Submission

Draft Infrastructure Commission - Te Waihanga Infrastructure Plan

The Future Is Rail
organiser@thefutureisrail.org
[redacted]
www.thefutureisrail.org

Thank you for the opportunity to comment on the draft Infrastructure Commission - Te Waihanga Infrastructure Plan.

Who are we

The Future is Rail is a citizen-led campaign grounded in communities across Aotearoa New Zealand. We started as an informal group campaigning for the return of the Northern Explorer and Coastal Pacific trains in 2022.

We work with a talented group of writers, researchers, and thought leaders who provide essential information on the future of rail and its ability to transform communities and protect the environment. Our research can be found at https://thefutureisrail.org/

Our organisation understands that transport does not operate in isolation from many other areas, including land use decisions and urban planning. However, this submission focuses primarily on the direct provision of transport infrastructure.

Our vision

To support the revival of regional and inter-regional passenger rail and freight services to unlock multiple economic, social and environmental benefits.

Our view of key issues that should be driving long term transport infrastructure decisions

- A need to rapidly and significantly reduce emissions from all forms of transport.
- An urgent requirement to grow our supply of renewable electricity while also ensuring that energy is used wisely.
- A need to electrify all forms of transport. Electrifying rail is a long-proven technology and now battery powered trains add another option. We note that KiwiRail has just announced bold plans to electrify rail.
- A need to reduce dependency on costly imported fuels in an increasingly unstable world, especially given our location at the distant end of supply chains.
- A need to reduce road maintenance costs which is currently hampered by policies that favour freight being carried by trucks and will get more challenging as the

https://www.nzherald.co.nz/business/business-reports/infrastructure-report/kiwirails-bold-electrification-plan-is-crucial-for-nzs-future-peter-reidy/6ZY5YHAKXRF3TC6VY26ER2ZKN4/

effects of climate change get worse. Heavy trucks are damaging our roading network and are not paying the full cost of this damage.

- A need to plan for an ageing population. One impact is that a significant number of older people will no longer be able to drive.
- A need to make our roads safer. Our roads are relatively dangerous compared with many similar countries. Getting freight off trucks onto rail has multiple benefits for road users.
- A need to better utilise our rail network. We already have an extensive rail network linking most towns, cities and shipping ports but, as the Commission shows, through long term lack of investment the network is underutilised. Nearly 90% of Kiwis live within fifteen minutes of a current or former rail station site on Kiwirail's current rail network.[i]
- A need to support regional connectivity. Our regional aviation network is under pressure and alternative public transport modes are either not available or of poor quality. Little progress is being made on decarbonising aviation.
- A need to cater for the mobility needs of all New Zealanders. Inter-regional passenger rail is ideal for young people, older adults and disabled travellers, kiwis and overseas visitors as it is safe, comfortable, low emission, and offers easy boarding, toilets, food, and space.

The Future is Rail has prepared a report on the damage heavy trucks do to our roading network and how the repair and maintenance of our roads is not fully paid for by these trucks.

We note that the Ministry of Energy is currently consulting on fuel security, stating in the forward to the Draft Fuel Security Plan Consultation document:

"Fuel security is a priority for this Government. Ensuring people and businesses have reliable access to fuel is essential to our way of life and growing the economy.

As an island nation without domestic refining capabilities, we rely on importing almost all of our liquid fuels. This makes us uniquely vulnerable to global supply chain disruptions, meaning our economic prosperity is at risk."

Electrified freight and passenger rail significantly reduces the need to import liquid fuels, replacing them with locally produced renewable electricity.

The Climate Change Commission has also just released a report assessing how New Zealand is working towards meeting climate goals.

In a chart on page 2 (Figure 1) of the Climate Change Commission Transport Sector report, it shows there are moderate risks in meeting goals of reducing emission intensity of passenger transport and significant risks in relation to decarbonising domestic aviation and the freight sector.

https://drive.google.com/file/d/1wroegkdxfkrE4hkhu5XfU_rwg_Qbw8sy/view
https://www.mbie.govt.nz/dmsdocument/30934-draft-fuel-security-plan-consultation
https://www.climatecommission.govt.nz/assets/Monitoring-and-reporting/ERM-2025/Monitoring-report-Emissions-reduction-Transport-sector-summary.pdf

Figure 1

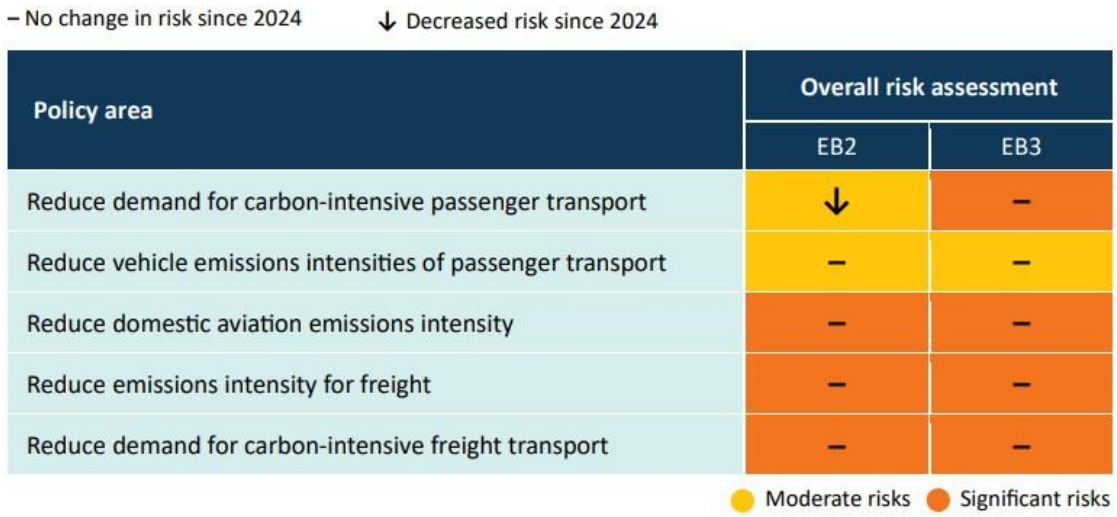


Figure 1 - Chart on page 2 of the Climate Change Commission Transport Sector Report shows there are moderate risks in meeting goals of reducing emission intensity of passenger transport and significant risks in relation to decarbonising domestic aviation and the freight sector

The report goes on to note (page 2) '[w]hile the sustainable aviation fuel mandate and targets for aviation decarbonisation are credible policies, there is a lack of clarity around policy detail, timelines and funding sources' and page 3 '[i]ntegrated national and regional planning could increase the amount of freight carried by rail and coastal shipping and reduce the emissions intensity of freight transport.'

As yet, we have no credible plans to decarbonise domestic aviation. But with suitable investment we can work towards some modeshift to trains.

This requires an investment in both longer distance passenger rail infrastructure and rail freight infrastructure.

The Commission's analysis

We agree with the aim of the Commission '...to transform infrastructure for all New Zealanders' and the overall goal '... to lift the economic performance of Aotearoa and improve the wellbeing of all New Zealanders.'

We recognise the Commission (page 4) aligns with our view that in a number of areas that New Zealand needs '...to keep building and improving infrastructure in response to a growing and ageing population, ongoing economic growth and international trade, technology changes, and the need to provide affordable and reliable electricity to decarbonise the economy.'

We agree with the Commission's view that we should only build new infrastructure we can afford to maintain. In this context we are concerned about the current government's RoNS program. It makes no sense to keep building new roads of "National Significance' that offer poor economic returns and will be difficult and expensive to maintain.

We value the analysis that the Commission has undertaken on roading and rail across a number of comparator countries. In particular, the chart on page 36 stands out (Figure 2).

Figure 2

NZ difference from comparator country average
(based upon simple unweighted average of multiple measures)

Network	Investment levels	Quantity of infrastructure	Usage	Quality	Comparator countries	Notes
Road	+34%	-13%	-33%	-13%	CZE, CAN, FIN, SWE, ISL, NOR	High investment levels, low usage, high amount of fatalities on the network
Rail	-64%	-43%	-23%	-90%	CHL, GRC, JPN, ESP, FIN, SWE, ISL, NOR	Low investment levels, low usage (both passenger and freight), high emissions

Figure 2 – Chart on page 36 of the draft Infrastructure Commission - Te Waihanga Infrastructure Plan. The statistics regarding investment, quantity and quality of the rail network stand out starkly, relative to comparator countries.

On page 131 the Commission provides notes the following more detailed information on our road and rail networks:

"• New Zealand has an average-sized, sparsely used road network, which is also the case for our comparator countries. Across broad metrics of quality, we are about average, except for the safety of our roads, which have higher fatality rates than our peers.

• Our rail networks are characterised by very low levels of investment and low usage, for both passenger and freight rail. The length of our network is comparable to our peers, although our network electrification is low. New Zealand's rail services also score comparatively poorly on measures of rail quality."

The *Future is Rail* questions the statement, that New Zealand rail networks are characterised by low usage. Usage of rail, relative to comparator countries, could be argued to be relatively well performing, given appalling quality and investment levels compared to comparator countries. How much better could rail in New Zealand do, with smart investment to improve quality?

Funding Transport

The draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan notes that:

"Rail networks are, or should be, primarily funded by users in the form of track user charges. This includes contributions from urban public transport users and local governments, for access to urban passenger rail networks."

As noted, *The Future is Rail* commissioned a Truck Subsidy Report that takes a deep dive into data from NZTA, MOT and other sources, that we understand, are recognised by New Zealand Infrastructure Commission - Te Waihanga.

Our report on subsidies granted to heavy trucks noted that the introduction of HPMVs (High Productivity Motor Vehicles), from 2010 generated a "bow wave" of road maintenance, that has never been caught up. Road maintenance costs have increased, and due to their higher axle weights, 93% of Equivalent Standard Axle (ESA) costs can be attributed to heavy vehicles. Pavement wear costs are allocated in the Road User Charges (RUC) Cost Allocation Model (CAM), by first estimating the wear caused by different vehicle classes, measured in 'equivalent standard axles' (ESAs).

The 2024 Government Policy Statement (GPS) for transport, acknowledged that there has been an underfunding of road maintenance in recent years, and that this has led to a deterioration in road quality. To address this, it was announced that the GPS aimed to more than double road surface maintenance expenditure by 2027, when implied local share contributions are included. This is highlighted in Figure 3.

Figure 3

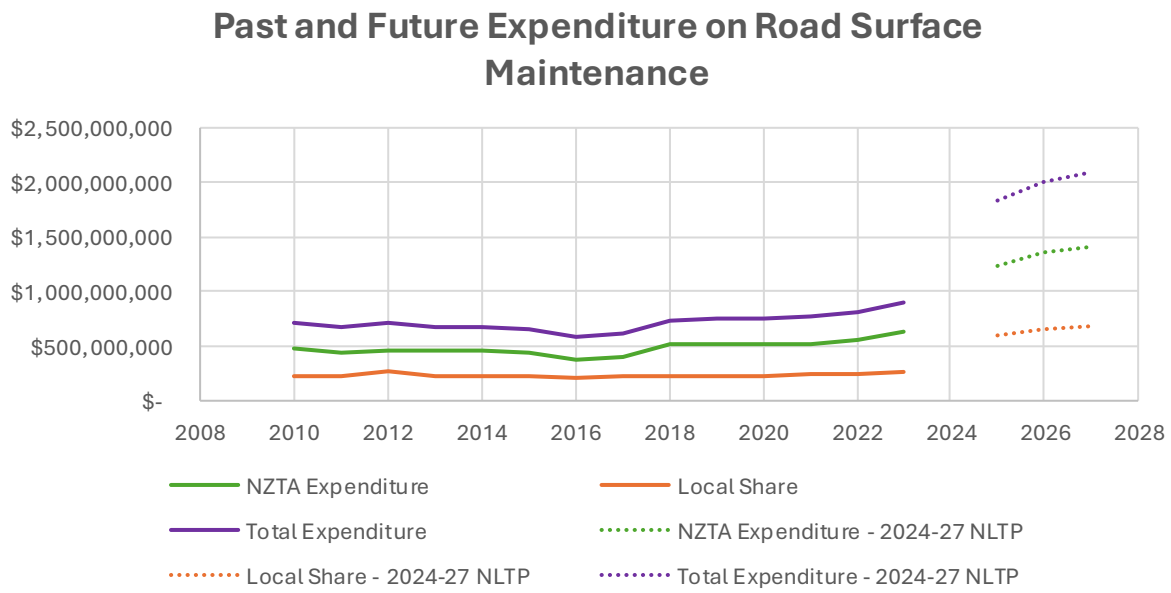


Figure 3 - Past and Future Expenditure on Road Surface Maintenance. Note that 93% of wear-related maintenance is attributable to heavy vehicles, and RUC rates have not been updated since 2020.

Data on historic maintenance was obtained from NZTA. NZTA maintenance expenditure in the 2024-27 NLTP, was estimated by taking midpoint values for 'pothole-prevention' expenditure, in the most recent GPS. Local share expenditure in the 2024-27 NLTP, was estimated in line with a 53% Funding Assistance Rate (FAR) for local road maintenance.

- 93% of road wear costs can be attributed to heavy vehicles, despite them making up only ~7% of VKTs. This is because they do far more damage to the roads. A 63-tonne heavy truck does more than 10,000 times as much damage as a small car.
- The below sub-bullet point line-items; mostly attributable to maintenance costs for heavy vehicles, will amount to an **overall $1.4 billion annual subsidy per year by 2027.**

i. Heavy vehicle 'Pavement Wear Cost' related Road User Charges (RUCs) have not been adjusted to match increased maintenance costs. This will amount to a $650 million subsidy to heavy vehicles by 2027.
ii. Technical assumptions around allocation of weight related costs, disproportionately favours heavy vehicles (Gross Vehicle Weight Costs). Combined with the increase in maintenance funding, this amounts to $530 million subsidy by 2027.
iii. Heavy vehicles are directly subsidised through taxpayer and ratepayer funding of road expenditure (Common Costs), receiving a $230 million dollar subsidy by 2027.
iv. Expenditure in other cost categories has also increased, and heavy vehicle RUCs have not been adjusted to match. This amounts to a further $39 million subsidy to heavy vehicles.

Our report noted that every billion net tonne-kilometres (NTK) of freight diverted from heavy vehicles to rail and sea, saves an estimated $43 million annually in avoided direct subsidies, and $230 million in avoided direct social and environmental costs per year by 2027.

HPMVs also enabled a mode shift from rail to road, and the Transport GPS noted that rail freight traffic has been stagnant despite government investment. Anecdotally, the lower roading cartage rates able to be charged by HPMVs, resulted in a shift of predominantly domestic freight, from rail to road.

In that context, *The Future is Rail* finds extraordinary, that the draft Te Waihanga Infrastructure Plan, suggested that 'Rail networks are, or should be, primarily funded by users in the form of track user charges,' without also similarly commenting on road networks.

An additional factor in the misalignment of budget away from roading maintenance requirements, was the Roads of National Significance (RoNS) programme between 2009 and 2017. Between 2012 and 2015 petrol taxes and road user charges rose 9 cents a litre to pay for RoNS. The proportion of the transport budget for new and improved state highways rose from 23.4% in 2009/2010, to 61.8% in 2011/2012. Funding for other transport, such as repairs and footpaths, fell by 26.1% . In 2013 that led to the Auditor General reporting a risk that prioritising RoNS created pressures on other road maintenance. From 2015 to 2020 average seal age rose from 6.86 to 7.96 years and average remaining seal life dropped from 2.18 to 1.23 years. Some of the RoNS had low-cost benefit ratios. In a written answer in 2017, the Minister of Transport, Simon Bridges, said the Warkworth to Wellsford motorway would return a benefit of 25 cents for every dollar spent.

In the further context of the RoNS evidence, pointing towards sub-optimal rates of return, and an unsustainably low level of funding for ongoing and future existing road maintenance, *The Future is Rail* finds it very disappointing that the draft Te Waihanga

Infrastructure Plan has not singled out the current and future next phase of RoNS projects being developed by government agencies for criticism and a credibility check.

Unsurprisingly, given the expectations on regional and local councils, facing funding shortfalls, infrastructure deficits, and government pressure to keep rates increases down, some regional and local councils have been advocates for regional rail freight initiatives in Rangitikei/Hawkes Bay and Whanganui/Taranaki, as a means to lower spiralling regional roading maintenance costs.

Citations for our commentary on road funding, are available within *The Future is Rail* Truck Subsidy Report.

Comparison between *The Future is Rail* Investigation into Heavy Vehicle Subsidies on New Zealand Roads report and the Domestic Transport Costs and Charges Study (DTCC)

The DTCC study was an important input into *The Future is Rail* Truck Subsidy Report. The DTCC study, authored by Ian Wallis Associates, and published in 2023, aimed to improve our understanding of the costs of the provision and use of New Zealand's domestic transport system.

The Study assessed both the financial and economic impacts of transport. **Financial** costs and charges are the costs and prices faced by users, infrastructure providers and service suppliers, expressed in dollars. The Study was particularly interested in the costs of government-provided infrastructure and services, and in the extent to which the prices charged to users cover these costs; and it was also interested in the total costs faced by users and the user costs per unit of output (i.e. cost per person-km or per net tonne-km).

The **economic** analysis considers the resource costs consumed or incurred in the transport task. This includes the direct costs to the user, the costs incurred through the use of transport infrastructure, and also the social and environmental costs (often referred to as externalities) associated with travel. Payments and their associated revenues were considered to be transfer payments and were not of interest for the economic analyses. Key measures of economic cost efficiency for person transport are total economic costs per person-km and for freight transport total economic costs per net tonne-km.

It should be noted that the DTCC study found that for freight movements, the economic cost for rail freight transport averages 26c/ntk, which may be compared with an average of 36.4c/ntk for heavy trucks (HCV2). However, it should be borne in mind that these two figures are very much averages over a wide range of situations. For financial costs, the financial costs, there was a shortfall of 1.1c/ntk for heavy trucks (HCV2), and 14.5c/ntk for rail. These differences reflect fundamental differences in the definition of financial costs, compared to economic costs.

For *The Future is Rail* Truck Subsidy Report, a focus was on a review of the financial cost parameters, used to help define the level of Road User Charges (RUCs), set for heavy trucks (HCV2), which make up part of the HPMV fleet. The financial cost parameters are calculated using the Cost Allocation Model (CAM).

The DTCC [1] study indicated that road user charges (RUCs) cover the maintenance costs incurred by road vehicles. This is indicated in table 4.18 below (Table 1), taken from the DTCC study.

Table 1

Table 4.18 Estimated RUC and average economic cost (km in billion)

Vehicle class	vehicle km	HV-km	PCE-km	GVW - km	EDA-km	PV-km	Financial cost $/1000km	Actual charge $/1000km	Economic cost $/1000km
Motorcycle	0.4	0.0	0.2	0.2	0.0	0.4	53.9	33.0	91.5
Car	35.7	0.0	35.7	99.2	0.2	35.7	65.0	66.1	109.1
LCV1	2.1	0.0	2.1	6.0	0.0	2.1	65.0	65.9	109.1
LCV2	7.0	0.0	7.0	17.4	0.0	7.0	62.5	65.9	105.2
MCV	1.1	1.1	2.3	8.3	0.2	1.1	132.3	137.4	227.0
HCV1	0.6	1.2	1.2	11.4	0.6	0.6	336.9	377.2	570.5
HCV2A	0.7	1.4	1.4	19.4	0.8	0.7	393.3	395.9	656.1
HCV2B	0.6	1.3	1.3	28.0	0.8	0.6	461.0	316.1	747.9
Bus 2axle	0.3	0.2	0.6	2.1	0.1	0.3	132.0	201.3	224.9
Bus 3axle	0.1	0.1	0.2	1.5	0.1	0.1	296.0	402.5	498.8

Source Waka Kotahi, consultant estimates.

For definition of vehicle classes see Table 4.20.

Table 4.18 applies the rates shown in Table 4.16 to the estimated travel output for nine vehicle classes defined in Table 4.17. This confirms that the 'base' (2018/19) RUC rates are set marginally higher than the CAM recommendations for heavy vehicles (except for HCV2B), but substantially less than our estimates of the economic costs.

Table 1 - Table 4.18 from Domestic Transport Costs and Charges Study (DTCC). The key columns are to the right. RUCs are included within 'Actual Charge'. HCV1 vehicles are trucks with four or more axles, but are not part of HCV2 rigs. HCV2A are typical "H" class rigs with six, seven or eight axles, that make the majority of HPMVs. HCV2B are less common "H" class rigs with nine or more axles. Of note is the difference between Economic Cost and Financial Cost.

Table 4.18 highlights that 2018/19 RUC rates were set marginally higher than the cost allocation model (CAM) recommendation for heavy vehicles. The CAM attributes RUC rates based on expenditure. As highlighted in *The Future is Rail* Truck Subsidy Report [2], a

[1] https://www.transport.govt.nz/area-of-interest/freight-and-logistics/transport-costs-charges/domestic-transport-costs-and-charges-study-reports

[2] https://thefutureisrail.org/government-policy-risk

deferred maintenance strategy from ~2008 onwards has resulted in maintenance expenditure being too low, and not keeping up with requirements. The 2024 draft GPS recognized this, and planned for a near-doubling of wear-related road maintenance. This is described under the section: **'Funding Transport'** in our response. Please note Figure 3 in that report.

The DTCC study assumed that the CAM correctly allocated costs, based on 2018/19 expenditure. However, deferred maintenance over this period meant that maintenance expenditure, and therefore RUC rates, did not meet long-term requirements. If the CAM were updated for current expenditure, and costs were correctly allocated to heavy vehicles, then we would expect the recommended RUC rates for heavy vehicles to roughly double. This would reflect both the wear-related costs, and other costs that heavy vehicles incur upon the road network.

In addition, the CAM has historically allocated most weight-related costs to light vehicles, despite these costs being wholly attributable to heavy vehicles. Weight related costs include the costs of upgrading bridges to carry heavier vehicles, and the costs of resurfacing sealed roads to withstand heavy vehicles. They are referred to as gross vehicle weight costs (GVW). In the CAM, weight related costs are calculated based on multiplying vehicle weight by vehicle kilometres travelled (VKTs). This unfairly allocates most (~60%) of weight-related costs to light vehicles, despite these costs being wholly attributable to heavy vehicles. In addition, despite weight related costs roughly doubling since 2020, RUCs have not been increased to match; this amounts to a ~$500 million dollar per annum subsidy in the draft 2024 GPS. This is highlighted in Figure 4.

Figure 4

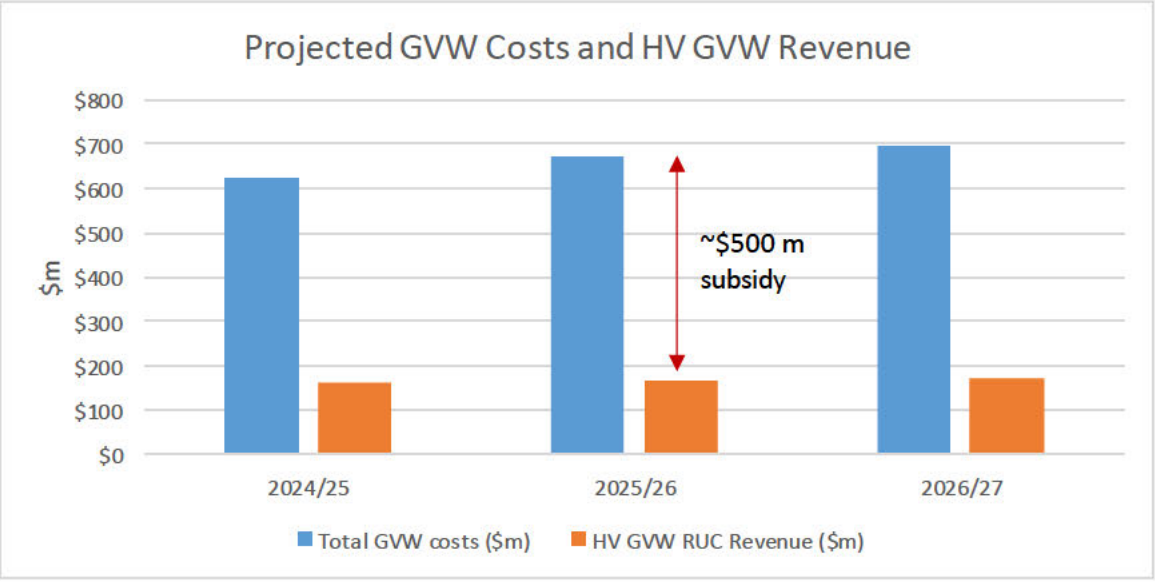


Figure 4 - Projected GVW costs and allocated heavy vehicle (HV) GVW revenue. Calculated as part of The Future is Rail Truck Subsidy Report, from NZTA data. In practice, all weight related costs are attributable to heavy vehicles, however historically ~60% of these costs have been paid by light vehicles. In addition, although weight-related expenditure has more than doubled since 2020, RUCs have not been increased to match this.

It has been acknowledged that rail freight performs well when assessed using economics cost criteria. This is described under the section: **'How funding rail lowers economic costs for New Zealand'** in our response. Please refer to Figure 11, within that section, which provides a breakdown of $2.3 billion Externality Benefits that rail provides to New Zealand.

The scepticism in New Zealand, has been focussed on the performance of rail freight under a narrower set of financial cost criteria. However, The Future is Rail Truck Subsidy Report established that heavy vehicles, are also substantially subsidised under **financial** cost criteria, through miscalculating the CAM, and other measures.

RoNS Northland Corridor (NZTA / Waka Kotahi)

The *Future is Rail* is very interested in New Zealand Infrastructure Commission - Te Waihanga's view on the proposed 4-lane Northern Expressway, within Table 5, Large Projects in the Planning Stages. This project has five $ signs within the draft Infrastructure Plan, noting high costs and high risk. It is also noted as having a solid green line meaning under construction without seemingly any requirement for a business case, while the text notes that it is 'under planning'.

While NZ Institute of Economic Research, has strongly backed the expressway, the quality of its research has been called into question. A NZIER produced report making the case for a major highway that could consume 10 percent of the Government's entire infrastructure budget in coming decades may overstate its economic benefits and cannot be easily verified, an independent analyst says.

According to the report, the expressway could lead to a $1.2 billion increase in annual GDP by 2050, "unlocking growth" in Northland and making the upper North Island more resilient to extreme weather events.

However, an independent analysis carried out for Parliament's transport and infrastructure committee by Motu Research affiliate Dr Simon Chapple has questioned some of the conclusions regarding the expressway's benefits.

The NZIER report is advocacy research, paid for by people with monetary skin in the game to commercial providers of consultancy services, meaning its conclusions need to be regarded with caution by the public," Chapple said, with its estimated benefits not readily verifiable.

There has been considerable interest in discussions on TVNZ's Q+A programme with Jake Tame about infrastructure, with Minister Chris Bishop and Infrastructure Commission Te Waihanga chief executive Geoff Cooper, Greater Auckland, has just posted a blog about the government's proposed Northern Expressway.

The Waikato Expressway has been used as a case study to support the proposed investment in the Northern Expressway. But the Waikato Expressway serves the Waikato region with a population of 527,600. It also serves the Bay of Plenty region with

https://northpower.nz/wp-content/uploads/2024/05/NCG-SH1-extension-NZIER-report.pdf

https://www.parliament.nz/resource/en-NZ/54SCTIN_ADV_483f926f-e5a3-4c60-bf75-08dc6a5b5565_TIN1856/0af9d4f343ab3baceb4da1703551caf2c8c87695

https://www.greaterauckland.org.nz/2025/08/04/the-governments-northern-expressway-obsession/

a population of 351,700, and points further south. By way of contrast, Northland has a population of 203,900 with no onward connections to other regions. Notably, the Waikato Expressway is not a tolled PPP, and it runs through geologically and meteorologically relatively stable countryside, in contrast with the situation in Northland.

Official numbers are not provided by NZTA Waka Kotahi, but Greater Auckland notes that the Northern Expressway is expected to carry around 25,000 AADT [average annual daily traffic], similar to the current volumes of the Waikato Expressway. At present, the main highways into Northland carry a much smaller average volume of traffic with 'only around 10,000 vehicles per day crossing the Brynderwyns', according to Greater Auckland.

When reviewing tolled PPP roads in Australia, a quick search indicates that there are currently 23 toll roads . Most of the toll roads are partially owned or operated by Transurban. All toll roads in Australia are tolled electronically (cashless) using free-flow tolling.

Notably, all bar one, appear to be in heavily urbanised areas with Melbourne's CityLink tollway (M1 and M2 sections) carrying the highest volume of traffic and also generating the highest revenue of all the tollways (by a substantial amount). CityLink motorway has an average daily traffic volume of 330,000 vehicles. A number of the other tollways on the list have volumes of 200,000 per day or more.

The Toowoomba Bypass which was built to divert some 22,000 vehicle movements per day through the centre of Toowoomba, is a 41km ring-road with a number of engineering features including the Multuggerah Viaduct. Key traffic for this strategic link are trucks connecting the Brisbane port and great South East Queensland region, with the main direct inland arterial highways south to Melbourne, and north to Darwin. Notably, the federal and state governments jointly funded the $1.6 billion project on an 80:20 basis. Today it is owned by the Queensland's Department of Transport and Main Roads (TMR). Transurban Queensland provides tolling service on the bypass on behalf of TMR.

When considering the economics of New Zealand's proposed ~100km Northern Motorway, it is noted that both the NZIER Report and Motu Research's critique quote between $5.6 and $11 billion to build the Southern (Warkworth to Whangārei) and Northern (Whangārei to Kaikohe) sections. On operating costs, the Motu Research report also notes the following:

"These costs also do not take into consideration the ongoing maintenance costs of the expressway once built. At 6.8 cents per kilometre travelled (an NZTA number), these costs could be up to $150 million annually in the higher travel volume scenario.''

Given concerns raised by *The Future is Rail*, and an admission of inadequate maintenance funding within the 2024 Government Policy Statement (GPS) for transport, then there is good reason to be sceptical that the $150 million per year is realistic. This

https://en.wikipedia.org/wiki/Toll_roads_in_Australia

is especially the case, given ongoing stability issues with the geology of the Northland region, and vulnerability to weather events.

If considering a commercial return on investment, and without largescale New Zealand government funding in the form of a grant, it is inconceivable that a privately funded and tolled PPP could be viable.

Therefore, one possible outcome is that a Northern Motorway may be a New Zealand Inc funded and owned, but privately tolled project. A key assumption appears to be largescale population growth in Northland from the current ~200,000, perhaps to something equivalent to Waikato / Bay of Plenty at ~900,000.

The long-term viability of such a motorway, looks to be dependent on the exurban form of typical northern suburbs of Auckland such as East Coast Bays, Orewa, Whangaparāoa, Silverdale, Mahurangi, Matakana, sprawling all the way through Northland. A feature of this type of development includes inland north/south arterial roads between retail and industrial hubs such as Albany and Warkworth, with a myriad of smaller roads running east/west; travelling quite some distance, to coastal housing developments. The physical environment, with headlands separating coastal communities, can make it difficult to directly connect adjacent communities. This type of development, represents a doubling down on a high carbon emissions footprint, and is not well suited to active modes of transport or public transport.

Long term under-investment in rail

All over the world, including oil producing nations in the middle east, in the conservative US states of Texas and Florida, and in Australia, there is new investment in both passenger rail and rail freight. This includes a revival of night trains in Europe.

In late 2023, Sense Consultants produced a report for KiwiRail titled 'Unlocking Rail Construction, Quantitative and Qualitative Analysis' . A big focus of the report was on the resourcing, efficiency and cost issues of boom-and-bust investment cycles for rail in New Zealand. The report also demonstrated New Zealand's history of low rail investment, including when compared with Australia.

Below are extracts from the report:

> *According to OECD data, the most comparable international dataset available, New Zealand has long underinvested in rail.*
>
> *Figure 6 below shows New Zealand's rail investment relative to GDP, versus the OECD interquartile range. We also plot Australia, which has had a similar economic development as New Zealand, although with significant differences in geography.*
>
> *The data shows New Zealand's rail investment as a share of GDP over the last two decades has been below even the lower quartile of OECD countries. Recent increases put New Zealand in the low end of the OECD inter-quartile range.*

https://www.kiwirail.co.nz/assets/Uploads/Our-network/Our-regions/Auckland-Metro-Rail/Economic-contribution-rail-construction-FINAL-Sense-Partners-Sept2023.pdf

Figure 5

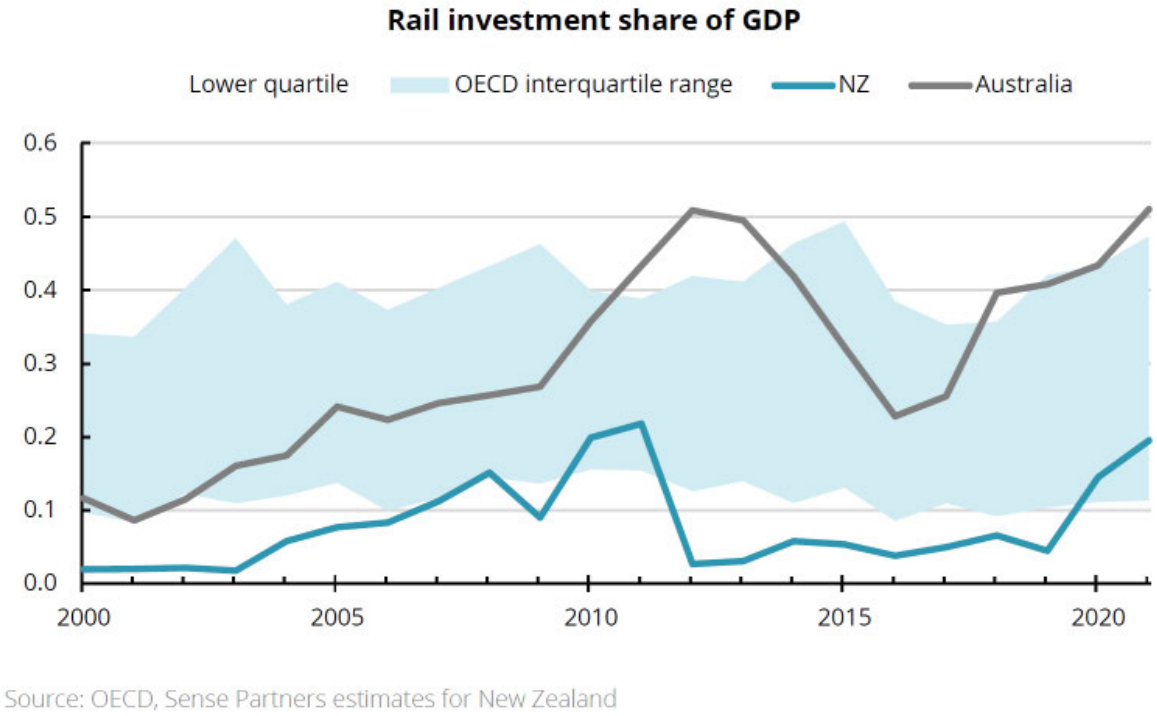


Figure 5 - New Zealand's Rail Investment level are very low relative to other countries. Sense used their own data for New Zealand, based on analysis of KiwiRail data, which is more accurate and up to date than the OECD dataset. Note that International comparisons of rail investment need to be treated with some caution, as investment is related to geography, population density, history of rail development, size and purpose of network, etc.

The report goes on to state that 'Australia has consistently invested more in rail than New Zealand. Australia invested 0.4% of GDP per year on average over the five years to 2021, compared to 0.1% in New Zealand. On a per capita basis Australia is investing six times that of New Zealand.'

On Boom-bust investment cycles in rail, Sense Partners noted the following –

> "Boom-bust cycles really matter. When investment slowed in the past, many businesses lost specialised staff and know-how atrophied. So, when investment rose again, it came with considerable delays and costs.
>
> • When work dried up we had to let go of highly skilled staff. They left for Australia and other places. They won't come back.
>
> • It took us around five years to get the teams to really hum. When our crew stopped working on rail projects they lost many of those skills and it was hard to put the same mix of crew back together.
>
> • When work came back, we had to scramble to find staff. We are competing in a global market for very specialised skill sets. We are often the third or fourth choice for candidates – they prefer markets with large and long pipelines of work, with multiple buyers and suppliers."

The Future is Rail does not see any consideration within the draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan, for supporting any long-term rail infrastructure investments, let alone the sort of consistent pipeline, that would enable skills to be gained, and time and costs to be controlled, through an experienced and efficient rail work-force.

Emissions Reductions and Moving People

The draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan does not appear to place any value on the need for urgent emissions reductions, within the task of moving people around our cities and regions.

As international data shows, New Zealand has the highest per capita ownership of cars in the world.

In part, this is due to the lack of an effective linked up public transport network across the country, including passenger rail. Countries such as Finland have much lower car ownership levels supported by a well-functioning train network.

Other data sources show New Zealand stands out in domestic flying.

> *We see large differences in emissions from domestic flights across the world. In the United States the average person emits around 386 kilograms of CO2 each year from internal flights. This is followed by Australia (267 kg); Norway (209 kg); New Zealand (174 kg); and Canada (168 kg). Compare this with countries at the bottom of the table – many across Africa, Asia, and Eastern Europe in particular emit less than one kilogram per person – just 0.8 kilograms; or 0.14 kilograms in Rwanda.*

On a per capita basis, New Zealanders emit seven times that of people living in the UK and nine times that of Germany.

When emissions by mode of travel are considered, it is clear that relying on driving and flying lead to high per capita emissions.

https://www.autocar.co.nz/kiwis-own-the-most-cars-per-capita-in-the-world-new-data-shows/

https://ourworldindata.org/carbon-footprint-flying

Figure 6

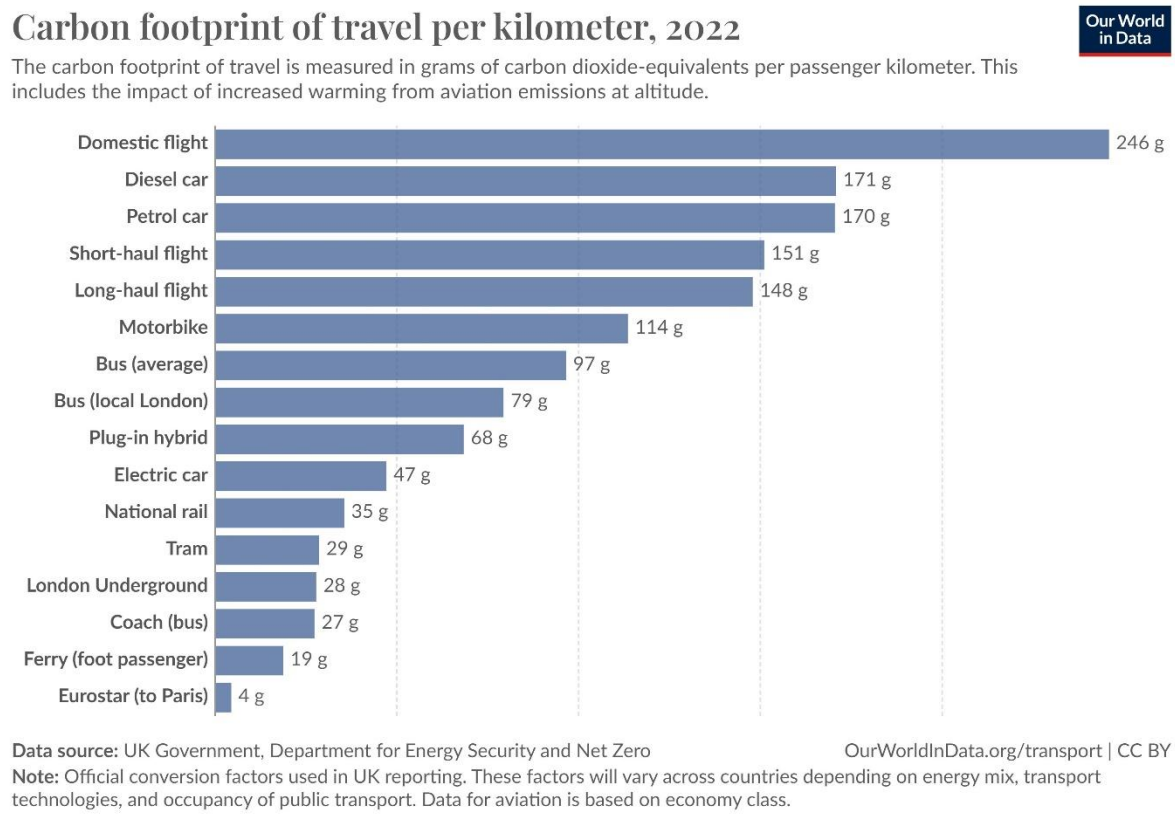


Figure 6 – International footprint of travel per kilometre, 2022. Domestic flights and private car travel, by diesel or petrol car, are among the highest emitters of carbon dioxide equivalents, per passenger kilometre.

Figure 7

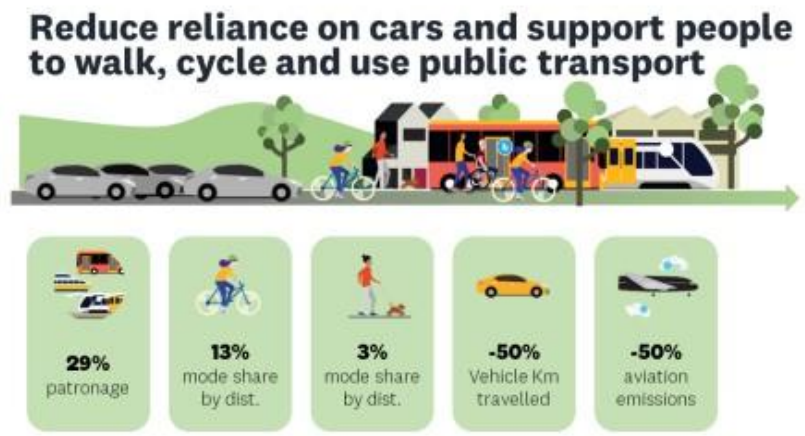


Figure 7 - Unlike the second draft New Zealand Emissions Reduction Plan, in Auckland's Transport Emissions Reductions Pathway, adopted in 2022. there is a target of reducing domestic aviation emissions by 50% in just eight years through to 2030. Significant modeshare shifts are also suggested.

There are a range of possibilities for reducing aviation and car emissions. These include travelling less, and using other forms of communication more, such as Zoom meetings; relying on aviation decarbonisation through the use of Sustainable Aviation Fuels and bringing electric planes, which Air New Zealand's pullback from emission reductions shows is not working; and switching to rail.

Travelling less can be done immediately. But switching to rail is both a very attractive short- and long-term option.

Table 2

Auckland to Wellington travel emission estimates

Mode	Type	Emissions kg per person km	Km	KgCO2e/person
UK Short haul flight	Economy	0.15573	496	77
	Business	0.23360	496	116
Atmosfair A320				116
Atmosfair A320neo				93
Atmosfair ATR				50
UK small petrol car		0.15301	643	98
UK medium petrol car		0.19158	643	123
UK large petrol car		0.28295	643	182
UK Rail	National rail	0.04115	682	28
	International rail	0.00597	682	4
UK coach		0.02779	643	18

The UK estimates are sourced from official government data https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019. Atmosfair is a carbon calculator

Table 2 - The above table shows estimates of per person emissions for various modes of travel between Auckland and Wellington by plane, car and train.

The estimates for fully electrified rail, based around the Eurostar service, is for the trip between Auckland and Wellington to emit just 4kg per person. Flying on the lowest emission alternative, a turboprop ATR, has emissions over 12 times higher. Or, to put it another way, if we compare with the planes that do actually fly this route, the Airbus A320 neo, a person catching a fully electrified train service would have a 96% reduction in emissions.

In contrast to promised innovations within aviation "in the not too distant future", proven low emission technology exits right now, for trains. There are electric trains, using overhead wires, operating all over the world. The whole of Switzerland's extensive passenger rail network is electrified.

Battery powered trains already exist.

In an article in The Herald, KiwiRail CEO argues for electrifying the whole of the Golden Triangle rail network. He argues:

https://www.trains.com/trn/news-reviews/news-wire/metra-board-approves-deal-for-up-to-six-battery-locomotives/

Electrifying the Golden Triangle would save around 1 to 1.4 million tonnes of carbon over 30 years, reducing our emissions from trains on that route by 45% by 2035 and 90% by 2050. This would also contribute to New Zealand's carbon reduction goals.

In a post on Linkedin, Geoff Cooper notes Finland as a country with a transport system worth examining.

Finland has retained its longer distance passenger network. We note that Finland has road transport emissions of 1.6 tCO2 per person compared to 2.4 tCO2 per person in New Zealand.

Finland provides an example as to how a country with a relatively small population and a lower population density than New Zealand can support intercity passenger rail such as between Auckland and Tauranga. Rail links two smallish cities in the north in Finland, Tampere and Oulu. Both are of similar sizes with a bit more than 200,000 residents. In comparison Auckland is much larger, but Tauranga city is smaller. However, Hamilton is on route, as are some smaller towns like Matamata, so overall the three New Zealand cities plus smaller towns combined population is significantly bigger. If you wanted to catch a train from Tampere to Oulu during the week you could hop on the night train coming through from Helsinki at 2.37am. Or you could catch the 7.02, 8.02, 10.02, 12.02, 14.02, 15.02, 16.02, 18.02 and 20.02.

Emissions Reductions and Moving Freight

The draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan does not appear to place any value on the need for urgent emissions reductions, within the task of moving freight around our regions, and to and from our ports.

Where within the draft Infrastructure Plan, is there policy support that encourages reorganisation of logistics, hubs, and supply chains, away from low-energy efficiency "just-in-time" delivery?

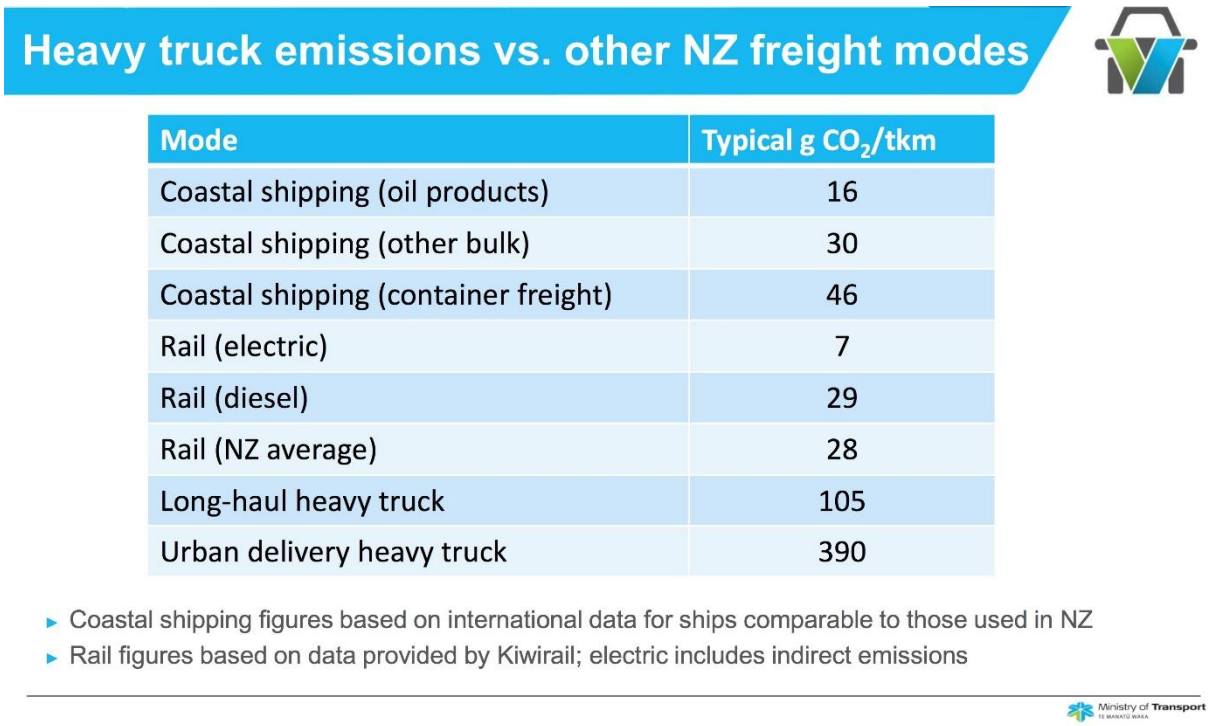
One KiwiRail project that will have a major positive impact on emissions reductions for freight and logistics, is the replacement rail-enabled ferry fleet and associated infrastructure at Wellington and Picton. It isn't even included within the National Infrastructure Pipeline. Another important project not included within the National Infrastructure Pipeline, is a major intermodal freight hub in Palmerston North, Manawatu, to support the growth of the lower North Island's logistics industry. This hub will integrate road and rail transport, including a container terminal and warehousing, and is designed to handle longer trains in the future.

Where within the draft Infrastructure Plan, is there a policy framework, supporting projects that reduce dependency on imported fossil fuels, with their long and increasingly uncertain supply chains? Where is some solid encouragement towards developing domestically produced renewable electricity, or sustainable bio-fuel sources where feasible, such as from forestry slash.

https://www.linkedin.com/posts/geoffckcooper_why-nz-gets-poor-bang-for-buck-on-infrastructure-activity-7357916234413191170-lefZ?utm_source=share&utm_medium=member_desktop&rcm=ACoAAAGI8D4BV3hWQFPH2Twpqiq-LiSB4EO-jU8

As Ministry of Transport research shows, rail – and coastal shipping – are a very low emission ways to move freight. Rail is even lower when electrified. It is also interesting to note that coastal shipping favours bulk cargo for low emissions, while rail is actually superior for containerised freight. Both modes are far superior to long-distance heavy trucks (Figure 8).

Figure 8



Source: https://www.knowledgehub.transport.govt.nz/assets/TKH-Uploads/TKC-2019/Real-world-fuel-economy-of-heavy-trucks.pdf

Figure 8 – Excerpt slide from 'Real-world fuel economy of heavy trucks', a Ministry of Transport presentation Prepared by Haobo Wang, Iain McGlinchy and Ralph Samuelson, for the Transport Knowledge Conference 2019 (5 December)

Climate Resilience

The draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan, mentions the word resilience 23 times, but only within the context of maintenance or in statements such as 'Rising investment demand reflects the need to renew, replace and build resilience into our existing infrastructure, as well as building new or improved infrastructure in response to demographic change, economic growth and decarbonisation needs.'

On rail, the draft plan pointedly observes that 'with rail, if we choose to keep our current network size, investment will need to increase, although not to the levels observed in the last 10 years.'

It is useful to consider resilience following an earthquake in the New Zealand environment. Both road and rail were out of action for many months following the Kaikoura earthquake in November 2016. SH6 through Waiau Valley, Murchsion and Lewis Pass required a substantial uptick in maintenance during this period, but was able to keep the goods moving. While Lyttelton Port was able to open within days of the February 2011 Christchurch, the full rebuild took many years to complete, after the earthquakes that hit the region in 2010 and 2011. The railway was able to be returned to freight service, within 4 days of the September 2010 earthquake. Within a number of earthquakes and weather events, roads have been able to be returned to operation quickly, where the terrain is relatively flat, however the situation can be very different where the terrain is unstable and hilly. In conclusion, resilience comes about by having multi-modal options to keep regions connected, after earthquakes and weather events.

It is unfortunate, that the draft Infrastructure Plan, did not investigate these sorts of recent real life case studies, in its methodology.

How funding rail lowers economic costs for New Zealand

A 2024 study prepared for the Australasian Railway Association, by EY highlighted a net value of rail to New Zealand of $3.3 billion annually. The study estimates the total net public benefit of rail, by modelling road network operations, in the absence of any rail transport. To put this another way, the loss of the rail network would cost New Zealand $3.3 billion annually.

The rail industry generates almost $1 billion towards GDP and $2.3 billion in environmental, safety, health and reduced road congestion benefits.

The EY report titled *The Benefit of Rail to New Zealand*, also showed that the rail industry provides 1,010 full-time equivalent jobs annually in other sectors such as construction and wholesale and retail trade on top of 5,500 jobs in rail. Rail saves travellers 8.8 million hours and 10.3 million hours of driving annually in Auckland and Wellington respectively, and results in eight less road fatalities each year (Figure 9).

https://ara.net.au/media-release/rail-industry-delivers-3-3-billion-to-the-new-zealand-economy/

Figure 9

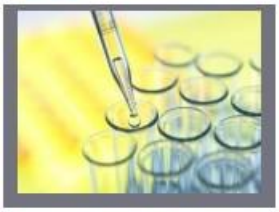
Rail Externality Benefits by Category	
	**Time and congestion savings ($1,533m per year)**: The absence of rail would cause dramatic increases in road traffic. Because highway and bus capacities are limited, urban land transport networks in New Zealand would essentially be crippled.
	**Avoid adverse health effects ($291m per year):** Diesel reliant heavy vehicles emit dangerous pollutants that limit lung development in children, increase susceptibility to infections and asthma, aggravate heart conditions, and reduce life expectancy.
	**Fuel and maintenance ($268m per year)[1]:** Heavy trucks are responsible for the majority of damage to New Zealand roads, as stress increases exponentially with axle weight. Repairs and resurfacing can be performed less frequently and at lower cost, as railway networks are more durable and cheaper to maintain. Trends towards larger, heavier trucks can be expected to exacerbate these differences over time. Rail freight and metro services also offer considerable efficiencies in the volume of petrol and diesel required for operation. Replacing these services would require over 146 million litres of additional fossil fuels to be consumed each year.
	**Avoided crashes, deaths, and serious injuries ($161m per annum)**: Rail travel involves significantly fewer crashes than road, due to the lack of structured operating environment and level of driver training. An absence of rail would lead to 8 more deaths and 202 additional serious and minor injuries combined through road crashes each year.
	**Mitigate domestic greenhouse gas emissions ($36m per annum)**: Reduced road travel leads to 400,000 fewer tonnes of carbon dioxide equivalent each year. The cost of these emissions is additional to local health impacts as gases such as carbon dioxide have a radiative forcing effect, contributing to anthropogenic climate change.

Figure 9 - The above table provides a breakdown of $2.3 billion Externality Benefits that rail provides to New Zealand. The table is from https://ara.net.au/wp-content/uploads/ARA_Benefit_of_Rail_New_Zealand_REPORT_August_2024.pdf

Without rail, New Zealand would expect a $97 million reduction in net exports, impacting NZ's performance as an "export powerhouse".

“Supporting the growth in patronage movement in major cities and increasing freight volumes through significant investment will result in the restoration of a resilient, reliable, and safe rail network, thus realising massive economic gains,” the report states.

It is disappointing that the draft New Zealand Infrastructure Commission - Te Waihanga Infrastructure Plan, has at this stage, dismissed the following KiwiRail infrastructure initiatives submitted into the National Infrastructure Pipeline (Table 5: Large Projects in the Planning Stages):

- Auckland Metro - Auckland Signalling Capacity Improvement - ASCI
- Auckland Metro - Avondale to Southdown crosstown rail corridor
- Critical Network Investment - Overdue renewals (in Auckland and Wellington)
- Auckland Metro - Southern corridor 4 tracking (Westfield to Pukekohe)

Given the clear economic benefits to metro passenger and national rail freight, derived from focussing on key rail network pinch-points in Auckland and Wellington, The Future is Rail encourages New Zealand Infrastructure Commission - Te Waihanga to support KiwiRail’s investment applications for these high value infrastructure investments.

Future Investment Opportunity:

Funding Regional Passenger Rail in the Auckland – Waikato – Bay of Plenty Golden Triangle

The Future is Rail is looking to the New Zealand Infrastructure Commission - Te Waihanga, to take a more holistic view on how transport investments other than roads, can sustainably transform the economy of a region, by investigating the way in which South East Queensland has developed, to become an economically strong and resilient region. Rail and roads, together form the backbone of the regional transport network. Public transport ridership is encouraged by 50 cent fares.

A big issue is capacity constraints within the Auckland metropolitan rail network. These challenges mean that the Hamilton-Auckland Te Huia train service for example, is slower than railcar services of 30 years ago. However, the Auckland Rail Network Programme Business Case proposes an early 2030s completion of 4-tracking between Wiri and Pukekohe. That will go a long way towards addressing speed and congestion, on the Auckland network. Further information is available here:

Of key interest are Appendices G and H: Options Development Report Parts 1 and 2.

It is time to bring back the Kamai Express linking the fast-growing areas of Tauranga, Hamilton and Auckland, especially South Auckland, and when it returns it will be electric powered. Electrification of the Golden Triangle (Auckland-Hamilton-Tauranga) rail corridor, will facilitate high frequency electric powered freight and passenger trains, through the Kaimai Tunnel.

https://www.kiwirail.co.nz/our-network/our-regions/amp/auckland-rail-program-business-case/

South East Queensland provides a great case study in how an electric rail spine network, can connect the region that spans 235km from the Sunshine Coast in the north to the Gold Coast in the south, with a busy metro commuter network operating within Greater Brisbane in-between. While the region is now home to 4 million people, the population was 1.9 million when the Gold coast line commenced construction in 1991.

By way of comparison, the current population for the main centres within the Golden Triangle rail corridor of similar ~230km distance is as follows –

- Auckland:1.716 million
- Greater Hamilton: 241,000
- Greater Tauranga:162,000

The rough total of 2.1 million people, along existing road and rail corridors, is more than enough, to begin planning and funding electrification for the Golden Triangle Rail, right now. The form of how population growth has historically occurred along these existing corridors, is with a ribbon or linear type of development, linked by road and rail. This provides the back-bone to be a great enabler of future public transport, and supporting active transport modes. This allows for population growth, with a low carbon emissions footprint.

A feature of South East Queensland; in often stark contrast to even the Auckland-Waikato-Bay of Plenty regions within Aotearoa New Zealand, is the strength and consistency of economic growth over the decades since Queensland made the decision to invest heavily infrastructure, including electric rail. While Queensland has had a multi-decade coal commodities boom, it could be similarly argued that Auckland-Waikato-Bay of Plenty regions have benefitted from a multi-decade dairy boom.

The fact of the matter is that the economic value proposition of the SE Queensland economy is compelling. This is based on a diversity and vibrancy of lifestyles, jobs, industry, housing, including as a subset of the larger economy, an important role for real estate. That is why 208,000 people born in New Zealand, call South East Queensland home.

An important facilitation strategy, that should be closely investigated within an updated New Zealand Infrastructure Commission - Te Waihanga national infrastructure plan, is the role of developer contributions in Queensland. Contributions are primarily funded through infrastructure charges levied by local governments and Economic Development Queensland (EDQ). These charges, calculated based on the type and size of development, contribute to expanding essential infrastructure like water, sewerage, transport, and community facilities. Developers can potentially also fulfil their obligations by providing trunk infrastructure directly, often through infrastructure agreements. EDQ manages a range of strategies, to plan and build for growth.

While the naysayers talk down regional passenger rail in New Zealand, South East Queensland, is a great demonstration of how affordable housing (of many mixed types from large standalone sections to apartments), and a "ute-based" lifestyle very recognisable to kiwis, has all been able to be accommodated, linked by road investments, and crucially; a low user cost, high economic value, electric rail corridor.

Figure 10

Figure 9 - South East Queensland Rail network map. The larger online map is available on; https://www.queenslandrail.com.au/forcustomers/stations-and-maps/maps

The path forwards

The Future is Rail has demonstrated, that there is a compelling case to fund rail in New Zealand, within an overall transportation eco-system, under the criteria established as the four areas of change, outlined by New Zealand Infrastructure Commission, Te Waihanga:

- Establish affordable and sustainable funding
- Clear the way for infrastructure
- Start with maintenance
- Right-size new investment

The Future is Rail looks forward to New Zealand Infrastructure Commission, Te Waihanga supporting KiwiRail infrastructure resilience and upgrades in the core Auckland and Wellington rail networks, by establishing affordable and sustainable funding, for this essential work.

As an integral part of a resilient transport network, rail will continue to have an important role to play in New Zealand nationwide. This is due to the fundamentally low-friction characteristics of steel wheel on steel rail. In New Zealand's topographically and geologically challenged landscape, the rail network stands out, as a rich legacy of well-engineered corridors, with gentle gradients, that allow for energy efficient freight operations, with a low carbon footprint. Relative to mega-highways, regional rail freight is 'right-size new investment', and the mahi needs to start with maintenance.

As with economically vibrant regions such as South East Queensland, passenger rail investments enable an inclusive and connected eco-system of communities, that will entice kiwis to stay, while also encouraging skilled immigrants to grow the local economy. A critical role for New Zealand Infrastructure Commission, Te Waihanga, is to enable or clear the way for infrastructure, through developing the right technical capabilities, to confidently support the procurement of large-scale regional building rail projects.

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[i]