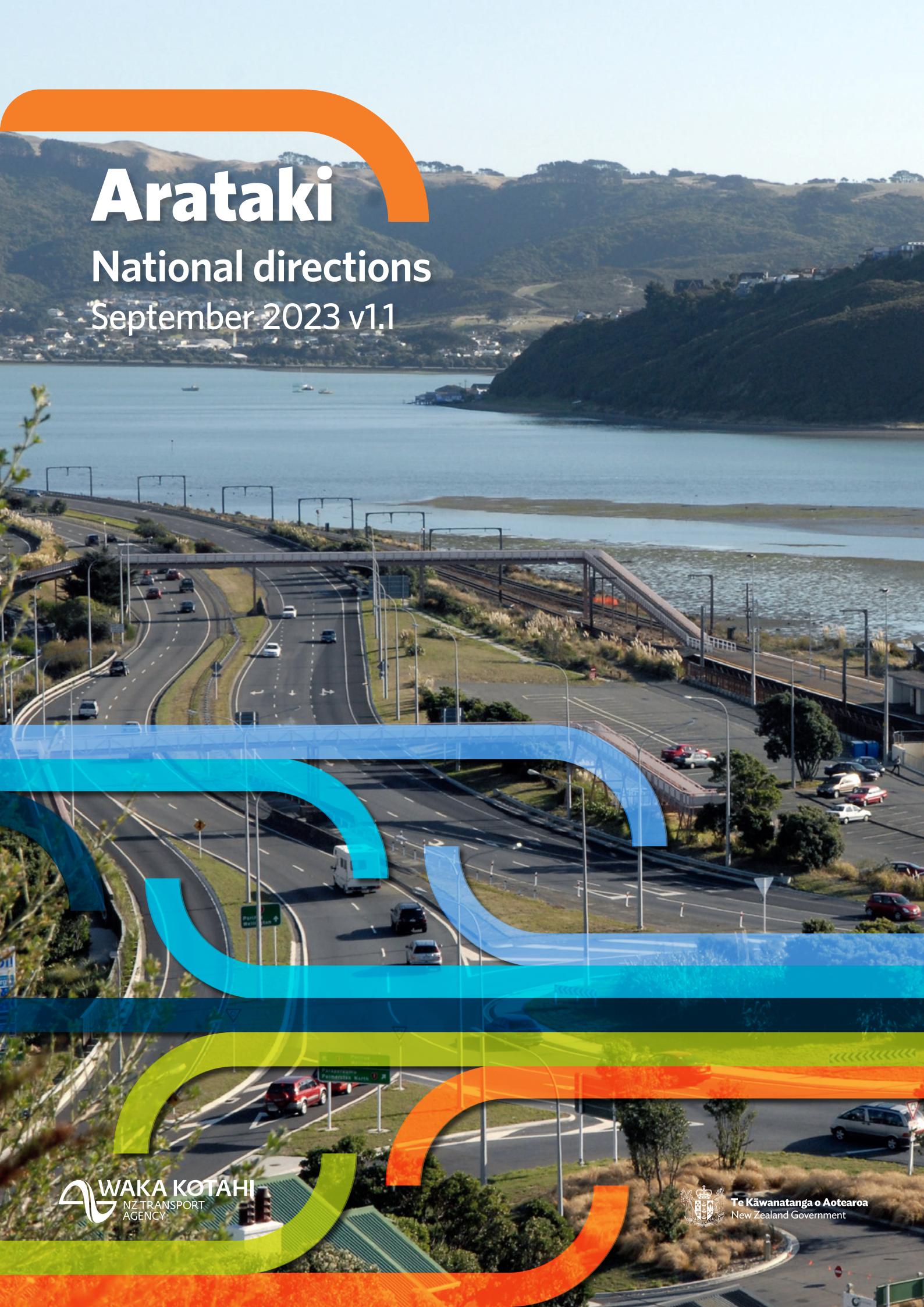
Arataki

National directions

September 2023 v1.1



WAKA KOTAHI
NZ TRANSPORT AGENCY

Te Kāwanatanga o Aotearoa
New Zealand Government

Contents

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.

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.

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.

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 or 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

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**