Evidence pack

Wellington region

June 2025

Version 1.0

NZ TRANSPORT AGENCY
WAKA KOTAHI

Te Kāwanatanga o Aotearoa
New Zealand Government

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More information

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Introduction

This Wellington region section is part of the *Evidence pack*, which is intended to help in the preparation of the strategic front end of regional land transport plans (RLTPs).

It does this by providing a consistent set of data and information setting out the current and future state of New Zealand's transport system at a national and regional level, and what interventions are likely to be effective to address identified deficiencies.

This iteration (version 1, June 2025) is the first step in the collaborative development with the sector of consistent and comprehensive evidence and information. For future iterations we will be drawing on your feedback to iteratively improve it and close any data and analysis gaps.

For more background information about the evidence pack, see the Introduction and national summary.

What's in the evidence pack?

The complete evidence pack is available on the Transport Insights portal.

There you will find:

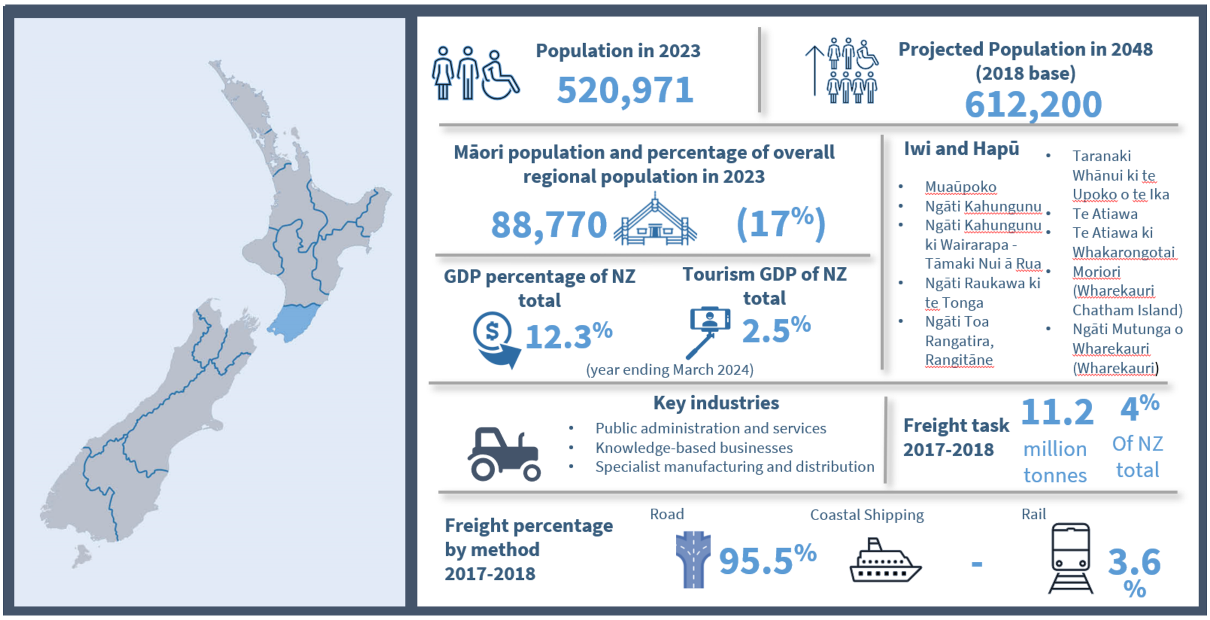
- evidence pack introduction and national summary, which gives you more background to the pack, its purpose and where the information and data are sourced from, and provides an overview for the whole country
- a section for each region, with data and information (calculated as strategic measures) specific to that region, and discussion of how it fits into the national network.

What's in this Wellington region section?

Each regional section follows the same structure:

- **Greater Wellington overview** – a brief overview of the region.
- **Strategic measures** – which looks at how the region currently rates against the 14 strategic measures from the Land Transport Benefits Framework, and how it's expected to change over time.
- **Current and future challenges** – specific issues for the region to address.
- **Focusing effort** – identifies key areas to focus investment in the short and longer term, and includes targeted suggestions of potential interventions.
- **Appendices** – data sources for the strategic measures and more information on potential interventions.

Greater Wellington overview



Greater Wellington Te Upoko o Te Ika a Māui is at the southern tip of the North Island and is characterised by its harbours, rolling hills, and dynamic urban centres. As the capital city of New Zealand, Wellington anchors a knowledge-based economy. Greater Wellington is the third largest regional economy in New Zealand and has the highest median household income. Forty percent of the region's employment opportunities are concentrated in Wellington's central business district.[1] Public sector administration, along with professional, scientific, and technical services, contribute 26 percent of the region's GDP.[2]

The region's population is projected to grow from 550,500 to 605,000 by 2048. Most of the population growth is expected to be in the Wellington urban area. The main centre on the Kapiti Coast is Paraparaumu, and in the Wairarapa region Masterton serves as the largest town and urban centre. Wellington city has a relatively young population, with an average age of 35 years, whereas the Wairarapa and Kapiti Coast have populations older than the national average, at around 48 years, compared to the national average of 37.6 years.[3,4] This trend is set to continue, in 2048 the average age in Wellington city is predicted to be 38.3 years, compared to just over 53 years in Kapiti and South Wairarapa. In 2023, people aged over 65 made up 15 percent of the overall population in the region. Approximately 80,613 people of Māori descent live in the region, which make up 17 percent of

[1] Infometrics (2024). Regional economic profile: Wellington region. https://ecoprofile.infometrics.co.nz/Wellington%20Region/Gdp/Structure

[2] Ministry of Business, Innovation & Employment (2022). Our current economy. https://www.mbie.govt.nz/business-and-employment/employment-and-skills/regional-skills-leadership-groups/wellington/regional-workforce-plans/regional-workforce-plan/part-2-the-foundations-of-our-plan-the-region-its-people-and-its-work/about-our-region/our-current-economy

[3] Stats NZ (2025). 2023 Census place summaries: Wellington region. https://tools.summaries.stats.govt.nz/places/RC/wellington-region

[4] Stats NZ (2025). 2023 Census place summaries: Auckland region https://tools.summaries.stats.govt.nz/places/NZ/new-zealand/vs/RC/auckland-region

the population.[5] This is below the national average of 19.6 percent.[6] Lower Hutt has the highest proportion of Māori, where they make up 21 percent of the city's population.[7]

Approximately 8049 square kilometres of the region is rural, and includes agricultural and forestry activities, such as farming, viticulture, and horticulture.[8]

The region's road network includes approximately 4399km of road. State highways make up 290km and local roads make up 4109km (719km of these are unsealed).[9] There are 1007 bridges, with 259 of these on state highways and 748 on local roads. The region relies heavily on 2 north–south road and rail corridors for the movement of people and freight – SH1 in the east to Horowhenua and SH2 in the west to Wairarapa.[10] The Transmission Gully section of SH1, opened in March 2022, provides increased capacity and resilience along the northern corridor.[11]

Public transport is managed by Metlink, and uses 4 rail lines, over 90 public bus routes, and 4 harbour ferry stops to deliver services.[12] Recent upgrades include the electrification of part of the bus fleet, improvements to train stations, bus hubs and electrical substations to support reliability and future growth.

Wellington city is New Zealand's most walkable city, with 35 percent of Wellingtonians living within a 10-minute walk of daily amenities. Cycling levels are lower compared to cities such as Christchurch, but investments over the past 5 years have significantly improved the network and added approximately 25km of new dedicated cycle lanes, shared pathways, and upgraded bike routes.

The region's rail network includes approximately 184km of tracks,[13] around 83 multi-units and 24 carriages, serving 48 stations. The passenger network is served by the Kapiti Line, Hutt Valley Line (including the Melling Line), Johnsonville Line, and Wairarapa Line. Freight transport is mainly handled by the North Island Main Trunk (NIMT) line and the Wairarapa Line. Recent upgrades have focused on improving the network's capacity, performance and reliability, including the installation of new power systems, track renewals, and the refurbishment of bridges.[14, 15]

CentrePort is the northern port for road and rail trips between the North and South Islands, facilitated by the Cook Strait ferries. Wellington International Airport, the third busiest airport in New Zealand, is a significant transport hub for domestic flights and international services.

The freight task in the region in 2017/18 was 11.2 million tonnes, or around 4 percent of New Zealand's total. Road carried 95.5 percent of the freight tonnage in the region and 3.6 percent was

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[5] Stats NZ (2023). Our region: Wellington. https://www.stats.govt.nz/infographics/detailed-regional-infographics-from-2023-census/our-region-wellington/

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

[7] Hutt City Council (2023). *Quality of life survey: Māori in Te Awa Kairangi ki Tai Lower Hutt*. https://www.huttcity.govt.nz/__data/assets/pdf_file/0025/38527/1b01cca84cffed93b798f1cbabf7cf24bb9238f3.pdf

[8] Greater Wellington Regional Council (2024). Annual monitoring report. https://www.gw.govt.nz/assets/Documents/2024/11/FINAL-Annual-Monitoring-Report.pdf

[9] NZTA (2024). Regional summary Greater Wellington Te Upoko o Te Ika a Māui. https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2024/docs/regional-summaries/wellington-regional-summary-nltp-2024-27.pdf

[10] NZTA (2023). Te Upoko o Te Ika a Māui – Greater Wellington. https://www.nzta.govt.nz/planning-and-investment/planning/arataki/national-and-regional-directions/regional-directions/greater-wellington/

[11] NZTA (2022). Transmission Gully motorway. https://www.nzta.govt.nz/projects/wellington-northern-corridor/transmission-gully-motorway/

[12] Figure.NZ (2024). Number of bridges on New Zealand roads. https://figure.nz/chart/nHM7UwJuYIrWnLdT

[13] KiwiRail (n.d.) KiwiRail network map. https://kiwirail.maps.arcgis.com/apps/View/index.html?appid=556c4a9c73914fe1983529ddf9ae5099

[14] KiwiRail (2024). Wellington Metro & Lower North Island. https://www.kiwirail.co.nz/our-network/our-regions/wellington/

[15] Greater Wellington Regional Council (2024). Wellington Regional Public Transport Plan. https://www.gw.govt.nz/your-region/plans-policies-and-bylaws/plans-and-reports/transport-plans-and-strategies/

carried by rail.[16] Primary sector commodities were mostly concrete and wool, which represent 5 percent of the New Zealand's total in 2017/18.[17]

Wellington is compact and hilly, with limited road options to get around leading to congestion and safety issues, particularly during peak hours. There is also a high earthquake and tsunami risk because of the Wellington Fault and other major faults located in and around Wellington city and the region. The region is experiencing impacts of sea level rise and more extreme weather events, including heavy rainfall and high winds. Together these have the most impact on roads and rail lines that are exposed or that service low-lying river plains, coastal areas in the city and suburbs and hilly areas, with disruption for closure as a result of flooding, inundation and landslides and related repair/remediation. Wellington's adaption efforts focus on upgrading to seawalls and stormwater systems and community engagement and strategic planning to help build resilience and now and in the future.

Public transport in Wellington is well utilised but struggles with capacity and reliability as a result of congestion, particularly when it's not separated from general traffic, and there are terrain related infrastructure constraints and ageing facilities. These are most noticeable at peak times, but also increasingly at interpeak.

The region is benefiting from recent expansion of its cycling infrastructure, and with ongoing investments in walking and cycling infrastructure it can further promote active modes of transport to help relieve congestion and enhance safety and accessibility for pedestrians and cyclists.

Population growth, especially in the Hutt Valley, will put further pressure on the network. Better connectivity to support access, concentrating development around existing urban areas and public transport corridors are recommended by the Wellington Regional Leadership Committee and Kāpiti Coast District Council.[18,19]

[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] Ministry for Primary Industries (2017). Situation and outlook for primary industries (SOPI) December 2017. https://www.mpi.govt.nz/dmsdocument/26362/direct

[18] Kāpiti Coast District Council (2022.). Sustainable transport strategy. https://www.kapiticoast.govt.nz/media/mfjfaj2e/sustainable-transport-strategy.pdf

[19] Wellington Regional Leadership Committee (2024). Future development strategy. https://wrlc.org.nz/future-development-strategy

Strategic measures – current and future

This section provides tables summarising the 14 strategic measures in relation to this region. The data and evidence used to produce these results is included in Appendix A.

The 14 strategic measures are a subset of 60+ measures included in the Land Transport Benefits Framework. They have been selected to provide a coarse but practical overview of the 5 Transport Outcomes, as shown in the diagram.

The tables provide indicative current and future values for the 14 strategic measures (grouped by outcome), to understand how each measure (and therefore outcome) is likely to change if there is no significant investment (beyond that already committed).

More detail about the measures can be found in the Land Transport Benefits Framework measures manual.

Healthy and safe people

Benefit framework measure	Units		Current (2023/24)	Future (2048)	Change
1.1.1 Collective risk (crash density)	Average annual fatal and serious per kilometre of road section		0.039	0.053	0.014 (36%)
1.1.3 Deaths and serious injuries (DSIs)	Number of DSIs (annual)		171	233	62 (36%)
1.1.4 Personal risk (crash rate)	Average annual DSI per 100 million vehicle kilometres travelled		4.671	4.671	0 (0%)
1.2.1 Road assessment rating – roads	Infrastructure risk rating (applies to both current and future)	High: 17.98% Medium-high: 19.51% Medium: 41.67% Low-medium: 13.62% Low: 7.22%			N/A

Insights

- If there is no significant investment (beyond that already committed), crash density and the number of deaths and serious injuries (DSI) are projected to increase significantly by 2048. Projections are unavailable for other strategic measures for safety but indicate Greater Wellington currently performs moderately for this outcome on those strategic measures.

- Collective risk (crash density) shows where the biggest difference can be made in terms of absolute numbers of DSI and is affected by population size and transport mode chosen. The average annual fatal and serious crashes per kilometre of road section in Greater Wellington are currently much higher than the national average and the second-highest of all regions. If there is no significant investment (beyond that already committed), crash density is projected to increase by 36 percent by 2048.
- Greater Wellington is in the middle of the range of all regions for the number of DSI, with 6 percent of the national total and less than the average number of DSI of all regions. If there is no significant investment (beyond that already committed), the number of DSI is projected to increase by 36 percent by 2048.
- Personal risk (crash rate) highlights areas where a crash is more likely to occur based on use of the road network. The average annual DSI per 100 million vehicle kilometres travelled in Greater Wellington is currently higher than the national average and the third-lowest average of all regions.
- Infrastructure risk rating (IRR) describes the underlying level of risk a road presents to an individual road user based on key physical and operational attributes. The proportion of Greater Wellington's roads rated as being at medium-high and high risk (that is, with DSI per 100 million vehicle kilometres travelled (VKT) equal to or greater than 8) is 12 percent less than the country as a whole and the second-lowest proportion of all regions.

Resilience and security

Benefit framework measure	Units	Current (2023/24)	Future (2048)	Change
4.1.1 Availability of a viable alternative to high-risk and high-impact route	Percentage of high-risk, high-impact route with a viable alternative	Not included in this release		
4.1.2 Level of service and risk (note that for this evidence pack this data is from the National Resilience Assessment Tool (NRAT) and includes only state highways)	Number of identified sites in region by combined risk rating (future, geological and hydrological)	Low: 118 Med: 25 High: 37 Critical: 39 Not yet rated: 1	NA	NA

Insights

- If there is no significant investment (beyond that already committed), Greater Wellington is projected to have a moderate number of future (emerging) risks. The high proportion of high and critical risks indicate Greater Wellington currently performs poorly for this outcome.
- Hazard events at identified risk sites can lead to unplanned closures of the state highway network, impacting network resilience. Greater Wellington is mostly at risk from geological events (rockfall, overslips, underslips), which make up 136 of the 220 resilience risk sites in the region.

- High and critical risks make up 35 percent of all risks in the region rated to date. The proportion of high and critical risks is 4 percent higher than the national rate and the fourth-highest of all regions.
- The risks include 13 sites with future (emerging) risks, because of the impact of climate change for example. The number of future (emerging) risks is in the middle of the range of all regions, if there is no significant investment (beyond that already committed).

Economic prosperity

Benefit framework measure	Units	Current (2024)	Future (2048)	%Change
5.1.2 Travel time reliability – motor vehicles (note for this evidence pack, the data only relates to state highway traffic monitoring system (TMS) sites)	Calculated using coefficient of variation (CoV); standard deviation of travel time divided by average minutes travel time Rate: High <0.3, Medium 0.3–0.6, Low >0.6)	Low: AM 1% Day 1% Med: AM 30% Day 7% High: AM 68% Day 92%	Low: N/A% Med: N/A% High: N/A%	Low: N/A% Med: N/A% High: N/A%
5.1.3 Travel time delay (note, data is from the Wellington Transport Strategy Model (WTSM).	Difference between average travel time during AM peak and average travel time during the inter-peak in minutes per kilometre (by mode) as a percentage	Car: 18% PT: -27% Cycle: N/A	Car: 20% PT: -26% Cycle: N/A	Car 2% PT 1% Cycle: N/A
5.2.2 Freight – mode share value	Percentage of value for each mode	Not included in this release		
5.2.3 Freight – mode share weight	Percentage of weight for each mode	Road: 91% Rail: 9%	Road: 91% Rail: 9%	Road: 0% Rail: 0%

Insights

- If there is no significant investment (beyond that already committed), Greater Wellington's travel time delay in the morning peak is projected to increase slightly for cars and public transport by 2048. Also, the proportions of freight carried by road and rail in Greater Wellington are projected to remain unchanged by 2048. A projection is unavailable for travel time reliability, but the good travel time reliability in Greater Wellington compared to the national rate and other regions indicate Greater Wellington currently performs well for this strategic measure.
- Travel time reliability can impact the efficient movement of people and goods. One percent of Greater Wellington's state highway network (limited to data based on where we have TMS sites) has poor travel time reliability (that is, a high CoV), compared with 6 percent for the country as a whole, and the fourth-lowest proportion of all regions. The capability to estimate travel time reliability for future years is still being developed and is intended to be included in later iterations of the evidence pack.

- Travel time delay can impact the efficient movement of people and goods. We need to address the longer travel time in the morning peak for cars, for example by spreading peak demand and facilitating mode shift to public transport or active modes through investment in infrastructure, services or road pricing mechanisms. Public transport in Wellington currently has lower average travel times during the peak period than during inter-peak. However, if there is no significant investment (beyond that already committed), the difference is projected to reduce by 2048, resulting in slightly longer travel times during the peak than the inter-peak. The difference between peak and inter-peak travel times for cars is projected to increase slightly by 2048.
- While road freight is more efficient over short distances, rail freight is safer, lower emissions and more efficient over longer distances. 91 percent of freight in Greater Wellington is carried by road, 4 percent higher than the national rate and in the middle of the range of all regions. 9 percent of freight in Greater Wellington is carried by rail, 4 percent lower than the national rate and in the middle of the range of all regions. This reflects the short distance for exports and imports to travel to Centreport. If there is no significant investment (beyond that already committed), these shares are projected to remain unchanged in 2048.
- The freight mode share reflects the movement of goods to or from Centreport, the primary lower North Island port, which connects to the South Island and is consistent with forecast higher demand for imports and consumer goods, while primary sector exports are forecast to remain flat.

Environmental sustainability

Benefit framework measure	Units	Current (2023)	Future (2048)	Change
8.1.1 Greenhouse gas emissions (all vehicles)	Annual tonnes of CO_2 equivalents (CO_2-e) emitted	0.93 m	0.45 m	-0.48 m (-52%)
8.1.3 Light vehicle use impacts	Annual light vehicle kilometres travelled (light VKT)	3,488 m	4,746 m	+1,258 m (+36%)

Insights

- If there is no significant investment (beyond that already committed), Greater Wellington’s greenhouse gas (GHG) emissions from all vehicles are projected to reduce significantly (primarily due to a highly uncertain assumed level of vehicle fleet electrification) and light vehicle VKT is projected to increase significantly.
- Land transport is a major contributor to GHG emissions. Greater Wellington accounts for 7 percent of transport GHG emissions in New Zealand. This proportion of the national total is the fifth-largest contribution of all regions. If there is no significant investment (beyond that already committed), both Greater Wellington’s volume of GHG emissions and the proportion of the national total are projected to decrease by 2048, primarily through electrification of the vehicle fleet (as forecast using the Ministry of Transport Vehicle Fleet Model (VFM)). However, this assumed level of electrification has high uncertainty, and is a major factor affecting GHG emissions; therefore the calculated 52% decrease needs to be considered in this light.

- Light vehicle VKT is currently the largest source of transport GHG emissions. Electrification could be complemented by mode shift to public transport and/or active modes to maximise a reduction of GHG emissions. Greater Wellington accounts for 8 percent of light vehicle VKT in New Zealand. This proportion is the fourth-largest contribution of all regions. If there is no significant investment (beyond that already committed), the volume of Greater Wellington's light vehicle VKT is projected to increase and the proportion of the national total is projected to decrease by 2048.

Inclusive access

Benefit framework measure	Units	Current (2023)				Future (2048)				%Change			
10.2.1 People – mode share	Percentage by mode (Census (2023) journey to work and education)	Car: 64.1% PT: 18.4% Cycle: 3.0% Peds: 14.6 %				Car: 61.1% PT: 21.4% Cycle: 3.0% Peds: 14.5 %				Car: -3.0% PT: 3.0% Cycle: -0.0% Peds: -0.1%			
10.3.1 Access to key social destinations (all modes)	Number of jobs (x1000) accessible by mode in AM peak (car 40 min, PT 45 min, cycle 45 min) and distance from city centre (km)		0–5	5–10	10+km		0–5	5–10	10+km		0–5	5–10	10+km
		Car:	227	203	258	Car:	254	228	287	Car:	12%	12%	11%
		PT:	149	87	100 23	PT:	169	98	113	PT:	14%	12%	12%
		Cycle:	160	138	83 19	Cycle:	179	154	93	Cycle:	12%	11%	12%

Insights

- If there is no significant investment (beyond that already committed), the proportion of journeys to work and education by car are projected to decrease slightly by 2048 and the proportion of jobs more than 5km from central Wellington accessible by public transport and cycling is projected to remain unchanged in 2048.
- The availability of public transport services and active mode infrastructure can reduce car dependence, which can be a barrier to access for those who are on low incomes or unable to drive. Journeys to work and education in Greater Wellington by all modes are 11 percent of the national total and this proportion is the third highest of all regions.
- Journeys by car in Greater Wellington are 15 percent lower than the national rate and this proportion is the lowest rate of all regions.
- Public transport use in Greater Wellington is 11 percent higher than the national rate and the highest in the country of all regions.
- The proportion of people cycling in Greater Wellington is slightly higher than the national rate and in the middle of the range of all regions.
- The proportion of people walking in Greater Wellington is 4 percent higher than the national rate and the second-highest of all regions.

- If there is no significant investment (beyond that already committed), journeys to work and education by car are projected to decrease by approximately 3 percent by 2048, with public transport journeys increasing by a similar proportion. This projected level of mode shift is less than Canterbury and much less than Auckland.
- The accessibility of jobs by modes other than car increases people's ability to work. There are many more jobs accessible by car than other modes in Greater Wellington.
- Within 5km of central Wellington, accessibility by car is approximately 50 percent higher than for both public transport and cycling. The farther out the location, the greater the difference. If there is no significant investment (beyond that already committed), the proportions of jobs more than 5km from central Wellington accessible by public transport and cycling are projected to remain unchanged in 2048.
- A dispersed urban form in the Wellington urban area and several urban areas around the region means central Wellington is the main centre of employment but not the only one, with people who live further away working more locally. The lowest income households spend a greater proportion of their incomes on transport.[20] These factors combine to result in transport poverty (where people lack adequate access to affordable and reliable transport, hindering their ability to participate in essential activities such as work).

Interdependencies between outcomes

- Addressing the current and future challenges for one transport outcome can have negative impacts on others. On the other hand, it is possible to take an approach to each outcome that makes a positive impact on the others.
- For example, encouraging a compact urban form and continuing to facilitate mode shift from light vehicles to public transport and active modes in the Greater Wellington region could reduce exposure to safety risk (see healthy and safe people), improve the efficient movement of people and goods through urban areas and address congestion (see economic prosperity).
- This could be done in a way to manage current geological and future climate risks and could mitigate the long-term impacts of climate change (see resilience and security), reduce emissions (see environmental sustainability) and improve access to work and education (see inclusive access).
- Increasing active modes with safe infrastructure for walking and cycling can add to these by reducing conflict with light and heavy goods vehicles and health benefits.

[20] Te Manatū Waka Ministry of Transport (2022). *The distributional impacts of transport-related carbon policy*. https://www.transport.govt.nz/assets/Uploads/The-Distributional-Impacts-of-Transport-final-report-005.pdf

Current and future challenges

National context

New Zealand's transport networks are extensive and vital for the country's connectivity and economic prosperity. The state highway network spans about 11,750km,[21] while the local road network covers about 83,368km.[22] Additionally, the rail network consists of around 4128km of rail lines.[23]

Maintaining existing networks

Maintaining such a vast network requires significant effort. Annually, 5−10 percent of the road network (4750km to 9500km) needs resurfacing or rebuilding.[24] The network includes nearly 4200 bridges[25] on state highways and about 15,000 on local roads.[26] Urban growth and higher traffic volumes, especially of heavy vehicles, increase maintenance needs, which strains budgets. Neglecting maintenance can lead to safety risks, higher long-term costs, and disrupted connectivity.[27]

Looking ahead, future challenges are expected to intensify. Climate change is likely to increase the frequency and severity of extreme weather events, such as flooding and heatwaves, which can damage infrastructure and accelerate wear and tear. Technological advancements, such as the rise of electric and autonomous vehicles, may require new types of infrastructure and maintenance protocols. Additionally, population growth and urban sprawl will create pressure to further expand the network, which will lead to increasing the scale and complexity of maintenance operations.

Access to opportunities and enabling the efficient movement of freight around the country

The transport system underpins economic and social wellbeing, ensuring access to jobs, education, healthcare, and efficient freight movement. Remote and rural areas face significant access challenges, especially during adverse weather. These challenges include a lack of alternatives to private vehicle trips as public transport services are not a viable alternative because of coverage and frequency. In addition, there is a lack of redundancy in parts of the land transport system – some places rely on one or 2 critical lifelines to stay connected.

Looking ahead, existing access challenges in remote and rural areas will be exacerbated by the impacts of climate change and demographic change. The population is expected to remain static or decline in smaller, rural, and remote districts. In some areas, people aged over 65 are expected to make up more than 35 percent of the population. The affordability of local government rates increases will be an issue in these areas. Network resilience will be further challenged as damage caused by climate change becomes more frequent, outages last longer and repair costs increase. Rural and coastal communities may become increasingly isolated and have difficulty accessing essential services – this may particularly impact Māori.

Freight is a key part of economic activity and is fundamental to making places great to live (liveability).[28] The efficient movement of freight is essential for economic productivity. Current freight

21 NZTA (n.d.). State highway frequently asked questions. https://www.nzta.govt.nz/roads-and-rail/research-and-data/state-highway-frequently-asked-questions/

22 Ministry of Transport (n.d.). Statistics and insights. https://www.transport.govt.nz/statistics-and-insights

23 Stats NZ (n.d.). Transport. https://www.stats.govt.nz/topics/transport

24 NZTA (n.d.). Road management and maintenance. https://nzta.govt.nz/roads-and-rail/management-and-maintenance/

25 NZTA (n.d.). Bridges and structures. https://www.nzta.govt.nz/roads-and-rail/bridges-and-structures/

26 Figure.NZ (n.d.). Number of bridges on local roads in New Zealand. https://figure.nz/chart/nHM7UwJuYIrWnLdT

27 Government of New Zealand (n.d.). Government Policy Statement on land transport 2024–34. https://www.transport.govt.nz/assets/Uploads/Government-Policy-Statement-on-land-transport-2024-FINAL.pdf

28 Auckland Transport (2020). Auckland freight plan. https://at.govt.nz/media/1983982/auckland-freight-plan.pdf

inefficiencies such as delays, detours and highly variable travel times can increase costs by up to 20 percent.[29]

Looking ahead, total freight volume is expected to increase by 39 percent by 2053.[30] The location of freight origin and destination may change. A growing population in the largest urban areas means more goods will need to be moved to these locations, and industry and population concentration is occurring in the upper North Island. Climate change is expected to change the nature and location of primary production and increase the frequency of extreme weather events, disrupting transport networks, isolating communities, and affecting freight reliability.[31] Technological shifts, including the rapid growth of e-commerce and the transition to low-emission freight vehicles, will require significant infrastructure upgrades and new logistics strategies to ensure efficiency and sustainability.[32]

Resilience to natural hazards and climate change

New Zealand faces significant natural hazard risks, including earthquakes, floods, and cyclones, worsened by climate change. The land transport system has always been exposed to natural hazard risks, with minor closures or delays through small scale events like slips and localised flooding common. However, the network is increasingly exposed to national and regional scale events such as Cyclones Hale and Gabrielle and the Kaikoura earthquakes that caused widespread and significant damage.[33] For instance, Cyclone Gabrielle alone caused damage estimated at $13.5 billion.[34]

Recovery from small events is quick, but larger events, such as Cyclone Gabrielle, cause extensive damage and long recovery times. The state highway network performs critical lifeline functions for communities, and repeated disruption to these functions impacts communities' access to the services they need.

Looking ahead, the land transport system will have to adapt to escalating impacts from natural hazards and climate change now and into the future. These impacts include sea-level rise and ongoing changes in the physical environment, as well as increasingly severe and frequent climate-related events such as storms, flooding, droughts, and wildfires.[35] The probability of an Alpine Fault earthquake occurring in the next 50 years is 75 percent, and there is a 4 out of 5 chance that it will be a magnitude 8+ event.[36] Such an event has the potential to cause severe damage and disruption across the entire South Island, with major consequences for the rest of the country.

These types of impacts will continue and will affect communities and the transport networks that connect them. As damage becomes more frequent, outages last longer and repair costs increase, rural and coastal communities may become increasingly isolated and have difficulty accessing

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29 Ministry of Transport (2023). Aotearoa New Zealand Freight and Supply Chain Strategy. https://www.transport.govt.nz/assets/Uploads/MOT4806_Aotearoa-Freight-and-Supply-Chain-Strategy-p09-v03.pdf

30 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

31 KPMG & The Aotearoa Circle (2024). *Transport sector climate change scenarios: Report on big climate risks to New Zealand's transport sector*. https://kpmg.com/nz/en/home/media/press-releases/2024/06/report-on-big-climate-risks-to-new-zealand-s-transport-sector.html

32 Ministry of Transport (n.d.). Climate change — emissions work programme. https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/climate-change

33 Byett, A, et al (2019). *Climate change adaptation within New Zealand's transport system*. Motu Economic and Public Policy Research. https://www.motu.nz/our-research/environment-and-resources/climate-change-impacts/climate-change-adaptation-within-new-zealands-transport-system

34 NIWA (2024). Cyclone Gabrielle was intensified by human-induced global warming. https://niwa.co.nz/news/cyclone-gabrielle-was-intensified-human-induced-global-warming

35 NZTA (2022). *Tiro Rangi: our climate adaptation plan 2022–2024*. https://www.nzta.govt.nz/assets/resources/tiro-rangi-our-climate-adaptation-plan-2022-2024/tiro-rangi-our-climate-adaptation-plan-20222024.pdf

36 AF8 (2022). *AF8 Programme Strategy 2022–25*. https://af8.org.nz/media/fpxjy3uu/af8_programme-strategy-2022-25-jul22.pdf

essential services, and this may especially impact Māori. In urban areas, the impacts of climate change on multimodal networks can be complex, widespread and cascade across the land transport system. Interregional connections will also be disrupted.

Congestion and capacity constraints, especially in large and growing cities

New Zealand's road network is a vital part of the country's infrastructure, with significant portions now facing congestion and capacity constraints. This is particularly evident in Auckland, where congestion costs are estimated to range between $1.3 billion and $2.6 billion annually.[37]

The demand for transport in New Zealand has grown rapidly, meaning that in some places the demand exceeds the ability of the transport system to cater for it. This has resulted in frequent congestion across parts of the road and public transport networks, particularly on motorways in Auckland, Tauranga, Wellington, Queenstown and Christchurch. Previously confined to 'rush hour' periods, congestion has steadily lengthened and worsened over time.[38] Congestion on the local road network is a growing concern, especially in urban areas. Rail network capacity restraints currently affect both public transport services in Auckland and Wellington, and freight movements across the country. Population growth, dispersed land use patterns, and increasing vehicle ownership will continue to contribute to this issue into the future.

Looking ahead, a growing population in the largest urban areas means more people who need to get to work, education, business and entertainment. New Zealand's population is projected to reach over 6 million by the early 2030s, with much of this growth concentrated in urban areas.[39] This, combined with dispersed land use and rising vehicle ownership – currently at nearly 0.9 vehicles per person – will further strain transport corridors and worsen congestion.[40] Without significant investment, it is likely congestion will worsen, network productivity will fall, and emissions will rise. Future challenges include adapting for electric and autonomous vehicles, building resilience to climate impacts and reducing emissions through urban planning, mode shift and fleet carbonisation.

Reducing the level of harm to people and the environment

New Zealand's land transport system faces significant safety and environment challenges. In 2024, there were 292 road fatalities, placing New Zealand 7th highest in road deaths per capita among 35 OECD countries.[41] Contributing factors include adverse weather, unsafe driving behaviour, and poor road conditions. Rural road fatalities are disproportionately high, accounting for 60 percent of all road deaths, despite rural roads making up only 40 percent of the network.[42]

Air pollution from fossil fuels and particulate matter continues to impact public health, contributing to an estimated 2247 deaths in 2016.[43] While low-emission vehicles are essential for reducing transport-related emissions, they are not a complete solution. A broader systems approach – encompassing

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[37] NZTA (2013). *The costs of congestion reappraised*. https://www.nzta.govt.nz/assets/resources/research/reports/489/docs/489.pdf

[38] NZTA (2024). *Significant land transport challenges facing New Zealand*. https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2024/docs/significant-challenges-nltp-2024-27.pdf

[39] NZTA (n.d.). *Significant land transport challenges facing New Zealand*. https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2024/docs/significant-challenges-nltp-2024-27.pdf

[40] NZTA (n.d.). *Significant land transport challenges facing New Zealand*. https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2024/docs/significant-challenges-nltp-2024-27.pdf

[41] International Transport Forum (2024). Road safety country profile – New Zealand 2023. https://www.itf-oecd.org/sites/default/files/new-zealand-road-safety.pdf

[42] Stats NZ (n.d.). Transport. https://www.stats.govt.nz/topics/transport

[43] Emission: Impossible Ltd and the HAPINZ 3.0 team (2022) Key findings from HAPINZ. https://ehinz.ac.nz/projects/hapinz3/key-findings-from-hapinz/

clean energy, sustainable manufacturing, and urban planning – is needed to fully address environmental harm.[44]

The impact on the environment, including climate, on and from the transport network and its use is another pressing issue. The extensive road system crosses many sensitive ecosystems, habitats, and waterways, leading to habitat fragmentation, noise pollution, artificial light, and stormwater discharges.

Looking ahead, climate change is expected to intensify these impacts because of more frequent extreme weather events, increased infrastructure stress, and greater disruption to both human and natural systems. Future challenges will also include managing the environmental footprint of new transport technologies and ensuring that safety improvements keep pace with population growth and the needs of changing demographics (such as people with children), travel patterns (increased travel by older people) and vehicle types, while also taking advantage of new technologies (for example cooperative intelligent transport systems and alternatives to bitumen) to improve safety and environmental outcomes.

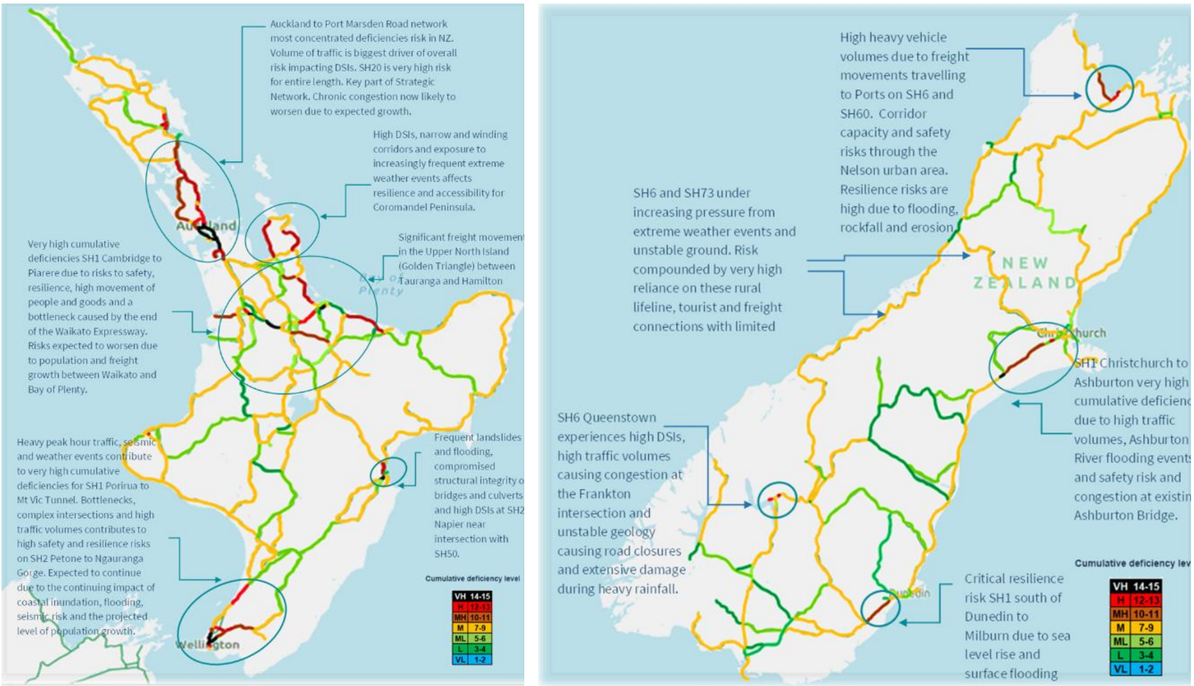

Figure 1: Cumulative (resilience, reliability and safety) deficiencies across the state highway network (source: NZTA data[45])

[44] Auckland Council (2022). *Transport emissions reduction pathway*. https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/Documents/transport-emissions-reduction-pathway.pdf

[45] Analysis of NZTA National Resilience Assessment Tool (NRAT), NZTA average annual daily traffic and NZTA cumulative risk using DSI data from 2019 to 2023.

Regional context

The Greater Wellington transport network plays an important role in the lower North Island. 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. It's home to nearly a quarter of New Zealand's population and generates 23 percent of the national GDP. Around 13 percent of the country's population growth over the next 20 years is expected in the lower North Island.

Figure 2: Map of current strategic network in the lower North Island (source: Arataki)

The Greater Wellington transport network connects to:

- North: SH1 to the central North Island
- East: SH2 to Wairarapa and southern Hawke's Bay.

These connections provide critical links to the rest of New Zealand, urban areas, freight hubs, ports, employment areas and tourist hotspots.

Congestion and capacity

The Greater Wellington region faces significant congestion and capacity challenges, particularly on major routes such as SH1 and SH2. SH1, especially around the Ngāūranga Gorge and the Wellington Urban Motorway, experiences heavy traffic during peak hours, leading to delays and inefficiencies. Similarly, SH2, particularly between the Hutt Valley and Ngāūranga, is often congested, impacting the overall flow of traffic. Improving the efficiency of the transport network is a key challenge.

Public transport reliability

Public transport reliability is a critical issue in the Wellington region. The rail network, including the Kapiti, Hutt Valley, and Wairarapa lines, is essential for commuter travel but faces challenges with aging infrastructure and service reliability. Efforts are ongoing to upgrade these lines to meet growing demand and improve service levels. Additionally, urban bus services in Wellington city and the Hutt Valley require enhancements in frequency, reliability and travel time (relative to private vehicles) to encourage even more public transport use.

Sustainable transport

Promoting sustainable transport options is a key goal for the region. This includes developing a comprehensive regional cycle network, such as the Wellington to Hutt Valley cycleway, to encourage cycling and walking. Reducing reliance on private vehicles by improving infrastructure for active transport modes and public transport is essential for creating a more sustainable and environmentally friendly transport system.

Safety

Safety is a top priority, with a focus on enhancing the safety of all road users, including pedestrians and cyclists. High-risk intersections, such as the Basin Reserve and the Ngāūranga Interchange, have been identified for safety improvements. Additionally, measures to improve pedestrian and cyclist safety, particularly in urban areas, are being implemented to reduce accidents and enhance the overall safety of the transport network.

Climate change and resilience

The transport network must be resilient to the impacts of climate change, such as sea-level rise and extreme weather events. Coastal roads, such as the SH1 coastal route, are particularly vulnerable to sea-level rise and storm surges, necessitating resilience planning. Additionally, sections of the network in low-lying areas, such as parts of the Hutt Valley, are at risk of flooding and require mitigation measures to ensure continued functionality during adverse weather conditions.

State highway hotspots

The following data sets have been overlaid to identify ‘hotspots’ on the state highway network:

- **Reliability:** Measured by the average annual daily traffic (AADT), which calculates the total number of vehicles, including heavy vehicles, passing through traffic count sites. High to medium reliability issues are identified when highways frequently operate at or near their capacity of 20,000 vehicles per day.
- **Resilience:** Assessed by examining the risk of disruptions across the state highway network over the past 12 years.
- **Safety:** Derived from the NZTA Collective Risk Map, which uses historical crash data from 2019 to 2023 to identify areas with higher accident risks.

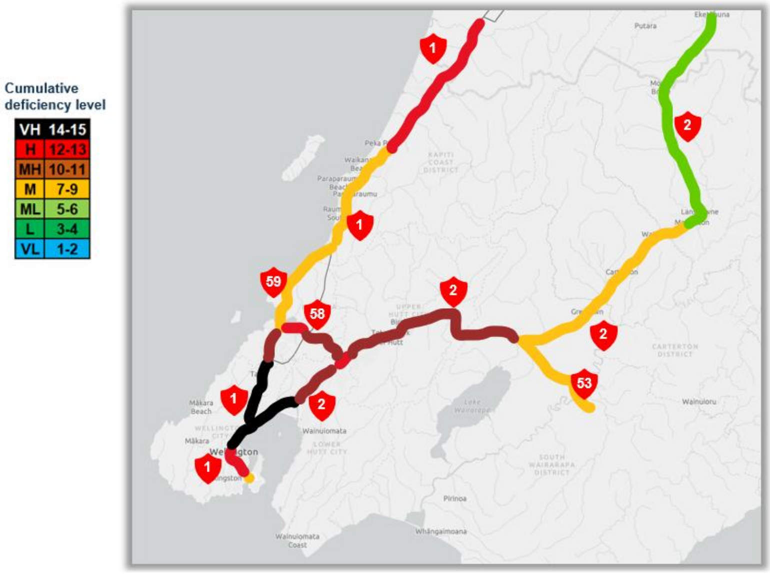

Figure 3: Cumulative deficiencies across the state highway network in the Greater Wellington region (source: NZTA data[46])

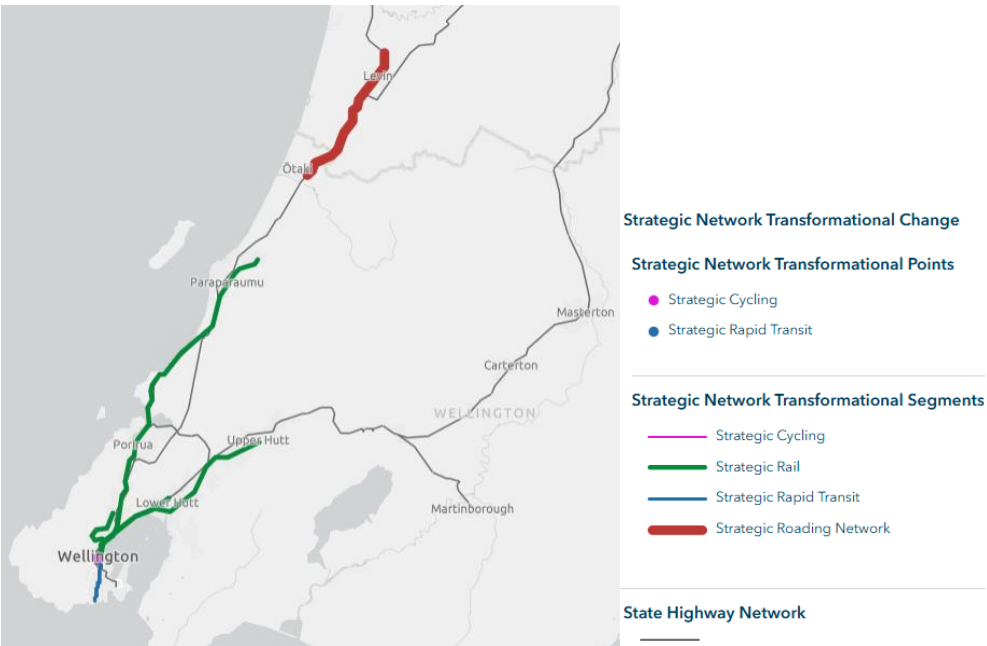

Figure 4: Arataki strategic network where transformational change is required (source: Arataki)

SH1 Airport to Tawa

SH1 corridor from Wellington Airport to Tawa is a vital artery in New Zealand's transport network, but it faces several significant challenges related to safety, journey reliability, and resilience.

Recent projects such as the Kapiti Expressway and Transmission Gully have reduced crash rates by approximately 30 percent,[47] making the journey safer for all road users. However, despite these improvements, certain sections of the corridor still pose risks, particularly during peak hours when traffic is heaviest.

46 Analysis of NZTA National Resilience Assessment Tool (NRAT), NZTA average annual daily traffic and NZTA cumulative risk using DSI data from 2019 to 2023.

47 NZTA (2024). SH1 Wellington improvements. https://www.nzta.govt.nz/projects/sh1-wellington-improvements/

Congestion, especially around the Mt Victoria Tunnel and Basin Reserve, remains a major issue. The average daily traffic volume near the Mt Victoria Tunnel is about 45,000 vehicles.[48] There are ongoing efforts to integrate public transport with the aim of reducing road traffic and improving reliability.[49] The area is also susceptible to earthquakes and extreme weather events.[50] Upgrades such as a second Victoria Tunnel and Basin Reserve improvements are expected to reduce travel times by 10 minutes and improve reliability by 50–60 percent.[51]

Some of the planned or committed projects for this corridor includes:

- **Second Mt Victoria Tunnel**: A new 0.7km tunnel running parallel to the existing Mt Victoria Tunnel is planned. This project aims to reduce congestion and improve traffic flow, with expected travel time reductions of up to 10 minutes during peak periods.[52,53]
- **Duplicate Terrace Tunnel**: A 0.5 km duplicate Terrace Tunnel is also planned to enhance traffic capacity and reliability on SH1.[54]
- **Basin Reserve Upgrades**: Significant upgrades to the Basin Reserve are included in the improvement plans. These upgrades are proposed to involve grade separation by extending the Arras Tunnel and redirecting SH1 westbound traffic to the northern side. This is expected to improve travel time reliability by 50–60 percent and support an improved north–south bus corridor. [55,56]
- **Public Transport Enhancements**: Efforts to operate public transport more effectively are underway. For example, commuters on the number 1 bus from Island Bay to the Railway Station are expected to save 9 minutes during morning peak times, while the number 2 bus from Miramar to the CBD could see an 11-minute reduction. [57]
- **Wellington Northern Corridor**: This project includes various improvements along SH1, such as the Kāpiti Expressway and Transmission Gully, which have already reduced crash rates by approximately 30 percent.[58,59]

These projects are part of the Roads of National Significance (RoNS) initiative, which aims to reduce congestion, improve safety, and stimulate economic growth in the Wellington region.

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48 Wellington Regional Leadership Committee (2022). State highway assessment for Wellington Region housing and business development capacity assessment. https://wrlc.org.nz/wp-content/uploads/2023/10/Appendix-5.3-State-highway-assessment-2022.pdf

49 NZTA (2024). Wellington Northern Corridor. https://www.nzta.govt.nz/projects/wellington-northern-corridor/

50 NZTA (2024). Network improvements. https://www.nzta.govt.nz/projects/wellington-northern-corridor/wellington-network-operational-readiness/network-improvements/

51 Wellington Airport (2025). Traffic reports. https://www.wellingtonairport.co.nz/corporate-hub/commercial-and-corporate-documents/traffic-reports/

52 NZTA (2024). SH1 Wellington improvements. https://www.nzta.govt.nz/projects/sh1-wellington-improvements/

53 Tharayil, R (2024). 'NZTA approves new tunnels to ease Wellington traffic.' *Tunnels and Tunnelling*. https://www.tunnelsandtunnelling.com/news/nzta-approves-new-tunnels-to-ease-wellington-traffic/

54 Tharayil, R (2024). 'NZTA approves new tunnels to ease Wellington traffic.' *Tunnels and Tunnelling*. https://www.tunnelsandtunnelling.com/news/nzta-approves-new-tunnels-to-ease-wellington-traffic/

55 NZTA (2024). SH1 Wellington improvements. https://www.nzta.govt.nz/projects/sh1-wellington-improvements/

56 Tharayil, R (2024). 'NZTA approves new tunnels to ease Wellington traffic.' *Tunnels and Tunnelling*. https://www.tunnelsandtunnelling.com/news/nzta-approves-new-tunnels-to-ease-wellington-traffic/

57 Tharayil, R (2024). 'NZTA approves new tunnels to ease Wellington traffic.' *Tunnels and Tunnelling*. https://www.tunnelsandtunnelling.com/news/nzta-approves-new-tunnels-to-ease-wellington-traffic/

58 NZTA (2024). SH1 Wellington improvements. https://www.nzta.govt.nz/projects/sh1-wellington-improvements/

59 New Zealand government (2024). NZTA confirms preferred option for second Mt Vic Tunnel and SH1 upgrades. https://www.beehive.govt.nz/release/nzta-confirms-preferred-option-second-mt-vic-tunnel-and-sh1-upgrades

SH2 Wellington city to Hutt City

The SH2 corridor between Wellington city and Petone is a critical part of the region's transport network, but it faces several significant challenges related to safety, congestion, and infrastructure resilience.

The section between Melling and Petone has high crash rates because of its complex intersections and high traffic volumes. Recent data shows an average of 56 injury crashes and 215 total crashes per year, resulting in crash costs of approximately $22.5 million every year.[60] Ongoing resurfacing works are essential to maintain skid resistance and reduce accidents, particularly on sharp bends near the Petone Overbridge.[61]

Congestion is also a persistent issue, especially during peak hours with an average daily traffic of approximately 40,000 vehicles at Petone.[62] Key bottlenecks, such as the Dowse Drive and Petone interchanges, contribute to significant delays and increased travel times. Without further improvements, travel times are expected to increase by up to 50 percent over the next decade.[63]

The corridor’s resilience is a critical concern because of its location along the Wellington Fault, making it vulnerable to earthquakes, sea level rise, and extreme weather events.[64] Legacy infrastructure, including bridges and overpasses, requires regular maintenance and upgrades to ensure it can withstand these challenges and the increasing traffic demands.[65]

Some of the planned or committed projects for this corridor includes:

- **Dowse to Petone Upgrade**: This project includes the construction of grade-separated interchanges to improve traffic flow and safety. These upgrades aim to reduce delays and accidents by separating local and regional traffic.
- **SH2 Melling Transport Improvements**: New interchange, river bridge, and a new location for the train station in Lower Hutt.
- **Ongoing work along the Ngā Ūranga to Petone coastal section of SH2**: This will improve resilience through tackling sea water inundation.
- **Petone to Grenada Link Road**: Land for housing and supports economic growth.
- **Cross Valley Link**: Improves access and connectivity in Lower Hutt.

The proposed RoNS for Petone to Grenada (and Cross Valley Link) and the second Mt Victoria Tunnel (and Basin Reserve Upgrade) will impact positively on the sections of the SH1 and SH2 with high and very-high deficiency ratings by reducing congestion and improving journey reliability in the Ngāūranga Gorge and improving journey times and resilience risk around the Basin Reserve.

Strategic network

SH1 to the airport is a crucial part of the nationally strategic network. Meanwhile, SH2 and SH58 are regionally strategic. The majority of the Wellington region's state highway network is classified as medium cumulative risk or higher, with several critical sections of SH1 and SH2 rated as very high

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60 NZTA (2024). State Highway 2 Hutt Corridor (Upper Hutt to Ngauranga) strategic study. https://www.nzta.govt.nz/assets/resources/state-highway-2-hutt-corridor-strategic-study/docs/sh2-hutt-corridor-strategic-study.pdf

61 NZTA (2024). Update: Resurfacing works planned – State Highway 2 Hutt Valley. https://www.nzta.govt.nz/media-releases/reminder-resurfacing-works-planned-state-highway-2-hutt-valley /

62 NZTA (2020). State highway traffic volumes 1975–2020. https://opendata-nzta.opendata.arcgis.com/

63 NZTA (2024). Regional summary Greater Wellington Te Upoko o Te Ika a Māui. https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2024/docs/regional-summaries/wellington-regional-summary-nltp-2024-27.pdf

64 Greater Wellington Regional Council (2024). Wellington Regional Land Transport Plan mid-term review. https://www.gw.govt.nz/your-region/plans-policies-and-bylaws/plans-and-reports/transport-plans-and-strategies/wellington-regional-land-transport-plan-mid-term-review/

65 NZTA (2024). Project background – Dowse to Petone Upgrade Project. https://www.nzta.govt.nz/projects/dowse-to-petone-upgrade-project/overview/

risk. The primary factors contributing to these deficiencies differ between the corridors: for SH1, the main issue is the high volume of traffic, while for SH2, the primary concern is resilience.

Committed improvements activities on the Remutaka section of the SH2 will address some of the high resilience risk for this corridor but will not address the lack of suitable detour routes when key sections of this corridor are unavailable.

Committed and proposed works in the Hutt Valley are expected to improve deficiencies around the SH2/SH58 intersection and continuing safety improvements will focus on reducing the cumulative deficiencies on the SH58 at the Porirua end.

Proposed activities along the SH59 will improve resilience between MacKay's Crossing and Linden.

The 'wet section' of SH1 that links the North and South Islands is an essential route via the Cook Strait ferries and the northern terminus CentrePort, and holds a vital role both for freight movement and supporting tourism. The RLTP states that it's highly likely that new or upgraded road transport infrastructure will be required to access an upgraded terminal, with reviews continuing to decide what is needed to provide a safe and resilient service.

Focusing effort

Note: this section has a high-level strategic focus; we'll develop more specificity in future iterations of the evidence pack.

Based on the preceding sections and consideration of regional investment priorities identified in regional plans, the following list of areas of investment focus have been identified.

Longer-term investment focus

Resilience

- Investigate options for critical transport corridors away from high-risk areas in the face of natural hazards such as relocation and extension of routes – this includes working with communities to identify plans for when to defend, accommodate, or retreat.
- Investigate the diversification of transportation networks by developing alternative modes.
- Investigate alternatives to SH2 Remutaka corridor between Te Marua and Featherston.

Transport connectivity

- Continue to improve regional movement patterns between urban centres/key employment centres and rural areas/areas of poor access.
- Create connected walking and cycling networks in urban areas – this includes the completion of cycling networks in Wellington city and improved active-mode facilities in smaller towns.
- Continue to make changes to the allocation of space on existing roads and streets to enable and encourage mode shift to public transport, walking, and cycling.
- Deliver an integrated public transport network.

Economic and urban development

- Continue to align transport investments with urban development plans – supporting, enabling, and encouraging growth and development in areas that have good travel choices and shorter trip lengths such as the work underway in the Wairarapa–Wellington–Horowhenua Future Development Strategy.
- Explore opportunities to move to a more multi-modal freight system, with greater use of rail and coastal shipping.
- Better understand the impact of future socio-economic transformation on travel patterns and freight volumes.

- Focus on improving travel in and around key destinations with complex transport interconnections, especially interregional connections, town centres and key freight and industrial hubs.

Safety and environment

- Continue to invest in safety infrastructure, education, enforcement, and incentives that significantly reduce harm caused by the region's transport system.
- Focus improvement on local corridors that have safety deficiencies across multiple modes.
- Deliver interventions, activities, and investments needed to achieve emissions reduction across the region.
- Continue to reduce the environmental impact of the maintenance, operations and improvement across the transport network including waste minimisation and resource efficiency.

Community and accessibility

- Work with iwi/hapū partners to improve or maintain, as appropriate, physical access to marae, papakāinga, wāhi tapu, and wāhi taonga.
- Continue to improve the design and provision of transport infrastructure and services to meet the needs of people of all ages and abilities, focusing on communities with unmet needs.
- Continue to improve access to social and economic opportunities, especially by public transport, walking, and cycling, so these low-cost, sustainable, and healthy travel options are safely used for more journeys.
- Explore opportunities to support the mobile or digital delivery of essential services.

Short-term investment focus

Projects in the shorter term typically will involve low-cost, low-risk, high-effectiveness improvements and projects that 'set the scene' to incrementally enable (or transition to) longer-term outcomes.

Steps to make progress towards transport outcomes in a more efficient and cost-effective way include:

- renewing the focus on programmes' small-scale projects
- getting more from existing infrastructure, by making the most of existing networks, services, and demand management
- reallocating existing road space, particularly for public transport and active modes
- seeking continuous improvement in network resilience through maintenance, renewals, and low-cost, low-risk investments
- influencing travel behaviour and growth patterns.

Resilience

- Progress identified transport network projects within the programme of works of the Wellington Lifelines Regional Resilience Project to improve community resilience such as critical transport and lifeline infrastructure.
- Investigate whether maintenance, operations, and renewals (MOR) will be sufficient to maintain the required level of performance over the next 30 years.
- Identify transport assets and infrastructure at risk of natural hazards and impacts of climate change, identifying priorities for network resilience and options for alternate routes less likely to be disrupted.
- Identify, plan and maintain alternate routes with appropriate level of service to support community resilience and safe movement of freight.
- Develop a plan for maintaining, operating, and replacing end-of-life infrastructure.

Transport connectivity

- Explore interregional public transport connections, particularly in between Kapiti Coast and Horowhenua.
- Focus on improving bus public transport services to existing centres.
- Continue to deliver the urban cycleway programme across the region.
- Expand and improve walking and cycling facilities and infrastructure.
- Maintain and improve the resilience and efficiency of road and rail connections to the Manawatū-Whanganui region and CentrePort.
- Support the ferry replacement project to improve the journey between Wellington and Picton, through Cook Strait.

Economic and urban development

- Investigate first- and last-mile freight solutions in key activity centres.
- Support multi-modal, resilient, reliable, and efficient freight and business travel around key parts of the network, especially interregional connections, and key freight and industrial hubs.
- Investigate how to efficiently and effectively improve public transport in growing urban communities in Kapiti Coast and Wairarapa.
- Influence growth through the Wairarapa–Wellington–Horowhenua Future Development Strategy to make sure future greenfield development is integrated with public transport and active mode networks to create medium-density residential areas.

Safety and environment

- Continue safety improvements that target high-risk intersections, run-off road crashes, high-volume roads, and head-on crashes on high-risk rural roads.
- Address safety challenges in non-protected areas of existing cycling and walking networks.
- Plan what interventions, activities, and investments are needed to achieve emissions reduction, focusing on the Wellington urban area.
- Reduce the environmental impact of the maintenance, operations and improvement across the transport network by supporting and enabling low-emission, low-carbon and low-impact policies, practices, and standards.

Community and accessibility

- Deliver bus stop access upgrades and infrastructure improvements.
- Improve public transport service quality and reliability by increasing frequency and reducing travel time relative to private vehicles.
- Expand and improve walking and cycling facilities in smaller towns.
- Improve access to opportunities for iwi Māori, focusing on enabling papakāinga development and improving access to sites of cultural significance with high safety risk.
- Improve travel choice and access to social and economic opportunities, focusing on Porirua and Lower Hutt.
- Continue and develop community transport/on-demand services where appropriate and develop a community transport policy and funding framework.

Potential interventions

As part of the PIE programme, NZTA is developing the Intervention Catalogue (IC) tool, which compiles a wide range of empirical data relating to the implementation of transport projects and how effective they have been in achieving the intended outcomes. We'll continue to add to this over time, using data from benefit realisation associated with the investment logic mapping (ILM) process.

An AI interface for supporting queries and providing relevant evidence is currently being investigated.

An example of how exploratory use of this tool might be used to match potential interventions to deficiencies to understand and compare the likely relative effectiveness is included in Appendix B.

The process seeks to avoid potential pitfalls that might occur during option formulation:

- an over-reliance on preconceived ideas
- a focus on the more obvious supply-side measures, such as infrastructure and management rather than demand-side measures such as regulation and pricing
- a general lack of awareness of the wider range of policy measures available
- lack of evidence of the performance of those measures in other contexts
- lack of a formalised or consistent approach for option generation.

The example tables included in Appendix B take the focus areas and related transport issues from the previous section of this report and maps them to some relevant interventions from the KonSULT knowledgebase.

Insights

Using IC is only intended to inform the option formulation process. It does not replace the need for judgement, but rather provides a set of empirical evidence that supports decisions (along with additional information sources).

The table of IC interventions included in Appendix B indicates the following:

- Most interventions related to addressing the identified Greater Wellington deficiencies are likely to be cost effective.
- Most interventions have mostly a positive (or neutral) effect across all outcomes, much more so than negative.
- A wide range of interventions for Greater Wellington indicated by IC include:
    - new infrastructure (road – safe systems)
    - new infrastructure (PT)
    - walking and cycling network improvements
    - road space reallocation
    - spatial and place-based planning.

Short-list of most effective interventions

It is intended that the information and tools provided above will assist consideration and development of projects to be included in the next RLTP and NLTP.

It provides a starting point for us to understand regional issues and investment opportunities, which can then be expanded upon through further engagement between approved organisations and NZTA to increase the likelihood of suitable projects being submitted for funding via the NLTP.

Appendix A: Data sources for the strategic measures

This appendix references all relevant data sources and assumptions for the 14 strategic measures reported within each regional chapter.

Because this is the first attempt at providing the evidence pack, and the development of the associated tools and processes under the Planning and Investment Evidence base (PIE) programme is still ongoing, we do not yet have the full capability to report outputs for all measures, particularly for future years. In these instances, we have noted that the data is 'not available' by using the 'N/A' abbreviation as a placeholder until such time this can be addressed by a subsequent version of the evidence pack.

Similarly, the process has identified the need for better understanding and reporting of data quality ratings, version control and internal consistency (that is, a single source of truth). These are all things we intend to improve in subsequent releases.

Bearing the above in mind, we have adopted the following general convention for this version in how we report numbers:

- For large numbers, only report 3–4 significant figures (and using rounding units of thousands or millions).
- For small numbers (including percentages), report to one decimal place by default, but make exceptions where appropriate (for example where more or less detail is required to make meaningful comparisons).

The focus is on convenience and the useability of the data. As such, it doesn't necessarily imply a particular level of accuracy (especially for future year forecasts, which have a great deal of uncertainty associated with them).

Each section below (grouped by outcome) provides data for all regions to allow comparison in terms of how each region contributes to the national total. It also provides any important caveats and limitations associated with each of the measures for that outcome.

Healthy and safe people

To understand the current and future safety risk both at the regional and national level, we calculated deaths and series injuries, personal risk and collective risk as shown in the following table. More details can be found in the Land Transport Benefits Framework.

Benefit framework measure	Units
1.1.1 Collective risk (crash density)	Average annual fatal and serious per kilometre of road section
1.1.3 Deaths and serious injuries (DSIs)	Number of DSIs (annual)
1.1.4 Personal risk (crash rate)	Average annual DSI per 100 million vehicle kilometres

Notes, caveats and data limitations:

- Data for the number of deaths and series injuries (DSIs) is sourced from the Crash Analysis System (CAS) database managed by NZTA.
- Regional VKTs and network length in kilometres is sourced from the NZTA official data published for financial year 2023/24.[66]
- Generally, DSI measures are calculated as multi-year rolling average. However, because of time and resource constraints the following data is for the financial year 2023/24 only.
- Future year growth factor is based on regional VKT change. This method to calculate this change is discussed in more detail for the 'E.4 Environmental sustainability' section later in this appendix.

[66] https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/transport-data/data-and-tools/

- It is assumed that crash rates remain constant over time. This is consistent with safety expert advice that application of crash trend adjustment factors for long term future predictions may no longer be supported by evidence.
- Future year DSIs were estimated based on the regional change on VKT (all vehicles) between 2023 and 2048 adopted for the GHG emissions measure (8.1.1). This assumes the crash rate (per VKT) remains constant (that is, no crash trend reduction factors applied).

Region	Current 2023/24			Future 2048		
	DSIs #	Per km	Per 100 million VKT	DSIs #	Per km	Per 100 million VKT
01 – Northland	181	0.027	7.783	176	0.026	7.554
02 – Auckland	593	0.073	4.267	924	0.114	6.651
03 – Waikato	416	0.035	6.372	501	0.042	7.678
04 – Bay of Plenty	184	0.038	5.321	210	0.044	6.059
05 – Gisborne	33	0.015	7.779	37	0.016	8.737
06 – Hawke's Bay	125	0.027	7.005	145	0.031	8.135
07 – Taranaki	82	0.021	6.293	97	0.024	7.429
08 – Manawatū-Whanganui	234	0.026	7.718	231	0.026	7.619
09 – Wellington	171	0.039	4.671	230	0.052	6.289
10 – Top of the South	117	0.027	6.868	151	0.035	8.848
11 – Canterbury	346	0.021	5.007	480	0.030	6.942
12 – West Coast	43	0.014	7.548	43	0.014	7.545
13 – Otago	137	0.013	4.799	142	0.013	4.968
14 – Southland	51	0.007	3.877	53	0.007	4.024
15 – Chatham Islands	0	0.000	0.000	0	0.000	0
National	**2713**	**0.025**	**5.451**	**3419**	**0.035**	**5.055**

Infrastructure risk rating (safety)

We calculate strategic measure 1.2.1 Road assessment rating to understand the current situation of infrastructure risk both at regional and national level. This measure can be used for any safety-related investment benefits, particularly those that target road infrastructure to improve safety. It is a comprehensive measure that considers land use, road type, alignment, average annual daily traffic (AADT), intersection density, land and shoulder width, roadside hazards and access density. More details can be found in the Land Transport Benefits Framework.

Benefit framework measure	Units
1.2.1 Road assessment rating – roads	Average infrastructure risk rating

Notes, caveats and data limitations:

- Data to calculate the regional infrastructure risk rating (IRR) measure in the following table is sourced from Megamaps, which is a geospatial platform managed by NZTA.[67]
- IRR data used to calculate regional and national measure values in the following table was calculated in Megamaps in 2024. The raw data used is for the period 2019–23.
- The data in Megamaps is for each road segment, intersection or corridor. We have aggregated it to calculate regional percentages under each risk band.

Region	High	Medium-high	Medium	Low-medium	Low
01 – Northland	45.77%	26.44%	18.74%	8.34%	0.71%
02 – Auckland	14.92%	17.54%	48.12%	13.18%	6.24%
03 – Waikato	21.40%	25.42%	34.39%	15.15%	3.64%
04 – Bay of Plenty	17.10%	20.74%	37.82%	19.35%	4.99%
05 – Gisborne	50.43%	19.93%	21.93%	7.50%	0.21%
06 – Hawke's Bay	33.47%	25.30%	29.79%	9.16%	2.28%
07 – Taranaki	28.83%	24.08%	33.13%	13.13%	0.83%
08 – Manawatū-Whanganui	41.81%	19.13%	25.67%	12.43%	0.96%
09 – Wellington	17.98%	19.51%	41.67%	13.62%	7.22%
10 – Top of the South	33.70%	23.83%	28.06%	12.94%	1.47%
11 – Canterbury	10.87%	29.16%	42.29%	16.36%	1.32%
12 – West Coast	17.75%	29.97%	38.04%	13.61%	0.63%
13 – Otago	21.83%	37.95%	26.55%	12.63%	1.04%
14 – Southland	6.99%	41.27%	37.99%	13.34%	0.42%
National%	**23.21%**	**2.29%**	**13.50%**	**34.25%**	**26.75%**

67 https://spatial.nzta.govt.nz/apps/megamaps/

Resilience and security

This transport outcome is about minimising and managing the risks from natural and human-made hazards, anticipating and adapting to emerging threats, and recovering effectively from disruptive events. We intended to use strategic measure 4.1.1 and 4.1.2 from the Land Transport Benefits Framework to understand the resilience and security situation at national and regional level. However, we don't currently have data to calculate measure 4.1.1, so this time around we have only calculated measure 4.1.2. The intent of the measure 4.1.2 is to allow for description and measurement of the risk to level of service by unplanned disruption (including earthquakes, storms, volcanos and tsunamis). This measure is generally used for any investment that focuses on maintaining or increasing the resilience of the transport network.

Benefit framework measure	Units
4.1.1 Availability of a viable alternative to high-risk and high-impact route	Percentage of high-risk, high-impact route with a viable alternative
4.1.2 Level of service and risk	Number of identified sites in region by combined risk rating (future, geological and hydrological)

Notes, caveats and data limitations:

- The data for the following measure is sourced from the National Resilience Assessment Tool (NRAT) managed by NZTA.[68]
- The following table shows the regional number of resilience risks on state highways under each risk band. This includes hydrological, geological and future risks.
- 'No rating' is for considered risk sites that have not yet been rated.
- There is no easy way to currently calculate future projections for this measure, but we are working on the capability to do so.

Regions	Critical	High	Moderate	Low	No rating
01 – Northland	29	84	276	171	169
02 – Auckland	5	13	29	41	1
03 – Waikato	20	175	212	174	149
04 – Bay of Plenty	16	64	153	121	67
05 – Gisborne	1	7	35	49	74
06 – Hawke's Bay	18	123	72	30	143
07 – Taranaki	0	11	9	0	98
08 – Manawatū-Whanganui	1	11	9	8	8
09 – Wellington	39	37	25	118	1
10 – Top of the South	9	51	59	177	91
11 – Canterbury	32	88	57	195	46
12 – West Coast	34	49	21	34	37
13 – Otago	26	84	86	247	172
14 – Southland	27	23	18	28	14
National	**257**	**820**	**1061**	**1393**	**1070**

68 https://national-resilience-assessment-tool-nzta.hub.arcgis.com/

Economic prosperity

This transport outcome is about supporting economic activity via local, regional, and international connections, with efficient movements of people and products. We calculated the following strategic measures from the Land Transport Benefits Framework to measure the economic prosperity outcomes at both regional and national level.

Benefit framework measure	Units
5.1.2 Travel time reliability – motor vehicles (note for this evidence pack, the data only relates to state highway traffic monitoring system (TMS) sites)	Calculated using coefficient of variation (CoV); standard deviation of travel time divided by average minutes travel time Rate: Low <0.3, Medium 0.3–0.6, High >0.6)
5.1.3 Travel time delay	Difference between average travel time during AM peak and average travel time during the Inter Peak in minutes per kilometre (by mode) as a percentage
5.2.2 Freight – mode share value	Percentage of value for each mode
5.2.3 Freight – mode share weight	Percentage of weight for each mode

Notes, caveats and limitations:

- Data for travel time reliability and delay measures is sourced from the National Network Performance (NNP) platform managed by NZTA.
- The sources used to calculate following measures is limited to the TMS sites only – that is, for state highways. In future, as more data is available in NNP for local roads, we intend to calculate using extensive local and state highway roads. Additionally, NNP will be able to assess both travel time delay and travel time reliability.
- The data for 5.1.2 Travel time reliability and 5.1.3 Travel time delay is for a typical day.
- Where we have gained access to regional model origin–destination data (for Auckland, Waikato, Wellington and Christchurch), we have used this to estimate current and future values of travel time for all available modes.
- Measure 5.2.2 Freight – mode share value has been selected as one of the 14 strategic measures but currently, there is insufficient data to reliably calculate this. Therefore, the data table for this measure remains unpopulated as a placeholder.
- Measure 5.2.3 Freight – mode share weight would ideally include coastal shipping but currently only includes road and rail modes.
- Future road freight is based on the same data used to forecast heavy commercial vehicle (HCV) VKT (also used for other measures) combined with average cargo weight from weigh-in-motion (WiM) sites (collected for the North Island only, but also applied to the South Island due to lack of data from the South Island). This data covers seven years and shows a trend of average load sizes decreasing over time. This trend line was used to estimate the 2048 average cargo weight (4615kg). Compared to the 2024 value (4822kg), this implies the average load size is projected to decrease by 7%. In contrast, national HCV VKT is projected to increase by 39% (2024 to 2048).
- The last seven years of rail freight net tonne-kilometres (NTK) by line segment has been provided by KiwiRail. This indicates that the amount of freight is reasonably steady over this period (with a small decline over the last few years). Based on the overall trend, we have assumed future year (2048) NTK will remain the same as current day (2024)
- A discrepancy in the rail data has been noted, where a 27km section of the network is missing from the calculations. This is possibly the section between Palmerston North and Woodville, which has been noted for further follow up.

5.1.2 Travel time reliability – motor vehicles

Region	Daily (CoV)			Peak time (CoV)		
	Low	Medium	High	Low	Medium	High
01 – Northland	96.43%	3.57%	0.00%	88.24%	0.00%	11.76%
02 – Auckland	96.67%	2.50%	0.83%	78.57%	9.18%	12.24%
03 – Waikato	94.59%	1.35%	4.05%	95.00%	0.00%	5.00%
04 – Bay of Plenty	100.00%	0.00%	0.00%	80.56%	19.44%	0.00%
05 – Gisborne	96.30%	3.70%	0.00%	100.00%	0.00%	0.00%
06 – Hawke's Bay	98.95%	1.05%	0.00%	65.38%	34.62%	0.00%
07 – Taranaki	94.74%	5.26%	0.00%	69.44%	16.67%	13.89%
08 – Manawatū-Whanganui	92.11%	7.89%	0.00%	82.56%	8.14%	9.30%
09 – Wellington	92.37%	6.78%	0.85%	67.90%	30.86%	1.23%
10 – Top of the South	100.00%	0.00%	0.00%	86.49%	10.81%	2.70%
11 – Canterbury	94.39%	3.96%	1.65%	73.98%	16.84%	9.18%
12 – West Coast	96.30%	1.23%	2.47%	98.08%	0.00%	1.92%
13 – Otago	92.59%	6.79%	0.62%	75.56%	17.78%	6.67%
14 – Southland	93.27%	5.77%	0.96%	71.43%	21.43%	7.14%
National	**95.30%**	**3.84%**	**0.86%**	**77.34%**	**15.54%**	**7.12%**

5.1.3 Travel time delay

Region	Peak (mins/km)	Inter-peak (mins/km)	Difference (mins/km)	%Change
01 – Northland	0.78	0.85	0.7	8.40%
02 – Auckland	0.77	0.86	0.8	10.23%
03 – Waikato	0.79	0.87	0.8	9.17%
04 – Bay of Plenty	0.69	0.76	0.6	8.18%
05 – Gisborne	0.75	0.77	0.2	3.30%
06 – Hawke's Bay	0.79	0.87	0.7	9.15%
07 – Taranaki	0.80	0.88	0.7	8.46%
08 – Manawatū-Whanganui	0.73	0.78	0.4	5.72%
09 – Wellington	0.83	1.00	0.2	16.94%
10 – Top of the South	0.82	0.84	0.1	1.98%
11 – Canterbury	0.75	0.77	0.2	3.46%
12 – West Coast	0.74	0.77	0.2	3.13%
13 – Otago	0.74	0.78	0.3	4.69%
14 – Southland	0.73	0.76	0.2	3.23%
National	**0.76**	**0.83**	**0.6**	**8.17%**

5.2.3 Freight – mode share weight – base year 2024

Region	Road (m NKT/yr)	Rail (m NKT/yr)	Total (m NKT/yr)	Road (%)	Rail (%)
01 – Northland	912	17	929	98%	2%
02 – Auckland	2904	132	3036	96%	4%
03 – Waikato	5016	751	5767	87%	13%
04 – Bay of Plenty	2208	534	2742	81%	19%
05 – Gisborne	301	0	301	100%	0%
06 – Hawke's Bay	1120	31	1152	97%	3%
07 – Taranaki	603	59	661	91%	9%
08 – Manawatū-Whanganui	1824	646	2470	74%	26%
09 – Wellington	1004	102	1106	91%	9%
10 – Top of the South	1193	60	1253	95%	5%
11 – Canterbury	4045	563	4608	88%	12%
12 – West Coast	409	313	722	57%	43%
13 – Otago	1396	220	1616	86%	14%
14 – Southland	776	73	849	91%	9%
15 – Chatham Islands	0	0	0	100%	0%
Grand total	**23,712**	**3,500**	**27,212**	**87%**	**13%**

5.2.3 Freight – mode share weight – future year 2048

Region	Road (m NKT/yr)	Rail (m NKT/yr)	Total (m NKT/yr)	Road (%)	Rail (%)
01 – Northland	912	17	929	98%	2%
02 – Auckland	2,904	132	3,036	96%	4%
03 – Waikato	5,016	751	5,767	87%	13%
04 – Bay of Plenty	2,208	534	2,742	81%	19%
05 – Gisborne	301	0	301	100%	0%
06 – Hawke's Bay	1,120	31	1,152	97%	3%
07 – Taranaki	603	59	661	91%	9%
08 – Manawatū-Whanganui	1,824	646	2,470	74%	26%
09 – Wellington	1,004	102	1,106	91%	9%
10 – Top of the South	1,193	60	1,253	95%	5%
11 – Canterbury	4,045	563	4,608	88%	12%
12 – West Coast	409	313	722	57%	43%
13 – Otago	1,396	220	1,616	86%	14%
14 – Southland	776	73	849	91%	9%
15 – Chatham Islands	0	0	0	100%	0%
Grand total	**23,712**	**3,500**	**27,212**	**87%**	**13%**

Environmental sustainability

This transport outcome is about transitioning to net zero carbon emissions, and maintaining or improving biodiversity, water quality and air quality. We calculated following strategic measures from the Land Transport Benefits Framework to the measure the economic prosperity outcomes at both regional and national level.

Benefit framework measure	Units
8.1.1 Greenhouse gas emissions (all vehicles)	Annual tonnes of CO_2 equivalents (CO_2-e) emitted
8.1.3 Light vehicle use impacts	Annual light vehicle kilometres travelled (light VKT)

Notes, caveats and limitations:

- Current year data for VKT is sourced from NZTA's open data portal.
- Future light national VKT projections have been sourced from the NZTA 2024 Light VKT projection models. These are based on Stats NZ population growth and forecasts for GDP and fuel prices (mid-range assumptions have been adopted for this evidence pack).
- Future regional light vehicle VKT distribution is based on research work done by Beca (VKT and GHG emissions baseline report – NZTA research note 008 September 2022). This assumes the base year light VKT per capita remains unchanged and uses population projection to estimate light VKT within each territorial local authority (TLA). The results are aggregated to spatial areas and adjusted to reconcile with the Ministry of Transport (MoT) observed and projected national totals. It uses base and projected light vehicle fleet GHG emissions factors from the Vehicle Fleet Emission Model (VFEM) to calculate GHG emissions for the baseline spatial areas. The report year 2035 (future) VKT values (by region) have been adjusted (scaled) to 2048 national light vehicle (LV) totals.
- Future year regional heavy vehicle VKT distribution has been calculated using growth factors comprising trend data, Stats NZ medium population forecast and Ministry of Business, Innovation and Employment (MBIE) GDP forecast data. This is a placeholder calculation pending further work on HCV demand forecasting currently being developed (using this general approach) as part of the PIE programme.
- GHG emissions have been estimated by applying light and heavy VKT to Vehicle Emissions Prediction Model (VEPM) (v7.0) emission rates (for current and future years) using the default MoT Vehicle Fleet Model (VFM) assumptions within VEPM (for each year) and average vehicle speeds from NNP or regional transport models (Auckland, Waikato, Wellington and Christchurch).
- Estimates of VKT are key inputs to multiple measures (such as vehicle emissions (affecting both health and environmental measures), DSIs, freight etc. Care has been taken to ensure consistency at the national, regional and local levels.

8.1.1 Greenhouse gas emissions (all vehicles)

Region	Current 2024	Future 2048	Change	% Change	Contribution
01 – Northland	0.61	0.27	-0.35	-57%	4%
02 – Auckland	3.58	2.19	-1.38	-39%	26%
03 – Waikato	2.00	1.36	-0.64	-32%	14%
04 – Bay of Plenty	1.01	0.63	-0.38	-38%	7%
05 – Gisborne	0.13	0.07	-0.06	-48%	1%
06 – Hawke's Bay	0.52	0.30	-0.22	-42%	4%
07 – Taranaki	0.35	0.19	-0.16	-46%	3%
08 – Manawatū-Whanganui	0.87	0.49	-0.38	-44%	6%
09 – Wellington	0.93	0.45	-0.48	-52%	7%
10 – Top of the South	0.51	0.36	-0.15	-30%	4%
11 – Canterbury	1.98	1.26	-0.71	-36%	14%
12 – West Coast	0.17	0.10	-0.08	-44%	1%
13 – Otago	0.78	0.40	-0.38	-48%	6%
14 – Southland	0.38	0.21	-0.17	-46%	3%
15 – Chatham Islands	0.002	0.001	-0.001	-39%	0.02%
National	**13.83**	**8.29**	**-5.54**	**-40%**	**100%**

8.1.3 Light vehicle use impacts

Region	Current 2024	Future 2048	Change	% Change	Contribution
01 – Northland	2172	2075	-97	-4%	5%
02 – Auckland	13137	20504	7367	56%	29%
03 – Waikato	5597	6514	918	16%	12%
04 – Bay of Plenty	3056	3349	293	10%	7%
05 – Gisborne	369	420	52	14%	1%
06 – Hawke's Bay	1581	1810	229	14%	3%
07 – Taranaki	1199	1397	198	17%	3%
08 – Manawatū-Whanganui	2702	2523	-179	-7%	6%
09 – Wellington	3488	4746	1258	36%	8%
10 – Top of the South	1484	1854	370	25%	3%
11 – Canterbury	6182	8583	2402	39%	14%
12 – West Coast	494	476	-18	-4%	1%
13 – Otago	2610	2624	14	1%	6%
14 – Southland	1175	1182	7	1%	3%
15 – Chatham Islands	5	4	-0.4	-7.9%	0%
National	**45250**	**58062**	**12812**	**28%**	**100%**

Inclusive access

This transport outcome is about enabling all people to participate in society through access to social and economic opportunities, such as work, education and health care. We calculated the 10.2.1 and 10.3.1 strategic measures from the Land Transport Benefits Framework to measure the inclusive access outcome both at the national and regional level.

Benefit framework measure	Units
10.2.1 People – mode share	Percentage by mode (Census (2023) journey to work and education)
10.3.1 Access to key social destinations (all modes)	Number of jobs (x1000) accessible by mode in AM peak (car 40 min, PT 45 min, cycle 45 min) and distance from city centre (km)

Notes, caveats and limitations:

- There is a limited information about measure 10.2.1 in the Land Transport Benefits Framework measures manual – that is, its intent, scope, forecasting methods etc are not defined yet.
- Mode share data, that is main means of travel to work and education, is sourced from census 2023 outputs produced by Stats NZ.[69]
- The data for all public transport (PT) modes (buses, trains and ferries) is aggregated together.
- Where we have gained access to regional model origin–destination data (for Auckland, Waikato, Wellington and Christchurch), we've used this to estimate current and future values of 10.2.1 People – mode share based on modelled relative changes applied to the base year census values.

10.2.1 People – mode share

Region	%Car	%PT	%Cycle	%Peds
01 – Northland	91.00%	1.33%	0.99%	6.67%
02 – Auckland	77.81%	11.29%	1.32%	9.58%
03 – Waikato	86.34%	2.69%	2.49%	8.48%
04 – Bay of Plenty	87.36%	2.06%	3.37%	7.22%
05 – Gisborne	89.78%	0.43%	2.54%	7.25%
06 – Hawke's Bay	88.12%	0.99%	2.96%	7.93%
07 – Taranaki	87.18%	1.25%	2.91%	8.66%
08 – Manawatū-Whanganui	86.33%	1.77%	2.60%	9.30%
09 – Wellington	63.97%	18.40%	2.98%	14.64%
10 – Top of the South	80.14%	1.09%	7.53%	11.24%
11 – Canterbury	85.26%	0.17%	3.27%	11.30%
12 – West Coast	79.75%	4.44%	6.27%	9.54%
13 – Otago	73.35%	4.38%	3.77%	18.50%
14 – Southland	87.70%	0.70%	3.40%	8.21%
Auckland city	77.78%	11.30%	1.32%	9.59%
Hamilton city	82.96%	4.96%	3.08%	9.01%

69 https://explore.data.stats.govt.nz/?fs[0]=2023%20Census%2C0%7CTransport%23CAT_TRANSPORT%23&pg=0&fc=2023%20Census&bp=true&snb=9

Region	%Car	%PT	%Cycle	%Peds
Tauranga city	85.33%	2.92%	4.65%	7.10%
Wellington city	48.62%	28.51%	3.59%	19.29%
Christchurch city	77.74%	5.84%	7.20%	9.22%
Queenstown-Lakes District	79.27%	4.13%	5.77%	10.83%
National total	**79.45%**	**7.46%**	**2.91%**	**10.19%**

Accessibility to employment

Notes, caveats and limitations:

- Data is sourced from the Accessibility Toolkit (ATK).
- It uses network-based travel times (by mode) between household locations and employment locations. This uses recorded travel times for general traffic, bus timetables for PT and road network distance with a constant average speed applied for cycles (the default used in OpenTripPlanner, which is 5m/s = 18km/h).
- Measure 10.3.1 currently estimates accessibility to employment rather than social destinations. Further work is progressing using ATK to also include access to social destinations, which will be included in subsequent versions of this evidence pack.
- ATK has been used to estimate future accessibility in a very limited way by only looking at changes associated with land-use growth based on population and employment sub-regional projections (while keeping base year travel times by mode). It may be possible to improve this in future releases, where other tools (currently being developed) can provide suitable inputs to ATK regarding future network performance (including travel times).

10.3.1 Access to key social destinations (all modes)

Region	Mode	Current year (2023)			Future year (2048)		
		0–5km	5–10km	10+km	0–5km	5–10km	10+km
01 – Northland	Car	31,292	30,536	35,034	36,807	35,913	40,486
	PT	16,850	5,845	869	19,200	7,465	1,311
	Cycle	29,138	19,854	2,377	34,068	24,541	3,369
02 – Auckland	Car	716,503	536,916	455,088	899,714	670,758	582,690
	PT	313,788	177,213	124,557	388,878	224,214	151,103
	Cycle	355,847	280,586	216,239	451,914	355,494	265,792
03 – Waikato	Car	133,357	133,999	213,804	176,632	177,837	276,406
	PT	69,881	25,929	9,321	95,049	33,744	12,351
	Cycle	104,923	82,607	16,567	140,886	112,340	21,034
04 – Bay of Plenty	Car	79,040	77,841	93,611	103,455	101,584	107,430
	PT	35,631	23,794	18,017	47,915	32,656	20,225
	Cycle	58,707	40,240	26,289	77,374	54,337	29,099
05 – Gisborne	Car	17,327	17,265	25,979	18,308	18,254	27,378
	PT	9,241	144	147	9,421	137	150
	Cycle	15,211	10,255	517	15,898	9,799	849
06 – Hawke’s Bay	Car	72,436	71,160	165,625	82,291	81,101	186,660
	PT	18,570	12,495	21,930	20,305	13,607	26,451
	Cycle	27,802	26,148	59,881	30,745	29,448	70,751
07 – Taranaki	Car	36,869	36,779	81,917	41,180	40,985	91,527
	PT	17,946	6,379	3,989	19,839	7,537	4,939
	Cycle	27,594	21,814	5,315	30,784	26,806	6,171

08 – Manawatū-Whanganui	Car	63,400	60,858	116,324	70,215	68,118	129,915
	PT	42,455	8,809	12,769	47,710	12,863	14,373
	Cycle	49,725	27,467	15,275	55,486	31,480	16,815
09 – Wellington	Car	226,937	203,306	257,735	254,242	227,977	286,594
	PT	149,015	87,351	100,318	169,490	97,902	112,643
	Cycle	160,012	138,296	82,987	178,699	153,837	93,008
10 – Top of the South	Car	59,509	39,238	43,526	65,205	43,653	48,604
	PT	33,554	20,850	2,236	36,531	23,406	2,550
	Cycle	48,104	34,767	5,135	52,973	39,147	5,744
11 – Canterbury	Car	246,820	237,377	350,704	298,103	286,139	440,946
	PT	135,521	83,670	25,420	164,523	99,853	33,350
	Cycle	197,173	163,672	46,480	238,400	196,568	59,540
12 – West Coast	Car	6,225	6,455	14,589	5,843	6,196	13,893
	PT	3,757	183	1,862	3,445	210	2,326
	Cycle	5,537	4,664	3,015	5,099	4,604	3,432
13 – Otago	Car	59,213	58,364	112,598	62,075	61,521	128,941
	PT	45,898	27,674	13,916	48,301	33,897	16,699
	Cycle	53,343	41,614	12,458	55,959	47,303	15,473
14 – Southland	Car	32,733	33,106	69,145	34,463	34,638	71,342
	PT	20,598	10,281	2,169	21,320	13,138	2,138
	Cycle	27,027	22,387	4,685	28,399	26,232	4,374
National	Car	1,781,661	1,543,200	2,035,679	2,148,533	1,854,674	2,432,812
	PT	912,705	490,617	337,520	1,091,927	600,629	400,609
	Cycle	1,160,143	914,371	497,220	1,396,684	1,111,936	595,451

Appendix B: Intervention Catalogue

As part of the PIE programme, NZTA is developing the Intervention Catalogue (IC) tool, which compiles a wide range of empirical data relating to the implementation of transport projects and how effective they have been in achieving the intended outcomes. We'll continue to add to this over time, using data from benefit realisation associated with the investment logic mapping (ILM) process.

An AI interface for supporting queries and providing relevant evidence is currently being investigated.

For this evidence pack, a limited subset of data (related to 80 interventions) based on the KonSULT knowledgebase maintained by the University of Leeds in the UK, on sustainable urban land use and transport has been made available to demonstrate how IC might be applied to explore and identify the effectiveness of various interventions as part of the option formulation process.

Effectiveness is reported using a simple qualitative 1–5 scale that is indicative rather than absolute, and results may vary based on context.

The screenshot in Figure 5 shows the interventions we extracted from the KonSULT knowledgebase. This data is available in the summary spreadsheet: Extract-of-IC-KonSULT-data-(interventions-typology).xlsx.

Figure 5: Extract of IC KonSULT data

We've used the data shown in Figure 5 to create a draft interactive tool ([Spreadsheet-deficiency-to-intervention-example.xlsx]) that allows users to explore the effectiveness and trade-offs associated with a range of interventions that are associated with a user-specified list of issues or deficiencies.

The tables shown in the screenshots below are examples of how the tool can be used (and is not necessarily recommending any of the interventions currently selected).

User Inputs	Intervention Catalogue	Intervention Catalogue		4) Select Area Type	5) Review likely effectiveness of se		
Issue/Deficiency	Intervention Group	IC Interventions	IC Lever		Effectiveness	Cost	
1) User to provide list of issues/deficiencies below	2) User drop down menus to explore availble Groups	3) User drop down menus to explore Interventions in Group		Area	(1-5)	Min.	Max.
Consolidate growth, shorten trip lengths, co locating transport hubs with community services	Regulation (pricing and incentives)	Public transport fare reductions	Pricing	Tier 1	3	0	0
Design and Planning - adaptable 'scenarios-based' (defend, accommodate, retreat), identify critical routes, improve operational responses to events	Spatial and place-based planning	Design and Planning	Resiliance	Tier 1	0	0	0
perceived safety (incl. crime)	Deliver new or upgraded infrastructure and services	Safe system approach	Safe System	Tier 1	4	0	0
prioritise low risk low cost maintenance projects	Maintain and optimise existing networks and services	Maintaining the existing road network level of service	Infrastructure	Tier 1	3	0	1
Implement high quality improvements that bring about mode change	Maintain and optimise existing networks and services	Conversion of road capacity to shared and active modes	Optimisation	Tier 1	2	0	2
perceived safety (incl. crime)	Deliver new or upgraded infrastructure and services	Safe system approach	Safe System	Tier 1	4	0	0
rapid transport network	Spatial and place-based planning	Spatially integrated land use and transport networks	Multi-modal planning	Tier 1	4	0	1
Improved services	Deliver new or upgraded infrastructure and services	Fixed line mass public transport	Public transport	Tier 1	3	0	5
Road pricing	Regulation (pricing and incentives)	Time and distance based charges	Pricing	Tier 1	2	-4	0
PT Fares	Regulation (pricing and incentives)	Public transport fare reductions	Pricing	Tier 1	3	0	0
Road safety plans, safe speed limits, reduce dangerous behavior	Deliver new or upgraded infrastructure and services	Safe system approach	Safe System	Tier 1	4	0	0
Encourage Evs (low emission zones)	Maintain and optimise existing networks and services	Banning polluting vehicles from a defined area	Management	Tier 1	2	0	1
Encourage active modes	Deliver new or upgraded infrastructure and services	Networks for small, low powered, low speed transport devices	MAAS	Tier 1	4	0	1
Encourage active modes	Education and awareness	School based travel behaviour change	Travel reduction	Tier 1	4	0	1
Accessible infrastructure	Deliver new or upgraded infrastructure and services	On call shared transport	Public transport	Tier 1	2	0	1
Adaptable approach to road space management (e-scooters)	Deliver new or upgraded infrastructure and services	Networks for small, low powered, low speed transport devices	MAAS	Tier 1	4	0	1
More Freq Rail &PT Services	Deliver new or upgraded infrastructure and services	New rail services on existing lines	Public transport	Tier 1	1	0	3
Bus Priority	Maintain and optimise existing networks and services	Reduce journey times and improve reliability of bus services	Public transport	Tier 1	3	0	1

Figure 6: Example of using tool to explore overall effectiveness and cost of potential interventions based on a list of user specified deficiencies or issues (entered in the first column)

User Inputs	Intervention Catalogue	MoT Outcome(s)											
Issue/Deficiency	IC Interventions	Economic prosperity		Environment		Health		Inclusive access		Safety		Resilience	
1) User to provide list of issues/deficiencies below	3) User drop down menus to explore Interventions in Group	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Consolidate growth, shorten trip lengths, co locating transport hubs with community services	Public transport fare reductions	0	0	0	2	0	2	0	4	0	1	0	0
Design and Planning - adaptable 'scenarios-based' (defend, accommodate, retreat), identify critical routes, improve operational responses to events	Design and Planning	0	0	0	0	0	0	0	0	0	0	0	0
perceived safety (incl. crime)	Safe system approach	-2	2	-1	3	0	0	0	3	0	5	0	0
prioritise low risk low cost maintenance projects	Maintaining the existing road network level of service	0	1	0	2	0	1	0	3	0	3	0	2
Implement high quality improvements that bring about mode change	Conversion of road capacity to shared and active modes	-1	2	-1	3	-1	4	0	3	0	3	0	0
perceived safety (incl. crime)	Safe system approach	-2	2	-1	3	0	0	0	3	0	5	0	0
rapid transport network	Spatially integrated land use and transport networks	0	3	0	2	0	3	0	4	0	3	0	0
Improved services	Fixed line mass public transport	-1	3	0	2	0	0	0	2	0	3	0	0
Road pricing	Time and distance based charges	0	3	0	4	0	3	-3	3	0	3	0	0
PT Fares	Public transport fare reductions	0	0	0	2	0	2	0	4	0	1	0	0
Road safety plans, safe speed limits, reduce dangerous behavior	Safe system approach	-2	2	-1	3	0	0	0	3	0	5	0	0
Encourage Evs (low emission zones)	Banning polluting vehicles from a defined area	-2	0	0	1	0	4	-2	0	0	1	0	0
Encourage active modes	Networks for small, low powered, low speed transport devices	0	0	-1	1	0	0	0	2	-1	0	0	0
Encourage active modes	School based travel behaviour change	0	1	0	3	0	3	0	1	0	4	0	0
Accessible infrastructure	On call shared transport	0	0	0	1	0	1	0	3	0	1	0	0
Adaptable approach to road space management (e-scooters)	Networks for small, low powered, low speed transport devices	0	0	-1	1	0	0	0	2	-1	0	0	0
More Freq Rail &PT Services	New rail services on existing lines	0	0	0	2	0	2	0	3	0	2	0	0
Bus Priority	Reduce journey times and improve reliability of bus services	0	2	0	2	-1	2	0	3	0	2	0	0

Figure 7: Example of using tool to explore overall trade-offs between outcomes associated with potential interventions