptation responses.
- Work with Māori to understand if Māori communities are more sensitive to climate change and where impacts could be greatest.
- Collaboratively build spatial tools to assess and understand geological and hydrological risk across the network.
- Support the development of a digital hazards and risks platform across the transport network.
- Support planning and design work that identifies natural hazards in high-risk areas with vulnerable communities and infrastructure.
- Plan and invest in managing extreme resilience risks on the state highway network.
- Work proactively with communities to assess approaches to dealing with extreme events and climate change before events occur.
- Use an adaptive planning approach to support future resilience.
- Identify alternate places, routes, and modes to support alternative networks that can be used in times of disruption.
- Use local planning processes to prepare for climate issues.
- Plan proactively with communities for when to avoid, protect, accommodate, and retreat.
- Better understand the locations of marae and the exposure to sea level rise and other land factors, like plate tectonics, volcanic activity, and soil subsidence, that create hazards for the transport system.

Regional context and directions

The regional directions provide guidance for 14 regions in Aotearoa New Zealand. Each regional section includes a high-level summary, context, and outlook to set the scene. This is followed by:

- detailed guidance to progress the five transport outcomes from Te Manatū Waka Ministry of Transport
- specific needs for urban areas
- a summary of where effort should be focused during the next 10 years.

Refer to the section on climate adaptation and regional direction for information on the five regions affected by the Auckland Anniversary Weekend floods and Cyclone Gabrielle in 2023:

- Te Tai Tokerau Northland
- Tāmaki Makaurau Auckland
- Waikato
- Tairāwhiti Gisborne
- Te Matau-a-Māui Hawke's Bay.

Regional Directions



Climate change adaptation and transport outcomes

Resilience and security

Given the uncertainty of climate change, an adaptive-management approach is necessary to provide a structured, iterative process of robust decision making.

The *National Resilience Programme Business Case* is an output of the *Waka Kotahi Resilience Framework*.³¹ The business case provides an evidence base for future planning and investment decisions. It identifies and rates current and future natural hazard risks to the land transport system.

Further work is underway in the five regions affected by the Auckland Anniversary Weekend floods and Cyclone Gabrielle. This work will determine how to balance access and costs to improve the resilience of the network.

High-priority risks need a range of responses. We also need to take a long-term view when considering the changing hazards of climate change.

An integrated-system response doesn't assume infrastructure will be maintained or upgraded to lessen risk; other interventions will be considered.

Response options include:

- **avoid** – avoid placing infrastructure in high-risk locations where possible
- **protect** – develop solutions to lessen the risk of disruption, like flood protection or slope stabilisation
- **accommodate** – plan for periodic disruption, like providing for temporary inaccessibility, rapid reinstatement, detour routes, and/or timely information
- **retreat** – re-route journeys away from the impacted area.

Climate change, particularly sea level rise and more extreme weather events, presents increased risk to the transport system. The transport sector will work with communities to plan when to defend, accommodate, and retreat. Adapting to climate change means the land transport system is preparing for, and adjusting to, the impacts of a changing climate so the land transport system is resilient.

The *National Adaptation Plan* focuses on:

- reducing vulnerability to climate change impacts by enhancing adaptive capacity
- considering climate change in all levels of decision making
- strengthening resilience.

To make infrastructure less vulnerable, renewal programmes need to:

- improve adaptive capacity
- carry out preventative maintenance
- ensure new infrastructure is ready for climate change.

Waka Kotahi has developed *Tiro Rangi – Our Climate Adaptation Plan*. *Tiro Rangi*:

- shapes the Waka Kotahi response to the changing climate
- describes the role of Waka Kotahi in climate adaptation across the land transport system.

It also includes the four actions in the *National Adaptation Plan* that Waka Kotahi leads or co-leads.

Tiro Rangi identifies priorities that underpin a Waka Kotahi adaptation response including:

- better understanding climate risks
- embedding climate adaptation into planning and decision making
- applying a Te Ao Māori worldview.

Ways to measure how we're tracking and the progress being made are still to be developed.

The *National Adaptation Plan* has highlighted the scale of the climate adaptation challenge and improved understanding of climate-related impacts.

Actionable data on climate impacts and resilience risks has been improved through the *National Adaptation Plan* and the *National Resilience Programme Business Case*. This will inform future decision making.

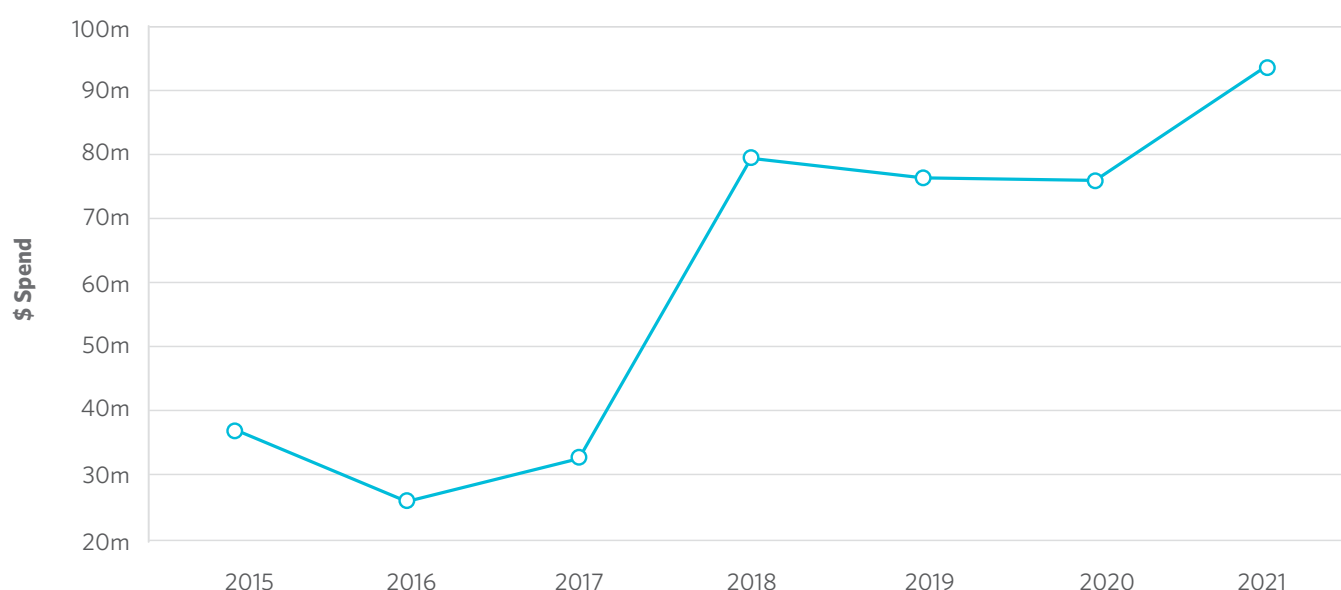
System-wide action on climate adaptation has grown. This is because national initiatives are funded through the Crown and regional adaptation plans through local government.

Some key challenges for this outcome as we move forward:

- There is a lack of redundancy in parts of the land transport system – some regions rely on one or two critical lifelines to stay connected to neighbouring regions.
- Some existing corridors are at high risk of disruption; climate impacts are expected to increase these risks.
- Climate change is already contributing to extreme and severe weather events resulting in more frequent flooding and slips; these events will happen more often.
- The rising costs of maintaining and repairing networks amidst growing climate impacts, like storms, flooding, sea level rise, and high temperatures.
- Māori communities in rural and coastal areas will be disproportionately affected by climate change impacts.

Emergency works spend³²

Figure 2



What do we still need to work on?

The *National Adaptation Plan* has several actions across infrastructure and the built environment that will be lead, or supported, by Waka Kotahi.

A key action in the plan is to investigate nature-based solutions for adapting to climate change.

The Climate Emergency Response Fund has funded the Māori Climate Action Platform. This platform will look into Māori-led responses to climate adaptation and mitigation.

Resource management reforms will inform future planning for resilience and climate change. Waka Kotahi will continue to work with local government on resilience and climate adaptation strategies. Future work will include collaboration on regional spatial strategies and managed retreat.

Our first *Tiro Rangi* set the foundations for the next couple of years. Initially, actions will build on existing initiatives. Those that unlock future action will be prioritised.

Waka Kotahi will also develop climate-change risk assessment tools specifically for the state highway network.

Environmental sustainability

Reducing carbon emissions worldwide is critical to mitigating the impacts of climate change. Activities that reduce carbon emissions can also contribute to resilience actions. Using nature-based solutions to increase resilience and reduce greenhouse gas emissions supports environmental sustainability. We will address this in more detail in future updates of *Arataki*.

Inclusive access

Climate change and extreme weather events will continue to impact many communities and groups. An inclusive and equitable approach to resilience would seek to manage these impacts for all communities.

Remote communities rely heavily on lifeline infrastructure. Severe weather events and sea level rise can impact these communities and cut them off from services for days. Some people that live in these locations are less able to respond quickly, like those that are lower-income, elderly, or mobility-restricted.

To support more equitable, long-term outcomes, we need to:

- continue targeted resilience programmes, ensuring all communities are appropriately supported
- look for new ways to keep communities connected through technology
- find ways to increase resilience of lifeline utilities like electricity, water, and communications, and better integrate this into the land transport network
- design resilience programmes that recognise some communities have limited access and need different support if lifelines are cut off.

There is currently little evidence about the impact of climate change on inclusive access and equity. We will address this in future updates of *Arataki*.

Economic prosperity

Climate change is already impacting the economy and will continue to do so with the rising costs of network resilience.

All regions have experienced extreme weather events, such as flooding and drought. The severity and frequency of these events is expected to grow.

Over the coming decades, parts of the country will become wetter, or drier and warmer. This may lead to changes in the nature and location of primary production. It may also affect businesses and freight that support the primary sector.

Tangata whenua are especially vulnerable to the effects of climate change.³³ We know that during previous recessions and COVID-19 lockdowns there were greater impacts on Māori. There are risks and opportunities for the Māori economy, particularly because of asset dominance in natural, resource-based sectors.

Significant growth in Te Ōhanga Māori (the Māori economy) is set to continue. This will be seen in the proportion of Māori in the labour force, as well as a diversified asset base of Māori employers, entities, and self-employed Māori.

Freight

Much of the strategic network used to move freight is vulnerable to extreme natural hazards. For example, in some locations that are important for the movement of goods, future sea level rise will greatly increase coastal flooding, erosion, and groundwater levels.

Climate change may also reduce production quality and quantity across primary industries like horticulture, viticulture, agriculture, and forestry.³⁴

The amount of suitable land for primary industries will decrease as sea levels rise and low-lying coastal areas are affected by inundation and groundwater salinisation.

The volume of freight of supply-driven primary industries, like dairy and meat, is forecast to grow less than 2% by 2033 and 0.4% by 2053.³⁵

Healthy and safe people

As we know from the severe weather events of 2023, climate change presents risks to the health and safety of the people of Aotearoa New Zealand. More work needs to be done to better understand this outcome. We will address this in future updates of *Arataki*.

For wider context relating to the five transport outcomes from Te Manatū Waka Ministry of Transport, please see the *Strategic Context*.

Strategic Context →

Equity lens



The land transport system enables people to access work, healthcare, essential services, and social events. However, access is not evenly spread through different places or groups in the community.

Equity refers to the distribution of fairness and justice. Some places are better served by a range of services than others. Sometimes services aren't always fairly and equitably accessible to all people regardless of their income, race, gender, disability, age, or other factors.

Transport equity

Having an equitable system means no one is excluded from experiencing fairness and justice. An equitable system recognises people have different needs and opportunities available to them. Interventions and activities are needed to help people or communities who are excluded, or experience disadvantages.

Transport equity is when groups and individuals have access to affordable transport options that meet their needs. Every person has many ways to travel; each transport option is safe, secure, reliable, and supports a range of individual capabilities.

Transport policy supports transport equity through the fair distribution of resources, benefits, costs, programmes, and services. It aims to reach many groups in all geographic locations, such as rural and urban areas.

Transport equity changes over time; this means individuals can experience it at different stages in their lives. This can happen as the result of a change in circumstance, such as having a family, losing a job, experiencing health issues, or ageing. Transport equity can also change when a person relocates geographically, such as moving to rural or outer city suburbs.

An equitable land transport system is one that:

- focusses on the outcome, such as access to employment, and removes barriers for different groups
- considers how transport accessibility, affordability, and availability impact people's ability to fully engage in social and economic opportunities
- considers how personal preferences and choices influence engagement with the transport system.

Achieving equity in the land transport system will take time and requires a shift in how we do things. Achieving equity for some or the majority won't be enough – we must aim for equitable access for all.

The inclusive access outcome from Te Manatū Waka Ministry of Transport's *Transport Outcomes Framework* aims for all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare.³⁶

The inclusive access outcome has encouraged the transport sector to think more widely about transport equity. This includes policy work led by Te Manatū Waka, with Waka Kotahi as an implementation agency. Both agencies have a role to play to improve transport equity.

The approach to transport equity described here is based on work by Te Manatū Waka. It's ongoing and not finalised. As the work progresses, updates will be reflected in future releases of *Arataki*.

The *Strategic Context of Arataki* has more on this.

Strategic Context →

Components of transport equity

An equitable transport system is when accessibility, affordability, and availability are in balance. A few examples of this might include:

- A person can afford to use a particular mode, or way of travel, that's available for their trip. However, they have a broken leg, so it's not an accessible option for them.
- A person has app-based on-demand services in their area and can physically access these. However, the services are too expensive, so it isn't an affordable option for them.
- A person lives near a bus stop, can afford to use the bus, and is physically able to do so. However, the bus doesn't run past 10pm and their work shift finishes at 11pm, so there may not be an available option for them.

Accessible transport

Accessibility in transport is the ability to reach desired goods, services, and destinations using the transport options available to them. If access is limited, this impacts the ability to access opportunities such as work, social events, and healthcare. Several factors contribute to transport accessibility such as:

- physical or mental illness, physical disability, reduced mobility, visual and audible limitations, or speaking a foreign language
- the built environment, including footpaths, ramps, lack of street lighting at night, and partially blocked footpaths because of bins or scooters
- access to technology through smartphones and the internet for route planning, ticket purchasing, or app-based services – not everyone has the required technology
- access to a pre-paid public transport card that requires funds to be loaded through a bank account, outlet, or automated machine
- personal circumstances including illness, injury, or disease; this may change over time and some people may experience this after an event, such as surgery
- overwhelming or complicated travel, like having to transfer while using public transport
- discrimination against certain groups that can impact safety.³⁷

Affordable transport

Affordable transport is the ability to pay for services people want to access without experiencing financial stress or hardship. Several factors contribute to transport affordability:

- Significant existing income disparities across a range of groups. For example, Māori are more likely to be on lower incomes or be unemployed.³⁸ Older people tend to have less disposable income.³⁹ Migrants and refugees sometimes experience lower wages.⁴⁰
- Those who earn lower incomes need to spend a higher proportion of their income on transport. This makes them vulnerable to rising costs and therefore unlikely to offset through other ways, like middle- and high-income earners working from home.
- Those with no alternatives to driving face rising and volatile maintenance costs that make budgeting difficult.
- New technologies or modes, like e-bikes, are expensive and require high start-up funds to access.

Available transport

Available transport is the range of options for people to travel. This includes the number of services, quality, timeliness, and convenience. Several factors contribute to transport availability such as:

- some urban areas have a range of options, while others have fewer; this can vary even between suburbs
- rural areas and smaller towns have much lower availability overall than larger cities
- a lower number of services reduces reliability; for example, relying on a vehicle exposes people to issues if it breaks down or reliance on a single mode of public transport if there is a cancellation or maintenance is required
- infrastructure, such as cycleways, may not exist or be planned but not yet ready
- how public transport is scheduled; for example, some services may not run when shift workers need to travel, or may follow a reduced schedule in evenings, weekends, or public holidays
- when there is maintenance required or faults to be repaired, particularly on metro rail, and services are replaced by alternatives which impacts availability.

Equity and transport outcomes

Inclusive access

Inclusive access focuses on enabling all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare.⁴¹

A range of groups experience reduced access to transport; this is influenced by income and availability. These groups include those that are:

- Māori
- people on low incomes
- women
- LGBTQI+
- people with disabilities
- older
- ethnic minority.

Since 2016, the proportion of household income spent on transport has increased from 16% to 28%.⁴² This means transport is becoming less inclusive for lower-income earners. One of the key factors for inclusive access is income, but it's not the only factor that determines equity and access.⁴³

The percentage of adults unable to travel because of cost, time pressure, and/or a lack of transport choice has declined from 12% in 2018–2019 to 8% in 2020–2021.⁴⁴ While this is trending in the right direction, it's likely influenced by the COVID-19 lockdowns.

The number people living near frequent public transport is relatively low in urban centres with:

- Tāmaki Makaurau Auckland at 26%
- Te Whanganui-a-Tara Wellington City at 18%
- Ōtautahi Christchurch at 24%.⁴⁵

Of those low numbers, it's likely a smaller percentage can use services in an equitable way.

Having a bus stop or a train station nearby is often not enough to support access for low-income people; this is because while the service might be affordable, it may not be frequent enough or serve the right places.⁴⁶

Most trips are multi-purpose; people leave home for an initial reason, like travelling to work, but complete other tasks while out, like dropping off kids at school or shopping.⁴⁷

Lower-income areas often have less access to public transport and live further away from work, meaning long journey times that might require them to transfer as part of their trip.⁴⁸

When public transport doesn't meet people's needs, they often require a vehicle. There are barriers to using private vehicles that can cause significant financial stress. These costs include:

- the amount to purchase a vehicle, which may require financing
- ongoing fuel and maintenance needs.

Sometimes multiple vehicles are required for a single household to meet their needs, like to accommodate work schedules and childcare.

There may be limited access to driver licensing testing centres, particularly in rural areas, that also impacts inclusive access.

Economic prosperity

Transport equity supports economic prosperity by helping people access jobs and opportunities.

Currently access to jobs is not equitably spread or enabled across modes.

In Tāmaki Makaurau Auckland, growth and pressure on existing networks means access to jobs will get worse for some parts of the city, particularly in the west and south, where incomes are generally lower and travel times longer.⁴⁹

Some future approaches to reducing congestion and improving freight reliability are likely to impact transport equity.

The introduction of congestion pricing will likely negatively affect low-income earners, who are already experiencing transport equity and find it hard enough as it is.⁵⁰ This could mean discounts or exemptions would be needed.⁵¹

However, congestion pricing could free up the network to allow faster trips that can't be shifted to other modes.

To support this outcome, Waka Kotahi will need to continue to:

- support programmes to improve access to transport, land-use planning, and getting the most from the existing network
- work with our partners on congestion pricing programmes to stay focussed on transport equity.

Environmental sustainability

Emissions reduction is likely to have transport equity implications. There are also opportunities to improve equity outcomes.

Aotearoa New Zealand has a high level of car dependency; this is inequitable in many ways. People who depend on vehicles are often unable to switch to lower-emission modes, like public transport (where it exists), because those options don't meet their needs.

Switching to e-bikes and cycling is often difficult, given the cost of the initial purchase and lack of infrastructure. For those with mobility restrictions, walking and cycling may not be possible.

It is essential to support a just transition when reducing transport emissions. This means prioritising actions that reduce emissions in a way that also helps improve equity outcomes.

At times, interventions and activities that aren't equitable may be put in place because they are effective. In these cases, any negative impacts on equity should be well understood and appropriately mitigated.

Transitioning to lower-emission vehicles is challenging given the:

- high cost to buy
- small used market to choose from.

As new low-emissions vehicles enter the fleet, this will increase the supply of used vehicles over time.



To support this outcome, the land transport system will need to:

- accelerate the delivery of low-emissions options, such as walking and cycling, in land transport projects
- continue supporting increased access to public transport
- support the implementation of electric vehicle (EV) uptake schemes, like Clean Car Discount
- consider how the transition to EVs can support safety improvements
- provide quality, mixed-use, compact towns and cities with the most growth in locations with better travel options and shorter trip lengths; this means people won't have to travel so far and/or use a car as much
- support rideshare programmes as well as bike- and micromobility-device sharing.

Resilience and security

Climate change and extreme weather events will continue to impact many communities and groups. An equitable approach to resilience would seek to manage these impacts for all communities.

Remote communities rely heavily on lifeline infrastructure. Severe weather events can impact these communities and severely cut them off from services for days. This is also where many people live who are less able to respond quickly, like those that are lower-income, elderly, and mobility-restricted.

To support this outcome, Waka Kotahi should:

- continue targeted resilience programmes, ensuring all communities are appropriately supported
- design resilience programmes recognising some communities have limited access and need different support if lifelines are cut off.

Healthy and safe people

People are over twice as likely to die or be seriously injured in a crash in a one-star vehicle as compared to a five-star.⁵²

One- and two-star safety-rated cars make up 41% of the national vehicle fleet.⁵³ Fifty-two percent of deaths and serious injuries (DSIs) occur in these cars; the figure is even higher for young drivers at 57%.⁵⁴

Vehicle safety is not evenly distributed. A range of groups are more likely to have older vehicles, mostly because of the high cost of newer, safer vehicles.

Vehicles older than 13 years make up half the total fleet and are more likely to be owned by young people.⁵⁵ These vehicles travel only 40% of the total distance covered by the whole fleet yet account for the majority of vehicles where someone is killed or seriously injured.⁵⁶

Air pollution is another concern and has been found to be responsible each year for:

- more than 3,300 premature adult deaths (60% associated with pollution from motor vehicles)
- more than 13,100 hospital admissions for respiratory and cardiac illnesses, including 845 asthma hospitalisations for children
- over 13,200 cases of childhood asthma
- about 1.7 million days when people couldn't do what they might have done if air pollution hadn't been present.⁵⁷

Air pollution may impact those with existing conditions, including:

- elderly people
- children, including babies
- people with pre-existing heart or lung disease
- people with respiratory conditions
- asthmatics
- diabetics
- pregnant people.

Air quality is typically worse:

- near major roads, especially near intersections with stop/start traffic
- in more industrialised areas, including ports and airports
- in low-lying valleys where pollution can get trapped.

Low-income areas are often near major roads, in valleys, or near industrial areas.

Increased air pollution makes people less likely to engage in physical activity, which means they're missing out on a wide-range of health benefits.

Air pollution is often worse during winter months, when the air is cold and calm meaning emissions from wood burners and traffic may be more concentrated.

To support this outcome, Waka Kotahi should:

- investigate programmes to reduce the age of the vehicle fleet
- look for ways to minimise exposure to transport emissions and noise, such as reverse-sensitivity setbacks and buffers that put distance or greater separation between residential and transport areas
- continue to support research about air quality.

Māori lens

For the 2023 release of Arataki, we have presented some of the available evidence about Māori in relation to the land transport system and the aspirations of Māori, as they have expressed them in their own documents. These include reports and strategic documents of iwi and post-Treaty settlement organisations, as well as secondary information from the transport and public sectors. Using the transport outcomes framework from Te Manatū Waka Ministry of Transport, several insights have been introduced to offer some conversation starters for future exploration with Māori.

While information and insights about Māori populations and aspirations are not limited to the Māori lens, we recognise the need to pull together, in one place, new insights about how the transport sector needs to develop and respond to Māori to ensure better outcomes for all. As we develop the Māori lens, we will continue to uplift the insights and evidence developed within it to shape the entire Arataki 30-year plan and its direction.

We look forward to using this as a base for engagement with Māori in future years to confirm these aspirations and develop a plan to respond to these in partnership with Māori.

Who are Māori?

Māori are the tangata whenua – the people of the land of Aotearoa New Zealand. Nearly 776,000 people, or 16.5% of the country's population, identify as part of the Māori ethnic group.⁵⁸ The median age for Māori is 25.4 years compared to 37.4 years for Aotearoa as a whole.⁵⁹ Of the total Māori population:

- more than 85% of live in Te Ika-a-Māui North Island
- about 14% live in Te Waipounamu South Island.⁶⁰

Māori descended from people who have always seen the value of travel and exploration.⁶¹ Archaeological evidence reveals Māori people came from Eastern Polynesians who travelled to Aotearoa over 700 years ago. Aotearoa was likely part of a voyage of discovery that marked the final stage of Polynesian migration and is now regarded as among the greatest acts of travel in world history. Today, these stories of transport to Aotearoa form a key part of Māori identity.⁶²

After arrival in Aotearoa, Māori became explorers of the land. In the first century after settlement, the main emphasis of mobility and transport was on locating resources, with

travel routes formed around mahinga kai (food sources). Settlements were often built on water- and track-based transport routes, to allow access to resources. There was also significant trade between hapū, because of the different resources available in different geographic areas.⁶³

Māori tended to travel on the water. Because of their preference for travel by waka, connection between coastal areas was far less of a barrier than inland routes. Transport along rivers was also important as it allowed access to settlements and mahinga kai. Only where access was not possible by river, Māori ventured by foot.⁶⁴

Travel patterns varied significantly between areas of the country, depending on available resources. Coastal iwi relied heavily on fishing, while inland tribes relied more on forest products.

There were also different iwi travel patterns in Te Ika-a-Māui and Te Waipounamu, largely driven by climate. For example, in Te Waipounamu, the cooler climate made it hard to plant and manage large-scale gardens, so Māori lived a nomadic lifestyle based around seasonal hunting.⁶⁵

Early settlers relied heavily on Māori knowledge for access to the inland areas of Aotearoa and many early roads were based on historic Māori routes. It is suggested that inland Māori communities were further connected by the introduction of Pākehā transport networks.⁶⁶

Development of the transport network has been criticised as being inflicted on Māori, with the government not always considering the broader impacts of transport decisions on society and Māori.

Historical and recent decisions about infrastructure have had intergenerational and inequitable consequences for Māori wellbeing. This legacy is seen by some Māori as disruptive and damaging, with ongoing consequences for safety, as well as physical, cultural, and emotional wellbeing.



Iwi highlight their key areas of interest as education, housing, employment, sustainable Māori businesses, social and cultural development, and their role as kaitiaki to the environment.

For many Māori, construction of roading infrastructure is part of a wider story of displacement, dislocation, and disenfranchisement from their land.⁶⁷

From 2018 to 2022, over 100 iwi and post-Treaty settlement organisations have produced annual reports and strategic documents that highlight their key interests or issues. There are several reoccurring themes:

- education
- housing
- employment
- sustainable Māori businesses
- social and cultural development
- kaitiaki roles to the environment.

Many of these annual reports also looked at the mental and physical health of their people.

Waka Kotahi can support the realisation of several iwi aspirations through the land transport system, by:

- connecting people to housing and jobs
- supporting the Māori economy
- developing enduring partnerships for safer road-user outcomes
- exploring environmental protections.

The next section, Māori and transport outcomes, expands on these themes.

We must understand the transport sector through a Te Ao Māori framework, with a whole-of-system lens, not just focusing on parts of it.⁶⁸ This means developing a land transport system that:

- is caring and nurturing
- provides support, inclusive mobility, and wellbeing for the people it serves.

Developing a holistic transport system in this way supports healthy whānau by removing barriers, such as cost, transport, and lack of opportunity.⁶⁹

While there is limited research about achieving Māori aspirations for hauora (wellbeing) in the land transport system, Te Whare Tapa Whā model describes health and wellbeing as a wharehui (meeting house) with four walls. These walls represent four aspects of wellbeing from a Māori world view, and when all are in balance, wellbeing thrives. Given its origins in the health sector, Te Whare Tapa Whā model was applied to the transport system to provide insight that may suggest how transport might be considered to uplift Māori wellbeing.⁷⁰

Aspect of wellbeing	Interaction between transport and aspect of wellbeing
Taha tinana (physical wellbeing)	Transport enables people to move around their communities. An element of taha tinana is providing active transport. Transport also enables access to important places including jobs, education, food, healthcare, and exercise.
Taha hinengaro (mental and emotional wellbeing)	Transport provides better mental health through increased control over one's life and how it is spent.
Taha whānau (social wellbeing)	Transport connects people to places and events. This supports connection to friends and whānau, leisure pursuits, and recreation.
Taha wairua (spiritual wellbeing)	Transport can increase spiritual wellbeing by increasing access to individual places of identity and beliefs, such as improving access to places of cultural significance and religious institutions.

Māori and transport outcomes

Environmental sustainability

The government's *Emissions Reduction Plan* recognises Māori are:

- kaitiaki of their whenua
- leaders in their communities
- decision-makers about resources and infrastructure
- land and business owners.

Māori will help lead the transition in each of these roles. Mātauranga Māori will help us learn and better inform our decision making.

The *Emissions Reduction Plan* notes that we need to ensure an equitable transition for Māori, led by Māori, to uphold their rights and interests under Te Tiriti o Waitangi. This requires building relationships and capability between government and Māori to work together as equal partners on our climate response.⁷¹

From 2018–2021, walking made up 10% of trips for Māori as compared to the national population at 12%.⁷² Cycling made up 1% of trips for Māori as compared to the national population at 2%.⁷³ Māori took more trips by car than the national population.⁷⁴ Public transport use was identical.⁷⁵

Tūhoe are the kaitiaki of Te Urewera and apply the principle of sustainable co-existence between people and the land. A section of State Highway 38 is largely unsealed as it runs through Te Urewera, causing potholes, corrugations, and dust. Since 2016, Tūhoe and Waka Kotahi have been trialling a road binder known as tall oil pitch as a sustainable option for resurfacing and maintaining this section. Tall oil pitch is:

- locally sourced from pine trees
- a natural by-product of the wood pulping process
- non-hazardous and doesn't harm the environment.⁷⁶

Resilience and security

The first *National Adaptation Plan* notes that establishing a platform for Māori climate action is the key way government will build a climate-response partnership with Māori.⁷⁷ This platform will build:

- Te Tiriti partnership
- greater recognition of Māori rights and interests, including Treaty settlement commitments.

The platform will build on three focus areas:

- embed partnership and representation
- support Māori-led strategy and alignment
- activate kaupapa Māori, tangata Māori solutions.

Of the 191 marae in Aotearoa New Zealand within one kilometre of the coast, about 47 are potentially exposed to a 100-year extreme sea-level now and in the future.⁷⁸

Further evidence is required on the locations of marae and their exposure to sea level rise; this should consider other land movements from:

- plate tectonics
- volcanic activity
- soil subsidence
- other factors.

Further evidence is also required to quantify the scale of climate change impacts on:

- the availability of mahinga kai food production on Māori land
- living conditions and access to marae
- the locations where impacts could be greater for Māori than other groups, or if a different response is required.

Healthy and safe people

When considering Māori road safety outcomes, it's important to also include contextual factors of Māori such as:

- geographic distribution
- age distribution
- deprivation status.⁷⁹

It's useful to understand these factors as part of a system, and how the various parts of the system lead to high-severity crash outcomes for Māori.

For example, the Māori population is relatively young and many live in the most populated parts of the country, such as Tāmaki Makaurau Auckland, Waikato, and Te Moana a Toi-te-Huatahi Bay of Plenty.⁸⁰

Some key findings about Māori health and safety from 2013–2017:

- Māori are overrepresented in death and serious injury (DSI) caused by road crashes; this is expected to continue increasing
- DSI for Māori remains above average through to 64 years old (for non-Māori, it levels out around 30 years old)
- tamariki Māori are more likely to be killed or seriously injured in crashes than non-Māori children
- Māori DSI is 8 to 13% higher in areas of deprivation
- Tairāwhiti Gisborne, Te Tai Tokerau Northland, and Te Moana a Toi-te-Huatahi regions have the highest numbers of Māori DSI
- Tāmaki Makaurau Auckland, Waikato, and Te Tai Tokerau combined make up half of all Māori DSIs.⁸¹

When asked about Māori aspirations for land transport in Aotearoa New Zealand, many iwi have expressed concern for safe physical access to:

- marae for tamariki (children) and kaumātua/kuia (the elderly)
- papakāinga (collective residential areas), wāhi tapu (sacred sites) and wāhi taonga (precious sites).⁸²

Many marae in rural areas are now accessed directly from state highways.⁸³

Inclusive access

Māori reliance on cars and roading infrastructure has grown because of transport and urban policy.⁸⁴

Māori homes are located further from whānau, cultural sites, and other places of social connection because of the:

- loss of land
- concentration of people and places in urban areas (urbanisation)
- areas changing because of more affluent resident and businesses (gentrification).⁸⁵



Many Māori people live and work in areas not well served by public transport.⁸⁶ Whānau are an important source of transport and sometimes the only option for those with:

- less social power
- greater financial constraints
- language and technology barriers.

Māori are often required to drive further than non-Māori, to pick up whānau or get to cultural sites.⁸⁷ Particularly in rural areas, Māori community roads are often of poor quality; this means more wear and tear on vehicles and more money spent on vehicle repair and maintenance.⁸⁸

Māori have lower average incomes and tend to experience more transport inequities than other New Zealanders.⁸⁹ As a result, Māori are more likely to be involuntarily without a vehicle, or in 'forced car ownership', where a low-income household must have a vehicle and a high amount of their income must go towards maintenance and upkeep.⁹⁰

Māori are less likely to gain their full licence and have lower rates of driver licensing as compared to non-Māori.⁹¹ This is particularly true for Māori living in rural areas.⁹²

Increased travel distance has caused Māori to be disconnected from whānau, cultural sites, and other places of social connection. This causes isolation and harm to Māori identity and has serious implications on wellbeing. Forced car ownership and usage causes social harms in low-income and Māori communities by making financial hardship and debt worse.⁹³

Māori are potentially missing out on important trips for shopping, social, sports or exercise, education, and even personal or medical appointments. In 2020–2021, 5.5% of Māori couldn't visit a general practitioner because they didn't have transport; this is compared to 2.4% of all New Zealanders.⁹⁴ In addition, 1.7% of Māori couldn't access after-hours healthcare compared to 0.7% of all New Zealanders.⁹⁵

Lack of transport access makes existing inequalities worse for Māori. Driver licensing is an example of the cyclical effects transport access has on opportunities. Financial barriers are the most common reason Māori don't get a driver's licence. Not having a driver's licence has implications on employment and further limits wider financial opportunities.⁹⁶

Not having a driver's licence also has wider social implications. For example, young Māori are more likely to drive illegally before getting a licence.⁹⁷ A common reason for entering the criminal justice system, particularly for young Māori men, is driving illegally.⁹⁸

Economic prosperity

In 2018, the financial value of Te Ōhanga Māori was estimated at \$68.7 billion.⁹⁹ Assets include those in the transport, postal, and warehousing sector totalling \$4.1 billion.¹⁰⁰

Of the total asset base, nearly \$21 billion is in Māori trusts, incorporations, and entities, with the majority (\$14 billion) in natural resource-based sectors.

There is a considerable amount of assets held by Māori entities in industrial, commercial, and residential property totalling \$4.8 billion.¹⁰¹

The assets of the businesses of more than 9,900 Māori employers makes up the bulk of this asset base at \$39.1 billion.¹⁰² The assets and businesses of Māori employers are spread broadly across many sectors, including:

- primary industries
- manufacturing
- service sectors.

Assets in real estate and property services total over \$8.2 billion, with another \$7.5 billion in agriculture, forestry, and fishing.¹⁰³

Many business assets of Māori employers are in transport and other sectors. These are mostly smaller businesses with self-financed ownership, such as vehicle drivers. Many businesses are much smaller, with an average of 14 employees and \$4 million in assets.¹⁰⁴

There are nearly 18,600 self-employed Māori whose assets total \$8.6 billion.¹⁰⁵ The majority are in primary industries, and real estate and property services. There are \$397 million in assets of self-employed Māori in transport, postal, and warehousing.¹⁰⁶

Of the 300,000 Māori employees in Aotearoa New Zealand, 74,000, or one quarter, are employed in high-skill jobs.¹⁰⁷ Of those in high-skill occupations, 40% are employed in two industries:

- health care and social assistance
- education and training.

Forty-four percent of Māori are operating their own business, either as a sole-trader or employer in a high-skill job.¹⁰⁸

Te Ōhanga Māori contributes to gross domestic product (GDP) across all three of its dimensions:

- value added by Māori organisations (the production measure)
- income (wages and profits, also known as operating surplus) received by Māori individuals (the income measure)
- spending of Māori households (the expenditure measure).¹⁰⁹

Each of these measures provides a different insight into the participation of Māori in the economy of Aotearoa. Across the three dimensions, Te Ōhanga Māori in 2018 ranges from 6.5% to nearly 15% of the national economy.¹¹⁰

We need to further understand the opportunities and challenges facing Māori entities, employers, self-employed, and employees in the transport sector.



Freight lens

Over the next 30 years, we must move to an integrated freight system. This means road, rail, and coastal shipping will each play to their strengths. Each will support a safe, reliable, and resilient freight system. Each will move goods effectively and with low emissions.

To do this, we need to respond to factors such as:

- population growth
- changing travel patterns
- climate change
- changing economic structure
- other factors that will influence freight and the demand for it.

We will support implementation of the government's *Emissions Reduction Plan* and the *National Freight and Supply Chain Strategy* from Te Manatū Waka Ministry of Transport. We will work closely with the freight industry, central government, and local government to identify and address new challenges and opportunities. We need more high-quality evidence and data so we can identify how the strategic modal networks might change over the next three decades.

What is freight?

Freight is the movement of commercial and domestic goods, and the distribution of exports and imports.

Freight is a key part of economic activity and is fundamental to making places great to live (liveability).¹¹¹

Freight volume depends on demand for goods and is heavily influenced by:

- the strength of the New Zealand dollar
- population growth
- disposable income.¹¹²

Freight today

In 2017–2018, the size of the country's freight task was

- 278.7 million tonnes
- 30.1 billion tonne-kilometres.¹¹³

Road is the dominant way of moving freight; it makes up nearly 93% of the total tonnes and 75% of the total tonne-kilometres (Figure 3).¹¹⁴

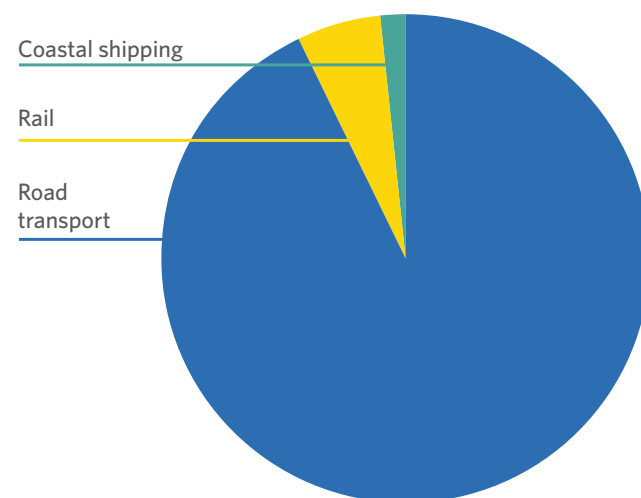
The heavy freight vehicle fleet accounts for 23% of transport carbon dioxide emissions, but only 6% of the annual vehicle kilometres travelled (VKT).¹¹⁵

In 2017–2018, 67% of freight movements were less than 100kms, 22% between 100 and 300km, and 10% longer than 300km (Figure 4).¹¹⁶

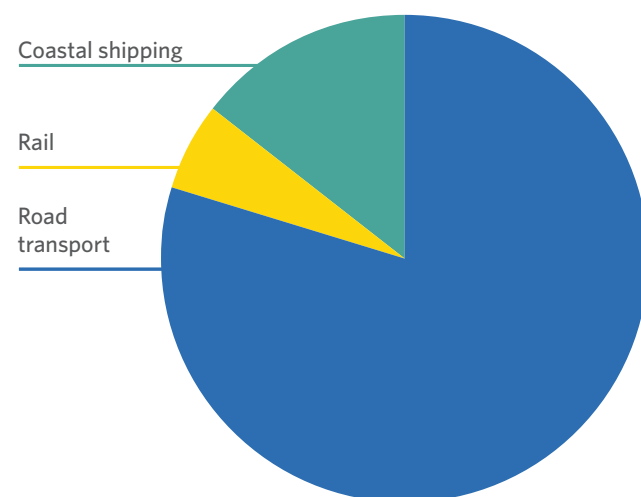
The freight task in 2017–2018 by mode

Figure 3

Freight tonnes

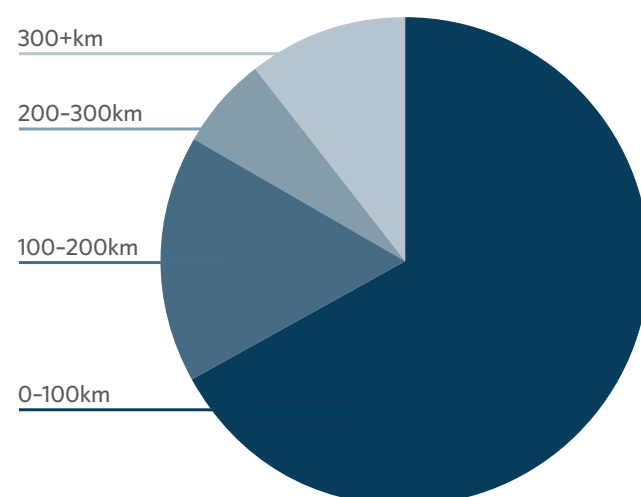


Freight tonnes per kilometre



Freight tonne kilometre distribution

Figure 4



Role of modes

For some goods, there are benefits to moving more freight by rail and coastal shipping.

In the short-to-medium term, shifting to lower-emissions modes like rail and coastal shipping can support:

- a transition to net zero
- improved road safety
- reduced road maintenance costs.

Road freight

Road freight can:

- accommodate shifting demands
- move time-critical goods
- serve almost any location in the country.¹¹⁷

Road freight is mostly moved on state highways, motorways, and the arterial roading network.

However, in the industrial areas of Tāmaki Makaurau Auckland and other major urban centres, a large number of freight movements happen on local roads to access warehouses and distribution centres.¹¹⁸

Road freight tends to be localised, with around 77% remaining within the region it was sourced.¹¹⁹

Rail freight

Rail freight is an attractive alternative for long-distance freight transport, especially for moving

- goods between major centres
- import and export goods to and from major ports.

Rail freight is best suited for moving bulk commodities such as coal, milk, logs, and steel.¹²⁰

The ability of rail to play a larger role in the movement of freight is constrained by a range of factors. These include:

- the current unreliable condition of the network
- network capacity constraints in Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington where metro passenger services compete for 'slots' on the network with freight services
- the comparatively small size of the rail network relative to the roading network and the limited number of intermodal freight terminals that provide efficient and effective transfers of freight between different modes.¹²¹

The mode share of rail has also been affected by the:

- rolling stock capacity constraints such as the towing capacity of locomotives and wagon availability

- Kaikōura earthquake in 2016 that reduced freight travelling between Te Ika-a-Māui North Island and the main centres of Te Waipounamu South Island
- reduction of coal exports from Te Tai o Poutini West Coast to Ōhinehou Lyttelton over the past 10 years.¹²²

The costs of external factors, such as environmental costs, are not currently internalised for road freight, which reduces the price competitiveness of rail.

Coastal shipping

Coastal shipping of domestic cargo supports the movement of:

- bulk commodities such as cement
- containerised goods, trucks, and trains on roll-on roll-off (RORO) ships.¹²³

Investments made through the Coastal Shipping Activity Class in the 2021-24 National Land Transport Programme will make coastal shipping a more viable alternative to strengthen and diversify our domestic supply chain.

Future government policy statements on land transport will guide decisions on investments in the coastal shipping industry.

Strategic freight connections

Nationally significant freight connections are critical to supporting the country's economic wellbeing. They provide primary land-based connections across Aotearoa New Zealand. They link the largest:

- population centres
- inland ports and freight hubs
- main seaports
- airports.

Regionally significant freight connections are vital to supporting a region's economic wellbeing. They link important:

- places
- industries
- main seaports.

Regional connections provide primary land-based connections between regions and sometimes serve a lifeline function.

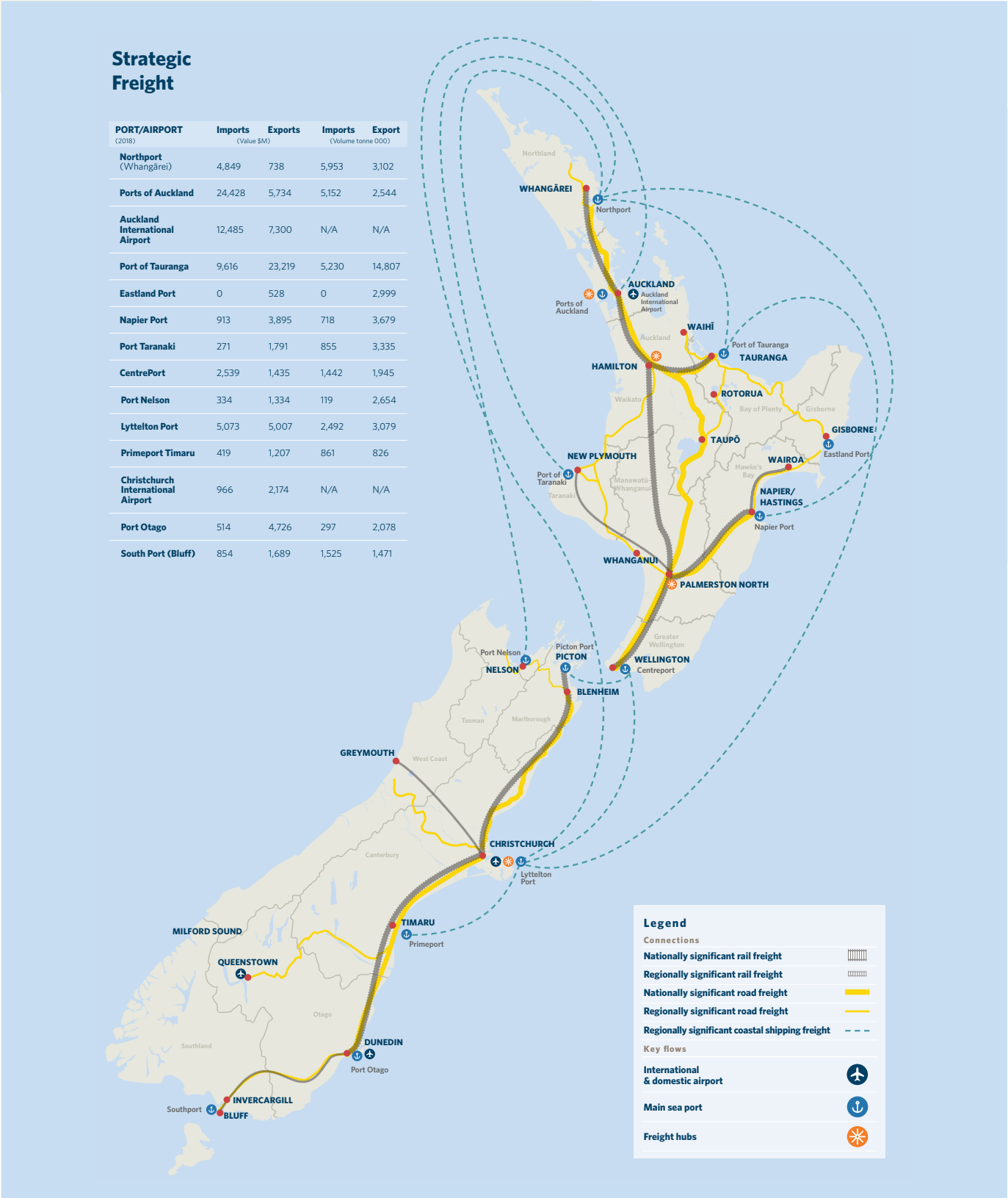
The strategic freight connections map (Figure 5) shows the significant national or regional freight connections from road or rail to seaports, airports, inland ports, and freight hubs that provide both international and domestic services.

The map includes summary information about the value and volume of imports and exports moving through seaports and airports that provide international and domestic services.

In addition to the strategic freight connections, Our Current Network Map developed as part of *Arataki* shows the suitable routes for High Productivity Motor Vehicles (HPMVs), or vehicles that can carry the maximum loads available under a permit.

Our Current Network Map →

Strategic freight connections
Figure 5



Freight and transport outcomes

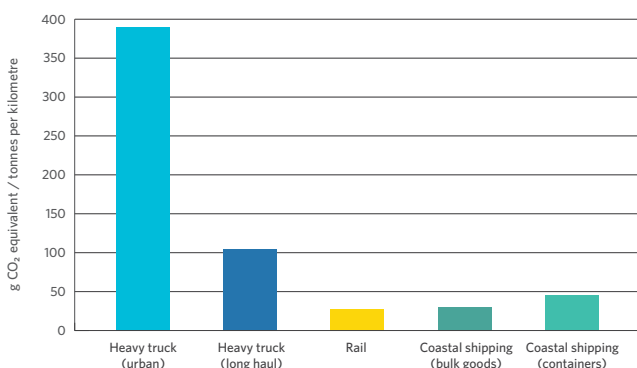
Environmental sustainability

The heavy freight vehicle fleet produces high carbon dioxide emissions because it takes more energy to move heavier vehicles.¹²⁴ The heavy freight vehicle fleet share of carbon dioxide emissions has remained mostly the same from 2017 to 2019.¹²⁵

Carbon dioxide emissions from rail is about 1% of total emissions; this has stayed consistent at just under 200 kiloton carbon dioxide equivalent (kt CO₂-e) since 2000.¹²⁶

Emission comparison by mode¹²⁷

Figure 6



Emissions from coastal shipping range from 30 g CO₂-e/tonne-km (bulk goods) to 46 g CO₂-e/tonne-km (container freight).¹²⁸ These have remained steady since 1990.¹²⁹

Under the Climate Change Response (Zero Carbon) Amendment Act 2019, Aotearoa New Zealand has committed to domestic and international targets to reduce greenhouse gas emissions to net zero by 2050 (except biogenic methane).¹³⁰ This will contribute to the international effort to limit global warming.

Moving to a low-emissions freight transport system will help us avoid the worst impacts of climate change. It will help:

- limit disruptions arising from climate change
- ensure the connectivity and performance of supply chains
- support the wellbeing of the people of Aotearoa.

Growing consumer preference for 'green' goods could provide opportunities for the country's producers. A low-emissions freight system could also put the country in a good position to deal with potential:

- global taxes on shipping emissions
- emission regulations imposed by trading partners.

The *Emissions Reduction Plan* sets a 2035 target to reduce:

- freight transport emissions by 35%
- transport emissions by 41%
- total vehicle kilometres travelled (VKT) by the light fleet by 20% to support improved reliability and efficiency of the freight network
- emissions intensity of transport fuel by 10% that will require an increased uptake of lower-emissions fuels, such as sustainable biofuels, by the road freight fleet; this has potential cost implications.¹³¹

Actions for reducing freight emissions in the *Emissions Reduction Plan* are:

- develop a national freight and supply chain strategy with industry that will identify how to best remove carbon (decarbonise) from the freight transport system to be net zero by 2050, while improving the efficiency and competitiveness of the supply chain
- continue implementing the *New Zealand Rail Plan* and support coastal shipping
- provide funding to support the freight sector to purchase zero- and low-emissions trucks
- establish a freight decarbonisation unit to help remove carbon from the freight sector through regulation and investment policy
- evaluate options to improve the efficiency of heavy vehicles
- regulate heavy vehicle imports to reduce emissions
- support infrastructure development for green fuels and fast charging for heavy vehicles
- reduce emissions from heavy vehicles operated or procured through government activities
- evaluate options for road user charges to support emissions reductions; this includes whether to extend the heavy electric vehicle (EV) exemption from road user charges and if road user charges rates should be set differently by fuel type/emissions
- consider the implementation timing of Euro VI standard for heavy vehicles
- work to remove carbon from aviation
- progress the removal of carbon from maritime transport.

Resilience and security

Climate change adaptation means the land transport system is prepared for, and resilient to, the impacts of a changing climate.

Much of the strategic network is vulnerable to extreme natural hazards. For example, in some locations that are important for the movement of goods, future sea level rise will greatly increase coastal flooding, erosion, and groundwater levels.

The *New Zealand Freight and Supply Chain Issues Paper* from Te Manatū Waka Ministry of Transport encourages a strong focus on long-term resilience in our supply chains to prepare for changing climate, demographics, and technology.¹³²

Resilient supply chains are more able to:

- avoid, absorb, and recover from disruptions
- maintain freight connections to keep goods moving.

Prompted by the end of refinery operations at Marsden Point in April 2022, the government is developing a policy on minimum onshore fuel stockholding.¹³³ An increase in onshore fuel stockholding, particularly diesel, would provide better resilience for emergency services and the broader supply chain.

Government is also developing a roadmap for hydrogen in Aotearoa New Zealand. This strategy will guide investment in hydrogen to maximise economic benefits and emissions reductions.¹³⁴

A project in the Taranaki region is looking into green hydrogen production from water through electrolysis.¹³⁵ Domestic hydrogen production would improve the resilience of the freight industry by reducing reliance on imported fuels. Similarly, the adoption of battery-electric vehicles in the freight sector would also decrease the need for imported fuels.

The government's first *National Adaptation Plan* sets the direction for how Aotearoa will:

- adapt to the unavoidable impacts of climate change
- address key climate risks up to 2028.¹³⁶

The *National Adaptation Plan* outlines actions about:

- reforming institutions to be fit for a changing climate
- providing data, information, and guidance to enable everyone to assess and reduce climate risks
- embedding climate resilience across government strategies and policies.

Waka Kotahi has committed to several actions in the plan, including:

- integrating adaptation into decision making
- developing and implementing a climate adaptation plan.

Waka Kotahi is working to support a more resilient land transport system. We are implementing and supporting activities to move more freight by rail and coastal shipping. This supports continued economic activity during and following unplanned disruptions, or a more redundant system.

We help the land transport system and communities recover from disruptive events. We respond quickly to transport network disruptions on significant freight connections. We work to restore appropriate levels of service, including emergency works. We manage and operate the state highway network to provide alternative routes and reopen disrupted routes as soon as possible. We invest in coastal erosion protection work on significant freight connections at high-priority locations when:

- it's cost-effective
- won't create negative impacts in the future.

We are developing a climate change adaptation plan to help us better understand the most effective mix of responses for the network. This will potentially include infrastructure to protect, accommodate, or retreat.

The Maps section of *Arataki* includes more information about the land transport system now and in the future.

Arataki Maps →

Healthy and safe people

Heavy goods vehicles aren't involved in more crashes than other vehicle types.¹³⁷ However, given how large heavy goods vehicles are, many deaths and serious injuries (DSIs) involving them are fatal.¹³⁸

From 2012 to 2021, heavy goods vehicles were involved in 9.5% of road crashes causing DSIs (Figure 8).¹³⁹ Of those crashes, 20% resulted in death (Figure 7).¹⁴⁰

Mode shift from road to rail and coastal shipping can support improved safety by reducing the number of freight movements along the road network. It can also decrease air pollution.

Road freight vehicles release harmful pollutants, such as nitrogen dioxide (NO₂) by diesel vehicles.¹⁴¹ Each year, harmful pollutants contribute to

- more than 3,300 premature adult deaths
- over 13,200 cases of childhood asthma
- around 1.7 million days when people can't do the things they might otherwise do if air pollution had not been present.¹⁴²

Even small improvements to air quality will significantly improve the health of many people. Quite a few actions in the *Emissions Reduction Plan* seek to reduce harmful pollutants by addressing diesel freight vehicle emissions.

Freight carried on key corridors through urban areas can cause noise or vibration impacts. As demand for urban freight increases over time, this could worsen noise pollution.

Health and safety on rail is improving, but there is still work to be done.

In 2020–2021, there were 13 deaths and four serious injuries on the rail system.¹⁴³ This is a reduction from 21 deaths and four serious injuries eight years earlier.¹⁴⁴

Also in 2020–2021, there were:

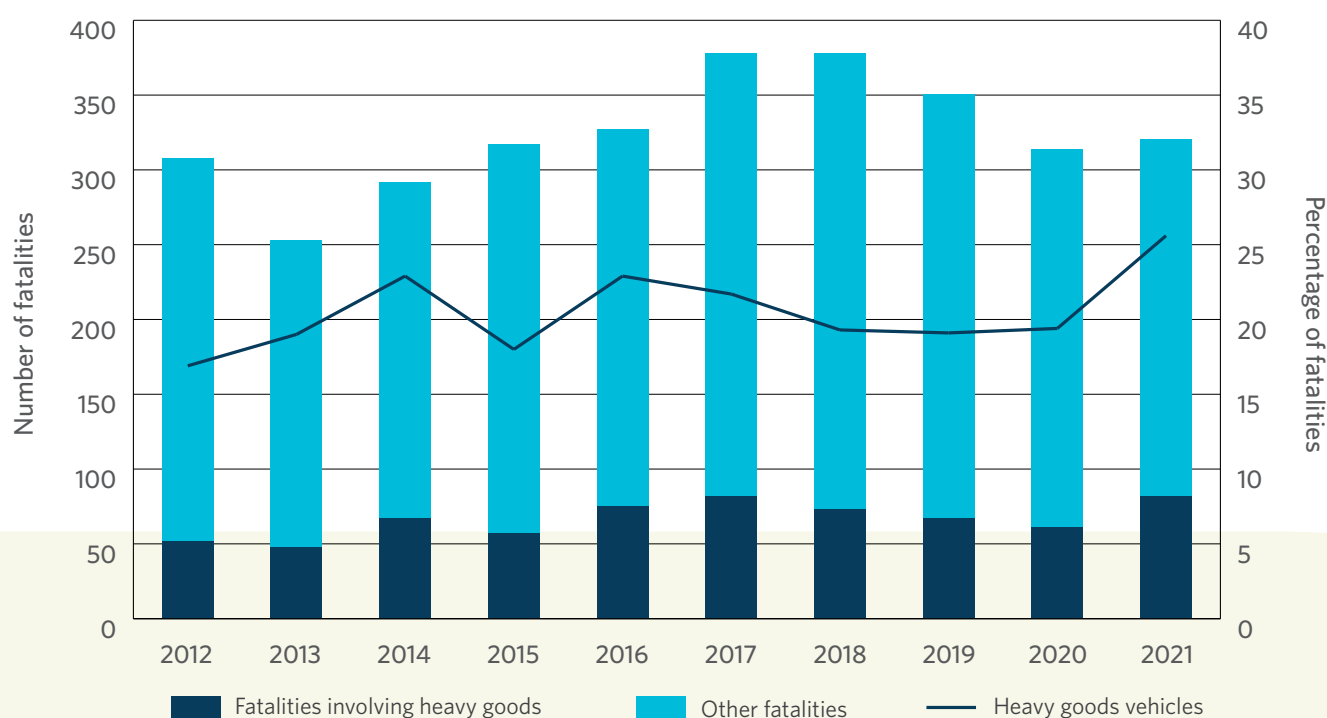
- three collisions between rail vehicles and heavy motor vehicles
- nineteen collisions between rail vehicles and light motor vehicles.¹⁴⁵

This is a reduction from 2013–2014 when there were:

- five collisions between rail vehicles and heavy motor vehicles
- twenty-nine collisions between rail vehicles and light motor vehicles in.¹⁴⁶

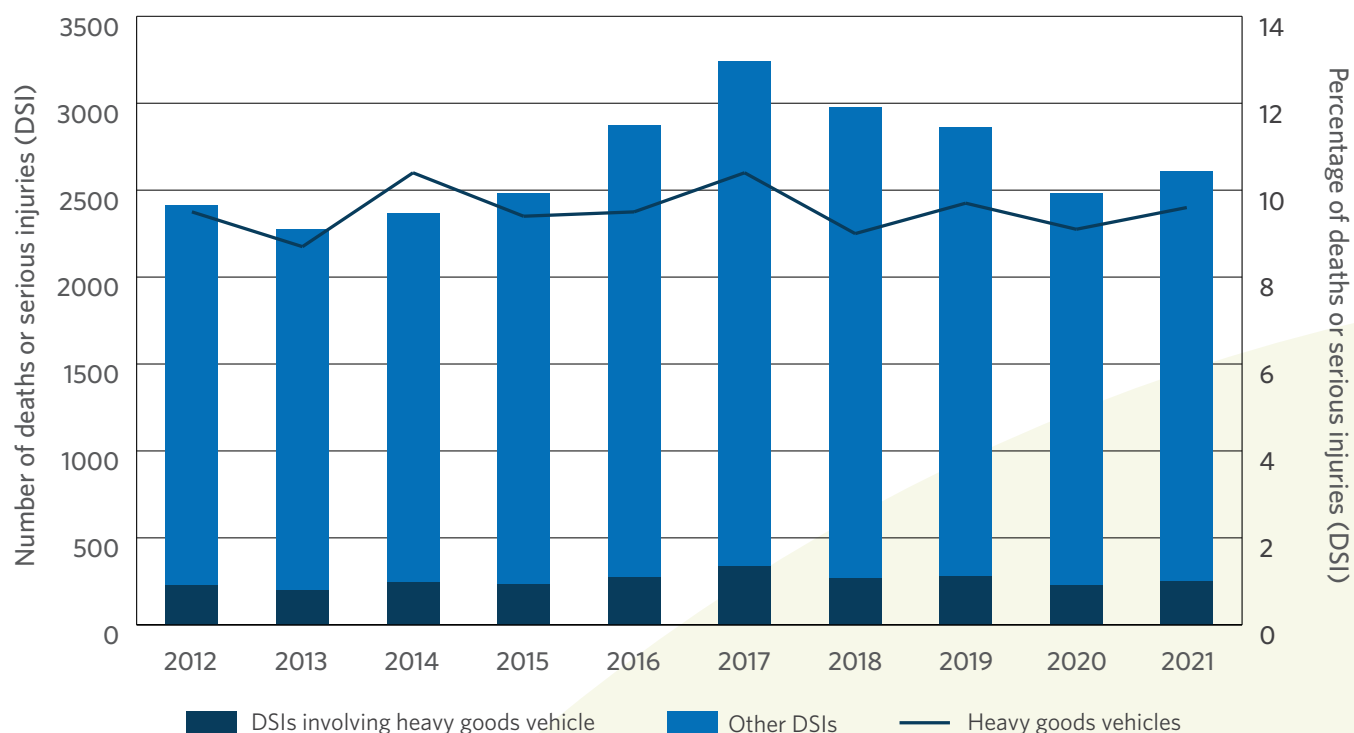
Heavy goods vehicle fatalities 2012–2021 ¹⁴⁷

Figure 7



Heavy goods vehicles death and serious injuries 2012-2021 ¹⁴⁸

Figure 8



Inclusive access

There is currently little evidence about freight in relation to the inclusive access outcome. We will address this in the next release of *Arataki*.

Competition for road space between the movement of freight and people is discussed in the following section, Economic prosperity. There are place and movement conflicts on some parts of the network, as identified in the *Transport Modes and Strategic Networks* section of *Arataki*.

[Transport Modes and Strategic Networks →](#)



Economic prosperity

How our urban centres are laid out determines the:

- distance goods need to travel between home, workplaces, distribution centres and ports
- transport options for these movements.

Most urban freight is moved by small trips in light vehicles between home, workplaces, and distribution centres. Larger freight movements by truck or train also move through our urban areas in transit for distribution.¹⁴⁹

Most container imports arrive through seaports in Tāmaki Makaurau Auckland, Te Whanganui-a-Tara Wellington City, and Ōtautahi Christchurch.¹⁵⁰ Over half of the country's employment is in these cities. This causes competition for road space between the movement of freight and people.¹⁵¹

Urban freight movement also adds to congestion in city centres. Congestion can delay deliveries and this unreliability can lead to less productivity.¹⁵²

Existing congestion on our roads costs us \$1.3 billion annually.¹⁵³

For example, key parts of the freight network in Tāmaki Makaurau, such as State Highway 1 between the city centre and Penrose, are often congested throughout the day. This rise in interpeak congestion is increasingly affecting freight travel, which mainly happens in the middle of the day.¹⁵⁴

Costs from congestion include:

- travel-time delays
- schedule delays
- environmental impacts.¹⁵⁵

Proposals for land use near freight corridors can impact the ability for these corridors to manage local and national travel demand. Increasing capacity on these corridors to maintain reliability could encourage local passenger vehicle travel during peak periods, when freight uses these corridors less.

Provincial areas help shape the economies of urban centres. These make a significant contribution to the country's freight task through primary production and related industries. For example, while Tāmaki Makaurau is a primary import gateway, exports mostly come from rural regions further south.¹⁵⁶

Nearly 75% of the country's state highways are equipped for high productivity motor vehicles (HPMVs).¹⁵⁷

50MAX vehicles have one more axle than conventional 44-tonne vehicles. This means the overall truck load of 50MAX is spread further with no additional wear on roads.

50MAX allows operators to carry larger payloads on parts of the network that, while economically important to the country, carry lower volumes of freight.¹⁵⁸

Road user charges (RUC) are paid by drivers of:

- light diesel vehicles
- diesel-powered heavy vehicles, such as trucks.

This is to ensure the drivers of heavier vehicles cover their share of the damage made to the road network. These charges also cover the wider costs of building and maintaining the land transport system.

Revenue is collected and paid to the National Land Transport Fund and allocated every three years through the National Land Transport Programme.

Some local roads in parts of the country experience greater damage from heavy freight vehicles. This creates funding challenges for affected local councils.

Waka Kotahi is working to identify the nature, scale, and location of this issue in central parts of Te Ika-a-Māui North Island and Te Upoko o te Ika a Māui Greater Wellington.

References



1. Ministry for the Environment (2022). Managed retreat: what it is and when it might be used. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/managed-retreat/>
2. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan 2022-24. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
3. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
4. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
5. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan 2022-24. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
6. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
7. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan 2022-24. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
8. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan 2022-24. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
9. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
10. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
11. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
12. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
13. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
14. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Arotakenga Tūrarū mō te Huringa Āhuarangi o Āotearoa: Technical report – Pūrongo whaihangā. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-technical-report.pdf>
15. Te Tumu Paeroa Office of the Māori Trustee (undated). What is whenua Māori. <https://www.tetumupaeroa.co.nz/about-the-whenua/what-is-whenua-maori/>
16. White, Sophie (2018). Māori Freehold Land & Climate Change Adaptation. <https://www.otago.ac.nz/law/otago711010.pdf>
17. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
18. White, Sophie (2018). Māori Freehold Land & Climate Change Adaptation. <https://www.otago.ac.nz/law/otago711010.pdf>
19. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Arotakenga Tūrarū mō te Huringa Āhuarangi o Āotearoa: Technical report – Pūrongo whaihangā. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-technical-report.pdf>
20. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
21. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
22. NIWA (2023) In Numbers: New Zealand's wild summer weather. <https://niwa.co.nz/news/in-numbers-new-zealands-wild-summer-weather>

23. Marlborough District Council. August Weather Event. <https://www.marlborough.govt.nz/civil-defence-emergency-management/august-storm-event-2022>
24. NZ SeaRise Te Tai Pari O Aotearoa (2022). Global sea-level rise. <https://www.searise.nz/>
25. NZ SeaRise Te Tai Pari O Aotearoa (2022). Global sea-level rise. <https://www.searise.nz/>
26. NZ SeaRise Te Tai Pari O Aotearoa (2022). Global sea-level rise. <https://www.searise.nz/>
27. Ministry for the Environment. Climate change impacts on New Zealand. https://environment.govt.nz/assets/Publications/Files/Climate-Impact-Mapkey_final.pdf
28. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
29. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
30. Waka Kotahi NZ Transport Agency (2022). Tiro Rangi: our climate adaptation plan. <https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf>
31. Waka Kotahi NZ Transport Agency (2020). National resilience programme business case. <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/resilience/national-resilience-programme-business-case/>
32. Ministry of Transport (2021). System indicator- Annual cost of emergency works. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/resilience-and-security>
33. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
34. Ministry for the Environment (2022). National climate change risk assessment for New Zealand – Arotakenga Tūrarū mō te Huringa Āhuarangi o Āotearoa: Main report – Pūrongo Whakatōpū. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-main-report.pdf>
35. Ministry of Transport (2019). National Freight Demand Study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
36. Ministry of Transport (2022). Transport outcomes framework. <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/>
37. Waka Kotahi NZ Transport Agency (2008). Personal security in public transport travel in New Zealand: Problems, issues and solutions. <https://www.nzta.govt.nz/assets/resources/research/reports/344/docs/344.pdf>
38. Ministry of Business, Innovation and Employment (2021). Overview of Māori employment outcomes in Aotearoa New Zealand. <https://www.mbie.govt.nz/business-and-employment/employment-and-skills/employment-strategy/maori-employment-action-plan/annexes/overview-of-maori-employment-outcomes-in-aotearoa-new-zealand/>
39. Te Ara – The Encyclopaedia of New Zealand (2010). Income and wealth distribution - Income distribution by gender, age and ethnicity. <http://www.TeAra.govt.nz/en/income-and-wealth-distribution/page-4>
40. Diversity Works NZ (2022). Migrant pay gap. <https://diversityworks.nz/media/5026/migrant-pay-gap-narrative-report-final.pdf>
41. Ministry of Transport (2022). Transport outcomes framework. <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/>
42. Ministry of Transport (2020). Equity in Auckland's transport system. https://www.transport.govt.nz/assets/Uploads/Report/NZ3060_Equity_in_Auckland_Transport_System.pdf
43. Ministry of Transport (2020) Equity in Auckland's transport system. https://www.transport.govt.nz/assets/Uploads/Report/NZ3060_Equity_in_Auckland_Transport_System.pdf
44. Ministry of Transport (2022). Transport indicators: Inclusive access. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access#element-2016>
45. Ministry of Transport (2022). Transport indicators: Inclusive access. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access#element-1992>
46. Rose E, Witten K, and McCreanor T (2009). Transport related social exclusion in New Zealand: Evidence and challenges. https://www.researchgate.net/publication/233436353_Transport_related_social_exclusion_in_New_Zealand_Evidence_and_challenges
47. Ministry of Transport (2022). Household travel survey: Key facts. <https://www.transport.govt.nz/statistics-and-insights/household-travel/key-facts/>

48. Chowdhury S, Govender D, Govender D, and Ceder A (2017). Assessing connectivity equity of a regional public transport network. https://www.researchgate.net/publication/313421478_Assessing_Connectivity_Equity_of_a_Regional_Public_Transport_Network
49. Ministry of Transport (2021). Auckland transport alignment project 2021–2031. https://www.transport.govt.nz/assets/Uploads/Report/ATAP_2021-31_Publication.pdf
50. Ministry of Transport (2020). The congestion question – Congestion persona report. <https://www.transport.govt.nz/assets/Uploads/Paper/PersonaReport.pdf>
51. Ministry of Transport (2019). The congestion question – Mitigations policy. <https://www.transport.govt.nz/assets/Uploads/Paper/MitigationsPolicy.pdf>
52. Waka Kotahi NZ Transport Agency (2022). Safety ratings. <https://rightcar.govt.nz/safety-ratings>
53. Waka Kotahi NZ Transport Agency (2022). Safety ratings. <https://rightcar.govt.nz/safety-ratings>
54. Waka Kotahi NZ Transport Agency (2022). Safety ratings. <https://rightcar.govt.nz/safety-ratings>
55. Ministry of Transport (2022). Overview of road safety in New Zealand. <https://www.transport.govt.nz/assets/Uploads/Presentation/Overview-of-Road-Safety-in-NZ-Data-packs-for-reference-groups.pdf>
56. Ministry of Transport (2022). Overview of road safety in New Zealand. <https://www.transport.govt.nz/assets/Uploads/Presentation/Overview-of-Road-Safety-in-NZ-Data-packs-for-reference-groups.pdf>
57. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0). http://www.ehinz.ac.nz/assets/HAPINZ3/HAPINZ-3.0_Vol-1-Findings-Report.pdf
58. Statistics New Zealand (2018). 2018 Census ethnic groups dataset. <https://www.stats.govt.nz/information-releases/2018-census-ethnic-groups-dataset/>
59. Statistics New Zealand (2018). 2018 Census ethnic groups dataset. <https://www.stats.govt.nz/information-releases/2018-census-ethnic-groups-dataset/>
60. Statistics New Zealand (2018). 2018 Census ethnic groups dataset. <https://www.stats.govt.nz/information-releases/2018-census-ethnic-groups-dataset/>
61. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
62. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
63. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
64. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
65. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
66. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
67. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
68. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>

69. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
70. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
71. Ministry for the Environment (2022). Empowering Māori. <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/empowering-maori/>
72. Ministry of Transport (2022). New Zealand household travel survey (2015–2021): Results by ethnicity 2015–2018 and 2018–2021 (3-year average). https://www.transport.govt.nz/assets/Uploads/Data/Ethnicity_travel-by-residents_2015onwards.xlsx
73. Ministry of Transport (2022). New Zealand household travel survey (2015–2021): Results by ethnicity 2015–2018 and 2018–2021 (3-year average). https://www.transport.govt.nz/assets/Uploads/Data/Ethnicity_travel-by-residents_2015onwards.xlsx
74. Ministry of Transport (2022). New Zealand household travel survey (2015–2021): Results by ethnicity 2015–2018 and 2018–2021 (3-year average). https://www.transport.govt.nz/assets/Uploads/Data/Ethnicity_travel-by-residents_2015onwards.xlsx
75. Ministry of Transport (2022). New Zealand household travel survey (2015–2021): Results by ethnicity 2015–2018 and 2018–2021 (3-year average). https://www.transport.govt.nz/assets/Uploads/Data/Ethnicity_travel-by-residents_2015onwards.xlsx
76. Tūhoe (2019). The road to nature. <https://www.ngaituhoe.iwi.nz/The-Road-to-Nature>
77. Ministry for the Environment (2022). Adapting to climate change. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/>
78. The University of Waikato (2021). Understanding the potential exposure of coastal marae and urupā in Aotearoa New Zealand to sea level rise. <https://researchcommons.waikato.ac.nz/handle/10289/14567>
79. Waka Kotahi NZ Transport Agency (2021). He pūrongo whakahaumaru huarahi mō ngā iwi Māori Summary of the Māori road safety outcomes report. <https://www.nzta.govt.nz/assets/resources/maori-road-safety-outcomes-report/maori-road-safety-outcomes-summary-report.pdf>
80. Waka Kotahi NZ Transport Agency (2021). He pūrongo whakahaumaru huarahi mō ngā iwi Māori Summary of the Māori road safety outcomes report. <https://www.nzta.govt.nz/assets/resources/maori-road-safety-outcomes-report/maori-road-safety-outcomes-summary-report.pdf>
81. Waka Kotahi NZ Transport Agency (2021). He pūrongo whakahaumaru huarahi mō ngā iwi Māori Summary of the Māori road safety outcomes report. <https://www.nzta.govt.nz/assets/resources/maori-road-safety-outcomes-report/maori-road-safety-outcomes-summary-report.pdf>
82. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
83. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
84. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
85. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
86. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>

87. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
88. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
89. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
90. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
91. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
92. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
93. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
94. Ministry of Health (2020). Health and independence report 2020. <https://www.health.govt.nz/system/files/documents/publications/health-and-independence-report-2020-24-nov-dg.docx>
95. Ministry of Health (2020). Self-rated health. <https://www.health.govt.nz/system/files/documents/publications/health-and-independence-report-2020-24-nov-dg.docx>
96. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
97. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
98. Waka Kotahi NZ Transport Agency (2022). A pathway towards understanding Māori aspirations for land transport in Aotearoa New Zealand. <https://www.nzta.govt.nz/assets/resources/research/reports/688/688-a-pathway-towards-understanding-maori-aspirations-for-land-transport-in-new-zealand.pdf>
99. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
100. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
101. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
102. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
103. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>

104. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
105. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
106. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
107. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
108. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
109. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
110. Reserve Bank of New Zealand (2018). Te Ōhanga Māori – The Māori Economy 2018. <https://www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx>
111. Auckland Transport (2020). Auckland freight plan. <https://at.govt.nz/media/1983982/auckland-freight-plan.pdf>
112. Ministry of Transport (2020). Green freight: Strategic working paper. https://www.transport.govt.nz/assets/Uploads/Paper/Green-Freight-Strategic-Working-Paper_FINAL-May-2020.pdf
113. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
114. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
115. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
116. Ministry of Transport (2019). Freight model. <https://www.transport.govt.nz/assets/Uploads/Data/Transport-outlook-updated/Freight-Model-Version-2-Documentation-20190423.pdf>
117. Waka Kotahi NZ Transport Agency (2018). Identifying freight performance and contextual indicators. <https://www.nzta.govt.nz/assets/resources/651/651-Identifying-freight-performance-and-contextual-indicators.pdf>
118. Auckland Transport (2020). Auckland freight plan. <https://at.govt.nz/media/1983982/auckland-freight-plan.pdf>
119. Ministry of Transport (2020). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
120. Waka Kotahi NZ Transport Agency (2018). Identifying freight performance and contextual indicators. <https://www.nzta.govt.nz/assets/resources/651/651-Identifying-freight-performance-and-contextual-indicators.pdf>
121. Auckland Transport (2020). Auckland freight plan. <https://at.govt.nz/media/1983982/auckland-freight-plan.pdf>
122. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
123. Waka Kotahi NZ Transport Agency (2018). Identifying freight performance and contextual indicators. <https://www.nzta.govt.nz/assets/resources/651/651-Identifying-freight-performance-and-contextual-indicators.pdf>
124. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
125. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>

126. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
127. Ministry for the Environment (2020). Measuring emissions: A guide for organisations. <https://environment.govt.nz/assets/Publications/Files/Measuring-Emissions-Detailed-Guide-2020.pdf>
128. Ministry for the Environment (2020). Measuring emissions: A guide for organisations. <https://environment.govt.nz/assets/Publications/Files/Measuring-Emissions-Detailed-Guide-2020.pdf>
129. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi Transport emissions: Pathways to net zero by 2050 – Green paper. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
130. New Zealand Government (2019). Climate change response (zero carbon) amendment act 2019. <https://www.legislation.govt.nz/act/public/2019/0061/latest/LMS183736.html>
131. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
132. Ministry of Transport (2022). New Zealand freight and supply chain issues paper. <https://www.transport.govt.nz/area-of-interest/freight-and-logistics/new-zealand-freight-and-supply-chain-strategy/>
133. Ministry of Business, Innovation and Employment (2022). <https://www.mbie.govt.nz/>
134. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
135. Environmental Protection Authority (2023). Kapuni Green Hydrogen Project. <https://www.epa.govt.nz/fast-track-consenting/referred-projects/kapuni/>
136. Ministry for the Environment (2022). National adaptation plan. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/adapting-to-climate-change/national-adaptation-plan/>
137. Ministry of Transport (2019). Road to zero action plan 2020–2022. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-Action-Plan_Final.pdf
138. Ministry of Transport (2019). Road to zero action plan 2020–2022. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-Action-Plan_Final.pdf
139. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
140. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
141. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0). http://www.ehinz.ac.nz/assets/HAPINZ3/HAPINZ-3.0_Vol-1-Findings-Report.pdf
142. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0). http://www.ehinz.ac.nz/assets/HAPINZ3/HAPINZ-3.0_Vol-1-Findings-Report.pdf
143. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
144. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
145. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
146. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
147. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
148. Waka Kotahi NZ Transport Agency (2021). Rail safety statistics. <https://www.nzta.govt.nz/assets/resources/rail-safety-statistics/rail-safety-statistics-end-31-December-2021.pdf>
149. Waka Kotahi NZ Transport Agency (2020). Planning better places. <https://www.nzta.govt.nz/>

150. Waka Kotahi NZ Transport Agency (2020). Arataki Version 2. <https://www.nzta.govt.nz/planning-and-investment/planning/arataki/strategic-context/evidence-and-resources/resources>
151. Waka Kotahi NZ Transport Agency (2017). The future of employment and economic activity and its transport and land use implications. <https://www.nzta.govt.nz/assets/resources/research/reports/637/637-future-of-employment-economic-activity-transport-land-use-implications.pdf>
152. New Zealand Institute of Economic Research Inc (2017). Benefits from Auckland road decongestion. <https://www.nzier.org.nz/publications/benefits-from-auckland-road-decongestion>
153. Auckland Transport Alignment Project (2018). Auckland transport alignment project. <https://www.transport.govt.nz/assets/Uploads/Report/ATAP2018-v2.pdf>
154. Ministry of Transport (2018). Phase one report: The congestion question. <https://www.transport.govt.nz/assets/Uploads/Report/The-Congestion-Question-Report.pdf>
155. Waka Kotahi NZ Transport Agency (2013). Costs of congestion reappraised. <https://www.nzta.govt.nz/assets/resources/research/reports/489/docs/489.pdf>
156. Ministry of Transport (2014). Future freight scenarios study. <https://www.transport.govt.nz/assets/Uploads/Report/Future-Freight-Scenarios-Study.pdf>
157. Waka Kotahi NZ Transport Agency (2021). HPMV permit questions and answers. <https://www.nzta.govt.nz/commercial-driving/high-productivity/hpmv-permit-questions-and-answers/>
158. Waka Kotahi NZ Transport Agency (2021). HPMV permit questions and answers. <https://www.nzta.govt.nz/commercial-driving/high-productivity/hpmv-permit-questions-and-answers/>

Arataki

National directions

September 2023 v1.1

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The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. No major updates were made to the *National directions*.



National directions

At a glance

A land transport system must be safe, resilient and connected. It must provide equitable access for everyone and reduce the impact on the environment. It's critical for the health and wellbeing of New Zealanders for them to have easy access to employment, education, and essential services.

The land transport system underpins our economic prosperity. It helps domestic and international goods get to market. It has a key role in shaping our communities and creating quality places where people want to live.

The land transport system has negative impacts on people and the environment – these need to be reduced. In some situations, gradual improvement won't be enough. Transformational shifts will be required.

Over the next 30 years, the land transport system will need to change dramatically. The ways we travel, or mode mix, will be safer, cleaner, and better for the environment. There will be less travel by vehicle to meet our emissions goals. We'll achieve significant mode shift through rapid transit, public transport, walking, and cycling. Network management will be more efficient because of new technology and data. These changes also offer new ways to improve public health, grow businesses, and make people safer.

The largest change will be in the cities of Aotearoa New Zealand, where most future population growth is forecast. Here, the transport system will be dramatically different. Land use and transport will better integrate to support quality, mixed-use, compact urban form. In our largest cities, rapid transit networks will enable, support, and shape urban development. They will connect more people to jobs and each other.

Public transport will play a greater role in small cities and towns. New approaches, like shared services, will be more important. Freight will move more efficiently and safely. Rail and coastal shipping will play a larger role in freight, too.

There are significant challenges ahead. Climate change and more frequent extreme weather will force us to adapt. We'll need different approaches to ensure resilience. Innovative technology and shifting customer expectations will require us to be flexible and agile. We also need to make the land transport system fair and equitable, so it achieves more for everyone.

Context

A great land transport system offers choice in how people move around. They can walk, cycle, or use public transport. They can use roads, rail, and coastal shipping networks. Combined, these different ways of travel make up an efficient and effective system.

A land transport system shapes place. It supports productive and healthy movement of visitors and freight between regions and islands. New Zealand's economy depends on getting goods to global markets and allowing international travellers to explore our country.

Historically, the land transport system has addressed growth and network capacity with gradual change, an approach known as 'predict and provide.' This has spread people over wide areas, especially in larger cities, and led to high dependency on private car travel. This approach will not be enough to achieve the outcomes we require from the transport system.

Instead, transformational change and significant shifts are needed in many areas to meet our goals. This requires us to proactively plan the desired future we want, then consistently make decisions based on what's needed to achieve this. This approach is known as 'decide and provide.'

National outlook

The next 30 years will see significant changes in Aotearoa that will greatly impact the form and function of the land transport system. The system will need to evolve and respond to these changes to support all users, through a fair and equitable approach.

Our population is expected to increase, grow older, and become more diverse. Most growth will be in urban areas and their provincial surroundings.¹ Some rural populations are expected to decline.² The land transport system will need to support these changing populations, but the usual ways may not be enough.

As our economy becomes more service focused, freight volumes will continue to increase.³ More freight will move between ports and regions, by both road and rail. This means increased pressure in urban areas with more deliveries to both businesses and homes.

The mix of modes and their use of the land transport system will change. Nationally, we'll need to reduce vehicle travel and provide a range of alternate modes to encourage a fair, equitable transition.

Public transport will look different. More services will reach more places, including tailored options for smaller and rural areas. In our largest cities, rapid transit networks will develop and expand.

We'll need to rapidly roll out cycling networks to:

- fill gaps
- encourage more trips
- support other forms of micromobility, like scooters.

We'll also need to operate the system differently. Currently, the transport system causes too much harm to people and the environment. It also worsens existing inequalities rather than reducing them.

Technology will encourage significant change. Connected vehicles will allow real-time management of the system.

System pricing will be embedded to help people make decisions about where, when, and how to travel.

Network management will be more integrated. This will help us achieve maximum value from our network and appropriate levels of service.

Network maintenance will change to include:

- targeting where maintenance will happen
- sequencing what comes first and where maintenance is prioritised
- future planning.

The system will reduce its environmental footprint. We'll aim to protect and enhance air quality, water quality, and biodiversity.

Nature-based solutions will help us adapt to and alleviate the impacts of climate change.

We'll deliver a high-performing national transport system by drawing on the strengths of urban and rural areas, and looking for complementary solutions.

Urban communities

Transport has a fundamental role in creating spaces where people want to live. This includes quality, mixed-use, compact urban environments that:

- use land efficiently
- reduce travel distances
- support sustainable transport options
- lower reliance on private vehicles.

Decisions about urban development greatly affect many parts of the transport system like:

- demand
- capital and operating costs
- outcomes of programme investments.⁴

For urban areas to thrive, people need to be able to move around easily and have a range of choices about how they get to work, connect with family and friends, and access services. We need to build a modern transport system with a mix of reliable transport options that help keep people and products safely moving.

We need to move away from conflicting outcomes when seeking to service urban growth, like unlocking affordable housing, addressing inequities, and reducing greenhouse gas emissions. Instead, we need to focus on approaches and actions that make progress in all these important areas simultaneously in an integrated way.

Current approaches to urban development have generally resulted in low-density, car-dependent development without enough consideration of where people live, work, study, and play. These environments are particularly poorly suited to adapting to future drivers of change, such as our ageing population or the impacts of climate change.

To create spaces where people want to live, we must make the most of existing transport infrastructure assets in our urban environments and invest wisely in new assets. Future opportunities, particularly around technology, mobility as a service, and connected vehicles, should be explored and implemented. Integrating transport investment and resourcing decisions within the urban transport, spatial planning, and development system is essential to transform urban mobility away from car dependency and towards more sustainable, adaptable, and safe forms of transport. Ultimately, transport can make places better in urban environments through how it contributes to things such as green spaces, natural resilience, and connected communities.



Rural communities

The transport system plays a key role in creating and supporting rural communities. Transport also helps people thrive socially and economically.

Rural areas contribute greatly to the New Zealand economy, through primary production, like farming and related industries.

Growth in urban centres has affected some rural areas. For example, smaller regions have experienced lower employment and incomes, or a decline in population and essential services.

These challenges make it hard for rural communities to reach their potential and satisfy their wellbeing needs, like opportunities for work, cultural belonging, and good health.⁵

A key principle of *Te hau mārohi ki anamata*, the government's *Emissions Reduction Plan* (ERP), is to ensure a fair and equitable transition for all communities as Aotearoa shifts to a low-carbon economy.⁶

The ERP mentions rural communities will want to be actively involved in solutions that will affect them.

The *National Adaptation Plan* highlights that rural communities will see large impacts from climate change, affecting transport connections.⁷ More specifically, we'll need to consider emergency situations in rural areas that call for managed retreat.

These challenges especially impact young people, Māori, Pasifika, and vulnerable segments of the rural community. If we make poor decisions about how we operate and manage the land transport system, this will only contribute to those existing challenges.

There are drivers of future change that offer opportunities for rural communities.

For example, provincial centres and towns near major cities have gained population since 2020. This is because of increased remote working, made possible by changing work patterns and technology.

Technology offers better access to transport services. This is significant for rural communities which previously had to travel to larger centres to access transport.

However, difficulties accessing technology, like low bandwidth and slow internet connections, could worsen existing disadvantages.

Rural communities must be involved in planning and managing the changes to come. Their expertise is vital to finding the best solutions to address social, economic, and environmental challenges.

A well-delivered land transport system has an important role to play in supporting:

- employment and industrial development
- reliable and efficient freight movements
- fair access to employment, education, and essential services
- safe and sustainable movement of residents and visitors.

Land transport decision making can focus on single outcomes. It can be integrated into socio-economic decision making. It must be fair and help rural communities identify new opportunities and act on these.

Rural and urban places are reflected in the national directions outlined in the following sections. In addition, directions about specific urban and rural areas can be found in the *Regional Directions*.

Regional Directions →



Making progress

This section outlines how the land transport system will need to deliver significant change to achieve multiple outcomes over the coming years. It covers what is to be done and how approaches must shift for effective and efficient solutions.

Achieve shared outcomes with our partners by:

- partnering with sector partners, stakeholders, and the public to agree on plans, strategies, and programmes
- making dramatic improvements, or step changes, to meet Treaty-partner obligations
- partnering to develop shared evidence and collaborative responses to system-wide challenges
- ensuring the right solution is used at the right place and time to achieve many outcomes
- refining procurement practices to deliver multiple outcomes
- working with external partners to develop frameworks, release open data, and enable community-led delivery
- using targeted regulatory change for a range of outcomes, particularly for vehicle safety and emissions reduction.

Maximise the benefits of technology, data, and innovation by:

- ramping up collection, use, and distribution of transport data (including real-time data)
- using data to help transport users, operators, and regulators make faster and better decisions
- using evidence and insights to inform approaches and direction
- providing clear direction about how new technology, services, and business models can support future transport.

Maximise value from transport infrastructure and services by:

- applying a renewed focus on maintaining and improving existing infrastructure and services, to protect and maximise value from current assets
- identifying, anticipating, and progressing opportunities to deliver multiple outcomes when maintaining existing networks and building new ones

- managing and operating transport networks more deliberately and actively
- supporting network movement and improving public spaces, like footpaths, to reduce conflicts between different users and prioritise critical services
- identifying and progressing areas to reallocate road space for a range of users and modes
- improving service and experience across public transport and rapid transit through real-time data
- boosting network resilience by maintaining critical parts of the network
- addressing immediate climate change and extreme weather challenges in high-risk areas
- improving management and funding practices of existing assets to reflect long-term drivers and reduce whole-of-life-cycle costs.

Support highly liveable urban areas by:

- enabling and supporting quality, mixed-use, compact towns and cities with better travel options and shorter trip lengths
- reshaping urban road networks to allow public transport, active modes, and freight movements
- providing better travel choices, especially to improve fairness and equity
- enabling and encouraging the use of public, shared, and active modes, especially for people with limited transport choices
- implementing rapid transit solutions in major metropolitan areas where transformational change is required for transport and urban development.

Support prosperous rural communities by:

- ensuring safe and resilient transport connections
- exploring new ways to access safe, convenient, and reliable shared services
- building resilience in rural and coastal communities by making adaptation a core, urgent part of transport planning, especially for high-risk areas and connections.

The following section outlines the challenges and opportunities of each transport outcome and highlights recommended actions.

Environmental sustainability

Challenges and opportunities

Climate change requires us to make significant changes (known as step changes). Our response must address the design, delivery, operation, and use of the land transport system. It must integrate transport planning into larger plans for land use.

Lowering transport emissions by reducing vehicle kilometres travelled (VKT) is a national challenge.

Transport is responsible for 17% of New Zealand's greenhouse emissions.⁸ Nearly 50% of all transport emissions come from light vehicles in urban areas.⁹

Te hau mārohi ki anamata, New Zealand's First Emissions Reduction Plan, outlines the following expectations for the land transport system:

- 20% reduction in vehicle travel by 2035
- net-zero emissions by 2050.

There are opportunities to reduce transport emissions across Aotearoa through:

- changes to urban form
- shifts to sustainable transport modes, like walking and cycling.

Lower traffic volumes and fewer emissions make places more attractive to live, and deliver other safety, economic, and health benefits.

Cities will have the greatest opportunity to reduce VKT and will need to make the biggest reduction in emissions.

Rural areas and regions need to be supported in their reduction of VKT, with care given to vulnerable ecosystems.

Reducing private vehicle use must be supported by a land transport system that offers many travel choices. This multi-modal offering will:

- deliver rapid transit in our largest urban areas
- improve public transport in cities and towns
- offer new services, like on-demand transport, in smaller and rural communities.

Current walking and cycling networks are underdeveloped. New networks will need to be rapidly rolled out to safely connect people and places.

There is a huge opportunity to gradually move the national vehicle fleet to cleaner, low-emissions options, like electric vehicles.¹⁰

To start, the focus should be on:

- decarbonising the light vehicle fleet (while maintaining inclusive access)
- reducing the distance we travel by private vehicles
- identifying new ways to encourage the use of safer, cleaner vehicles.

Low-emission options are also needed for freight. These might include:

- shifting more freight to rail
- encouraging cleaner heavy vehicles.

Urban freight is particularly well suited to electric vehicles and electric cargo bikes.

The land transport system must use resources well by taking a circular approach to planning and management. For example, looking at ways to reuse materials not just for the task at hand, but for the long-term.

Using a sustainable approach, from planning to delivery and operation, will create a system that understands and manages its impacts at all stages.

Some parts of the land transport system have negative impacts on biodiversity and water quality. This can be particularly true of new infrastructure delivery.

We need a more focussed approach to manage the impact of transport on the environment. This includes collecting the right environmental data to help make decisions.

Climate change requires us to make significant changes (known as step changes). Our response must address the design, delivery, operation, and use of the land transport system.

Making progress

Key actions to make progress on this outcome are:

- include resource efficiency and waste minimisation in design standards, procurement processes, and investment decision making
- plan and prepare national guidance to reduce light vehicle kilometres travelled (VKT) and support urban VKT reduction
- create shared evidence about significant natural areas and indigenous biodiversity for transport planning and delivery
- improve biodiversity direction and management on the transport network
- use nature-based solutions in design and delivery
- look after and maintain water quality
- use transport corridors to connect isolated greenspaces
- make sure planning and investment target options that deliver the lowest whole-of-life costs
- partner with Māori on climate response to include Mātauranga Māori and support a fair, Māori-led transition
- complete walking and cycling networks for safe, convenient, and sustainable journey options
- make sure programme delivery and planning takes a multi-outcome approach, like including safety and fairness in VKT reduction.

Healthy and safe people

Challenges and opportunities

Land transport affects our health and safety in many ways.

In the years leading up to 2013, the number of transport-related deaths and serious injuries was in decline. Since 2013, however, the numbers have been on the rise.¹¹

In 2021, 321 people died on Aotearoa roads and 13,252 were injured.¹²

Some improvements have been seen, but not in a sustained way.

Our road safety focus is guided by the government's Road to Zero Strategy.¹³

This action plan commits Waka Kotahi, Ngā Pirihimana O Aotearoa New Zealand Police, Te Manatū Waka Ministry of Transport, and other partners to a 40% reduction in the number of people killed and seriously injured in road crashes by 2030.

There are large parts of the road network that are below a safe standard. Actions must be taken to make roads safe to prevent deaths and injuries.

Proven ways of addressing safety concerns aren't being put in place fast enough or at scale to reverse the increased trend of transport-related deaths and serious injuries.

Rail safety needs to be better, with a long-term approach to support.

Rail will play a larger role for interregional freight and passenger travel, especially as demand for metro rail services grows.

We also need to reduce air noise pollution, through better transport network design in urban environments.

Health problems worsened by air pollution, mostly from diesel and motor vehicles, resulted in the premature death of more than 3,300 adult New Zealanders over the course of a year.¹⁴

There's no system-wide approach to managing and reducing air and noise pollution. New regulation may be required.

The vehicle fleet moving to cleaner technologies, like electric cars, will help reduce pollution. Despite this, there are still significant place and movement conflicts that need to be resolved, like car-dominated city streets.

All transport modes and ways of moving need to be safe. This requires moving an older vehicle fleet to higher safety-rated vehicles over time.¹⁵ As we make this transition, we'll need to make sure access for everyone is fair, equitable, and cost-effective.

Safety, and feeling safe, are important to consider in planning and investing, especially as we encourage more active and shared modes, like walking and public transport.

Some modes, like walking and cycling, have dangerous networks that must be made safer to encourage use of these ways of travel (mode shift) and boost physical activity.



Proven ways of addressing safety concerns aren't being put in place fast enough or at scale to reverse the increased trend of transport-related deaths and serious injuries.

Making progress

Key actions to make progress on this outcome are:

- improve poor air quality caused by transport through a stronger system-wide response
- look into ways to reduce transport noise in key locations
- identify barriers to reach the Road to Zero goal of reducing the number of people dying or seriously injured on roads
- identify and action partnerships, approaches, and solutions to achieve Road to Zero goals
- support road-safety partners to deliver solutions to achieve Road to Zero goals
- understand why Māori are overrepresented in road crash deaths and serious injuries
- develop a long-term approach to improving rail safety (beyond the current 10-year time horizon)
- work with partners to enable research and evidence-led planning for road safety
- focus safety research on more fair, equitable, and inclusive access for future projects.

Inclusive access

Challenges and opportunities

Our end goal is to provide fair and equitable access to opportunities through transport options that are available and affordable.

Currently, there are access issues for a range of groups including:

- low-income people
- those with mobility issues
- new migrants
- Māori.¹⁶

We'll continue developing *Arataki* to establish the most effective directions to improve transport fairness and equity over the next 30 years. The actions outlined below are a starting point.

A major challenge is to ensure a fair and equitable move to low-carbon transport and VKT reduction.

Many people rely on private motor vehicles. Because of personal circumstances or a lack of alternatives, these people can't switch to other ways of travel.¹⁷

A fair and equitable transition recognises these challenges. We'll aim to provide many transport options for people including:

- cleaner, safer vehicles
- improved public transport
- safer networks for active mobility options
- new solutions, like on-demand services.

These options will vary in rural and urban areas. They may be different for individual communities.¹⁸


Access to driver licencing training is not consistent across Aotearoa. In many rural areas, there are no options to access testing services.

Not being able to drive legally means less access to jobs and opportunities. This encourages people to drive without a licence. This puts them, and other road users, at risk of harm, fines, and infringement notices.¹⁹

Programmes are in place to improve rural access to licensing and driver training through more testing agents and funding.²⁰

Public transport helps people access jobs and social opportunities. Access to public transport is not fair or equitable across the country or for different groups including low income, Māori, disabled, and other groups.

Providing a range of public transport options in more places helps improve access and makes travel more affordable.



Our end goal is to provide fair and equitable access to opportunities through transport options that are available and affordable.

Making progress

Key actions to make progress on this outcome are:

- embed fairness, equity, and safe-system principles in transport policy and planning
- develop strategic guidance on inclusive access
- encourage participation in licensing and driver-safety programmes, particularly for rural and low-income communities
- improve access to compliance requirements, like for vehicle warrants and vehicle testing, particularly for rural and low-income communities
- make public and shared transport options more useful for those with few travel choices, like shift workers
- improve transport equity for Māori by reducing the number who don't have a car, or are forced to have one (because they have no transport alternatives)
- work with communities and partners to find the right level and mix of services, especially in areas of declining population
- engage Māori to better understand their aspirations and objectives
- build an evidence base for Māori for transport outcomes
- support access for women that reflects needs like safety, affordability, and traveling with children.

Economic prosperity

Challenges and opportunities

The major challenge for national and regional corridors is to ensure safe journeys and reliable travel times.

In urban centres, a key focus is providing a range of ways to travel, or modes. Urban transport must connect people to employment, education, and other opportunities through safe, predictable journeys.

Key initiatives, like rapid transit, improve economic prosperity by:

- improving access to major centres
- connecting businesses
- expanding labour pools and access to jobs.

The change needed to meet these challenges creates opportunities, like using sustainable materials and finding ways to encourage low-emissions transport options.

Another key challenge is improving travel-time reliability and predictability for rail and road freight. This requires a deeper understanding of issues on the freight network, particularly where location may limit freight access to and from ports.

A high-quality, shared database using real-time data will help us address freight challenges.

The freight system includes several modes, like road, rail, and coastal shipping, all with their own strengths and weaknesses.

There is a major opportunity for freight to integrate across modes. This means each can play to its strengths and contribute as much as possible to emissions reduction – ‘the right mode for the right load’.

This may mean changes to the kind of products moved on each mode. It will also highlight the growing importance of rail and coastal shipping.²¹

Making progress

Key actions to make progress on this outcome are:

- deepen and expand our understanding of the economic prosperity outcome
- develop a shared-freight evidence base across public and private sector of high-quality, accessible information
- use digital networks and tools to improve services, network management, and connectivity
- develop guidance with, and for, the freight sector to improve economic outcomes with the sector
- create an evidence base about the transport opportunities and challenges facing Māori entities, employers, self-employed, and employees
- develop business models and services that match goods and carriers for efficient movement across all modes from origin to destination.
- move to an integrated and multi-modal freight system where road, rail, and coastal shipping play to their strengths
- contribute to a safe, reliable, resilient freight system that moves goods easily and with low emissions
- prepare remaining sections of the state highway network for use by high productivity motor vehicles (HPMV)



The major challenge for national and regional corridors is to ensure safe journeys and reliable travel times.

- identify the nature, scale, and location of damage on local roads from heavy freight vehicles – focus on those that present funding challenges for local councils
- make sure regulatory settings support safe trialling and adoption of technologies, including new forms of mobility
- develop and implement a stopping-places strategy for freight to improve convenience and infrastructure.

Resilience and security

Challenges and opportunities

Aotearoa is a geologically-active country. We often experience wild or extreme weather.

We face ongoing natural hazard events, like earthquakes and cyclones, that:

- cause serious damage to infrastructure and communities
- limit our ability to connect with people, businesses, and places.

In some areas, sea level rise and severe weather events will mean more flooding, erosion, and rising groundwater levels. There will be more fires as well as high winds and temperatures.²²

New Zealand's *National Adaptation Plan* outlines an ambitious work programme to improve resilience by:

- reducing vulnerability of exposed assets
- ensuring all new infrastructure is fit for a changing climate
- using renewal programmes to improve our ability to adapt.²³

Our transport system needs to prepare for natural and human-made risks and make plans to recover from disruptive events.

Some parts of the country depend on one or two transport links to stay connected. Maintaining these links during severe weather or natural disasters is a challenge.

New approaches to recovering from disruption should be considered like:

- adapting to new conditions
- temporarily reducing service levels
- using other ways of travel.

Adaptation planning will help reduce the impacts of climate change where possible. It will also help ensure we recover quickly when disruption occurs.

Some transport corridors are in areas with extreme and high risk of disruption. Climate change is expected to increase the frequency of these risks.

These areas must focus on adapting to climate change so they continue to function as important parts of the network.

In some places this may mean changing the mix of modes or providing lower levels of service.

These parts of the network are also expensive to maintain and operate, often with limited funding. This is another reason new approaches are needed.

The system needs to be agile and adaptable to other unexpected changes like:

- global pandemics
- volatile imported fuel prices
- new technology disruptions.

Digital systems and data are becoming more important to the transport sector. There are new digital solutions to pricing and integrated ticketing that pose security risks.²⁴

In the past, there have been inconsistent approaches to assessing and responding to digital security issues.

In the future, an aligned and targeted approach to digital planning and operation would help lift sector preparedness.

Our transport system needs to prepare for natural and human-made risks and make plans to recover from disruptive events.

Making progress

Key actions to make progress on this outcome are:

- build resilient communities by including climate adaptation in national and regional transport planning
- apply physical- and digital-security standards to construction, asset management, and operation
- include Te Ao Māori views in regional and local transport planning
- work closer with Māori communities on adaptation responses
- understand if Māori communities are more sensitive to climate change and where impacts could be greatest
- research the locations of marae and their exposure to sea level rise, earthquakes, volcanoes, land slips, and other events
- collaboratively build spatial tools to assess geological and hydrological risks across the transport network
- safely manage cybersecurity risks as the transport system becomes more connected
- develop a digital resilience platform to understand risk across the transport network.

References

The background of the page features a blurred photograph of a train, likely a passenger train, moving from left to right. The train has a red and orange livery. In the foreground, there is a platform with yellow safety markings on the ground. A large, thick orange curved line starts from the top left and curves downwards towards the right, partially obscuring the train image.

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
3. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
4. D Foy, T Erasmus, C Taylor, D Fairgray, K Bligh and D Hunter (2017). The future of employment and economic activity and its transport and land use implications, p8. <https://www.nzta.govt.nz/assets/resources/research/reports/637/637-future-of-employment-economic-activity-transport-land-use-implications.pdf>
5. The Treasury (2022). Our living standards framework. <https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards/our-living-standards-framework>
6. Ministry for the Environment (2022). Emissions reduction plan. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan/>
7. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
8. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
9. Ministry for the Environment (2022). Aotearoa New Zealand's first emissions reduction plan. <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>
10. Ministry of Transport (2021). Hīkina te Kohupara – Kia mauri ora ai te iwi transport emissions: Pathways to net zero by 2050 green paper, p15. <https://www.transport.govt.nz/assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf>
11. Ministry of Transport (2022). Transport indicators, healthy and safe people. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/healthy-and-safe-people>
12. Ministry of Transport (2022) Annual crash statement (2021). <https://www.mot-dev.link/acs/acs-2021/>
13. Ministry of Transport (2019). Road to zero – New Zealand's road safety strategy 2020-2030. https://www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
14. Kuschel et al (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
15. Ministry of Transport (2022). Overview of road safety in New Zealand. <https://www.transport.govt.nz/assets/Uploads/Presentation/Overview-of-Road-Safety-in-NZ-Data-packs-for-reference-groups.pdf>
16. Waka Kotahi NZ Transport Agency (2022). Benchmarking sustainable urban mobility. <https://nzta.govt.nz/assets/resources/sustainable-urban-mobility-benchmarking/sustainable-urban-mobility-benchmarking-report.pdf>
17. Ministry of Transport (2022). Te karore ā-whānau, Household travel. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
18. Ministry for the Environment (2022). Empowering Māori. <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/empowering-maori/>
19. Waka Kotahi NZ Transport Agency (2021). He pūrongo whakahaumaru huarahi mō ngā iwi Māori summary of the Māori road safety outcomes report. <https://www.nzta.govt.nz/assets/resources/maori-road-safety-outcomes-report/maori-road-safety-outcomes-summary-report.pdf>
20. Beehive (2022). Government clears road for 64,000 people to get driver licenses. <https://www.beehive.govt.nz/release/budget-2022-government-clears-road-64000-people-get-driver-licenses>
21. Maersk (2022). Maersk to launch dedicated coastal service in New Zealand. <https://www.maersk.com/news/articles/2022/06/15/maersk-to-launch-dedicated-coastal-service-in-new-zealand>
22. Ministry for the Environment (2020). National climate change risk assessment for New Zealand – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa: Technical report – Pūrongo whaihanga. <https://environment.govt.nz/assets/Publications/Files/national-climate-change-risk-assessment-technical-report.pdf>
23. Ministry for the Environment (2022). Aotearoa New Zealand's first national adaptation plan. <https://environment.govt.nz/assets/publications/climate-change/MFE-AoG-20664-GF-National-Adaptation-Plan-2022-WEB.pdf>
24. Austroads (2020). Future vehicles 2030, p22. https://austroads.com.au/publications/connected-and-automated-vehicles/ap-r623-20/media/AP-R623-20_Future_Vehicles_2030.pdf

Arataki

Regional direction
Te Tai Tokerau – Northland
September 2023 v1.1

At a glance



Te Tai Tokerau Northland depends on its rail and road connections south to Tāmaki Makaurau Auckland and the rest of Aotearoa New Zealand. These connections support social benefits, like helping communities thrive, and economic opportunities for the key industries of tourism, horticulture, forestry, and manufacturing.

In recent years, Te Tai Tokerau has grown faster than any other region in the country. This has put pressure on housing and infrastructure, including transport.

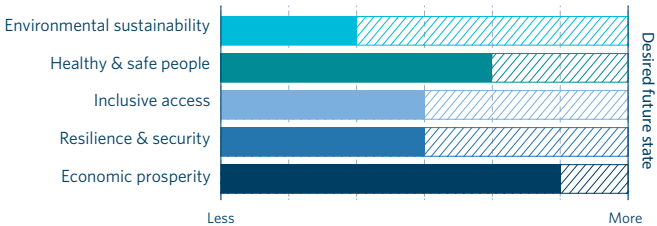
About half the region’s population lives in the Whangārei district, with growth rates varying across the region. Some areas are growing rapidly; others are in decline. Overall, the region’s population is expected to grow from 200,000 to 231,000 by 2048.¹

Most growth has occurred as low-density housing. Whangārei has allowed for greater density growth; this has yet to be taken-up. This area is highly dependent on cars because of low density of development, dispersed rural and coastal communities, and limited public transportation.

Te Tai Tokerau has one of the highest rates of road deaths and serious injuries of any region.² Key safety challenges include poor vehicle condition, speeding, drug and alcohol impairment, fatigue, and not using seat belts.³

The region’s transport system is vulnerable to sea-level rise, flooding, intense storms, and slips. Many communities in Te Tai Tokerau are often accessed by one road or state highway. The region’s transport network is also vulnerable to resilience challenges. This is because the only road and rail connections from the region to the rest of the country is through Tāmaki Makaurau.

Scale of effort to deliver outcomes in Te Tai Tokerau – Northland

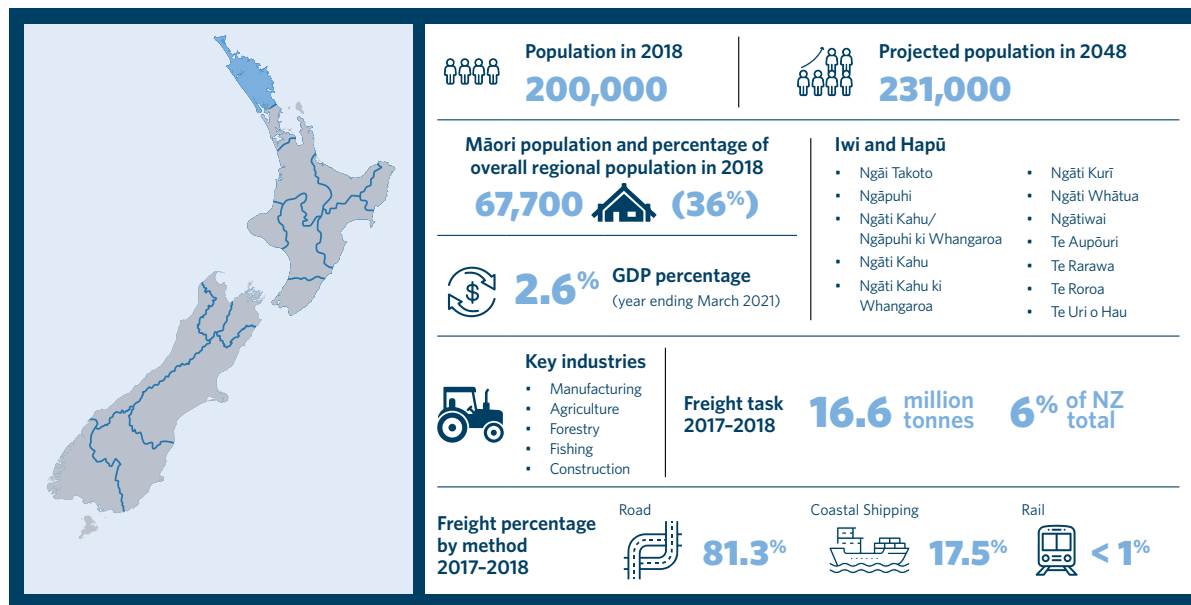


The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. Most sections of the *Regional direction Te Tai Tokerau – Northland* have climate-related updates.

Context



The population of Te Tai Tokerau Northland is projected to grow from 200,000 to about 231,000 by 2048, or 4% of the country's population.⁴ Nearly 70% of the population lives outside the region's only major urban centre, Whangārei.⁵

From 2013 to 2018, the region's population growth was the highest of any region in Aotearoa New Zealand.⁶ Spill-over from Tāmaki Makaurau Auckland is a key growth driver for the region, particularly for Kerikeri, Whangārei, Mangawhai, Ruakākā, and along the corridor from Whangārei to Tāmaki Makaurau.

A large amount of population growth will be in Whangārei. This will mostly happen through a mix of greenfield growth (development of undeveloped areas) and urban redevelopment. This could support significant mode shift.

High-growth townships like Te Poupouwhenua Marsden/ Ruakākā, Kerikeri/Waipapa, and Mangawhai, will likely remain car dependent unless there is significant investment in public transport.

In 2018, Māori living in Te Tai Tokerau made up 36% (67,700) of the region's population which is projected to increase to 43% by 2043.⁷ This is more than double the national rate of 16.5%.⁸ In the district of Far North, Māori make up 49% of the population.⁹ There are a number of iwi and hapu throughout the region that have yet to receive a full Treaty settlement with the Crown.

The iwi and hapū in the Te Tai Tokerau region are Ngāi Takoto, Ngāpuhi, Ngāti Kahu/ Ngāpuhi ki Whangaroa, Ngāti Kahu, Ngāti Kahu ki Whangaroa, Ngāti Kuri, Ngāti Whātua, Ngātiwai, Te Aupōuri, Te Rarawa, Te Roroa and Te Uri o Hau.¹⁰

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Te Tai Tokerau rohe, which relates to the Te Tai Tokerau region. It notes the asset base in the rohe is valued at \$8.0 billion.¹¹ The primary sector important, followed by property.¹²

The region's economic advantages include:

- close proximity to the large Tāmaki Makaurau market
- easy access to export markets
- the natural environment and sub-tropical climate.

Despite this, Te Tai Tokerau has the lowest GDP per capita in Aotearoa.¹³ It also has high levels of poverty throughout the region, especially for Māori and in rural areas.¹⁴

To create greater opportunities in Te Tai Tokerau, a focus on regional development is needed. This includes improved access to employment, education, training, and essential services, particularly for communities in remote areas.

The country's transition to a low-emission economy will impact rural land-use in Te Tai Tokerau. For example, there is already evidence of a transition from dairying to avocado production and forestry.¹⁵

Severe weather events are already affecting the land transport system in Te Tai Tokerau. There were two severe weather events at the start of 2023: the Auckland Anniversary Weekend floods in January and Cyclone Gabrielle in February. Flooding, landslips, and storm damage caused road closures on SH1 at Brynderwyn and at multiple locations along SH12. Rail was also affected with a closure on the North Auckland Line between Swanson and Whangārei. Expected closures will be an ongoing and significant issue in Te Tai Tokerau.

Key transport routes, such as SH1, are critical in connecting the towns and communities of Te Tai Tokerau. As access along the corridor north of Tāmaki Makaurau is improved, Te Tai Tokerau will become an even more attractive region to live, work, and visit.

The freight task in Te Tai Tokerau in 2017–2018 was 16.6 million tonnes, or around 6% of the Aotearoa total.¹⁶ A total of 81.3% of the freight task in Te Tai Tokerau was moved by road, 17.5% by coastal shipping, and less than 1% by rail.¹⁷



Te Tai Tokerau – Northland: Outlook

Over the next 30 years, significant transformation to the transport system of Te Tai Tokerau is needed to address challenges and make progress on key transport outcomes.

Te Tai Tokerau has a spread out population and limited public transport services beyond Whangārei. This means people are highly dependent on private vehicles to access key services, such as tertiary education, training, and healthcare.

A greater role for Northport and investment in the productive sector, such as horticulture and fruit, in the Upper North Island could significantly increase freight volumes. The safe and efficient movement of goods to Tāmaki Makaurau Auckland and other domestic markets would need support from road, rail, and coastal shipping.

Recent or future work in the region will support an increased role for rail freight. This includes:

- recent investment in upgrading the North Auckland Line between Tāmaki Makaurau and Whangārei
- the planned reopening of the line to Otiria, where a new container terminal is to be located.

KiwiRail plans to construct a new 19km rail spur connecting Northport to the rail network.

These projects will contribute to the expansion of Northport and will allow growth for container traffic. Northport's Vision for Growth, along with business cases for a dry-dock facility, outline continued expansion of the port and the surrounding industrial area.¹⁸

In light of increased extreme weather events, the next 30 years will present long-term resilience challenges as the likelihood of damaged roads and rail networks grows. It will be necessary to work with communities to:

- understand climate adaptation
- identify and prioritise responses in high-risk areas
- identify sections of the network prone to closure
- plan to avoid infrastructure and development in high-risk areas.

It will be challenging to fund new infrastructure and services to keep pace with expected growth in Te Tai Tokerau. Maintenance of existing transport infrastructure is already costly because of the:

- size of the network
- number of isolated communities on the network
- challenging geography and increased hazards and storm events.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- a renewed focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns
- creating a more resilient network
- implementing a targeted safety programme.

Even with these steps, more investment from a wider range of finance and funding sources is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’

approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Tai Tokerau Northland will need to make some contribution to reducing transport emissions, to reach 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁹

As the main urban centre, Whangārei presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in an urban centre with high levels of private vehicle use.

During the past decade there has been progress to increase public transport services and significantly expand walking and cycling networks.

Whangārei, and the surrounding towns, will need to carefully manage how the transport system addresses population growth by:

- providing reliable public transport
- ensuring quality infrastructure for walking and cycling
- encouraging travel by alternative modes, like implementing parking restrictions.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- improving freight connections
- increasing mode share for rail and coastal shipping.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and urban development that supports compact and mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions and investments are needed to achieve emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- making it more safe and convenient for residents to travel around urban areas by completing the Whangārei urban cycle network, and improving public transport, such as putting in bus lanes and more frequent services
- exploring opportunities to provide more comprehensive electric vehicle (EV) infrastructure in rural communities
- exploring opportunities to use technology to help deliver better services at a lower cost
- more actively managing carparking in Whangārei to increase use of public transport, walking, and cycling
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the transport system on the local environment
- supporting the implementation of key policies, such as vehicle fleet transformation, and investigation of pricing tools.



The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Healthy and safe people

Challenges and opportunities

Te Tai Tokerau has a poor road safety record, with an average of 180 annual deaths and serious injuries during the past three years.²⁰ The greatest risk areas are:


- SH1 from Mahurangi Warkworth to Pakaraka (SH10)
- urban areas in Whangārei
- high-risk rural roads.²¹

Key safety issues are around driver behaviours, such as speeding, alcohol and drug impairment, people not wearing seatbelts, and vehicle condition.²²

These issues are made worse by high levels of deprivation in Te Tai Tokerau. This highlights the importance of regional development.

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated *Action Plan 2020–2022*, and regional safety strategies.²³

There is a significant opportunity, and need, to increase walking and cycling rates in urban areas of Te Tai Tokerau. Active mode use has fallen substantially in recent decades, contributing to many health problems around lack of physical activity. These health issues, like obesity and diabetes, disproportionately affect some demographics.²⁴ The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²⁵



There is a significant opportunity, and need, to increase walking and cycling rates in urban areas of Te Tai Tokerau.

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and support dramatic changes to encourage walking and cycling will help the urban areas of Te Tai Tokerau Northland. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- completing planned safety improvements, notably on SH1 between Whangārei, Port Marsden Highway, and Te Hana, and the replacement of single-lane bridges
- supporting safety improvements to the urban network
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- improving access to driver learning and licensing, particularly in isolated rural communities
- rapidly rolling out a well-connected, separated cycling network in Whangārei and other towns across the region through reallocation of existing street space
- encouraging high-quality active mode infrastructure be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- advocating for robust mobile network coverage in rural and regional areas.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

A high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice
- limiting access to education, training, and employment opportunities, which impacts the wider regional economy.

Rural and coastal communities in Kaipara and the Far North need improved connections to centres, such as Whangārei. Young people need access to education and increased employment opportunities. Older residents need access to physical and social activities, as well as health and social services.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around the Far North and Kaipara, and improve access to services in Whangārei. Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure. The growing popularity of online purchasing and home delivery will impact on-demand travel, including the movement of freight.


Free driving lessons and tests for the region's young drivers are expected to improve access to education, training, and employment opportunities. This will help those without access to alternative transport services and reduce road deaths.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- working with councils to shape planning rules and decision-making to encourage more people to live in areas with better existing access to social and economic opportunities, especially in Whangārei and other fast-growing towns
- improving public transport infrastructure and services, and expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys – this includes the completion of urban cycling networks in Whangārei and improved active-mode facilities in smaller towns
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to marae, and sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Young people need access to education and increased employment opportunities. Older residents need access to physical and social activities, as well as health and social services.

Economic prosperity

Challenges and opportunities

Te Tai Tokerau Northland has the lowest GDP per capita in Aotearoa New Zealand.²⁶ Regional development is required to:

- support communities
- create greater opportunities and prosperity, especially for Māori and those living in rural areas.

Northland Inc, the Te Tai Tokerau Economic Development Agency, supports several initiatives through the *Te Tai Tokerau Economic Action Plan* and the *Regional Economic Development Strategy*. Waka Kotahi is supporting both programmes.

Because weather-related events have frequently closed key transport routes along road and rail networks, access to markets and the Ports of Auckland has been impacted.

The transition to a low-emissions economy may result in land-use changes, particularly dairying, with flow-on effects for freight movement. A growing role for Northport in the country's overall supply chain seems likely in the future, meaning improved road and rail connections will be critical.

An increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Technological change will have significant impacts on demand for travel and on the economy of Te Tai Tokerau. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling in Whangārei and other regional towns
- supporting resilient, reliable, and efficient freight travel through interregional road and rail connections to Tāmaki Makaurau Auckland and Northport
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving the access and amenity (attractiveness)
- working with Northland Inc to identify and support economic development opportunities
- using social procurement initiatives to support positive outcomes for training and employment.

The transition to a low-emissions economy may result in land-use changes, particularly dairying, with flow-on effects for freight movement.

Resilience and security

Challenges and opportunities

The next 30 years will see growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁷

Climate change will mean hotter, drier summers. This will create dust issues on the region's many unsealed roads (only 40% of the region's 5,805kms of local roads are sealed).²⁸

Rising sea levels and more intense storms will continue to disrupt access in some areas. Many remote communities and marae rely on a single access road. The added risk is that marae often serve a dual role, operating as key civil defence infrastructure in an emergency event.

Landslips and flooding present long-term resilience challenges, and the highest risk natural hazards, for areas in the Te Tai Tokerau Northland region.

SH1 from the Brynderwyn Hills to Whangārei is subject to both landslips and flooding; this will likely increase in the future because of sea level rise and increased rainfall. SH1 in the Far North is at risk with sections often affected and closed because of slips and storm damage. This section, and others on the state highway and rail network, were closed in 2023 because of severe weather events. There are significant challenges and costs to ensuring long-term resilience along this part of the state highway network.

Sections of SH12 and SH14 in the Kaipara are also at risk from flooding. These are vital connections for local communities and major townships.

The small number of connections between Te Tai Tokerau, Tāmaki Makaurau Auckland, and the rest of the country mean network resilience is of particular significance to the region.


More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- fast-tracking a business case to identify short- and long-term options for the Mangamuka Gorge closure
- supporting local government, communities, iwi, and hapu through Climate Adaptation Te Tai Tokerau (CATT) and the proposed projects around understanding climate adaptation for at-risk communities
- continuing work to better understand routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts – this includes identifying priorities for network resilience and long-term strategic planning for key areas of risk, such as SH1, SH10, SH12, and sections of SH14
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



Landslips and flooding present long-term resilience challenges, and the highest risk natural hazards, for areas in the Te Tai Tokerau region.

Te Tai Tokerau – Northland: Focusing our efforts



For efficient and effective progress, the transport challenges for Te Tai Tokerau Northland must be tackled in a cohesive way.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Significantly reduce the harm caused by the transport system of Te Tai Tokerau, especially through improved road safety and reduced pollutants dangerous to health.
- Reduce vehicle kilometres travelled, focusing on Whangārei, in a way that's fair, equitable, and improves quality of life.
- Plan and deliver growth in Whangārei and key townships, such as Kerikeri and Mangawhai, in an affordable and cost-effective way that aligns with safety and emissions-reduction goals.
- Support the prosperity of Te Tai Tokerau by providing a safe, efficient, and resilient transport network that helps address low incomes, supports Māori economic opportunities, and improves access for rural communities to employment, training, and education.
- Increase resilience by focusing on key connections and communities at risk, as well as important road and rail connections to Tāmaki Makaurau Auckland and Northport.
- Provide communities with access to a range of social and economic opportunities by public transport, walking, and cycling.
- Work with local government, developers, and agencies to support and encourage development in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks with a focus on completing existing planned networks in Whangārei and reshaping existing streets, to make these options safe and attractive.
- Improve and expand public transport services, including potential on-demand services, to improve access to social and economic opportunities.
- Identify and support opportunities to move to a multimodal freight system with greater use of rail and coastal shipping.
- Work with communities and councils to identify and confirm how key resilience risks will be addressed over time.
- Progressively upgrade road and rail connections to Tāmaki Makaurau and Northport to improve the safety, efficiency, and resilience of these critical links to the rest of Aotearoa New Zealand.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Reduce financial and other barriers to iwi Māori getting a driver's licence in areas not well served by public transport.
- Improve or maintain, as appropriate, physical access to marae, papakāinga wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
3. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
4. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
10. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
13. Statistics New Zealand (2021). Regional gross domestic product: Year ended March 2021. <https://www.stats.govt.nz/information-releases/regional-gross-domestic-product-year-ended-march-2021/>
14. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
15. Statistics New Zealand (2021). Agricultural and horticultural land use. stats.govt.nz/indicators/agricultural-and-horticultural-land-use
16. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
18. Ministry of Transport (2019). Interim progress report on the Upper North Island supply chain strategy. www.transport.govt.nz/assets/Uploads/Report/UNISCS-Interim-progress-report-on-the-Upper-North-Island-Supply-Chain-Strategy_Final.pdf
19. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
20. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
21. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
22. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
23. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
24. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
25. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
26. Statistics New Zealand (2021). Regional gross domestic product: Year ended March 2021. <https://www.stats.govt.nz/information-releases/regional-gross-domestic-product-year-ended-march-2021/>

27. Ministry for the Environment (2018). Climate change projections for the Northland region. **environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-northland-region/**
28. Ministry of Transport (2022). Length of road network, sealed and unsealed. **www.transport.govt.nz/statistics-and-insights/road-transport/sheet/length-of-road**

Arataki

Regional direction
Tāmaki Makaurau – Auckland
September 2023 v1.1

At a glance

Because of its size, scale and substantial forecasted future growth, Tāmaki Makaurau Auckland has a significant role to play in achieving transformational change and our national transport outcomes.

The scale and complexity of the transport challenges in Tāmaki Makaurau, coupled with the country's reliance on its economic significance, means a strong partnership between central government, local government, and Māori is essential.

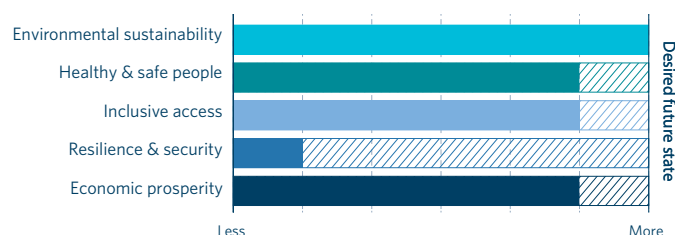
Tāmaki Makaurau needs more compact, mixed-use, urban form along with greater use of public transport, walking, and cycling. This would support emissions reduction, improve access to travel options, increase housing supply and affordability, and help make Tāmaki Makaurau a better place to live.

Significant investment is needed to expand the rapid transit network, improve public transport services, complete the cycling network, and enable growth. This investment needs to get more from the city's existing infrastructure and increase the numbers using alternative travel choices.

Tāmaki Makaurau has well-established transport plans and planning processes, such as the Auckland Transport Alignment Project (ATAP) and the *Auckland Plan 2050*. Throughout 2023 central government and Auckland Council have been developing the Tāmaki Makaurau Integrated Transport Plan (TMITP), to maintain alignment on a long-term strategic approach and short-term investment priorities. The Auckland Development Strategy and the new Future Development Strategy were also reviewed in 2023 to better integrate future land use with infrastructure provision. Ongoing joint planning will be critical to delivering the right outcomes in a complex and constantly changing landscape.

Resilience should also be considered, with parts of Tāmaki Makaurau vulnerable to landslips, flooding, erosion, and high winds.

Scale of effort to deliver outcomes in Tāmaki Makaurau – Auckland



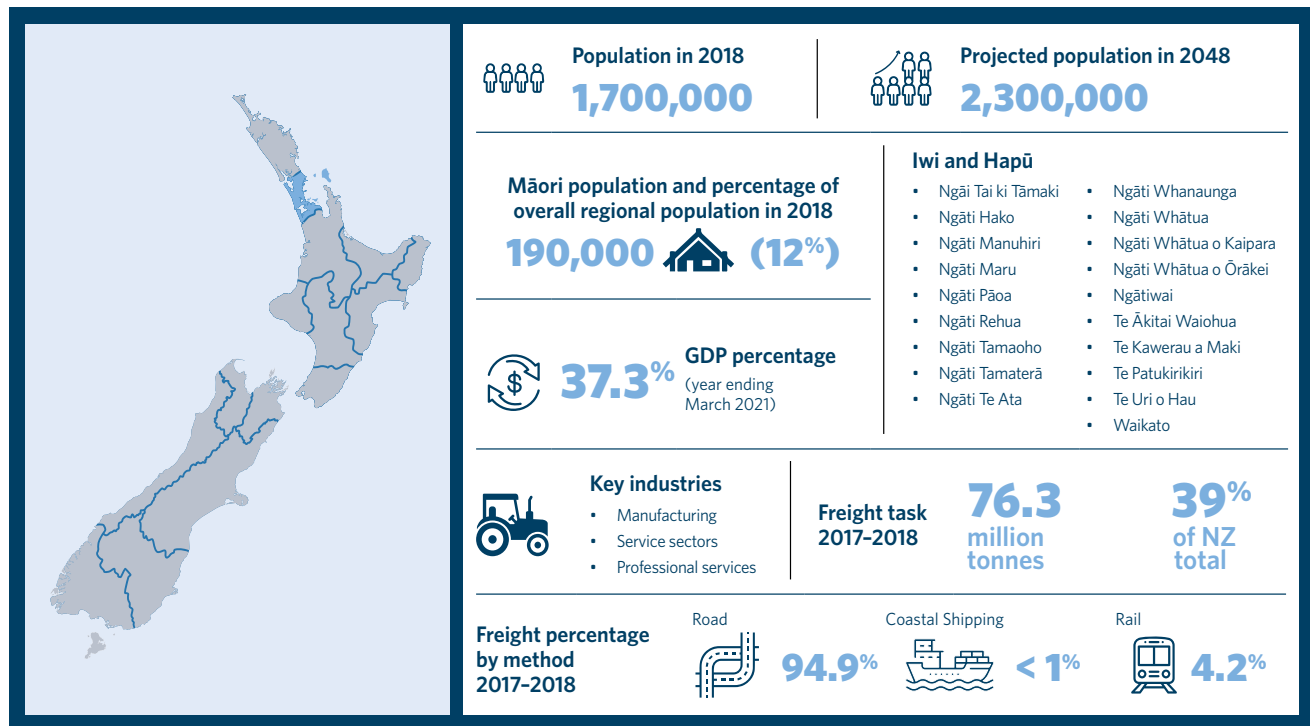
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. Most sections of the *Regional direction Tāmaki Makaurau – Auckland* have climate-related updates.

Context

Tāmaki Makaurau – Auckland



More than a third of the country's population live in the Tāmaki Makaurau Auckland region, which has grown by about 500,000 people over the past 20 years.

The size and ongoing growth in Tāmaki Makaurau, combined with a challenging geographic layout and history of imbalanced transport investment, means the region already has many transport challenges that will increase over time. Because Tāmaki Makaurau plays a key role within the wider Upper North Island, achieving national transport outcomes is highly dependent on what happens in the country's biggest city.

The population of Tāmaki Makaurau is projected to grow from about 1.7 million in 2021 to 2.3 million by 2048.¹ This is a faster rate of growth than the rest of Aotearoa New Zealand, because of higher immigration rates and a younger population. By 2048, the region's share of the country's population is forecast to increase from 33% to 37%.²

In 2018, more than 190,000 Māori lived in Tāmaki Makaurau, making up 12% of the region's population.³

While this is a lower proportion than the national total of 16.5%, there are still more Māori living in Tāmaki Makaurau than any other region.⁴ Most Māori live in west and south Tāmaki Makaurau. Manurewa has the highest proportion of Māori at 26% of the population.⁵

The iwi and hapū in the Tāmaki Makaurau region are Ngāi Tai ki Tāmaki, Ngāti Hako, Ngāti Manuhiri, Ngāti Maru, Ngāti Pāoa, Ngāti Rehua, Ngāti Tamaoho, Ngāti Tamaterā, Ngāti Te Ata, Ngāti Whanaunga, Ngāti Whātua, Ngāti Whātua o Kaipara, Ngāti Whātua o Ōrākei, Ngātiwai, Te Ākitai Waiohūa, Te Kawerau ā Maki, Te Patukirikiri, Te Uri o Hau, and Waikato.⁶

Over the next 30 years, Tāmaki Makaurau is expected to see 54% of the country's total population growth and 63% of working age (15-64 years) growth.⁷ The region's population is expected to stay relatively young and more culturally diverse than any other city in Aotearoa.⁸ Between 2018 and 2021, the fastest growing local board areas were Rodney and Papakura.⁹ Populations declined in Albert-Eden, Kaipātiki, and Devonport-Takapuna.¹⁰

Tāmaki Makaurau is the powerhouse of the country's economy, making up 38% of the country's GDP and 40% of its tax revenue.¹¹ It's where nearly every large headquarters in Aotearoa is based; this includes many high-end professional services and finance jobs. There are 900,000 workers in Tāmaki Makaurau.¹² In the past decade, economic growth in Tāmaki Makaurau was driven by population growth, resulting in increased demand for construction and business service sectors.¹³

Most of the population of Tāmaki Makaurau live in urban areas. Manufacturing and the service sector dominate the region's economy. The large population supports a higher level of specialisation than other parts of the country. Many jobs are concentrated in key centres, like the city centre – this is the country's largest employment area with well over 100,000 jobs.¹⁴ Tāmaki Makaurau has a growing Māori economy and asset base, valued at \$12.5 billion in 2018.¹⁵ It is focused on property, public, and professional services.¹⁶

Tāmaki Makaurau is the main gateway in and out of Aotearoa New Zealand for people and goods. The Port of Auckland receives the largest value of imports.¹⁷ Inland ports at Wiri and Southdown are nationally significant distribution hubs.

Before COVID-19, the region's total annual tourism spend (about \$7.8 billion) was the country's largest (more than double that of Ōtākou Otago in second place).¹⁸ Of this, 53% was generated from international visitors.¹⁹

Severe weather events are already affecting the land transport system of Tāmaki Makaurau. There were two severe weather events alone at the start of 2023: the Auckland Anniversary Weekend floods in January and Cyclone Gabrielle in February. Flooding, landslips, and storm damage caused road closures at multiple locations of SH1, SH16 between Kumeū and Wellsford, and SH20A Kirkbride Tunnel. Rail was also affected with closures to the North Auckland Line between Swanson and Whangārei and at multiple locations along the Auckland rail network.

Because Tāmaki Makaurau plays a critical role in the country's supply chain, the effects of any deterioration to the resilience and efficiency of key freight networks have national implications.

The region's freight task in 2017–2018 was 76.3 million tonnes, or around 39% of the Aotearoa total.²⁰ A total of 94.9% of the freight task tonnage in Tāmaki Makaurau was moved by road, 4.2% by rail, and less than 1% by coastal shipping.²¹ Internal freight movements make up around 84% of the freight task in Tāmaki Makaurau.²²

Every year, the people of Tāmaki Makaurau travel around 15 billion kilometres by private vehicle and 1 billion kilometres by public transport.²³ Public transport use grew steadily from around 35 million boardings a year in the mid-1990s to more than 100 million a year in 2019.²⁴ Use of public transport is slowly recovering from the impacts of COVID-19.

The Auckland Plan and Auckland Transport Alignment Project (ATAP)

Tāmaki Makaurau Auckland has taken steps to integrate spatial and transport planning through the Auckland Plan and ATAP

Auckland Plan 2050

Tāmaki Makaurau Auckland is currently the only region with a legislatively mandated spatial plan, the *Auckland Plan 2050*.²⁵ Adopted in 2018, this 30-year plan guides how the region will grow. It also outlines how it will ensure shared prosperity for all Aucklanders in response to the challenges of high population growth, environmental degradation, and climate change.

The *Auckland Plan 2050* proposes a 'quality compact' growth model.²⁶ This model allows for the most growth in existing urban areas, with the growth balance in new peripheral areas. The greatest levels of change are anticipated in nodes, centres, and development areas. The plan also provides a long-term transport strategy for the region, through three objectives and seven focus areas.

Objectives

1. Maximise safety, environmental protection, and emissions reduction.
2. Better connect people, places, goods, and services.
3. Increase genuine travel choices for a healthy, vibrant, equitable Auckland.

Focus areas

1. Make better use of existing transport networks.
2. Target new transport investment to the most significant challenges.
3. Maximise the benefits of transport technology.
4. Make walking, cycling, and public transport preferred choices for more Aucklanders.
5. Better integrate land-use and transport.
6. Move to a safe transport network free from death and serious injury.
7. Develop a sustainable and resilient transport system.


Auckland Transport Alignment Project (ATAP)

ATAP is a cross-agency partnership between the government and Auckland Council.²⁷ It was formed in 2015 to develop an aligned long-term strategic approach for the region's transport system. The scale and complexity of transport challenges in Tāmaki Makaurau means a different, more collaborative approach to transport planning is essential.

Three shorter-term 10-year reports in 2017, 2018, and 2021 provided detailed investment direction to guide the *Regional Land Transport Plan* (RLTP) and the National Land Transport Programme (NLTP).

Throughout 2023, ATAP partners have been developing the Tāmaki Makaurau Integrated Transport Plan (TMITP). The scope of this plan includes:

- developing a long-term strategic integrated view of transport needs
- presenting an integrated network that shows how all transport modes will work together, including people and freight, now and into the future
- outlining the implications of consolidating and moving Ports of Auckland
- providing direction to upcoming statutory-funding processes on the three-to-10-year transport programme, within known funding sources and options for investment above this level.



The scale and complexity of transport challenges in Tāmaki Makaurau means a different, more collaborative approach to transport planning is essential.

Tāmaki Makaurau - Auckland: Outlook

To achieve key transport outcomes over the next 30 years, transformational change is required in Tāmaki Makaurau Auckland.

The region's transport network has been significantly upgraded during the past two decades, with completion of the long-planned motorway network and the beginning of a region-wide rapid transit network.

Significant planning projects underway include:

- Auckland Light Rail
- North West Rapid Transit
- Airport to Botany Rapid Transit
- Waitematā Harbour Connections additions.

However, public transport and cycle networks remain relatively undeveloped, and most people are dependent on private vehicle use. This is because of a long history of outwards urban growth and imbalanced transport investment to expand the road network.

Addressing the transport challenges in Tāmaki Makaurau is especially difficult. This is because of rapid growth and the need to fund the maintenance, operation, and renewal of a growing, dispersed, and heavily used transport network.

Changes to the rules around land-use planning means significant growth will be possible across most of the urban areas. This can be done through higher density redevelopment and a more flexible approach to allowing low-density housing (greenfield growth) on the urban periphery. This creates uncertainty about where the additional 520,000 people in Tāmaki Makaurau will live in 30 years. Initial work suggests most growth will be in the existing urban area, but may spread more evenly across the city than previously forecast.²⁸

In light of increased extreme weather events, the next 30 years will present long-term resilience challenges as the likelihood of damaged roads and rail networks grows. It will be necessary to work with communities to:

- understand climate adaptation
- identify and prioritise responses in high-risk areas
- identify sections of the network prone to closure
- plan to avoid infrastructure and development in high-risk areas.

It's becoming more expensive to operate, maintain, and renew existing assets and services, because of greater use and past under-investment. Delivering new infrastructure is also becoming more expensive as land prices soar and more sophisticated solutions, like tunnelling, are required.

Steps to make sure transport outcomes are delivered in a more efficient and effective way include:

- increasing the focus on small-scale projects across more locations in response to the uncertainty about where growth will occur – this includes getting more from existing infrastructure and services
- increasing use of active modes and public transport by reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour through pricing tools.

Even with these steps, more investment from a wider range of finance and funding sources is required to achieve key outcomes. New sources should be investigated, especially where these will help incentivise desirable growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Tāmaki Makaurau Auckland has a crucial role to play in reducing carbon emissions from transport. The region needs to make a major contribution if the country is to achieve the 2035 targets set in the *Emissions Reduction Plan* and net-zero emissions by 2050.²⁹ Compared to other parts of Aotearoa New Zealand, Tāmaki Makaurau has the greatest potential to reduce emissions and lower traffic volumes by changing urban form and shifting to more sustainable travel choices. Achieving these goals would mean wider safety, economic, health, and quality of life benefits for the people of Tāmaki Makaurau.

To meet vehicle kilometres travelled (VKT) reduction targets in the *Emissions Reduction Plan*, traffic volumes in Tāmaki Makaurau must decrease almost immediately.³⁰ Decoupling VKT from population and employment growth will require a fundamental change to the Tāmaki Makaurau transport system. There must be unprecedented improvements to travel choice. New policies and regulations are required to reduce car dependency and encourage shorter travel distances using sustainable modes, like walking, public transport, and cycling.

Land-use decisions to reduce trip lengths and focus growth in areas with better travel choice will be essential. Major investment and change to existing infrastructure and services needs to make public transport, walking, and cycling more attractive than driving for more journeys. Policies, like congestion or distance pricing, and good parking management are essential to supporting these changes.

While there is a good understanding of what interventions and activities are needed to progress to achieve changes, more work is required to confirm the scale of these interventions – especially given the urgency to meet emission reduction targets. Legislation is also required to enable some interventions, such as congestion pricing.

These rapid and radical changes will deliver many benefits, yet also present major challenges. Tāmaki Makaurau must find ways to reduce VKT in a way that’s fair and equitable. Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups. This will be difficult given many outer suburbs in west and south of the city have:

- poorer existing travel choices
- higher levels of deprivation
- longer trips to work, education, and other services.³¹

VKT must be reduced in a way that manages negative impacts on the economy, given VKT and economic performance have been linked in the past.³² Care must be taken around any major increases to the cost of travel, especially in the movement of goods and services, as these costs will eventually be passed on to the end user.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

To meet vehicle kilometres travelled (VKT) reduction targets in the *Emissions Reduction Plan*, traffic volumes in Tāmaki Makaurau must decrease almost immediately.

Making progress

As a Tier 1 urban environment, Tāmaki Makaurau Auckland will need to do much of the heavy lifting for the country, to contribute towards national vehicle kilometres travelled (VKT) reduction. This work will inform future planning and investment decision-making.

Key actions over the next 10 years to make progress on this outcome are:

- enabling and incentivising growth and urban development decision-making to support a compact, mixed-use urban form that reduces trip length and car dependency
- confirming the details, pace, and scale of interventions and investments required to achieve VKT and emissions reduction
- making rapid and extensive changes to the allocation of space on existing roads to accelerate delivery of public transport, walking, and cycling networks
- expanding and upgrading the rapid transit network to encourage mode shift for people and freight, and shape a more compact, mixed-use urban form along key transport corridors
- improving public transport service frequency, reliability, coverage, and efficiency – this includes exploring opportunities to use technology to deliver better services at a lower cost
- more actively managing carparking at major destinations and employment areas, to increase use of public transport, walking, and cycling
- identifying opportunities for smaller projects, like making the most of the existing network, that can improve system outcomes while larger transformational projects are planned and built
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the transport system on the local environment of Tāmaki Makaurau
- supporting the implementation of key policies, like the introduction of congestion pricing and efforts to transform the vehicle fleet to lower emissions.

Healthy and safe people

Challenges and opportunities

The number of deaths and serious injuries on Tāmaki Makaurau Auckland roads nearly doubled between 2013 and 2017, reversing decades-long improvement.³³ Some headway has been made over the past five years, but not in a sustained way. Road users are exposed to high levels of harm in urban areas, as well as unsafe roads in rural areas.³⁴ This disproportionately affects children, Māori, Pacific people, and people living in higher deprivation areas.³⁵ As roads become more congested and more people choose to walk and cycle, these risks will only worsen unless addressed.

Efforts to improve road safety are guided by the *Road to Zero – New Zealand's Road Safety Strategy 2020–2030*.³⁶ They are also informed by the *Auckland Road Safety Programme Business Case*.³⁷

Walking and cycling rates are low in Tāmaki Makaurau. The region has an urban form that often requires long trips to access services and facilities. It also has an undeveloped, unsafe, and disconnected cycling network. Walking and cycling rates have declined substantially over recent decades, contributing to a lack of physical activity and subsequent health problems. These health issues, like obesity and diabetes, disproportionately impact some demographics and occur more frequently in some parts of Tāmaki Makaurau.³⁸ The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.³⁹

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries – which in Tāmaki Makaurau is particularly skewed towards vulnerable road users – will also encourage more people to walk and cycle.

Making progress

As highlighted, there are well-developed plans to guide the steps to reduce harm and enhance physical and mental health in Tāmaki Makaurau Auckland. These plans focus on making it easier and safer for people to choose active travel options. This contributes to reducing exposure to harmful pollutants and achieving the Road to Zero vision of reducing transport-related deaths and serious injuries.

Transformational shift needs to be made to improve safety of active modes. The cycling network of Tāmaki Makaurau is a major area of focus given its highly undeveloped nature. The current approach will take decades to complete, so new approaches to design and delivery are required along with significantly more investment.

Key actions over the next 10 years to make progress on this outcome are:

- encouraging more compact, mixed-use urban form where a greater number of trips are short and easily accessible by active modes
- rapidly rolling out the planned cycling network for Tāmaki Makaurau, largely through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- significantly reducing the number of deaths and serious injuries, especially for vulnerable road users, by creating safer and more forgiving roads and streets, applying safe and appropriate speed limits, and reducing dangerous travel behaviour.



Road users are exposed to high levels of harm in urban areas, as well as unsafe roads in rural areas.

Inclusive access


Challenges and opportunities

The Tāmaki Makaurau Auckland transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities. Despite progress over the last 20 years, the people of Tāmaki Makaurau are still reliant on private vehicles for most journeys. Vehicle dependency creates several access challenges, including:

- difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- significant pressure on household budgets to meet the high costs of car ownership and use
- limiting peoples' ability to travel in a way that best meets their needs due to varied coverage and frequency of public transport, and safe cycling and walking networks
- overwhelming congested networks leading to delays and poor travel time reliability – this reduces the number of social and economic opportunities people can access within a set travel time.

Major effort is required to ensure inclusive access for the people of Tāmaki Makaurau over the next 30 years. The above challenges are magnified when combined with the region's geographic layout, population growth, response to climate change, and urban development.

This is especially true for south and west Tāmaki Makaurau. People in these areas are far from the large number of jobs in, and around, the city centre. This means they're heavily reliant on private vehicles. They also have higher levels of deprivation and Māori population than other parts of Tāmaki Makaurau.⁴⁰



Major effort is required to ensure inclusive access for the people of Tāmaki Makaurau over the next 30 years.

Making progress

A shift is needed in research, planning, and design processes, with greater focus on understanding the transport needs and challenges for people of different ages, ethnicities, incomes, and abilities.

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may also be challenging trade-offs to consider over time. For example, balancing the likely increase in travel costs to reduce emissions against the equity impacts on lower-income families. Or the extent to which public transport services could improve coverage and affordability, compared to focusing on economic and environmental benefits.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision-making to enable and encourage growth in areas with better existing access to social and economic opportunities
- improving the frequency and reliability of public transport services, especially in higher deprivation areas
- improving the affordability of public transport for lower-income families
- expanding and improving walking and cycling facilities, so low-cost, sustainable, and healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided in a way that meets the needs of people of all ages and abilities, especially in improving access to the transport system for those with mobility constraints
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- supporting mobile or digital delivery of essential services.⁴¹

Economic prosperity

Challenges and opportunities

In Tāmaki Makaurau Auckland, residential, employment, shopping, and industrial/logistics hubs are spread across the urban area. Although public transport is improving and is a competitive alternative for travel to the city centre and education facilities, most commuting, shopping trips, and business travel is by private vehicle. Most freight is transported by road, especially for trips within Tāmaki Makaurau.

Much of the strategic road network is congested during peak periods and is increasingly overwhelmed on key routes during the interpeak. Without action, these problems will get worse as the population grows and will result in suppressed economic growth due to high travel costs.

Declining road network performance risks two wider economic impacts:

1. Reduced ability for people to easily access employment because of time and travel choice constraints. This is particularly relevant in parts of west and south Tāmaki Makaurau that have relatively low access to cars and public transport. In combination, these access challenges impact on the city's overall productivity and risk reducing the benefits of economic scale as Tāmaki Makaurau grows.
2. Longer travel times, congestion, and unreliable travel times impact freight, courier, and business movements. This requires more people and vehicles to do the same task. This disrupts the supply chain and increases costs, which are then passed on to businesses and consumers. This is important because Tāmaki Makaurau contains key transport and logistics hubs that serve the rest of Aotearoa New Zealand, so cost impacts would be spread throughout the economy.

Over the coming decades, technological change will have significant impacts on the economy of Tāmaki Makaurau, and on travel demand. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising higher levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns. It will also provide an opportunity to manage the use of the network more effectively. The electrification of the light vehicle fleet will help reduce carbon emissions. However, unless road congestion is also reduced, the economic benefits of this change will not be fully realised.

Making progress

Economic productivity and business competitiveness in Tāmaki Makaurau Auckland can be improved by a transport system that provides:

- a range of travel options with sufficient capacity
- reliable journey times
- safe and low-cost ways of getting around.

These improvements have wider and more indirect benefits like:

- supporting increased productivity by clustering large numbers of people and jobs (agglomeration)
- enabling housing supply and urban development for a changing population demographic
- increasing labour pools and the number of available jobs to people within a reasonable travel time.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities (especially by public transport, walking, and cycling) and for west and south Tāmaki Makaurau to enable all people of the region to benefit from ongoing growth
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially outside peak periods and to key freight and industrial hubs
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of economic centres by improving access and amenity (attractiveness)
- supporting more efficient options for the 'last-mile' movement of goods to reduce congestion and air pollution
- supporting improved accessibility to local and town centres to allow them to flourish and provide for the day-to-day needs of residents
- enabling easy connections between transport modes and co-locating transport and community services at transport hubs
- supporting the Māori economy to increase rangatahi (young people) participation in education and training.

Resilience and security

Challenges and opportunities

The natural layout in Tāmaki Makaurau Auckland creates resilience challenges for the transport network. High dependency on key connections, like Auckland Harbour Bridge and the Northwestern Motorway causeway, means that small incidents can quickly create widespread disruption. Rising sea levels and extreme weather events threaten key locations that are at high risk of damage or disruption.

The greatest challenges are landslips, flooding, erosion, and high winds. The Auckland Harbour Bridge, and its approaches, face major resilience challenges related to flooding and high-wind events when the bridge must be closed for safety. In 2023, this section and others on the state highway and rail network were closed because of severe weather events. These impacts are expected to increase over time as the climate changes.

More extreme weather events and ongoing population growth means an unprecedented level of effort is required to look after existing assets and maintain current levels of access and connectivity. There is a major opportunity to make progress on multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Conflicts between passenger and freight use of the rail network also needs to be addressed over time to enable both to grow. Ongoing shared use of infrastructure creates major resilience risks, where minor incidents and delays can have significant knock-on effects to the rail network.

The main security challenge facing Tāmaki Makaurau is crime. Fears for personal safety discourage many people, particularly women, seniors, and children, from using public transport, walking, and cycling. This is felt especially after dark. Travel options must feel safe to all users to encourage greater use.

Making progress

To improve resilience in Tāmaki Makaurau Auckland, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in a highly complex urban environment, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- continuing to better understand routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- engaging in local planning to avoid infrastructure and development in areas at increased risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events, to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the transport system.

More extreme weather events mean an unprecedented level of effort is required to look after existing assets and maintain current levels of access and connectivity.



Tāmaki Makaurau - Auckland: Focusing our efforts

Transport challenges in Tāmaki Makaurau Auckland must be tackled in a cohesive way for efficient and effective progress. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Actively support, enable, and encourage as much growth and development as possible in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate delivery of walking, cycling, and public transport improvements through reshaping and reallocating existing streets to drive significant mode shift in line with emission reduction goals.
- Confirm timing and sequencing of major planned strategic projects, especially the rapid transit network, to provide greater certainty to the public about these investments to help shape future growth patterns.
- Confirm the implementation of demand management tools, such as pricing, to unlock the significant benefits while mitigating potential equity challenges.
- Confirm how key resilience risks will be addressed over time, and work with communities to identify when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes, including those focused for iwi Māori.
- Establish new methods of effective, long-term, integrated planning and investment decision-making for infrastructure that reflects the high-level of uncertainty around the location and timing of growth.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
4. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
5. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
6. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
7. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
8. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
9. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
10. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
11. Auckland Council (2021). Te Mahere Whanake Ōhanga. Economic development action plan 2021-24. <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/DocumentsEDAP/economic-development-action-plan-2021-24.pdf>
12. Auckland Council (2021). Te Mahere Whanake Ōhanga. Economic development action plan 2021-24. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/DocumentsEDAP/economic-development-action-plan-2021-24.pdf
13. Auckland Council (2021). Te Mahere Whanake Ōhanga. Economic development action plan 2021-24. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/DocumentsEDAP/economic-development-action-plan-2021-24.pdf
14. Auckland Council (2021). Te Mahere Whanake Ōhanga. Economic development action plan 2021-24. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/DocumentsEDAP/economic-development-action-plan-2021-24.pdf
15. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
16. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
17. Statistics New Zealand (2022). Imports for overseas cargo. nzdotstat.stats.govt.nz/wbos/Index.aspx?DataSetCode=TABLECODE7302
18. Ministry of Business, Innovation & Employment (2020). Annual tourism spend grouped by TA, RTO, country of origin and product category. www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-rto-country-of-origin-and-product-category/
19. Ministry of Business, Innovation & Employment (2020). Annual tourism spend grouped by TA, RTO, country of origin and product category. www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-rto-country-of-origin-and-product-category/
20. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
21. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
22. Auckland Transport (2020). Auckland freight plan. at.govt.nz/media/1983982/auckland-freight-plan.pdf

23. Auckland Transport (2019). Vision zero for Tāmaki Makaurau. at.govt.nz/media/1980910/vision-zero-for-tamaki-makaurau-compressed.pdf
24. Auckland Transport (2022). Auckland Transport monthly indicators report 2021/22. at.govt.nz/media/1989818/11-1-business-report-monthly-transport-indicators.pdf
25. Auckland Council (2022). Auckland plan 2050. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/Pages/default.aspx
26. Auckland Council (2022). Auckland plan 2050. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/Pages/default.aspx
27. Ministry of Transport (2020). Te Whakakotahi i ngā Kaupapa Waka o Tāmaki, Auckland Transport alignment project. www.transport.govt.nz/area-of-interest/auckland/auckland-transport-alignment-project
28. Auckland Council (2022). Auckland plan 2050. www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/Pages/default.aspx
29. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
30. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
31. Ministry of Transport (2020). Equity in Auckland's transport system summary report. www.transport.govt.nz/assets/Uploads/Report/NZ3060_Equity_in_Auckland_Transport_System.pdf
32. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
33. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
34. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
35. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
36. Ministry of Transport (2019). Road to zero – New Zealand's road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
37. Auckland Transport (2019). Auckland road safety programme business case. at.govt.nz/media/1980866/item-911-road-safety-programme-business-case-att-2-at.pdf
38. Waka Kotahi, NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
39. Waka Kotahi, NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
40. Ministry of Transport (2020) Equity in Auckland's transport system. https://www.transport.govt.nz/assets/Uploads/Report/NZ3060_Equity_in_Auckland_Transport_System.pdf
41. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base –2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043

Arataki

Regional direction

Waikato

September 2023 v1.1

At a glance

Waikato has the fourth largest regional economy in Aotearoa New Zealand and is nationally important for a range of export-focused primary industries. It sits at the heart of the Upper North Island, with important economic connections to Tāmaki Makaurau Auckland to the north and Te Moana a Toi-te-Huatahi Bay of Plenty to the east. Over the next 30 years, the population of Waikato is expected to grow from about 500,000 to 615,000 by 2048.¹

The region's transport network is vital to the country's economic prosperity, linking people to key destinations and providing important freight access. SH1, SH29, and the East Coast/Main Trunk Lines between Tāmaki Makaurau and Tauranga are among the country's busiest and most important freight corridors.

The metro area of Kirikiriroa Hamilton is the main urban centre for the region and where the fastest population growth is happening. This area includes the surrounding towns of Kemureti Cambridge, Te Awamutu, Ngāruawāhia, and Mōrena Morrinsville.

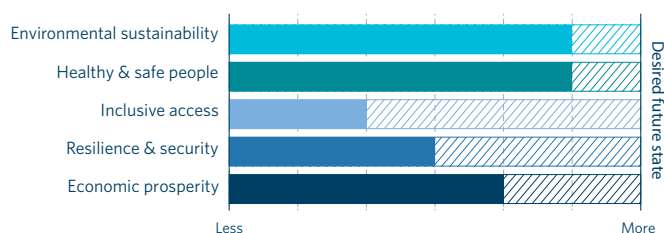
The Waikato region, including the metro area of Kirikiriroa, is highly dependent on vehicles. To address this and make progress towards reducing transport emissions, the following will be essential:

- joint spatial planning work
- rollout of high-quality cycling networks
- progressive implementation of aspirational public transport plans.

Waikato has a poor road safety record, with high rates of deaths and serious injuries requiring ongoing effort.²

Resilience must also be a key focus, with parts of the Waikato vulnerable to sea-level rise, flooding, coastal erosion, and landslides.

Scale of effort to deliver outcomes in Waikato

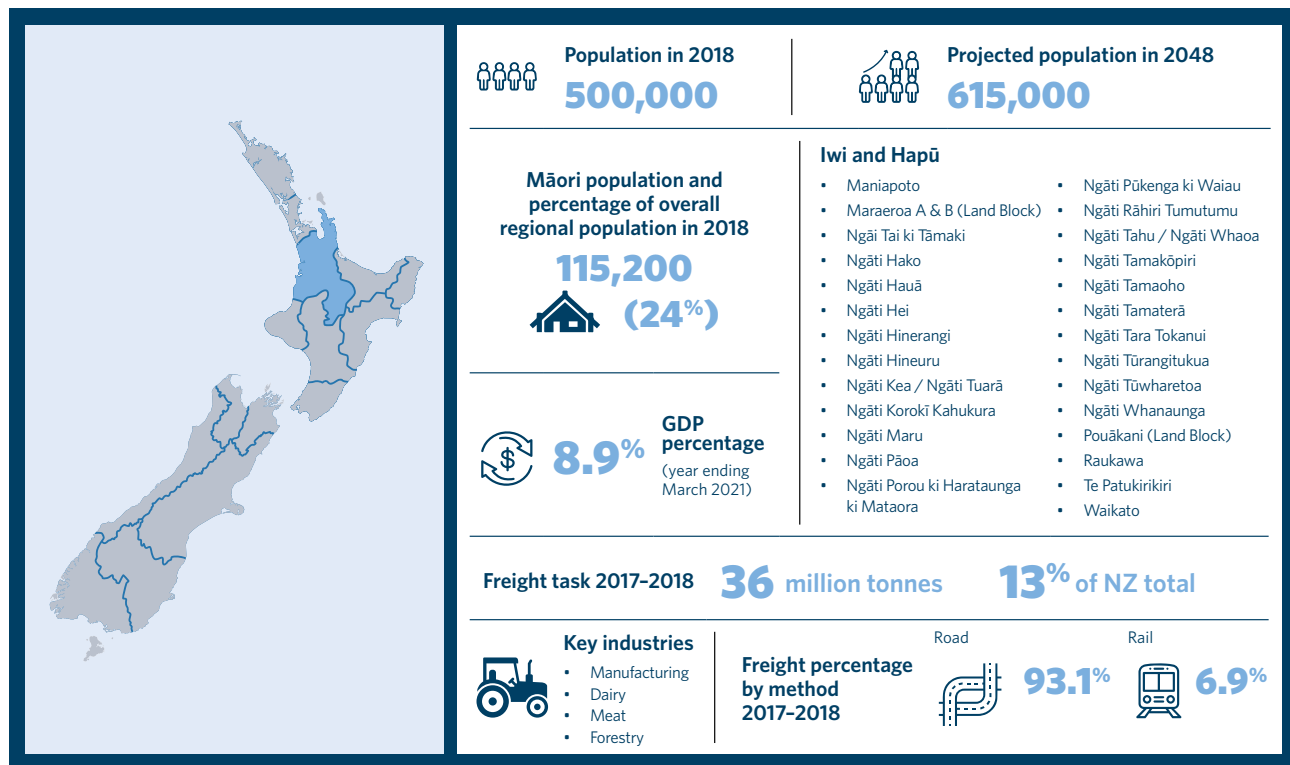


The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicates where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. Most sections of the *Regional direction Waikato* have climate-related updates.

Context



The population of Waikato is expected to grow from 500,000 to about 615,000 by 2048, or 10% of the country's population.³ High growth is projected within Kirikiriroa Hamilton and surrounding towns; this area is already home to more than half the region's population.

The corridor from Kirikiriroa to Tāmaki Makaurau Auckland is expected to see significant population and employment growth. In recent years, the northernmost parts of Waikato have grown quickly because of spill-over growth from Tāmaki Makaurau. Future Proof is a partnership to help guide the future development of Kirikiriroa, Waipā District, Waikato District, and Matamata-Piako District.

Low growth, static, or declining populations are expected in the remainder of the region. This may slow down in the short-to-medium term, depending on the economic profile of each district. An ageing population is expected in the districts of Thames-Coromandel and Hauraki, so it will be important to ensure suitable transport options are available for older residents.

In 2018, 115,200 Māori lived in the Waikato, making up 24% of the region's population; this is higher than the national rate of 16.5%.⁴ Most Māori live in Kirikiriroa, where they make up 24% of the city's population.⁵

The iwi and hapū in the Waikato region are Maniapoto, Maraeroa A & B (Land Block), Ngāi Tai ki Tāmaki, Ngāti Hako, Ngāti Hauā, Ngāti Hei, Ngāti Hinerangi, Ngāti Hineuru,

Ngāti Kea / Ngāti Tuarā, Ngāti Korokī Kahukura, Ngāti Maru, Ngāti Pāoa, Ngāti Porou ki Harataunga ki Mataora, Ngāti Pūkenga ki Waiau, Ngāti Rāhiri Tumutumu, Ngāti Tahu / Ngāti Whaoa, Ngāti Tamakōpiri, Ngāti Tamaoho, Ngāti Tamaterā, Ngāti Tara Tokanui, Ngāti Tūrangitukua, Ngāti Tūwharetoa, Ngāti Whanaunga, Pouākani (Land Block), Raukawa, Te Patukirikiri, and Waikato.⁶

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Waikato rohe, which relates to the Waikato region. It notes the asset base is valued at \$11.5 billion.⁷ It is dominated by the primary sector, followed by other sectors, including property.⁸

Manufacturing, dairy, meat, and forestry will continue to be important across the region, along with aquaculture on the Te Tara-O-Te-Ika-A-Māui Coromandel Peninsula. The region's economy continues to be influenced by growth in Tāmaki Makaurau. Over time, employment in service industries will grow, particularly in the Kirikiriroa urban area.

When international travel was restricted because of the COVID-19 pandemic, there was an increase in travel demand to domestic visitor destinations. Travel to areas such as Te Tara-O-Te-Ika-A-Māui, Whāingaroa Raglan, and Taupō, help offset the decline in international visitors.

Severe weather events are already affecting the land transport system of Waikato. There were two severe weather events in 2023: the Auckland Anniversary Weekend floods in January and Cyclone Gabrielle in February. These events followed high rainfall in the region in 2022, so resilience thresholds were significantly lower. These combined factors meant landslip closures at multiple sites along SH25, SH25A between Kōpū and Hikuaui, and SH23 between Whāingaroa and Whatawhata.

Because Waikato plays a central role in the country's supply chain, any deterioration to the resilience and efficiency of key freight networks has national implications.

The freight task in the Waikato in 2017-2018 was 36 million tonnes, or around 13% of the country's total.⁹ A total of 93.1% of the freight task tonnage in the Waikato was moved by road and 6.9% by rail.¹⁰

The region plays a nationally significant role in the country's supply chain, with 32% of the nation's freight movements going into, out of, or through the region by both rail and road.¹¹ Connections to Tāmaki Makaurau, Te Moana a Toi-te-Huatahi Bay of Plenty, Taranaki, and the Lower North Island are all nationally significant freight corridors. Pōkeno to Tauranga on SH2 supports local trips and is a key tourist journey to Te Tara-O-Te-Ika-A-Māui Coromandel Peninsula, Te Moana a Toi-te-Huatahi, and Hobbiton near Matamata.

Completion of the Waikato Expressway has improved safety and reliability. It allows the majority of north-south through traffic to bypass Kirikiriroa, reducing traffic on the urban networks. The Future Proof Strategy identifies Ruakura/Ruakura East, adjacent to the Expressway, as a strategic industrial node. This has enabled development of the Superhub inland port which takes advantage of the location on the strategic road and rail networks. Work on the Future Development Strategy will investigate the potential for further growth to the east of the Expressway in this location. This will take account of the need to maintain efficient interregional connections to the strategic transport networks.

The Te Huia train service is trialling interregional commuter rail, connecting Kirikiriroa and Tāmaki Makaurau. This service could play a key role in encouraging mode shift and vehicle kilometres travelled (VKT) reduction.

Waikato: Outlook

Over the next 30 years, significant transformation of the Waikato transport system is needed to address challenges and make sufficient progress on key transport outcomes.

The biggest change will be within the metro area of Kirikiriroa Hamilton, where the greatest share of the region's population growth is forecast. Here there's a significant need and major opportunity to improve access and safety while reducing emissions.

As high-growth urban areas, Kirikiriroa and north Waikato will continue to face infrastructure funding challenges to keep pace with growth.

In light of increased extreme weather events and other natural hazards, the next 30 years will present long-term resilience challenges as the likelihood of damaged roads and rail networks grows. It will be necessary to work with communities to:

- understand climate adaptation
- identify and prioritise responses in high-risk areas
- identify sections of the network prone to closure
- plan to avoid infrastructure and development in high-risk areas.

Low- or no-growth areas face different funding pressures; this is because as their populations age, the number of people on fixed incomes will also rise. This will make it more difficult to raise funds to:

- maintain existing networks
- deliver climate-friendly infrastructure services.

Climate change will make this even harder.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Waikato will need to make an important contribution to reducing carbon emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹² This includes a target to reduce total vehicle kilometres travelled (VKT) by our light vehicle fleet by 20% by 2035.

Waikato has the second highest carbon emission profile in the country, with a significant proportion from interregional freight movement.¹³

As the main urban centre, Kirikiriroa Hamilton metro area presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require significant change to how people travel in a city focused on private car usage. Improving transport options and reducing traffic are not just important for meeting our climate commitments. They are vital for reducing congestion and making our transport system more safe, healthy, and inclusive for people of all ages and abilities.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail.

The way Kirikiriroa grows, including surrounding towns, will need to be carefully managed to ensure it is supported by:

- public transport
- quality infrastructure for walking and cycling.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads needs to continue to be treated to ensure water quality is improved before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and development that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions, activities, and investments are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and prioritise mode shift to public transport, walking, and cycling
- supporting progressive improvement of interregional passenger rail on the strategic connection from Kirikiriroa to Tāmaki Makaurau Auckland (H2A) Corridor Plan/ Te Huia
- continuing to support development and improvement of walking and cycling networks and infrastructure to enable safe, integrated, connected multi-modal networks; this should focus on access to and within the central city from supporting suburbs, key centres, and multi-modal transport hubs
- continuing to improve and prioritise public transport services
- exploring opportunities to use technology to deliver better services at lower costs
- managing carparking at major destinations and employment areas to increase use of public transport, walking, and cycling for trips to these locations
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the region’s transport system on the local environment
- supporting the implementation of key policies, such as vehicle fleet transformation, public transport funding initiative, priced parking (demand-responsive), congestion charging, and zero-low emission zoning.

Healthy and safe people

Challenges and opportunities

Waikato has a particularly poor safety record, with 400 to 450 annual deaths and serious injuries on the region's roads during the past three years.¹⁴

There is a particular need to reduce:

- crashes at intersections
- run-off road and head-on crashes
- crashes involving vulnerable road users, like people walking or cycling
- speeding
- alcohol and drug impairment
- people not wearing seatbelts.¹⁵

Safety issues are worsened by the complexity of the network and high proportion of movement on the road network through and within the region.

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030 and associated Action Plan 2020–2022*, and regional safety strategies.¹⁶

Parts of the region, such as the Kirikiriroa Hamilton urban area, are suited to a significant increase in active modes because of the flat landscape and short overall trip lengths. However, levels of walking and cycling in Waikato have declined substantially over recent decades. Lack of physical activity contributes to many health problems, like obesity and diabetes. These problems disproportionately impact some demographics. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.¹⁷

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Waikato. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements targeting high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads – particular focus on SH2 Pokeno to Mangatarata and SH29 Piarere to Te Poi/Te Poi to Kaimai Summit
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, distracted drivers, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- rapidly rolling out a well-connected, separated cycling network through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation.

Waikato has a particularly poor safety record, with 400 to 450 annual deaths and serious injuries on the region's roads during the past three years.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

A high reliance on private vehicles creates several access challenges, including:

- difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- significant pressure on household budgets to meet the high costs of car ownership and use
- limited ability for people to travel in a way that best meets their needs because of poor travel choice.

Employment and essential services will likely be concentrated in Kirikiriroa Hamilton and Tāmaki Makaurau Auckland. Population growth outside these areas could experience increased trip lengths and reliance on private vehicles unless local services and employment opportunities are provided.

Rural communities need to access key centres for education, employment, and essential services. As the population of Waikato ages, travel needs will change; there will be a greater need to access health services, and less need to access education and employment.

An ongoing issue to be addressed is the conflict between heavy volumes of through-traffic versus safety, convenience, and disconnection (severance) in rural towns, like Tīrau and Putāruru.

Emerging technologies, such as on-demand shuttles, provide a shared-transport option. These would help people get around smaller towns and rural communities, and improve access to services in larger centres.

Improved access to high-quality data and information will allow better management of the transport system to get the most from existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules to enable and encourage more people to live in areas with better existing access to social and economic opportunities; this includes mixed-use development and the concept of a '20-minute city' aligned with key nodes along the rapid transit corridors and micro-mobility networks
- improving public transport service frequency and bus infrastructure (stops and crossing points)
- expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- continuing to support the development, expansion, and improvement of walking and cycling facilities so low-cost, sustainable, healthy travel options are safe and attractive for more journeys; this should focus on completing cycling networks in and around Kirikiriroa Hamilton and improving active mode facilities in smaller towns
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services
- exploring how Te Huia train services can support interregional connectivity.

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

Economic prosperity

Challenges and opportunities

The transition to a low-emissions economy may result in land-use changes, particularly for dairying, with flow-on effects for freight movement. Efforts must focus on supporting a productive and growing regional economy as this transition occurs, by continuing to provide reliable and resilient access to employment, education, and essential services.

Access to urban areas rely on long and increasing commuting distances – this won't help the region achieve low-emissions goals and VKT targets. Instead, urban areas should seek greater concentration of housing and look to grow industries outside of farming.

The region is strategically located in the Upper North Island and is part of the Golden Triangle (Tāmaki Makaurau Auckland, Kirikiriroa Hamilton, and Tauranga). This is important for the national economy by delivering safe, reliable interregional journeys, especially road and rail freight connections to key ports, including the inland rail ports and hubs of Kirikiriroa.

An increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Efforts must focus on supporting a productive and growing regional economy while transitioning to low emissions which may impact on how land is used.

Technological change will have significant impacts on demand for travel and on the economy of Waikato. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- investigating first- and last-mile freight solutions in key activity centres to meet and balance the needs for loading and servicing against low-emission zoning and targets
- completing and progressively implementing the *Hamilton-Waikato Metro Spatial Plan* (MSP) and integrated transport programme (including *Access Hamilton*); this includes ensuring long-term corridor protection to shape the city's future urban form
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections, and to key freight and industrial hubs
- progressing the Kemureti Cambridge to Piarere project to deal with safety issues where the Waikato Expressway ends; this includes an upgrade to the SH1/SH29 intersection
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness)
- supporting improved accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents, like being able to walk, cycle, or take public transport to work, school, or shopping areas in a safe and easy way.¹⁸

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.¹⁹

There are many high risks in the Waikato area related to landslips, erosion, flooding, and other weather factors. Key areas include:

- around Lake Karapiro
- Te Tara-O-Te-Ika-A-Māui Coromandel Peninsula
- low-lying areas in the Hauraki Plains
- SH3 link to Ngāmotu New Plymouth, particularly in low-lying sections like around Mōkau, and ice and snow along SH5 (Kaweka Ranges)
- the key link to Te Matau a Māui Hawke's Bay.

More than ever, there must be a greater focus on maintaining existing assets, access, and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the popularity of e-bikes and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas; this includes working with communities to identify plans for when to defend, accommodate, or retreat
- understanding routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts; this includes identifying priorities for network resilience and options for alternate routes less likely to be disrupted
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.

Kirikiroa Hamilton: Urban focus

Kirikiroa: The country's fourth largest city with a growing and diverse economy

The wider Kirikiroa Hamilton metropolitan area stretches from Taupiri in the north to Te Awamutu, Ngāruawāhia, and Kemureti Cambridge in the south. Around 270,000 people live in the area, which has seen steady growth in recent decades.

Historic growth of Kirikiroa has been largely through urban expansion. In the last 10 years this trend has shifted towards intensification (68%) rather than urban expansion (38%).²⁰ Greenfield growth (development of undeveloped areas) will continue to form part of the city's land supply but is expected to reduce over time.

Eighty-eight percent of trips in Kirikiroa are by private vehicle and people still make increasingly long trips to access jobs and essential services.²¹ This reflects:

- low population densities
- dispersed employment
- relatively low levels of congestion
- not providing adequate public transport services.

Of the current trips made in Kirikiroa, only 11.3% are by active modes and 1% by public transport.²² *The Hamilton-Waikato Metro Spatial Plan Business Case and Access Hamilton* outline a pathway to improving the availability of public transport in the city and wider metropolitan area.

Low usage of public transport in Kirikiroa reflects low-population densities, spread out employment, low levels of congestion, and a strong culture of car use. However, Kirikiroa is well positioned to increase active mode trips given its:

- scale
- distribution of employment, services, and education
- relatively flat terrain.

Kirikiroa is strategically located in the Golden Triangle between the cities and ports of Tāmaki Makaurau Auckland and Tauranga. It is a key freight hub and distribution centre for the Upper North Island, benefiting from the Waikato Expressway and the North Island and East Coast Main Trunk Lines. The North Island Main Trunk Line and East Coast Main Trunk Line provide key rail links from the metro area to Tāmaki Makaurau, Tauranga, and Te Upoko o te Ika a Māui Wellington. The Te Huia rail passenger service operates between Kirikiroa and Tāmaki Makaurau.

Historic growth of Kirikiroa has been largely through urban expansion. In the last 10 years this trend has shifted towards intensification (68%) rather than urban expansion (38%).

Access Hamilton

Access Hamilton is the 30-year transport strategy for Kirikiriroa Hamilton.²³ It aims for a transport network that enables everyone to connect to people and places in safe, accessible, and smart ways.

The strategy outlines what the transport system of Kirikiriroa needs to become to serve the community's needs now and into the future; it also identifies where to focus efforts to achieve this.


Access Hamilton also explores:

- opportunities and challenges
- outcomes for the city's transport future
- the plan to get there.

The strategy guides investment decisions through long-term and annual plans. The initiatives that come from this strategy allow Kirikiriroa to work alongside their partners to deliver a city to be enjoyed for generations.

The vision for the future of transport in Kirikiriroa includes:

- Everyone is safe, and feels safe, while using the streets and public spaces.
- A low-emission transport system that is resilient against climate change.
- Kirikiriroa is a great place to live for everyone.
- A healthy Waikato River and natural sites that sustain abundant life and prosperous communities for all generations.
- More people choose to travel by foot, bike, bus, or use micromobility devices, such as scooters.
- Kirikiriroa is accessible for all because it has a city culture and heritage that is shared, protected, and celebrated.
- Kirikiriroa is a great place for everyone to work and do business.
- An adaptable, future-ready transport system that supports quality and compact urban form.



The initiatives that come from this strategy allow Kirikiriroa to work alongside their partners to deliver a city to be enjoyed for generations.

The Hamilton-Waikato Metro Spatial Plan

The *Hamilton-Waikato Metro Spatial Plan* (MSP) guides how the wider Kirikiriroa Hamilton metropolitan area will grow and develop over time.²⁴ It includes how this growth will happen alongside necessary infrastructure investment, including transport, to enable, support, and shape this growth.

The MSP outlines a vision for a significantly different urban future from recent trends. It anticipates 70% of growth will be in Kirikiriroa and 30% in the townships of Waikato and Waipa.²⁵ Half the growth is expected through intensification, or concentration, of existing urban areas; 50% will require expansion into Future Urban Areas.²⁶ Employment will be focused at nodes on easily accessible corridors moving people and goods.

Transformational change is proposed for the Ngāruawāhia to Ruakura corridor. As the city's core economic area, the MSP envisages the development of major mixed-use centres in Horotiu, Te Rapa, Frankton, and Kirikiriroa central city. In time, these centres would be supported by a rapid transit corridor from Ngāruawāhia and Ruakura, while frequent public transport services would link Kirikiriroa to Te Awamutu, Kemureti Cambridge, and other local growth nodes.

The MSP has four key directives for transport:

- offer a viable and attractive alternative to private vehicles by providing and expanding rapid, frequent, high-quality public transport networks
- plan and protect efficient freight network operations and interregional corridors
- connect transport and resident hubs, linking major growth centres by public transport and active modes
- plan and design neighbourhoods to make public transport use, walking, and cycling easy and attractive.

MSP is a starting point to direct focus, investment, and time to help Kirikiriroa deliver a radical transformational shift to a multi-modal transport network shaped around how communities will grow. MSP was not designed nor intended to meet or deliver on the emission and VKT reduction targets of Kirikiriroa. The scale and pace of the delivery of MSP needs to be coordinated alongside other strategies and plans for Kirikiriroa such as *Access Hamilton*, *Hamilton Urban Growth Strategy*, and the *Biking and Micro-mobility Programme Business Case* (and *Regional Public Transport Plan*).

Key challenges

Long-standing safety, travel time, and reliability issues in Kirikiriroa Hamilton remain important to address. There is also an increased urgency to reduce transport emissions and reshape the urban form of the Kirikiriroa metropolitan area.

Kirikiriroa has the country's highest rate of death and serious injury (DSI) involving pedestrians and cyclists, despite the city having overall lower DSI rates than other urban centres.²⁷

The Waikato Expressway now bypasses Kirikiriroa, freeing up capacity on the urban networks that can be used to support local journeys by sustainable modes. Future growth patterns will incentivise urban concentration to reduce vehicle kilometres travelled (VKT) and avoid peripheral car-based growth linked to the expressway. This will also help preserve the important national function of the Waikato Expressway.

Climate change

Urgency around climate change action and emission reductions has increased significantly in recent years. Larger urban areas, like Kirikiriroa Hamilton, provide the greatest opportunity to reduce transport emissions. Reduced traffic flows will achieve wider benefits such as better health, safety, congestion-relief, and quality of life. Kirikiriroa has the fourth highest transport emissions of the country's cities.

Reducing vehicle kilometres travelled (VKT) and overall emissions in a growing urban area like Kirikiriroa will require transformational change; this will be extremely challenging, especially given its car dependent urban form and legacy of past transport investments. Transformational change is required to:

- improve urban form
- offer better transport options
- manage demand for travel by vehicles.

The Waikato Expressway now bypasses Kirikiriroa Hamilton, freeing up capacity on the urban networks that can be used to support local journeys by sustainable modes.

VKT reduction planning will confirm what actions and scale are required to meet emissions reduction goals. Waka Kotahi will partner with local government, Māori, and community representatives to develop this work.

As one of the country's inland cities, Kirikiriroa won't be impacted by sea level rise like many other centres. However, it will likely be impacted by more extreme weather events, rising temperatures, and increased drought conditions. Some areas of the Waikato River are prone to flooding and have at times required the closure of cycleways in the city. It is expected more slips and closures will likely occur with high rainfall and more extreme weather events – this will place increased pressure on the transport system. Hamilton may experience migration from areas that are more affected by climate change, which will accelerate the growth of the city and contribute to the emissions-reduction challenge. Hamilton also has less exposure to earthquakes and volcanic activity.

Reshaping urban form in Kirikiriroa

A major shift in urban form in Kirikiriroa Hamilton is required to achieve the outcomes identified in the *Hamilton-Waikato Metro Spatial Plan* (MSP) and *Access Hamilton*. Moving from a historically vehicle-focused urban form towards one that's more compact and shaped around a multimodal rapid and frequent public transport network will mean a dramatically different urban future for Kirikiriroa. In this new urban form, most growth will occur in Kirikiriroa and there will be more of a focus on intensification, or concentration, of existing urban areas.

Future greenfield development (development of undeveloped areas) should:

- integrate with public transport and active modes networks
- contain a mix of activities and amenities to reduce the need to travel
- deliver at least medium-density residential development.

Making this shift will require all partners to work together to ensure a wide variety of investment, policy, behaviour change, and regulatory controls are applied; this will influence the way growth happens and the necessary transport interventions and activities to enable, support, and shape development.

Careful decision-making is required to sequence investment and balance competing factors such as:

- value for money
- transport infrastructure and services that lead urban form as well as shape the location and type of growth.



Waikato: Focusing our efforts

For efficient and effective progress, transport challenges in Waikato must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Apply a multi-outcome approach to the delivery of programmes and planning. This includes principles such as fairness, equity, and safety.
- Begin to reduce vehicle kilometres travelled (VKT) in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the North Island and to the west and east coasts.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants that are dangerous to people's health.
- Use spatial planning work to support, enable, and encourage growth and development into areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Implement transport components of the *Hamilton Waikato Metro Spatial Plan* and integrated transport programme; this includes protecting key corridors plus enabling and accelerating a step-by-step approach to potential future rapid transit corridors over time.
- Continue to improve interregional connectivity for people and freight, especially to Tāmaki Makaurau Auckland, Tauranga, and the Lower North Island; this includes ongoing upgrades to interregional passenger rail between Tāmaki Makaurau and Kirikiriroa Hamilton.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multi-modal freight system with greater use of rail.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Reduce financial and other barriers to iwi Māori getting a driver's licence in areas not well served by public transport.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
5. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
6. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
7. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
8. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
9. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
10. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
11. Waikato Regional Council (2019). Freight in the Waikato region. www.waikatoregion.govt.nz/services/regional-services/transport/freight-in-the-waikato
12. Ministry for the Environment (2022). Emissions reduction plan. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan/>
13. Waka Kotahi NZ Transport Agency (2022). Vehicle emissions mapping tool. nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/air-quality-climate/planning-and-assessment/vehicle-emissions-mapping-tool
14. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
15. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
16. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
17. Waka Kotahi, NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
18. Future Proof (2020). Hamilton-Waikato metro spatial plan. futureproof.org.nz/h2a/metrosatialplan
19. Ministry for the Environment (2018). Climate change projections for the Waikato region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-waikato-region
20. Ministry of Transport (2019). New Zealand Household Travel Survey. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
21. Ministry of Transport (2019). New Zealand household travel survey. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
22. Ministry of Transport (2019). New Zealand Household Travel Survey. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
23. Access Hamilton (2022). Ara Kootuitui Kirikiriroa Access Hamilton Strategy. <https://hamilton.govt.nz/strategies-plans-and-projects/strategies/access-hamilton/>
24. Future Proof (2020). Hamilton-Waikato metropolitan spatial plan. <https://futureproof.org.nz/h2a/metrosatialplan/>
25. Future Proof (2020). Hamilton-Waikato metropolitan spatial plan. <https://futureproof.org.nz/h2a/metrosatialplan/>
26. Future Proof (2020). Hamilton-Waikato metropolitan spatial plan. <https://futureproof.org.nz/h2a/metrosatialplan/>
27. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system

Arataki

Regional direction

Te Moana a Toi-te-Huatahi – Bay of Plenty

September 2023 v1.1

At a glance



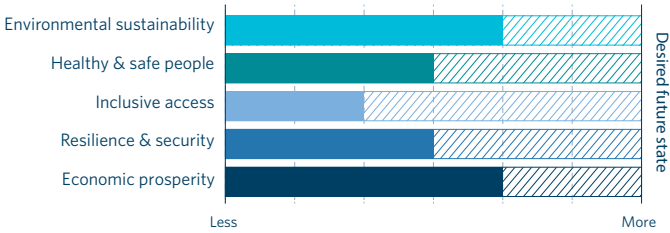
Te Moana a Toi-te-Huatahi Bay of Plenty is one of the fastest growing regions in Aotearoa New Zealand. Within the region there are significant differences between the rapidly growing western section of Te Moana a Toi-te-Huatahi as compared to other regional areas that are growing slower, facing higher unemployment rates, and earning lower incomes.

As the country’s primary export port, Port of Tauranga plays an important role in the region. Transport connections between Te Moana a Toi-te-Huatahi and Waikato have national economic significance. The economy of Te Moana a Toi-te-Huatahi relies on tourism, horticulture, and forestry.

Tauranga is experiencing significant growth. It requires transformational change to address high rates of private vehicle use. Changes to the transport network and urban form are necessary to improve access and safety, as well as reduce emissions. Te Moana a Toi-te-Huatahi has a poor road safety record, with high numbers of deaths and serious injuries.

Resilience also needs to be a key focus, with parts of the region vulnerable to tsunami risk, sea level rise, flooding, coastal erosion, and landslides.

**Scale of effort to deliver outcomes in
Te Moana a Toi-te-Huatahi – Bay of Plenty**



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

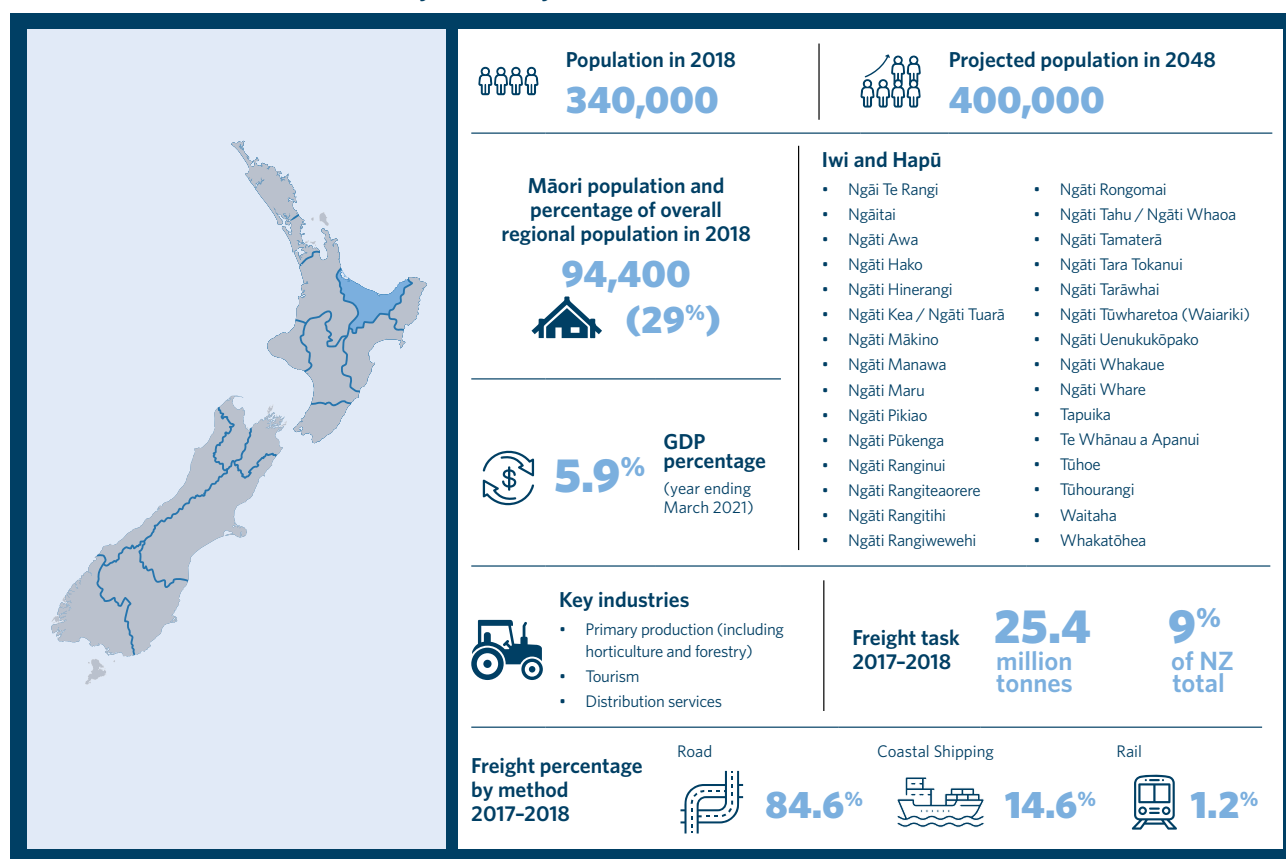
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context



Te Moana a Toi-te-Huatahi – Bay of Plenty



The population of Te Moana a Toi-te-Huatahi Bay of Plenty is projected to grow from 340,000 to just over 400,000 by 2048, or 7% of the country's population¹. Most of this growth is forecast to occur in the districts of Western Bay of Plenty and Tauranga. The population of Rotorua is projected to grow about 8% to 81,000 in 2028, then slow to 5% to 2048.² Low population growth is projected in eastern Te Moana a Toi-te-Huatahi.³

Te Moana a Toi-te-Huatahi has an older population than many other regions, with 19% of the population aged over 65. Providing good access for these residents is important so they remain socially connected, active, and able to participate in their communities.

The fast-growing western part of Te Moana a Toi-te-Huatahi is expected to grow through concentration in existing urban areas and new greenfield growth areas (development of undeveloped areas).

In 2018, 94,400 Māori lived in Te Moana a Toi-te-Huatahi, making up 29% of the region's population.⁴ This is much higher than the national rate of 16.5%.⁵ Māori make up 40% of Rotorua's population, the highest proportion in the region.⁶

The iwi and hapū in Te Moana a Toi-te-Huatahi region are Ngāi Te Rangi, Ngāitai, Ngāti Awa, Ngāti Hako, Ngāti Hinerangi,

Ngāti Kea / Ngāti Tuara, Ngāti Māhino, Ngāti Manawa, Ngāti Maru, Ngāti Pūkenga, Ngāti Ranginui, Ngāti Rangiteaorere, Ngāti Rangitahi, Ngāti Rangiwewehi, Ngāti Rongomai, Ngāti Tahu / Ngāti Whaoa, Ngāti Tamatera, Ngāti Tara Tokanui, Ngāti Tarāwhai, Ngāti Tūwharetoa (Te Moana a Toi-te-Huatahi), Ngāti Uenukukōpako, Ngāti Whakaue, Ngāti Whare, Tapuika, Te Whānau ā Apanui, Tūhoe, Tūhourangi, Waitaha, and Whakatōhea.⁷

Te Ōhanga Māori - The Māori Economy 2018 includes information for Te Moana a Toi-te-Huatahi - Waiariki rohe. It notes the asset base is valued at \$8.9 billion.⁸ The primary and property sectors are important.⁹

Over the next 30 years, primary production (including horticulture and forestry), tourism, and distribution services tied to the Port of Tauranga will continue to play an important role in the economy of Te Moana a Toi-te-Huatahi. Employment in service industries is expected to grow in the larger urban centres in line with the national trend.

The freight task in Te Moana a Toi-te-Huatahi in 2017-2018 was 25.4 million tonnes, or around 9% of the country's total.¹⁰ A total of 84.6% of the freight task tonnage in Te Moana a Toi-te-Huatahi was moved by road, 14.6% by rail, and 1.2% by coastal shipping.¹¹ The Port of Tauranga handles 25% of the country's imports and exports.¹²

Rail freight movements to and from the Port of Tauranga reduce the number of heavy vehicles travelling through the urban area. This improves safety and emission outcomes. About 40% of imports and 50% of exports are transported by rail.¹³

Te Moana a Toi-te-Huatahi – Bay of Plenty: Outlook



Significant transformation of the transport system in Te Moana a Toi-te-Huatahi will be needed over the next 30 years. The most significant change is in and around Tauranga, where fast growth will require improved access and safety, while reducing emissions.

It will be a challenge to fund new infrastructure and services to keep pace with growth, especially in western parts of the region. In areas with many people living on fixed incomes, or where populations are static or declining, raising sufficient funds to maintain existing networks and deliver new infrastructure will be challenging. Climate change will make this even harder.

Addressing these challenges will require a shift from the 'predict and provide' approach to transport planning, or solely focusing on the expansion of infrastructure to meet future growth. Instead, a more integrated 'outcomes-led' approach is needed, to deliver on agreed urban form and transport system requirements.

Steps to make sure transport outcomes are delivered in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- encouraging use of active modes and public transport by reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources is required to achieve key goals. New sources should be investigated, especially where these incentivise positive urban form or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Moana a Toi-te-Huatahi Bay of Plenty will need to make an important contribution to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁴ This includes a target to reduce total vehicle kilometres travelled (VKT) by our light vehicle fleet by 20% by 2035.

As the main urban centres, Tauranga and Rotorua present the greatest opportunities to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require significant change to how people travel in districts focused on private car usage. Improving transport options and reducing traffic are not just important for meeting our climate commitments. They are vital for reducing congestion and making our transport system more safe, healthy, and inclusive for people of all ages and abilities.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air quality, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

As a Tier 1 urban environment, Tauranga will need to do much of the heavy lifting for the region, to contribute towards national vehicle kilometres travelled (VKT) reduction. This work will inform future planning and investment decision-making.

Key actions over the next 10 years to make progress on this outcome are:

- implementing spatial plans developed for the region in a way that guides growth and urban development towards a compact, mixed-use urban form, to reduce trip length and car dependency – this includes the Urban Form and Transport Initiative (UFTI)-Connected Centres approach, *Rotorua Connect*, *Rotorua Spatial Plan*, and *Eastern Bay of Plenty Beyond Today*
- planning what interventions, activities, and investments are needed to achieve VKT and emissions reduction
- enabling and encouraging mode shift through rapid and extensive changes to the allocation of space on existing roads and streets to accelerate delivery of public transport plus walking and cycling networks
- implementing well-connected walking and cycling networks, with a focus on access into, and within, the central city from surrounding suburbs, access to key centres, and safe journeys to schools
- delivering key public transport routes connecting major centres in and around Tauranga, such as Cameron Road and Tauriko West
- continuing to improve public transport service quality and exploring opportunities to use technology to deliver better services at a lower cost
- transforming the freight fleet and improving freight network efficiency
- more actively managing carparking at major destinations and employment areas, to increase use of public transport, walking, and cycling
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the region’s transport system on the local environment
- exploring alternative funding and financing to support integrated growth of housing, mixed-use centres, transport connections, and infrastructure
- supporting the implementation of key policies, such as vehicle fleet transformation to lower emissions.

Healthy and safe people

Challenges and opportunities

Significant reduction in deaths and serious injuries is required in Te Moana a Toi-te-Huatahi Bay of Plenty. During the past three years, there have been over 200 annual deaths and serious injuries on the region's roads.¹⁵ In particular, we need to reduce crashes along key state highway routes and in urban areas. This will mean focusing on:

- speed reduction
- alcohol and drug impairment
- people not wearing seatbelts.¹⁶

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020-2030* and associated *Action Plan 2020-2022*, plus regional safety strategies.¹⁷

Walking and cycling rates have declined substantially over recent decades, contributing to a lack of physical activity and subsequent health problems. These health issues, like obesity and diabetes, disproportionately impact some demographics.¹⁸ The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.¹⁹

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Te Moana a Toi-te-Huatahi Bay of Plenty. New approaches to planning, design, and delivery, along with significant investment,¹⁹ are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements that target high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads, especially between Tauranga and Katikati
- rapidly rolling out a well-connected, separated cycling

network through reallocation of existing street space

- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

Walking and cycling rates have declined substantially over recent decades, contributing to a lack of physical activity and subsequent health problems.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

High reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to and use of a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Employment and essential services are concentrated in Tauranga and Rotorua. Unless local services and employment opportunities are provided to meet population growth outside these areas, people will be reliant on private vehicles and face long trip lengths.

Rural communities need to access key centres for education, employment, and essential services. As the population ages, travel needs will change; there will be greater reliance on accessing health services, while fewer people will access education and employment. An ongoing issue to be addressed is the conflict between large volumes of through-traffic versus safety, convenience, and disconnection (severance) in rural towns.


Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These shuttles could help people in smaller towns and rural communities get around and improve access to services in larger centres. Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure. The growing popularity of online purchasing and home delivery will impact on-demand travel, including the movement of freight.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower income households aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision-making, especially through spatial planning processes, to improve existing connections and expand local services at key locations – this will encourage more people to live in areas with better access to social and economic opportunities
- improving public transport services, expanding on-demand services where appropriate
- exploring opportunities to improve public transport affordability
- expanding and improving walking and cycling facilities, especially through completion of cycling networks in and around Tauranga and Rotorua
- improving active mode facilities in smaller towns, so these low-cost, sustainable, and healthy travel options are safely used for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced.

Economic prosperity

Challenges and opportunities

As Te Moana a Toi-te-Huatahi Bay of Plenty transitions to a low-emissions economy, the region will need to continue providing reliable and resilient access to employment, education, and essential services. Significant primary production and tourism industries are likely to remain important but may be impacted by climate change. Rail can play a greater role in carrying bulk commodities, such as logs, and provide reliable and resilient connections for growing industries, such as horticulture, and aquaculture in Ōpōtiki.

The region's nationally significant role in supply chains and global connections means it's important to deliver safe and reliable interregional journeys, especially road and rail freight connections to key ports and hubs.

In the coming decades, technological change will have significant impacts on travel demand and on the economy of Te Moana a Toi-te-Huatahi. The COVID-19 pandemic accelerated working from home, while future developments could impact the type and location of work people do. Emerging technologies can improve freight safety and efficiency, while better use of available data can improve freight efficiency and network management.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

The region's nationally significant role in supply chains and global connections means it's important to deliver safe and reliable interregional journeys, especially road and rail freight connections to key ports and hubs.

Making progress

Economic productivity and business competitiveness in Te Moana a Toi-te-Huatahi Bay of Plenty can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- implementing regional spatial planning work in Tauranga and Rotorua that includes long-term corridor protection to ensure these areas can perform strategic functions
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially interregional connections and access to the Port of Tauranga
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness)
- supporting improved accessibility to local and town centres to better enable them to flourish and provide for the day-to-day needs of residents
- supporting safe and reliable movement of visitors across the region, particularly from Rotorua to Eastern Bay, Waikato and Tāmaki Makaurau Auckland, and between Tauranga, Rotorua, Taupō, and areas further south and to the east.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁰

There are already many high risks in Te Moana a Toi-te-Huatahi Bay of Plenty area related to landslips, coastal erosion, flooding, and other weather-related factors. A notable risk is the impact of slips on SH2 through the Waioeka Gorge and at the Waimana Gorge, which forms part of the primary connection between Tairāwhiti Gisborne and Te Moana a Toi-te-Huatahi.

More extreme weather events, and the need to make the transport system resilient to a variety of natural disasters, will require a greater effort than ever to look after existing assets and maintain current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

To improve resilience in Te Moana a Toi-te-Huatahi Bay of Plenty, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in a highly complex urban environment, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat

- understanding routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience, particularly on State Highway 2 through Waioeka Gorge and Waimana Gorge
- engaging in local planning processes to avoid infrastructure and development in areas at increased risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events, to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using Te Moana a Toi-te-Huatahi transport system
- improving supply chain resilience to protect the critical economic role of the Port of Tauranga.

More extreme weather events, and the need to make the transport system resilient to a variety of natural disasters, will require a greater effort than ever to look after existing assets and maintain current levels of access and connectivity.

Tauranga: Urban focus

Tauranga: A fast growing city and critical national freight hub

Tauranga is the fifth biggest city in Aotearoa New Zealand and home to about 150,000 people.²¹ It has the country's biggest export port. It's also a freight and export hub and key destination for regional horticultural production.

The population of Tauranga and the western Te Moana a Toi-te-Huatahi Bay of Plenty is projected to grow to over 70,000 between 2018 to 2048.²²

Tauranga is spread around its harbour and inlets and depends heavily on private vehicle travel, with 90% of journeys to work made by private vehicle.²³ Significant investment has been made in developing a strategic road network in recent decades.

Urban Form + Transport Initiative (UFTI)

Tauranga has taken recent steps to integrate spatial and transport planning through the Urban Form + Transport Initiative (UFTI).²⁴

Developed by the SmartGrowth Partnership, UFTI provides high-level guidance on how Tauranga should grow over the coming decades and what transport investment is needed to enable and support this growth. The main components of UFTI's Connected Centres programme are:

- Major centres will be interspersed with smaller centres and a mix of housing, services, and amenities.
- Social and economic opportunities will increase; most people will be able to access everyday needs within a 15-minute walk or cycle ride. Regional opportunities and amenities will be accessible by a 30- to 45-minute journey on high-frequency public transport.
- Transport corridors will connect the city east (Paengaroa to Baypark), west (SH36/SH29 toward Rotorua), north (Bethlehem to Waihi), and centrally (Tauriko Crossing to Mount Maunganui via Cameron Road) with improved public transport service hubs to connect to other services.
- New dwellings will be evenly split between zoned greenfield land (development of undeveloped areas) and intensification of existing urban areas over the next 30 years.

The *Western Bay of Plenty Mode Shift Plan* builds on UFTI with actions centred around:

- shaping a supportive urban form
- making public transport and active modes more attractive by influencing travel demand and travel choice
- delivering a strategic walking and cycling network
- reviewing parking policy.²⁵

Key challenges

Tauranga faces significant transport challenges despite ongoing major investment in recent decades. These challenges include:

- an awkward geographic layout
- highly dispersed urban form
- high car dependency
- rapid population growth
- conflicting transport functions.

Current challenges around the safety and reliability of freight movement are now compounded by new challenges like reducing emissions and supporting more compact, efficient urban form.

Climate change

Urgency around climate change action and emission reductions has increased significantly in recent years. Larger urban areas, like Tauranga, provide the greatest opportunity to lower transport emissions. Reductions in traffic flow will also achieve wider benefits for health, safety, reliability, and quality of life.

Reducing vehicle kilometres travelled and overall emissions in a growing urban area, like Tauranga, will be extremely challenging, especially given its high car dependent urban form and legacy of past transport investment decisions.

Transformational change is required to improve urban form, offer better transport options, and manage demand for travel by cars. Vehicle kilometres travelled (VKT) reduction planning will confirm what interventions and activities, and at what scale, are required to achieve the necessary change to meet emissions reduction goals. Waka Kotahi will partner with local government, Māori, and community representatives to develop this work.

Climate change impacts such as intense rainfall, storms, and sea-level rise can lead to flooding risks that impact stormwater management, low-lying coastal areas, and critical transport corridors (such as Port of Tauranga, parts of Bethlehem, Matua, and Mount Maunganui). The result is higher maintenance costs and the need for adaptive management.

Reshaping the urban form of Tauranga

The urban form of Tauranga needs to change to address its challenges, achieve its goals, and contribute to national transport outcomes. Over time, the city's urban form will be shaped by higher density centres and inter-connected multimodal transport corridors.

Changes in urban form, land use planning, and transport investment must accelerate to meet emission reduction targets and mode shift goals. These changes will also make our communities better places to live. This requires more collaboration and coordination between iwi, local government, and central government.

Further work is required to understand whether the future urban form proposal and supporting land transport system from the Urban Form + Transport Initiative (UFTI) will be sufficient to deliver desired long-term outcomes, such as reducing emissions and providing affordable housing.

Enabling growth in Tauranga that delivers on long-term outcomes will be a significant challenge. It will require all partners to work together to make sure the right approach is taken using the right tools.



Changes in urban form, land use planning, and transport investment must accelerate to meet emission reduction targets and mode shift goals.



Te Moana a Toi-te-Huatahi – Bay of Plenty: Focusing our efforts

The transport challenges for Te Moana a Toi-te-Huatahi Bay of Plenty need to be tackled in a cohesive way for efficient and effective progress. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Use spatial planning to enable and encourage growth in areas that already have good travel choices and shorter trip lengths, such as the work underway in Tauranga, Western Bay of Plenty, and Rotorua.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Implement the transport components of the Urban Form + Transport Initiative (UFTI) – this includes protecting key strategic corridors and developing high-quality public transport, walking, and cycling infrastructure to connect centres.
- Continue to improve interregional connectivity and resilience, especially to Tāmaki Makaurau Auckland, Kiriakiroa Hamilton, and Tairāwhiti Gisborne.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Confirm how key resilience risks will be addressed and work with communities to identify plans for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes, including those focused on iwi Māori.
- Reduce financial and other barriers to iwi Māori getting a driver's licence in areas not well served by public transport.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
5. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
8. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashxp16
9. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
10. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
11. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
12. Ministry of Transport (2018). Sea freight. FIGS – Tables. www.transport.govt.nz/statistics-and-insights/air-and-sea-transport/sheet/sea-freight
13. Bay of Plenty Regional Council (2019). Bay of Plenty region passenger and freight rail. atlas.boprc.govt.nz/api/v1/edms/document/A3277034/content
14. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
15. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
16. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
17. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
18. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
19. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
20. Ministry for the Environment (2018). Climate change projections for the Bay of Plenty region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-bay-of-plenty-region
21. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
22. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
23. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
24. Urban Form and Transport Initiative (2020). Urban Form and Transport Initiative (UFTI) final report. https://ufti.org.nz/wp-content/uploads/2020/07/22527_UFTI-Final-Report.pdf
25. Waka Kotahi NZ Transport Agency (2020). Regional mode shift plan: Bay of Plenty. <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/BoP-regional-mode-shift-plans.pdf>

Arataki

Regional direction
Tairāwhiti – Gisborne
September 2023 v1.1

At a glance



Tairāwhiti Gisborne is one of the most remote regions in Aotearoa New Zealand and home to about 1% of the country’s population.¹ The economy is largely based on primary production, forestry, fishing, sheep and beef farming, horticulture, and viticulture.

The region is highly dependent on SH35 and SH2. Both highways have resilience challenges with no alternate routes. The reliability of these corridors is critical.

The region’s population is forecast to grow from 49,500 to about 55,000 by 2048.² Transport can support regional development by:

- improving access to employment, education, training, and essential services for remote East Cape communities
- enabling the movement of goods to Eastland Port and access to visitor destinations
- ensuring safe and reliable connections to neighbouring regions.

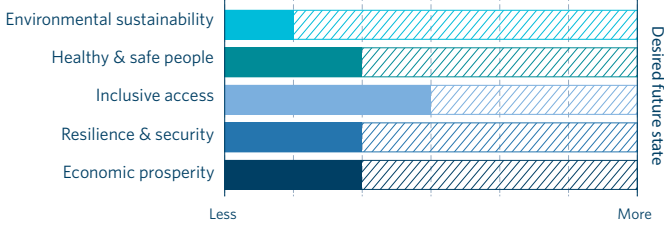
Challenging terrain and long distances result in relatively long travel times. Of the region’s 1,889kms of local roads, 37% are unsealed.³

Tairāwhiti has limited public transport services. Around 90% of trips to work are by private vehicle.⁴ Active modes are likely the best way to reduce vehicle kilometres travelled, along with increasing the share of freight moved by coastal shipping. The region has higher than average rates of walking and cycling, but numbers are declining. Investment in safe and easy ways to access facilities can help shift more people to active modes.

The region’s social and economic opportunities are dependent on connections north to Te Moana a Toi-te-Huatahi Bay of Plenty and south to Te Matau-a-Māui Hawke’s Bay, and other regions. These routes support key industries, move goods to market, provide access to specialist services, and allow communities to thrive.

Other critical transport challenges facing Tairāwhiti over the next three decades include safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Tairāwhiti – Gisborne



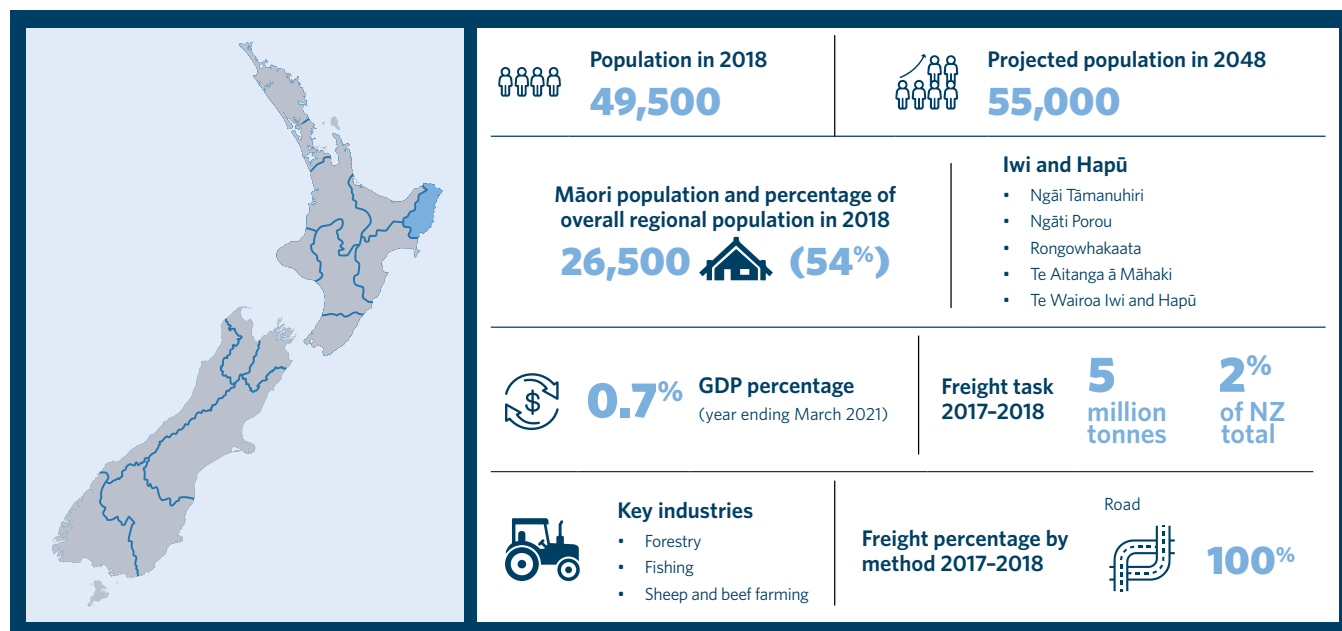
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. Most sections of the *Regional direction Tairāwhiti – Gisborne* have climate-related updates.

Context

Tairāwhiti – Gisborne



The population of Tairāwhiti Gisborne is projected to grow from 49,500 to about 55,000 by 2048, or 1% of the country's population.⁵ Growth will be heavily focused in the Tairāwhiti urban area, which is home to 75% of the region's population and the key hub for employment and services.⁶

Communities in the north of the region are small, relatively isolated, and highly reliant on a single road transport connection. These communities have high levels of deprivation and populations that are expected to decline.⁷ The population is largely young people and seniors, with a comparatively small working-age population. If current settlement trends continue, there could be an increase in private vehicle reliance and longer journey times longer.

In 2018, 26,500 Māori lived in Tairāwhiti, making up 54% of the region's population.⁸ This is over three times higher than the national rate of 16.5%.⁹

The iwi and hapū in the Tairāwhiti region are Ngāi Tāmanuhiri, Ngāti Porou, Rongowhakaata, Te Aitanga ā Māhaki, and Te Wairoa Iwi and Hapū.¹⁰

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Tairāwhiti rohe, which relates to the region. It notes the asset base in the rohe is valued at \$3.0 billion.¹¹ It is dominated by the primary sector.¹² Tairāwhiti is one of three regions with the highest proportion of Māori deaths and serious injuries related to traffic incidents.¹³

The economy of Tairāwhiti has lagged behind other parts of the country. The *Tairāwhiti Regional Economic Action Plan, He Huarahi Hei Whai Oranga* was launched in February 2017.¹⁴ The plan focuses on freight, tourism, and efficiency.

Tairāwhiti has received government funding to address access to social and economic opportunities, and to help diversify the economy.

Severe weather events are already affecting the land transport system of Tairāwhiti. In February 2023, Cyclone Gabrielle caused flooding and landslips, resulting in road closures on SH2 between Gisborne and Wairoa and multiple sites along SH35. There are several years of rebuild ahead for these parts of the network.

The freight task in Tairāwhiti in 2017-2018 was 5 million tonnes, or about 2% of the Aotearoa total.¹⁵ One hundred percent of the freight task tonnage was moved by road.¹⁶

The background image shows a coastal scene with prominent white cliffs. In the foreground, there's a body of water with white foam from waves. A ship is visible in the distance, partially obscured by the white foam. The sky is a deep blue. A large, light blue curved shape is overlaid on the left side of the image, framing the title.

Tairāwhiti – Gisborne: Outlook

Around 90% of trips to work in the region are by private vehicle.¹⁷ Recent decades have seen limited public transport services and a decline in people walking and cycling.¹⁸

The urban road network is well connected, with capacity to manage projected volumes in most areas. There is some pressure around freight growth, particularly export log volumes to Eastland Port and other sites. Growing traffic volumes on a few key urban routes also raise issues.

The rail line from Ahuriri Napier to Wairoa was reopened for log freight in 2020. However, the section from Wairoa to Tairāwhiti remains mothballed following a land slip in 2012. It was further damaged by a larger land slip in November 2021.

As the region's population grows 11% over the next 30 years, its economy and transport system will need to adapt as Aotearoa transitions to a low carbon future.

The most significant changes to the region's transport system over the next three decades include:

- recovering and rebuilding after Cyclone Gabrielle
- supporting emissions reduction
- improving safety
- managing resilience
- encouraging more walking and cycling in the Tairāwhiti urban area.

In light of increased extreme weather events, the next 30 years will present long-term resilience challenges as the likelihood of damaged roads and rail networks grows. It will be necessary to work with communities to:

- understand climate adaptation
- identify and prioritise responses in high-risk areas
- identify sections of the network prone to closure
- plan to avoid infrastructure and development in high-risk areas.

Tairāwhiti faces long-term challenges, such as high unemployment and low incomes.¹⁹ The number of people on a fixed income will likely place pressure on the region's council to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services.

Climate change will make this even harder.

Steps to make sure transport outcomes are delivered in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- encouraging active modes by reallocating existing road space and making temporary or low-cost improvements
- applying adaptive management techniques to transport assets, to help manage risks and uncertainty, and support communities to adapt to the impacts of climate change.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Tairāwhiti Gisborne will need to make a modest contribution to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.²⁰

To support national emissions targets, there will need to be significant change in Tairāwhiti Gisborne to how people travel in a district focused on private car travel.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:


- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the region’s transport system on the local environment
- identifying opportunities for smaller projects, including making the most of the existing network, that can improve system outcomes
- engaging in local planning processes to ensure development, planning, and investment focuses on reducing emissions, private vehicle travel, and average trip length
- enabling and increasing mode shift through rapid and extensive changes to the allocation of space on existing roads and streets to accelerate delivery of public transport plus walking and cycling networks
- continuing to improve public transport service quality, including exploring use of technology to help deliver better services at a lower cost.



To support national emissions targets, there will need to be significant change in Tairāwhiti Gisborne to how people travel in a district focused on private car travel.

Healthy and safe people

Challenges and opportunities

Serious crashes are concentrated in the Tairāwhiti Gisborne urban area and on high-risk rural roads.²¹ Safety improvements should focus on addressing:

- high-risk intersections
- run-off road crashes
- vulnerable users
- driver behaviour.²²

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated *Action Plan 2020–2022*, plus regional safety strategies.²³

Undeveloped networks contribute to low and declining rates of walking and cycling in Tairāwhiti. These levels have declined substantially over recent decades, contributing to a lack of physical activity and subsequent health problems. These health issues, like obesity and diabetes, disproportionately impact some demographics.²⁴ The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²⁵

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting changes to encourage walking and cycling in the city of Tairāwhiti Gisborne will help the region. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements that target high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads, especially on SH2 and SH35
- rapidly rolling out well-connected, separated cycling networks in Tairāwhiti Gisborne and other regional towns through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

Safety improvements should focus on addressing:

- **high-risk intersections**
- **run-off road crashes**
- **vulnerable users**
- **driver behaviour.**

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

High reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to and use of a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Rural and remote communities need better connections to the Tairāwhiti Gisborne urban area, where employment, education, and essential services are concentrated. Residents rely on access to Waikato Hospital for a range of specialist medical services. Access improvements should address the barriers of distance, affordability, and network resilience.


Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These shuttles could help people get around remote communities in the north of the region and improve access to services in the Tairāwhiti urban area. Improved access to high-quality data and information will allow better management of the existing land transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider over time, such as balancing increased travel costs to reduce emissions while ensuring lower income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- expanding and improving walking and cycling facilities, so these low-cost, sustainable, healthy travel options are safe and attractive for more journeys
- improve public transport services, including on-demand services where appropriate
- exploring opportunities to improve public transport affordability
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services
- shaping planning rules and urban development decision-making to encourage more people to live in areas with better access to social and economic opportunities.



The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

Economic prosperity

Challenges and opportunities

He Huarahi Hei Whai Oranga Tairāwhiti Regional Economic Action Plan identifies several transport objectives to support improved economic and social outcomes for the region.²⁶

These include:

- safety and resilience of the network
- freight efficiency, including safe and reliable connections to the Eastland Port, SH35, and its connecting routes, and SH2 to the rest of the country
- tourism-related upgrades
- efficient routes for both general and heavy traffic
- driver licensing and mentoring to support access to training and jobs.

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean change to the region's economy. Transport has a role to support this change, including for freight.



Transport, including freight, has a role to play in the region's economy.

Making progress

Economic productivity and business competitiveness in Tairāwhiti Gisborne can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by low carbon modes in Tairāwhiti and its regional towns
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections, and key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- planning and delivering transport infrastructure and services that maximise industry initiatives, like supporting the growth of forestry
- supporting improved accessibility to local and town centres to better enable them to flourish and provide for the day-to-day needs of residents
- planning and delivering transport infrastructure and services that improve economic and social connections, like supporting the Tairāwhiti Rooding Package
- supporting improvements in social and economic outcomes in areas of high deprivation, like better access to employment, education, and essential services for isolated communities.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁷

Maintaining safe and reliable connections to Eastland Port, Te Matau-a-Māui Hawke's Bay, and Te Moana a Toi-te-Huatahi Bay of Plenty remain critical for the region's economy. Closures along Waioeka Gorge, which connects Tairāwhiti Gisborne with Te Moana a Toi-te-Huatahi, isolate communities and impact the time sensitive delivery of food produce to the port and Tāmaki Makaurau Auckland.

Closures will become more common, as will disruption to SH35, north of Tairāwhiti. Devil's Elbow is prone to natural hazards and has the highest risk of land slips. In 2023, these and other sections on the state highway network were closed because of Cyclone Gabrielle. Of the region's 2199kms of local roads, 37% were unsealed as of 2019-2020.²⁸

With the expansion of forestry harvesting in the region, upgrading rural roads is a priority to handle the increase in freight vehicles. On SH2 south of Tairāwhiti, the number of high productivity motor vehicles (HPMVs) is growing, but full HPMV access is restricted on many roads.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.


Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

To improve resilience in Tairāwhiti Gisborne, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in a highly complex urban environment, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- understanding routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at increased risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events, to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning.



To improve resilience in Tairāwhiti, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks.



Tairāwhiti – Gisborne: Focusing our efforts

For efficient and effective progress, transport challenges in Tairāwhiti Gisborne must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Rebuild the network destroyed by Cyclone Gabrielle and improve resilience.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of key connections to the west and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Begin to reduce vehicle kilometres travelled in a way that's equitable and improves people's quality of life.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Actively support, enable, and encourage growth and development in areas that already have good travel choices and shorter trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Confirm how key resilience risks will be addressed over time, and work with communities to identify plans for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused on iwi Māori.
- Reduce financial and other barriers to iwi Māori getting a driver's licence in areas not well served by public transport.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2019). 2018 Census population and dwelling counts. stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Ministry of Transport (2020). Length of road network, sealed and unsealed (Lane km) for all Regions in New Zealand. transport.govt.nz/statistics-and-insights/road-transport/sheet/length-of-road
4. Ministry of Transport (2019). Household travel survey. transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2017). Urban area population projections, by age and sex, 2013(base)–2043 update. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
7. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
10. Te Puni Kōkiri (2022). Find iwi by local authority. tkm.govt.nz/browse
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
13. Waka Kotahi, NZ Transport Agency (2021). He pūrongo whakahaumaru huarahi mō ngā iwi Māori, Summary of the Māori road safety outcomes report. nzta.govt.nz/assets/resources/maori-road-safety-outcomes-report/maori-road-safety-outcomes-summary-report.pdf p6
14. Gisborne District Council (2020). Tairāwhiti 2050, Shaping the future of our region. <https://trusttairawhiti.nz/assets/Uploads/17-Jan-TEAP-Report-Full-Version-v24-single-pages2.pdf>
15. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
16. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry of Transport (2019). Household travel survey. transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey
18. Ministry of Transport (2019). Household travel survey. transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey
19. Ministry for Business, Innovation and Employment (2022). Regional economic activity web tool, Gisborne. webrear.mbie.govt.nz/summary/gisborne?accessedvia=gisborne
20. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
21. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
22. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
23. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf

24. Waka Kotahi, NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi.
25. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. **[nzta.govt.nz/resources/research/reports/696](https://www.nzta.govt.nz/resources/research/reports/696)**
26. Trust Tairāwhiti (2022). *Trust documents*. **trusttairawhiti.nz/documents**
27. Ministry for the Environment (2018). Climate change projections for the Gisborne and Hawke's Bay region. **environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region**
28. Ministry of Transport (2020.) Road transport: Length of road core dashboard information. **transport.govt.nz/statistics-and-insights/road-transport/sheet/length-of-road**

Arataki

Regional direction

Te Matau-a-Māui – Hawke's Bay

September 2023 v1.1



At a glance

Te Matau-a-Māui Hawke's Bay is home to about 166,000 people, or 3.5% of the population of Aotearoa New Zealand.¹ It's expected to grow to 202,000 by 2048.² Ahuriri Napier and Heretaunga Hastings are the main employment centres and home to nearly 80% of the region's population.³ This is where most of the region's future growth will occur.

By 2048, nearly 30% of the population in the districts of Ahuriri and Central Hawke's Bay is expected to be older than 65, compared to the national average of 23%.⁴

Outside the two main centres, jobs in primary production such as horticulture, wine, sheep and beef farming and processing are significant. The importance of logging is forecast to grow.

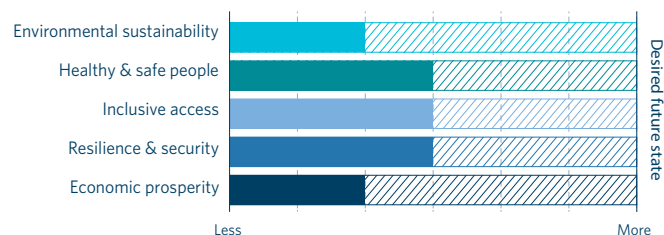
There is an uneven distribution of economic opportunities and growth in the region, with the north experiencing declining populations, high unemployment, and low incomes.⁵

There are several natural hazard risks related to landslips, flooding, coastal inundation/erosion, and earthquake/liquefaction.

There's an opportunity to build on average rates of walking and cycling in Ahuriri and Heretaunga, by ongoing investment in safe facilities that can accommodate mobility scooters. Active modes are likely the best ways to reduce vehicle kilometres travelled (VKT). Increasing the share of freight moved by rail and coastal shipping will also have an important role to play in reducing emissions.

Other critical transport challenges facing the region over the next three decades include safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Te Matau-a-Māui – Hawke's Bay



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

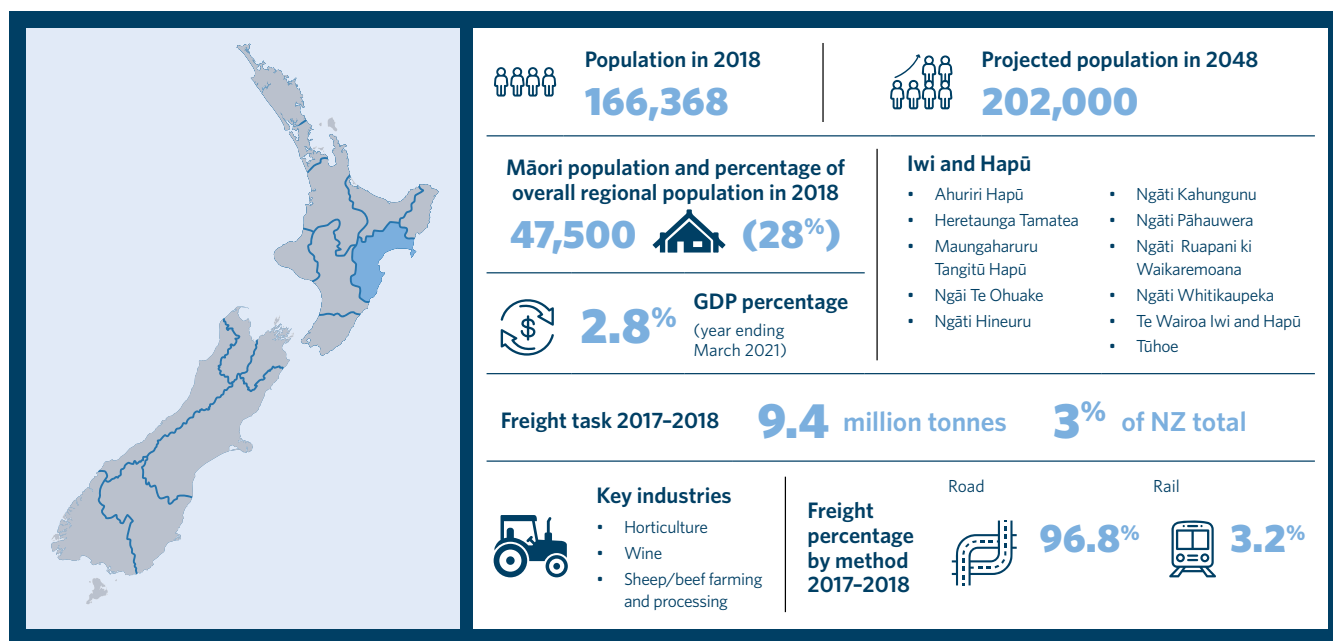
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. Most sections of the *Regional direction Te Matau-a-Māui – Hawke's Bay* have climate-related updates.

Context



Te Matau-a-Māui – Hawke's Bay



The population of Te Matau-a-Māui Hawke's Bay is projected to grow from 166,368 to about 202,000 by 2048, or 3% of the country's population.⁶ Most of this growth will be in Ahuriri Napier and Heretaunga Hastings.

By 2048, nearly 30% of the population of Ahuriri and central districts of Te Matau-a-Māui is expected to be older than 65 years, well ahead of the national average of 23%.⁷ Providing good access for residents over 65 will be important to ensure they remain socially connected, active, and able to participate in their communities.

In 2018, 47,500 Māori lived in Te Matau-a-Māui, making up 28% of the region's population.⁸ This is almost 1.7 times the national rate of 16.5%.⁹ Most Māori live in Heretaunga, where they make up 28% of the district's population.¹⁰

The iwi and hapū in the region are Ahuriri Hapū, Heretaunga Tamatea, Maungaharuru Tangitū Hapū, Ngāi Te Ohuake, Ngāti Hineuru, Ngāti Kahungunu, Ngāti Pāhauwera, Ngāti Ruapani ki Waikaremoana, Ngāti Whitikaupeka, Te Wairoa Iwi and Hapū, and Tūhoe.¹¹

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Tākitimu rohe, which relates to the Te Matau-a-Māui region. It notes the asset base in the rohe is valued at \$3 billion.¹² Property and primary sector are key industries.¹³

Primary industries such as horticulture, wine, sheep and beef farming and processing are important for the region. Log volumes for export through Te Herenga Waka o Ahuriri Napier Port are forecast to grow.

Tourism, including cruise ships in summer and cycle tourism, were forecast to grow before the COVID-19 pandemic.¹⁴

While the existing transport system has capacity to accommodate forecast growth, there is likely to be growing pressure around the Te Herenga Waka o Ahuriri because of increased heavy vehicle trips.

The construction of Te Ahu a Turanga: Manawatū-Tararua highway project, an alternate road between Manawatū and Te Matau-a-Māui, is important to supporting the safe, reliable, and efficient movement of people and freight.

The rail network connects Te Herenga Waka o Ahuriri to distribution hubs in Te Papa-i-Oea Palmerston North and extends north to Wairoa, though the Wairoa-Ahuriri rail line is currently closed. Rail services are focused on freight container movements between Te Papa-i-Oea and Te Herenga Waka o Ahuriri. The line north to Wairoa is focused on transporting logs to Te Herenga Waka o Ahuriri. Rail usage has declined since 2014, following the loss of two key customers. Increased truck movement has resulted in more crashes involving trucks.

Severe weather events are already affecting the land transport system of Te Matau-a-Māui. In February 2023, Cyclone Gabrielle caused flooding, landslips, and storm damage resulting in road closures of SH2 at multiple sites, SH5 between Ahuriri and Taupō, and SH38 between Frasertown and Aniwanui Falls. Rail was also affected between Woodville and Heretaunga, Heretaunga and Napier Port, and Ahuriri and Wairoa.

The freight task in Te Matau-a-Māui in 2017-2018 was 9.4 million tonnes, or around 3% of the country's total.¹⁵ A total of 96.8% of the freight task tonnage in Te Matau-a-Māui was moved by road and 3.2% by rail.¹⁶

The background of the page is an aerial photograph of a rolling landscape in Hawke's Bay, New Zealand. The terrain is a mix of green fields, some with visible furrows from farming, and patches of brownish vegetation. In the upper right corner, there is a bright sunburst effect with rays of light spreading across the sky and the landscape below. A large, semi-transparent white shape, resembling a stylized 'C' or a thick curved line, frames the left and bottom portions of the page, creating a modern, graphic design element.

Te Matau- a-Māui - Hawke's Bay: Outlook

While the population of Te Matau-a-Māui is expected to grow by 22% during the next 30 years, its economy will need to transform as Aotearoa New Zealand transitions to a low carbon future.

The most significant changes to the region's transport system will include:

- recovering and rebuilding after Cyclone Gabrielle
- transforming to lower emissions
- making significant improvements to safety and resilience.

An ageing population and high numbers of residents on fixed incomes will put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services to residents.

Climate change will make this even harder.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’

approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Matau-a-Māui Hawke’s Bay will need to make an important contribution to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁷

As main urban centres, Ahuriri Napier and Heretaunga Hastings present the greatest opportunity to support emissions reductions by providing alternative transport options and reducing the need to travel. This will require significant change to how people travel in districts with high private vehicle usage.

There are significant numbers of daily commuter trips between Ahuriri and Heretaunga, with 93% of journeys to work by private vehicle.¹⁸ While public transport usage is low, walking and cycling in the urban areas is slightly above the national average.¹⁹

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:


- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and urban development decision-making that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions and investments are needed to achieve emissions reductions
- enabling and increasing mode shift through changes to the allocation of space on existing roads and streets to accelerate delivery of public transport plus walking and cycling networks
- improving public transport services and exploring ways technology can deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas, to increase the use of public transport, walking, and cycling for trips to these locations
- identifying opportunities for smaller projects, including making the best use of the network, that can improve system outcomes
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the transport system on the local environment
- supporting the *Heretaunga Plains Urban Development Strategy* target 60% growth in existing urban areas.²⁰



We must reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems.

Healthy and safe people

Challenges and opportunities

Te Matau-a-Māui Hawke's Bay has a relatively poor safety record. This is because of:

- run-off road crashes
- speeding
- impairment
- people not wearing seatbelts.²¹

Forecasted growth of freight traffic could increase these risks.

Safety efforts should focus on the Ahuriri Napier to Heretaunga Hastings urban areas, SH2 between Ahuriri and Waipukurau, and high-risk rural roads. In 2019, Wairoa District had the highest levels of personal risk in the country.²²

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030*, associated *Action Plan 2020–2022*, and regional safety strategies.²³

Undeveloped networks contribute to average rates of walking and cycling in Ahuriri and Heretaunga. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²⁴

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and support dramatic changes to encourage walking and cycling will help the urban areas of Te Matau-a-Māui. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- rapidly rolling out a well-connected, separated cycling network largely through reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation, particularly along the Hawke's Bay Expressway
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- continuing safety interventions targeting high-risk intersections, run-off roads crashes, high-volume roads, and head-on crashes on high-risk rural roads
- advocating for robust mobile network coverage in rural and regional areas.

Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options.

Inclusive access

Challenges and opportunities

The growing number of those aged 65 and over means changes in housing, support services, and travel needs. The transport system needs to make sure the older population remains socially connected and able to participate in their communities.

The region's high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Emerging technologies, such as on-demand shuttles being trialled in Heretaunga Hastings and Ahuriri Napier, could provide a shared-transport option. This can help people get around smaller and rural communities, and improve access to services in Ahuriri and Heretaunga.

Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure. Rural communities will need improved connections to Ahuriri and Heretaunga to access education, employment, and essential services.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income households aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision making to encourage more people to live in areas with better existing access to social and economic opportunities
- improving public transport services and expanding on-demand services where appropriate
- exploring opportunities to improve public transport affordability for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Emerging technologies, such as on-demand shuttles being trialled in Heretaunga Hastings and Ahuriri Napier, could provide a shared-transport option.

Economic prosperity

Challenges and opportunities

Te Matau-a-Māui Hawke's Bay is a priority for regional development support. This is because of the long-term challenges the region faces, such as high unemployment and low incomes. The government has identified the area as needing investment to support regional economic development, particularly in Wairoa and Central Hawke's Bay.

Matariki – Hawke's Bay Regional Economic Development Strategy and Action Plan has identified several areas where transport can help regional social and economic development that include:

- supporting tourism such as improvements to SH38 through to Lake Waikaremoana to open up this key natural asset and improve the safety of tourists travelling through the area
- encouraging driver licensing and mentoring to support access to training and jobs.²⁵

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean change to the economy of Te Matau-a-Māui. Transport has a role to support this change, including for freight.

Technological change will have significant impacts on demand for travel and on the economy of Te Matau-a-Māui. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Making progress

Economic productivity and business competitiveness in Te Matau-a-Māui Hawke's Bay can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- supporting improvements in social and economic outcomes in areas of high deprivation, particularly around access for isolated communities
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections and key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't excessively impact economic activity
- supporting the continued development of key economic centres by improving their access and amenity (attractiveness) for local residents
- supporting improved accessibility to local and town centres to allow these areas to flourish and better provide for the needs of residents
- supporting initiatives to increase visitor numbers, particularly in the north of the region.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁶

Wairoa, Whirinaki Bluff, and access to the airport in Te Matau a Māui Hawke's Bay are vulnerable to coastal erosion and the long-term effects of climate change. Because of the impacts from Cyclone Gabrielle in 2023, these and other sections on the state highway and rail network were closed.

The region provides important connections to the north and inland to Te Papa-i-Oea Palmerston North. There are risks of land slips along these routes that could worsen with changing weather patterns.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.


Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- rebuilding the network destroyed by Cyclone Gabrielle and improving resilience
- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- continuing work to better understand routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks.



Te Matau-a-Māui – Hawke's Bay: Focusing our efforts



For efficient and effective progress, transport challenges in Te Matau-a-Māui must be tackled in a cohesive way.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Rebuild the network destroyed by Cyclone Gabrielle and improve resilience.
- Reduce vehicle kilometres travelled (VKT), focusing on Ahuriri Napier and Heretaunga Hastings, in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the north and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Actively support, enable, and encourage growth and development in areas that already have good travel choices and shorter trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a multimodal freight system with greater use of rail and coastal shipping.
- Advocate for better integration of land use and transport planning, including spatial planning for sustainable management of urban growth.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
7. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
10. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
11. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
12. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
13. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
14. Ministry of Business, Innovation and Employment (2022). Tourism data insights. <https://www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-insights/>
15. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
16. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
18. Ministry of Transport (2019). Household travel survey. www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/
19. SmartGrowth partnership and Waka Kotahi NZ Transport Agency (2019). Urban form and transport initiative foundationrReport (draft - August 2019). ufti.org.nz/wp-content/uploads/2019/08/21456-UFTI-Foundation-Report-V13.pdf
20. Hawke's Bay Regional Council (2017). Heretaunga Plains Urban Development Strategy. <https://www.hpuds.co.nz/>
21. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
22. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
23. Ministry of Transport (2019). Road to zero - New Zealand's road safety strategy 2020-2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
24. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
25. Matariki Hawke's Bay Regional Development Strategy for economic, inclusive and sustainable growth (2019). Matariki - Hawke's Bay Regional Economic Development Strategy and Action Plan. <https://www.hbreds.nz/>
26. Ministry for the Environment (2018). Climate change projections for the Gisborne and Hawke's Bay region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region/

Arataki

Regional direction Taranaki

September 2023 v1.1

At a glance

Taranaki is a highly productive region of Aotearoa New Zealand, with an economy based on the export industries of dairy farming and processing, plus oil and gas.

Taranaki relies on SH3 for safe, reliable connections to move people and freight north to Waikato and the road and rail connections southeast to Manawatū-Whanganui. There are no alternative northern routes suitable for heavy vehicles.

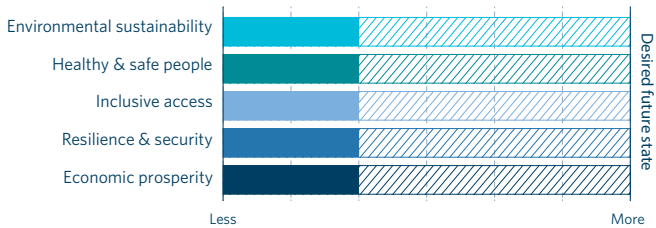
During the next 30 years, the population of Taranaki is expected to grow from 121,000 to 138,000 by 2048.¹ Seventy percent of the region lives in and around Ngāmotu New Plymouth, where most future growth is projected.

With higher than average rates of walking and cycling, Ngāmotu can continue boosting active modes by investing in safe and attractive facilities. Walking and cycling are the best ways for the region to reduce vehicle kilometres travelled (VKT). Increasing the share of freight moved by rail and coastal shipping will also have an important role to play in reducing emissions.

Over the next three decades, the other critical transport challenges facing Taranaki are safety, resilience, and supporting the transition to a low-carbon economy.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Scale of effort to deliver outcomes in Taranaki



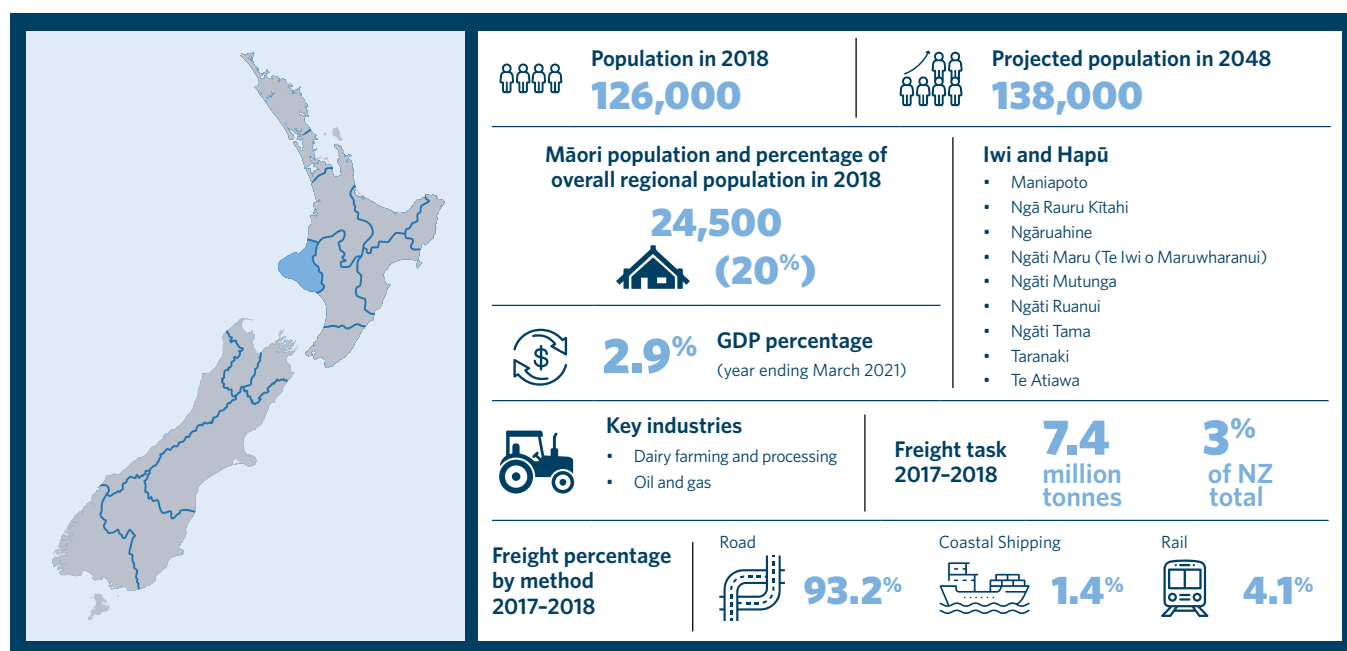
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicates where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system levels metrics. Further details are captured in the methodology document.

Context

A photograph of a modern white bridge with a ribbed arch structure spanning a river, with a mountain in the background. The bridge features a series of white, curved ribs that form a large arch over the water. The railing is also white and has a simple vertical bar design. The water is calm, reflecting the bridge and the sky. In the background, a green mountain rises against a clear blue sky. The overall scene is bright and clear, suggesting a sunny day.

Taranaki



Taranaki has home to about 126,000 people, or 2.5% of the country's population.² Ngāmotu New Plymouth, the primary urban area, is home to nearly 70% of the region's population.³ The population of Taranaki is projected to grow to around 138,000 by 2048, or 2% of the population of Aotearoa New Zealand.⁴ In recent years, most growth in Taranaki has been from people moving into the region, rather than a natural increase in the existing population.

Most growth is expected in urban Ngāmotu. Low growth is forecasted in the smaller urban and rural areas of Ngāmotu, South Taranaki, and Stratford districts.⁵

By 2048, it's expected that those aged over 65 will make up 27% of the Ngāmotu district population – more than the Aotearoa average of 23%.⁶ It will be important to provide good access for residents over 65 so they remain socially connected, active, and able to participate in their communities.

In 2018, 24,500 Māori lived in Taranaki, making up 20% of the region's population.⁷ This is higher than the national rate of 16.5%.⁸ Most Māori live in Ngāmotu, where they make up 18% of the district's population.⁹

The iwi and hapū in the Taranaki region are Maniapoto, Ngā Rauru Kītahi, Ngāruahine, Ngāti Maru (Te Iwi o Maruwharanui), Ngāti Mutunga, Ngāti Ruanui, Ngāti Tama, Taranaki, and Te Atiawa.¹⁰

Te Ōhanga Māori – The Māori Economy 2018 includes information for the Te Tai Hauāuru rohe, that relates to the regions of Taranaki and Manawatu-Whanganui. It notes the asset base in the rohe is valued at \$5.7 billion.¹¹ The primary sector is noticeably important, followed by property.¹²

Taranaki has the second highest level of economic productivity in Aotearoa, making a 2.9% contribution to the country's GDP – impressive given its relatively small population.¹³ The region's economic performance is underpinned by two high-earning, export-oriented sectors:

- dairy farming and processing
- oil and gas.

The region relies heavily on road and rail connections to the rest of the North Island for the movement of people, freight, and visitors. SH3 provides the main northern connection linking Taranaki to the Waikato and Upper North Island and the southern connection between Ngāmotu and Te Papa-i-Oea Palmerston North. SH3 is critical to the dairy industry as it connects the production centre in Hāwera to distribution centres in Te Papa-i-Oea.

Every year, heavy vehicles travel 75 million kilometres on Taranaki roads, with 63 million related to the key sectors of oil and gas, dairying, and forestry.¹⁴ The transport networks of Ngāmotu are generally well connected and fit for purpose. A key area of pressure is the transport link between Ngāmotu city centre and the eastern part, where residential and business areas are growing.

The region's freight task in 2017–2018 was 7.4 million tonnes, or around 3% of the country's total.¹⁵ A total of 93.2% of the freight task tonnage in Taranaki was moved by road, 4.1% by rail, and 1.4% by coastal shipping.¹⁶

Taranaki: Outlook

While the population of Taranaki is projected to grow slightly during the next 30 years, its economy will likely transform considerably as Aotearoa New Zealand transitions to a low-carbon future.

Over the next three decades, key changes to Taranaki will be:

- supporting the country's economic transformation
- making improvements to safety and resilience
- achieving higher rates of walking and cycling in Ngāmotu New Plymouth.

The ageing population and higher proportion of residents on fixed incomes is likely to put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services.

Climate change will make this even harder.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Taranaki will need to make an important contribution to reducing carbon emissions, to reach 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁷

As the main urban centre, Ngāmotu New Plymouth presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in a city with high levels of private vehicle use.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

In the Taranaki region, 84% of journeys to work are made by private vehicles.¹⁸

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and development that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions, activities, and investments are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- improving public transport services and exploring ways technology can deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas to increase use of public transport, walking, and cycling for trips to these locations
- identifying opportunities for smaller projects that can improve system outcomes, like getting the most from the existing network
- ensuring appropriate place standards, policies, and regulations are put in place to reduce the impact of the transport system on the local environment
- supporting the implementation of key policies that develop zero-emission transport solutions, such as vehicle fleet transformation; this includes working with the H2 Taranaki Hydrogen Ecosystem Development Centre in its role as the land transport regulator.

Ngāmotu New Plymouth presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel.

Healthy and safe people

Challenges and opportunities

The number of deaths and serious injuries on roads in Taranaki has been fairly consistent, fluctuating between 81 and 94 per year.¹⁹ Serious crashes in the region are focused:

- in and around Ngāmotu New Plymouth and Hāwera
- along SH3 that connects these two centres
- on high-risk rural roads.²⁰

Safety issues include:

- head-on and run-off road crashes
- high-risk intersections
- crashes involving vulnerable users, like people walking and cycling
- driver behaviour, like not wearing seatbelts.²¹

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated Action Plan 2020–2022, and regional safety strategies.²²

Significant investments to improve road safety are underway on SH3 between Waitara and Bell Block. Te Ara o Te Ata: Mt Messenger Bypass project will also mean people no longer need to use a dangerous section of road.

Taranaki has low rates of walking and cycling because of incomplete networks. These levels have declined substantially over recent decades. Lack of physical activity contributes to many health problems, like obesity and diabetes. These problems disproportionately impact some demographics. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²³


Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of the region. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements targeting high-risk intersections, run-off road crashes, and head-on crashes on high-risk rural roads
- rapidly rolling out a well-connected, separated cycling network through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.



Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

A high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Rural communities need access to key centres, such as Ngāmotu New Plymouth and Whanganui, for education, employment, and essential services. As the population of Taranaki ages, travel needs will change; there will be a greater need to access health services, and less need to access education and employment.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around smaller towns and rural communities, and improve access to services in Ngāmotu and Whanganui.


Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules to enable and encourage more people to live in areas with better existing access to social and economic opportunities
- improving public transport services, and expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Rural communities need access to key centres, such as Ngāmotu New Plymouth and Whanganui, for education, employment, and essential services.

Economic prosperity

Challenges and opportunities

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean significant change to the region's economy. Transport has a role to support this change. It must also be flexible to the evolving nature and direction of freight movement.

As the oil and gas centre of Aotearoa New Zealand, Taranaki is exploring alternative energy options in response to climate change.

Expanded forestry harvesting to 2030 will increase freight movements in the south and east of the region. Reliable and resilient interregional connections to the north and south will continue to be important.

With the sea to the north and challenging terrain to the west and south, most residential growth in Ngāmotu New Plymouth will be east of the city. This will put pressure on the transport system and create conflict points between local trips and convenience versus longer-distance journeys.

An increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Technological change will have significant impacts on demand for travel and on the economy of Taranaki. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.


Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling, in Ngāmotu New Plymouth and other regional towns
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections, and to key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness)
- supporting improved accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents
- completing investigations and improvements along SH3 and SH43 Forgotten World Highway, to strengthen connections from Taranaki to the rest of the country.



Reliable and resilient interregional connections to the north and south will continue to be important.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁴

Networks to the north and east of the region are expected to come under increased pressure from storm intensity combined with unstable terrain. Particularly significant risks along SH3 relate to rockfall, landslips, erosion, and flooding.

Te Ara o Te Ata: Mt Messenger Bypass along SH3 will remove a problematic, steep, narrow, and winding section of road at Mt Messenger. There are also a range of safety, resilience, and reliability issues being addressed through this corridor safety improvement project.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.


Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- understanding routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts – this includes identifying priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change.

Taranaki: Focusing our efforts

For efficient and effective progress, transport challenges in Taranaki must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Begin to reduce vehicle kilometres travelled (VKT), focusing on Ngāmotu New Plymouth, in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the north and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants dangerous to people's health.
- Actively support, enable, and encourage growth and development in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a multimodal freight system with greater use of rail and coastal shipping.
- Confirm how key resilience risks will be addressed over time, and work with communities to plan when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2019). 2018 census population and dwelling counts. stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts
4. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2022). Subnational population projections, by age and sex, 2013(base)-2043 update. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
10. Te Puni Kōkiri (2022). Find iwi by local authority. tkm.govt.nz/browse
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. <https://www.rbnz.govt.nz/hub/research/additional-research/te-ohanga-maori---the-maori-economy-2018>
12. Statistics New Zealand (2018). 2018 Census place summaries, Taranaki Region. <https://www.stats.govt.nz/tools/2018-census-place-summaries/taranaki-region>
13. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
14. Ministry of Transport (2020). Vehicle kms travelled (VKT). transport.govt.nz/statistics-and-insights/road-transport/sheet/vehicle-kms-travelled-vkt
15. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
16. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
18. Ministry of Transport (2019). *New Zealand household travel survey*. transport.govt.nz/mot-resources/household-travel-survey
19. Waka Kotahi NZ Transport Agency (2022). *Crash analysis system*. nzta.govt.nz/safety/partners/crash-analysis-system
20. Waka Kotahi NZ Transport Agency (2022). *Crash analysis system*. nzta.govt.nz/safety/partners/crash-analysis-system
21. Waka Kotahi NZ Transport Agency (2022). *Crash analysis system*. nzta.govt.nz/safety/partners/crash-analysis-system
22. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020-2030. transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
23. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696
24. Ministry for the Environment (2018). Climate change projections for the Taranaki region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-taranaki-region

Arataki

Regional direction
Manawatū–Whanganui
September 2023 v1.1

At a glance



The central location of Manawatū-Whanganui means its transport networks carry significant volumes of through-traffic, connecting people and freight south to Te Upoko o te Ika a Māui Greater Wellington, east to Te Matau-a-Māui Hawke’s Bay and north to Waikato and beyond.

Network resilience is an issue. Climate change is expected to bring more intense and frequent storms that will impact areas with unstable terrain north of Whanganui. The impacts of sea level rise will also increase for low-lying coastal communities.

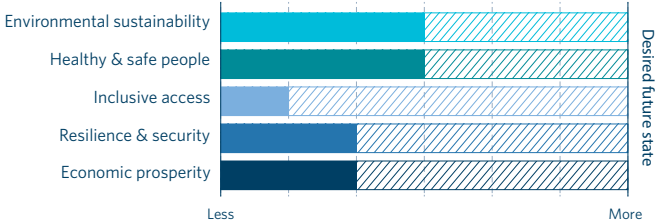
Te Papa-i-Oea Palmerston North is emerging as the primary distribution centre for the Lower North Island. The development of a high-tech rail hub in the northeast will allow rail to play a greater role in moving freight.

The population of Manawatū-Whanganui is expected to increase from 238,000 to more than 276,000 by 2048, or 2% of the population of Aotearoa New Zealand.¹ Most of this growth is expected in Te Papa-i-Oea, Aorangi Feilding, and Taitoko Levin.²

There is an opportunity to increase walking and cycling rates in Te Papa-i-Oea, Whanganui, Aorangi, and Taitoko, by investing in safe and attractive facilities. Active modes are the best way to reduce vehicle kilometres travelled, along with growing the amount of freight moved by rail and coastal shipping.

Other critical transport challenges facing the region over the next three decades include safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Manawatū-Whanganui



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

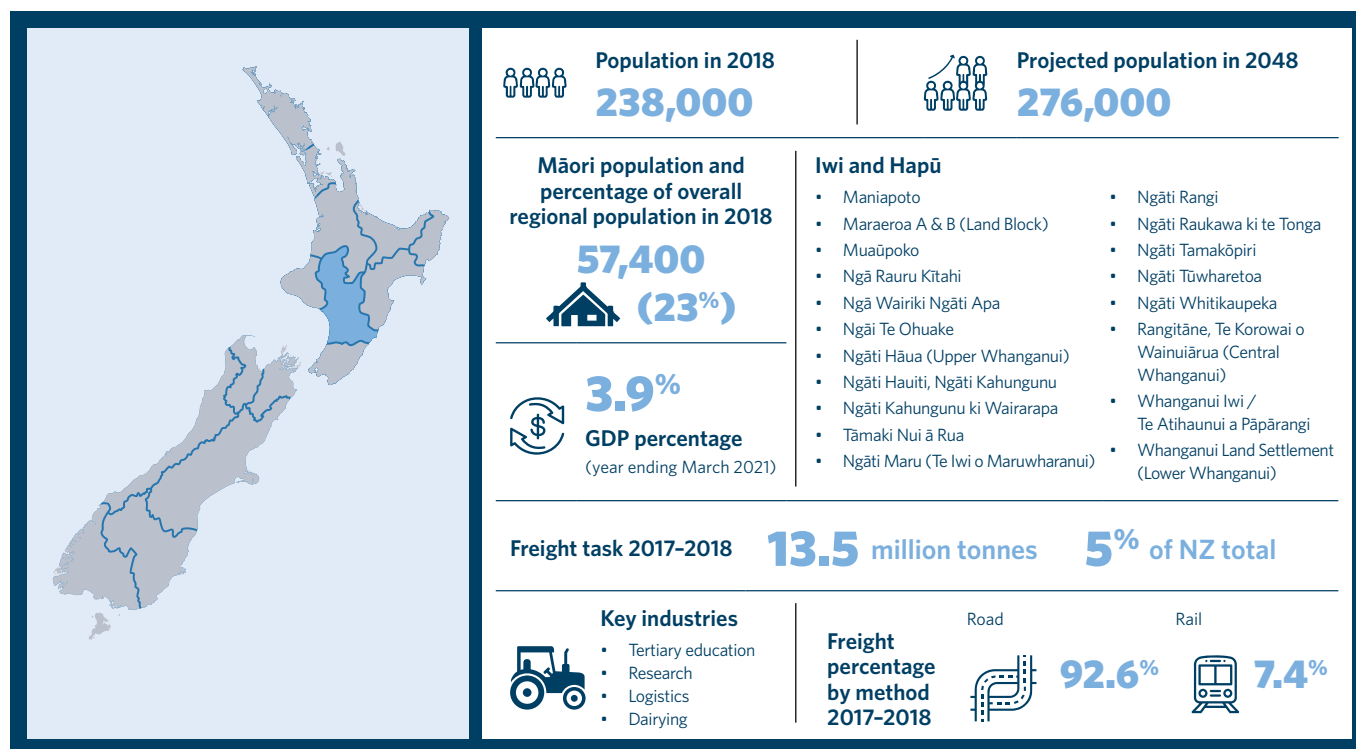
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context



Manawatū-Whanganui



With 238,000 residents, Manawatū-Whanganui is the sixth-most populated region in Aotearoa New Zealand.³ Its population is expected to grow to over 276,000 by 2048, or 2% of the country's population.⁴

The region's population is getting older, consistent with the national trend. The Horowhenua District, particularly Taitoko Levin, is actively positioning itself as a destination for retired residents. By 2043, 36% of the district's population is expected to be aged over 65.⁵ Enabling access for senior residents will be important to make sure they remain socially connected, active, and able to participate in their communities.

The region is located at the centre of the road and rail networks; these connect Te Matau-a-Māui Hawke's Bay, Te Upoko o te Ika a Māui Greater Wellington, Taranaki, and the Upper and Lower North Island. These connections are a key economic lifeline; they enable the movement of people and goods between key production centres, consumer markets, and freight distribution hubs. SH3 provides the main northern connection, linking Taranaki to Waikato and the Upper North Island, and a southern connection between Ngāmotu New Plymouth and Te Papa-i-Oea Palmerston North. SH3 is critical to the dairy industry, as it connects the dairy production centre in Hāwera to distribution centres in Te Papa-i-Oea.

Efforts to revitalise Whanganui Port could lead to increased movement of freight to and from the port by coastal shipping, rail, and road. The Capital Connection provides a weekday passenger rail service to Te Upoko o te Ika a Māui Greater Wellington, which could be improved in the future.

In 2018, 57,400 Māori lived in Manawatū-Whanganui, making up 23% of the region's population.⁶ This is almost 1.4 times the national rate of 16.5%.⁷ Most Māori live in Te Papa-i-Oea, where they make up 19% of the population.⁸

The iwi and hapū in the Manawatū-Whanganui region are Maniapoto, Maraeroa A & B (Land Block), Muaupoko, Ngā Rauru Kītahi, Ngā Wairiki Ngāti Apa, Ngāi Te Ohuake, Ngāti Hāua (Upper Whanganui), Ngāti Hauiti, Ngāti Kahungunu, Ngāti Kahungunu ki Wairarapa - Tāmaki Nui ā Rua, Ngāti Maru (Te Iwi o Maruwharanui), Ngāti Rangī, Ngāti Raukawa ki te Tonga, Ngāti Tamakōpiri, Ngāti Tūwharetoa, Ngāti Whitikaupeka, Rangitāne, Te Korowai o Wainuiārua (Central Whanganui), Whanganui Iwi / Te Atihaunui a Pāpārangi, and Whanganui Land Settlement (Lower Whanganui).⁹

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Te Tai Hauāuru rohe, that relates to the Taranaki and Manawatū-Whanganui regions. It notes the asset base in the rohe is valued at \$5.7 billion.¹⁰ The primary sector is important, followed by property.¹¹

Te Papa-i-Oea is the region's largest centre and provides a service hub supporting the surrounding areas. Tertiary education, research, logistics, and military activities are significant economic contributors. Outside of the main urban areas, primary production is the key economic driver with tourism critical to the Ruapehu District.

Only 17% of tourism spend comes from international visitors, the lowest of any region in Aotearoa.¹²

Redeployment of defence force personnel is expected to increase activity at the military bases in Ohakea and Linton. Te Papa-i-Oea is becoming the primary distribution centre in the Lower North Island; this has increased heavy vehicle traffic and raised safety and efficiency issues on the local road network.


The region has high unemployment rates and a low median household income.¹³

The freight task in Manawatū-Whanganui in 2017-2018 was 13.5 million tonnes, or around 5% of the country's total.¹⁴

A total of 92.6% of the freight task tonnage in Manawatū-Whanganui was moved by road and 7.4% by rail.¹⁵

Primary sector commodities produced in Manawatū-Whanganui, representing 5% of the country's total in 2017-2018, were:

- Aggregate – 1.9 million tonnes, or 5.2% of Aotearoa production
- Logs – 2.1 million tonnes or 6.5% of Aotearoa log harvest
- Meat – 150,000 tonnes or 12.5% of Aotearoa meat and meat products
- Milk – 1.3 billion litres or 6.2% of Aotearoa milk production
- Wool – 25,771 tonnes or 18.4% of Aotearoa wool production.¹⁶



Manawatū- Whanganui: Outlook

Over the next 30 years, the population of Manawatū-Whanganui is projected to grow 16%; this will be focused in Te Papa-i-Oea Palmerston North, Aorangi Feilding, and Taitoko Levin.

The economy of Manawatū-Whanganui must transform as Aotearoa New Zealand reduces emissions and becomes more sustainable. The most significant changes to the region's transport system will include:

- supporting economic transformation to lower emissions
- making significant improvements to safety and resilience
- encouraging higher rates of walking and cycling in the main urban areas.

The region's economic drivers, like primary production, are expected to remain relatively consistent to 2030. Employment in service industries is expected to grow in the larger urban centres from 2025 to 2030. The role of Te Papa-i-Oea as a distribution hub will grow.

Manawatū-Whanganui faces long-term challenges, such as high unemployment and low incomes.¹⁷ These factors, together with an ageing population and many residents on fixed incomes, are likely to put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services to residents.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’

approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

The transport carbon emissions per capita of Manawatū-Whanganui are above average, because of the large volumes of through traffic, particularly freight, using the region’s road networks.¹⁸

The region will need to make an important contribution to reducing transport emissions and light vehicle kilometres travelled (VKT), to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁹

As the main urban centre, Te Papa-i-Oea Palmerston North presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in a city with high levels of private vehicle use.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

Te Kunenga ki Pūrehuroa Massey University in Te Papa-i-Oea Palmerston North creates significant daily transport flows between the city and campus. Free bus services have helped increase public transport use. Journeys to work by foot or bike are above the national average at 11.4%.²⁰

We need to reduce freight transport carbon through:


- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and urban development that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions, activities, and investments are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- continuing to improve public transport services and exploring ways technology can deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas, to increase the use of public transport, walking, and cycling for trips to these locations
- identifying opportunities for smaller projects, including making the best use of the network, that can improve system outcomes
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the transport system on the local environment
- supporting key policies, like vehicle fleet transformation, to develop zero-emission transport solutions.



**Te Papa-i-Oea
Palmerston North
presents the greatest
opportunity to support
national emissions
reductions by providing
alternative transport
options and reducing the
need to travel.**

Healthy and safe people

Challenges and opportunities

The safety record of Manawatū-Whanganui is relatively poor. This is because of:

- head-on and run-off road crashes
- high-risk intersections
- driver behaviour.²¹

Focus is needed in the urban areas of Te Papa-i-Oea Palmerston North, Whanganui, and Taitoko Levin, and the state highways that link them.

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020-2030* and associated Action Plan 2020-2022, and regional safety strategies.²²

The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²³

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes, or step changes, to encourage walking and cycling in urban areas will help Manawatū-Whanganui. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- rapidly rolling out a well-connected, separated cycling network predominantly through reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- improving safety around high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads
- advocating for robust mobile network coverage in rural and regional areas.

Continuing to realise safety plans and supporting dramatic changes, or step changes, to encourage walking and cycling in urban areas will help Manawatū-Whanganui.

Inclusive access

Challenges and opportunities

The transport system in Manawatū-Whanganui struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

High reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Population growth in Te Papa-i-Oea Palmerston North, Aorangi Feilding, and Taitoko Levin will:

- increase travel demand on the region's networks
- provide opportunities to support increased use of public transport, walking, and cycling.

As the population of the region ages, travel needs will change. There will be a greater reliance on accessing health services, with a smaller proportion of the population needing to access education and employment.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. This can help people get around within smaller towns and rural communities, while also improving access to services in Te Papa-i-Oea and Whanganui.


Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower income households aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision making to encourage more people to live in areas with better existing access to social and economic opportunities
- improving public transport services, including the Capital Connection rail upgrades and on-demand services where appropriate
- exploring improvements to the affordability of public transport for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities, particularly in the districts of Horowhenua and Ruapehu
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced.

Economic prosperity

Challenges and opportunities

Manawatū-Whanganui has received substantial government investment to support regional development. These projects include:

- a cycle-walkway strategy
- a regional rail freight hub
- a farmer-driven programme to improve the cultural, environmental, social, and economic wellbeing of the Rangitikei district.

The revitalisation of the Whanganui Port area will contribute to the social, environmental, and economic wellbeing of the area. There is a need to secure existing uses for the port area and identify future ones; this includes upgrading Wharf One.

The region provides nationally significant freight and tourism connections. It will continue to support interregional connectivity, especially road and rail freight connections to key ports and hubs.

While international visitor numbers have dropped, most tourism revenue in Manawatū-Whanganui comes from domestic visitors.²⁴

An increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Technological change will have significant impacts on demand for travel and on the economy of Manawatū-Whanganui. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

KiwiRail has started design and land purchase for the Te Papa-i-Oea Palmerston North freight hub. This facility will support better integration of road and rail freight movements.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling in Te Papa-i-Oea, Whanganui, Aorangi Feilding and Taitoko Levin
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections and key freight and industrial hubs
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving their access and amenity (attractiveness) for local residents
- supporting improved accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents
- delivering safety upgrades on SH1 from Ōtaki to Taitoko, and along the southern portion of SH57
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- supporting freight improvements like interregional connectivity that is multimodal, efficient, and safe – this includes the Whanganui Port revitalisation, the KiwiRail freight hub in Te Papa-i-Oea, and the *Palmerston North Integrated Transport Improvements Business Case*
- supporting Te Ahu a Turanga: Manawatū-Tararua highway project
- completing and promoting walking and cycling trail plans, such as the *Tararua Tourism and Trails Strategy*, and a connected network of cycle and walking trails.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to already vulnerable road and rail networks. This is because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁵

For example, the Desert Road is vulnerable to snowfall and volcanic activity, as well as SH4 north of Whanganui. Flooding on SH2 at Mangatainoka and SH3 at Whangaehu is considered a significant risk and is expected to worsen with climate change.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

Te Ahu a Turanga - Manawatū Tararua Highway project is well underway, following a major slip in 2017 that left SH3 through the Manawatū Gorge impassable. This project will provide a safe and reliable connection to Te Matau a Māui Hawke's Bay. It will also reinstate SH4 north, between Whanganui and Raethi.

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- continuing work to better understand routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning.



Manawatū- Whanganui: Focusing our efforts

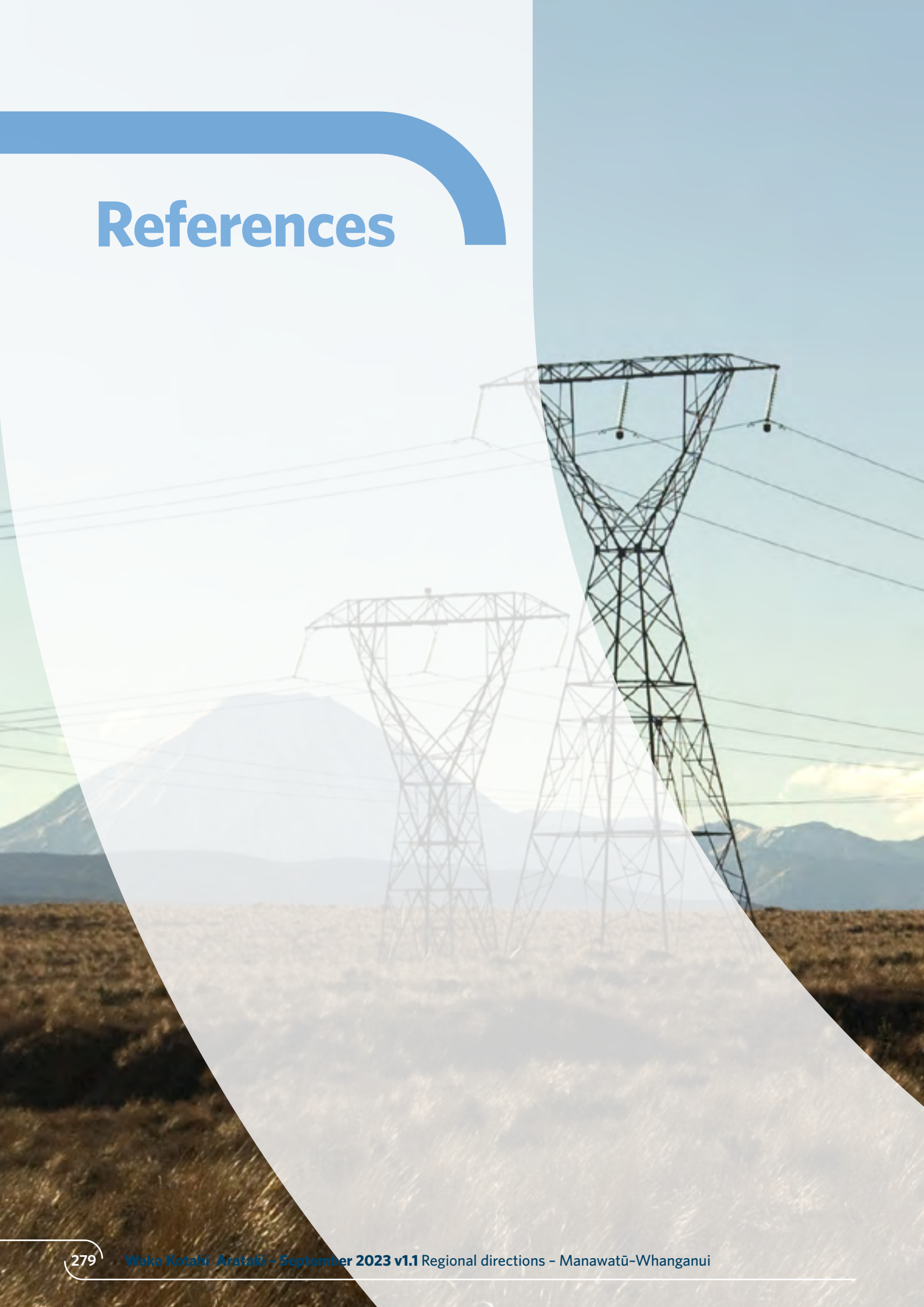
For efficient and effective progress, transport challenges in Manawatū-Whanganui must be tackled in a cohesive way.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Reduce vehicle kilometres travelled, focusing on Te Papa-i-Oea Palmerston North, in a way that's equitable and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the north and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Actively support, enable, and encourage growth and development in areas that already have good travel choices and shorter trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a multimodal freight system with greater use of rail and coastal shipping.
- Confirm how resilience risks will be addressed over time, and work with communities to plan when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2019). 2018 Census population and dwelling counts. stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts
4. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
10. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Ministry of Business, Innovation & Employment (2020). Annual tourism spend grouped by TA, region, country of origin and product category. www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-region-country-of-origin-and-product-category
13. Ministry of Business, Innovation & Employment (2022). Regional economic activity web tool, Manawatū-Wanganui. webrear.mbie.govt.nz/summary/manawatu-wanganui?accessedvia=manawatu-wanganui
14. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
15. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
16. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry of Business, Innovation & Employment (2022). Regional economic activity web tool, Manawatū-Wanganui. webrear.mbie.govt.nz/summary/manawatu-wanganui?accessedvia=manawatu-wanganui
18. Waka Kotahi, NZ Transport Agency (2022). Vehicle emissions mapping tool. nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-sustainability-in-our-operations/environmental-technical-areas/air-quality/vehicle-emissions-mapping-tool/
19. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
20. Ministry of Transport (2019). Household travel survey. www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/
21. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
22. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
23. Waka Kotahi, NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/

24. Ministry of Business, Innovation & Employment (2020). Annual tourism spend grouped by TA, region, country of origin and product category.
www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-region-country-of-origin-and-product-category/
25. Ministry for the Environment (2018). Climate change projections for the Manawatū-Whanganui region.
environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-manawatu-whanganui-region/

Arataki

Regional direction
Te Upoko o te Ika a Māui
– Greater Wellington
September 2023 v1.1

At a glance



Te Upoko o te Ika a Māui Greater Wellington is particularly vulnerable to seismic risk and other natural hazards. Sea level rise and more severe storms will increasingly impact on the region's coastal communities, roads, and rail infrastructure.

Future growth must build on high levels of public transport use, walking, and cycling to:

- create stronger communities
- connect people to employment, education, and essential services
- support lower-income communities in Porirua and Te Awa Kairangi Hutt Valley.

Despite many people using public transport, the region still must reduce private vehicle use and encourage lower-emission transport options. Programmes like Let's Get Wellington Moving (LGWM) will help with this shift.

Te Upoko o te Ika a Māui is the third largest regional economy in Aotearoa New Zealand. The region also has the highest median household income.¹ In the wider region though, there are still some areas of high deprivation.

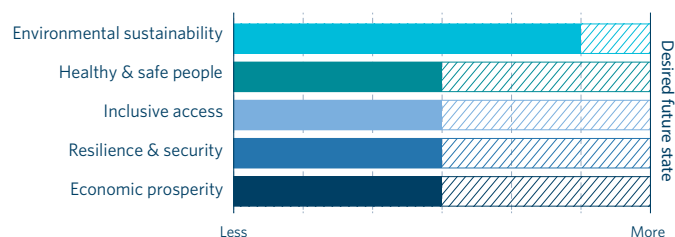
The population of Te Upoko o te Ika a Māui will grow from 525,900 to about 612,000 by 2048, or 10% of the country's population.²

Te Upoko o te Ika a Māui relies heavily on two north-south corridors, for the movement of people and freight by road and rail. This shapes the region's transport system. Current work is committed to addressing safety, resilience, and capacity issues.

Over 30% of all journeys to work are by public transport, walking, or cycling. Ongoing investment in safe and attractive facilities can help the region build on already high rates of walking and cycling. Active modes are the primary way to reduce vehicle kilometres travelled (VKT). Increasing the share of freight moved by rail and coastal shipping will also have an important role to play in reducing emissions.

Other critical transport challenges facing the region over the next three decades include safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Te Upoko o Te Ika a Māui – Greater Wellington



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

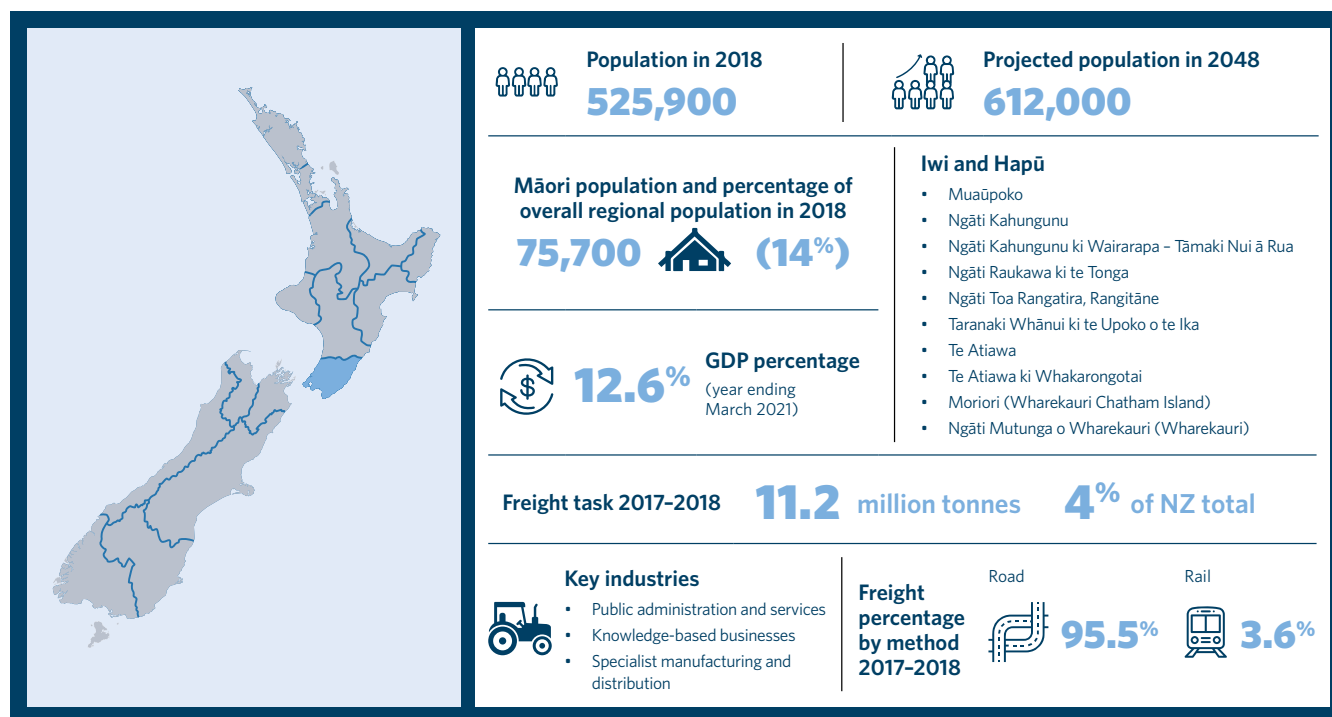
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context



Te Upoko o te Ika a Māui – Greater Wellington



The population of Te Upoko o te Ika a Māui Greater Wellington will grow from 525,900 to 612,000 by 2048, or 10% of the country's population.³ People aged over 65 made up 13% of this. However, while Te Whanganui-a-Tara Wellington has a fairly young population, areas like the Wairarapa and Kāpiti Coast have populations older than the national average.⁴

Recent growth has placed pressure on housing supply and rental affordability. In the future, the focus will need to be on concentration in existing urban centres where there will be high-frequency bus routes and Let's Get Wellington Moving's future mass rapid transit.

Immigration will be the most important factor in population growth, because of the country's ageing population and the narrowing gap between the number of births and deaths.⁵

Te Upoko o te Ika a Māui relies heavily on two north-south road and rail corridors for the movement of people and freight – one east to Horowhenua and the other west to the Wairarapa. Current work is underway to address safety, resilience, and capacity issues.

Te Aranui o Te Rangihaeata Transmission Gully section of SH1, opened March 2022, provides increased capacity and resilience along the northern corridor.

Te Upoko o te Ika a Māui is the northern port for road and rail trips between the North and South Islands, by the Cook Strait ferries. Access to CentrePort, and the safety and reliability of road and rail corridors north of Te Upoko o te Ika a Māui, are critical to supporting these journeys.

Wellington International Airport is the third busiest airport in Aotearoa New Zealand. It is a significant transport hub for many domestic flights, as well as international services.

In 2018, 75,700 Māori lived in Te Upoko o te Ika a Māui, making up 14% of the region's population; this is lower than the national rate of 16.5%⁶. Most Māori live in Te Awa Kairangi ki Tai Lower Hutt, where they make up 18% of the city's population.⁷

The iwi and hapū in Te Upoko o te Ika a Māui are Muaūpoko, Ngāti Kahungunu, Ngāti Kahungunu ki Wairarapa – Tāmaki Nui ā Rua, Ngāti Raukawa ki te Tonga, Ngāti Toa Rangatira, Rangitāne, Taranaki Whānui ki te Upoko o te Ika, Te Ātiawa, and Te Ātiawa ki Whakarongotai.⁸ Iwi in the Chatham Islands include Moriori and Ngāti Mutunga o Wharekauri.⁹

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Te Whanganui-a-Tara and Kurahaupō rohe, which relates to the Te Upoko o te Ika a Māui region. It notes the asset base in these rohe is valued at \$5.4 billion.¹⁰ Property is important, followed by public and professional services.¹¹

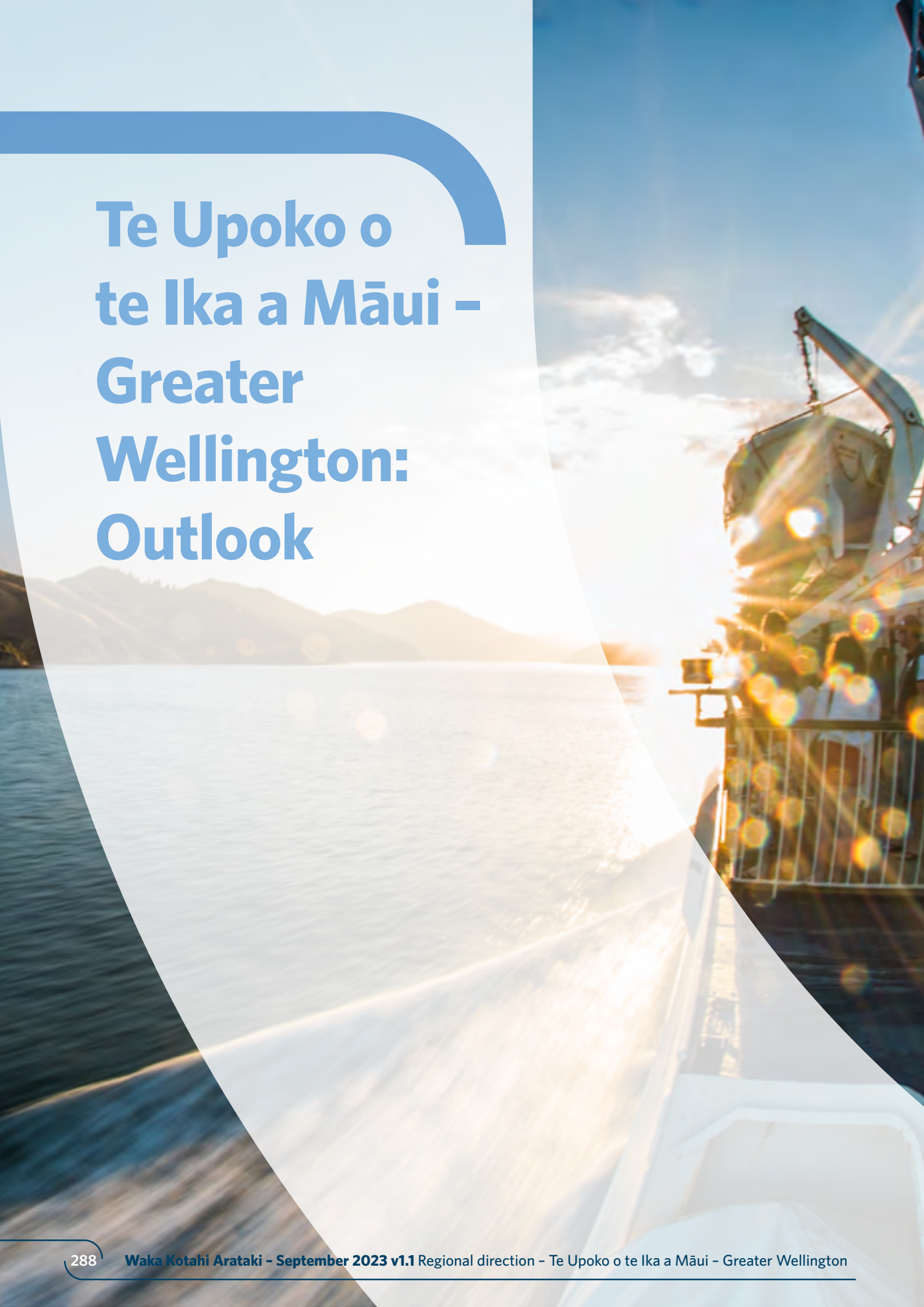
As home to our capital city, the regional economy is dominated by public administration and services, knowledge-based businesses, with a smaller amount (15%) of specialist manufacturing and distribution. Forty percent of the region's jobs are in the central business district of Te Whanganui-a-Tara.

With the third largest regional economy in Aotearoa, Te Upoko o te Ika a Māui also has the highest median household income.¹² Despite this, the wider region has areas of high deprivation, such as Cannons Creek in Pari-ā-Rua Porirua and Taitā in Te Awa Kairangi ki Tai. Unemployment rates in these areas are higher than the national average.¹³

The freight task in the region in 2017–2018 was 11.2 million tonnes, or around 4% of the Aotearoa total.¹⁴ A total of 95.5% of the freight task tonnage in the region was moved by road and 3.6% by rail.¹⁵

Primary sector commodities produced in Te Upoko o te Ika a Māui, representing 5% of the Aotearoa total in 2017–2018, are:

- Concrete – 710,000 tonnes, or 7.2% of the country's ready-mix concrete production.¹⁶
- Wool – 7,699 tonnes, or 5.5% of the country's wool production.¹⁷



Te Upoko o te Ika a Māui – Greater Wellington: Outlook

Te Upoko o te Ika a Māui Greater Wellington is the political hub of Aotearoa New Zealand.

The region's constrained topography means there are limited transport corridors creating a fragile transport network prone to disruption. The transport system needs to be safer, reduce carbon emissions, and support new ways of moving for future generations.

Population growth is putting pressure on the transport system, along with the need for housing. *The Wellington Regional Growth Framework* (WRGF) is a spatial plan that guides how the region should grow.¹⁸ It provides councils and iwi with an agreed regional direction for growth and investment. The plan addresses challenges such as:

- providing increased housing supply
- transitioning to a low carbon future
- improving resilience and multimodal access.

Implementation of the WRGF with our partners in the Wellington Regional Leadership Committee is a key focus. (Further discussion of the WRGF is in the Urban Wellington focus section).

The Let's Get Wellington Moving (LGWM) programme seeks to deliver a transport system with multiple ways to move more people, goods, and services reliably using fewer vehicles. While mass transit is a core element of the programme, there is also a focus on road space reallocation to support public transport, walking, and cycling to make the city a better place to live. Outcomes from this work, together with ongoing discussions about future port developments and light rail, will shape the region's future transport system.

Public services will continue to be a significant employment sector in the region. Service industries and health are expected to grow from 2025 to 2030. The further decline of manufacturing and wholesale trade may impact on employment opportunities in Pari-ā-Rua Porirua and Te Awa Kairangi Hutt Valley; this contributes to already high levels of deprivation in these local communities.

Te Whanganui-a-Tara Wellington is a major tourist destination, with one third of tourism income coming from international visitors. While international visitor numbers have dropped sharply and are forecast to remain below pre-COVID-19 levels for the foreseeable future, the impact on the economy of Te Whanganui-a-Tara has been offset by a rise in domestic tourism since 2020.¹⁹


The region will continue to play an important role in moving freight and people between the North and South Islands. Lowering freight transport emissions will also drive change in the transport system, by using lower-emitting fuels and increasing mode share for rail and coastal shipping

The *Emissions Reduction Plan* sets vehicle kilometres travelled (VKT) reduction targets for light vehicles.²⁰ As a main urban centre, Te Whanganui-a-Tara will require an increasing focus on:

- integrating land-use and transport to support mode shift
- reducing emissions.

During the next three decades, climate change will be one of the most significant drivers influencing the land transport system. Impacts, such as flooding, are expected in the low-lying areas of Te Awa Kairangi ki Tai Lower Hutt, Pito-one Petone, Te Awa-a-Tāia Kilbirnie, and the city centre of Te Whanganui-a-Tara.

The region will need to find ways to fund new infrastructure and services to keep pace with expected growth in Te Whanganui-a-Tara. High seismic risks also present funding challenges for some councils. Climate change will make this even harder and put pressure on the region's ability to maintain existing networks.



Population growth is putting pressure on the transport system, along with the need for housing.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Upoko o te Ika a Māui Greater Wellington has the fourth highest carbon emissions in Aotearoa New Zealand.²¹ This is despite the region having the highest public transport usage in Aotearoa, with over 30% of journeys to work by public transport, walking, or cycling.²² Customer satisfaction levels with public transport are relatively low because of capacity and reliability issues.

Te Upoko o te Ika a Māui will need to make an important contribution to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.²³ This includes a target to reduce total vehicle kilometres travelled (VKT) by our light vehicle fleet by 20% by 2035.

As the main urban centre, Te Upoko o te Ika a Māui presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require significant change to how people travel in a district focused on private car usage. Improving transport options and reducing traffic are not just important for meeting our climate commitments. They are vital for reducing congestion and making our transport system more safe, healthy, and inclusive for people of all ages and abilities.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

The delivery of Let’s Get Wellington Moving (LGWM) is expected to make a significant contribution to emissions reduction through:

- reduced VKT
- greater use of public transport
- higher density land use along the main transit corridors.

During the next decade, technological changes like mobility as a service, on-demand travel, and intelligent systems will:

- offer new travel choices
- reduce carbon emissions
- lessen reliance on private transport
- improve network management.

There will be increased demand to plan, book, and pay digitally for journeys. The growing popularity of online purchasing and home delivery will impact on-demand travel, including the movement of freight.

We need to reduce freight transport carbon through:

- using lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

There will be increased demand to plan, book, and pay digitally for journeys. The growing popularity of online purchasing and home delivery will impact on-demand travel.

Making progress

As a main urban centre, Te Upoko o te Ika a Māui Greater Wellington will need to do much of the heavy lifting for the region to contribute towards national vehicle kilometres travelled (VKT) reduction. This work will inform future planning and investment decision-making.

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and urban development that supports compact, mixed-use urban form to reduce trip length and car dependency
- focusing new housing in areas that don't need new infrastructure, through the *Wellington Regional Growth Framework* (WGRF)
- planning what interventions, activities, and investments are needed to achieve VKT and emissions reduction
- changing the allocation of space on existing roads and streets to allow and increase mode shift to public transport, walking, and cycling
- improving public transport service quality and reliability
- exploring opportunities to use technology to deliver better public transport services at a lower cost
- influencing growth through the WGRF to make future greenfield development (development of undeveloped areas) is integrated with public transport and active mode networks to create medium-density residential areas
- working with Kāinga Ora on proposals for the Specified Development Project in the Northern Growth Area to make sure development helps to reduce VKT, and supports public transport and active modes
- shifting more people from private vehicles to lower-emission travel options through the delivery of the LGWM programme
- getting more from the region's existing transport system, by making the most of existing networks, services, and demand management
- delivering the urban cycleway programme across the region
- working with councils to manage car parking in the city centre, city fringe area, and other key centres to increase use of public transport, walking and cycling.

Healthy and safe people

Challenges and opportunities

A focus on safety is needed throughout Te Upoko o te Ika a Māui Greater Wellington. Efforts should address:

- high-risk motorcycle routes
- speed on rural roads
- harm to vulnerable users, such as cyclists and pedestrians, in the urban areas of Te Whanganui-a-Tara Wellington.²⁴

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030*, associated *Action Plan 2020–2022*, plus regional safety strategies.²⁵

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe and attractive walking and cycling facilities will encourage even more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users, like people cycling or walking, will

- encourage more people to travel by active modes
- deliver important health, access, and sustainability benefits.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Te Upoko o te Ika a Māui Greater Wellington. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety interventions that target high-risk intersections and high-risk, large-volume urban roads
- rapidly rolling out a well-connected, separated cycling network, largely through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.



Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Te Upoko o te Ika a Māui.

Inclusive access

Challenges and opportunities

Lower socio-economic communities in Pari-ā-Rua Porirua and Te Awa Kairangi ki Tai Lower Hutt have high levels of deprivation and unemployment rates that are above the national average.²⁶ These areas need well-planned land-use and transport changes to improve access to education, employment, and essential services.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These shuttles could help people get around urban areas, smaller towns, and rural communities.

Improved access to high quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved and car dependency reduced. However, there may be challenging trade-offs to consider over time, such as balancing increased travel costs to reduce emissions while ensuring lower income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision-making to encourage people to live in areas with better access to social and economic opportunities
- improving public transport services, including on-demand services where appropriate
- exploring opportunities to improve public transport affordability
- expanding and improving walking and cycling facilities, so these low-cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- supporting mobile or digital delivery of essential services.



Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These shuttles could help people get around urban areas, smaller towns, and rural communities.

Economic prosperity

Challenges and opportunities

The *Wellington Regional Growth Framework* provides a 30-year plan to identify development opportunities and transport investment priorities for Te Upoko o te Ika a Māui Greater Wellington, including Horowhenua.²⁷ It has been developed in partnership with central government, local government, and iwi.

In addition, several of the larger councils have already completed, or are developing, growth strategies for their districts, for example Pari-ā-Rua Porirua and Te Whanganui-a-Tara Wellington. Regeneration in the eastern parts of Pari-ā-Rua offers an opportunity to improve the urban design and transport system to achieve a range of outcomes, improve travel options, and boost the local community.

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean significant change to the region's economy. Transport has a role to support this change. It must also be flexible to the evolving nature and direction of freight movement. Reliable and resilient interregional connections to the north and to the South Island, through Cook Strait, will continue to be important.

Technological change will have significant impacts on demand for travel and on the economy of Te Upoko o te Ika a Māui. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Reliable and resilient interregional connections to the north and to the South Island, through Cook Strait, will continue to be important.

Making progress

Economic productivity and business competitiveness in Te Upoko o te Ika a Māui Greater Wellington can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- supporting the iRex Project to improve the journey between Te Whanganui-a-Tara Wellington and Waitohi Picton, through Cook Strait
- supporting the Let's Get Wellington Moving (LGWM) joint initiative between Te Kaunihera o Pōneke Wellington City Council, Te Pane Matua Taiao Greater Wellington Regional Council, and Waka Kotahi
- working with Kāinga Ora on the Pari-ā-Rua Northern Growth Area (NGA) potential Specified Developmental Project (SDP) to support local economic growth through access improvements for deprived communities
- making sure the transport system is maintained to an appropriate level of service with minimal disruptions
- improving access to social and economic opportunities, especially by walking and cycling
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections and key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting development of key economic centres by improving access and convenience while reducing carbon emissions and vehicle kilometres travelled.²⁸

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁹ Impacts of climate change, such as flooding, are expected to impact the low-lying areas of Te Awa Kairangi ki Tai Lower Hutt, Pito-one Petone, Te Awa-a-Tāia Kilbirnie, and Te Whanganui-a-Tara Wellington.

Te Upoko o te Ika a Māui Greater Wellington has significant seismic risks made worse by the reliance on a limited number of key road and rail corridors to connect communities and key destinations.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

To improve resilience in Te Upoko o te Ika a Māui Greater Wellington, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in a highly complex urban environment, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- understanding routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- supporting the Wellington Lifelines Regional Resilience Project to improve community resilience such as critical transport and lifeline infrastructure
- engaging in local planning processes to avoid infrastructure and development in areas at increased risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity.

Urban Wellington focus

A growing city and national capital

For the purposes of *Arataki*, 'urban Wellington' is defined using the Wellington Regional Growth Framework (WRGF); this includes the eight councils of the region, plus southern Horowhenua including Taitoko Levin.³⁰

The urban areas of Te Upoko o te Ika a Māui Greater Wellington are projected to grow by about 86,000 people (16%) by 2048.³¹ The WRGF outlines how the region can accommodate an additional 200,000 people and 100,000 jobs in the next 30 years.

Public administration and services, and knowledge-based businesses dominate the economy. Te Whanganui-a-Tara Wellington city centre will continue to be the region's primary employment centre. Increasing employment is expected in Pari-ā-Rua Porirua, Te Awa Kairangi ki Tai Lower Hutt, Te Awa Kairangi ki Uta Upper Hutt, Paraparaumu, Taitoko, Whakaoriori Masterton, and other smaller local centres. This will increase urban vibrancy, improve equity and access to opportunities, and reduce long distance private vehicle trips.

The geographic layout and urban form of Te Upoko o te Ika a Māui creates a unique set of transport challenges and opportunities. A high reliance on two north-south road and rail corridors creates several capacity and resilience challenges. It concentrates travel demand in corridors well served by public transport. However, new growth will increasingly happen at the edges of the urban area, which is a long distance from employment, social, and economic opportunities. Similarly, the high concentration of jobs and economic activity in central Te Whanganui-a-Tara Wellington, and the highly constrained nature of the city centre's transport system, creates conflicts between travel choice and goals for the central area. It also plays a major role in Te Whanganui-a-Tara as the country's least car dependent city, with 30% of all journeys to work made by public transport, walking, or cycling.

The Wellington Regional Growth Framework

The Wellington Regional Growth Framework (WRGF), developed in 2019–2020 by central and local government and iwi, provides a 30-year plan about development opportunities and transport investment priorities for Te Upoko o te Ika a Māui Greater Wellington, including Horowhenua.


The WRGF allows a range of future growth paths that could have different transport and emission outcomes. A high degree of regional coordination and cooperation is needed to direct growth to areas for better outcomes, including limiting growth in undesirable locations.

The WRGF aims for concentration within existing urban centres, with a focus on:

- high-quality rapid transit (rail)
- high-frequency bus routes
- future mass rapid transit (delivered through Let's Get Wellington Moving LGWM).

The WRGF plan estimates that about 25% of growth will be in Te Upoko o te Ika a Māui, one-third along the eastern corridor from Te Awa Kairangi ki Tai Lower Hutt to Whakaoriori Masterton, and the remainder in the western corridor from Tawa to Taitoko Levin. Growth scenarios developed by LGWM highlight significant benefits from a greater proportion of growth occurring in Te Whanganui-a-Tara, especially in the future rapid transit corridor from the city centre to Taputeranga Island Bay.

To realise the WRGF and National Policy Statement on Urban Development (NPS-UD), individual councils are planning urban growth and considering the nature of concentration along rapid transit corridors and potential greenfield sites (development of undeveloped areas).³²



The urban areas of Te Upoko o te Ika a Māui are projected to grow by about 86,000 people (16%) by 2048.

Let's Get Wellington Moving (LGWM)

LGWM is a partnership between Waka Kotahi, Te Pane Matua Taiao Greater Wellington Regional Council, and Te Kaunihera o Pōneke Wellington City Council. In recent years, LGWM has looked at how to improve the transport system between Ngauranga Gorge and Wellington International Airport. LGWM aims to provide better travel choices to help reduce carbon emissions, by making Te Upoko o te Ika a Māui Greater Wellington more compact and sustainable through moving more people in fewer vehicles.

The LGWM programme includes:

- better walking facilities
- connected cycleways
- high-quality mass rapid transit
- more reliable buses
- improvements at the Basin Reserve
- a second Mount Victoria Tunnel.

These improvements go hand-in-hand with planning and urban development changes. LGWM is a large and complex plan with three broad phases:

1. A short-term, three-year programme.
2. A city-streets package that focuses on improving safety and getting more out of existing streets.
3. A long-term programme involving significant investments in rapid transit and the addressing key bottlenecks at Basin Reserve and Mount Victoria.

Key challenges

Climate change and transport resilience

A well-developed rail system and completion of large sections of the Wellington Northern Corridor project mean large parts of urban Wellington are well served by strategic transport networks. However, significant investment is needed over time to address maintenance and capacity issues with the rail network. Key safety and resilience issues remain, such as undeveloped active travel networks and high reliance on a small number of transport corridors with few alternative routes. These vulnerabilities, alongside the region's high seismic risk and more extreme weather events, means transport system resilience is an ongoing challenge.

Climate change

Larger urban areas, like Te Whanganui-a-Tara Wellington, provide the greatest opportunity to reduce transport emissions. Reducing traffic will also mean:

- significant health and safety benefits
- less congestion
- better places to live.

These benefits will be particularly significant in urban Wellington, given its highly constrained form.

The region's urban form and well-developed public transport networks mean it's well-placed to lead the way and demonstrate how emissions reduction can be achieved.

A wider variety of available actions are needed to reduce traffic volumes in Te Whanganui-a-Tara, including:

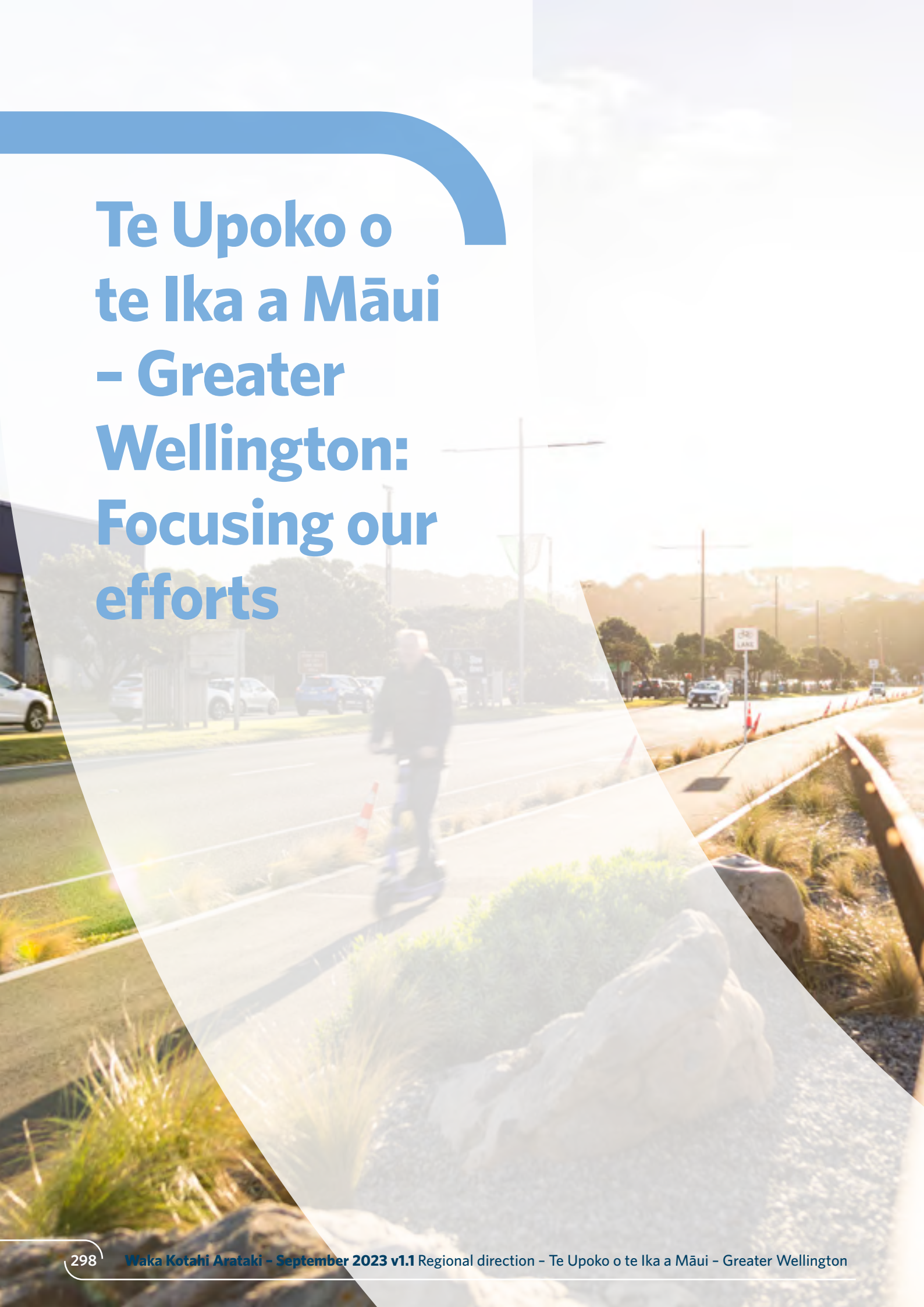
- improving urban form
- offering better transport options
- managing demand for travel by cars.

Planning to reduce vehicle kilometres travelled will confirm what actions and at what scale is needed to meet emissions reduction goals. Waka Kotahi will partner with local government, iwi, and community representatives to develop this work.

Housing and urban development

In recent years, housing supply across urban Wellington has not kept up with population growth and has led to rising costs. Over the next 30 years, the city must focus on increasing housing supply and improving housing affordability in a way that also contributes to other key outcomes, like emission reduction.

Decisions need to be made about how the region will grow, especially along the planned rapid transit corridor that forms part of LGWM. LGWM confirmed the potential benefits of a more compact urban form with a greater share of growth in this corridor. Significant and proactive effort is needed to realise this.

The background image shows a person on a skateboard riding down a paved road. The scene is captured from a low angle, with the skateboarder in the center. The road is flanked by greenery and a metal guardrail on the right. In the background, there are parked cars, a 'BIKE LANE' sign, and hills under a bright sky. A large blue curved graphic element is positioned in the upper left corner, partially overlapping the text.

Te Upoko o te Ika a Māui – Greater Wellington: Focusing our efforts

The transport challenges for Te Upoko o te Ika a Māui Greater Wellington need to be tackled in a cohesive way for efficient and effective progress. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Reduce vehicle kilometres travelled (VKT), focusing on Te Whanganui-a-Tara Wellington, in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional road and rail connections, especially north to the rest of the North Island and passenger/freight ferry connections to the South Island.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce harm caused by the region's transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Actively support, enable, and encourage growth and development in areas that have good travel choices and shorter trip lengths.
- Rapidly accelerate delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities, especially in areas with fewer sustainable transport choices.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore moving to a more multimodal freight system with greater use of rail.
- Confirm how resilience risks will be addressed over time, and work with communities to plan when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Household income and housing-cost statistics: Year ended June 2020 – corrected. stats.govt.nz/information-releases/household-income-and-housing-cost-statistics-year-ended-june-2020
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2019). 2018 Census population and dwelling counts. stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. <https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048>
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
9. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
10. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Ministry of Business, Innovation and Employment (2019). MBIE household income estimates. Regional economic activity web tool: Median household income in New Zealand. webrear.mbie.govt.nz/theme/household-income-median/map/timeseries/2018/newzealand?right-transform=absolute
13. The University of Auckland (2018). New Zealand index of multiple deprivation (IMD). <https://hgd.auckland.ac.nz/imd18/>
14. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
15. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
16. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
17. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
18. Wellington Regional Growth Framework (2022). Wellington regional growth framework. wrgf.co.nz
19. Ministry of Business, Innovation and Employment (2020). Annual tourism spend grouped by TA, region, country of origin and product category. www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-region-country-of-origin-and-product-category
20. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
21. Waka Kotahi NZ Transport Agency (2022). Vehicle emissions mapping tool. nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/air-quality-climate/planning-and-assessment/vehicle-emissions-mapping-tool
22. Ministry of Transport (2019). Household travel survey. www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/
23. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
24. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
25. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf

26. Statistics New Zealand (2019). 2018 Census population and dwelling counts. stats.govt.nz/information-releases/2018-census-population-and-dwelling-counts
27. Wellington Regional Growth Framework (2022). Wellington regional growth framework. wrgf.co.nz
28. Let's Get Wellington Moving (2022). Golden Mile revitalisation. lgwm.nz/all-projects/golden-mile-improvements/?gclid=EAlaIQobChMlv-n95vma-QIVWJImAh13bwF-EAAYASAAEgLMvfD_BwE
29. Ministry for the Environment (2018). Climate change projections for the Wellington and Wairarapa region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-wellington-wairarapa-region
30. Wellington Regional Growth Framework (2022). Wellington regional growth framework. wrgf.co.nz
31. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
32. Ministry of Housing and Urban Development (2021). National policy statement on urban development. www.hud.govt.nz/urban-development/national-policy-statement-on-urban-development/

Arataki

Regional direction
Te Taihū – Top of the South
September 2023 v1.1

At a glance



Te Taihū Top of the South covers the prosperous regions of Te Tai o Aorere Tasman, Whakatū Nelson, and Te Taihū-o-te-Waka-a Māui Marlborough. The population of the three regions will grow from 155,400 to about 175,000 by 2048, or 3% of the country's population.¹ The region is ageing faster than the national average.²

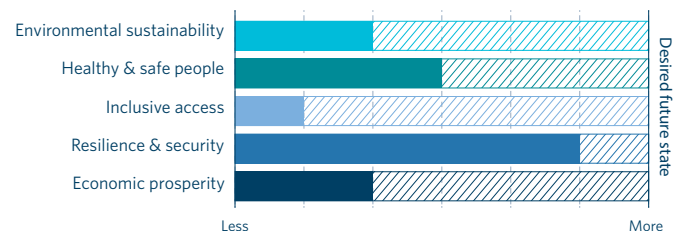
The urban area of Whakatū has the highest share of people walking and cycling in Aotearoa New Zealand. Public transport use in the area has doubled in the past five years. A high proportion of journeys to work in the region are by private vehicles with a limited number of bus services available for work travel in Waiharakeke Blenheim.

Road and rail links down the East Coast are critical for the movement of freight and tourism between Waitohi Picton and Ōtautahi Christchurch. The ports in Whakatū and Waitohi play an important role in getting the regions' goods to market.

The coastal communities and transport networks of Te Taihū are expected to be continually impacted by more frequent and severe weather patterns, particularly in coastal and hilly areas. Seismic risks associated with the Alpine, Waimea, and Wairau Faults are also significant.

During the next three decades, the other critical transport challenges facing the Te Taihū are safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Te Taihū – Top of the South



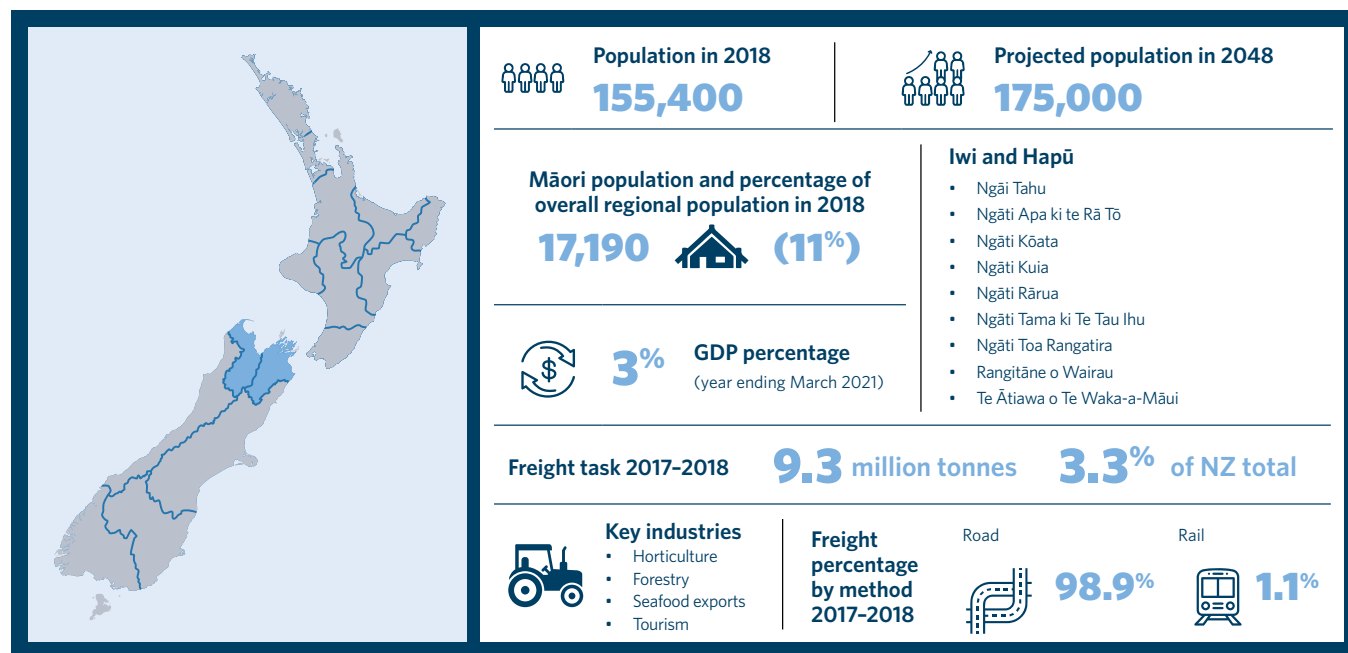
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicates where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system levels metrics. Further details are captured in the methodology document.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context

Te Taihu - Top of the South



The population of Te Taihu Top of the South region (which includes Whakatū Nelson, Te Tai o Aorere Tasman, and Te Taihu-o-te-Waka-a Māui Marlborough) will grow from 155,400 to about 175,000 by 2048, or 3% of the country's population.³ The Whakatū urban area (Whakatū to Waimea Richmond) is home to about 70,000 residents. This area straddles the border of the Whakatū and Te Tai o Aorere regions, and will see most of the region's growth.

Recent residential growth in Whakatū has been accommodated in areas to the west and south of Waimea and concentrated in existing residential areas. Most commercial growth is expected in Waimea.

The second largest township of the region, Waiharakeke Blenheim, has a population of just over 31,000.⁴

The population of Te Taihu is ageing faster than the national average. By 2048, those aged 65 years and over will make up 34% of the region's total, compared to 23% nationally.⁵ A greater range of transport options will be needed, supported by new technologies, to ensure all ages have good access to essential services and recreational activities.

The South Island's main trunk line and SH1 provide the key connections for freight and tourism between the ports in Waitohi Picton and Ōtautahi Christchurch. The two transport corridors in Kaikōura are located between high mountain ranges and the sea. Although both corridors re-opened following a major earthquake in 2016, ongoing disruption is expected from landslips, rockfall, and flooding from coastal storms. Network resilience is becoming a significant issue across Te Taihu, with more frequent disruptions and costly repairs from significant weather events.

Other key connections are the state highway links between:

- Waimea and Motueka
- Whakatū and Waiharakeke
- SH6 to Te Tai o Poutini West Coast.

The ports in Whakatū and Te Taihu-o-te-Waka-a Māui (Waitohi) play an important role in getting the region's goods to market. The majority of the land-based freight travels by road, as rail opportunities are limited to the South Island main trunk line.

The urban link between Waimea and Whakatū has been identified as a key connection to access employment, goods, and services. The Whakatū urban area transport system is under growing strain because of:

- population growth and the related demands for improved accessibility
- increased freight movements.

In 2018, 17,190 Māori lived in Te Taihū, making up 11% of the region's population.⁶ This is lower than the national rate of 16.5%.⁷ Most Māori live in Te Taihū-o-te-Waka-a Māui, where they make up 14% of the district's population.⁸

The iwi and hapū in Te Taihū region are Ngāi Tahu, Ngāti Apa ki te Rā Tō, Ngāti Kōata, Ngāti Kuia, Ngāti Rārua, Ngāti Tama ki te Tau Ihu, Ngāti Toa Rangatira, Rangitāne o Wairau, and Te Ātiawa o Te Waka-a-Māui.⁹

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Te Tau Ihu rohe, which relates to Te Taihū region. It notes that the asset base in these rohe is valued at \$1.3 billion.¹⁰ Property is noticeably important.¹¹

The economies and communities of the three areas of Te Taihū are highly interdependent. The Whakatū central business district is the main commercial centre across the region. The Whakatū and Te Tai o Aorere economies focus on horticulture, forestry, pastoral farming, tourism, and seafood exports – Whakatū is the largest fishing port in Australasia.

The district of Te Taihū-o-te-Waka-a Māui is the largest grape growing region in Aotearoa New Zealand. Viticulture generates high vehicle movements because of the number of workers and visitors. Forestry harvests across the area are expected to increase transport demand.

The area attracts strong tourism and is the gateway to three national parks. Development of the Waimea Community Dam will boost regional productivity and freight demand. The planned Picton Ferry Terminal upgrade will improve rail services by expanding the docks and upgrading the passenger terminal.

The freight task in Te Taihū (Te Tai o Aorere, Te Taihū-o-te-Waka-a Māui, and Whakatū) in 2017–2018 was 9.3 million tonnes, or around 3.3% of the country's total.¹² A total of 98.9% of the freight task tonnage in Te Taihū was moved by road and 1.1% by rail.¹³

Primary sector commodities produced in Te Taihū, representing 5% of more of the country's total in 2017–18 were:

- Horticulture – 463,000 tonnes, or 16.8% of the country's horticultural production
- Logs – 3.3 million tonnes, or 10% of the country's log harvest.¹⁴

Te Taihu – Top of the South: Outlook

While the population of Te Taihū Top of the South is projected to grow 13% during the next 30 years, its economy will likely transform considerably as Aotearoa New Zealand transitions to a low-carbon future.

Over the next three decades, key changes to Te Taihū are:

- supporting the country's economic transformation
- making improvements to safety and resilience
- achieving higher rates of walking and cycling.

The ageing population and higher proportion of residents on fixed incomes is likely to put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services.

Climate change will make this even harder.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Taihū will need to make an important contribution to reducing carbon emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁵

As the main urban centre, Whakatū Nelson-Waimea Richmond presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in cities with high levels of private vehicle use. This will require an increased focus on:

- effective integration of land-use and the transport system to support mode shift
- reductions in emissions.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

The challenge to achieve the required VKT reduction across each area will vary between regions. In Waiharakeke Blenheim, a high proportion of journeys to work are by private vehicle, with a limited number of bus services available.

The Whakatū urban area has the highest share of people walking and cycling in the country. Public transport use has doubled in the past five years. However, further mode shift is hindered by busy arterial routes that sever, or disconnect, communities. This reduces the attractiveness of active modes and leads to public transport delays.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- encouraging growth and development that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- planning what interventions, activities, and investments are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- continuing to improve public transport services and exploring ways technology can deliver better services at lower costs
- identifying opportunities for smaller projects that can improve system outcomes, like getting the most from the existing network
- ensuring appropriate standards, policies, and regulations are put in place to reduce the impact of the transport system on the local environment
- supporting implementation of key policies such as vehicle fleet transformation.

Whakatū Nelson-Waimea Richmond presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel.

Healthy and safe people

Challenges and opportunities

Te Taihū Top of the South has a relatively poor road safety record with issues including:

- high-risk intersections
- run-off road crashes
- vulnerable users, like harm to people cycling or walking
- high-risk urban and rural roads
- speeding.¹⁶

A focus on safety is needed on:

- the urban areas of Whakatū Nelson and Waiharakeke Blenheim
- high-risk rural roads.

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated *Action Plan 2020–2022*, and regional safety strategies.¹⁷

While the Whakatū urban area has high numbers of people walking, cycling, and using public transport, the other areas of Te Taihū should look at developing networks to boost walking and cycling rates.

The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.¹⁸

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes, or step changes, to encourage walking and cycling will help the urban areas of the region. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements targeting the urban areas of Whakatū Nelson and Waiharakeke Blenheim, high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads – this includes a critical focus on SH6 between Waiharakeke and Whakatū, and SH1 south of Waiharakeke
- rapidly rolling out a well-connected, separated cycling network through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

A high reliance on private vehicles outside of the urban area of Whakatū Nelson creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Rural communities need access to key centres, such as Whakatū and Waiharakeke Blenheim, for education, employment, and essential services. As the population of Te Taihu Top of the South ages, travel needs will change; there will be a greater need to access health services, and less need to access education and employment.

An ageing population means a wider range of accessible options are required, including:

- room for mobility scooters
- a wider range of walking and cycling facilities.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around within smaller towns and rural communities, and improve access to services.


Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules to enable and encourage more people to live in areas with better existing access to social and economic opportunities
- investing in public transport in the Whakatū Nelson urban area to improve services both within and between Whakatū and Waimea Richmond
- improving public transport services, and expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Rural communities need access to key centres, such as Whakatū Nelson and Waiharakeke Blenheim, for education, employment, and essential services.

Economic prosperity

Challenges and opportunities

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean significant change to the region's economy. Transport has a role to support this change. It must also be flexible to the evolving nature and direction of freight movement.

Freight movements will increase across the region following:

- development of the Waimea Community Dam
- the Picton Ferry Terminal upgrade with expanded dock facilities.


Reliable and resilient interregional connections to the North Island, through Cook Strait, and to the east and west coasts will continue to be important.

An ageing population and increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Technological change will have significant impacts on demand for travel and on the economy of Te Taihū Top of the South. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.



Reliable and resilient interregional connections to the North Island, through Cook Strait, and to the east and west coasts will continue to be important.

Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

We will focus on progressing the Nelson Future Access Project through a detailed business case and supporting the Richmond Network Operating Framework.¹⁹

The Nelson Future Access Project will look at:

- the corridors of Rocks Road and Waimea Road
- access across all transport options to get people and freight in and out of Whakatū Nelson in a safe and efficient way.

The business case will also seek to better link the land transport network with Port Nelson, to ensure there are safe and accessible walking and cycling facilities, and consider public transport improvements.

The completion of the Ōpaoa River Bridge (SH1, Waiharakeke Blenheim) has provided better access for high productivity motor vehicles (HPMVs) travelling from Waitohi Picton to Ōtautahi Christchurch, as well as improved walking and cycling facilities.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling, in Whakatū and other regional towns
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections, and to key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness)
- improving accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents
- considering further extension of the Whakatū cycleway network and completing a key link between Annesbrook and the beach at Tāhunanui.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²⁰

Te Tai o Aorere Tasman, along with Waitaha Canterbury and Ōtākou Otago, has the highest estimated value of roading infrastructure that will be exposed to the risk of sea level rise.²¹ Climate change will place even greater pressure on these areas' ability to maintain networks and fund new infrastructure and services.

Erosion is already a key risk along the Buller Gorge. Frequent rockfall on the SH6 stretch between intersections with SH65 and SH63 (Murchison to St Arnaud) are considered a high priority for the region. Seismic risk associated with the Alpine Fault is also significant across the South Island.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the popularity of e-bikes and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.


Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

For the transport system of Te Taihu Top of the South, the key to resilience will be an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- continuing work to better understand routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts – this includes identifying priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change, for example Atawhai, Tāhunanui Beach, Māpua, Tākaka, Tākaka Hill, Mārahau, Brooklyn, Riwaka, Motueka, Ruby Bay, and The Wood
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



Te Tai o Aorere Tasman, along with Waitaha Canterbury and Ōtākou Otago, has the highest estimated value of roading infrastructure that will be exposed to the risk of sea level rise.



Te Taihū – Top of the South: Focusing our efforts

For efficient and effective progress, transport challenges in Te Taihū Top of the South must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Apply a multi-outcome approach to the delivery of programmes and planning. This includes principles such as fairness, equity, safety, and light vehicle kilometre reduction.
- Begin to reduce vehicle kilometres travelled (VKT) in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the North Island and to the west and east coasts.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants that are dangerous to people's health.
- Actively support, enable, and encourage growth and development in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Confirm how key resilience risks will be addressed over time, and work with communities to identify plans for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2022). Subnational population projections, by age and sex, 2013(base)–2043 update. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Te Puni Kōkiri (2022). Find iwi by local authority. tkm.govt.nz/browse
10. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
13. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
14. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
15. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
16. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
17. Ministry of Transport (2019). Road to zero – New Zealand's road safety strategy 2020–2030. transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
18. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
19. Waka Kotahi NZ Transport Agency (2021). Nelson future access detailed business case. nzta.govt.nz/assets/projects/nelson-future-access-project/nelson-future-access-project-detailed-business-case-summary-oct-2021.pdf
20. Ministry for the Environment (2018). Climate change projections for the Nelson-Tasman and Marlborough regions. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region
21. NIWA (2015). National and regional risk exposure in low-lying coastal areas. <https://ref.coastalrestorationtrust.org.nz/documents/national-and-regional-risk-exposure-in-low-lying-coastal-areas/>

Arataki

Regional direction
Te Tai o Poutini – West Coast
September 2023 v1.1

At a glance

Te Tai o Poutini West Coast is home to some of most spectacular landscapes and natural environments in Aotearoa New Zealand, making it a magnet for tourists and outdoor enthusiasts. It is the most sparsely populated of the country's regions, with conservation land making up nearly 85% of the region's land area.¹

Economically, the region performs below the national average in terms of productivity and employment rates. The economy is largely focused on dairy farming, mining, and tourism.

The region is relatively isolated. It relies heavily on SH6, SH73, and the Midland Rail Line to connect communities as well as move freight and people.

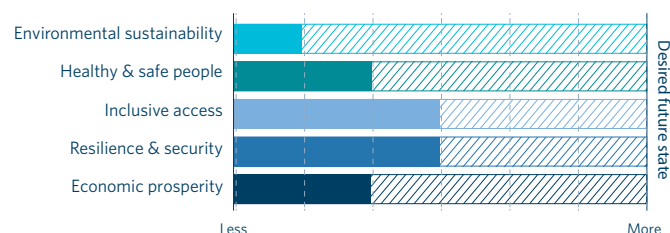
It is the country's fifth largest region by land area but has the smallest population. The region's population of 32,400 is expected to fall to 30,600 by 2043.² This population decline is forecast across all districts, including the largest centre, Māwhera Greymouth.³

Te Tai o Poutini has one of the highest per capita deaths and serious injuries on its roads, which needs to be addressed.⁴

There are several locations on the network at high risk of damage or disruption from the effects of climate change or other natural hazards; this affects regional long-term resilience. Because the region is mostly made up of conservation land, councils don't receive rates from these areas. Maintaining the existing network is already an issue.

Another challenge for Te Tai o Poutini will be reducing greenhouse gas emissions as the country moves to a low-carbon economy.

Scale of effort to deliver outcomes in Te Tai o Poutini – West Coast



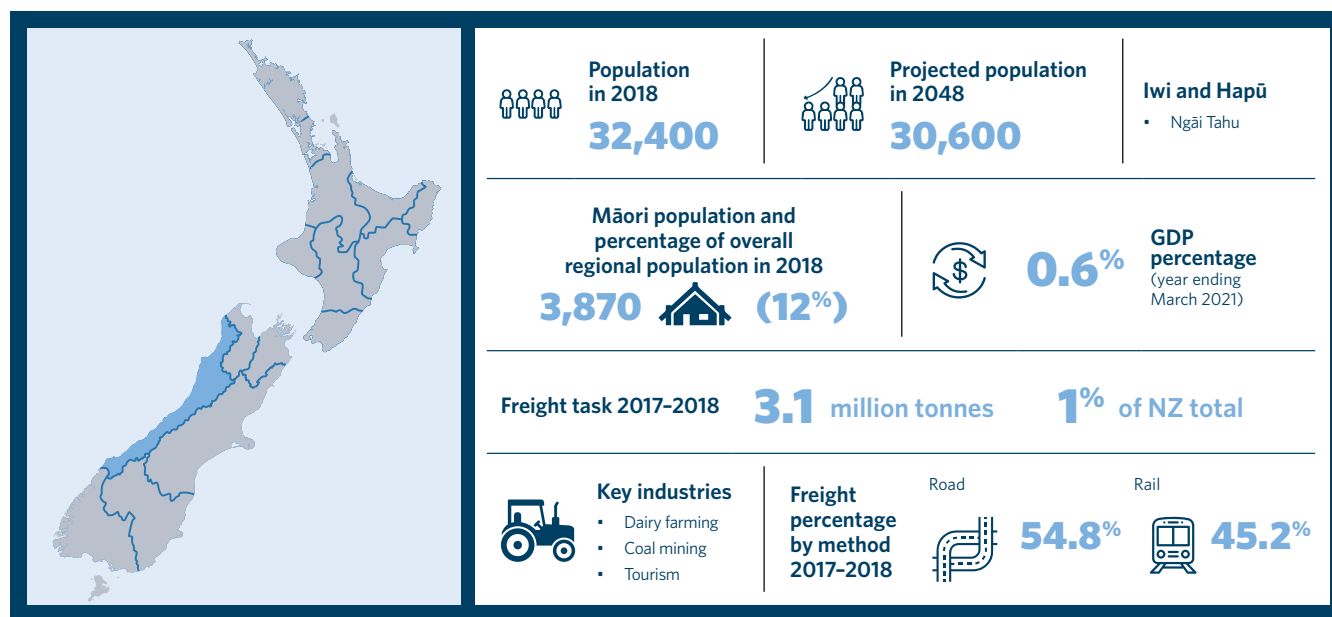
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context

Te Tai o Poutini – West Coast



Te Tai o Poutini West Coast has the smallest population of all the country's regions. By 2028, the population is expected to grow slightly from 32,400 to 32,600, or about 0.5% of the country's population.⁵ Then from 2028 to 2048, the region's population is expected to decline to 30,600.⁶ Te Tai o Poutini is the only region in Aotearoa New Zealand expected to have a decline in population during this period.

The projected decline beyond 2028 is because of:

- an ageing population
- declining birth rate
- low immigration to the region
- people leaving the region.⁷

All districts of Te Tai o Poutini are expected to experience population decline to some degree by 2048, including the largest centre, Māwhera Greymouth.⁸

The average age of the region's population is increasing faster than the national average, with 31% of the population expected to be aged 65 or over in 2048; this includes a relatively high median age also.⁹ Ensuring good access to social networks, sports, social activities, and essential services will be key.

In 2018, 3,870 Māori lived in Te Tai o Poutini, making up 12% of the region's population.¹⁰ This is lower than the national rate of 16.5%.¹¹

Most Māori live in Māwhera, where they make up 10% of the population.¹² The iwi in Te Tai o Poutini is Ngāi Tahu.¹³

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Waitaha rohe, which relates to the regions of Te Tai o Poutini, Waitaha Canterbury, Ōtākou Otago, and Murihiku Southland. It notes the asset base in this rohe is valued at \$9.3 billion.¹⁴ The primary sector and property are both important.¹⁵ The Waitaha rohe has the highest proportion of Māori self-employed (13%) and employers (17%).¹⁶

Te Tai o Poutini is performing below the national average in terms of economic productivity and employment rates.¹⁷

The region is reliant on international tourism. Guest nights per capita (40) was five times higher than the national average (8) in 2019.¹⁸

Before COVID-19, domestic and international tourism was forecast to grow. With 50% of tourism spend coming from international visitors, the region has been heavily impacted by border closures.¹⁹ The ongoing impact remains unclear.

Domestic tourism has not offset this reduction in visitor numbers, largely because of how far away Te Tai o Poutini is from major population centres in the North Island.

Leading up to 2020, there was a significant difference in the economic performance of the three districts. Westland was performing better because of its strong tourism industry.²⁰

The freight task in Te Tai o Poutini in 2017–2018 was 3.1 million tonnes, or around 1% of the Aotearoa total.²¹ A total of 54.8% of the freight task tonnage in Te Tai o Poutini was moved by road and 45.2% by rail.²²

Coal is the primary sector commodity produced in Te Tai o Poutini, with 1.5 million tonnes produced, or 45.9% of the country's coal mining production.²³ This represents 5% or more of the country's total primary sector commodity production in 2017–2018.²⁴

Te Tai o Poutini is relatively isolated and relies heavily on SH6, SH73, and the Midland Rail Line to connect communities as well as move freight and people. These corridors are all subject to high-risk natural hazards from ice and snow, erosion, rockfall, landslips, and flooding. Network closures are made worse because there are no alternate routes and detours are extremely lengthy. The tourist and freight sectors are greatly affected by these closures.

The background of the cover is a composite of three nature photographs. The top right shows a tall, moss-covered tree against a blue sky. The middle left shows a dense forest of tall, thin trees on a hillside. The bottom left shows a close-up of green, spiky plants. A large, light blue curved shape is on the left side, framing the title.

Te Tai o Poutini – West Coast: Outlook

Over the next 30 years, as the population of Te Tai o Poutini West Coast is expected to slightly decline, its economy is likely to transform considerably as Aotearoa New Zealand transitions to a low-carbon future.

The most significant changes to the region's transport system will be:

- supporting the country's economic transformation
- making significant improvements to safety and resilience
- improved accessibility for an ageing population.

Conservation land makes up 85% of the region, from which councils receive no rates income. The region will face an ageing population and a significant proportion of residents on fixed incomes. These factors will likely put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services.

The increasing impacts of climate change plus maintenance and renewal costs for land transport infrastructure will make this even harder.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’

approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Te Tai o Poutini West Coast will need to make an important contribution to reducing carbon emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.²⁵

To support national emissions targets, there will need to be significant change to how people travel in Te Tai o Poutini, a region with:

- a transport system reliant on private vehicle use
- limited scope to grow public transport because of relatively small population centres.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

In the region, 84% of journeys to work are made by private vehicles. Care is required to ensure efforts to reduce VKT are fair, equitable, and don’t unfairly affect specific communities or groups.²⁶

We need to reduce freight transport carbon through:

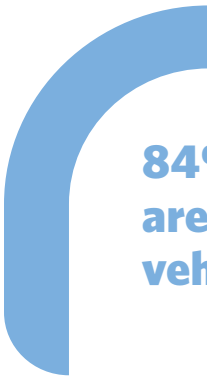
- adopting lower-emitting fuels
- increasing mode share for rail.

With key transport corridors passing through conservation land, we must reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- engaging in local planning processes to ensure development and transport planning focuses on reducing emissions, private vehicle travel, and average trip length
- focusing transport planning on interventions, activities, and investments that are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- identifying opportunities for smaller projects, including making the most of the network, that can improve system outcomes
- ensuring appropriate standards, policies, and regulations are put in place to reduce the impact of the region’s transport system on the local environment.



**84% of journeys to work
are made by private
vehicles.**

Healthy and safe people

Challenges and opportunities

The number of deaths and serious injuries per capita on the roads of Te Tai o Poutini West Coast is among the highest in Aotearoa New Zealand.²⁷

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated Action Plan 2020–2022, and regional safety strategies.²⁸

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Using urban speed management and providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes, or step changes, to encourage walking and cycling will help the urban areas of the region.

New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements targeting run-off road and head-on crashes on high-risk rural roads
- using urban speed management, along with improving walking and cycling facilities and infrastructure, to increase levels of walking and cycling
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Inclusive access

Challenges and opportunities

The transport system of Te Tai o Poutini West Coast struggles to provide rural and remote communities with reliable connections to Māwhera Greymouth and beyond. It's essential that young people can access education and work; senior residents need access to social activities as well as health and social services.

A high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.


Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around within smaller towns and rural communities, and improve access to services in Māwhera.

Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- exploring opportunities to incorporate public transport or shared services, including on-demand shuttles where appropriate, to improve access to essential services, and social and economic opportunities
- ensuring transport infrastructure and services are designed and provided in a way that meets the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support mobile or digital delivery of essential services.



The transport system of Te Tai o Poutini struggles to provide rural and remote communities with reliable connections to Māwhera Greymouth and beyond.

Economic prosperity

Challenges and opportunities

Te Tai o Poutini West Coast is a priority for regional development support because of the long-term challenges it faces, such as high unemployment and low incomes. The region has worked with central government and independent consultants to develop the *Tai Poutini West Coast Growth Study*, which identifies the region's opportunities for, and barriers to, economic growth.²⁹

The small proportion of rateable land and an increasing proportion of residents on fixed incomes is likely to put pressure on the region's ability to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- completing regeneration plans for towns and villages, such as master plans for Franz Josef and Māwhera Greymouth, and delivering well-planned transport that enables future growth

- completing visitor destination plans and providing transport infrastructure and services that improve access to destinations, such as Franz Josef, Dolomite Point, Croesus Track, and Ōpārara Arches
- improving safety and access on the road corridors, particularly critical routes to key tourist destinations
- completing and promoting walking and cycling trail plans, such as the Regional Cycle Trail Strategy, and a connected network of cycle and walking trails
- implementing transport initiatives that improve economic performance, including investment in the TranzAlpine service upgrade
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- working closer with councils and regional tourism organisations to explore ways to improve tourism and amenity (attractiveness).



Completing visitor destination plans and providing transport infrastructure and services that improve access to destinations will help the region.


Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.³⁰

Networks across the region are expected to come under increased pressure because of storm intensity combined with relatively unstable terrain, resulting in rockfall, landslips, erosion, and flooding. Particularly significant risks relate to rockfall and landslips along SH6, SH7, and SH73.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.



More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity.

Making progress

The key to improving resilience in the region's transport system is an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks.

Key actions over the next 10 years to make progress on this outcome are:

- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change; this includes prioritising other high-risk areas, for example at Franz Josef
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- improving operational responses to events to support quick recovery following disruption to the land transport system.



Te Tai o Poutini – West Coast: Focusing our efforts

For efficient and effective progress, transport challenges in Te Tai o Poutini West Coast must be tackled in a cohesive way.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Begin to reduce vehicle kilometres travelled (VKT) in a way that's fair, equitable, and improves quality of life.
- Enable and support the region's transition to a low-carbon economy.
- Maintain and improve resilience of the region's land transport network.
- Support efforts to improve access to essential services as well as social and economic opportunities.
- Significantly reduce the harm caused by the region's transport system, especially through improved road safety and reduced pollutants that are dangerous to people's health.
- Maintain and improve efficiency of interregional road and rail connections, especially east to Ōtautahi Christchurch on SH73 and Midland Rail Line.

- Support the delivery of walking and cycling networks, predominantly through reshaping existing streets to make these options safe and attractive.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail.
- Confirm how key resilience risks will be addressed over time, and work with communities to identify plans for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. This is New Zealand (2022). West Coast: Wild coastline and rich wilderness. <https://thisisnewzealand.com/west-coast>
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
7. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
8. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
9. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
10. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
11. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
12. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
13. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
14. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
15. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
16. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
17. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
18. Ministry for Business, Innovation and Employment (2019). Regional economic activity web tool, Guest nights per capita in New Zealand. webrear.mbie.govt.nz/theme/guest-nights-per-capita/map/timeseries/2019/new-zealand?right-transform=absolute
19. Ministry for Business, Innovation and Employment (2019). Regional Economic Activity Web Tool, Guest nights per capita in New Zealand. <http://webrear.mbie.govt.nz/theme/guest-nights-per-capita/map/timeseries/2019/new-zealand?right-transform=absolute>
20. Ministry for Business, Innovation and Employment (2019). Regional economic activity web tool, Guest nights per capita in New Zealand. webrear.mbie.govt.nz/theme/guest-nights-per-capita/map/timeseries/2019/new-zealand?right-transform=absolute
21. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
22. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
23. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
24. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
25. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
26. Ministry of Transport (2019). New Zealand household travel survey. www.transport.govt.nz/mot-resources/household-travel-survey

27. Ministry of Transport (2017). Safety – Annual statistics. www.transport.govt.nz/statistics-and-insights/safety-annual-statistics/regional-stats/
28. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
29. Ministry for Primary Industries (2016). Tai Poutini West Coast growth study. www.mpi.govt.nz/dmsdocument/14008-tai-poutini-west-coast-growth-study-summary-report
30. Ministry for the Environment (2018). Climate change projections for the West Coast region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-west-coast-region

Arataki

Regional direction
Waitaha – Canterbury
September 2023 v1.1

At a glance

Waitaha Canterbury is the largest geographic region in Aotearoa New Zealand. It dominates the South Island economy and is home to over half its population.

Christchurch International Airport is the main gateway to the South Island for international visitors. Ports in Ōhinehou Lyttelton and Te Tihi-o-Maru Timaru, and an inland port at Tauwharekākaho Rolleston, are the nucleus of the region's freight system. State Highway 1 links to Waitohi Picton and the Interislander ferry to the north and Ōtākou Otago to the south. Waitaha provides critical lifelines, freight, and tourist routes to Te Tai o Poutini West Coast across the Southern Alps.

Most people in the region live in the Greater Christchurch area, which is also where most future growth is forecast. The region's population is expected to grow from 650,000 to about 780,000 by 2048.¹ Following a series of major earthquakes, growth patterns in Greater Christchurch over the past decade have created several transport challenges.

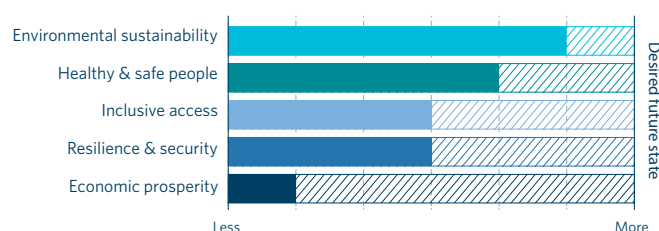
Despite high rates of cycling, the urban area remains car dependent. Three essential initiatives can help address this high-car reliance and enable Greater Christchurch to reduce transport emissions:

- joint spatial planning with local government and other partners
- continued rollout of high-quality cycling networks
- implementation of aspirational public transport plans.

Waitaha has work to do to improve a poor road safety record. Safety improvement efforts should focus around the urban area of Ōtautahi Christchurch and SH1 between Ōtautahi and Te Tihi-o-Maru, where there are high-risk rural roads and motorcycle routes.

Resilience is also a key focus, with Waitaha vulnerable to frequent and intense storms, sea level rise, flooding, and wild fires. Seismic risk is also considerable given the region's proximity to the Alpine Fault.

Scale of effort to deliver outcomes in Waitaha – Canterbury



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

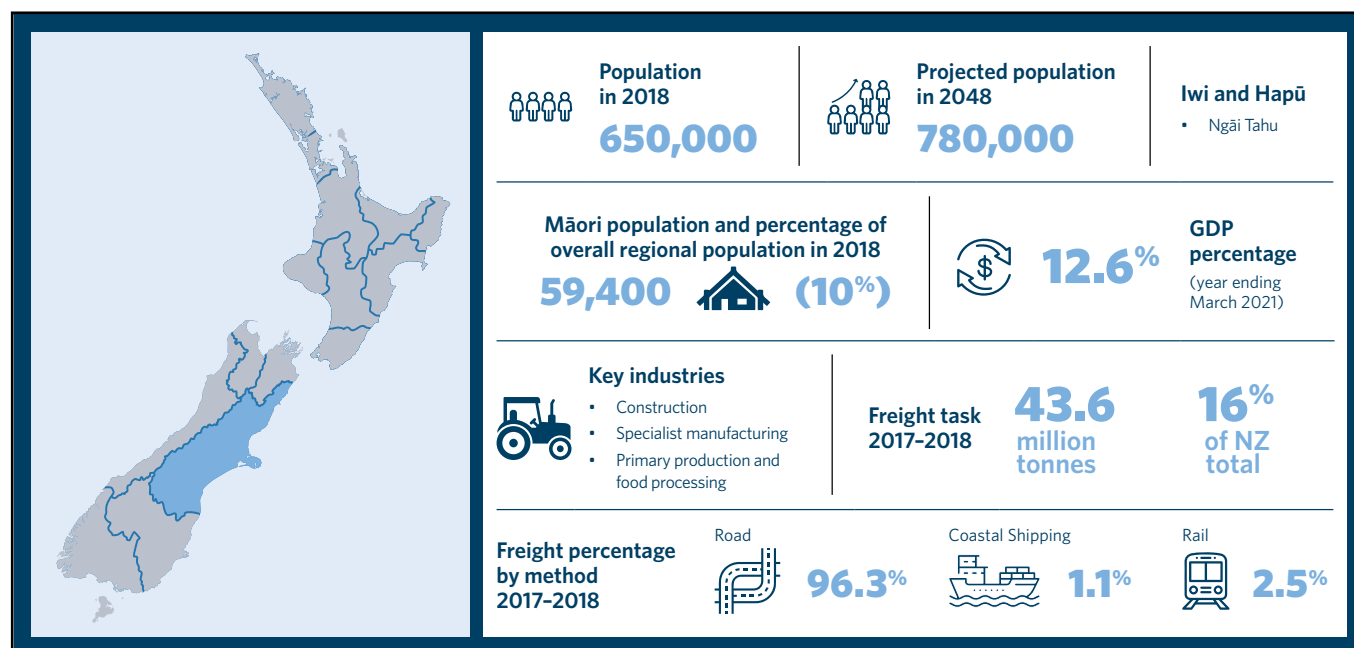
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context



Waitaha – Canterbury



The population of Waitaha Canterbury is projected to grow from 650,000 to 780,000 by 2048, or 13% of the country's population.² The highest growth is forecast in Greater Christchurch and the surrounding district townships of Herewini Selwyn and Waimakariri.

Those aged 65 years and over will make up 24% of the Waitaha population by 2048; this is slightly higher than the national average of 23%.³ Providing good access for these residents is important so they remain socially connected, active, and able to participate in their communities.

In 2018, 59,400 Māori lived in Waitaha, making up 10% of the region's population.⁴ This is lower than the national rate of 16.5%.⁵ Most Māori live in Ōtautahi Christchurch, where they make up 10% of the city's population.⁶ The iwi in the Waitaha region is Ngāi Tahu.⁷

Te Ōhanga Māori 2018 Māori Economy includes information for the Waitaha rohe, which relates to regions of Te Tai o Poutini West Coast, Waitaha, Ōtākou Otago, and Murihiku Southland. It notes the asset base in this rohe is valued at \$9.3 billion.⁸ The primary sector and property sectors are important.⁹

Waitaha produces 57% of the South Island's GDP.¹⁰ Key industries contributing to the economy of Waitaha include construction, specialist manufacturing, primary production, and food processing. Economic activity is focused in and around Greater Christchurch, which is a major manufacturing and freight distribution centre.

Before the COVID-19 pandemic, Waitaha had the third largest tourism spend in the country, with 40% coming from international visitors.¹¹ Although Greater Christchurch will remain the primary South Island freight hub, the port at Te Tihi-o-Maru Timaru is expected to play a greater role in the freight system over time. Maintaining strong freight connections to Te Tai o Poutini will be critical for the region's communities and economy.

Dairy, sheep, and crop farming, along with food processing, are likely to remain important contributors to the regional economy. However, the transition to a low-emissions economy may result in changes to how land is used and affect future freight patterns.

The freight task in Waitaha in 2017-2018 was 43.6 million tonnes, or around 16% of the country's total.¹² A total of 96.3% of the freight task tonnage in Waitaha was moved by road, 2.5% by rail, and 1.1% by coastal shipping.¹³

Waitaha – Canterbury: Outlook

Significant transformation to the transport system of Waitaha will be needed over the next 30 years. Greater Christchurch will see the largest changes in population growth, so improvements to access and safety, while reducing emissions, will be a priority. With the urban area's strategic road network now complete, travel patterns need to change as the population grows to avoid increasing congestion and emissions.

It will be challenging to fund the new infrastructure and services required to keep pace with expected growth in Greater Christchurch. Climate change will make this even harder and put pressure on existing network maintenance.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- encouraging active modes and public transport by reallocating existing road space and making temporary or low-cost improvements
- influencing travel behaviour and growth patterns.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes. This includes exploring road pricing for vehicle kilometres travelled (VKT) reduction and demand management in Ōtautahi Christchurch.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Waitaha will need to make an important contribution to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050. This includes a target to reduce total vehicle kilometres travelled (VKT) by our light vehicle fleet by 20% by 2035.¹⁴

As the main urban centre, Greater Christchurch presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require significant change to how people travel in a district focused on private car usage. Improving transport options and reducing traffic are not just important for meeting our climate commitments. They are vital for reducing congestion and making our transport system more safe, healthy, and inclusive for people of all ages and abilities.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

As a Tier 1 urban environment, Greater Christchurch will need to do much of the heavy lifting for the region, to contribute towards national vehicle kilometres travelled (VKT) reduction. This work will inform future planning and investment decision-making.

Ōtautahi Christchurch, and the surrounding towns, will need to carefully manage how the transport system addresses population growth by:

- providing reliable public transport
- ensuring quality infrastructure for walking and cycling
- encouraging travel by alternative modes, like implementing parking restrictions.

Key actions over the next 10 years to make progress on this outcome are:

- completing and implementing the *Greater Christchurch Spatial Plan* to encourage growth and urban development that reduces trip length and car dependency
- planning what interventions, activities, and investment are needed to achieve VKT and emissions reduction
- enabling and increasing mode shift through rapid and extensive changes to the allocation of space on existing roads and streets to accelerate delivery of public transport plus walking and cycling networks
- completing walking and cycling networks, with a focus on access into, and within, the central city from surrounding suburbs to key activity centres
- enabling safe journeys to schools by ensuring safe speeds in low-traffic neighbourhoods
- developing existing infrastructure to provide connected networks
- improving the quality of public transport through the Public Transport Futures programme – this includes improving coverage of existing public transport, progressing rapid transit in the northern and southwestern corridors, and exploring opportunities to use technology to deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas, to increase use of public transport, walking, and cycling
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the region’s transport system on the local environment
- supporting the implementation of key policies, such as vehicle fleet transformation to lower emissions, and the investigation of pricing tools.

Healthy and safe people

Challenges and opportunities

Waitaha Christchurch has a poor road safety record. Over the past three years, there have been over 300 annual deaths and serious injuries on the region's roads.¹⁵

Safety improvements should be focused in the urban area of Ōtautahi Christchurch and surrounding townships, SH1 between Ōtautahi and Te Tihi-o-Maru Timaru, and high-risk rural roads. Issues to be addressed include:

- speeding on high-risk roads
- not wearing seatbelts
- crashes at intersections
- crashes involving people walking and cycling.¹⁶

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated *Action Plan 2020–2022*, plus regional safety strategies.¹⁷

Ōtautahi has relatively well-developed cycling networks and some of the highest levels of cycling in Aotearoa New Zealand.¹⁸ Despite this, walking and cycling rates have declined substantially over recent decades, contributing to a lack of physical activity and subsequent health problems. These health issues, like obesity and diabetes, disproportionately impact some demographics. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.¹⁹

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Waitaha Canterbury. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements that target high-risk intersections, run-off road crashes, high-volume roads, high-risk rural roads, and high-risk motorcycle routes
- rapidly rolling out a well-connected cycling network, often through reallocation of existing road space to accommodate a cycling lane
- requiring high-quality active mode infrastructure be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Waitaha.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

High reliance on private vehicles in Waitaha Canterbury creates several access challenges, including:

- creating difficulties for those without easy access to, and use, of a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

As the residential edges of Ōtautahi Christchurch and surrounding areas grow, it will be harder for people to access quality public transport options, community facilities, and employment opportunities. This may lead to an increase in private-vehicle dependency.

Rural communities need to access the key centres of Ōtautahi, Hakatere Ashburton, and Te Tihi-o-Maru Timaru for education, employment, and essential services. As the population ages, people's travel needs will change; there will be greater reliance on accessing health services, while fewer people will access education and employment.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These shuttles could help people in smaller towns and rural communities get around and improve access to services in larger centres. However, there still needs to be reasonable housing density for these to operate efficiently.


Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure. The growing popularity of online purchasing and home delivery will impact on-demand travel, including the movement of freight.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules and urban development decision making, especially through the *Greater Christchurch Spatial Plan* and supporting the An Accessible City programme in Ōtautahi Christchurch, to improve existing connections and expand local services at key locations – this will encourage more people to live in areas with better access to social and economic opportunities²⁰
- improving public transport services by implementing the *Public Transport Futures* plan in Greater Christchurch, expanding on-demand services where appropriate²¹
- exploring ways to improve the costs of public transport for lower-income households
- expanding and improving walking and cycling facilities, especially the completion of cycling networks in Greater Christchurch
- improving active mode facilities in smaller towns, so these low-cost, sustainable, and healthy travel options are safely used for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Rural communities need to access the key centres of Ōtautahi Christchurch, Hakatere Ashburton, and Te Tihi-o-Maru Timaru for education, employment, and essential services.

Economic prosperity

Challenges and opportunities

The transition to a low-emissions economy may mean changes to land use, such as for dairying, with flow-on effects for freight movement. While Greater Christchurch will remain the primary South Island freight hub, the port at Te Tihi-o-Maru Timaru is expected to play a larger role. Maintaining strong freight connections to Te Tai o Poutini West Coast will be critical for its communities and economy.

In the coming decades, technological change will have significant impacts on travel demand and on the Waitaha Canterbury economy. The COVID-19 pandemic accelerated working from home, while future developments could impact the type and location of work people do. Emerging technologies can improve freight safety and efficiency, while better use of available data can improve freight efficiency and network management.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.



Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.

Making progress

Economic productivity and business competitiveness in Waitaha Canterbury can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling in Greater Christchurch and other regional towns
- supporting the ongoing renewal of the central area of Ōtautahi Christchurch as the South Island's largest employment hub, through ongoing investment in access and amenity improvements, including the progressive implementation of rapid transit
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections and to key freight and industrial hubs
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness) for local residents
- supporting improved accessibility to local and town centres to better enable them to flourish and provide for the day-to-day needs of residents
- exploring opportunities to move to a multimodal freight system through greater use of rail and coastal shipping.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²²

The Waitaha Canterbury plains are already prone to flooding because of intense rainfall in the Southern Alps. There are only two road crossings over each of the region's three largest rivers – Waimakariri, Rakaia, and Rangitata. Closures of these bridge crossings result in long detours.

Hotter, drier summers will increase the risks of drought and wild fires. Recent history has clearly shown the region's significant seismic risk.

More extreme weather events and the need to make the transport system resilient to a variety of natural disasters will require a greater effort than ever to look after existing assets and maintain current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must adapt to uncertainty and rapid change. For example, in recent years the popularity of e-scooters and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.


There is a strong dependency on private vehicles and road freight in the region. Encouraging and providing alternative travel modes can unlock vehicle reliance and boost resilience.

Making progress

To improve resilience in Waitaha Canterbury, the transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in a highly complex urban environment, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- understanding road, rail, and shipping routes that provide critical connections, the condition of these, the pressures, and the level of investment needed to address impacts – this includes assessments to identify priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at increased risk of natural hazards and climate change
- completing strategic road improvements to the north and south of Greater Christchurch to reduce conflicting movements and improve network resilience
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- supporting phase two of the An Accessible City programme
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



To be resilient, the region's transport system must adapt to uncertainty and rapid change.

Greater Christchurch : Urban focus



Greater Christchurch: South Island's largest centre

For the geographic area of Greater Christchurch, Arataki uses the Our Space definition.²³ This area includes the city of Ōtautahi Christchurch and the surrounding satellite towns from Rangiora in the north, to Tauwharekākaho Rolleston and Rikona Lincoln in the south.

The Greater Christchurch population is expected to grow from about 450,000 to more than 640,000 people by 2048, placing greater demand on the transport network.²⁴

Our Space – integrating land use and transport planning

The Greater Christchurch Partnership developed Our Space in 2019. It provides an integrated plan for the delivery of housing, business land, and infrastructure across Greater Christchurch through to 2048.

In the later decades of the plan, there will be a stronger focus on redevelopment and concentration of existing urban areas. This builds on renewal and initiatives to make places better (place-making) in central parts of Ōtautahi Christchurch and suburban centres.

During the next 30 years, 65% of forecast growth is expected to be in Ōtautahi, 20% in Selwyn District, and 15% in Waimakariri District. Our Place anticipates there will be 20,000 people living in the central city by 2028, up from 6,000 in 2018. A total of 67,000 more jobs are forecast by 2048, with 89% of these in Ōtautahi.

Most growth in the surrounding districts is mostly through greenfield expansion (development in undeveloped areas) in the towns of Tauwharekākaho Rolleston, Rangiora, and Kaiapoi. The aim is to make these areas more self-sufficient, by reducing travel to Ōtautahi to access jobs and essential services.

As the region's principal commercial hub, the central city will see ongoing development of business and activity centres for local communities.

Our Space anticipates a transformation of the land transport system to foster much higher rates of public and active transport usage (including rapid transit services) and reduced reliance on private vehicles.

Joint work is underway between local and central government and iwi on a spatial plan for the Greater Christchurch area. It will provide a future vision for the city and its communities, to realise the National Policy Statement on Urban Development 2020 (NPS-UD).

Key challenges

Regional earthquakes in 2010 and 2011 had a significant impact on the patterns of population and employment in Greater Christchurch. People and jobs migrated to the fringes of the central city, and to larger towns in the Selwyn and Waimakariri districts.

Recent years have seen businesses and workers return to central Ōtautahi Christchurch, helping to restore it as the region's principal commercial hub.

The key strategic challenges for Ōtautahi Christchurch are to:

- tackle climate change
- reshape the city's urban layout to increase housing supply and affordability in a way that supports other outcomes.



As the region's principal commercial hub, the central city will see ongoing development of business and activity centres for local communities.

Climate change

Transformational change is required to improve urban form, offer better transport options, and manage demand for travel by cars. These changes can also deliver benefits beyond reducing emissions, like:

- improved travel choice and accessibility
- better health and safety
- more network resilience
- reliable travel times.

While the proposed direction is ambitious, it comes with significant challenges. One percent of trips are made by public transport in Greater Christchurch.²⁵ The city isn't well positioned to grow public transport use because of a strong culture of car use combined with people and jobs that are geographically spread out.

However, Ōtautahi Christchurch is well positioned to support active mode use because of:

- flat terrain
- distribution of employment
- retail services and education
- high-quality connections into and within the city centre.

Significant investment in the Major Cycleway network continues to encourage active travel. Cycling makes up 3% of trips in Ōtautahi, which is double the average across all Tier 1 centres.²⁶

The impacts of climate change, such as seaside flooding, are expected to be felt in low-lying coastal areas and along the lower areas of the Styx, Avon, and Heathcote rivers.

Reshaping the urban form of Greater Christchurch

To reach its transport goals, Greater Christchurch must deliver high-density housing along the main public transport corridors, with a focus on rapid transit corridors, while encouraging a shift away from private vehicles. Changes in urban form, land use planning, and transport investment must happen faster to reduce emissions, achieve mode-shift goals, and make communities better places to live.

Transport contributes to making places better (placemaking), through tools like the One Network Framework. This work requires more collaboration and coordination between iwi, local government, and central government.

As part of the *Greater Christchurch Spatial Plan* process, several urban forms were evaluated.²⁷ The best form was a compact scenario, focused on greater concentration near centres and along transit corridors. However, this form still won't achieve the emission reduction targets. This means demand management measures, including transport pricing, must be considered.

Over half the jobs in Greater Christchurch are located along the corridor that runs from Hornby to the city centre. Our Space identifies a potential rapid transit connection from the city centre to Hornby, and on to Tauwharekākaho Rolleston, to make it easier for people to access jobs and services. A second potential rapid transit corridor extends from the city centre to Belfast (via Papanui) and continues to townships north of the Waimakariri River. If supported by transport demand management tools and high-density development along the high-demand corridors, investment in rapid transit could deliver:

- significant increases in public transport use
- improved access to jobs, services, and education
- reduced reliance on private vehicles.

Waitaha – Canterbury: Focusing our efforts

The transport challenges for Waitaha Canterbury need to be tackled in a cohesive way for efficient and effective progress.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Support, enable, and encourage growth and development in areas that have good travel choices and shorter average trip lengths through the Greater Christchurch Partnership and spatial planning work.
- Accelerate the delivery of walking and cycling networks predominantly through reshaping existing streets, to make these options safe and attractive.
- Implement the Public Transport Futures programme, starting with bus services and infrastructure improvements; confirm the design and timing of rapid transit along the corridors in the north and southwest of Greater Christchurch.
- Explore new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Confirm how key resilience risks will be addressed over time, and work with communities to identify plans for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu and wāhi taonga.
- Reduce financial and other barriers to iwi Māori getting a driver's licence in areas not well served by public transport.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). *Subnational population projections: 2018(base)–2048*. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
5. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)–2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Te Puni Kōkiri (2022). Find iwi by local authority. tkm.govt.nz/browse/
8. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
9. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
10. Statistics New Zealand (2019). Regional gross domestic product: Year ended March 2018. <https://www.stats.govt.nz/information-releases/regional-gross-domestic-product-year-ended-march-2018>
11. Ministry of Business, Innovation & Employment (2020). Annual tourism spend grouped by TA, RTO, country of origin and product category. mbie.govt.nz/immigration-and-tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-rto-country-of-origin-and-product-category
12. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
13. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
14. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
15. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
16. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
17. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
18. Ministry of Transport (2019). New Zealand household travel survey. transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey
19. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696
20. Canterbury Earthquake Recovery Authority (2013). An accessible city – Christchurch Central recovery plan: Replacement transport chapter – October 2013. otakarold.co.nz/assets/Projects/ProjectDocuments/An-Accessible-City.pdf
21. Environment Canterbury Regional Council (2023). Future public transport. ecan.govt.nz/your-region/living-here/transport/public-transport-services/future-public-transport
22. Ministry for the Environment (2018). Climate change projections for the Canterbury region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-canterbury-region
23. Greater Christchurch Partnership (2019). Our space 2018–2048. greaterchristchurch.org.nz/assets/Documents/greaterchristchurch/Our-Space-final/Our-Space-2018-2048-WEB-FINAL.pdf
24. Statistics New Zealand (2021). Subnational population projections: 2018(base)–2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
25. Greater Christchurch Partnership (2021). Travel mode. greaterchristchurch.org.nz/our-work/indicators/urban/travel-modetrip-length/
26. Greater Christchurch Partnership (2021). Travel mode. greaterchristchurch.org.nz/our-work/indicators/urban/travel-modetrip-length/
27. Greater Christchurch Partnership (2022). Greater Christchurch spatial plan and mass rapid transit indicative business case briefing. greaterchristchurch.org.nz/assets/Documents/greaterchristchurch/Spatial-Plan/Briefing-pack-Urban-form-direction-to-informengagement-with-stakeholders-and-the-development-of-the-draft-Spatial-Plan.pdf

Arataki

Regional direction

Ōtākou – Otago

September 2023 v1.1

At a glance

Ōtākou Otago is the country’s second largest region by land area. It has a population of just under 250,000 and is expected to grow to about 282,000 by 2048.¹ Ōtepoti Dunedin is the region’s largest urban centre, but Tāhuna Queenstown is the fastest growing area.

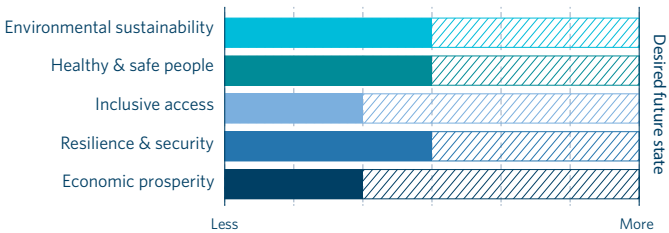
The economy of Ōtākou is dominated by the accommodation, food service, and education sectors; this reflects the importance of regional tourism and Ōtepoti as a tertiary centre of excellence. Safe and reliable access to Port Otago and the airports in Ōtepoti and Tāhuna is important for the economies of Ōtākou and Murihiku Southland.

The region’s transport network has enough capacity to meet current and future demand, although the scale of growth in Tāhuna means transformational change is needed in coming decades. While public transport use has grown in Ōtepoti and Tāhuna, private vehicles still dominate across the region.

The number of deaths and serious injuries in Ōtākou is high, with issues on high-risk rural roads, at high-risk urban intersections, and in urban areas with many deaths and serious injuries involving pedestrians and cyclists.²

Resilience also needs to be a focus, with coastal flooding expected to increase in the southern parts of Ōtepoti and other coastal areas.

Scale of effort to deliver outcomes in Ōtākou – Otago



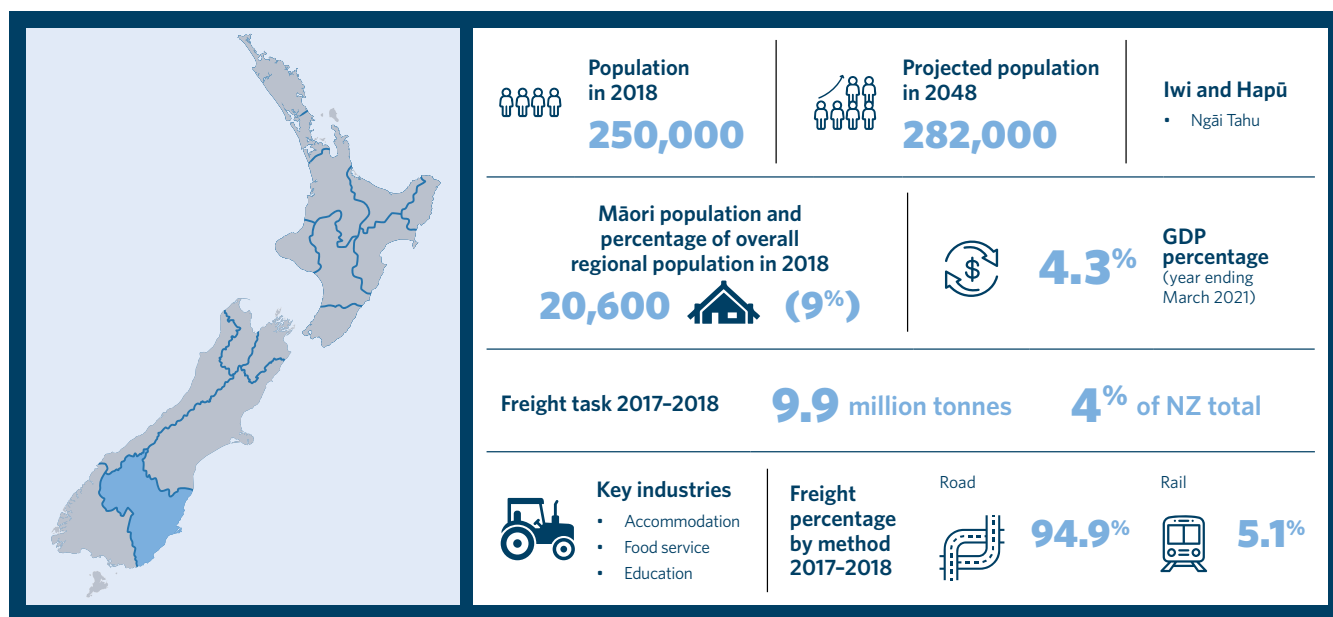
The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context

Ōtākou – Otago



The population in Ōtākou Otago is expected to grow from just under 250,000 to about 282,000 by 2048, or 5% of the country's population.³ Ōtepoti Dunedin, the region's largest urban centre, has about 133,000 residents.⁴ Tāhuna Queenstown is a nationally significant tourism destination with a relatively small resident population of 28,000.⁵ The town grew a lot in the years before COVID-19 travel restrictions, with rising numbers of domestic and international visitors.

In 2018, 20,600 Māori lived in Ōtākou, making up 9% of the region's population.⁶ This is lower than the national rate of 16.5%.⁷ Most Māori live in Ōtepoti, where they make up 9% of the city's population.⁸ The iwi in the Ōtākou region is Ngāi Tahu.⁹

Te Ōhanga Māori - The Māori Economy 2018 notes the asset base in this rohe is valued at \$9.3 billion.¹⁰ The primary sector and property are both important.¹¹

The Waitaha Canterbury rohe, which includes Ōtākou, Waitaha Canterbury, Te Tai o Poutini West Coast, and Murihiku Southland, has the highest number of Māori self-employed (13%) and employers (17%).¹²

The key interregional journeys in Ōtākou are:

- along the north and south road and rail connections to Waitaha and Murihiku
- the road corridors that link Tāhuna to Piopiotahi Milford Sound and other key tourist destinations across the South Island.

In rural areas, sheep and beef farming, along with fruit growing, will likely remain important contributors to the regional economy. The main employment growth areas in Ōtepoti, Tāhuna, and other urban centres are expected to be public services, electricity, manufacturing, healthcare, service industries, education institutes, and construction.

The freight task in Ōtākou in 2017-2018 was 9.9 million tonnes, or about 4% of the country's total.¹³ A total of 94.9% of the freight task tonnage in Ōtākou was moved by road and 5.1% by rail.¹⁴

Ōtākou - Otago: Outlook



Over the next 30 years, the transport system of Ōtākou Otago will need to change, particularly in Ōtepoti Dunedin and Tāhuna Queenstown, to address the challenges and make progress on the key transport outcomes.

Future growth in Ōtepoti is expected to be concentrated within the existing urban area. The city centre is undergoing a renewal, with ongoing expansion of Te Whare Wānanga o Ōtākou Otago University and the construction of a new hospital. This extended period of construction will create traffic management challenges and mode-shift opportunities in the central city.

While private vehicle use is dominant in Ōtepoti, trips by public transport, walking, and cycling make up a significant contribution in some locations, particularly the city centre and northern Ōtepoti.¹⁵ Ōtepoti has a relatively young demographic with university students contributing to a high level of walking in the inner city.

The new hospital in Ōtepoti, investment in Te Whare Wānanga o Ōtākou infrastructure, and the central city upgrade will:

- support renewal of the central city
- influence transport connections and travel in the wider urban area.

The geographical layout of Tāhuna has limited the size of the main centre and access roads. Limited transport options have created a heavy dependency on private vehicles. This means increasingly restricted access to the town centre and difficulties moving freight along SH6/6A. Ensuring the effective movement of people and goods in and around Tāhuna is important to the region and Aotearoa New Zealand.

International tourism has dropped sharply and visitor numbers are likely to remain low in the near future.¹⁶ However, Tāhuna remains an internationally renowned tourist destination and visitor numbers are expected to rebound over time.¹⁷ The population of permanent residents is expected to keep growing.

It will be challenging to fund the new infrastructure and services required to keep pace with expected growth in Ōtākou. Low incomes in parts of the region, combined with climate change, will make it harder for local government to maintain existing networks.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus projects relating to small-scale and area-wide safety, public transport, and active travel, along with getting more from existing infrastructure
- reallocating existing road space and making temporary or lower-cost improvements to reflect the One Network Framework approach
- delivering current mode shift programmes – for example, bus priority upgrades to SH6 at Ladies Mile in Tāhuna, to serve an existing employment hub and new development
- influencing travel behaviour, particularly through parking management plans
- focusing on urban outcomes, such as progressing priority development areas identified in the Queenstown Lakes Spatial Plan.¹⁸

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’

approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Ōtākou Otago will need to contribute to reducing transport emissions and light vehicle kilometres travelled (VKT), to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁹

As the main urban centres, Ōtepoti Dunedin and Tāhuna Queenstown present the greatest opportunities to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in cities with high levels of private vehicle use and low but growing public transport usage. In these cities, there are opportunities to:

- deliver greater travel choice
- support increased use of public transport, walking and cycling
- move away from travel by single-occupancy vehicles.

Care is required to ensure efforts to reduce VKT don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:

- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- planning work to encourage compact, mixed-use urban form that reduces trip length and car dependency, particularly through implementing the Queenstown Lakes Spatial Plan
- planning what interventions, activities, and investments are needed to achieve vehicle kilometres travelled (VKT) and emissions reduction
- making changes to the allocation of space on existing roads and streets to enable and encourage mode shift to public transport, walking, and cycling
- continuing the expansion of the cycleway network in Ōtepoti through delivery of its active travel network by completing separated cycling lanes on SH1, making improvements to walking and cycling, and improving crossing facilities in Tāhuna
- completing public transport projects in Tāhuna, on SH6 between Ladies Mile and Kawarau Falls Bridge and SH6A
- making improvements to public transport hubs in Te Kirikiri Frankton and Tāhuna
- improving safety and access at key intersections for all modes
- exploring ways to use technology to deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas to increase use of public transport, walking, and cycling for trips to these locations
- ensuring appropriate standards, policies, and regulations are in place to reduce the impact of the transport system on the local environment
- supporting the implementation of key policies, such as vehicle fleet transformation.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems.

Healthy and safe people

Challenges and opportunities

During the past three years, the roads of Ōtākou Otago have had around 140 annual deaths and serious injuries.²⁰ Crashes in the region highlight the need to focus on:

- Ōtepoti Dunedin and surrounding townships
- Tāhuna Queenstown and Wānaka
- SH1 between Ōtepoti and Oamaru
- high-risk rural roads.²¹

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated *Action Plan 2020–2022*, and regional safety strategies.²²

There is a significant opportunity, and need, to increase walking and cycling rates in Ōtākou, especially in Ōtepoti and Tāhuna. Active mode use has fallen substantially in recent decades, contributing to many health problems around lack of physical activity. These health issues, like obesity and diabetes, disproportionately affect some demographics. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.²³

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Ōtākou Otago. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- completing safety improvements, notably on SH1, with an initial focus between Oamaru and Ōtepoti Dunedin
- completing intersection upgrades to address safety issues on SH6 and SH8B in Tīrau Cromwell
- rapidly rolling out well-connected, separated cycling networks in Ōtepoti, Tāhuna Queenstown, and other towns across the region, predominantly through reallocating existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- advocating for robust mobile network coverage in rural and regional areas.

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Ōtākou.

Inclusive access

Challenges and opportunities

The Ōtākou Otago transport system struggles to provide for people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a variety of social and economic opportunities.

A high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Rural communities need improved connections to centres such as Tāhuna Queenstown and Ōtepoti Dunedin. Young people need access to education and increased employment opportunities. Older residents need access to physical and social activities, as well as health and social services.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around smaller centres and improve access to services in Ōtepoti and Tāhuna. Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure. The growing popularity of online purchasing and home delivery will impact on-demand travel, including the movement of freight.


In Tāhuna, a range of travel choices are needed to help tourists of all abilities get to where they're going, without using a private vehicle.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- working with urban developers to shape planning rules and decision-making to encourage more people to live in areas with better existing access to social and economic opportunities, especially in Ōtepoti Dunedin and Tāhuna Queenstown
- improving public transport services, and expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- expanding and improving walking and cycling, so low cost, sustainable, healthy travel options are safe and attractive for more journeys – this includes the completion of cycling networks in Ōtepoti and Tāhuna, and improved active-mode facilities in smaller towns
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



Rural communities need improved connections to centres such as Tāhuna Queenstown and Ōtepoti Dunedin.

Economic prosperity

Challenges and opportunities

The region's economy is dominated by the accommodation, food service, and education sectors. This reflects the importance of tourism and the role of Ōtepoti Dunedin as a tertiary centre of excellence. The Te Whare Wānanga o Ōtākou Otago University contributes around 15% of the city's GDP.²⁴

In rural areas, primary production and processing continue as key economic drivers. Ōtākou Otago region has the second highest tourism spend in the country, with 55% total spend from international visitors, rising to 63% in Tāhuna Queenstown Lakes District.²⁵

International travel restrictions during the COVID-19 pandemic had a significant impact on the economy of Tāhuna Queenstown, because of its dependence on international tourism.

The key interregional journeys in Ōtākou are:

- along the north and south road and rail connections to Waitaha Canterbury and Murihiku Southland
- road corridors that link Tāhuna to Piopiotahi Milford Sound and other key tourist destinations across the South Island.

An increasing number of residents on fixed incomes will likely make it harder to:

- maintain existing infrastructure
- fund new infrastructure
- provide appropriate services.

Technological change is also likely to have significant impacts on the region's economy and on travel demand, in the coming decades. The COVID-19 pandemic has accelerated working from home, while future developments in artificial intelligence and increased automation could have profound implications for the type and location of work people undertake. Transport planning will need to respond to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.


Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by public transport, walking, and cycling in Ōtepoti Dunedin, Tāhuna Queenstown, and other regional towns
- supporting resilient, reliable, and efficient freight travel around key parts of the network, especially around interregional road and rail connections to Ōtautahi Christchurch and Waihōpai Invercargill, to Port Otago, and airports in Ōtepoti and Tāhuna
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness) for residents
- improving accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents.



The region's economy is dominated by the accommodation, food service, and education sectors.

Resilience and security

Challenges and opportunities

Ōtākou Otago faces a range of effects from climate change and natural hazards. The most significant natural hazard risks, especially along state highways 6, 8, and 88, are:

- rockfall
- landslips
- flooding
- ice and snow.

The region's steep and unstable terrain also creates significant risk when hazards happen.

Sections of the interregional coastal corridor are at risk from the impacts of climate change. This corridor contains major rail line and state highway connections to the north and south of Ōtepoti Dunedin. The southern part of Ōtepoti, the most densely populated part of Ōtepoti, is particularly at risk of rising sea and groundwater levels. Surface flooding is also expected to increase around Dunedin International Airport.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the introduction of e-scooters in Ōtepoti and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

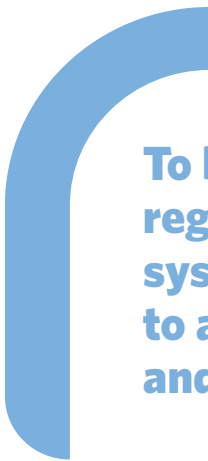
Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- better understanding routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts – this includes identifying priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving personal security for people using the region's transport system.



To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change.

The background of the slide is a photograph of a mountainous landscape. In the foreground, two hikers are walking up a grassy slope. The hiker on the left is wearing a light-colored jacket and dark shorts, while the hiker on the right is wearing a red shirt and dark shorts. They are both carrying backpacks. In the background, there are large, rugged mountains under a blue sky with some clouds. A large, semi-transparent blue shape is overlaid on the left side of the image, containing the text.

Ōtākou – Otago: Focusing our efforts

For efficient and effective progress, transport challenges in Ōtākou Otago must be tackled in a cohesive way.

The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Begin to reduce vehicle kilometres travelled, focusing on Tāhuna Queenstown and Ōtepoti Dunedin, in a way that's equitable and improves people's quality of life.
- Plan and deliver growth and urban development, especially in rapidly growing Tāhuna, in an affordable and cost-effective way that aligns with emissions-reduction goals.
- Maintain and improve the resilience and efficiency of road and rail connections to surrounding regions and the Port Otago.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Provide better access for tourists in Tāhuna and opportunities created by the new Dunedin Hospital.
- Significantly reduce the harm caused by the transport system of Ōtākou, especially through improved road safety and reduced pollutants dangerous to health.
- Encourage growth and development in areas that already have good travel choices and shorter average trip lengths, like working with Queenstown Lakes District Council (QLDC) and central government to implement the *Queenstown Lakes Spatial Plan*.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Improve and expand public transport services, including exploring the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a multimodal freight system with greater use of rail and coastal shipping.
- Continue support of the Milford Opportunities Project to encourage resilience, tourism, safety, and mode shift for the Milford corridor, and surrounding region.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References

1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
5. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
8. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
9. Te Puni Kōkiri (2022). Find iwi by local authority. www.tkm.govt.nz/browse/
10. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
11. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
12. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. www.rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
13. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
14. Ministry of Transport (2019). National freight demand study 2017/18. www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
15. Ministry of Transport (2019). Household travel survey. www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/
16. Queenstown Lakes District Council (2022). Queenstown Lakes Spatial Plan. <https://www.qldc.govt.nz/your-council/council-documents/queenstown-lakes-spatial-plan>
17. Queenstown Lakes District Council (2022). Queenstown Lakes spatial plan. www.qldc.govt.nz/your-council/council-documents/queenstown-lakes-spatial-plan
18. Queenstown Lakes District Council (2022). Queenstown Lakes spatial plan. www.qldc.govt.nz/your-council/council-documents/queenstown-lakes-spatial-plan
19. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
20. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
21. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
22. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. www.transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
23. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696/
24. University of Otago (2015). University of Otago annual report 2014. www.otago.ac.nz/about/official-documents/otago089958.pdf
25. Ministry of Business, Innovation and Employment (2020). Annual tourism spend grouped by TA, region, country of origin and product category. www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/annual-tourism-spend-grouped-by-ta-region-country-of-origin-and-product-category

Arataki

Regional direction Murihiku – Southland

September 2023 v1.1

At a glance



Murihiku Southland is the southern-most region of Aotearoa New Zealand with just over 97,000 residents.¹ As the largest urban centre, Waihōpai Invercargill provides most core services for the wider region, including the main hospital and tertiary education.

Low population growth is projected for the whole region up to 2043. There's unlikely to be pressure on urban development in Waihōpai or the wider Murihiku region.

The region relies heavily on its extensive road networks to support rural production and tourist movement around the region.

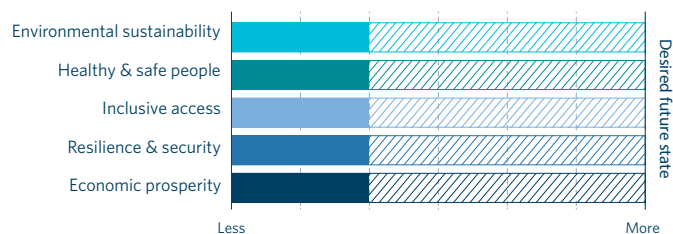
There is good capacity on the existing network and opportunities for increased rail freight. In some areas, ageing infrastructure, especially bridges, may impact network efficiency and reliability.

The region will be increasingly affected by flooding and erosion along coastal roads and low-lying areas around Motupōhue Bluff. Inland routes, including the road to Piopiotahi Milford Sound, will be affected by extreme weather events like increased rainfall and rockfall from reduced snow falls. There are also significant natural hazards risks, such as the Alpine Fault.

There is a high reliance on private vehicles for most travel needs across the region. There is a significant opportunity to build on below average rates of walking and cycling in Waihōpai, supported by ongoing investment in safe and attractive facilities. Active modes are likely to be the primary way to reduce vehicle kilometres travelled (VKT). Increasing the share of freight moved by rail and coastal shipping will also have an important role to play in reducing emissions.

Other critical transport challenges facing the region over the next three decades include safety, resilience, and supporting the transition to a low-carbon economy.

Scale of effort to deliver outcomes in Murihiku – Southland



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

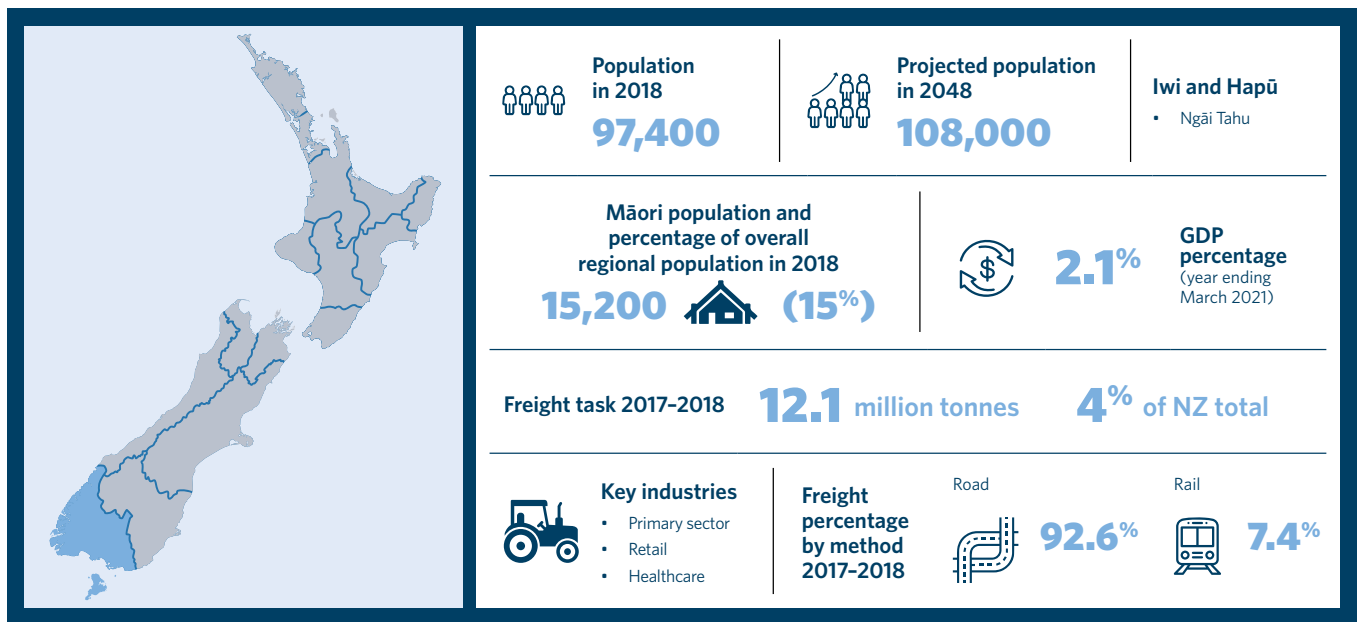
The rating assessments are based on evidence using system-levels metrics. Further details are captured in the methodology document.

The September v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Context



Murihiku – Southland



The population of Murihiku Southland is projected to grow from 97,400 to about 108,000 by 2048, or 2% of the country's population.² Low population growth means there is unlikely to be urban development pressure in Waihōpai Invercargill or the wider Murihiku district.

By 2048, residents aged over 65 are projected to make up 27% of the Murihiku, higher than the national average of 23%.³ Providing good access for residents over 65 will be important to ensure they remain socially connected, active, and able to participate in their communities.

In 2018, 15,200 Māori lived in Murihiku, making up 15% of the region's population.⁴ This is lower than the national rate of 16.5%.⁵ Most Māori live in Waihōpai, where they make up 18% of the city's population.⁶ The iwi in the Murihiku region is Ngāi Tahu.⁷

Te Ōhanga Māori - The Māori Economy 2018 includes information for the Waitaha rohe, which relates to Ōtākou, Waitaha Canterbury, Te Tai o Poutini West Coast, and Murihiku Southland regions. It notes the asset base in this rohe is valued at \$9.3 billion.⁸ The primary sector and property are both important.⁹ The Waitaha rohe has the highest number of Māori self-employed (13%) and employers (17%).¹⁰

Murihiku has an extensive network of state highways and local roads, as well as a rail freight connection linking Waihōpai and Ōtepoti Dunedin. As a rural-based economy, these networks are critical for moving goods to production centres and on to domestic and international markets.

Two key connections in and out of the region are the:

- freight movement north to Ōtepoti/Koputai Port Chalmers
- tourist connection to Tāhuna Queenstown.

The realignment of SH1 at Edendale in Murihiku provides safer and improved access for the community.

Employment growth in the region's core primary sectors is expected to continue through to 2030. Retail and healthcare are also expected to remain important employers. As a result, access for freight and the transport connection to South Port will continue to be important.

As the largest urban centre in the region, Waihōpai provides most of the core services for the wider region, including the main hospital and tertiary education. South Port in Motupōhue Bluff is the country's seventh largest port by volume, primarily handling bulk, non-containerised goods.¹¹ It also provides an important tourist gateway to Rakiura Stewart Island.

The freight task in Murihiku in 2017-2018 was 12.1 million tonnes, or around 4% of the country's total.¹² A total of 92.6% of the freight task tonnage in Murihiku was moved by road and 7.4% by rail.¹³ Primary sector commodities produced in Murihiku, representing 5% of more of the country's total in 2017-2018, were:

- Coal – 571,300 tonnes, or 17.6% of the country's coal production
- Meat – 120,000 tonnes, or 10.5% of the country's meat and meat products production
- Milk – 2.7 billion litres, or 12.8% of the country's milk production
- Wool – 20,301 tonnes, or 14.5% of the country's wool production.¹⁴

Murihiku – Southland: Outlook

While there is expected to be little population growth in Murihiku Southland, its economy is likely to shift significantly as Aotearoa New Zealand transitions to a low-carbon future.

Over the next three decades, key changes to Murihiku are:

- supporting the country's economic transformation
- making improvements to safety
- maintaining journey reliability
- improving accessibility for an ageing population.

The ageing population and higher proportion of residents on fixed incomes is likely to put pressure on the region's ability to:

- maintain existing networks
- fund new infrastructure
- provide appropriate services.

Climate change will make this even harder.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on small-scale projects and getting more from existing infrastructure
- reallocating existing road space and making temporary or low-cost improvements
- applying a better understanding of climate adaptation to transport assets – this will help manage risks and uncertainty, and support communities to adapt.

Even with these steps, more investment from a wider range of finance and funding sources, is required to achieve key goals. New sources should be investigated, especially where these incentivise growth or transport outcomes.

This section uses the *Transport Outcomes Framework* from Te Manatū Waka Ministry of Transport to support a ‘decide and provide’ approach to proactively plan the desired future state we want to achieve. Key challenges and opportunities are identified and discussed. Then we highlight the most important actions to be taken to make progress on each outcome.

Environmental sustainability

Challenges and opportunities

Murihiku Southland will need to contribute to reducing transport emissions, to reach the 2035 targets set in the government’s *Emissions Reduction Plan* and net-zero emissions by 2050.¹⁵

As the main urban centre, Murihiku presents the greatest opportunity to support national emissions reductions by providing alternative transport options and reducing the need to travel. This will require a significant change to how people travel in an urban centre with high levels of private vehicle use. This requires an increased focus on effective integration of land-use and transport to:

- reduce the need to travel
- shorten trip lengths
- support mode shift to reduce emissions.

Care is required to ensure efforts to reduce vehicle kilometres travelled (VKT) don’t unfairly impact specific communities or groups.

We need to reduce freight transport carbon through:


- adopting lower-emitting fuels
- increasing mode share for rail and coastal shipping.

We must also reduce the impact of the region’s transport system on the local environment, especially its impacts on air pollution, waterways, and ecological systems. Contaminated stormwater runoff from roads must be treated before entering waterways. The impact of new and improved transport infrastructure on the natural environment must be appropriately managed.

Making progress

Key actions over the next 10 years to make progress on this outcome are:

- ensuring appropriate standards, policies, and regulations are put in place to reduce the impact of the transport system on the local environment
- encouraging growth and development that supports compact, mixed-use urban form, reduces trip length, and lessens car dependency
- focusing transport planning towards interventions and investments that support emissions-reduction goals
- investigating changes to the allocation of space on existing roads and streets to enable and increase mode shift to public transport, walking, and cycling
- continuing to improve public transport services; this includes exploring the potential for on-demand services and ways technology can help deliver better services at lower costs
- more actively managing carparking at major destinations and employment areas to increase use of public transport, walking, and cycling for trips to these locations
- identifying opportunities for smaller projects that can improve system outcomes, like getting the most from the existing network.



To minimise congestion and support national emissions targets, there will need to be significant change to how people travel in Murihiku.

Healthy and safe people

Challenges and opportunities

Crashes in the region highlight the need to focus on Waihōpai Invercargill and surrounding areas and high-risk rural roads.¹⁶ Murihiku Southland has safety issues around:

- run-off road and head-on crashes
- crashes at intersections
- speeding
- crashes involving vulnerable users, like people cycling or walking.¹⁷

Efforts to improve road safety are guided by the *Road to Zero: New Zealand's Road Safety Strategy 2020–2030* and associated Action Plan 2020–2022, and regional safety strategies.¹⁸

Murihiku has low rates of walking and cycling because of incomplete networks. Lack of physical activity contributes to many health problems, like obesity and diabetes. These problems disproportionately impact some demographics. The harmful impacts of vehicle tailpipe pollutants on health, especially on the respiratory systems of our youngest, oldest, and most vulnerable, are much greater than previously realised.¹⁹

Significant progress on the healthy and safe people outcome will support environmental sustainability and inclusive access. Providing extensive networks of safe walking and cycling facilities will encourage more people to use these healthy and sustainable travel options. Similarly, a focus on reducing deaths and serious injuries for vulnerable road users will also encourage more people to walk and cycle.

Making progress

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Murihiku. New approaches to planning, design, and delivery, along with significant investment, are needed to accelerate progress.

Key actions over the next 10 years to make progress on this outcome are:

- continuing safety improvements targeting high-risk intersections, run-off road crashes, and head-on crashes on high-risk rural roads
- rapidly rolling out a well-connected, separated cycling network predominantly through the reallocation of existing street space
- requiring high-quality active mode infrastructure to be part of new developments
- encouraging and implementing regulatory changes that reduce harmful vehicle emissions and encourage the use of zero-emissions vehicles
- continuing to manage transport system noise through planning and mitigation
- targeting road policing and behaviour change programmes with a focus on alcohol and drug impairment, speeding, and people not wearing seatbelts
- managing safe and appropriate speeds on high-risk rural roads – this includes targeted use of safety cameras to reduce speeding
- improving safety for visiting drivers, like improved signage and markings, and providing safe journeys through to Piopiotahi Milford Sound
- advocating for robust mobile network coverage in rural and regional areas.

Continuing to realise safety plans and supporting dramatic changes to encourage walking and cycling will help the urban areas of Murihiku.

Inclusive access

Challenges and opportunities

The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access to a wide variety of social and economic opportunities.

A high reliance on private vehicles creates several access challenges, including:

- creating difficulties for those without easy access to, and use of, a private vehicle to fully participate in society
- placing significant pressure on household budgets to meet the high costs of car ownership and use
- limiting people's ability to travel in a way that best meets their needs because of poor travel choice.

Regional and rural communities need to access key centres, such as Waihōpai Invercargill and Ōtepoti Dunedin, for education, employment, and essential services.

As the population of Murihiku Southland ages, travel needs will change; there will be a greater need to access health services, and less need to access education and employment.

Emerging technologies, such as on-demand shuttles, could provide a shared-transport option. These would help people get around smaller towns and rural communities, and improve access to services in Waihōpai and Ōtepoti.


Improved access to high-quality data and information will allow better management of the transport system to get the most out of existing infrastructure.

Making progress

Improving inclusive access will often align with making progress on other outcomes, especially where travel choice is improved, and car dependency reduced. However, there may be challenging trade-offs to consider, such as balancing increased travel costs to reduce emissions while ensuring lower-income families aren't unfairly impacted.

Key actions over the next 10 years to make progress on this outcome are:

- shaping planning rules to enable and encourage more people to live in areas with better existing access to social and economic opportunities
- improving public transport services, and expanding on-demand services where appropriate
- exploring opportunities to improve the affordability of public transport for lower-income households
- expanding and improving walking and cycling facilities, so low cost, sustainable, healthy travel options are safe and attractive for more journeys
- ensuring transport infrastructure and services are designed and provided to meet the needs of people of all ages and abilities
- improving access to opportunities for iwi Māori, including access to sites of cultural significance
- exploring opportunities to support the mobile or digital delivery of essential services.



The region's transport system struggles to provide people of all ages, abilities, and income levels with safe, sustainable, and reliable access a wide variety of social and economic opportunities.

Economic prosperity

Challenges and opportunities

There is uncertainty regarding future trends, particularly the number of international visitors to the region. However, access to Piopiotahi Milford Sound and Tāhuna Queenstown will likely remain a focus.

The Milford Opportunities Project is a multi-agency approach to look at how future visitors are managed at Piopiotahi and along the Milford Road corridor.

Access for freight and the transport connections to South Port will continue to be important.

The *Southland Regional Development Strategy Action Plan* identifies where transport can support economic growth in the region with a focus on two key areas:

- supporting the tourist industry through enhanced visitor experiences, corridor improvements, and increased visitor information
- providing safe and reliable connections within the region, and north to Tāhuna and Ōtepoti Dunedin.²⁰

Over the next three decades, the transition to a low-emissions economy in line with the Climate Change Response (Zero Carbon) Amendment Act will mean significant change to the region's economy. Transport has a role to support this change. It must also be flexible to the evolving nature and direction of freight movement.

The region's large network is important for freight, but its ability to afford this will depend to a degree on the performance of primary industries. There will be greater pressure on local government to maintain infrastructure and provide services because of projected slow regional growth and an increasing number of people living on fixed incomes. Looking to 2030, councils in the region will face increased maintenance and renewal of assets, such as ageing bridges. The increasing impacts of climate change will make this even harder.

Technological change will have significant impacts on demand for travel and on the economy of Murihiku Southland. The COVID-19 pandemic accelerated working from home, while future developments, like artificial intelligence and automation, could have an impact on the type and location of work people do.

Transport planning will need to be flexible in response to these changes, recognising high levels of uncertainty around the nature and location of future jobs and the impact of this on travel patterns.


Making progress

Economic productivity and business competitiveness in the region can be improved by a transport system that provides:

- a range of travel options with wide capacity
- reliable journey times
- safe and low-cost ways of getting around.

Key actions over the next 10 years to make progress on this outcome are:

- improving access to social and economic opportunities, especially by walking and cycling, in Waihōpai Invercargill and other regional towns
- supporting resilient, reliable, and efficient freight and business travel around key parts of the network, especially around interregional connections, and to key freight and industrial hubs
- exploring opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping
- managing increased transport costs in a way that doesn't negatively impact economic activity
- supporting the continued development of key economic centres by improving access and amenity (attractiveness)
- supporting improved accessibility in local and town centres to allow these areas to flourish and better provide for the needs of residents.



There is uncertainty regarding future trends, particularly the number of international visitors to the region. However, access to Piopiotahi Milford Sound and Tāhuna Queenstown will likely remain a focus.

Resilience and security

Challenges and opportunities

The next 30 years will see a growing risk of damage to road and rail networks because of increased rain and storm intensity, coastal and soil erosion, sea level rise, flooding, slips, and storm surges.²¹ The region will see increased flooding and erosion along coastal roads and low-lying areas around Motupōhue Bluff. However, compared to other regions, Murihiku Southland only has a small number of significant resilience issues.

The biggest challenge relates to a coastal section of SH1 where flooding at high tide can result in traffic lanes submerged by over 70 millimetres; this affects all traffic, but especially freight access to South Port.

Inland routes, such as the road to Piopiotahi Milford Sound, will be affected by more extreme weather events like heavier rainfall, landslides, and increased rockfall from reduced snow falls. This is combined with significant natural hazard risks, including the Alpine Fault. The Milford Rockfall/Avalanche Protection Programme will investigate improved ways to reduce the risk of closure of one of the country's premier tourist corridors, SH94 between Te Anau and Piopiotahi Milford Sound.

More than ever, there must be a greater focus on maintaining existing assets at current levels of access and connectivity. There is a major opportunity to progress multiple outcomes by investing in maintenance and renewals, but this requires changes to current practices and increased funding.

To be resilient, the region's transport system must be able to adapt to uncertainty and rapid change. For example, in recent years the popularity of e-bikes and then the need for social distancing during the COVID-19 pandemic highlighted:

- a need for more adaptable approaches to road space management
- unexpected benefits from past improvements to walking and cycling facilities.

Rapidly fluctuating fuel prices throughout 2022, caused by international events, also emphasised the need to reduce dependency on fossil fuel.

Making progress

The transport system needs an ongoing focus on maintaining existing assets along with targeted improvements to reduce risks. We also need to expand our understanding of resilience in urban environments, to ensure planning work is flexible and adaptable to change.

Key actions over the next 10 years to make progress on this outcome are:

- continuing design and planning work to identify and prioritise responses to natural hazards in high-risk areas – this includes working with communities to identify plans for when to defend, accommodate, or retreat
- continuing work to better understand routes that provide critical connections, the conditions of these, the pressures, and the level of investment needed to address impacts – this includes identifying priorities for network resilience
- engaging in local planning processes to avoid infrastructure and development in areas at risk of natural hazards and climate change
- seeking continuous improvement in network resilience through maintenance, renewals, and 'low cost/low risk' investments
- improving operational responses to events to support quick recovery following disruption to the land transport system
- shifting to more adaptable 'scenarios-based' planning
- improving the safety and resilience of Homer Tunnel and investigating a long-term solution.



Inland routes, such as the road to Piopiotahi Milford Sound, will be affected by more extreme weather events like heavier rainfall, landslides, and increased rockfall from reduced snow falls.

Murihiku – Southland: Focusing our efforts



For efficient and effective progress, transport challenges in the region must be tackled in a cohesive way. The directions below identify the most important issues to be resolved over the next 10 years to make progress towards transport outcomes.

- Begin to reduce vehicle kilometres travelled (VKT), focusing on Waihōpai Invercargill, in a way that's fair, equitable, and improves quality of life.
- Enable and support the transition to a low-carbon economy.
- Maintain and improve the resilience and efficiency of interregional connections to the north and south.
- Improve access to social and economic opportunities, especially by public transport, walking, and cycling.
- Significantly reduce the harm caused by the transport system, especially through improved road safety and reduced pollutants dangerous to health.
- Support, enable, and encourage growth and development in areas that already have good travel choices and shorter average trip lengths.
- Rapidly accelerate the delivery of walking and cycling networks, predominantly through reshaping existing streets, to make these options safe and attractive.
- Explore the potential for new and emerging technologies, such as on-demand services, to improve access to social and economic opportunities.
- Better understand the impact of future economic transformation on travel patterns and freight volumes.
- Explore opportunities to move to a more multimodal freight system with greater use of rail and coastal shipping.
- Continue involvement in the Milford Opportunities Project to encourage resilience, tourism, safety, and mode shift for the Milford corridor, and surrounding region.
- Confirm how resilience risks will be addressed over time, and work with communities to plan for when to defend, accommodate, or retreat.
- Continue to implement road safety plans and programmes including those focused for iwi Māori.
- Improve or maintain, as appropriate, physical access to marae, papakāinga wāhi tapu, and wāhi taonga.

These will be updated over time to focus effort on the most critical matters.

References



1. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
2. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
3. Statistics New Zealand (2021). Subnational population projections: 2018(base)-2048. stats.govt.nz/information-releases/subnational-population-projections-2018base2048
4. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
5. Statistics New Zealand (2022). *Subnational ethnic population projections: 2018(base)-2043*. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
6. Statistics New Zealand (2022). Subnational ethnic population projections: 2018(base)-2043. stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043
7. Te Puni Kōkiri (2022). Find iwi by local authority. tkm.govt.nz/browse
8. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
9. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
10. Reserve Bank of New Zealand (2018). Te Ōhanga Māori 2018. rbnz.govt.nz/-/media/0212182a319f481ea4427bcf5dd703df.ashx
11. Ministry of Transport (2020). Freight movements around New Zealand. transport.govt.nz/mot-resources/freight-resources/figs/trade/tables
12. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
13. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
14. Ministry of Transport (2019). National freight demand study 2017/18. transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf
15. Ministry for the Environment (2022). Emissions reduction plan. environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan
16. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
17. Waka Kotahi NZ Transport Agency (2022). Crash analysis system. nzta.govt.nz/safety/partners/crash-analysis-system
18. Ministry of Transport (2019). Road to zero – New Zealand’s road safety strategy 2020–2030. transport.govt.nz/assets/Uploads/Report/Road-to-Zero-strategy_final.pdf
19. Waka Kotahi NZ Transport Agency (2022). Research report 696 health and air pollution in New Zealand 2016 (HAPINZ 3.0) He rangi hauora he iwi. nzta.govt.nz/resources/research/reports/696
20. Beyond 2025 Southland (2022). Regional long term plan. sords.co.nz/site/assets/files/1/sords_action_plan.pdf
21. Ministry for the Environment (2018). Climate change projections for the Southland region. environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-southland-region

Arataki

Land transport modes and strategic networks

September 2023 v1.1



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The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors.

Land transport system | modes



The land transport system refers to the movement of people and goods. It affects individuals, households, businesses, and communities. It includes all institutions, networks, purposes, and ways of travel (modes). It excludes pipelines, and separate but related parts of the wider transport system including aviation, maritime, and outer space.

There are several modes in the land transport system. These ways of moving play different roles based on their strengths, locations, networks, levels of service, and user preferences.

Historical user preference for road-based modes for moving people and goods as well as population changes have led to relatively high investment in road networks over time, an approach referred to as 'predict and provide.'

The mix of modes will change in the future as we reduce emissions, make the most of existing networks, and encourage use of public transport modes, like rapid transit and public transport.

This reflects a 'decide and provide' approach by proactively planning the desired future we want, then consistently making decisions based on what's needed to achieve this.

However, there are challenges to work through, like how we manage different modes and how they interact (such as cycling on busy roads). There are long-standing safety issues to address, such as with a road network that doesn't forgive drivers' mistakes. There are conflicts of place and movement where highways pass through communities that need to be resolved.

Walking, cycling, and micromobility

Walking and cycling are the most affordable modes of transport. These healthy and sustainable travel choices support vibrant towns and cities.

Sixty-five percent of all trips are under 5kms, within reach of a short walk or bike ride for most people.¹ As populations grow and become more concentrated in our largest cities, the role of walking and cycling for short trips will become more important.

In 2018, walking made up 10% of total time travelled and 12% of all trips.² Older and younger people walk more than those aged 25 to 64 years old.³ Those more likely to walk also include people on a lower income, without a driver's licence, and without access to a vehicle.⁴

Walking and cycling trips to work have been in decline over the last 50 years. Walking trips dropped from 14% in the 1970s to 7% in 2013 – cycling went from 4% to 3% respectively.⁵ Cycling makes up only 1% of trips nationwide, because of safety risks and concerns.⁶

Use of walking and cycling varies greatly around the country because of:

- land-use patterns
- quality of networks
- levels of service (like comfort, safety, and convenience).

While current walking and cycling numbers are relatively low, there is high demand for better infrastructure for both. In urban centres, 75% say they would cycle more if the network better met their needs.⁷

The 2014–2018 Urban Cycleways Programme was designed to fast-track cycling network development in urban areas and improve safety (and perceptions of safety) for people on bikes.

This investment of over \$333 million is already showing results. For example, since the 2012 development of the north-western cycleway in Tāmaki Makaurau Auckland, the number of people cycling has quadrupled.

Manatū Hauora Ministry of Health is looking closer at the benefits that result from walking and cycling. Their findings help the transport system support positive health outcomes instead of compounding them through road trauma, air and noise pollution, and physical inactivity. In 2010, the annual national cost of physical inactivity was \$1.3 billion.⁸

Micromobility is growing in our towns and cities. On-demand and private e-scooters, electric skateboards, and other small electric devices, are helping people move. They can be especially useful for the first and last parts of a trip, like from home to public transport and then to work. Mobility scooters for older people and electric wheelchairs also help people get around.

Challenges

Safe cycling networks are still extremely underdeveloped. Existing infrastructure is often disconnected, making safe journeys impossible.

In June 2022, only 17% of cycling networks in the largest centres provided safe, connected journeys to key destinations.⁹

Further investment and decisions about land use are necessary to provide safe and convenient travel choices. This will improve access to key places like schools, workplaces, urban centres, recreational facilities, and public transport hubs.

There are challenges to integrating new cycling infrastructure into existing road and pedestrian networks.

In urban areas, there are often competing priorities for parking, vehicle movement, and people. Multimodal transport networks in high-quality environments with lots of walking and cycling can conflict with vehicle movement.

Walking and cycling rely on safe, convenient, and easy to use routes. This requires careful integration between transport networks, land-use, and urban design.

There are also conflicts of different modes on footpaths, like between pedestrians, e-scooters, and other small electric devices. As walking and micromobility continue to grow, we need to consider how these modes can share space safely and efficiently.

Government is working to simplify the process for making changes to street layout. This will allow more dedicated street space to prioritise active modes.¹⁰

Five short-term focus areas for cycling are:

- target the rapid completion and promotion of strategic networks in urban centres (including facilities to make journeys easier) with a focus on short journeys for everyday purposes, using road space allocation as first preference
- continue to grow and connect safe urban cycling networks in regional centres
- promote economic development through safe on-road links between the New Zealand Cycle Trail Great Rides and other cycle trails
- encourage activities that maximise use of cycling infrastructure, such as engagement, education, and promotion
- lift the confidence and capability of cyclists, especially young cyclists entering the transport system for the first time.

Investment in walking follows similar principles to cycling. This focuses on safe and easy access to public transport hubs. It supports local journeys within and around activity centres.

The future

Growth in e-bikes and micromobility devices, like e-scooters, is:

- changing how people get around
- improving access to cycling
- changing the cycling experience.

Electric bike sales have doubled year-on-year since 2013.¹¹ Bikeshare schemes have launched in Tāmaki Makaurau Auckland, Te Whanganui-a-Tara Wellington, Ōtautahi Christchurch, and Tāhuna Queenstown. These activities feed into future mobility as a service and travel-demand management.

These transport devices may require new regulation and policy to manage conflicts and support users. For example, footpaths may need to widen to cope with two scooters passing. Kerb design and new services, like charging stations, may need consideration and management.

Cycle counters monitor the number of people using the cycling network. Counters enable smart, targeted investment and behavioural change.

Investment to encourage new users of active modes and improve road-user behaviour will continue to be important. A national cycling education system is in place to provide bike-handling skills.

Walking is expected to grow in urban areas and around concentrated activity centres. Here the focus is to create high-quality public spaces and provide safe, enjoyable walking facilities.

Additional focus areas are:

- supporting walking trips to and from school
- integrating walking with other modes, like public transport
- getting the transport network set up well in new development areas to create walkable neighbourhoods
- providing neighbourhoods with more route choices, direct routes, and routes that are close to key destinations
- designing walking infrastructure in towns and cities for universal access so all users can move around safely and easily.

Public transport

Public transport provides mobility to a large and diverse range of people. It is a space-efficient, sustainable travel option ideal for journeys that are too far to walk or cycle. Public transport doesn't require private vehicle ownership or use.

To make public transport an attractive travel option for a growing number of journeys, it needs to be:

- affordable
- accessible
- frequent
- reliable
- safe
- efficient.

Use of public transport grows when it's integrated with walking and cycling networks. This also helps people get physical exercise as part of their everyday routine.

Challenges

Key challenges for public transport in Aotearoa New Zealand are:

- past under-investment in public transport services and infrastructure – despite recent efforts, public transport often remains an unattractive travel choice
- insufficient corridor space in some parts of Tāmaki Makaurau, Te Upoko o te Ika a Māui Greater Wellington, and Ōtautahi to allow growing demand for peak-period bus services – this impacts service reliability and efficiency, as well as the comfort and quality of public spaces
- attraction and retention of bus drivers to offer a reliable service
- fleet transition from diesel to electric
- dispersed land-use patterns in urban areas that make it difficult to deliver attractive and efficient service
- quality and convenient services to attract and retain customers that factor in comfort, safety, accessibility, and other network connections
- regulation and funding keeping pace with change and innovation
- financial viability of public transport in areas with small populations and dispersed land – services have low users, high subsidies, and struggle to compete with car use in areas of little traffic and affordable (or free) parking
- traditional public transport services focused on larger vehicles travelling on fixed schedules along set routes – this doesn't necessarily meet peoples' travel requirements, like accessing essential services in ageing, rural communities.

The future

Public transport needs to play a much greater role in meeting travel demand. This will help Aotearoa achieve its goals of emissions reduction and inclusive access. It will also reduce congestion in major cities.

Public transport needs to move away from providing basic access and peak-time commuting. Instead, services should aim to be an attractive travel choice for a greater number, and wider variety, of journeys.

This will require:

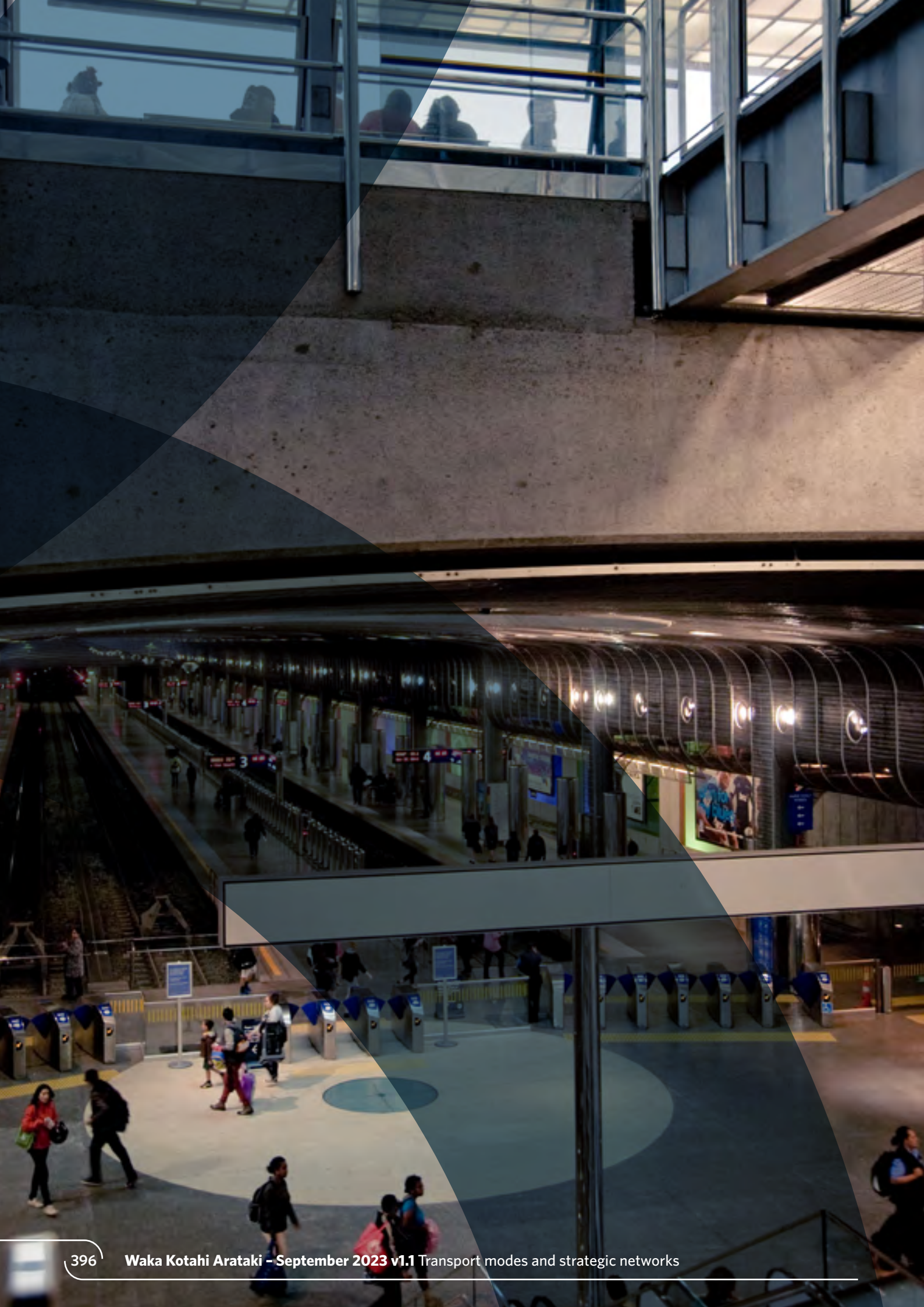
- scaling up existing modes
- providing services to education, health, and employment centres
- taking advantage of developing technologies.

In growing cities, new public transport networks will act as the spine of future networks to support growth patterns.

Electric and faster ferries will play a role in improving connectivity. They'll transport people from further afield, like Te Tara-O-Te-Ika-A-Māui Coromandel to Tāmaki Makaurau. Ferries and water taxis will also support resilience, like after a weather event or where maintenance is difficult.

Key factors for future public transport planning are:

- making significant improvements in large and fast-growing cities to encourage mode shift, reduce vehicle travel, ease congestion, and shape urban form
- integrating land use and transport planning from the beginning, ensuring public transport supports growth and land use
- looking for opportunities for transit-orientated development
- exploring opportunities to improve public transport service coverage and reliability as new modes and approaches become available
- planning focused on the sequence and priority of improvements, to improve service frequency, and reallocate road space to improve efficiency and reliability
- providing access as the population ages and fewer people hold a driver's licence and own a car
- meeting increased customer expectations for personalised journeys
- ensuring ongoing improvements to facilities to meet customers' needs
- delivering a better, more efficient service using developing technologies, like payment systems, real-time customer information, and driverless options
- developing and integrating new types of public transport, like mobility as a service, integrated ticketing and payments, and bikeshare schemes.



Rapid transit

Rapid transit forms the backbone of public transport networks in Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington. It provides fast, frequent, and reliable access for large numbers of people. It uses strategic corridors that are separated from other modes and unaffected by traffic.

Rapid transit plays a key role in the wider transport networks of these large urban areas especially in:

- connecting and providing access to major high-density employment centres
- allowing large volumes of people to travel quickly, efficiently, and reliably.

However, developing, upgrading, and operating these networks cost billions of dollars and can take more than a decade to complete.

The high costs, extreme complexity, and wide benefits of rapid transit mean investments need careful planning to deliver value for money.

Rapid travel also needs to consider how factors like ageing populations and the rise in remote working will affect future use and demand.

Challenges

Rapid transit infrastructure and services have several significant challenges.

Unlike state highways, there is no clear policy, funding, or delivery framework for rapid transit. A lack of clarity about roles and responsibilities, planning processes, funding arrangements, and decision-making processes means key issues need to be resolved on a project-by-project basis.

Historic under-investment in public transport, especially during the second-half of the 20th century, means rapid transit networks are under-developed in many cities, especially Tāmaki Makaurau, when compared internationally. Significant investment is needed to bring existing networks up to standard, like passenger rail in Tāmaki Makaurau and Te Upoko o te Ika a Māui, let alone meet future needs.

Decisions around corridors, mode, and timing have become highly politicised in recent years as there is no policy framework nor has network planning been done. The high cost and profile of rapid transit projects has also been a contributor. There remains significant risk of churn in progressing key investments. We need to clearly define when rapid transit is and isn't required.

Achieving value for money and realising the scale of potential benefits from rapid transit projects require strong integration with growth and urban development decision making. Current processes for achieving integration are generally unclear or undeveloped.

The role of Waka Kotahi in Transit Orientated Development (TOD) projects needs more clarity and is likely to be location specific.

For example, Waka Kotahi could be an investor in major transport infrastructure that unlocks a TOD partnership or could facilitate urban development by influencing partners at the planning and investment stage with minimal investment in the transport system.

Working out where, when, and how to use rapid transit requires dedicated planning. This work must factor in the complex changes to key drivers, like demographics, technology, and travel patterns, as well as the scale of change needed to achieve outcomes, like emissions reduction.

The future

In recent years, rapid transit planning has progressed in many large cities.

In Tāmaki Makaurau, a 30-year rapid transit plan is being developed to:

- confirm the rapid transit corridor needs over the next three decades
- provide an overview of the full network as the starting point for more detailed project development
- indicate how improvements should be phased over time.

Project planning work is underway for many corridors, alongside construction of the City Rail Link, Eastern Busway and other network upgrades.



Working out where, when, and how to use rapid transit requires dedicated planning.

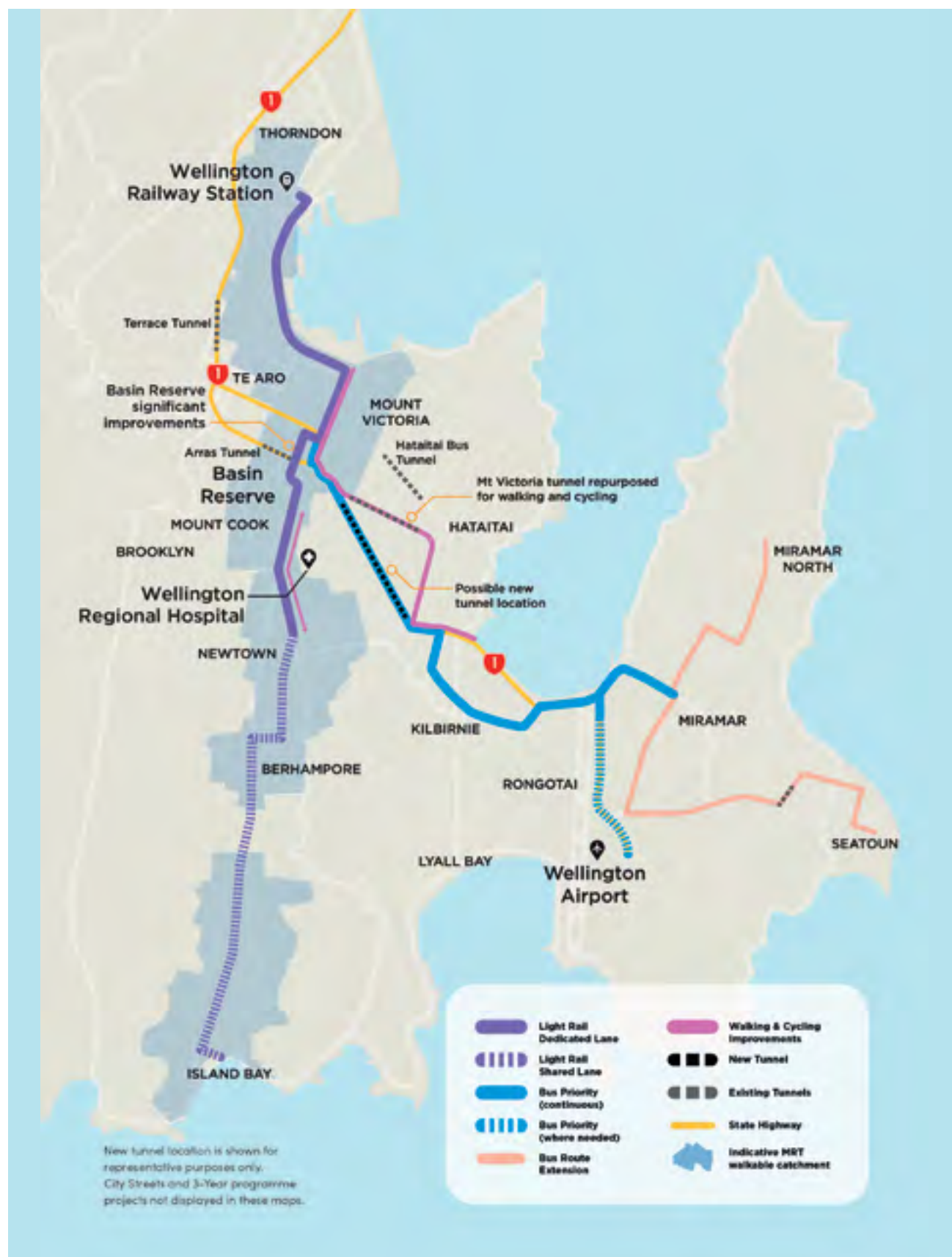
Draft Auckland rapid transit network blueprint



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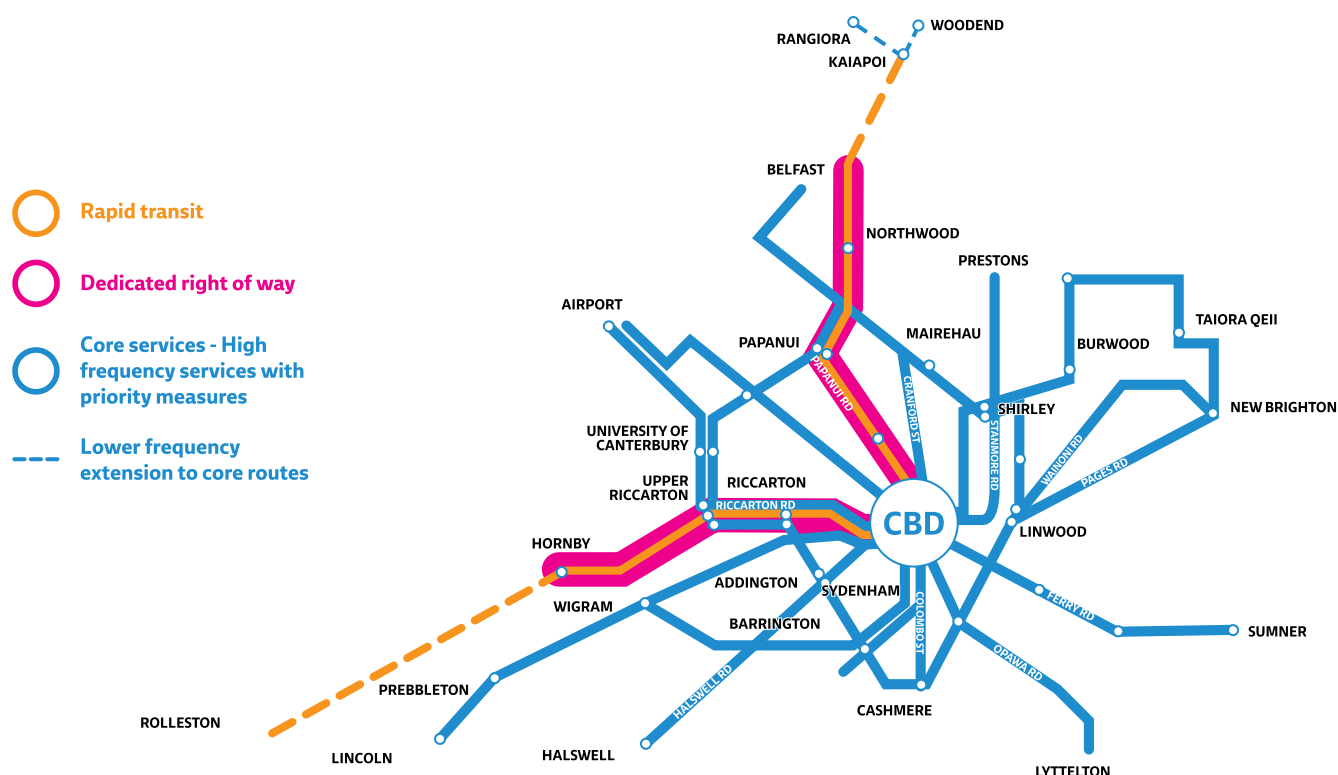
In Te Upoko o te Ika a Māui Greater Wellington, planning and improvements to the rail network continue to meet current and future needs. The Let's Get Wellington Moving programme has identified a new rapid transit corridor to the south of the city centre.¹²

Let's Get Wellington Moving preferred option



In Ōtautahi Christchurch, long-term public transport and spatial planning work have identified the need for new rapid transit corridors to the north and southwest of the city.¹³

Proposed Christchurch public transport network



In other major urban areas, like Kirikiriroa Hamilton and Tauranga, spatial planning has identified the potential need for future rapid transit corridors. These will deliver key transport outcomes and shape the future urban form of these cities.

Te Manatū Waka Ministry of Transport is developing a *Rapid Transit Framework* to provide a clearer, nationwide approach to planning, funding, and delivery of rapid transit.

Once in place, the framework will allow work on rapid transit to progress in an efficient and effective manner.

In the meantime, effort is focused on:

- planning to protect future corridors
- delivering several in-flight projects around the country.

Heavy rail

The rail network consists of the main trunk line stretching from Tāmaki Makaurau Auckland to Invercargill. It's connected across the Cook Strait by ferry with spurs to Te Tai Tokerau Northland, Te Moana a Toi-te-Huatahi Bay of Plenty, Taranaki, Te Matau-a-Māui Hawke's Bay, and Te Tai o Poutini West Coast.

Rail serves all ports except Northport (Marsden), Tairāwhiti Gisborne, and Whakatū Nelson.

Double-tracked lines run from Tāmaki Makaurau to Kirikiriroa Hamilton, along most of the metro lines in Tāmaki Makaurau and Te Upoko o te Ika a Māui Greater Wellington, and some lines around Ōtautahi Christchurch. The remaining network is single track with passing loops.

Most of the rail network is used for freight. Rail transports around 25% of New Zealand's exports and has a natural competitive advantage for moving heavy goods over longer distances.¹⁴

Rail provides a lower-carbon alternative for freight transportation when compared with road, with 66% fewer carbon emissions per tonne of freight moved.¹⁵

Nearly half of freight tonnage is carried by rail in the golden triangle between Tāmaki Makaurau, Kirikiriroa, and Te Moana a Toi-te-Huatahi. Rail is a critical part of the freight supply chain to the Port of Tauranga, New Zealand's largest export port.

The Tāmaki Makaurau and Te Upoko o te Ika a Māui rail networks are electrified, as is the section of the North Island Main Trunk Line between Kirikiriroa and Papaioea Palmerston North. The remainder of the network is operated by diesel locomotives.

In Tāmaki Makaurau and Te Upoko o te Ika a Māui, commuter rail services are an important part of the rapid transit system, particularly in and out of city centres.

Rail offers some of the most acclaimed luxury tourism journeys in the world through The Great Journeys of New Zealand. Rail carries an increasing number of tourist passengers each year. The three long-distance passenger services are:

- Tāmaki Makaurau to Te Whanganui-a-Tara Wellington (Northern Explorer)
- Ōtautahi to Māwhera Greymouth (TranzAlpine)
- Waitohi Picton to Ōtautahi (Coastal Pacific).

Challenges

Current operational challenges for rail include:

- continuing the Main North Line rebuild effort (Kaikōura coast) to move goods in the South Island, reconnect communities, and ensure Aotearoa New Zealand has an efficient rail network across both islands
- servicing growing commuter and freight demand on urban networks, particularly in the Tāmaki Makaurau Auckland region
- maintaining a strong focus on safety, including improvements to level crossings with higher frequency train movements, particularly in Te Upoko o te Ika a Māui Greater Wellington and Tāmaki Makaurau
- building network resilience, like planning for extreme weather events and climate change
- maintaining aged rolling stock – many parts of freight rolling stock are past end-of-life and require significant maintenance that can limit capacity in some areas.

Rail also faces several strategic challenges:

- increasing mode share, and encouraging rail as a sustainable transport solution and alternative to increasing traffic congestion in urban areas
- working across the transport sector to integrate transport planning and maximise the value and usefulness delivered by each mode.

The future

Rail will play a key role in supporting export trade and providing resilience to the broader transport network.

Points of difference are likely to remain:

- separate corridors
- unobstructed access to key freight hubs
- low-carbon emissions.

Rail also plays a key role in

- reducing road maintenance and upgrade costs
- easing traffic congestion
- providing an alternative transport mode for resilience purposes.

The ability of rail to provide additional freight capacity on key routes across the network is an opportunity for future growth.

In the short-to-medium term, it's expected rail will provide support to meet future demand for rapid transit in Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington. In South Auckland, there will be scope to extend commuter services to support population growth.

Rail for interregional tourism and interregional passenger services should be explored for future opportunities and offerings, especially for the choice and efficiencies that can be gained for customers.



Coastal shipping

As an island nation, coastal shipping and ports are vital to our transport system.

Ports are the access point for much of the country's imports and exports. Coastal shipping moves bulky items, particularly for longer interisland journeys.

The Cook Strait ferries are a critical link between the North and South Islands for:

- passengers
- freight-carrying trucks
- freight-carrying trains on roll-on roll-off (RORO) ships.

Coastal shipping provides longer interregional journeys within Aotearoa to move large, bulky items like logs, cement, containerised goods, and fertiliser.

Coastal shipping carries around 14% of all freight-tonne kilometres travelled in Aotearoa and 2% of tonnage.¹⁶ Coastal shipping adds resilience to the overall transport system by providing options and capacity.

Major coastal ports include:

- Northport (Whangārei)
- Port of Tauranga
- Port of Auckland
- Lyttelton Port.

Land transport port connections are some of the most important corridors in the transport system.

Inland ports continue to develop in Aotearoa and play an important role in:

- sorting and distributing freight away from seaports
- freeing up constrained port land for maritime activities.

Key inland ports include Southdown (Penrose, Auckland), Wiri (South Auckland), Ruakura (Hamilton – currently under construction), and Rolleston (Christchurch).

Inland ports influence the type of transport mode freight is distributed on. This means it is vital inland ports are in the right place to allow use of different transport modes, like road freight, rail, or air.

Ports are important for the movement of people. Aotearoa currently has commuter ferries in Tāmaki Makaurau Auckland, Tauranga, Te Upoko o te Ika a Māui Greater Wellington, and Ōtautahi Christchurch.

These ferries reduce peak-hour congestion by moving people who might otherwise travel on roads. The country's ports also provide a key tourism channel for visitors on cruise ships.

Challenges

Current operational challenges for coastal shipping include:

- addressing labour shortages and an ageing workforce, particularly as the sector grows following investment through the Coastal Shipping Activity Class, and with several companies launching a new coastal shipping service
- competing with international shipping services for domestic cargo, and import and export cargo transshipment when freight is transferred between ships or different forms of transport
- handling supply-chain disruption, like the effects of COVID-19, felt at ports that handle large volume imports and exports.¹⁷

Coastal shipping also has several strategic challenges including:

- increased mode share
- the role of coastal as a sustainable transport solution
- work across the transport sector to integrate transport planning
- work to maximise the value and utility of each mode
- changes to and pressures on international supply chains
- the ability for port facilities to service larger vessels.

The future

There's an opportunity for coastal shipping to play a greater role in moving freight around the country. This could support:

- additional resilience in the supply chain
- smaller ports and regions connected directly to their markets
- re-prioritisation and locations of existing ports
- making the most of the existing freight network and existing connections, like rail.

Investments made through the Coastal Shipping Activity Class in the 2021-24 National Land Transport Programme will make coastal shipping a viable alternative to strengthen and diversify our domestic supply chain.

Road transport

Roads are the most important element of our domestic transport system. Roads enable journeys by:

- private motor vehicle
- heavy vehicle
- bus
- bicycle
- foot.

Road corridors support other important infrastructure like:

- water
- power
- gas
- telecommunications networks.

Road transport makes up 84% of freight land movement. Road tonnage per kilometre has increased over time, from 19 billion tonne km in 2005–2006 to 30.1 billion tonne km in 2017–2018.¹⁸

Goods vans, trucks, and utility vehicles make up 15% of the total Aotearoa vehicle fleet.¹⁹

The New Zealand road network is made up of two broad classifications: state highways and local roads.

The state highway network connects all main population centres, seaports, and airports. It is one of the country's most important pieces of infrastructure. The state highway network makes up 12% of New Zealand's total road network, but carries 50% of vehicle traffic.²⁰

Local roads are administered by city and district councils. They range from low volume residential streets to large arterials that move high volumes of people and goods.

The local road network provides coverage across urban and rural areas. Most journeys start and end on the local road network. The local road network is critical to enabling local journeys. It also connects the primary sector to wider distribution networks.

In 2020, there were over 4.4 million registered motor vehicles that were driven 46 billion kilometres.²¹ Of this fleet total, just over 90% are light vehicles.²² Seventy-seven percent of the light fleet is petrol engine.²³

The heavy fleet consists of trucks and buses. The remaining categories include motorcycles and unclassified vehicles, like agricultural equipment.²⁴

While the national average of light vehicle ownership is high, there is significant regional variation. For the last decade, Te Upoko o te Ika a Māui Greater Wellington and Tairāwhiti Gisborne had the lowest ownership rates per capita.²⁵

South Island regions, except Ōtākou Otago, are well above the national average.²⁶ In the North Island, only Te Moana a Toi-te-Huatahi Bay of Plenty is consistently above the national average.²⁷

While cars have become more efficient, we're buying larger vehicles and driving further. This means emissions reduction is less than expected.

In 2020, the average CO₂ emissions of light vehicles entering the fleet was 191 g/km, a 19% decrease from 2005.²⁸

In 2022, 21% of passenger vehicle imports were reduced-emission vehicles.²⁹

The average age of the vehicle fleet is getting older. In 2020, it was 14.3 years.³⁰ This means a higher proportion of cars on the road are without the latest safety features. This increases the risk of people dying or being seriously injured in road crashes.

Cars provide a vital role in the transport system. Each year, 82% of time spent travelling is either as a driver or passenger in a car or van.³¹ Drivers cover 37,629 million km per year, or 63% of all distance travelled.³²

Cars are also an essential role for:

- tourists
- provincial and rural communities
- carpooling or sharing a car journey on a regular or ad hoc basis
- private transport in urban areas like taxis, on-demand car hire, and short-term vehicle rental schemes.

In 2020, there were over 167,000 heavy vehicles registered that were driven 3.3 billion kilometres.³³ Trucks, carrying freight, are a major contributor of heavy vehicle travel.

Ageing trucks and used imports result in an older truck fleet.³⁴ While 66% of trucks in the 2020 fleet were new, less than half of the new trucks were made in the last 10 years.³⁵



The state highway network makes up 12% of New Zealand's total road network, but carries 50% of vehicle traffic.

Challenges

Current challenges facing road transport in Aotearoa include:

- reducing harm and fatalities on our roads
- reducing light vehicle kilometres travelled (VKT) by 20% by 2035
- increasing zero-emissions light vehicles to 30% by 2035
- supporting residential development in high-growth urban areas that are affordable and great places to live
- rising transport demand from population growth and increased economic activity, including tourism
- ensuring interregional routes have an appropriate level of service that is reliable, resilient, fit for purpose, and safe – despite challenges of topography, geology, and seasonal impacts
- allocating urban road space to different modes
- matching road space to the function of the road, like street parking
- maintaining networks and services given pressures from population growth or decline, and climate change
- maintaining networks and services for active modes and mobility users where facilities haven't been provided.

The future

Population growth will increase demand on the transport system. Growth will be greater in some parts the country than others.

By 2043, New Zealand's population is expected to reach 5.9 million people, with most growth in urban centres.³⁶

An ageing population that continues to work could mean more older drivers. Younger people may drive less, as the rate of applying for a driver's licence has slowed over recent years.

Technological changes will have a significant impact on how the road network is used in Aotearoa New Zealand. Timeframes depend on many factors, like the country's slow rate of private vehicle turn-over.

In the short term, increased technology use could help us get more out of our existing roads through better network management. This includes asset management and renewal, as well as providing real-time information to users.

Personal access to data is allowing customers to plan travel and make informed choices. Options like mobility as a service (MaaS), automated ticketing, and ride sharing will give customers many options based on time, cost, and quality.

In the long term, connected and autonomous vehicles may make travel time more productive – though these vehicles could also result in increased travel demand. Safety-related technologies could bring significant benefits to road users. Electric vehicles will need new infrastructure, such as charging stations.

Climate change is expected to affect the road transport network. In line with the *Emissions Reduction Plan*, we expect an increased consumer demand for:

- low-carbon transport
- electric vehicles
- public transport services
- walking and cycling facilities.³⁷

Climate change may require a review of the location of some roads because of flooding and landslides from weather events. With sea levels forecast to rise, coastal erosion and inundation in low-lying coastal areas will increase the need for repairs, relocation, and preventative measures.



International maritime and aviation transport

While *Arataki* is focused on the land transport system, it should include an understanding of the current and potential role of international maritime and aviation transport.

Ports and airports are key demand drivers for the land transport system. For example, drones are likely to play an increasing role in moving people and freight.

Arataki isn't the appropriate document to discuss and determine the future direction of international maritime and aviation transport, but it will be informed by available insights.

International maritime transport

The coastal shipping network in Aotearoa is part of a wider maritime supply chain.

There is a growing global trend of using larger ships to move international freight. That trend has been seen in Aotearoa and is expected to continue. This may change patterns of port use around the country as import and export freight functions, particularly containerised freight, are consolidated in fewer ports.

This means some export freight will need to move longer distances (either by land or coastal shipping) to fewer destinations, like larger consolidation centres and major container ports.

Currently, most imports arrive through the three northern-most ports: Te Tai Tokerau Northland, Tāmaki Makaurau, and Tauranga. This is expected to continue given these ports are closest to our trading partners and are well positioned to serve the largest domestic markets in the Upper North Island.

Aviation

Air transport is suited to freight that is high-value, low-volume, and time sensitive.

While air freight accounts for 1% of freight movement by volume, by value it represents 22% of imports and 16% of exports (to June 2016).³⁸

Auckland Airport receives 87% of New Zealand's air freight, followed by Ōtautahi Christchurch, and a small amount through Te Upoko o te Ika a Māui Greater Wellington.³⁹

Providing reliable land transport connections to airports is important for the movement of people and goods to support New Zealand's economy. Aviation also acts as a backup for land transport in emergency situations.

Most international visitors arrive in Aotearoa New Zealand through airports in Tāmaki Makaurau Auckland, Ōtautahi Christchurch, Te Upoko o te Ika a Māui Greater Wellington, Tāhuna Queenstown, and Ōtepoti Dunedin.

International visitors have increased dramatically in recent years, jumping from 2.6 million in 2011 to 3.89 million in 2019.⁴⁰

COVID-19 dramatically affected international arrivals, with 528,000 arrivals in the year to April 2022.⁴¹ Over time, we expect a gradual return to pre-pandemic levels.

Growing international visitor numbers impact how airports connect to the transport system. Airport facilities have undergone, or will undergo, infrastructure upgrades to cope with growth.

Domestic air travel also plays an important role in supporting business and personal trips within Aotearoa. Air travel is increasingly replacing land-based trips for longer trips between cities and between the North and South Islands. It's difficult to predict whether this trend will change as climate change measures are taken.

Advances in drone technology will mean greater integration of the aviation and land transport systems. For example, drones will likely use existing land transport corridors within towns and cities. Drones may also be useful as tools for managing and surveying parts of the network. Appropriate regulatory settings and infrastructure are required to ensure the safety of people, vehicles, and property.

Strategic networks

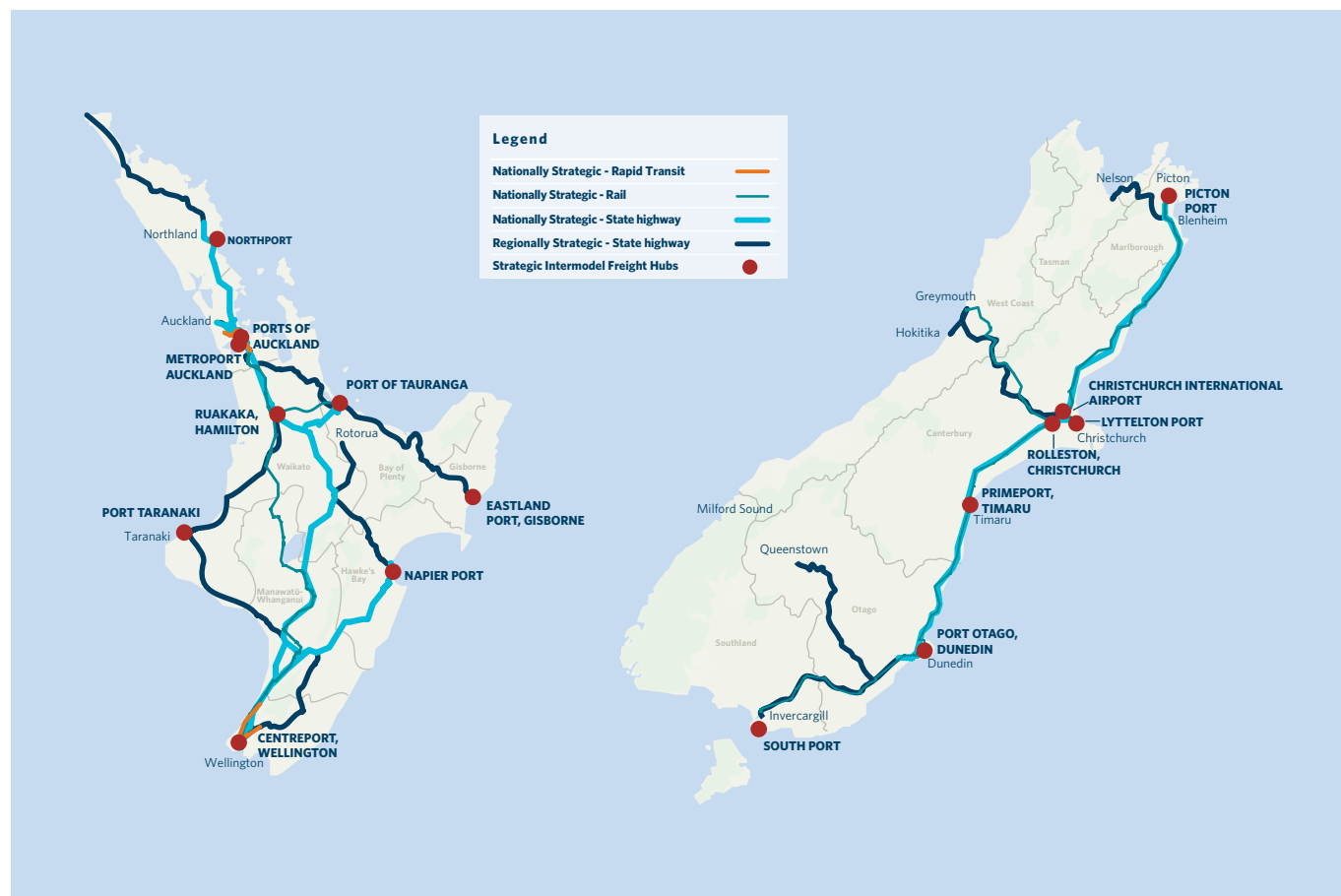


Strategic networks are the most critical parts of the country's land transport network. They form the backbone of the entire transport system, supporting the most essential movements of people and freight across all modes.

Many of these networks across Aotearoa have been in place for a long time. They've shaped the way the country has grown and developed. Many towns and cities exist where they do because of past or current strategic transport routes.

North Island strategic networks

South Island strategic networks



Our Current Network map →

Strategic networks play a major role in our daily lives. We use them to shop, access recreation, catch public transport, or cycle to school and work. The goods and services we purchase have been transported – often on multiple occasions – along these routes.

Because we are so reliant on strategic networks, the consequences are significant when there are performance issues.

Strategic networks will play an important role as we work towards our transport outcomes and address current and future challenges.

Our strategic networks across road, rail, rapid transit, and active modes will need to be high performing. They'll need to work together as a system to move large volumes of people and freight safely, reliably, and sustainably.

Some existing networks will need refinement and extension, like rapid transit in Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington. Others will be adapted progressively, starting with targeted improvements.

In Kirikiriroa Hamilton, Ōtautahi Christchurch, and Tauranga, rapid transit networks are likely to start with more frequent services that are improved and extended to meet future demand.

This section of *Arataki* outlines the necessary steps over the next three decades, so our strategic networks make the best contribution to the Te Manatū Waka Ministry of Transport's *Transport Outcomes Framework*.

At a national level, this section:

- describes the role of strategic networks and how they work within the wider transport system
- explains the challenges and opportunities for strategic networks over the next 30 years
- outlines how strategic networks should be maintained and improved over time.

At a pan-regional level for the Upper North Island, Lower North Island, and South Island, this section:

- identifies the current strategic networks and key drivers of change
- identifies where transformational change may be required and provides direction about work in those locations.

Role and function

Role of strategic networks

Strategic networks are high-performing parts of the land transport network. They make a significant contribution to achieving transport outcomes at a national level.

Strategic networks make up a relatively small proportion of the overall transport network – yet carry a significant amount of the country’s people and freight.

There are a few things that make strategic networks different from the rest of the transport network. Strategic networks have corridors that:

- are critical to the overall network
- handle large volumes of use
- are in significant locations
- are large-scale contributors to transport outcomes.

While all strategic networks have the characteristics above, each play a specific role depending on their mode and location.

For example, the role of strategic rail networks varies by location. In major urban areas, they form a large part of rapid transit networks that carry lots of passengers. In rural areas, rail networks are focused on moving large freight volumes over long distances between major cities and ports.

Some modes, like walking and cycling, are better for shorter journeys. Strategic networks for these modes tend to be located within towns and cities. They can look quite different from road- and rail-strategic networks.

The following table outlines the role of strategic networks in different areas.

	Urban	Interregional and rural
Road	<ul style="list-style-type: none"> • provides safe and reliable freight access to ports and airports • provides the most critical road connection to, or through, a major urban area. 	<ul style="list-style-type: none"> • provides primary connections between major population centres • provides safe and reliable freight access to markets.
Rail and rapid transit	<ul style="list-style-type: none"> • moves large numbers of people across key transport bottlenecks and into highly-constrained areas • supports and shapes growth and urban development • provides efficient, sustainable, and reliable freight access to ports and major distribution centres. 	<ul style="list-style-type: none"> • provides efficient and sustainable movement of large freight volumes across long distances, between cities, and to/from ports and major distribution centres • plays a growing role for larger volumes of sustainable, interregional passenger movement.
Active modes	<ul style="list-style-type: none"> • are the backbone of urban walking and cycling networks • enable healthy, reliable, and sustainable travel for short-to-medium length journeys. 	<ul style="list-style-type: none"> • need further work to determine if strategic active mode networks are appropriate for these locations.

Strategic road networks

There are two parts to the roads network:

- nationally-strategic
- regionally-strategic.

Some roads play an important national function by connecting cities, towns, and regions. These are nationally-strategic road networks.

Some roads serve important regional functions, like connecting areas, acting as lifelines, and offering alternate routes. These are regionally-strategic networks.

Nationally-strategic roads network

The nationally-strategic roads network acts as the spine of the network. It serves critical functions by:

- providing important primary connections between population centres, ports, and urban areas
- performing national-level functions
- linking major freight hubs to cities
- supporting in-region and interregional travel
- having trips of high volumes and value.

Regionally-strategic roads network

These roads perform strategic functions at a regional or sub-national scale by:

- providing interregional connections
- connecting areas to the spine of the network
- providing a lifeline for areas with a single connection
- providing alternate routes in the event of disruption or closures.

Strategic rail network

The strategic rail network provides the efficient and sustainable movement of large freight volumes across long distances between cities, ports, and major distribution centres. It has a growing role in sustainable interregional passenger movement.

Priority Lines, as classified by KiwiRail in the Rail Network Investment Programme (RNIP), make up the current strategic rail network.⁴²

In Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington, the strategic rail network and rapid transit networks overlap.

Rapid transit network

The rapid transit network moves large numbers of people across key transport bottlenecks and into highly-constrained areas. It supports and shapes growth and urban development, especially quality, compact design.

Only Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington have a rapid transit network. These are largely made up of passenger rail systems. The rapid transit network in Tāmaki Makaurau includes the Northern and Eastern busways.

Strategic walking and cycling networks

Strategic walking and cycle networks form the backbone of urban active modes. They allow healthy, reliable, and sustainable travel for short-to-medium length journeys. They support neighbourhood trips to shops, schools, services, and work.

Strategic walking and cycle networks are different to other networks. There is less hierarchy across different walking and cycling routes. This makes them more extensive.

Strategic walking and cycling networks include:

- **One Network Framework (ONF) class C1** – A primary strategic cycling network, intended to support high volumes of cyclist movement.
- **ONF class C2** – A secondary strategic cycling network, providing key connections to schools, community facilities, or employment.
- **ONF class W1** – Key routes within primary walking areas connecting pedestrians with key destinations and places of significance.
- **ONF class W2** – Key routes within secondary walking areas, providing key connections to local destinations and access to W1 networks.

Intermodal freight terminals

Intermodal freight terminals support freight movement and cruise ships. They include:

- national and regional ports
- interisland connections at Te Upoko o te Ika a Māui Greater Wellington and Waitohi Picton
- inland hubs
- major international airports.

Challenges and opportunities

Our strategic networks contribute greatly to Te Manatū Waka Ministry of Transport's *Transport Outcomes Framework*.

This section outlines the key challenges and opportunities in achieving transport outcomes.

Inclusive access

Strategic networks play a major role in helping people of all ages, abilities, and income levels access social and economic opportunities.

High-performing strategic networks allow large volumes of people to travel safely, reliably, and sustainably. This is especially critical in urban areas where jobs, healthcare, and educational activities are often clustered in high-density centres.

Providing a selection of high-performing travel options allows people to travel in ways that work for them.

In rural areas, strategic networks are often the only way people can access social and economic opportunities. These networks perform key lifeline functions – they allow people to access employment, education, healthcare, and other essential activities.

Current challenges and opportunities

In larger towns and cities, high reliance on private vehicles creates access challenges.

Strategic networks become overwhelmed at peak times. This leads to congestion, delays, and poor travel-time reliability for thousands of people.

Delays reduce the number of social and economic opportunities people can access within a set travel time. This also reduces overall quality of life.

Urban areas with underdeveloped rapid transit and strategic active mode networks offer few opportunities for people to avoid congestion or use these travel options.

Poor access and travel choice can limit opportunities to thrive and participate in society. This is especially true for people who live in high-deprivation areas, or who have specific mobility needs.

In provincial and rural areas, people often have few travel choices. They sometimes experience long travel times to access social and economic opportunities.

There is high reliance on private vehicles for all but the shortest journeys. This is because of reduced inter-city passenger rail services and very limited public transport services.

Being dependent on a car can be very expensive. Transport makes up an increasing proportion of household budgets, up to 28% in 2019.⁴³ This means money may go towards transport instead of other critical necessities.

Future challenges and opportunities

Future demand on strategic networks is likely to be highly variable over the next 30 years.

Most population and economic growth is expected to occur in a few parts of the country, particularly in urban areas of the Upper North Island.

Climate change will require less light vehicle travel over time.

Ageing and declining populations in some parts of Aotearoa mean inclusive access challenges of the future may be quite different than today.

Key issues will be about using strategic networks in new and different ways to provide access to everyone.


Technology developments will offer new and fair ways to provide access.

For areas of high growth, climate change and urban development will be important considerations to ensure inclusive access to strategic networks.

Strategic road networks in urban areas will play a multi-modal role in the transport system. Some locations need to provide access to rapid transit and strategic active mode infrastructure. That way, people will use fewer vehicles and reduce CO₂ emissions.

Rail infrastructure may be more heavily used in the future. This could create conflicts between freight and passenger services that will need to be worked through.

There is a major opportunity to use strategic networks to shape growth and urban development. For example, strategic networks could create more compact, mixed-use communities where people make shorter trips and rely less on private vehicles.



Strategic networks play a major role in helping people of all ages, abilities, and income levels access social and economic opportunities.

Key areas of focus

Some key areas to focus efforts:

- understand future travel demand across different strategic networks, in light of changing population, economic trends, and climate change
- understand how strategic networks can take a fair approach and improve access for everyone
- explore opportunities, like technological developments, to improve travel choice for all areas and parts of society
- expand and upgrade under-developed strategic networks (rapid transit, rail, and active modes), especially in large, fast-growing urban areas.

Economic prosperity

Strategic networks play a fundamental role in supporting New Zealand's economic prosperity.

These critical networks support economic activity by connecting businesses with their workers, customers, suppliers, and other businesses.

They allow products to connect to domestic and international markets, starting from producers through to ports and airports. They help imports reach customers, efficiently and effectively.

They are often the routes used most by tourists and contribute to economic activity across many parts of Aotearoa.

We can boost economic productivity and business competitiveness by offering a range of travel:

- options
- journey times
- reliability
- capacity
- improved economic productivity and cost.

Because strategic networks play a major role in the movement of people and freight, well-targeted improvements can have transformational impacts on economic prosperity.

There can also be wider indirect benefits, especially in urban areas where transport:

- supports the key functions of cities (agglomeration)
- enables housing supply and urban development
- increases labour pools and job opportunities.

Current challenges and opportunities

Some strategic networks in major cities are overburdened, underdeveloped, and inefficient. These networks struggle to provide access to economic opportunities. They experience delays and poor reliability that drive up costs.


Past efforts to improve network performance have been less effective than hoped.

For example, adding extra traffic capacity to roads improves travel times and reliability. But these efforts are short-lived and encourage more people to drive.

Improvements to rapid transit and strategic active modes have generally increased use of these travel options. Yet gaps in these networks mean they still play a small role in meeting travel demand (apart from a few key journeys like access to city centres at peak times).

Outside major urban areas, strategic networks support economic prosperity by providing reliable and efficient travel for people, goods, and services. However, there remain key challenges, including:

- past under-investment in the rail network means substantial effort is required to provide a resilient and reliable freight option
- some regions face significant social deprivation – this appears linked to areas of lower transport accessibility and connectivity
- network resilience risks are becoming more frequent because of extreme weather events – closures to strategic networks often have severe and widespread economic impacts.



Strategic road networks in urban areas will play a multi-modal role in the transport system. Some locations need to provide access to rapid transit and strategic active mode infrastructure.

Future challenges and opportunities

Strategic networks will need to be managed and progressively upgraded to connect people to jobs, education, and training.

In urban areas, demand varies greatly. This means it can be hard to predict where new services will be required. As a result, there can be delays to required upgrades.

In rural areas, strategic networks that support freight traffic and tourism would benefit from targeted efforts to increase efficiency. These areas are likely to see a shift away from fewer, large-scale projects. Instead, projects may focus on small improvements to key parts of the network to deliver return on investment.

There's an opportunity to shift more long-distance freight to rail and coastal shipping. This will:

- free up the strategic road network for vehicle traffic
- reduce the number of heavy vehicles through small communities
- reduce emissions
- improve freight reliability.

Key areas of focus

Some key areas to focus efforts:

- better understand likely future travel demand across different strategic networks by considering population changes, economic trends, and private vehicle travel reduction to tackle climate change
- maximise use of existing infrastructure, through maintenance and demand-management tools, like pricing
- target efforts to maximise efficiency for tourism and freight
- expand and upgrade under-developed strategic networks, especially in large and fast-growing urban areas.

Healthy and safe people

Given the large volumes of people and freight that travel strategic networks, any safety risk on these networks creates a high level of collective risk.

It also means safety improvements on these networks will benefit a lot of people, and greatly reduce:

- deaths and serious injuries from road crashes
- air pollution
- noise.

Strategic networks may affect:

- how safety improvements are made
- what the key risks are.

This could be driven by things like a higher-than-normal volume of heavy vehicles, or existing issues because of geography.

Infrastructure investment in these routes mean safety improvements can be made in a way that retains efficiency. But investment often comes with a substantial upfront and on-going cost.

Strategic networks carry large volumes of cars and trucks, including diesel vehicles. As a result, these networks have a high concentration of harmful pollutants and noise. This impacts physical and mental health.

Reducing emissions could have significant health benefits. It could be particularly beneficial in areas with high-population densities, and where housing is centred around transport nodes.

Active mode networks also have physical health and wellbeing benefits. They encourage physical activity, like walking and cycling, to meet everyday travel needs.

Current challenges and opportunities

An unacceptable number of people are killed or seriously injured on our roads each year.

The Road to Zero programme aims for a future where no one is killed or seriously injured in road crashes. Meeting this vision requires us to make improvements on the strategic network.

Strategic networks have health and safety implications because they:

- make up a large number of trips
- have the highest vehicle speed limits
- pose risks for people walking and cycling.

Strategic networks carry large volumes of cars and trucks, including diesel vehicles. As a result, these networks have a high concentration of harmful pollutants and noise.

Safety on much of the strategic road network is below standard, with little margin for error. Small mistakes on these high-speed, high-volume roads can easily cause major tragedies. This is heightened by factors like weather, congestion, and fatigue.

Addressing this means we need to target safety improvements on many parts of the network.

In towns and cities, strategic networks can become dangerous routes, especially as increased volumes are made up of heavy vehicles. This can cut off communities and create conflicts with active modes.

The rail network has similar issues, with the added problem of level-crossing safety.

Emissions and noise have a serious impact on health.⁴⁴ More than 3,300 adult New Zealanders die prematurely each year from air pollution, mostly from diesel motor vehicles; another 38,000 people are exposed to high levels of noise from state highways and major local roads.⁴⁵

Some strategic active mode networks are underdeveloped. If safety infrastructure was improved, these networks could encourage more mode share, especially cycling, to deliver better health outcomes.

Future challenges and opportunities

With increasing growth and demands on the network, health and safety challenges will likely continue over time. That is, unless there is substantial mode shift for freight and people.

In urban areas, continued growth will likely mean ongoing conflicts between different modes. Better integration of land use and transport will reduce exposure to air pollution and noise.

Safer networks will help reduce deaths and serious injuries. Our safety responses must keep pace with changes.

Key areas of focus

Some key areas to focus efforts:

- make strategic networks more forgiving of driver errors
- reduce deaths and serious injuries from road crashes
- expand active modes and make them safer
- expand public transport networks as safer modes
- reduce conflicts and negative impacts in highly-populated areas.

Environmental sustainability

Vehicles are a major source of transport emissions along strategic networks. They also present an opportunity for major emission reductions through:

- developing rapid transit and active mode networks in urban areas
- encouraging rail and coastal freight to play a greater role in the movement of goods.

Strategic networks are often major pieces of infrastructure. They can affect an environment's biodiversity and water quality. The impact to the environment needs great consideration when building and operating these networks.

Current challenges and opportunities

Strategic networks can create transformational improvements to encourage sustainable travel options, like public transport, walking, and cycling.

Given the scale of mode shift and reduction of vehicle kilometres travelled (VKT) needed to meet emissions goals, strategic networks will be critical to the step-change required. This should be a key focus in urban areas.

Many strategic networks, even in urban areas, aren't multi-modal or contribute positively to environmental outcomes.

Some pass through constrained environments but are often the only available strategic network in an urban area.

Enabling transport connections to public transport, walking, and cycling will help avoid or minimise costly activities, like tunnelling, elevation, demolition, and land purchase.

According to Health and Air Pollution New Zealand (HAPINZ)

3,300

adult New Zealanders die prematurely from air pollution each year.



38,000

people are exposed to high levels of noise from state highways and major local roads each year.

Future challenges and opportunities

Emissions reduction challenges will grow over time as we work towards a net-zero emissions transport system by 2050.

While the vehicle fleet will decarbonise, there will be an ongoing need to reduce VKT beyond the 2035 target. This means encouraging mode shift for emissions-reduction purposes and improving access.

We also need to reduce the impact of strategic networks on biodiversity and other localised environmental issues, like water quality.

Key areas of focus

Some key areas to focus efforts:

- encourage sustainable-travel options, especially in urban areas
- improve how we handle the impacts of strategic networks, like management of stormwater through nature-based solutions
- maximise opportunities to use strategic corridors as biodiversity areas
- make the most of existing networks

- find ways to integrate multi-modal connections within constrained corridors
- support mode shift to reduce emissions and improve access.

Resilience and security

Strategic networks provide lifeline connections between populated areas, ports, and other infrastructure. They need to be resilient to perform their functions effectively.

A well-functioning strategic network is vital for:

- responding to emergencies quickly
- restoring communities and business activity after an emergency.

As climate-related impacts increase, planning for adaptation is critical to manage future vulnerabilities in the transport system and the communities served.

Many parts of the strategic network have considerable resilience issues. Reduced or interrupted services must be addressed, as this greatly impacts communities and businesses.



Current challenges and opportunities

As the second riskiest country in the world for natural disasters, Aotearoa is particularly prone to significant seismic and geological activity.⁴⁶

Critical parts of the strategic network have been impacted by these in the past. For example, State Highway 1 and Main South Railway Line north of Kaikōura following the earthquake in 2016.

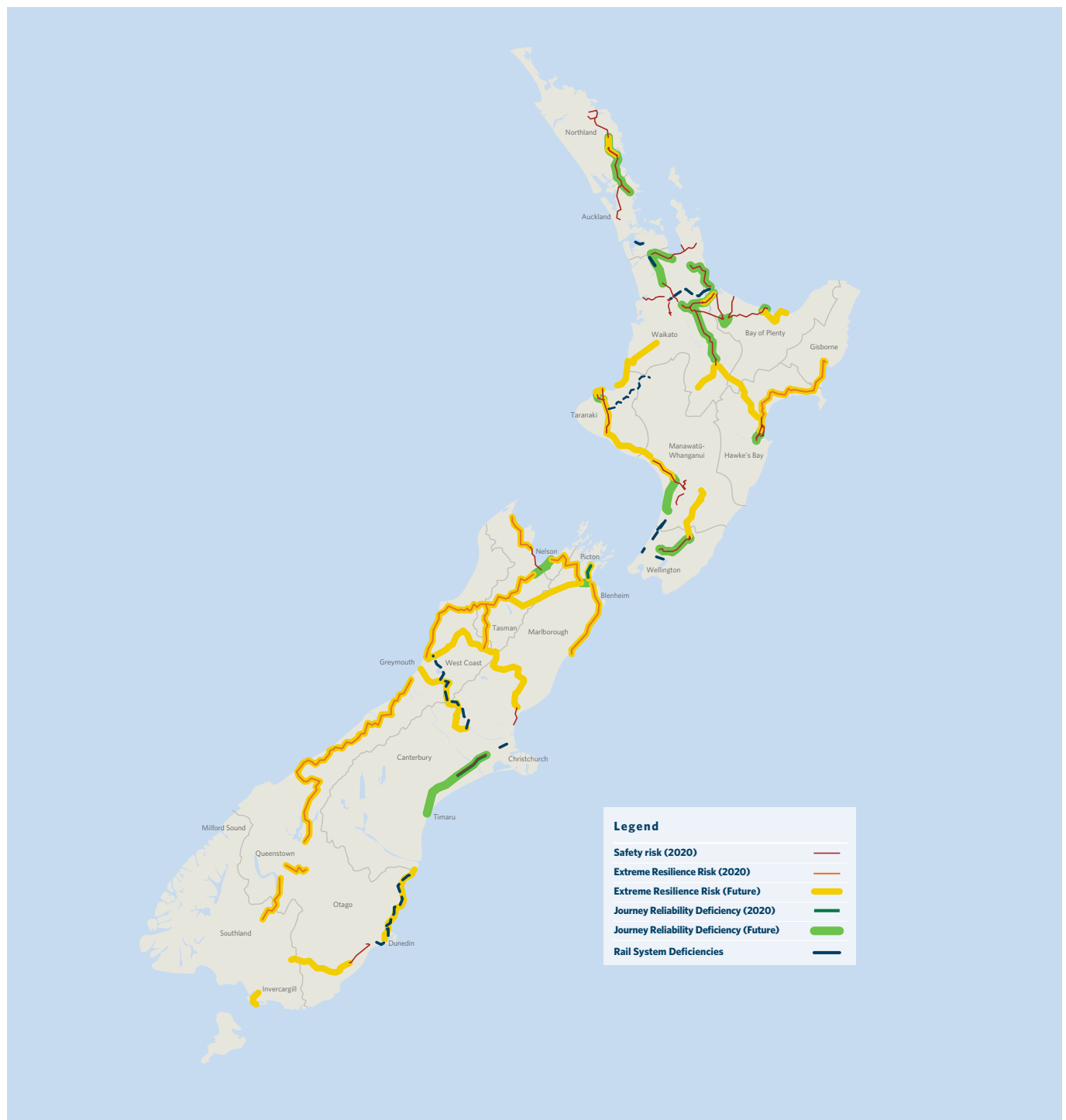
Others have high levels of risk, like fault lines near State Highway 1 in Te Whanganui-a-Tara Wellington and the interisland ferry terminal.

Some alternative routes also have risks, like the closure of State Highway 7 Lewis Pass because of heavy snow.

These risks are mostly unpredictable, but how they are dealt with can be planned.

Our Future Focus map →

Map of network deficiencies



There is a lack of redundancy, or ways to minimise downtime, in parts of the strategic network. Some regions depend on one or two critical lifelines to stay connected to neighbouring regions.

Emergency and maintenance costs on strategic networks are rising. This is mostly because of climate change. Areas are experiencing more frequent and severe unplanned disruptive events like:

- storms
- flooding
- sea-level rise
- higher temperatures.

This is expected to continue and only get worse.

Future challenges and opportunities

Challenges are likely to remain the same, but increase in:

- magnitude
- frequency
- duration.

To continue as lifeline connections, the strategic network will need to balance resilience, service levels, and maintenance costs.

As we expand or change strategic networks in the future, we'll need to make sure we don't create new resilience challenges.

Key areas of focus

Some key areas to focus efforts:

- consider how to maintain lifeline connections and service levels during disruption
- develop a greater understanding of the changing risks of climate-related hazards
- improve monitoring of real-time system hazards and data collection
- use an adaptive-management approach to climate change when maintaining and operating the transport network
- develop a better understanding of managing security risks.

Our strategic networks plan

Approach

How we manage, operate, and develop strategic networks now and over the next 30 years will significantly affect:

- achieving the government's transport outcomes
- resolving key issues
- realising major opportunities.

Decisions we make around strategic networks are complex with significant implications:

- Major upgrades or new corridors can cost billions of dollars. They may take years, or even decades, to complete. They create major complex new assets that require significant investment in operations and maintenance.
- Strategic networks have the potential to create transformational benefits but can have adverse impacts if not carefully planned and designed.
- The scale and impact of these networks means there's high public and political interest in decision-making, including competing interests across stakeholders and the public.
- Future strategic networks can impact decision-making in advance of construction – this sets community expectations and encourages different patterns of development, as well as economic and population growth.

Our approach to strategic networks over the next 30 years has two parts:

- look after and get more out of existing networks through ongoing programmes
- target transformational change across multiple outcomes for the greatest impact.

This approach recognises the best way to progress towards transport outcomes is through ongoing programmes to:

- maintain
- renew
- make incremental improvements.

This applies to most strategic networks, especially those already well developed.

It also highlights that in some areas and networks, an incremental approach won't be enough. Here, more transformational change is required.

To give confidence that transformational change is necessary and will deliver value in the long run, these situations must be:

- extremely well targeted
- based on robust evidence
- of a national perspective.

Ongoing programmes

Our standard approach across most strategic networks, especially well-developed networks, is a series of programmes that maintain, renew, and make the most of existing infrastructure.

This requires significant effort and investment to ensure these networks continue to deliver and function well in the transport network.

Alongside this, small-scale improvements help networks respond to changing circumstances, with the aim to contribute to transport outcomes over time.

Key programmes are:

- maintenance, operations, and renewal
- safety
- optimisation and resilience.

Maintenance, operations, and renewal programmes

Current strategic transport networks are among New Zealand's most important and valuable assets. They require constant care.

Historically, under-investing in the maintenance and renewal of assets leads to deterioration that can be difficult, costly, and disruptive to fix.

Well-resourced programmes for maintenance and renewal are needed. They also need sufficient operational investment to manage and run critical networks daily.

To ensure critical parts of the strategic networks continue to function, decisions must be made about programme investment standards and timings.

Programmes should avoid rebuilding infrastructure that's not fit for purpose. Instead, the focus should be on improvements to all modes and safety.

Programmes will need to adapt to change over time. For example, an ageing population may require footpath standards to change to support mobility scooters.

Automated vehicles may require new road markings and increased cell phone coverage to support a connected fleet.

Safety programmes

Stretches of New Zealand's strategic networks – especially the road network – have a high-safety risk rating.

[Our Future Focus map →](#)

Map of high safety risks on state highways



Small-scale, safety-focused programmes will be implemented across existing networks over time. They will focus on improving things like:

- side and centre barriers
- road curves and curve easing
- pavement
- rumble strips
- level crossing upgrades and removals.

These programmes should build on and extend the Road to Zero goal of zero deaths and serious injuries.

For speed limits that have been lowered because of safety reasons, investment will enable these limits to be safely raised again.

Optimisation programmes

Small-scale improvements to strategic networks can deliver significant benefits and help get more value out of existing infrastructure. This applies to all modes.

Reallocating space is one way we can make existing networks more efficient. There is an opportunity to better provide for different modes on existing parts of the strategic network.

Small, flexible changes can be used in a targeted way, particularly for walking and cycling. Consider the right level of service for a range of new modes like e-scooters, e-bikes, and mobility scooters.

Public transport can be improved by dedicating space for permanent- and dynamic-bus priority.

Demand-management approaches can help:

- reduce transport demand
- redistribute demand across different modes of transport.

Technological change will affect how this shift occurs through:

- increased flexible work

- real-time information for journey planning.

Transformational change

While ongoing programmes are the best way to make progress for most of the strategic network, transformational change will be required when:

- current networks are under-developed and require the introduction or expansion of new solutions – for example, rapid transit and strategic active mode networks in major cities
- scale of change required is beyond what can be achieved through ongoing programmes – for example, the scale of existing or forecasted deficiency, how challenging the desired outcome is, where circumstances change, or where new approaches are required.

Transformational change doesn't always mean large-scale investment is required. These programmes still need robust planning and design to deliver the best solution and value for money.

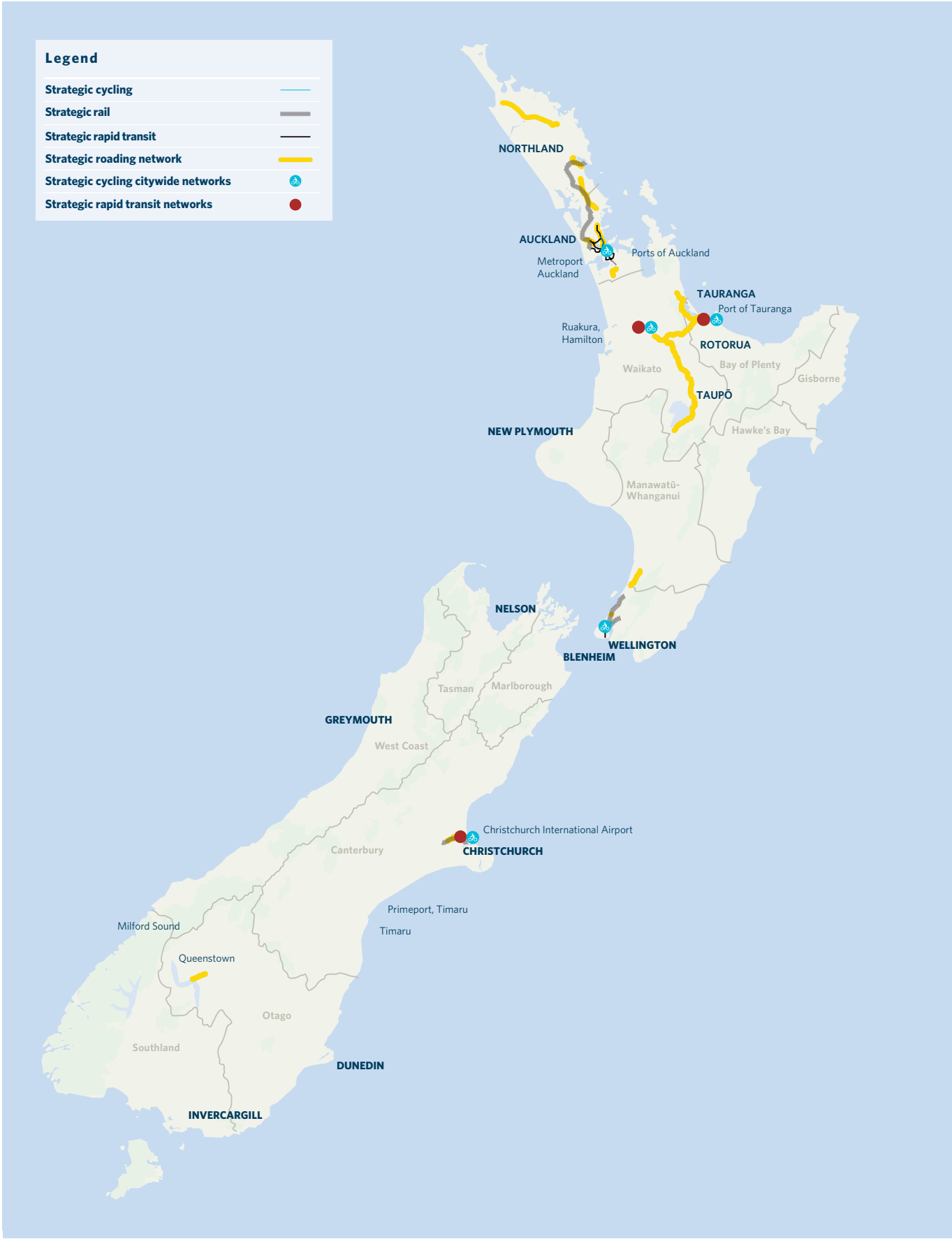
The key test for transformational change relates to:

- the scale of required change
- if addressing the issues through ongoing programmes would be successful.

Arataki maps areas of transformational change on the state highway and rail network. Other areas of transformational change on the strategic network will be updated as part of future releases of *Arataki*. This includes identifying transformational change on public transport routes, local

Our Future Focus map →

Map of transformational change on the strategic network



roads, and active mode networks in smaller urban areas. We'll partner with local government to develop this.

Mode	Key drivers
Road	<ul style="list-style-type: none"> ▪ significant safety, resilience, or reliability issues with national-scale implications that can't be addressed through incremental improvement programmes ▪ a level of demand where improvements will deliver lasting value, after considering decreased traffic to reduce emissions ▪ fundamental place and movement conflicts that undermine nationally-significant transport outcomes.
Rail and rapid transit	<p>Rapid transit</p> <ul style="list-style-type: none"> ▪ significant issues with access and travel choice for large numbers of people ▪ a level of demand where improvements will deliver lasting value that can't be achieved by lower-capacity interventions ▪ opportunities to shape nationally-significant urban development to enable, support, and shape compact, mixed-use, land-use patterns. <p>Rail</p> <ul style="list-style-type: none"> ▪ nationally-significant passenger or freight conflicts on the rail network, to ensure both modes continue growing ▪ a nationally-significant improvement to the country's freight and supply-chain system.
Active modes	<ul style="list-style-type: none"> ▪ creating a core to wider active mode networks in major urban areas ▪ addressing the most critical network gaps.

Current and future strategic networks

Mai te Puku o te Ika a Māui ki te Hiku o te Ika a Māui – Upper North Island

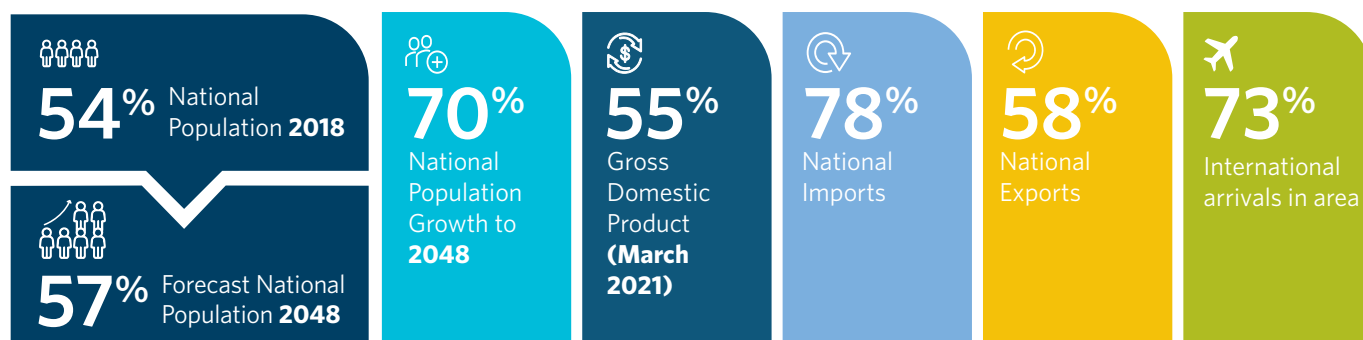
Four regions make up the Upper North Island area:

- Te Tai Tokerau Northland
- Tāmaki Makaurau Auckland
- Waikato
- Te Moana a Toi-te-Huatahi Bay of Plenty.

This area is vital to New Zealand’s social and economic success. It’s home to over half of New Zealand’s population and generates more than 50% of the national GDP.⁴⁷

Nearly 75% of the country’s population growth over the next 20 years is expected in the Upper North Island.⁴⁸

Upper North Island



Current strategic networks

The nationally-strategic road network in the Upper North Island consists of:

- SH1 Whangārei to Lower North Island
- SH15 Ruakākā to Marsden Point
- SH20 Manukau to Waterview
- SH20 to SH20A and SH20B to Auckland Airport
- SH16 Ports of Auckland to Westgate
- SH18 Westgate to Albany
- SH29 Tauranga to Piarere, including port access SH2/SH29

- SH2 Pōkeno to Tauranga
- SH2 Tauranga to Gisborne (Lower North Island)
- SH3 Hamilton to Whanganui (Lower North Island)
- SH5 Taupō to Napier (Lower North Island).

The regionally-strategic road network in the Upper North Island consists of:

- SH1 Kaitaia to Whangārei
- SH5 Taupō to Rotorua
- SH16 Westgate to Kumeū/Huapai
- SH22 Drury to Pukekohe
- Neilson Street, Tāmaki Makaurau
- Port of Tauranga access.

Map of current strategic network in the Upper North Island



The strategic-rail network in the Upper North Island consists of:

- North Island Main Trunk Line (NIMT)
- East Coast Main Line (ECML).

The strategic rapid transit network in the Upper North Island consists of:

- Auckland Metro Rail Network
- Northern Busway
- Eastern Busway.

The strategic walking and cycling network is defined as all walking and cycling connections in classes C1, C2, W1, and W2.

Several intermodal freight terminals are in the Upper North Island:

- Northport
- Ports of Auckland
- Port of Tauranga
- Westfield (Auckland)
- Metroport (Auckland)
- Ruakura (Hamilton)
- Auckland Airport.

Key drivers of change

The most significant drivers of change for strategic networks in the Upper North Island over the next 30 years are:

- increasing travel demand from population and economic growth
- urgently and dramatically reducing transport emissions
- improving resilience to the impacts of climate change
- addressing unacceptable safety, health, and resilience deficiencies
- addressing unacceptable impacts of network conflicts, including those between movement and place outcomes
- potentially changing national supply chains, particularly the long-term location of the Ports of Auckland.

Areas of potential transformational change

Areas of transformational change in the Upper North Island are identified in this section. For parts of the strategic network not identified below, transformational change is not required unless there's a significant shift in key drivers.

[Our Future Focus map](#) →

Required transformational changes reflect the identified triggers and preconditions in Our Future Focus map. Where triggers and preconditions for a change have been reached, they've been incorporated into the potential areas of transformational change. New areas of transformational change will be added as key drivers change, and preconditions and triggers are met.

Map of potential transformational change for the Upper North Island



Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Kawakawa to Kaitaia	Road	<ul style="list-style-type: none"> Sections of current route (especially through Mangamuka Gorge) are extremely vulnerable to ongoing closures from slips – this results in extended, repeated, ongoing closures that are expected to become more frequent because of climate change. Route is a strategic connection for many isolated communities. Existing route is unsafe. 	<ul style="list-style-type: none"> The entire route is vulnerable to flooding, rockfalls, and slips – some parts have limited redundancy (ability to minimise downtime when disruption occurs). Challenging topography and geology. Alternate routes limited and substandard. 	<ul style="list-style-type: none"> Fast-track planning work to respond to current closure. Investigate what's required to achieve a long-term solution to current slip vulnerabilities. Investigate potential alternative routes to existing connection.
Whangārei to Port Marsden	Road	<ul style="list-style-type: none"> A combination of severe safety issues, the need to improve access to Northport, and ongoing growth in Whangārei. Incremental programmes may delay the need for transformational change, but continued growth and access demand to the port area will likely trigger needed changes. 	<ul style="list-style-type: none"> Safety upgrades are required on SH1 because of high numbers of deaths and serious injuries. 	<ul style="list-style-type: none"> Confirm funding for the safety component on SH1. Confirm detailed design.
North Auckland Line – Tāmaki Makaurau Auckland to Port Marsden	Rail	<ul style="list-style-type: none"> Northport will play a larger role in New Zealand's future supply chain because of constraints at other ports – the rail network north of Tāmaki Makaurau needs to support this growing function, to limit growth of heavy trucks on SH1. The rail network doesn't currently serve Northport. There are growing conflicts between passenger and freight services within Tāmaki Makaurau on the North Auckland Line (Westfield-Newmarket-Swanson) – these will limit the ability to increase passenger and freight services. 	<ul style="list-style-type: none"> Rail upgrades connecting the North Auckland Line at Oakley to the port area have been proposed through the New Zealand Upgrade Programme. KiwiRail Northland Rail Rejuvenation Programme. KiwiRail has a designation for a future rail spur line to Port Marsden. Auckland rail network planning highlighted growing conflicts between freight and passenger services – these may need major investment to address. 	<ul style="list-style-type: none"> Confirm future investment programme and implementation plan.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Brynderwyns to Warkworth	Road	<ul style="list-style-type: none"> Very high safety risk, especially through Dome Valley and around the Brynderwyns. Hilly and low-standard corridor for such a critical link. Little resilience as the only main road connection between Tāmaki Makaurau and Northland. Incremental programmes are in progress and should continue, but need to be developed with a long-term plan in mind. 	<ul style="list-style-type: none"> Warkworth to Wellsford route protection work has confirmed this as the preferred long-term route for this section. A combination of online and offline improvements to progress over 30 years. Current focus on addressing critical safety issues and resilience. 	<ul style="list-style-type: none"> Confirm plan from current programmes of improvement through to preferred long-term corridor form. Complete route protection process for Warkworth to Wellsford project.
Orewa to Auckland City Centre	Road, rapid transit, walking, and cycling	<ul style="list-style-type: none"> Resilience issues on the Auckland Harbour Bridge and its approaches. Forecast growth and capacity constraints on Northern Busway and Northern Motorway that can't be fully addressed through small-scale improvements. All-day congestion is forecasted, despite significant improvements to public transport and active modes. Gaps in the active mode and rapid transit networks. Extremely high forecast demand for public transport which, if not provided for, will undermine mode shift and urban form outcomes. 	<ul style="list-style-type: none"> Business case work for additional Waitematā Harbour connections confirmed need for a programme of work that includes busway enhancements, an additional rapid transit connection, and improvements to road connectivity. Growth-planning work confirmed the need for strategic roading corridor upgrades between Orewa and Albany. New and upgraded interchanges with enhanced capacity and public transport priority. No walking and cycling structure can be attached to the existing Harbour Bridge – a connection alongside SH1 is preferred (Harbour Bridge to Albany). 	<ul style="list-style-type: none"> Confirm the preferred additional Waitematā Harbour connections option with partners. Complete route-protection work between Albany and Orewa. Confirm programme of improvements over time.
Tāmaki Makaurau: Upper Harbour	Rapid transit	<ul style="list-style-type: none"> Significant forecast growth in corridors and limited capacity on SH18 corridor mean there's a need to increase capacity by introducing rapid transit. A connection between critical-growth nodes of Westgate and Albany is necessary to realise the potential of these locations. Provides network-level benefits by connecting Northwest and North Shore rapid transit. 	<ul style="list-style-type: none"> Some work on corridor protection as part of SH18 development. High-level work confirmed bus rapid transit as most likely mode, and potential station locations. 	<ul style="list-style-type: none"> Need to confirm design and plan to implementation, potentially through a series of interventions over time.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Tāmaki Makaurau: Westgate to Kumeū/ Huapai	Road and rapid transit	<ul style="list-style-type: none"> Very significant future growth planned in Northwest Auckland – this will create fundamental place and movement conflicts, especially through Whenuapai and Kumeū/Huapai. Northwest Auckland has relatively poor access to employment and travel choice – this results in high car dependency and significant congestion. 	<ul style="list-style-type: none"> Supporting Growth Alliance work and SH16/18 work identified preferred future solutions – the focus on removing traffic from key value locations by motorway-to-motorway links, enhancing interchanges, and a bypass of Kumeū /Huapai. Rapid transit between Westgate and Kumeū /Huapai confirmed necessary, as part of wider Northwest Rapid Transit corridor. 	<ul style="list-style-type: none"> Focus on timing, when different investments are needed, and how investments should integrate with development and the wider transport network to achieve key outcomes.
Tāmaki Makaurau: City Centre to Westgate	Rapid transit	<ul style="list-style-type: none"> Significant forecast growth and major reliance on the single-lane SH16 corridor – need to dramatically increase the corridor's capacity by introducing rapid transit. Northwest part of Auckland has relatively poor access to employment and travel choice. High levels of car dependency and relatively high deprivation in many areas. 	<ul style="list-style-type: none"> Planning and business-case work confirmed the need for rapid transit, alignment, and the preferred mode as either bus rapid transit or light-rail. Regional-planning work confirmed corridor as a high priority. Interim bus improvements are in progress. 	<ul style="list-style-type: none"> Confirm mode and design. Confirm timeframe for implementation, including progression from short-term bus improvements to a more permanent solution.
Tāmaki Makaurau: City Centre to Māngere	Rapid transit	<ul style="list-style-type: none"> Growing public transport demand can't be met through incremental improvements to bus system because of capacity constraints in city centre and on key approaches. Encourage more of Auckland's future growth into this corridor for regional-level benefits. Access and travel choice deficiencies in parts of the corridor contribute to deprivation. 	<ul style="list-style-type: none"> Several previous business cases, most recently culminating in an indicative business case, confirmed light-rail with tunnelled sections. 	<ul style="list-style-type: none"> Confirm project design and implementation pathway. Integrate with wider rapid transit network, especially Northwest and North Shore corridors.
Tāmaki Makaurau: Cross-Isthmus	Rapid transit	<ul style="list-style-type: none"> Links up several rapid transit corridors, providing faster journeys across Tāmaki Makaurau. Enables, supports, and shapes significant potential growth across a part of Tāmaki Makaurau well suited to transformational change. 	<ul style="list-style-type: none"> Little planning work to date. Rail planning work has suggested the potential need for a freight-focused rail corridor using the long-designated Avondale-Southdown route – this could also be used by passenger services. 	<ul style="list-style-type: none"> Need to confirm extent of corridor, alignment, and mode. Develop a pathway to implementation.
Neilson Street, Tāmaki Makaurau	Road	<ul style="list-style-type: none"> Nationally-significant freight corridor and location faces highly complex challenges and conflicting movements. Indirect strategic connections result in heavy freight movements on local roads and reduced efficiency. 	<ul style="list-style-type: none"> Designation for full East West Link acquired. Some incremental improvements done, particularly at the eastern end and near Great South Road. 	<ul style="list-style-type: none"> Confirm a progressive programme of improvements that align with policy direction and priorities. Identify smaller-scale improvements to be made in the short term.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Tāmaki Makaurau: Eastern Busway	Rapid transit	<ul style="list-style-type: none"> Improve travel choice for a large part of Tāmaki Makaurau that's very car dependent. Increase people capacity along a corridor that's constrained and under pressure. 	<ul style="list-style-type: none"> Extensive work confirmed project design. 	<ul style="list-style-type: none"> Construction to start shortly.
Tāmaki Makaurau: Airport to Botany	Rapid transit	<ul style="list-style-type: none"> Transformational access improvements to South Auckland's two major future employment nodes – Manukau and Auckland Airport. Improve travel options for southeast Auckland, which is highly dependent on cars. Support major growth opportunities, especially at Botany, Flat Bush, Manukau, Puhinui, and Auckland Airport. 	<ul style="list-style-type: none"> Business case confirmed route and mode (bus rapid transit). Previous business case identified a progressive implementation pathway, starting with service improvements and minor infrastructure upgrades. 	<ul style="list-style-type: none"> Secure the route through a designation process. Begin progressive implementation of corridor.
Auckland Rail Network	Rail and rapid transit	<ul style="list-style-type: none"> Enable the heavy rail network to play a larger role in moving people and freight, and an emerging role in inter-city passenger movement – this will help reduce private-vehicle reliance and improve access to opportunities. Realise the full benefits of City Rail Link. Reduce resilience, safety, and capacity constraints on the rail network. 	<ul style="list-style-type: none"> Rail network not likely to grow substantially over time in Tāmaki Makaurau – other modes are more suitable for new rapid transit corridors. Additional tracks required to reduce conflicts between different services (metro rail, freight, intercity rail), especially between Westfield and Pukekohe – tracks will enable express- and limited-stop services to growing South Auckland areas. Level crossings to be removed from the network over time. Further tranches of trains, and supporting infrastructure, required to increase capacity over time. 	<ul style="list-style-type: none"> Rail programme business case will provide a view of how the rail network needs to evolve over time to meet future requirements, including maximising full benefit of the City Rail Link. Complete current tranche of rail network improvements.
Tāmaki Makaurau Auckland Cycling Network	Walking and cycling	<ul style="list-style-type: none"> Need to rapidly provide additional connections across the city. Safety challenges for non-protected parts of the network. Significant shift to cycling (7%) required to support emissions and mode shift goals. 	<ul style="list-style-type: none"> Active modes and micromobility business case identified priority routes and locations. 	<ul style="list-style-type: none"> Identify additional funding sources to support progress towards full implementation. Support policy changes to enable progress.
Drury to Pukekohe	Road	<ul style="list-style-type: none"> Very significant growth in the Drury, Paerata, and Pukekohe areas will create fundamental place and movement conflicts – will require urbanisation of the existing road. Significant safety risks along the corridor. 	<ul style="list-style-type: none"> Supporting Growth Alliance work to confirm the form and function of the current corridor, and will consider if alternative corridors are needed. 	<ul style="list-style-type: none"> Confirm long-term transport network. Integrate short-term upgrades to align across programmes and outcomes.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
North Island Main Trunk: Tāmaki Makaurau to Kikiroa Hamilton	Rail	<ul style="list-style-type: none"> Most of the country's future growth is within the Golden Triangle between Tāmaki Makaurau, Hamilton, and Tauranga – greater connectivity between these cities has potential to generate nationally-significant economic and productivity benefits. A transformational improvement to the Tāmaki Makaurau to Hamilton rail corridor could achieve an optimal development pattern in the Upper North Island and open up significant new labour and job markets. Growing conflicts between passenger and freight services need to be addressed, especially to enable faster passenger services. 	<ul style="list-style-type: none"> Tāmaki Makaurau to Hamilton Rapid Rail business case, led by Te Manatū Waka Ministry of Transport, has explored options about how faster passenger services can be provided. Important incremental upgrades to the line should be made. Required double tracking of some sections to support additional services. 	<ul style="list-style-type: none"> Complete rapid rail business case to confirm preferred long-term form and function of rail corridor. Confirm implementation pathway and incremental upgrades.
Kikiroa Mass Rapid Transit (MRT)	Rapid transit	<ul style="list-style-type: none"> Support transformational improvement to the quality of public transport to achieve goals of mode shift and less car dependency. Support and shape a more efficient and sustainable urban form for Hamilton. 	<ul style="list-style-type: none"> <i>Metro Spatial Plan</i> and integrated programme business case confirmed strategic direction and approach of a staged delivery to rapid transit. Core is a dedicated bus rapid transit corridor serving the north-south and east rapid-transit corridors that connects Te Awa Lakes, Hamilton Airport, and Ruakura. 	<ul style="list-style-type: none"> Confirm route, detailed form, staging, and refine integrated urban-development outcomes.
Kikiroa to Port of Tauranga	Road and rail	<ul style="list-style-type: none"> Safety and resilience challenges on road connection. Need rail to play a greater role in serving freight demand to Port of Tauranga. Fundamental place and movement conflicts in Tauranga section. 	<ul style="list-style-type: none"> Tauriko long-term business case Piarere to Tauriko business case and corridor-management plan work. Double tracking of rail connection (other than tunnels) identified as key priority. 	<ul style="list-style-type: none"> Confirmation of preferred road design in Tauranga section. Long-term planning exercise needed to identify preferred long-term rail and road solutions along whole corridor.
Waihi to Tauranga	Road	<ul style="list-style-type: none"> Safety risk. Population growth and increased pressure on network. Increased place and movement conflicts that can't be resolved through incremental improvements. 	<ul style="list-style-type: none"> Takatimu North Link stage one required for safety improvements and accessibility. Takatimu North Link stage one required later (post 2030). 	<ul style="list-style-type: none"> Stage one in construction. Stage two progressing to route protection, but unfunded past this point. Focus on timing and triggers for stage two.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Tauranga Mass Rapid Transit (MRT)	Rapid transit	<ul style="list-style-type: none"> Support transformational improvement to public transport quality to achieve goals of mode shift and less car dependency. Support and shape a more efficient and sustainable urban form for Tauranga. 	<ul style="list-style-type: none"> Planning and high-level business case identified the highest priority to consider for a high-quality MRT solution is the corridor linking Tauranga CBD, down the Te Papa corridor, and then connecting to Tauriko. Next priority is an east to central-western corridor connection over the harbour. 	<ul style="list-style-type: none"> Confirm route, detailed form, staging, and refine integrated urban-development outcomes.
Kemureti Cambridge to Taupō	Road	<ul style="list-style-type: none"> Significant safety risk. Fundamental place and movement conflicts, especially through the towns of Tīrau, Putāruru, and Tokoroa. Current SH1 corridor is an indirect route for longer journeys, meaning people are encouraged onto local, unsuitable roads that are highly unsuitable for this task. 	<ul style="list-style-type: none"> Safety issues south of Piarere. Low quality surface south of Tīrau. Need to resolve access issues in South Waikato towns. Cambridge to Piarere project to deal with safety issues where the Waikato Expressway ends, including upgrade to SH1/SH29 intersection. 	<ul style="list-style-type: none"> Planning needed for the corridor to identify a preferred long-term solution and progressive programme of implementation.
Taupō to Tūrangi	Road	<ul style="list-style-type: none"> Safety risk. Resilience challenges. Poor physical condition that creates key constraints. 	<ul style="list-style-type: none"> Eastern edge of Lake Taupō (Three Sisters): severe physical constraints on the current alignment, existing safety and resilience challenges, and forecast growth in demand, particularly freight. 	<ul style="list-style-type: none"> Planning needed for the corridor to identify a preferred long-term solution and progressive programme of implementation.
Network-level decarbonisation	Rail	<ul style="list-style-type: none"> Freight carried by rail currently saves at least 70% of the carbon emitted by heavy-road transport. Need to switch to low-emissions modes. 	<ul style="list-style-type: none"> Electrification justified on high-volume routes: <ul style="list-style-type: none"> North Island Main Trunk rail line between Pukekohe and Hamilton East Coast Main Trunk rail line between Hamilton and Tauranga. 	<ul style="list-style-type: none"> Planning needed to identify preferred long-term solutions.

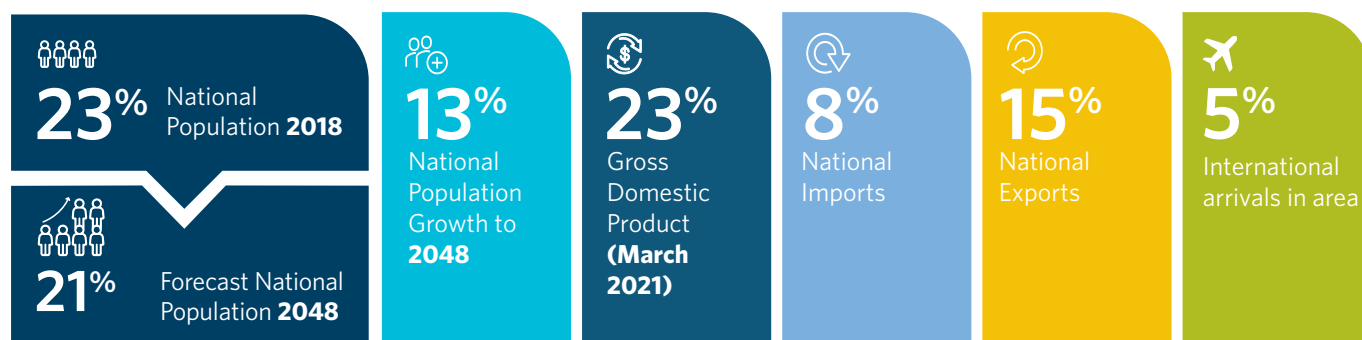
Mai te Puku o te Ika a Māui ki te Upoko o te Ika a Māui – Lower North Island

The Lower North Island is made up of Tairāwhiti Gisborne, Te Matau-a-Māui Hawke's Bay, Taranaki, Manawatū-Whanganui, and Te Upoko o te Ika a Māui Greater Wellington. In 2018, it was home to more than 1,077,000 residents, or 23% of New Zealand's population.⁴⁹

The Lower North Island has a diverse transport network that provides access to a wide range of economic and social opportunities.

The transport corridors that pass through the area are a key part of the transport system of Aotearoa New Zealand. They enable movement of people and goods between key centres of production, consumer markets, and freight distribution hubs.

Lower North Island



Current strategic networks

The nationally-strategic road network in the Lower North Island consists of:

- SH1 Wellington Airport to Upper North Island
- SH3 Sanson to Ashhurst (this is mapped following the new Te Ahu a Turanga alignment)
- SH57 Ashhurst to Levin.

The regionally-strategic road network in the Lower North Island consists of:

- SH3 Whanganui to Bulls
- SH58 Paremata to Haywards
- SH2 Ngauranga to Woodville
- SH3 Hamilton to Whanganui
- SH5 Taupō to Napier.

The strategic rail network in the Lower North Island consists of:

- North Island Main Trunk line (NIMT).

The strategic rapid transit network in the Lower North Island consists of:

- Wellington Metro Rail.

The strategic walking and cycling network is defined as all walking and cycling connections in classes C1, C2, W1 and W2.

Several intermodal freight terminals are in the Lower North Island:

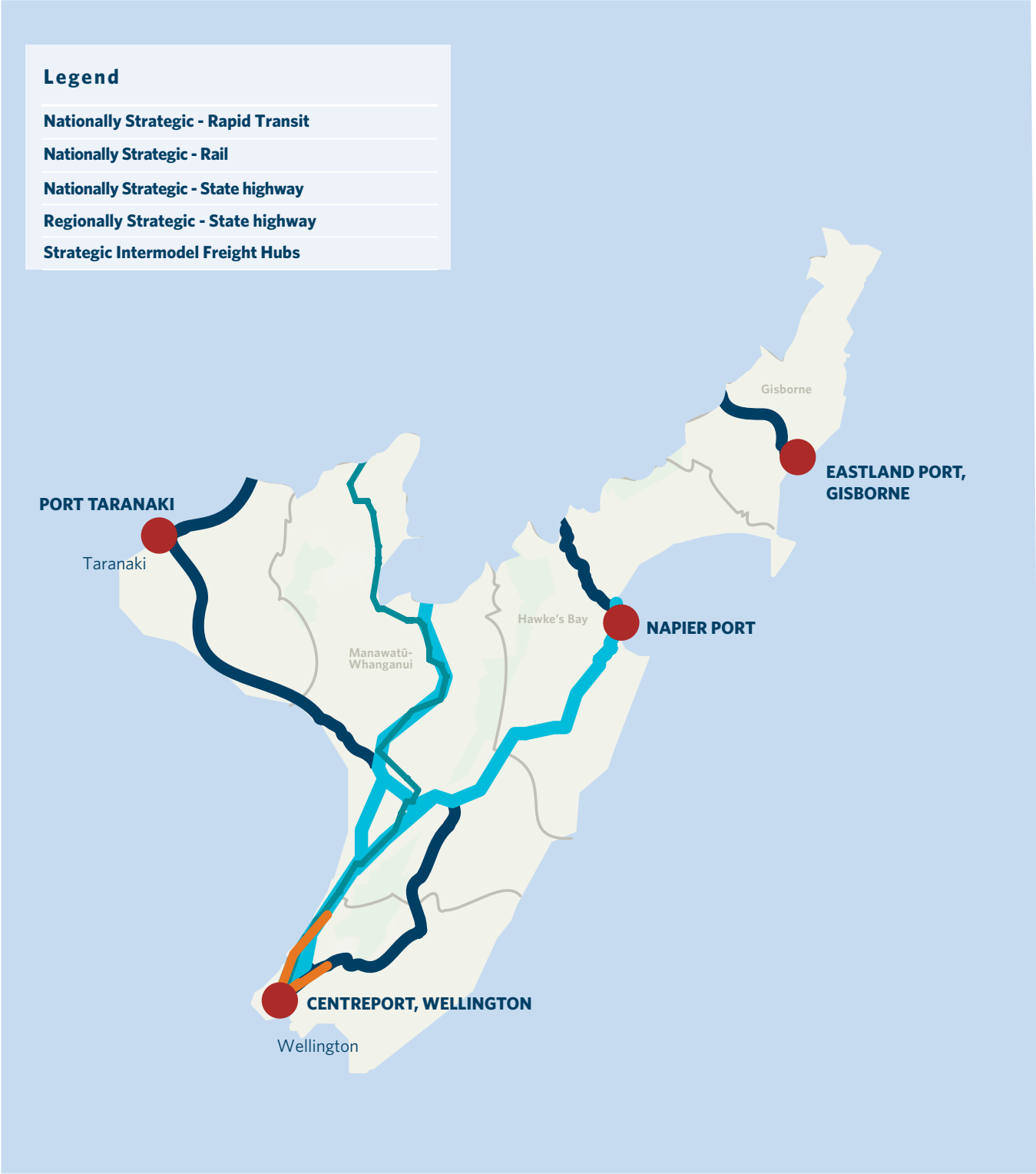
- CentrePort, including Interislander
- Port Taranaki
- Napier Port
- Eastland Port (Gisborne).

Key drivers of change

The most significant drivers of change for strategic networks in the Lower North Island over the next 30 years are:

- unacceptable safety, health, and resilience deficiencies
- the need to urgently and dramatically reduce transport emissions
- the need to improve resilience because of the impacts of climate change
- unacceptable impacts of network conflicts, including conflicts between movement and place outcomes
- the need to preserve effective and efficient connectivity across Cook Strait.

Map of current strategic network in the Lower North Island



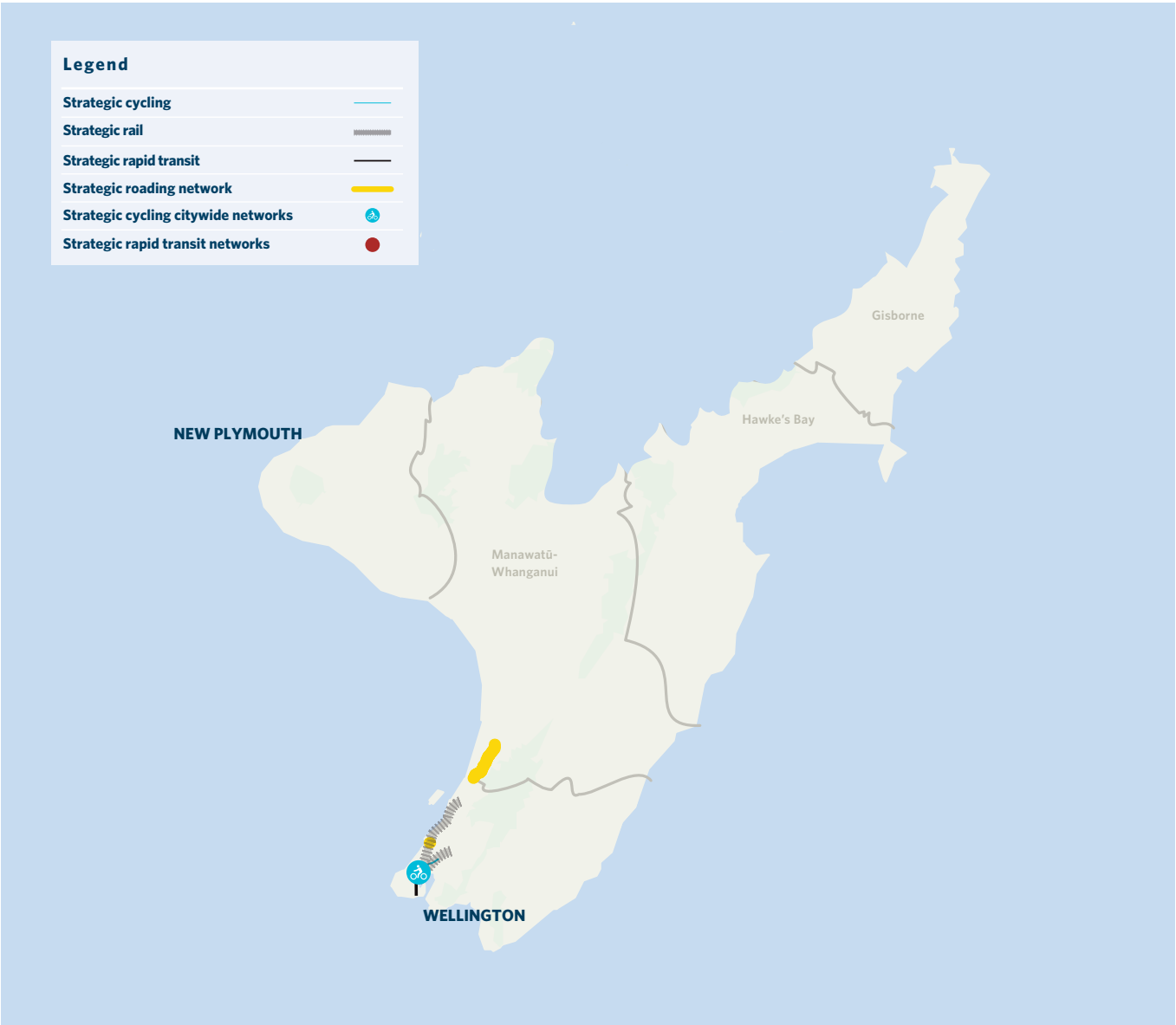
Areas of potential transformational change

Areas of transformational change in the Lower North Island are identified in this section. For parts of the strategic network not identified below, transformational change is not required unless there is a significant shift in the key drivers.

Our Future Focus map →

Required transformational changes reflect the identified triggers and preconditions in Our Future Focus map. Where triggers and preconditions for a change have been reached, they’ve been incorporated into the potential areas of transformational change. New areas of transformational change will be added as key drivers change, and preconditions and triggers are met.

Map of potential transformational change for the Lower North Island



Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Ōtaki to north of Levin	Road	<ul style="list-style-type: none"> High safety risk, requiring a range of targeted interventions. Place and movement conflicts through settlements. Lack of transport choice for residents. 	<ul style="list-style-type: none"> Proposed highway and shared path from Ōtaki to SH57 intersection. Safer speeds and safety improvements on existing SH1. 	<ul style="list-style-type: none"> Planning needed for the corridor north of Levin to identify a preferred long-term solution and progressive programme of implementation.
Te Whanganui-a-Tara Wellington: City Centre to Island Bay	Rapid transit	<ul style="list-style-type: none"> Resolve capacity constraints on the public transport system for people travelling to the city centre from the south and east. Encourage a greater proportion of Wellington's growth to occur in more central parts of the urban area, resulting in significant access improvements and emissions reduction. Significantly improve public transport service quality in south and east Wellington, to support mode shift and reduce private vehicle reliance. 	<ul style="list-style-type: none"> Let's Get Wellington Moving business case has confirmed high-level route and that light-rail is the likely mode choice. 	<ul style="list-style-type: none"> Detailed business case to confirm alignment and mode. Route protection work to secure corridor. Timing and sequencing of implementation to be confirmed – particularly to ensure region-level integration across major investments and growth plans.
Te Upoko o te Ika a Māui Greater Wellington Rail Network Upgrades	Rail and rapid transit	<ul style="list-style-type: none"> Increase capacity and resilience of the rail system, so it can play a growing role in meeting the region's travel needs (especially from the north into the city centre). Enable, support, and shape the region's urban growth, – especially to encourage intensification around existing train stations. 	<ul style="list-style-type: none"> A programme of upgrades has been identified. This includes: <ul style="list-style-type: none"> removing key bottlenecks of single-track station upgrades and access improvements fleet expansion, including supporting infrastructure ongoing service frequency improvements ongoing track and infrastructure upgrades. 	<ul style="list-style-type: none"> Further work to confirm how the programme is implemented over time, especially in a way that's integrated with other regional investments and affordable to funders. More detailed planning of high priority and urgent investments.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Te Whanganui-a-Tara Wellington Cycling Network – Paneke Pōneke	Cycling	<ul style="list-style-type: none"> Connect suburbs to the city and destinations. Help people of all ages and abilities get where they need to. Safety challenges for unprotected parts of the network. Significant shift to cycling required to support goals around emissions, vehicle kilometres travelled (VKT), and mode shift. 	<ul style="list-style-type: none"> <i>Paneke Pōneke</i> outlined the need for a significant upgrade to the cycling network and includes a network plan. Barriers to cycling in Te Upoko o te Ika a Māui Greater Wellington include safety and access. 	<ul style="list-style-type: none"> Identify additional funding sources to support progress towards full implementation. Some key routes to be completed early.
Te Ara Tupua	Walking and cycling	<ul style="list-style-type: none"> Need for a safe, separated connection between Lower Hutt and Wellington. Currently, cyclists ride with the traffic on SH2. Improve resilience and placemaking. 	<ul style="list-style-type: none"> Existing connection isn't safe or fit for purpose. Can integrate resilience (sea level rise) within the project. 	<ul style="list-style-type: none"> Construction began in 2022.
Network-level decarbonisation	Rail	<ul style="list-style-type: none"> Freight carried by rail currently saves at least 70% of the carbon emitted by heavy-road transport. Need to switch to low-emissions modes. 	<ul style="list-style-type: none"> Electrification justified on high-volume route – NIMT between Palmerston North and Waikanae. 	<ul style="list-style-type: none"> Planning needed to identify preferred long-term solutions.

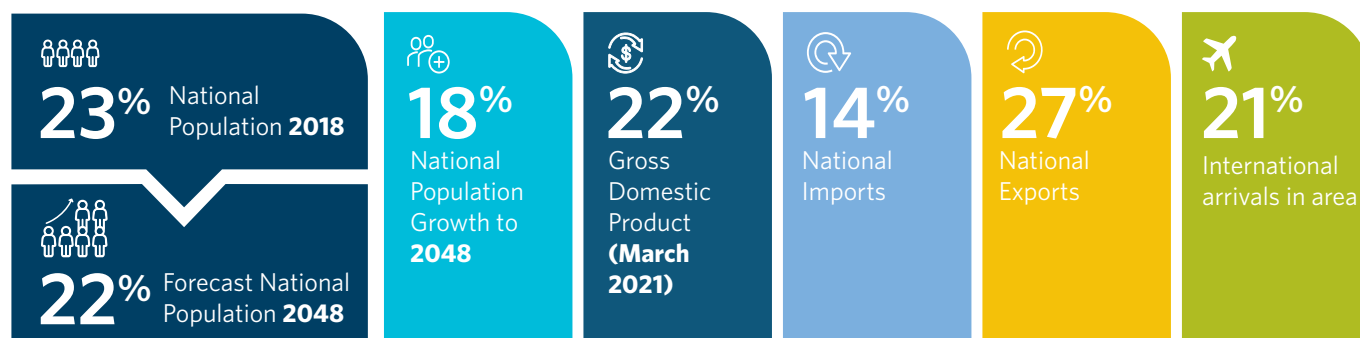
Te Waipounamu – South Island

Te Waipounamu, the South Island, includes Te Taihu Top of the South (Te Taihu-o-te-waka Marlborough, Whakatū Nelson, and Te Moana-nui-a-Kiwa Tasman), Waitaha Canterbury,

Te Tai Poutini West Coast, Ōtākou Otago, and Murihiku Southland.

The South Island is 32% larger than the North Island and contains 23% of the total population.⁵⁰

South Island



Current strategic networks

The nationally-strategic road network in the South Island consists of:

- SH1 Picton to Dunedin
- SH76 Weedons to Ferrymead
- SH74 Ferrymead to Lyttelton.

The regionally-strategic road network in the South Island consists of:

- SH6 Blenheim to Nelson
- SH6 Greymouth to Hokitika
- SH73 Ōtautahi Christchurch to Kumara Junction
- SH8 Clarksville to Cromwell
- SH8B Cromwell link
- SH6/6A Cromwell to Queenstown
- SH78 Timaru Port access
- SH88 Dunedin to Port Chalmers
- SH1 Dunedin to Invercargill.

The strategic rail network in the South Island consists of:

- Main North Line
- Midland Line
- Main South Line.

The strategic walking and cycling network is defined as all walking and cycling connections in classes C1, C2, W1 and W2.

Several intermodal freight terminals are in the South Island:

- Lyttelton Port
- Picton Port, including Interislander
- Port Otago
- Rolleston, serves Lyttelton and Timaru
- South Port
- PrimePort (Timaru)
- Christchurch Airport.

Key drivers of change

The most significant drivers of change for strategic networks in the South Island over the next 30 years are:

- increasing travel demand from population, economic growth, and tourism
- urgently and dramatically reducing transport emissions
- improving resilience to the impacts of climate change
- addressing unacceptable safety, health, and resilience deficiencies
- addressing unacceptable impacts of network conflicts, including conflicts between movement and place outcomes.

Map of current strategic network in the South Island



Areas of potential transformational change

Areas of transformational change in the South Island are identified in this section. For parts of the strategic network not identified below, transformational change is not required unless there is a significant shift in the key drivers.

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Map of potential transformational change for the South Island



Areas of potential transformational change – South Island

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
SH1 Ōtautahi Christchurch (Hornby)	Road and rapid transit	<ul style="list-style-type: none"> Major growth location. Fundamental movement and place conflicts between existing infrastructure and desired centre role. Road and rail level crossing on SH1 near critical intersection makes achieving incremental improvement extremely difficult. 	<ul style="list-style-type: none"> Additional motorway capacity has already been added to the Christchurch network, including SH76. Mass rapid transit business case identified an emerging conflict between current SH1 alignment through Hornby and potential use of Main South Road as part of a rapid transit route. This is caused by the station/terminus function, coupled with the potential role of Hornby as a centre for development. 	<ul style="list-style-type: none"> Long-term planning needed to identify preferred long-term solution, to be done with mass rapid transit and spatial planning.
SH6/6A Tāhuna Queenstown	Road and public transport	<ul style="list-style-type: none"> Rate of population growth. Rate of tourism growth. High dependency on private vehicle travel and visitor population. Safety issues, particularly for walking and cycling. 	<ul style="list-style-type: none"> Corridor width constraints along SH6/6A restrict ability to provide more capacity for private vehicles. Constraints at SH6/6A intersection – all vehicles must use this intersection to access central Queenstown, airport, and connecting routes. Significant improvement to public transport required to support transport outcomes in the Wakatipu Basin – public transport spine along SH6/6A and into town centre. 	<ul style="list-style-type: none"> Planning approach for interventions identified as part of the Queenstown Lakes spatial plan. Deliver active mode network and demand management approach. Investigate offline public transport approach. Identify further requirements on SH6/6A after New Zealand Upgrade Programme project is complete.
Ōtautahi Mass Rapid Transit (MRT) Network	Rapid transit	<ul style="list-style-type: none"> There needs to be step-change improvements in the attractiveness of public transport to drive mode shift and improve travel choice. There are significant urban development opportunities in parts of Ōtautahi that will be enabled and supported by rapid transit. Christchurch's strategic road networks are essentially complete, yet significant growth is forecast in the future – without additional people movement capacity, congestion will increase over time. 	<ul style="list-style-type: none"> Christchurch Public Transport Futures Programme confirmed north and southwest as the key corridors where rapid transit is likely required in the future. To support urban form, the mass rapid business case has proposed a turn-up-and-go service along a dedicated corridor from Hornby through to the city centre ending in Belfast. 	<ul style="list-style-type: none"> A detailed business case to investigate the design of the corridor and stations along the route.

Location	Type	Key drivers of need for transformational change	What has previous work confirmed?	Strategic direction/Next steps
Ōtautahi Cycling Network	Cycling	<ul style="list-style-type: none"> Need to rapidly provide additional connections across the city for all kinds of trips. Safety challenges for unprotected parts of the network. Significant shift to cycling required to support goals around emissions, vehicle kilometres travelled (VKT), and mode shift. 	<ul style="list-style-type: none"> <i>Christchurch Transport Plan</i> identifies cycling infrastructure as a key contributor to the city's transport goals. Focus on city centre, redesigning intersections, and completing major and local cycleways. 	<ul style="list-style-type: none"> Rapidly expand the cycling network. Improve streets as places for people. Reduce speeds to support cycling.
Lyttelton to Rolleston Rail spur	Rail	<ul style="list-style-type: none"> Intermodal freight terminals at Rolleston serving Lyttelton and Timaru ports. Capacity and resilience required to support additional freight movements to and from the port. 	<ul style="list-style-type: none"> Need for additional capacity and resilience. Safety and congestion challenges at existing level crossings. Opportunity to shift freight onto lower emissions modes for this connection. 	<ul style="list-style-type: none"> Planning needed to identify preferred long-term solutions.
Network-level decarbonisation	Rail	<ul style="list-style-type: none"> Freight carried by rail currently saves at least 70% of the carbon emitted by heavy road transport. Need to switch to low emissions modes. 	<ul style="list-style-type: none"> Electrification justified on high-volume routes – low-emission diesels only current solution for South Island. 	<ul style="list-style-type: none"> Planning needed to identify preferred long-term solutions.

References

1. Waka Kotahi NZ Transport Agency (2022). Benchmarking sustainable urban mobility. <https://nzta.govt.nz/assets/resources/sustainable-urban-mobility-benchmarking/sustainable-urban-mobility-benchmarking-report.pdf>
2. Ministry of Transport (2022). Te karore ā-whānau, Household travel. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
3. Ministry of Transport (2022). Te karore ā-whānau, Household travel. <https://www.transport.govt.nz/area-of-interest/public-transport/new-zealand-household-travel-survey/>
4. NZ Centre for Sustainable cities (2015). Benchmarking cycling and walking in six New Zealand cities. https://rcaforum.org.nz/sites/public_files/images/Benchmarking-cycling-and-walking-in-six-NZ-cities.pdf
5. NZ Centre for Sustainable cities (2015). Benchmarking cycling and walking in six New Zealand cities. https://rcaforum.org.nz/sites/public_files/images/Benchmarking-cycling-and-walking-in-six-NZ-cities.pdf
6. Waka Kotahi NZ Transport Agency (2022). Benchmarking sustainable urban mobility. <https://nzta.govt.nz/assets/resources/sustainable-urban-mobility-benchmarking/sustainable-urban-mobility-benchmarking-report.pdf>
7. Waikato Regional Council (2013). The costs of physical inactivity. https://www.waikatoregion.govt.nz/assets/PageFiles/25488/The_Costs_of_Physical_Inactivity.PDF
8. Waikato Regional Council (2013). The costs of physical inactivity. https://www.waikatoregion.govt.nz/assets/PageFiles/25488/The_Costs_of_Physical_Inactivity.PDF
9. Waka Kotahi NZ Transport Agency (2022). Benchmarking sustainable urban mobility. <https://nzta.govt.nz/assets/resources/sustainable-urban-mobility-benchmarking/sustainable-urban-mobility-benchmarking-report.pdf>
10. Waka Kotahi NZ Transport Agency (2022). Reshaping streets regulatory changes consultation document. <https://www.nzta.govt.nz/assets/consultation/reshaping-streets/reshaping-streets-regulatory-changes-consultation-document.pdf>
11. Waka Kotahi NZ Transport Agency (2017). Regulations and safety for electric bicycles and other low-powered vehicles. <https://www.nzta.govt.nz/assets/resources/research/reports/621/621-regulations-and-safety-for-electric-bicycles-and-other-low-powered-vehicles.pdf>
12. Let's Get Wellington Moving (2021). <https://lgwm.nz/>
13. Environment Canterbury Regional Council (2018). Draft Canterbury regional public transport plan. <https://www.ecan.govt.nz/document/download?uri=3456298>
14. KiwiRail (2017). Statement of corporate intent 2017–2019. Retrieved from www.kiwirail.co.nz
15. Sustainable Business Council (2016). Sustainable procurement guidelines for freight: September 2016. Retrieved from www.sbc.org.nz
16. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
17. Maersk (2022). Maersk to launch dedicated coastal service in New Zealand. <https://www.maersk.com/news/articles/2022/06/15/maersk-to-launch-dedicated-coastal-service-in-new-zealand>
18. Ministry of Transport (2019). National freight demand study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
19. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
20. Sustainable Business Council (2016). Sustainable procurement guidelines for freight: September 2016. Retrieved from www.sbc.org.nz
21. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
22. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
23. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
24. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
25. Ministry of Transport (2022). Te tauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>

26. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
27. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
28. Stats NZ (2022). Electric vehicle imports accelerate as New Zealanders look to the future. <https://www.stats.govt.nz/news/electric-vehicle-imports-accelerate-as-new-zealanders-look-to-the-future/>
29. Stats NZ (2022). Electric vehicle imports accelerate as New Zealanders look to the future. <https://www.stats.govt.nz/news/electric-vehicle-imports-accelerate-as-new-zealanders-look-to-the-future/>
30. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
31. Ministry of Transport (2022). Te karore ā-whānau, Household travel. <https://www.transport.govt.nz/statistics-and-insights/household-travel/>
32. Ministry of Transport (2022). Te karore ā-whānau, Household travel. <https://www.transport.govt.nz/statistics-and-insights/household-travel/>
33. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
34. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
35. Ministry of Transport (2022). Te tatauranga rāngi waka a tau 2021 | Annual fleet statistics 2021. <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>
36. Stats NZ (2020). National population projections: 2020(base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
37. Ministry for the Environment (2022). Emissions reduction plan. <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-plan/>
38. Ministry of Transport (2016). New Zealand international air freight. <https://www.transport.govt.nz/assets/Uploads/Report/Airfreight-Research-Final-Report-23-March.pdf>
39. Ministry of Transport (2018). Ngā waka rangi me ngā waka moana, Air and sea transport. <https://www.transport.govt.nz/statistics-and-insights/air-and-sea-transport/sheet/air-freight>
40. Stats NZ (2020). Key facts. [https://www.stats.govt.nz/information-releases/international-travel-december-2019#:~:text=Key%20facts,United%20States%20\(up%20%203%2C300\)](https://www.stats.govt.nz/information-releases/international-travel-december-2019#:~:text=Key%20facts,United%20States%20(up%20%203%2C300))
41. Stats NZ (2022). International travel: April 2022. <https://www.stats.govt.nz/information-releases/international-travel-april-2022/>
42. KiwiRail (2021). Rail network investment programme. <https://www.kiwirail.co.nz/assets/Uploads/documents/Rail-Network-Investment-Programme-July-2021.pdf>
43. Ministry of Transport (2022). Transport indicators, Inclusive access. <https://www.transport.govt.nz/statistics-and-insights/transport-indicators/sheet/inclusive-access>
44. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
45. Emission: Impossible Ltd and the HAPINZ 3.0 team (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. <https://environment.govt.nz/assets/publications/HAPINZ/HAPINZ-3.0-Findings-and-implications.pdf>
46. Crombie Lockwood (2018). New Zealand – Second in the world for natural disaster costs. <https://www.crombielockwood.co.nz/news/new-zealand-second-in-the-world-for-natural-disaster-costs/>
47. Stats NZ (2020). National population projections: 2020(base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
48. Stats NZ (2020). National population projections: 2020(base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
49. Stats NZ (2020). National population projections: 2020(base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
50. Stats NZ (2020). National population projections: 2020(base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>

Arataki

Methodology

September 2023 v1.1



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The September 2023 v1.1 release of *Arataki* includes updates to reflect the severe weather events of 2023 and correct minor errors. This also includes new layers added to the two geospatial maps: Our Current Network and Our Future Focus. More detail about these layers has been added to the updated sub-section Geospatial Maps in the Methodology.

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Overview



Arataki is being developed as a shared sector view of how we need to plan, develop, and invest in the land transport system during the next 30 years. This version of *Arataki* provides a strong foundation for us to have ongoing conversations with our partners and others to co-create the plan. *Arataki* provides direction that will guide how we'll work together during the next 30 years to deliver the future land transport system needed to keep Aotearoa New Zealand moving.

Arataki: 2021-2031 was first published in 2019. It identified the significant shifts, known as step changes, needed to meet the government's short-term priorities and long-term outcomes. It also considered how Waka Kotahi should focus its efforts within each region.

Arataki Version 2 was published in 2020. This release reflected the initial impact of COVID-19 on the land transport system. This work supported the Waka Kotahi response to the global pandemic.

In 2022, we took our first step towards a longer-term view with the *30-Year Plan: Baseline Network Version (BNV)*, released as a prototype on a digital platform to support planning and investment decisions. It focused on the actions Waka Kotahi, in collaboration with others, may need to make to the state highway network to achieve priority outcomes and deliver a fit-for-purpose land transport system.

Arataki: 30-Year Plan replaces all previous versions of *Arataki*. All relevant information has been included in this latest version of *Arataki*. References to information from *Arataki: 10-Year Plan* and the BNV are still available within the *Arataki: 30-Year Plan*. Information that is outdated, archived, or not available, such as the pan-regional summaries, can be requested.

This methodology statement explains the conceptual framework of *Arataki: 30-Year Plan*. It also outlines how the evidence, insights, and directions that inform the current version were found and applied.

What is the land transport system?

We have defined the land transport system as anything that affects transport outcomes for individuals and households, businesses, and communities through the movement of people and goods. It consists of all institutions, networks, purposes, and modes. It excludes pipelines and separate but related components of the wider transport system such as aviation, maritime and outer space (as these are not covered by the definition in the Land Transport Management Act 2003).

Conceptual framework for Arataki

Arataki aims to understand the challenges we face from a system perspective through the application of a strategic approach to provide clear direction.

Conceptual framework for Arataki

Figure 1



Understanding the challenge

The Why: We need to understand where the greatest challenges and opportunities are to achieve the long-term outcomes.

The current challenges, as we have understood while developing this version, can be summarised in Figure 2. Detailed analysis and insights can be found in the following sections of Arataki: *Strategic Context, National Directions, Regional Directions, and Transport Modes and Strategic Networks*.

Understanding the challenge

Figure 2

Desired future	Current and future state	Outcome gaps
<ul style="list-style-type: none"> Affordable, convenient, safe and sustainable access for everyone to social and economic opportunities. Efficient, resilient and reliable connections that support economic activity and move goods to market. Safe, decarbonised travel that avoids harm to people and the environment. Plan, design, build, maintain and operate in a way that minimises waste and uses resources efficiently. Responsive and adaptive to disruption and the impacts of climate change. Contribution to the creation of great places. Respect and uphold Te Tiriti and Te Ao Māori. 	<ul style="list-style-type: none"> Uneven population growth, focused in and near major urban areas and the Upper North Island. An aging and increasingly diverse population, with changing travel needs. An economy with equity and productivity challenges, increasingly focused on the service sector, that will need to decarbonise. A pressing need to both dramatically reduce greenhouse gas emissions and also adapt to the impacts of climate change. Rapid development of transport technologies with complex and unpredictable impacts. Growing cost pressures and an increasingly outdated funding system. 	<ul style="list-style-type: none"> A lack of genuine travel choice, undermining access and reinforcing a dependence on private vehicles. An unacceptable level of harm to people from unsafe and unforgiving transport networks, and from harmful pollutants. A need for fundamental change to decarbonise transport in an equitable way. Long and unreliable journey times, adding cost and reducing quality of life. Declining use of active travel modes, with significant health impacts. Growing challenges in looking after existing networks appropriately. Poor integration between transport and growth, undermining the creation of great places and achieving transport outcomes. Insufficient recognition of Te Tiriti and Te Ao Māori.

Applying an outcomes-led strategic approach

The Why: We need to strategically focus our effort on the things that make the best progress across multiple outcomes.

Apply an outcomes-led strategic approach

Figure 3

Collaborate with partners	Whole-of-system approach	Evidence based	Tailor solutions
<ul style="list-style-type: none"> Partner across the sector and with the public, to build broad agreement on plans, strategies and programmes. Make a step-change improvement to meeting Te Tiriti partner obligations. 	<ul style="list-style-type: none"> Use the right tool for the job, in the right place, at the right time. Prioritise actions that achieve multiple outcomes and deliver value in a variety of possible futures. Use maintenance and operational activities to achieve multiple outcomes. 	<ul style="list-style-type: none"> Use data and real-time information to better understand system deficiencies and target effort. Use the most effective solutions to achieve change. Create clear and transparent plans and programmes to inform robust decision-making. 	<ul style="list-style-type: none"> Apply different approaches in urban and rural areas, reflecting their fundamentally different transport challenges. Use different transport tools for tasks they are well suited to and perform strongly. Apply a mix of interventions in an integrated way.

Providing clear direction

The What: We aim to direct effort to the right things, at the right scale, in the right place and time.

Details about providing direction is captured in the *National Directions* and *Regional Directions* sections of *Arataki*.

Providing clear direction at a national level

Figure 4

Achieving shared outcomes with our partners		Maximise the benefits of technology, data, and innovation	
<ul style="list-style-type: none"> Build broad agreement on plans, strategies, and programmes. Make step-change improvement to meeting Treaty partner obligations. Develop shared evidence bases and collaborative responses to system-wide challenges. Ensure the right tool is used at the right place at the right time, and prioritise those that achieve multiple outcomes. Further refine procurement practices to help achieve multiple outcomes. Develop joint frameworks, release open data for use, and enable community-led delivery. Use targeted regulatory change to achieve a range of outcomes, particularly for vehicle safety and emissions. 		<ul style="list-style-type: none"> Ramp up collection, use, and distribution of transport data (including real-time) to improve the speed and quality of choices that transport system users, operators, and regulators can make. Extend the use of evidence and insights to inform approaches and direction. Provide clear direction on the role for new technology, services, and business models to support the future transport system. 	
Maximise value from transport infrastructure and services	Support highly liveable urban areas	Support prosperous rural communities	
<ul style="list-style-type: none"> Focus on maintaining and optimising existing infrastructure and services, to protect and maximise value from current assets. Identify, anticipate, and progress opportunities to deliver multiple outcomes as part of looking after existing networks and building new ones. Manage and operate transport networks more deliberately and actively, to support their movement and place functions, reduce conflicts between different users, and prioritise critical services. Identify and progress opportunities to reallocate road space for a range of users and modes. Improve service levels across public transport and rapid transit, and make the experience for customers better through real-time data to increase patronage. Boost network resilience by maintaining critical parts of the network and addressing immediate challenges in areas with heightened risk from climate change and extreme weather. Better manage existing assets by improving management and funding practices to reflect long-term drivers and reduce whole of life-cycle costs. 	<ul style="list-style-type: none"> Enable, support, and shape quality, mixed-use, compact towns and cities where most growth happens in locations with better travel options and shorter trip lengths. Reshape the use of urban road networks to free up space for public and active transport modes, and more efficient freight movements. Provide improved travel choices, especially where this helps improve equity outcomes. Enable and support the use of public, shared, and active modes, especially for those with limited transport choices. Implement rapid transit solutions in major metropolitan areas where transformational change to transport and urban development outcomes is required. 	<ul style="list-style-type: none"> Ensure rural communities are provided with safe and resilient transport connections. Explore new ways rural communities can access safe, convenient, and reliable shared transport services. Build more resilient rural and coastal communities by making adaptation a core and urgent element of transport planning, especially for high-risk areas and connections. 	

Strategic framing



The strategic framing of the 2023 version of *Arataki* includes:

- outcomes
- key drivers for future change
- levers
- step changes (for future versions of *Arataki*).

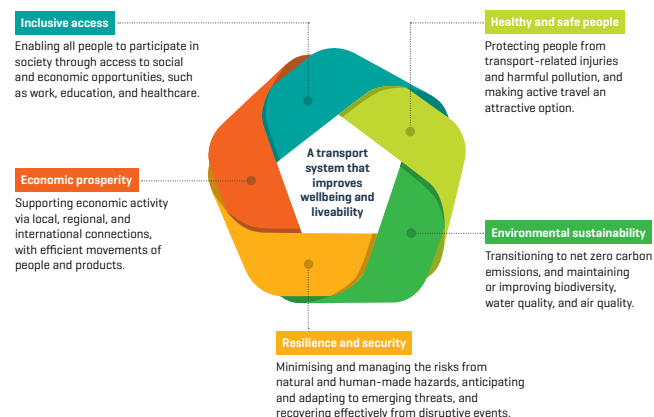
Outcomes

To help government and the transport sector take a strategic approach, Te Manatū Waka Ministry of Transport developed the *Transport Outcomes Framework*. This framework sets a purpose for the transport system centred around the wellbeing of New Zealanders and making places great to live.¹ It outlines five outcome areas to contribute to this purpose:

- inclusive access
- healthy and safe people
- environmental sustainability
- resilience and security
- economic prosperity.

Transport Outcomes Framework

Figure 5



The *Transport Outcomes Framework* clarifies:

- what we are aiming to achieve
- why this is important
- how we will work together to achieve our goals.

Why does Arataki use the Transport Outcomes Framework from Te Manatū Waka?

The *Arataki* 2023 release is framed towards delivering against the *Transport Outcomes Framework*. Previous versions of *Arataki* and the *Baseline Network Version* were framed around delivering against the six key drivers for future change. The refocus to the outcomes framework was to provide an enduring and apolitical structure from a transport system perspective. Targets for the transport outcomes will be adopted and incorporated into *Arataki* when made available by Te Manatū Waka.

The scale of change required to address outcome gaps is outlined in the *Regional Directions* section of *Arataki*. The methodology of this section is outlined in Appendix 1: Regional ratings methodology.

Key drivers for future change

How were the key drivers identified?

The Waka Kotahi Performance Improvement Framework (PIF) review identified six external factors that will shape our operating environment over the next 10 to 15 years. The key drivers for future change identified in *Arataki* draw on these factors and remain largely consistent in the current version of *Arataki*. Where possible, the key drivers have been extended across 30 years in *Arataki* and draw from the same evidence sets.

The six key drivers for change are:

- demographic change
- climate change
- technology and data
- changing travel patterns and preferences
- changing economic structure
- funding and financing challenges.

Drivers for future change

Figure 6



These key drivers draw on the base case set out in the *Transport Outlook: Future State* from Te Manatū Waka Ministry of Transport.² The key drivers will be monitored and emerging trends identified to influence the choices and trade-offs that need to be made to achieve the long-term view.

Levers

In *Arataki*, we use ‘lever’ to describe a group of related directions that can be used to bring about change.

Levers, and the related directions, provide us with the ways we can bring about change to the transport system. Levers can be used to:

- respond to and prepare for key challenges, such as those presented in the key drivers
- unlock opportunities to improve the way the system runs.

Levers

Figure 7

Lever type	Definition	Strengths of this lever	Weaknesses of this lever
Regulate network use	Positively influence the movement of people and goods across the network to ensure users, and those who affect the system, can use and comply with the system by: <ul style="list-style-type: none"> ▪ setting and communicating standards ▪ overseeing licensed regimes ▪ enforcing responses to non-compliance ▪ ensuring the network can absorb new technologies and approaches. 	<ul style="list-style-type: none"> ▪ able to be directed at classes and/or groups to bring about larger scale change ▪ provides a direct way to change behaviour ▪ can work well when paired with complementary levers that incentivise compliance and certain travel behaviours. 	<ul style="list-style-type: none"> ▪ less opportunity for regional and/or user nuances than other levers provide ▪ less able to be easily changed and/or amended as opportunities and challenges evolve ▪ comparatively expensive to operate to ensure high compliance and accountability.
Pricing tools	Influencing access to and use of the land transport system by changing the price of transport.	<ul style="list-style-type: none"> ▪ price signals are a strong tool to incentivise behaviour ▪ can support a range of outcomes ▪ allows people to make their own decisions about the value of the activity ▪ can provide a revenue stream to support use of other levers. 	<ul style="list-style-type: none"> ▪ can have equity impacts because of increasing costs ▪ requires a legislative basis and so can be slower to bring in and adapt if needed ▪ usually requires some form of system to support operation which increases costs.

Achieving the outcomes of *Arataki* will likely require a mix of different levers and directions across the whole land transport system, not just from Waka Kotahi.

Over time, we want to offer high-level guidance to our system partners. This will identify what we see as the most effective changes to the system to make the best progress towards achieving transport outcomes. As a step towards this, we have started to group core directions for the transport sector under six main levers. This builds on the levers we used for the *Arataki: 10-Year Plan*. Using these groupings as a starting point allows us to test the effectiveness and impact of different directions, including which may work best in different places.

The levers described in Figure 7 are those that we think can have the greatest impact on the outcomes as described by the outcome framework.

Lever type	Definition	Strengths of this lever	Weaknesses of this lever
Spatial and place-based planning	Long-term integrated growth and infrastructure plans and land-use decision-making that covers both urban and non-urban areas.	<ul style="list-style-type: none"> • supports better travel options, improved social, health and community outcomes, and efficient use of land • delivers value for money by providing more detail about how funds are invested • provides assurance by giving long-term, strategic direction and supporting the optimal integration of other levers • helps maximise the value of assets and space and deferral and/or delay of investment in new assets • supports communities to respond to key drivers, such as climate change. 	<ul style="list-style-type: none"> • urban form is critical to determining transport networks and services but the ability to direct private development is limited • resource intensive to participate • delivery occurs over many decades and can have long lead times for change • requires significant cross-agency alignment.
Maintain and get the most out of existing networks and services	<p>Ensuring land transport system users have continued access to current land transport services and networks by:</p> <ul style="list-style-type: none"> • providing public transport • managing access to the network • operating and maintaining existing networks • managing disruptive events. 	<ul style="list-style-type: none"> • able to 'design in' features at an early stage to reduce the likelihood of long-term negative impacts to the network and promote positive shifts • responses can be flexible, and tailored to specific conditions, users, or parts of the network • further investment can be avoided or deferred. 	<ul style="list-style-type: none"> • scope of impact is limited by the original design of the infrastructure being maintained or operated • scope of impact is limited by revenue available, and prioritisation is needed • some changes have long lead times to deliver and may require legislative change.
Deliver new or upgraded infrastructure and services	Performance improvements to the land transport system, including multi-modal capacity, networks, connections, and facilities, through new or enhanced infrastructure, technologies, and services.	<ul style="list-style-type: none"> • can be prioritised and targeted to specific projects or issues • adds to network capacity and provides for multi-modal options • flexible, can be used to provide new connections or services, to maintain and to improve • well established process for determining how to deliver • enables partnership approach, such as with local government 	<ul style="list-style-type: none"> • may require significant investment • lag time in delivery because of the work required in investment processes and planning, consenting, and construction • risk of cost increases or unforeseen issues.
Education and awareness	<p>Providing information and education to:</p> <ul style="list-style-type: none"> • raise sector capability • support better decision-making • improve the authorising and influencing environment. 	<ul style="list-style-type: none"> • always 'on' and can be changed according to the audience • ability to identify customer insights that influence outcomes • can be used to influence change in behaviours • can reach a large audience • can be introduced, targeted, modified or finished quickly • cost effective. 	<ul style="list-style-type: none"> • low degree of confidence in terms of directly changing behaviour • achieved changes in behaviour may not be sustainable • behavioural change and social norms can be slow to achieve.

These levers will be supported by a set of cross-cutting enablers that underpin the delivery of all levers.

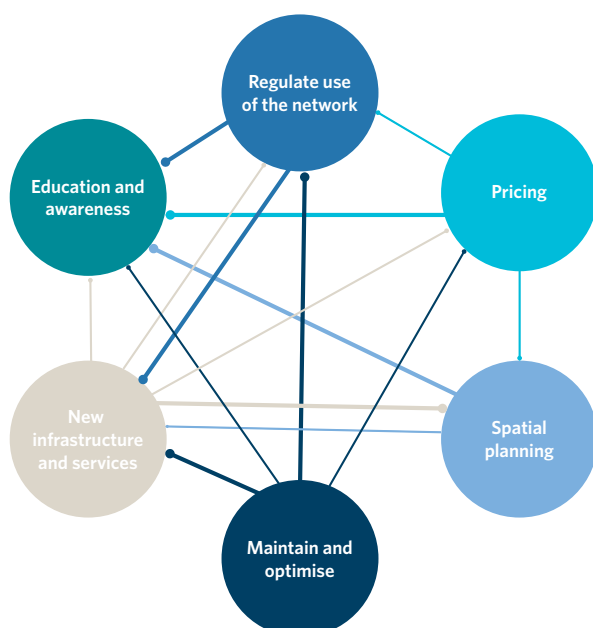
Policy and planning	<p>Planning and policy involves:</p> <ul style="list-style-type: none"> • establishing goals and guidance • identifying barriers • comparing options and developing solutions for planning, managing, funding, and using the land transport system • creating, initiating, and monitoring programmes of activities to deliver solutions.
Collaboration and partnership	<p>Transport system partners work together to:</p> <ul style="list-style-type: none"> • provide sector leadership • deliver programmes of work • positively drive delivery against long-term outcomes by advising, guiding, enabling, and learning from others.
Evidence and research	<p>Evidence and research includes:</p> <ul style="list-style-type: none"> • collecting data, evidence, and insights • analysing, researching, and evaluating • providing an informed basis for the selection, design, delivery, and improvement of interventions.

How do the levers interact with each other?

There are many dependencies between the levers. In Figure 8, thick lines show strong dependencies and thin lines shows medium dependencies.

Interaction of levers

Figure 8



We need to do more work to better understand:

- how the levers interact with each other
- the core levers needed to deliver on each transport outcome
- the circumstances in which they are most usefully applied
- whether improvements could be made to how they are currently being delivered.

This version of *Arataki* doesn't feature levers. As we gain more understanding and agreement on the right levers, future versions will reflect the application of this work.

Step changes

A step change is a transformational shift that the sector needs to make to close the gap between:

- our outcome targets
- what will be achieved if we continue on our current pathway.

It is a potential element in our strategic response to address the challenge of operating in a complex system with multiple outcomes, levers, and partners. It is about how we use system thinking to look at our problems in a new way to achieve step change in performance. Currently, our step changes are:

- support regional development
- transform urban mobility
- improve urban form
- tackle climate change
- significantly reduce harms.

It is recognised that a major review of these step changes is required to:

- determine if they provide enough direction for the next 30 years
- identify where new or re-focused transformations are needed in the system.

Therefore the 2023 version of *Arataki* hasn't focused on the impact of step changes. The next future release will feature a review of our step changes, including how we use them and their degree of impact.

National and regional directions

In 2023, we developed directions at national and regional scales. Our key objective was to better understand which directions would help us deliver on multiple outcomes from Te Manatū Waka Ministry of Transport's *Transport Outcomes Framework*. Developing the directions followed a two-step process.

Firstly, we used a bottom-up approach to identify directions across all outcomes from subject matter experts within Waka Kotahi. This process yielded a long list of potential directions including those that were:

- already underway
- planned and about to start
- identified to deliver on a range of Waka Kotahi strategies, such as Road to Zero, vehicle kilometres travelled (VKT) reduction, and mode shift plans
- planned as part of Waka Kotahi involvement in partnerships, such as spatial plans and the Urban Growth Agenda
- identified as future or potential directions.

For each direction, existing peer-reviewed studies were used to populate the qualitative impact across multiple outcomes, costs, and key contextual factors, such as the spatial scale and time horizon at which evidence suggests the direction best operates.³ International studies were used where there was a lack of robust local evaluation. Key contextual factors have been translated to a New Zealand context. Each direction was scored across all five outcomes. The scores were then used to build a composite score to assess and identify directions that were most likely to deliver across multiple outcomes. The directions were then tested with:

- subject matter experts across Waka Kotahi
- internal key stakeholders including regional teams, transport planners, local government partnerships, and others.

As a second set, the set of directions were tested by the advisory group who applied a top-down approach using a long-term system lens. As a result, the altitude of the directions was amended to reflect the long-term system view. The directions were then assessed through a national lens and then a regional lens. These were again tested with subject matter experts and key stakeholders. This focused on making sure:

- the directions were positioned at the appropriate spatial scale
- the national directions supported and enabled the regional directions.

We don't expect the directions to change with each version of *Arataki*. The triggers for change will depend on the significance of the evidence and insights. In the next version of *Arataki*, we are looking to further test these directions with our partners, including local government.

Land transport modes

The land transport system refers to anything that affects transport outcomes for individuals, households, businesses, and communities through the movement of people and goods.

It consists of all:

- institutions and organisations such as Te Manatū Waka Ministry of Transport, Waka Kotahi, KiwiRail, and councils
- regulations, policies, funding/investment tools, and agreements
- networks of infrastructure, services, and technology, including all transport corridors
- purposes and modes of travelling by land (walking, cycling and micromobility), public transport, rapid transit, private motor vehicles, heavy motor vehicles, heavy rail, and coastal shipping.

It excludes pipelines and separate but related components of the wider transport system including aviation, maritime, and outer space.

Rapid transit

Rapid transit is defined as public transport:

- running to a 15 minute or less frequency
- in either road- or rail-based modes.

For the purposes of *Arataki*, we have included the entire Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington metro-rail services, recognising that not all lines experience a 15 minute or less service frequency even during the peak periods. However, we believe their inclusion in the overall rapid transport picture is valid both from public perception and a holistic transport system perspective.

Heavy rail

The national rail network in *Arataki* is the KiwiRail owned and maintained rail network. Privately-owned tourist lines are excluded.

Public transport

Bus services and ferry services that run to public schedules, on established routes and charged an advertised fare.

Coastal shipping

Shipping flows that carry cargo within Aotearoa New Zealand waters and between Aotearoa maritime ports only.

Lenses



The land transport system can be viewed from multiple perspectives or lenses. Those using *Arataki* resources may wish to focus on content that is relevant to their perspective, or view all content through their own specific lens.

For this reason, the 2023 releases of *Arataki* begin to include content related to four lenses: climate change adaptation, Māori, freight, and equity.

For each of these lenses we have outlined:

- their specific characteristics and current state
- the impact of key drivers
- the evidence we have in relation to the transport outcomes
- key messages to take away from the 2023 releases.

We are at the beginning of the journey of creating and presenting *Arataki* lenses, with each at a different stage of development.

Climate change adaptation lens	Māori lens
<p>For the climate change adaptation lens, we have presented current:</p> <ul style="list-style-type: none"> • national and regional outlooks • challenges and opportunities. <p>We have limited evidence and content in relation to the transport outcomes of:</p> <ul style="list-style-type: none"> • healthy and safe people • environmental sustainability • inclusive access • economic prosperity. <p>In the future, we intend to develop this lens further by:</p> <ul style="list-style-type: none"> • expanding to include mitigation • gathering more evidence of climate change impacts and how these relate to transport outcomes. 	<p>We have included the Māori lens to embed the principles of Te Tiriti o Waitangi.</p> <p>For 2023, we have presented available evidence about Māori in relation to the land transport system and the aspirations of Māori, as they have expressed them in their own documents. These include reports and strategic documents of iwi and post-Treaty settlement organisations, as well as secondary information from the transport and public sectors.</p> <p>We hope to use this as a base for engagement with Māori in future years to:</p> <ul style="list-style-type: none"> • confirm these aspirations • gather more evidence • develop a plan to respond to these in partnership with Māori.
Freight lens	Equity lens
<p>For the freight lens, we have relied on forecasts of the freight task included in the <i>National Freight Demand Study 2017-18</i>, which was conducted before COVID-19 impacted the economy and supply chains.</p> <p>We have limited live evidence on freight movements and relatively little content on coastal shipping or urban freight.</p> <p>The <i>National Freight and Supply Chain Strategy</i> is being developed by Te Manatū Waka Ministry of Transport. We intend to develop this user lens further in the future by:</p> <ul style="list-style-type: none"> • reflecting the strategy • obtaining more live data • expanding on coastal shipping and urban freight. 	<p>Transport equity is an area of increasing focus for the land transport system.</p> <p>For 2023, we have included an equity lens. This is an initial way of thinking about transport equity, focused on:</p> <ul style="list-style-type: none"> • accessibility • availability • affordability. <p>This framework is new, evolving and is led by Te Manatū Waka Ministry of Transport. We expect this will be updated as the framework evolves.</p> <p>We know equitable access is an issue in the land transport system, and including this lens allows us to consider equity issues across the system and evolve our approach as needed.</p>

New lenses

In addition to further developing the current lenses with our partners, there are other lenses that weren't included in this release. We will scope these out and confirm these in due course, including who we will work with.

Geospatial maps



The geospatial (GIS) maps developed for *Arataki* focus on showing the modal networks operated by Waka Kotahi and KiwiRail. The current maps included are outlined below. Future versions of *Arataki* will expand on this.

There are currently two maps available:

1. Our current network map
2. Our future focus map

The digital platform of *Arataki* enables multiple insights from shared evidence bases, data, and information. As a step towards progressing these, we have hosted two types of layers:

1. Insight layers – these layers incorporate insights derived by *Arataki* from shared evidence bases.
2. Information layers – these layers provide users with information from external and internal sources.

Both insight and information layers are nested within either Our current network map or Our future focus map, or both.

Users can interact with the maps by selecting, showing, and hiding layers to manage visibility and shape the map to their requirements.

As the maps are updated, more information and insights will become available.







The maps hosted on the *Arataki* digital platform source data from:

- internal and external shared evidence sources
- internal and external GIS data links.

Icons and colours






Icons

Icons are attributed and aligned with the primary impact of the intervention.

Icon	Description	Focus of intervention benefit
	Truck	Road freight
	Train	Public transport – rail
	Bicycle	Walking / cycling
	Car	State highway improvements
	Boat	Public transport – ferry
	Bus	Public transport – bus

Colours

Icon colours show the primary outcome that the intervention is focused on.

Colour	Description	Outcome
	Orange	Economic prosperity
	Green	Environmental sustainability
	Light green	Healthy and safe people
	Teal	Inclusive access
	Yellow	Resilience and security

Our current network map

Our current network map shows our view of the existing land transport network of Aotearoa New Zealand. It includes currently planned projects and activities for the state highway and national rail networks.

Our future focus map

Our future focus map details the expected long-term approach to managing different sections of the state highway network managed by Waka Kotahi and national rail network.

Layers overview

Our current network map

Insight layers and sublayers	Information layers and sublayers
State Highway Network	Aggregated Harmful/(GHG) Emissions <ul style="list-style-type: none">Aggregated Harmful/GHG Emissions at SA1 LevelsAggregated Harmful/GHG Emissions at SA2 Levels
Strategic Network <ul style="list-style-type: none">Nationally StrategicRegionally StrategicStrategic Intermodal Freight Hubs	Coastal Sensitivity Index <ul style="list-style-type: none">Coastal Sensitivity Index CSI – ErosionCoastal Sensitivity Index CSI – Inundation
	Coastal Shipping Routes
	Commercial Vehicle Safety Centres
	Crash Analysis System (CAS) Data
	Department of Conservation (DOC) Walking Experiences <ul style="list-style-type: none">Great WalksNormal Walks
	Department of Conservation (DOC) Public Conservation Land <ul style="list-style-type: none">National ParksDepartment of Conservation (DOC) Other Public Conservation Land TypesConservation Covenant Areas
	Electric Vehicle (EV) Charging Points
	Ferry Service
	Flood Prone Areas <ul style="list-style-type: none">Auckland Flood Prone Areas
	Freight Flows
	Heavy Vehicle Routes (High Productivity Motor Vehicle/50Max)
	Index of Multiple Deprivation
	InterCity Bus Network

Insight layers and sublayers	Information layers and sublayers
	Interregional Passenger Rail <ul style="list-style-type: none"> Commuter Tourist
	Iwi by Local Authority
	Key Alternate Routes
	Māori Demographics <ul style="list-style-type: none"> Current Māori Demographics Projected Māori Demographics
	Marae Locations
	Maritime Ports
	National Rail Network <ul style="list-style-type: none"> National Rail Network National Rail Network – Infrastructure National Rail Network – Line Priorities
	New Zealand Cycle Trail
	One Network Framework <ul style="list-style-type: none"> One Network Framework: State Highway
	Projected Aging Population
	Projected Population Growth
	Rapid Transit <ul style="list-style-type: none"> Auckland Bus Auckland Rail Wellington Rail Wellington Bus
	Tourism Flows
	Traffic Cameras

Insight layers and sublayers	Information layers and sublayers
	<p>What's planned</p> <ul style="list-style-type: none"> ▪ Primary Outcomes <ul style="list-style-type: none"> ▪ Inclusive Access <ul style="list-style-type: none"> ▪ Inclusive Access – Points ▪ Inclusive Access – Corridors ▪ Economic Prosperity <ul style="list-style-type: none"> ▪ Economic Prosperity – Points ▪ Economic Prosperity – Corridors ▪ Resilience and Security <ul style="list-style-type: none"> ▪ Resilience and Security – Points ▪ Resilience and Security – Corridors ▪ Healthy and Safe People <ul style="list-style-type: none"> ▪ Healthy and Safe People – Points ▪ Healthy and Safe People – Corridors ▪ Environmental Sustainability <ul style="list-style-type: none"> ▪ Environmental Sustainability – Points ▪ Environmental Sustainability – Corridors ▪ KiwiRail Interventions <ul style="list-style-type: none"> ▪ KiwiRail Intervention – Points ▪ KiwiRail Intervention – Corridors ▪ Mode <ul style="list-style-type: none"> ▪ Cycling/Walking ▪ Road Freight ▪ Car ▪ Public Transport

Our future focus map

Insight layers and sublayers	Information layers and sublayers
Change required	Aggregated Harmful/(GHG) Emissions <ul style="list-style-type: none"> Aggregated Harmful/GHG Emissions at SA1 Levels Aggregated Harmful/GHG Emissions at SA2 Levels
Maintain with Current Programmes	Crash Analysis System (CAS) Data
Our Network Deficiencies <ul style="list-style-type: none"> Safety Risk (2020) Extreme Resilience Risk (2020) Extreme Resilience Risk (Future) Journey Reliability Deficiency (2020) Journey Reliability Deficiency (Future) National Rail Network Deficiencies 	National Rail Network <ul style="list-style-type: none"> National Rail Network National Rail Network – Infrastructure National Rail Network – Line Priorities
Potential Change Required	One Network Framework: State Highway
Strategic Network Transformational Change <ul style="list-style-type: none"> Strategic Network Transformational Points Strategic Network Transformational Segments 	Projected Aging Population
	Projected Population Growth
	Iwi by Local Authority
	Marae Locations
	Māori Demographics <ul style="list-style-type: none"> Current Māori Demographics Projected Māori Demographics

Layers in detail

Aggregated harmful/Green House Gas (GHG) emissions

The carbon dioxide equivalent, CO₂-e, was selected as the key visualised measure for greenhouse gases using 2022 levels.

Emissions for each calendar year are estimated based on the:

- length of the road transport network travelled together with traffic data
- expected emissions as predicted by the New Zealand Vehicle Emission Prediction Model (VEPM).

VEPM predicts emissions from the New Zealand vehicle fleet under typical road, traffic, and operating conditions.

Data is displayed at both Statistical Area 1 (SA1) and Statistical Area 2 (SA2) levels.

Map	Our Current Network, Our Future Focus
Data source	Waka Kotahi (Vehicle Emission Mapping Tool) ⁴
Layer type	Information

Change required

Our understanding of future demand and pressure on the network indicates change is likely to be required over the next 30 years to address a system deficiency relating to travel time reliability, resilience (including climate impacts), and/or safety.

The need for change was identified using:

- evidence regarding existing or emerging system deficiencies for travel time reliability, safety, and resilience
- insight from existing business cases and corridor management plans – this includes any significant constraints with resolving system deficiencies on their current alignment, for example topography, landownership, and operational constraints with undertaking work in the existing corridor.

It is important to note that capacity is not the only factor used to determine where change may be required on the state highway network. Many corridors identified for change through significant interventions are subject to a mix of safety, resilience, and physical constraints that cannot be readily addressed on their current alignment, for example State Highway 1 Lake Taupo and Desert Road, and State Highway 6 Cromwell to Queenstown.

Arataki includes direction about the triggers and preconditions that apply to each corridor. Triggers indicate the level of service deficiency or impact expected to trigger the need to do a significant intervention. Preconditions apply the intervention hierarchy and signal where we expect other levers or activities to be maximised prior to committing to a significant intervention. The triggers and preconditions for each corridor were determined based on insights about the potential future impacts of key drivers, and our understanding of local context. Assessments from Waka Kotahi subject matter experts, existing investigations, and business cases were also considered. Where the scale of change required is likely to significantly alter the form and scale of the current corridor, and may include a new corridor alignment, interim works on the corridor should be limited to maintenance and renewals or works that will provide long-term value for money regardless of future significant interventions.

Map	Our Future Focus
Data source	Waka Kotahi
Layer type	Insight

Coastal sensitivity index

Visualisation for the index values for erosion and inundation risks around the coast of Aotearoa New Zealand. These are derived from the Coastal Sensitivity Index (CSI) which provides a snapshot of the potential sensitivity of New Zealand's soft shore coastline to coastal inundation (coastal flooding) and coastal erosion due to future climate change.

Map	Our Current Network
Data source	Taihoru Nukurangi National Institute of Water and Atmospheric Research (NIWA) ⁵
Layer type	Information

Coastal shipping routes

Illustrates the significant regional coastal shipping flows that carry freight within the waters of Aotearoa New Zealand. The indicative flows were derived from the National Freight Demand Study (NFDS) 2017/18, which was published in September 2019.

The petroleum shipping element following the closure of the Marsden Point refinery was removed from the data and required further detailed examination of flows from NorthPort.

Map	Our Current Network
Data source	Te Manatū Waka Ministry of Transport (National Freight Demand Study (NFDS)) ⁶
Layer type	Information

Commercial vehicle safety centres

The locations of commercial vehicle safety centres (CVSCs) – previously called weigh stations. These centres are where officers can safely carry out inspections of:

- vehicle weight
- Road User Charges (RUC)
- logbook accuracy
- driver impairment.

Map	Our Current Network
Data source	Waka Kotahi ⁷
Layer type	Information

Crash analysis system (CAS) data

The locations of when, where, and how road crashes occurred on the New Zealand road network since the 2017/18 financial year.

Map	Our Current Network, Our Future Focus
Data source	Waka Kotahi ⁸
Layer type	Information

Department of Conservation (DOC) - Walking experiences

Shows the tracks that are managed and maintained by Te Papa Atawhai Department of Conservation and classified as either Great Walks or Normal Walks.

Map	Our Current Network
Data source	Te Papa Atawahi ⁹
Layer type	Information

Department of Conservation (DOC) - Public conservation land

Shows how parcels of land are geographically defined, recognised, dedicated, and managed through legal or other means to achieve the long-term conservation of nature with associated ecosystem services and cultural values. Conservation land includes land administered by Te Papa Atawhai Department of Conservation and Public Conservation Land (PCL). This layer also maps out national parks, other public conservation land type, and conservation covenant areas.

Map	Our Current Network
Data source	Te Papa Atawahi ¹⁰
Layer type	Information

EV charging points

The location and technical details of publicly accessible electric vehicle (EV) charging points in Aotearoa New Zealand as of March 2023.

Map	Our Current Network
Data source	External stakeholders including EV charge station owners and operators, Waka Kotahi ¹¹
Layer type	Information

Ferry service

This layer shows ferry services in Aotearoa New Zealand that provide a service for commuters or freight transport.

Map	Our Current Network
Data source	Auckland Transport, ¹² Metro Christchurch, ¹³ Bluebridge, ¹⁴ Interislander, ¹⁵ Wellington Harbour Ferries ¹⁶
Layer type	Information

Flood prone areas - Auckland flood prone areas

Flood prone areas are low points in the ground that may flood. They are often associated with roads or railway embankments, or places where water can become trapped and pool if the outlet is blocked. These areas are also associated with one-in-100-year rainfall events. This flood map shows the extent of flooding expected around the Tāmaki Makaurau Auckland region during severe rainfall events. However, areas that are not highlighted may also experience flooding in some circumstances.

Map	Our Current Network
Data source	Auckland Council ¹⁷
Layer type	Information

Freight flows

This layer was developed as part of the pan-regional summaries for *Arataki 10-Year Plan V2* and shows the key freight flows in Aotearoa New Zealand.

Map	Our Current Network
Data source	Tatauranga Aotearoa Stats NZ, ¹⁸ Te Manatū Waka Ministry of Transport, ¹⁹ Te Manatū Waka Ministry of Transport, ²⁰ Governance Group ²¹
Layer type	Information

Heavy vehicle routes (High productivity motor vehicle/50Max)

Where Road Controlling Authority (RCA) and state highway restrictions are in place on the road network. Only restrictions on the state highway network are shown.

Map	Our Current Network
Data source	Waka Kotahi 50Max interactive map ²²
Layer type	Information

Index of multiple deprivation

The 2018 New Zealand Index of Multiple Deprivation (IMD18) is a set of tools for identifying concentrations of deprivation in Aotearoa New Zealand. The IMD18 includes 29 indicators grouped into seven domains of deprivation:

1. employment
2. income
3. crime
4. housing
5. health
6. education
7. access to services.

IMD18 is the combination of these seven domains, which may be used individually or combined.

The overall index rating is displayed on the layer and the ranking is indicated by colour as per the map layer legend. Sub-domains and their rankings/deciles are identified in the pop-out boxes for each data zone.

Map	Our Current Network
Data source	Waipapa Taumata Rau University of Auckland ²³
Layer type	Information

InterCity bus network

The geolocations of bus stops served by the InterCity bus network. The locations were provided as general transit feed specification (GTFS) files by InterCity buses, part of the Entrada Travel Group.

Map	Our Current Network
Data source	InterCity Buses ²⁴
Layer type	Information

Interregional passenger rail

Commuter

This layer shows the routes of the current interregional passenger rail services that are primarily focused on commuters.

Note: This includes the Wairarapa line service between Te Whanganui-a-Tara Wellington City to Whakaoriori Masterton although this is intraregional.

Tourist

This layer shows the routes of the current interregional passenger rail services that are primarily focused on tourists.

Map	Our Current Network
Data source	Great Journeys New Zealand, ²⁵ Te Huia, ²⁶ Metlink, ²⁷ Capital Connection ²⁸
Layer type	Information

Iwi by local authority

The iwi authorities/rohe primarily located in, or associated with, a local council area. They are listed in a pop-up box for each local council.

Map	Our Current Network, Our Future Focus
Data source	Te Puni Kōkiri ²⁹
Layer type	Information

Key alternative routes

For state highway corridors, the layer indicates the:

- key tourism and freight flows on each corridor
- designated alternate state highway routes used in the event of disruption on the main corridor.

The alternate routes were identified using the Waka Kotahi Detour Routes tool. Future versions of *Arataki* will expand this layer to include alternative routes using local roads.

Map	Our Current Network
Data source	Waka Kotahi ³⁰
Layer type	Information

Maintain with current programmes

The current corridor is generally fit for purpose given our best understanding of the impacts of key drivers, future demand, and pressure on the network. The current alignment and form of the corridor is likely to remain largely unchanged over the next 30 years.

Some sections of the corridor may be subject to safety and resilience challenges, but capacity is not expected to be an issue over the coming decades.

Our focus will be on maintenance, renewals, and targeted improvements as required (including for safety and resilience) to ensure the corridor delivers an appropriate level of service for customers.

Additional investment may be required on designated alternate routes to ensure that they can function at an appropriate level of service in the event of disruption on the main corridor.

Map	Our Future Focus
Data source	Waka Kotahi
Layer type	Information

Māori demographics

This layer shows Māori demographics by the current population and the population projection to 2043.

Current Māori population

- Māori population as a percentage of total population for each local authority area.
- Māori population male and female totals compared to total population figures.
- Māori median age compared to total population median age.

Projected Māori demographics

- Projected percentage of total population that is Māori as at 2043.
- Māori population projections in five-year snapshots from 2023 to 2043. The comparative total population data was included for context and comparison.

Map	Our Current Network, Our Future Focus
Data source	Tatauranga Aotearoa Stats NZ (Medium forecast for subnational ethnic population projections and Māori age profiles) ³¹
Layer type	Information

Marae locations

Tribal, urban, institutional, and historic marae of Aotearoa New Zealand.

Map	Our Current Network, Our Future Focus
Data source	Local and central government departments, Te Kāhui Māngai (TKM), Te Puni Kōkiri ³²
Layer type	Information

Maritime ports

Strategic ports were identified from freight and logistics data available from Te Manatū Waka Ministry of Transport. These were further cross-checked with Manatū Ahu Matua Ministry for Primary Industries ports of first arrival list to determine which non-strategic ports should be included, for example commercial freight handling and excluding passenger or fishing (commercial or pleasure).

Map	Our Current Network
Data source	Te Manatū Waka Ministry of Transport, ³³ Manatū Ahu Matua Ministry for Primary Industries ³⁴
Layer type	Information

National rail network

Information for this layer is presented across three sub-layers:

- National rail network: Shows active lines and some unused or inactive (mothballed) lines currently managed by KiwiRail. Some lines shown as unused by KiwiRail may be used for tourist purposes by private sector operators using very light rail vehicles, for example the Whakaahurangi Stratford to Okahukura line.
- Infrastructure: The level crossings, tunnels, bridges, key operational centres, stations, electrification, and track layout.
- Line priorities: Shows how national rail network lines have been classified by KiwiRail, for example:
 - priority
 - secondary
 - tertiary
 - mothballed/unused.

Map	Our Current Network, Our Future Focus
Data source	KiwiRail (Rail Network Investment Programme), ³⁵ KiwiRail ³⁶
Layer type	Information

New Zealand community facilities

Locations relating to health centres and schools are currently presented in this layer.

NZ community facilities – health centres

- Health centres: State and private sector health facilities.
- Type: Public Hospital (state run facilities) or NGO Hospital (privately run facilities).

NZ community facilities – schools

- Schools: Educational establishments catering for students from years 0-15.
- Type: Full Primary, Contributing, Intermediate, Composite, and Secondary.

Map	Our Current Network
Data source	Toitū Te Whenua Land Information New Zealand ³⁷
Layer type	Information

New Zealand cycle trail

The current national cycling network under five cycling trail headings. Geospatial data is drawn from the Waka Kotahi Cycling Network – Cycle Trail Category map.

Map	Our Current Network
Data source	Waka Kotahi ³⁸
Layer type	Information

One Network Framework: State Highway

The One Network Framework (ONF) is a tool to help establish transport network function, performance measure, operating gaps, and potential interventions for each road and street type.

The ONF data set used in this layer was extracted as shapefiles from the Road Assessment and Maintenance Management system (RAMM) and entered in the geospatial system. The layer displays the current state highway network and the ONF road segment terminology.

Map:	Our Current Network, Our Future Focus
Data source:	Waka Kotahi ³⁹
Layer type:	Information

Our network deficiencies

Our network deficiencies identifies parts of the state highway and rail network that experience a significant service deficiency in relation to safety, resilience, or travel time reliability. Layers indicate current deficiencies and areas where a deficiency may emerge over the next 30 years. This is based on our best understanding of the impacts of key drivers including population growth, technology, and climate change.

Arataki acknowledges the uncertainties associated with trying to understand future impacts on the land transport system. The deficiency layers are not intended to be a definitive statement on where action is required over the next three decades; rather they are intended to indicate where significant challenges and opportunities may play out around the country. They are intended to support further conversations and more detailed analysis regarding the scale of issues and delivery of priority outcomes.

The layers were developed using a combination of:

- evidence of existing deficiencies
- modelling of future network capacity pressure
- input from Waka Kotahi and KiwiRail subject matter experts
- analysis of safety and resilience risks
- the potential impacts of climate change.



Resilience

Resilience indicates parts of the network that are at particular risk of closure and disruption because of unplanned events, either natural or human. The ratings reflect the risk and impact of disruption and emphasise connections with high-potential impacts on customers and/or corridors with no viable alternate routes.

Extreme resilience risk (2020)

The sections of the state highway network with an existing resilience risk rating of extreme, sourced from the National Resilience Programme Business Case.

Extreme resilience risk (Future)

The sections of the state highway network that are expected to have an extreme resilience risk rating by 2050, as sourced from the National Resilience Programme Business Case. The 2050 ratings help us understand the sections of the network expected to experience increased risks because of climate change, including the impacts of more extreme weather events and sea level rise.



Journey reliability

Journey reliability indicates how well the transport system delivers reliable travel times to customers. Delivering reliable travel times doesn't mean a trip won't have delays, but ideally users of the transport system should experience consistent travel times when making the same journey at different times of day and from day-to-day.

On interregional corridors, travel time reliability tends to vary most:

- in and around major urban centres where urban peak traffic periods impact the reliability of trips
- on corridors with extended sections that offer limited opportunities for vehicles to safely overtake slower traffic, for example the stretch from Waitohi Picton to Waiharakeke Blenheim, along the Kaikōura Coast, or on Desert Road.

In some parts of the country, travel time reliability can also be affected by increased demand caused by holidays, large events, and severe weather events.

The travel time reliability layers indicate sections of the state highway network:

- that currently experience poor travel time reliability
- where travel time reliability is expected to get worse over the coming decades.

Forecasted growth in traffic volumes is expected to cause some parts of the network to reach or exceed maximum capacity, leading to reduced time travel reliability.

Journey reliability (2020)

The parts of the rural and interregional state highway networks that experience poor travel time reliability on a regular basis, in other words not during holiday peaks. This layer is based on:

- evidence of existing traffic volumes
- analysis contained within corridor management plans and business cases
- input from network managers.

Most of the corridors identified:

- have average daily traffic volumes nearing the carrying capacity of the corridor
- are in areas experiencing strong population growth.

An exception is the corridor between Waitohi Picton to Waiharakeke Blenheim. This corridor experiences variable travel times because of the periodic flows of vehicles disembarking from the Cook Strait ferries, combined with hilly terrain and limited passing opportunities along the corridor. This issue is made worse by increasing road and rail interactions at the rail crossing of State Highway 1 and South Island Main Trunkline in Waitohi.

Journey reliability (Future)

The sections of the rural and interregional networks where growth in demand, driven primarily by population growth, is expected to place capacity pressure on a corridor. The assessment of future travel time reliability combines:

- basic forecasts of potential growth in traffic demand, driven primarily by population growth
- analysis of the capacity of the existing road network.

This identifies the corridors where travel time reliability is expected to drop below an acceptable level if nothing is done to:

- manage demand
- get the most out of networks
- enable mode shift
- increase network capacity.

Waka Kotahi doesn't currently have a national travel demand model that can provide future state highway demand estimates. In the absence of this model, *Arataki* made use of two sets of data to understand future demand on each interregional corridor.

Te Manatū Waka Ministry of Transport data

This data set uses region-level projections from the Staying Close to the Action transport outlook scenario. The regional growth projections were then assigned to the state highway corridor segments based on current level demands.

Waka Kotahi data

These projections are based on a very simplistic methodology that looked at recent annual growth rates on state highway corridor segments. To provide a range of potential future demand, the 25th and 75th percentiles were calculated for each corridor and these numbers were used in the analysis of possible future demand.

Neither of these approaches considers detailed demographic, economic, mode-shift effects, or changes in the network. They need to be used with caution and are only considered a starting point for analysis. They aren't considered sufficiently robust to be considered as forecasts, rather they are extrapolations, or estimates, of the current state. The Disclaimer at the end of this sub-section has more about this.

The Waka Kotahi extrapolations, or estimates, were done for corridors classified as high volume, national, regional, and arterial, as detailed by the One Network Road Classification. Lower classification corridors were not modelled as they tend to carry relatively low volumes of traffic and were considered unlikely to come under demand pressure over the next 30 years.

The following corridor capacity levels were applied to the state highway network:

- Four-lane highway – approximately 40,000 vehicles per day maximum capacity.
- Two-lane highway – approximately 20,000 vehicles per day maximum capacity.
- Two-lane highway (constrained) – less than 20,000 vehicles depending on the nature of the constraint.

When all three future-demand numbers exceeded the current capacity of a corridor, that corridor was noted as expected to reach capacity and result in travel time reliability issues. When two of the future-demand numbers exceeded the current capacity, the corridor was noted as possible to reach capacity. If one or none of the numbers exceeded the current capacity, the corridor was noted as unlikely to reach capacity.

Arataki combines the future-demand numbers with specialist network and regional expertise to identify which corridors are likely to experience a travel time reliability deficiency over the next 30 years. All corridors noted as expected to reach capacity have been mapped as a future travel time reliability deficiency. For the corridors noted as possible to reach capacity, discretion was applied in interpreting the future-demand numbers. In situations where there was a significant gap between current volumes and forecast volumes, with no clear driver of future demand, a softer position was taken. This focuses on monitoring demand to understand whether demand is growing as detailed by the forecasts and whether any interventions may be required in the future. An example of where this occurred was State Highway 8 between Tīrau Cromwell and Areketanara Alexandra. No corridors assessed as unlikely to reach capacity have been mapped.

Disclaimer

The future-demand extrapolations, or estimates, done by Waka Kotahi reflect recent trends in demand, forecast growth in population, and the future transport patterns described in the Staying Close to the Action transport outlook scenario from Te Manatū Waka Ministry of Transport. They don't account for:

- events such as pandemics
- major changes in land-use patterns
- changes in demand following mode shift
- further investment in the transport system.

While the future-demand extrapolations are useful in providing an initial indication of the parts of the network that may come under demand pressure in the future, they aren't a replacement for proper travel demand modelling.

We will continue testing the layers with the resilience and safety teams at Waka Kotahi to ensure they are aligned with the latest analysis and prioritisation from development of the Resilience Platform and Road to Zero road safety strategy delivery programme. Ongoing analysis of real-time traffic data will enhance our understanding of travel time reliability.

Safety risk

The safety deficiency ratings indicate the risk profiles for different sections of the state highway network.

Safety risk

State highway corridors with elevated risk profiles, as sourced from the New Zealand Road Assessment Programme's ratings of collective risk. It records the sections of the network that are rated as high or medium-high.

There is currently no assessment of safety risk beyond the current Road to Zero period from 2020 to 2030. Work is underway to understand the longer-term safety challenges for the land transport system beyond 2030. Once completed, this work will be included in the safety deficiency layers.

National rail network deficiencies

Key national rail infrastructure and service pinch points identifies the:

- level of service gap
- potential solution
- timescale of likely activity.

The expected trigger point for activity is also identified. The national rail network deficiencies information is aligned with the Rail Network Investment Programme and was provided by the KiwiRail investment team in comma-separated values (CSV) format and geolocated within *Arataki*.

Map	Our Future Focus
Data source	Waka Kotahi, ⁴⁰ Te Manatū Waka Ministry of Transport, ⁴¹ KiwiRail (Rail Network Investment Programme) ⁴²
Layer type	Information

Projected aging population

Data in 10-year snapshots starting in 2018 for:

- total estimated population aged over 65
- percentage make-up of the total population.

Map	Our Current Network, Our Future Focus
Data source	Tatauranga Aotearoa Stats NZ ⁴³
Layer type	Information

Potential change required

Our understanding of future demand and pressure on the network indicates the corridor will come under increasing pressure in terms of travel time reliability, resilience including climate impacts, and/or safety. Triggers indicate the level of service deficiency or impact expected to trigger the need to do a significant intervention. Preconditions apply the intervention hierarchy and signal where we expect other levers or activities to be maximised before committing to a significant intervention.

The triggers and preconditions for each corridor were determined based on insights about the potential future impacts of key drivers and our understanding of local context. Assessments from Waka Kotahi subject matter experts, existing investigations, and business cases were also considered. It is uncertain whether the speed of change will require a significant intervention within the next 30 years. We will continue to monitor these change pressures but at this stage, any significant intervention would most likely happen near the end of the 30-year timeframe.

Investigations into potential future interventions should consider thresholds and triggers for both short- and long-term interventions. Before doing any new work on the corridor, consider the likelihood and potential impacts of long-term pressures to ensure any interventions can be adapted and will provide value for money over the longer term.

Map	Our Future Focus
Data source	Waka Kotahi
Layer type	Insight

Projected population growth

The projected population growth at local authority level shown in five-year increments from 2018 to 2048.

Map	Our Current Network, Our Future Focus
Data source	Tatauranga Aotearoa Stats NZ ⁴⁴
Layer type	Information

Rapid transit

Auckland bus

The bus rapid transit network in Tāmaki Makaurau Auckland includes high frequency bus services. The routes were identified from the Auckland Transport Journey Planner schematic and then geolocated for mapping purposes on this geospatial layer.

Please see the *Land Transport Modes and Strategic Networks* section of *Arataki* for more about what makes up the rapid transit networks.

[Land Transport Modes and Strategic Networks →](#)

Auckland rail

The rail rapid transit network in Tāmaki Makaurau Auckland includes all metro-rail lines. The routes were identified from the Auckland Transport Journey Planner schematic and then geolocated for mapping purposes on this geospatial layer.

Please see the *Land Transport Modes and Strategic Networks* section of *Arataki* for more about what makes up the rapid transit networks.

[Land Transport Modes and Strategic Networks →](#)

Wellington bus

The bus routes were identified by analysis of Metlink's timetables to determine which services operate at a minimum of a 15-minute frequency for much of the day. They were then geolocated for mapping purposes on this geospatial layer.

Wellington rail

The metro rail lines in Te Upoko o te Ika a Māui Greater Wellington including Johnsonville, Kapiti, Melling, and Hutt Valley lines. The routes were identified from Metlink's Regional Rail Network schematic and then geolocated for mapping purposes on this geospatial layer.

Note: The Wairarapa Line service from Te Whanganui-a-Tara Wellington City to Whakaoriori Masterton is not included in this layer as there are currently only five trains per day in each direction.

Map	Our Current Network
Data source	Auckland Transport, ⁴⁵ Metlink ⁴⁶
Layer type	Information

State highway network

The state highway network has been broken into segments to enable data, attributes, insights, and guidance to different parts of the system.

The state highway network segments are based on the corridors between state highways and state highway intersections. These segments were reviewed and refined to reflect situations where the:

- volume or type of traffic using the corridor changes significantly
- physical form of the corridor changes significantly – for example, steep terrain, narrow lane widths, and windy alignment.

Within the larger urban centres, the state highway networks have been grouped given highway corridors form part of a more complex urban transport system involving multiple mode and route choices. In this situation, it's more appropriate to consider the highway corridors as part of the whole system, rather than focusing on individual corridors.

Where a state highway corridor passes through a city, defined as an urban centre with a population over 50,000, a segment has been created extending from one side of the city to the other. This allows for targeted attributes and insights that reflect the urban setting and the wider range of routes options, modes, and trips occurring along these corridors.

Map	Our Current Network
Data source	Waka Kotahi
Layer type	Insight

Strategic network

The strategic network identifies the critical parts of the land transport system.

Nationally strategic

These roads cover the most critical parts of the network, acting as the spine of the strategic road and rail networks.

Nationally strategic roads:

- provide important primary connections between population centres and ports, and through urban areas
- perform national level functions
- link major freight hubs to cities
- support both in-region and interregional trips in cities
- have the highest volumes and significant value of trips.

Regionally strategic

These roads perform strategic functions at a regional or subnational scale.

Regionally strategic roads:

- provide interregional connections
- connect areas to the spine of the network
- provide a lifeline function for areas with a single connection
- provide alternate routes in the event of disruption or closures.

Strategic intermodal freight hubs

These are the critical hubs where freight is transhipped between transport modes and are served by nationally and regionally strategic networks.

Please see Appendix 2 for more details.

Map	Our Current Network
Data source	Waka Kotahi
Layer type	Insight

Strategic network transformational change

Transformational change may be required if the:

- current networks are underdeveloped and require the introduction or expansion of new solutions
- scale of change required is beyond what can be achieved through ongoing programmes.

Strategic network transformational points

Indicates where transformational change may be required at various points in a city.

Strategic network transformational segments

Indicates where transformational change may be required along a particular section of road, rail, or cycling network.

Please see Appendix 2 for more details.

Map	Our Future Focus
Data source	Waka Kotahi
Layer type	Insight

Tourism flows

This layer was developed as part of the pan-regional summaries for *Arataki 10-year plan V2* and shows the key tourism flows around Aotearoa New Zealand.

Map	Our Current Network
Data source	Hikina Whakatutuki Ministry of Business, Innovation and Employment ⁴⁷
Layer type	Information

Traffic cameras

Information about Waka Kotahi traffic cameras on the state highway network including the location and direction of view.

Map	Our Current Network
Data source	Waka Kotahi ⁴⁸
Layer type	Information

What's planned

Committed and planned interventions on the state highway network and other interventions that Waka Kotahi and KiwiRail are responsible for delivering. Interventions for this purpose are projects or programmes that either:

- change the use and/or form of the existing network
- improve the level of service.

For version 1.1 of *Arataki*, interventions for walking, cycling, and public transport have been added and all funding thresholds have been removed.

The starting point for developing the list of interventions was an extract in March 2023 from Transport Investment Online (TIO) for the period from 2021 to 2051.

The initial extract was split into the 16 regions and then refined by applying a range of filters to:

- retain only interventions that had the funding status identified as 'Funding Approved' or 'Included in RLTP 2021-24' or 'Included in NLTP 2021-24'
- remove all interventions that had an end year of 2022 or earlier and retain only those interventions with an end year of 2023 or later
- remove local road improvements and maintenance, leaving interventions focused on Waka Kotahi infrastructure
- remove state highway maintenance activities as they are effectively maintaining the current level of service and they are not able to be geolocated from a geospatial (GIS) perspective.

The remaining interventions were reviewed and non-geographically specific activities were removed, like funding investment planning activities or advertising spend.

Interventions were geolocated as either a:

- point, either when the intervention was at a specific location or where it was dispersed across a geographic area
- line segment, where the intervention was clearly identified as occurring between two points.

Locations were derived from road centre-line data and other data to give an approximate location of the activity.

Primary Outcomes Mode

Interventions were then allocated a primary outcome and a related transport mode or theme, as identified in Transport Investment Online.

Users can choose to display the interventions in sub-layer by outcome.

Mode

Users can choose to display the interventions in sub-layers by mode such as cycling/walking, road freight, car, and public transport.

KiwiRail Interventions

Rail interventions show the current and planned projects and interventions on the national rail network. Interventions were geolocated to either a:

- a specific point, either where the intervention was focused on a particular asset or impacted across a wider geographical area
- to an identifiable rail line section.

This information was provided by the KiwiRail investment planning team and is aligned to the Rail Network Investment Programme (RNIP).

Map	Our Current Network
Data source	KiwiRail, ⁴⁹ Waka Kotahi
Layer type	Information

Appendix 1: Regional ratings methodology



The regional ratings show how Waka Kotahi has assessed the potential scale of effort required in each region to achieve the future desired state for each Te Manatū Waka Ministry of Transport outcome over the next 10 years. The ratings in each region indicate where effort can be best focused and inform conversations with partners about priority outcomes in each region.

Healthy and safe people

The healthy and safe people ratings are focused on road safety.

While the healthy and safe people outcome encompasses both safety and health elements, the current regional ratings for this outcome are restricted to analysis of the road safety issues in each region. At this stage health harms are addressed primarily through efforts to reduce emissions and vehicle kilometres travelled (VKT) under the environmental sustainability outcome.

Metrics and methodology

The regional ratings have been developed using death and serious injury (DSI) data for the 2018/19, 2019/20, 2020/21 period. The assessment considers both total DSI (collective risk) and DSI per 100,000 population (personal risk).

Collective risk is a measure of the total number of fatal and serious injury crashes within each region. It highlights regions with higher traffic volumes, as this is where the majority of crashes occur.

Personal risk is a measure of the danger to each individual using the road network in each region. Unlike collective risk, personal risk considers the resident population in each region. Personal risk shows the average likelihood of a road user being involved in a fatal or serious crash in a particular region. Personal risk tends to be highest in regions with more difficult terrain and where traffic volumes and road standards are often lower.

For both collective and personal risk, the regions were rated on a five-point scale depending on how their collective and personal risk figures compared to other regions, as shown in Table 1. The ratings were allocated to reflect groupings or breakpoints within the data.

Legend

More effort

Less effort



Collective and personal risk per region

Table 1

Region	Collective risk (average total death and serious injury 2018/19 to 2020/21)	Personal risk (average death and serious injury per 100,000 population 2018/19 to 2020/21)
Te Tai Tokerau Northland	182	93.9
Tāmaki Makaurau Auckland	581	34.1
Waikato	428	86.2
Te Moana a Toi-te-Huatahi Bay of Plenty	208	62
Tairāwhiti Gisborne	53	103.4
Te Matau-a-Māui Hawke's Bay	124	69.5
Taranaki	89	71.3
Manawatū-Wanganui	198	78
Te Upoko o te Ika a Māui Greater Wellington	195	36.2
Te Taihū Top of the South	84	156
Te Tai o Poutini West Coast	33	101
Waitaha Canterbury	313	48.9
Ōtākou Otago	139	57.1
Murihiku Southland	81	79.5

It was considered that *Arataki* should focus on those regions where the majority of DSIs occur, as this is where there is the greatest scope to reduce harm. However, it is also important to recognise those regions that have high personal risk ratings, as travel in these regions carries the greatest risk.

Legend

More effort

Less effort

6	5	4	3	2	1
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Table 2 matrix was used to combine the collective and personal risk ratings into a single rating for each region for the healthy and safe people outcome.

Collective and personal risk rating matrix

Table 2

		Regional rating DSI per 100,000				
		1	2	3	4	5
Regional rating total DSI	5	5	5	5	6	6
	4	4	4	4	5	5
	3	3	3	3	4	4
	2	2	2	2	3	3
	1	1	1	1	2	2

The matrix enabled *Arataki* to focus on those regions with the highest collective risk (total DSI), while also giving increased weighting to regions with higher personal risk (DSI per 100,000 population) to recognise the increased risk for customers travelling in those regions. Table 3 shows the final regional ratings for the reduce harm step change.

Final ratings for healthy and safe people

Table 3

Region	Regional rating
Te Tai Tokerau Northland	4
Tāmaki Makaurau Auckland	5
Waikato	5
Te Moana a Toi-te-Huatahi Bay of Plenty	3
Tairāwhiti Gisborne	2
Te Matau-a-Māui Hawke's Bay	3
Taranaki	2
Manawatū-Wanganui	3
Te Upoko o te Ika a Māui Greater Wellington	3
Te Taihū Top of the South	3
Te Tai o Poutini West Coast	2
Waitaha Canterbury	4
Ōtākou Otago	3
Murihiku Southland	2

Legend

More effort

Less effort



Environmental sustainability

The environmental sustainability ratings are focused on current and potential future greenhouse gas (GHG) emissions.

Metrics and methodology

The regional ratings have been developed using road transport emission (CO₂ equivalents) data from 2015 to 2019. Existing emission rates have been combined with forecast regional population growth from 2018 to 2048 (Tatauranga Aotearoa Statistics New Zealand medium projections) as a proxy for where emissions can be expected to increase in.

For both existing emissions and forecast population growth, each region was rated using a five-point scale depending on how their figures compared to other regions, as shown in Table 4. The ratings were allocated to reflect groupings or breakpoints within the data.

Current greenhouse gas emissions and future population growth ratings

Table 4

Region	Average emissions 2015–2019	Population growth 2018–2048
Te Tai Tokerau Northland	582	45,400
Tāmaki Makaurau Auckland	4,455	648,000
Waikato	1,532	139,500
Te Moana a Toi-te-Huatahi Bay of Plenty	966	83,500
Tairāwhiti Gisborne	158	5,600
Te Matau-a-Māui Hawke's Bay	471	29,600
Taranaki	372	17,100
Manawatū-Wanganui	733	29,200
Te Upoko o te Ika a Māui Greater Wellington	1,226	86,300
Te Taihū Top of the South	560	20,918
Te Tai o Poutini West Coast	201	-1,800
Waitaha Canterbury	1,824	157,700
Ōtākou Otago	730	47,600
Murihiku Southland	348	7,800

Legend

More effort

Less effort

6	5	4	3	2	1
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It was considered that *Arataki* should focus on those regions where the largest emissions occur, as this is where there is the greatest scope to reduce emissions. However, it is also important to recognise those regions that are forecast to experience the highest levels of growth, as these regions have the greatest potential to deliver growth in a way that can support emissions reductions.

Table 5 matrix was used to combine the emissions and population growth ratings into a single rating for each region for the healthy and safe people outcome. Table 5 matrix enabled *Arataki* to focus on those regions with the highest existing emissions, while also giving increased weight to regions with the highest levels of projected population growth.

Emission and population growth rating matrix

Table 5

		Projected population growth rating				
		1	2	3	4	5
Average emissions rating	5	6	6	6	5	5
	4	5	5	5	4	4
	3	4	4	4	3	3
	2	3	3	3	2	2
	1	2	2	2	1	1

Table 6 sets out the final regional ratings for the reduce harm step change.

Final ratings environmental sustainability

Table 6

Region	Regional rating	Region	Regional rating
Te Tai Tokerau Northland	2	Manawatū-Wanganui	3
Tāmaki Makaurau Auckland	6	Te Upoko o te Ika a Māui Greater Wellington	5
Waikato	5	Te Taihū Top of the South	2
Te Moana a Toi-te-Huatahi Bay of Plenty	4	Te Tai o Poutini West Coast	1
Tairāwhiti Gisborne	1	Waitaha Canterbury	5
Te Matau-a-Māui Hawke's Bay	2	Ōtākou Otago	3
Taranaki	2	Murihiku Southland	2

Legend

More effort

Less effort



Resilience and security

The resilience and security ratings are focused on the impact of unplanned disruptions caused by weather events or natural hazards on the state highway network, measured as vehicle hours lost to disruption.

Metrics and methodology

The resilience and security regional ratings combine evidence about the:

- number and duration of unplanned closures
- number of vehicles impacted by the closure averaged over a 10-year period (to provide the annual average vehicle disruption hours within each region from 2012 to 2021).

The data used for these disruptions was recorded in TREIS, a database managed by the Waka Kotahi Transport Operations Centres (TOCs). When an unplanned closure occurs, Waka Kotahi contractors notify the TOC who then records the:

- location
- time and date information
- duration of the event until reopening
- cause of the disruption.

Within TREIS there are four categories of corridor disruptions to reflect the scale of impact. The four categories ranked from least to greatest impact are:

- caution
- delay
- vehicle restriction
- closure.

Arataki regional ratings included all unplanned events that involved a vehicle restriction or full closure.

To understand the number of vehicles impacted by the unplanned disruptions, traffic volumes have been taken from state highway traffic monitoring sites. Because there are large variances depending on locality, an average has been taken for each state highway defined by the Network Operating Contract (NOC) regional boundaries. This has been normalised over a 24-hour period and therefore doesn't measure disruption during peak travel times.

The average annual vehicle hours disrupted on state highway corridors was calculated for each NOC region to provide a resilience summary. Where necessary, the NOC region totals were aggregated up to align with local government regions as shown in Table 7.

Vehicle hours lost to unplanned disruption per region

Table 7

Region	Vehicle hours lost to unplanned disruption	Regional rating
Te Tai Tokerau Northland	43,823	3
Tāmaki Makaurau Auckland	3,301	1
Waikato	29,411	3
Te Moana a Toi-te-Huatahi Bay of Plenty	24,553	3
Tairāwhiti Gisborne	10,003	2
Te Matau-a-Māui Hawke's Bay	25,917	3
Taranaki	16,607	2
Manawatū-Wanganui	78,936	4
Te Upoko o te Ika a Māui Greater Wellington	34,850	3
Te Taihū Top of the South	141,509	5
Te Tai o Poutini West Coast	24,582	3
Waitaha Canterbury	31,429	3
Ōtākou Otago	34,933	3
Murihiku Southland	12,651	2

Caveats:

- Historically, the quality of data in the TREIS database has been patchy, as the recording of closures has relied on individuals logging network closure. Since the TOCs have taken over responsibility for logging state highway closures and disruptions, the consistency and completeness of entries has improved. The accuracy of the entries in TREIS will continue to improve, but over the past decade there have been gaps in the recording of network disruption which may result in some regions being underrepresented in the ratings.
- The network closure data contained in the TREIS database is categorised by NOC region, not local government region. While the NOC and local government region boundaries generally align, there are some discrepancies. Therefore, the regional ratings are not an exact match of network disruptions based on local government region boundaries. Notable areas of misalignment in regional boundaries include:
 - Northland NOC region contains parts of the Tāmaki Makaurau Auckland local government region north of Kumeū in the west and Puhoi in the east
 - Te Moana a Toi-te-Huatahi Bay of Plenty East NOC region contains a section of the Waikato local government region east of SH1 between Rotorua and Taupō
 - Central Waikato NOC region contains parts of northern Manawātū-Whanganui local government region, including Waiouru, Ohakune, and Tongariro National Park and extending north to Pureora Forest Park
 - Taranaki NOC region extends north into the Waikato local government region to just south of Te Kūiti, and west into Manawātū-Whanganui as far as Taumarunui; this means the resilience hotspots of Mount Messenger and Awakino Gorge are included in the Taranaki rating, even though they are located within the Waikato region.

This analysis is based on historical data reflecting where disruption has occurred in the past. While it is useful in understanding the scale of disruption experienced in different regions over the past decade, it does not indicate which regions will be most impacted by unplanned disruption in the future. Future versions of the analysis should consider including research and analysis of the geographic impacts of climate change, to provide a sense of where resilience impacts are likely to grow over time.

This analysis doesn't include analysis or weighting to reflect where certain routes serve a lifeline function, if there are adequate alternate routes available, or if alternate routes are able to accommodate the likely volume and types of traffic.

All of this influences the impact of unplanned disruptions of network users and local communities. Future versions of this analysis should consider options for including these elements in the regional ratings.

The ratings don't reflect recent improvements to the state highway network that will improve system resilience, such as the opening of Te Aranui o Te Rangihaeata Transmission Gully north of Te Whanganui-a-Tara Wellington city and the Waikato Expressway.

The Kaikōura earthquake and Manawātū Gorge closures were excluded from this analysis, as the scale and duration of those events is much larger than other disruptions and can skew the regional ratings. In addition, the Manawātū Gorge corridor is being replaced by a new, more resilient alignment, so the resilience challenges posed by the old corridor won't be a factor in the future.

Economic prosperity

The economic prosperity ratings are focused on travel time predictability on key freight routes.

Metrics and methodology

The economic prosperity ratings are based on analysis of travel time predictability along key state highway freight routes, combined with details regarding trip length and number of heavy vehicles using each route. The analysis brought these elements together to evaluate the cost impact of poor travel time predictability on heavy vehicle freight movements.

The main source for this measure was TomTom travel time data to provide wide coverage of traffic mobility. This data comes from iPhones, as well as other in-vehicle navigation devices.

Predictability is recorded on a continuous basis for key interregional routes considered important for freight. The method involves examining a series of 15-minute travel time slots across TomTom road-segments during the interpeak period (between 10am and 2pm). The travel times for the financial year 2020–2021 were tested against the previous financial year and were found to be unpredictable if the travel time is 10% or more than the previous year, for the same time slot and the same road-segment. The proportion of those tests that are predictable, in other words are not slower by over 10%, across the full financial year is calculated for a series of sub-journeys within each key freight route. Sub-journeys are aggregations of TomTom road segments but are smaller than an overall freight route.

Legend

More effort



Less effort

Each sub-journey is examined for predictability and the regional score is an average of the scores for all sub-journeys within the region. When a sub-journey straddles two or more regions, its influence on each region's score is weighted according to the distance contained within the regional boundary. For example, if a sub-journey is 100km, and 50km falls inside Region A and 50km falls inside Region B, then its overall influence on each of the region's predictability score is halved.

In some regions, such as Tāmaki Makaurau Auckland, there are overlapping sub-journeys where several routes enter the isthmus along the same state highway. In these circumstances, the influence of each sub-journey on the region's overall score is proportionally reduced by the distance of the overlap so as not to double count the overlap, otherwise the Southern Motorway in Tāmaki Makaurau, which has three overlapping sub-journeys but is often congested, would have a negative influence on the regional score. This data is shown in Table 8.

Travel time predictability per region

Table 8

Region	Travel time predictability on key freight routes (weighted average 2020/21)
Te Tai Tokerau Northland	55.20%
Tāmaki Makaurau Auckland	65.80%
Waikato	81.30%
Te Moana a Toi-te-Huatahi Bay of Plenty	75.70%
Tairāwhiti Gisborne	94%
Te Matau-a-Māui Hawke's Bay	96.30%
Taranaki	96.50%
Manawatū-Wanganui	94.90%
Te Upoko o te Ika a Māui Greater Wellington	90.60%
Te Taihu Top of the South	92.20%
Te Tai o Poutini West Coast	95.20%
Waitaha Canterbury	99.10%
Ōtākou Otago	96.40%
Murihiku Southland	94.20%

Heavy vehicle kilometres travelled (VKT) per region

Table 9

Region	Heavy vehicle VKT annual average 2018-2021 (000,000 km/Year)
Te Tai Tokerau Northland	159.5
Tāmaki Makaurau Auckland	891.2
Waikato	581.2
Te Moana a Toi-te-Huatahi Bay of Plenty	252.0
Tairāwhiti Gisborne	37.0
Te Matau-a-Māui Hawke's Bay	140.4
Taranaki	89.6
Manawatū-Wanganui	237.0
Te Upoko o te Ika a Māui Greater Wellington	244.9
Te Taihu Top of the South	134.1
Te Tai o Poutini West Coast	48.7
Waitaha Canterbury	534.2
Ōtākou Otago	199.6
Murihiku Southland	126.2

Legend

More effort



Less effort

Finally, rather than taking a simple average of all sub-journeys contained within a region, each sub-journey's influence on the regional score is weighted based on its estimated heavy vehicle kilometres travelled (VKT) from 2020, sourced from the Vehicle Emissions Prediction Model from Waka Kotahi that draws on traffic counting data to determine road link based heavy VKT as shown in Table 9.

This means sub-journeys within a region that carry significant volumes of heavy vehicles over a significant distance have more influence than sub-journeys in the same region that don't carry as much, and vice-versa. The aim of this weighting within each region is to help build a score which reflects a typical freight user experience, rather than a simple route-based average. This is shown in Table 10. The final ratings for economic prosperity are shown in Table 11.

Travel time predictability per region

Table 10

Region	Travel time predictability on key freight routes (weighted with heavy VKT and distance 2020/21)
Te Tai Tokerau Northland	53.0%
Tāmaki Makaurau Auckland	64.5%
Waikato	77.8%
Te Moana a Toi-te-Huatahi Bay of Plenty	74.3%
Tairāwhiti Gisborne	94%
Te Matau-a-Māui Hawke's Bay	95.7%
Taranaki	96.9%
Manawatū-Wanganui	93.9%
Te Upoko o te Ika a Māui Greater Wellington	90.5%
Te Taihū Top of the South	94.0%
Te Tai o Poutini West Coast	95.9%
Waitaha Canterbury	98.8%
Ōtākou Otago	96.3%
Murihiku Southland	93.9%

Regional economic prosperity ratings

Table 11

Region	Regional rating
Te Tai Tokerau Northland	5
Tāmaki Makaurau Auckland	5
Waikato	4
Te Moana a Toi-te-Huatahi Bay of Plenty	4
Tairāwhiti Gisborne	2
Te Matau-a-Māui Hawke's Bay	2
Taranaki	2
Manawatū-Wanganui	2
Te Upoko o te Ika a Māui Greater Wellington	3
Te Taihū Top of the South	2
Te Tai o Poutini West Coast	2
Waitaha Canterbury	1
Ōtākou Otago	2
Murihiku Southland	2

Caveats:

- The travel time predictability datasets are relatively new, and were developed during the COVID-19 pandemic, an exceptional period in terms of traffic volumes and trips undertaken. We anticipate the quality of data will improve over time as we build a longer timescale of data and as Aotearoa New Zealand emerges from the pandemic, enabling more detailed assessments of travel time predictability across the land transport system.
- The travel time predictability data is recorded according to key routes, and sub-journeys within them, taken on the state highway network; for example, Wiri to Port of Tauranga via SH1 and SH29, or Māwhera Greymouth to Christchurch Airport via SH73 & SH1. Within a sub-journey it's not possible to identify the specific location or cause of reduced travel time predictability.
- The data is based upon TomTom general traffic flows which may not accurately reflect the experiences of road freight users. Over time we hope to improve this by using EROAD data which should be more representative of road freight.

Inclusive access

The inclusive access ratings are focused on:

- access to employment
- what modes people have available
- how far people need to travel
- if deprived neighbourhoods need to travel further.

Metrics and methodology

The regional ratings have been developed using three datasets:

- percentage of people that can reach their jobs in different time thresholds by different modes
- median commuting distance by region
- average commuting distance by deprived area.

Percentage of people that can reach their jobs in different time thresholds by different modes was sourced from the 2020 Integrated Data Infrastructure (IDI). This measure was used to calculate the percentage of people who can reach their jobs by a 30-minute public transport trip, walk, and cycle. Driving was excluded from this measure as in all regions over 90% of people can get to work within a 30-minute drive, excluding Tāmaki Makaurau Auckland where it's 82%, and 99.5% within a 45-minute drive. This is shown in Table 12.

Median commuting distance by region was calculated using the IDI measure of average one-way road networked distance between place of work and place of residence for employees in 2019. This was then divided by the number of full-time equivalent employees in the region. This gives an assessment of the median one-way distance travelled by people to get to work.

Average commuting distance by deprived area was calculated using the average IDI measure of one-way road networked distance between place of work and place of residence for employees in 2019, totalled for deprived area (deciles eight, nine, and 10).

The average commuting distance minus the average commuting distance by deprived area gives a measure of how much further or shorter average commuting trips are for those from deprived areas, as shown in Table 12.

Legend

More effort

Less effort



Modal journey distance to workplace and excess distance for deprived neighbourhoods per region

Table 12

Region	Percentage of people that can reach their jobs by a 30-minute trip				Length of trip (kilometers)	
	Public transport	Walking	Cycling	Overall (excludes driving)	Median distance travelled per employee	How much more do deprived neighbourhoods have to travel
Te Tai Tokerau Northland	10.17%	20.19%	52.53%	27.63%	8.004579671	-1.393057386
Tāmaki Makaurau Auckland	12.12%	11.10%	34.86%	19.36%	10.64639248	-0.106763841
Waikato	17.27%	21.99%	60.12%	33.13%	6.789433563	-1.986295131
Te Moana a Toi-te- Huatahi Bay of Plenty	14.44%	16.41%	49.75%	26.87%	8.417711962	-2.474581173
Tairāwhiti Gisborne	0.00%	25.58%	72.43%	32.67%	5.20898293	0.158513005
Te Matau-a-Māui Hawke's Bay	11.39%	20.21%	53.61%	28.40%	6.90366455	-1.375233366
Taranaki	4.99%	23.84%	56.85%	28.56%	6.569239402	-1.783426136
Manawatū-Wanganui	16.90%	25.17%	65.97%	36.01%	6.126856036	-1.812333087
Te Upoko o te Ika a Māui Greater Wellington	25.60%	19.48%	52.09%	32.39%	8.059651726	0.185150273
Te Taihū Top of the South	17.08%	26.33%	61.18%	34.86%	6.402653965	-2.475718477
Te Tai o Poutini West Coast	0.00%	37.84%	67.24%	35.03%	5.819878349	-0.210828612
Waitaha Canterbury	13.93%	14.90%	49.98%	26.27%	8.202561313	-2.241874886
Ōtākou Otago	24.81%	25.90%	63.29%	38.00%	6.645722552	-2.319623736
Murihiku Southland	10.54%	25.17%	68.82%	34.84%	5.263222288	-1.250407677

Legend

More effort



Less effort

To develop the final ratings, we first ranked each indicator in each region, using a five-point scale. This gave ratings for each indicator in each region. Next a matrix approach was used to develop the overall rating. For example, if two indicators were rated five, and the third was three, then the overall rating was a four. Alternatively, if two indicators were rated one, and the third was three, then the overall rating was two. The highest rating was used as the key driver of the overall rating, meaning this would move the overall rating up a category. If all indicators were the same, then the overall rating was the same, too. Inclusive access ratings are shown in Table 13.

Caveats:

- This approach only considers access to jobs, rather than other opportunities like school, university, social engagements.
- It only considers access for people who are currently employed.
- Some travel to work trips may be multi-purpose such as dropping kids at school or popping into the shops.
- The percentage of trips to work on modes and times is relatively new data and may have some limitations.

Inclusive access ratings per region

Table 13

Region	Regional rating
Te Tai Tokerau Northland	4
Tāmaki Makaurau Auckland	5
Waikato	2
Te Moana a Toi-te-Huatahi Bay of Plenty	2
Tairāwhiti Gisborne	3
Te Matau-a-Māui Hawke's Bay	3
Taranaki	2
Manawatū-Wanganui	1
Te Upoko o te Ika a Māui Greater Wellington	4
Te Taihū Top of the South	1
Te Tai o Poutini West Coast	3
Waitaha Canterbury	3
Ōtākou Otago	2
Murihiku Southland	2

Appendix 2: Strategic network

The strategic network section is a new addition to the 2023 release of *Arataki*.

The strategic network identifies the critical parts of the land transport system and what should happen on each of these to maintain appropriate levels of service. It covers all modes and is mode neutral. It has two components:

- current strategic network
- areas of transformational change.

The defining characteristics of strategic networks, that set these apart from the rest of the transport network, is a combination of the:

- criticality of the corridor to the overall network of that mode
- volume of use of the corridor
- significance of locations served by the corridor
- scale of contribution the corridor makes to transport outcomes.

For this release, the strategic network is limited to state highways, rail, rapid transit, walking, and cycling in Tier 1 cities. Future releases of *Arataki* will build on this to include public transport and strategic networks on local roads.

Identifying the current strategic network

The current networks were identified using existing work and classifications where possible including:

- pan-regional summaries developed for *Arataki Version 2*
- Our Current Network map
- Our Future Focus map
- One Network Framework (ONF)
- KiwiRail's network classification from the *Rail Network Investment Programme*
- spatial plans and rapid transit plans for Tier 1 urban areas.

A working group from across Waka Kotahi used these inputs to determine the current strategic network.

Strategic road network

To identify the strategic road network, Our Current Network map and the two highest classes of roads from the One Network Framework (transit corridors and interregional connectors) were grouped together to form a long list of the strategic roads network. Where these overlapped, then a road was considered part of the strategic network. To be considered strategic at this point, the road had to be:

- classified as nationally or regionally significant in *Arataki Version 2* for the purposes of the pan-regional summaries
- either a transit corridor or interregional connector (ONF).

This list was then categorised into nationally strategic and regionally strategic.

The nationally strategic network covers the most critical parts of the network, acting as the spine of the strategic road network to:

- provide important primary connections between population centres, ports, and through urban areas
- perform national level functions
- link major freight hubs to cities
- support both in-region and interregional trips
- have the highest volume and significant value of trips.

Regionally strategic roads perform strategic functions at a regional or sub-national scale to:

- provide interregional connections
- connect areas to the spine of the network
- provide a lifeline function for areas with a single connection
- provide alternate routes in the event of disruption or closures.

Some roads on this long list didn't meet either of these classifications and they were removed from the network. Some important connections on the local road network have also been included because they support freight and connect to the strategic network.

Strategic rail network

The strategic rail network was defined as the parts of the network that:

- provide for the efficient and sustainable movement of large volumes of freight across longer distances between cities, ports, and major distribution centres
- have an emerging role for larger volumes of sustainable interregional passenger movement.

The strategic rail network is the same as the priority lines in the *Rail Network Investment Programme* and includes the Rolleston to Lyttelton rail spur.

Strategic rapid transit network

The strategic rapid transit network was defined by the *National Policy Statement on Urban Development 2020* from Manatū Mō Te Taiao Ministry for the Environment.⁵⁰ It covers services moving large numbers of people across key transport bottlenecks and into highly constrained areas to support and shape growth and urban development. Currently only the following meet this definition:

- Tāmaki Makaurau Auckland metro rail
- Te Upoko o te Ika a Māui Greater Wellington metro rail
- Tāmaki Makaurau northern and eastern busways.

Strategic cycling network

The strategic cycling network was defined as the backbone of urban cycling networks to:

- enable healthy, reliable, and sustainable travel for short-to-medium length journeys
- support neighbourhood trips to shops, schools, services, and work.

The following One Network Framework classes were used to develop the strategic cycling network:

- Class C1 – Primary strategic cycling network, intended to support high volumes of cyclist movement.
- Class C2 – Secondary strategic cycling network, providing key connections to schools, community facilities, or employment.

Strategic walking network

Key pedestrian attractors that are strategically important parts of walking networks include:

- city and suburb centres
- shopping precincts
- business districts
- schools and universities.

Walking catchments are also critical to support public transport networks. Strategic walking networks also correlate closely with public transport stops and interchanges.

The following One Network Framework classes were used to develop the strategic walking network:

- Class W1 - Key routes within primary walking catchments connecting pedestrians with key destinations and places of significance.
- Class W2 - Key routes within secondary walking catchments, providing key connections to local destinations and providing access to W1 networks.

Identifying areas of transformational change

Areas of transformational change were identified using three steps:

1. Assess against criteria.
2. Compare against information from the system deficiencies layers and Our Future Focus map, for state highway and rail.
3. Assess against existing work, including programme business cases, corridor management plans, and spatial plans.

Criteria

The table below was used to assess whether a part of the network needed transformational change. These criteria were used as a first assessment of whether a part of the network requires transformational change.

Key drivers of transformational change

Table 14

Mode	Key drivers
Road	<ul style="list-style-type: none"> Very significant safety, resilience, or reliability deficiencies with national-scale implications that can't be effectively addressed through incremental programmes of improvement. A level of demand over time, after considering necessary traffic reductions to reduce emissions, that mean improvements deliver enduring value. Resolution of fundamental place/movement conflicts that will continue to undermine achieving nationally significant transport outcomes if not addressed over time.
Rail and rapid transit	<p>Rapid transit</p> <ul style="list-style-type: none"> Significant existing access and travel choice deficiencies for large numbers of people. A level of demand over time that will deliver enduring value and cannot be adequately served through lower-capacity interventions. Opportunities to shape nationally significant urban development, to enable, support, and shape compact, mixed-use land-use patterns. <p>Rail</p> <ul style="list-style-type: none"> Nationally significant passenger/freight conflicts on the rail network, to ensure both can continue to grow over time. Delivers a nationally significant improvement to the country's freight and supply chain system.
Active modes	<ul style="list-style-type: none"> Creates a key element for wider active mode networks in major urban areas. Addresses the most critical network gaps.

Comparison against network deficiencies layers and our future focus map

To create the list of potential transformational changes, Our Future Focus map was used as a first step. This map assesses whether there is a need for an intervention on a part of the network. Where part of the network was classified by the map as significant intervention expected or possible, it was assessed against the criteria in Table 14. Previous GIS maps layers were also considered, including system deficiencies that shape the need for change.

This list of potential transformational changes was checked to see if changes were planned and underway through existing programmes and safe system corridor improvements. Where this was not the case, these were considered as transformational change. Table 15 outlines how this assessment was done.

Projects that are part of The New Zealand Upgrade Programme were also included in this analysis, with an assessment of whether they were transformational. Some additional deficiencies identified since the Baseline Network Version was completed were also added at this point, such as SH1 Mangamuka Gorge and SH1 Hornby.

Assessment was done against existing work including programme business cases, corridor management plans, and spatial plans.

Each of the strategic roading network areas of transformational change were then analysed to determine what the strategic direction for each of these parts of the network should be. This analysis considered:

- the key drivers of transformational change, including what the critical deficiencies and opportunities are over time, and why these can't be achieved through incremental change
- what previous work has confirmed, including corridor management plans, programme business cases, Te Tupu Ngātahi Supporting Growth alliance work, and others.

For rail and rapid transit, areas of transformational change were analysed to determine what the strategic direction for each of these parts of the network should be. This analysis considered:

- the key drivers of transformational change, including what the critical deficiencies and opportunities are over time, and why these can't be achieved through incremental change
- what previous work on rapid transit has been done, including the Auckland Transport Alignment Project, Auckland Rapid Transit Plan, Auckland Light Rail, Hamilton Metro Spatial Plan, Urban Form + Transport Initiative project (Tauranga), Let's Get Wellington Moving, and Christchurch Public Transport Futures
- what previous work on rail has been done, including Tāmaki Makaurau Auckland and Te Upoko o te Ika a Māui Greater Wellington network improvements, New Zealand Upgrade Programme, and the Rail Network Investment Programme.

For walking and cycling areas of transformational change were analysed to determine what the strategic direction for each of these parts of the network should be. This analysis considered:

- the key drivers of transformational change including what the critical deficiencies and opportunities are over time and why they can't be achieved through incremental change
- walking and cycling programmes in Tāmaki Makaurau, Kirikiriroa Hamilton, Tauranga, Te Whanganui-a-Tara Wellington city, and Ōtautahi Christchurch
- specific network completion projects including Tāmaki Makaurau city centre to Albany and Te Ara Tupua in Te Upoko o te Ika a Māui Greater Wellington.

The potential transformational change required reflects the triggers and preconditions identified in Our Future Focus map. Where triggers and preconditions for a change have been reached, they have been included in the potential areas of transformational change. As the key drivers continue to change, and preconditions and triggers are met, then new areas of transformational change will be added.

Strategic network – 30-year plan – Our future focus map: Need for intervention and deficiencies

Table 15

Name	Need for significant corridor intervention	Deficiency shaping potential need for significant intervention	30-year plan - Our future focus map	2023 Arataki strategic networks update
SH1: Whangārei to Ruakākā	Expected	Resilience (adaptation) and capacity	A New Zealand Upgrade Programme project is underway to address current safety issues. We anticipate resilience (climate adaptation) deficiencies and growing demand will trigger the need for a significant intervention within the next 30 years. This should only be progressed once demand management and getting the most out of the network have been maximised.	Transformational change
SH1: I/S Waipu Gorge Road to Brynderwyn	Expected	Resilience	Growing resilience challenges on the Brynderwyns, combined with forecast growth in demand, are likely to trigger the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and resilience where these will provide long-term value for money.	Transformational change
SH1: Brynderwyn to Wellsford	Expected	Capacity	Forecast growth in demand, combined with resilience challenges and a lack of viable alternate routes, may trigger the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and resilience where these will provide long-term value for money.	Transformational change
SH1: Wellsford to Warkworth	Possible	Resilience and capacity	Growing resilience challenges and forecast growth in demand are likely to trigger the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and resilience where these will provide long-term value for money.	Transformational change

Name	Need for significant corridor intervention	Deficiency shaping potential need for significant intervention	30-year plan - Our future focus map	2023 Arataki strategic networks update
SH1: Cambridge to Piarere (I/S with SH29)	Expected	Safety and capacity	Existing resilience and safety challenges, combined with forecast growth in demand, are likely to trigger the need for a significant intervention over the 30-year period. In the interim, maintain existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety, resilience, and access where these will provide long-term value for money.	Transformational change identified between Cambridge and Taupō which captures these segments.
SH1: Piarere (I/S with SH29) to Tirau (I/S with SH27)	Expected	Safety and capacity	Safety challenges and forecast growth in demand are expected to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and access where these will provide long-term value for money.	
SH1: Tirau (I/S with SH27) to I/S with SH5	Expected	Safety, access, and capacity	Safety challenges, forecast growth in demand, and associated impacts on community severance are expected to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and access where these will provide long-term value for money.	
SH1: I/S with SH5 to Putāruru (I/S with SH28)	Possible	Safety and capacity	Safety challenges and forecast growth in demand are expected to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and access where these will provide long-term value for money.	
SH1: Putāruru (I/S with SH28) to Tokoroa	Possible	Safety, access, and capacity	Safety challenges, forecast growth in demand, and associated impacts on community severance are expected to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and access where these will provide long-term value for money.	
SH1: Tokoroa to Wairakei	Possible	Safety and capacity	Safety challenges and forecast growth in demand are expected to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety and access where these will provide long-term value for money.	

Name	Need for significant corridor intervention	Deficiency shaping potential need for significant intervention	30-year plan - Our future focus map	2023 Arataki strategic networks update
SH1: Taupō to Tūrangi	Expected	Resilience and capacity	We anticipate a significant intervention will be required on parts of the corridor (eastern edge of Lake Taupō, Three Sisters) because of severe physical constraints on the current alignment, existing safety and resilience challenges, and forecast growth in demand, particularly freight. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to improve resilience, safety, and travel time reliability.	Transformational change
SH1: Bulls to Sanson	Possible	Safety, access, and capacity	A significant intervention may be required between Bulls and Sanson, triggered by increasing demand particularly for freight, safety issues, and place-making/severance issues. A safe system corridor transformation is proposed as part of the Speed and Infrastructure Programme. In the interim, maintain the corridor at appropriate levels of service and get the most out of travel along the network to ensure interregional journeys and freight movements are safe and reliable.	Likely covered as part of SH1 Ōtaki to Palmerston North above. The current state highway safety risks layer in the system deficiencies layers also points out that a safety intervention is already planned as part of existing programmes so not considered transformational.
SH1: Sanson to Levin	Possible	Safety and capacity	A significant intervention may be required between Sanson and Levin, triggered by increasing demand. In the interim, maintain the corridor at appropriate levels of service and get the most out of travel along the network to ensure interregional journeys and freight movements are safe and reliable.	

Name	Need for significant corridor intervention	Deficiency shaping potential need for significant intervention	30-year plan - Our future focus map	2023 Arataki strategic networks update
SH1: Christchurch to Ashburton	Expected	Safety and capacity	Existing safety challenges, combined with forecast growth in demand particularly for freight, are likely to drive the need for a significant intervention over the 30-year period. NZUP projects along this corridor will improve safety and access. In the interim, maintain the existing corridor and deliver small-medium scale improvements to ensure road and rail journeys between Christchurch and Ashburton are safe, resilient, and reliable. Monitor the impacts of climate change, particularly more intense rainfall events on strategic infrastructure, including bridges.	Unlikely transformational change is needed along whole corridor. Issues can be largely addressed through ongoing programmes. Potential isolated areas of transformational change (such as Hornby).
SH1: Ashburton to Timaru	Expected	Safety and capacity	Existing safety challenges, combined with forecast growth in demand particularly for freight, are likely to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and deliver small-medium scale improvements to safety to ensure journeys between Ashburton and Timaru are safe, resilient, and reliable. Future interventions should take growth in travel demand into account. Monitor the impacts of climate change, particularly more intense rainfall events on strategic infrastructure, including bridges.	
SH1: Timaru urban	Expected	Capacity	Forecast growth in demand, driven by continued population growth, is expected to trigger the need for significant interventions over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety, access, and resilience where these will provide long-term value for money.	
SH2: Hastings urban	Possible	Safety and capacity	A significant intervention may be required between Napier and Hastings, triggered by increasing demand. A safe system corridor transformation is proposed as part of the Speed and Infrastructure Programme. Maintain the existing corridor to ensure interregional journeys are reliable and safe, and work with partners to integrate land-use planning and transport improvements to enable mode shift.	The Current State Highway Safety Risks layer also points out that a safety intervention is already planned as part of existing programmes so not considered transformational.
SH2: Masterton to Featherston	Possible	Safety, access, and capacity	A significant intervention may be required between Masterton and Featherston, triggered by increasing transport demand and associated place-making/severance issues. A safe system corridor transformation is proposed as part of the Speed and Infrastructure Programme. Maintain the network to an appropriate level of service and integrate land-use planning for the townships along SH2 with transport planning to ensure interregional journeys are safe and reliable.	Likely covered as part of SH1 Ōtaki to Palmerston North above. The Current State Highway Safety Risks layer also points out that a safety intervention is already planned as part of existing programmes so not considered transformational.

Name	Need for significant corridor intervention	Deficiency shaping potential need for significant intervention	30-year plan - Our future focus map	2023 Arataki strategic networks update
SH29: Piarere (I/S with SH1) to I/S with SH28 (base of Kaimai Range)	Possible	Safety and capacity	The SH1/SH29 intersection at Piarere will be upgraded through NZUP to improve safety outcomes. The need for a significant intervention over the next 30 years is expected to be triggered by increased demand particularly for freight. Maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety, resilience, and access.	Intervention layers of the geospatial maps indicate that an NZUP project is planned as part of existing programmes so not considered transformational.
SH29: I/S with SH28 (base of Kaimai Range) to Tauranga	Possible	Safety, resilience, and capacity	Existing safety challenges, combined with forecast growth in demand particularly for freight, are likely to drive the need for a significant intervention over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety, resilience, and access where these will provide long-term value for money. Land-use changes in the Tauranga urban area should integrate with other transport interventions.	Transformational change
SH3: New Plymouth to Inglewood	Possible	Safety and capacity	A significant intervention may be required between New Plymouth and Waitara, triggered by increasing demand and place-making/severance issues. Corridor safety improvements are proposed as part of the Speed and Infrastructure programme. Maintain the existing corridor to appropriate levels of service and enable mode shift along urban parts of the corridor to ensure interregional journeys between New Plymouth and Whanganui are safe, resilient, and reliable.	
SH6: Nelson urban	Possible	Capacity	Forecast growth in demand, driven by continued population growth, may trigger the need for significant interventions over the 30-year period. In the interim, maintain the existing corridor and make ongoing small-medium scale improvements to respond to deficiencies in safety, access, and resilience where these will provide long-term value for money.	
SH6/6A: Cromwell to Queenstown	Possible	Resilience and capacity	Growing resilience challenges and forecast growth in demand may trigger the need for a significant intervention between Cromwell and Queenstown over the next 30 years. In the interim, maintain the existing corridor and deliver improvements through spatial partnerships while ensuring journeys between Wanaka and Queenstown are safe, resilient, and reliable. NZUP projects on SH6 near Queenstown will enable mode shift through improving walking, cycling, and public transit networks and services.	The What's Planned layer on the Our Current Network map also points out that an NZUP project is planned as part of existing programmes so not considered transformational.

References

The background of the page features a photograph of a train at a station platform. The train is primarily yellow and white, with blue accents. The front of the train is visible, showing the windshield and a red light. The side of the train has the text 'SD 5893' and a blue door. The platform has a yellow safety line and a blue curved graphic element that frames the 'References' title.

1. Ministry of Transport (2021). Transport outcomes framework. <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/>
2. Ministry of Transport (2019). Transport outlook. <https://www.transport.govt.nz/area-of-interest/infrastructure-and-investment/transport-outlook/>
3. KonSULT (2022). Decision makers' guidebook. <http://www.konsult.leeds.ac.uk/dmg/09/>
4. Waka Kotahi NZ Transport Agency (2023). Vehicle emissions mapping tool. <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-sustainability-in-our-operations/environmental-technical-areas/air-quality/vehicle-emissions-mapping-tool/>
5. NIWA (2023). Coastal Adaptation to Climate Change: Mapping a New Zealand Coastal Sensitivity Index. <https://niwa.co.nz/climate/research-projects/coastal-adaptation-to-climate-change>
6. Ministry of Transport (2019). National Freight Demand Study 2017/18. <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>
7. Waka Kotahi NZ Transport Agency (2022). About the commercial vehicle safety centres. <https://www.nzta.govt.nz/commercial-driving/trucks-and-tow-trucks/the-commercial-vehicle-safety-programme/about-the-commercial-vehicle-safety-centres/>
8. Waka Kotahi NZ Transport Agency (2022). Crash analysis system (CAS). <https://www.nzta.govt.nz/safety/partners/crash-analysis-system/>
9. Department of Conservation (2022). Walking and tramping. <https://www.doc.govt.nz/parks-and-recreation/things-to-do/walking-and-tramping/>
10. Department of Conservation (2023). DoC open data source: Public Conservation Land. <https://doc-deptconservation.opendata.arcgis.com/search?groupIds=2f464d8a0dde474cb63d44183fa0f556>
11. Waka Kotahi (2023). EV Roam charging stations open data source. <https://nzta.maps.arcgis.com/home/item.html?id=238dd4298c0445d8ac8567eefe22413e>
12. Auckland Transport (2022). Auckland's rapid transit network and ferry services. <https://at.govt.nz/media/1989560/auckland-s-rapid-transit-network-map.pdf>
13. Metro (2023). Lyttelton to Diamond Harbour. <https://www.metroinfo.co.nz/timetables/f-diamond-harbour-ferry/>
14. Bluebridge (2023). <https://www.bluebridge.co.nz>
15. Interislander (2023). <https://www.interislander.co.nz>
16. Metlink (2023). Wellington harbour ferries. <https://www.metlink.org.nz/getting-started/wellington-harbour-ferries/>
17. Auckland Council (2023). Auckland's hazard viewer. <https://aucklandcouncil.maps.arcgis.com/apps/MapSeries/index.html?appid=81aa3de13b114be9b529018ee3c649c8>
18. Statistics New Zealand (2019). Regional gross domestic product: Year ended March 2018. <https://www.stats.govt.nz/information-releases/regional-gross-domestic-product-year-ended-march-2018/>
19. Ministry of Transport (2018). Freight Information Gathering System (FIGS). <https://www.transport.govt.nz/statistics-and-insights/freight-and-logistics/trade-trends/>
20. Ministry of Transport (2014). National Freight Demand Study. <https://www.transport.govt.nz/assets/Uploads/Report/National-Freight-Demand-Study-Mar-2014.pdf>
21. Governance Group (2015). Draft South Island Freight Plan. <https://www.nzta.govt.nz/assets/resources/draft-south-island-freight-plan/docs/draft-south-island-freight-plan.pdf>
22. Waka Kotahi NZ Transport Agency (2022). 50MAX interactive map. <https://nzta.maps.arcgis.com/apps/webappviewer/index.html?id=28cdbf52c1664e92a1a84d6a5bdcf575>
23. University of Auckland (2023). 2018 NZ Index of Multiple Deprivation. <https://imdmapp.auckland.ac.nz/download/>
24. InterCity (2023). <https://www.intercity.co.nz/>
25. Great Journeys New Zealand (2023). <http://www.greatjourneysnz.com>
26. Te Huia (2023). <https://www.tehuiatrain.co.nz/>
27. Metlink (2022). Wellington regional rail network. <https://www.metlink.org.nz/getting-started/apps-maps-and-guides/network-maps/>
28. Great Journeys New Zealand (2023). Capital connection. <https://www.greatjourneysnz.com/capital-connection/>
29. Te Puni Kōkiri (2023). Te Kāhui Māngai. <https://www.tkm.govt.nz>
30. Waka Kotahi NZ Transport Agency (2022). Detour routes tool. <https://detours.myworksites.co.nz/>

31. Statistics New Zealand (2018). Subnational ethnic population projections, age profiles and census summaries. <https://www.stats.govt.nz/information-releases/subnational-ethnic-population-projections-2018base2043>
32. Te Puni Kōkiri (2023). Map marae open data source. <https://hub.arcgis.com/maps/TPK::map-marae/about>
33. Ministry of Transport (2022). FIGS: Containers. <https://www.transport.govt.nz/statistics-and-insights/freight-and-logistics/>
34. Ministry for Primary Industries (2022). Place of first arrival – seaports. <https://www.mpi.govt.nz/resources-and-forms/registers-and-lists/places-of-first-arrival-seaports/>
35. KiwiRail (2021). Rail network investment programme. <https://www.kiwirail.co.nz/assets/Uploads/documents/Rail-Network-Investment-Programme-July-2021.pdf>
36. KiwiRail (2023). KiwiRail network map. <https://kiwirail.maps.arcgis.com/apps/View/index.html?appid=556c4a9c73914fe1983529ddf9ae5099>
37. Land Information New Zealand (2023). <https://data.linz.govt.nz/layer/105588-nz-facilities/>
38. Waka Kotahi NZ Transport Agency (2022). New Zealand cycling network – Cycle trail category. <https://maphub.nzta.govt.nz/public/?appid=824225b4257e409f9ba2e9b24e1c94be>
39. Waka Kotahi NZ Transport Agency (2022). One network framework. <https://www.nzta.govt.nz/planning-and-investment/planning/one-network-framework/>
40. Waka Kotahi NZ Transport Agency (2020). National resilience programme business case: Risk assessment. https://experience.arcgis.com/experience/7f71bcbcea9f4efc9c5c72c2d8cebb7a/page/page_3/
41. Ministry of Transport (2022). Transport outlook. <https://www.transport.govt.nz/statistics-and-insights/transport-outlook/sheet/updated-future-state-modelresults>
42. KiwiRail (2023). Rail network investment programme. <https://www.kiwirail.co.nz/our-network/funding-our-network/rail-network-investment-programme/>
43. Statistics New Zealand (2020). National population projections: 2020 (base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
44. Statistics New Zealand (2020). National population projections: 2020 (base)-2073. <https://www.stats.govt.nz/information-releases/national-population-projections-2020base2073>
45. Auckland Transport (2022). Auckland's rapid transit network and ferry services. <https://at.govt.nz/media/1989560/auckland-s-rapid-transit-network-map.pdf>
46. Metlink (2022). Wellington regional rail network. <https://www.metlink.org.nz/getting-started/apps-maps-and-guides/network-maps/>
47. Ministry of Business, Innovation and Employment (2020). Annual tourism spend grouped by TA, region, country of origin and product category. <https://www.mbie.govt.nz/immigration-and-tourism/tourismresearch-and-data/tourism-data-releases/monthlyregional-tourism-estimates/>
48. Waka Kotahi NZ Transport Agency (2023). Traffic cameras open data source. <https://nzta.maps.arcgis.com/home/item.html?id=893d8a697d7f418f87392fb1222f5b95>
49. KiwiRail (2023). Rail Network Investment Programme. <https://www.kiwirail.co.nz/our-network/funding-our-network/rail-network-investment-programme/>
50. Ministry for the Environment (2022). National policy statement on urban development 2020. <https://environment.govt.nz/assets/publications/National-Policy-Statement-Urban-Development-2020-11May2022-v2.pdf>